THE IMPACTS OF GLOBAL OIL PRICES FLUCTUATIONS ON STOCK MARKET RETURNS: AN EMPIRICAL ANALYSIS FOR OECD COUNTRIES

A THESIS SUBMITTED TO

THE INSTITUTE OF SOCIAL SCIENCES

OF

YILDIRIM BEYAZIT UNIVERSITY

BY

AYYUCE MEMIS

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR

THE DEGREE OF MASTER OF BANKING AND FINANCE

IN

THE DEPARTMENT OF BANKING AND FINANCE

This study was supported by YBU Scientific Research Project Coordination Unit with Project number: 1348 as a Master Thesis

MARCH 2015

Approval of the Institute of Social Sciences

Prof. Dr. Zeki Salih ZENGİN

Manager of Institute

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

Prof. Dr. Nildağ Başak CEYLAN

Head of Department

This is to certify that I 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.

Assoc. Prof. Dr. Ayhan KAPUSUZOĞLU

Supervisor

Examining Committee Members

Assoc. Prof. Dr. Ali İhsan AKGÜN	(YBU, Management)	
Assoc. Prof. Dr. Ayhan KAPUSUZOĞLU	(YBU, Banking and Finance)	
Assist. Prof. Dr. Erhan ÇANKAL	(YBU, Banking and Finance)	

PLAGIARISM PAGE

I hereby declare that all information in this thesis has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work; otherwise I accept all legal responsibility.

Name, Last name: Ayyuce MEMIS

Signature:

ABSTRACT

THE IMPACTS OF GLOBAL OIL PRICES FLUCTUATIONS ON STOCK MARKET RETURNS: AN EMPIRICAL ANALYSIS FOR OECD COUNTRIES

Memis, Ayyuce

Master of Science, Department of Banking and Finance

Supervisor: Assoc. Prof. Dr. Ayhan KAPUSUZOGLU

March, 2015

Purpose of this study is to analyze the effect of fluctuations occurred in national and world oil prices to financial (Equity Share Price Index (RSP)) and macroeconomic factors (Short Term Interest Rate (IR), Industrial Production Rate (IPR)) within the scope of 19 OECD countries (Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Ireland, Israel, Italy, Netherland, Norway, Poland, Portugal, South Korea, Spain, Switzerland, United Kingdom) and to contribute to empiric studies which take place in field literature. In the study monthly data set of the period of 1994-2013 of above counties was used. For the analysis these data; stationary, cointegration and Granger tests were used. In line with the findings offered on the basis of countries, even though it is not possible to come up with a certain deduction between the energy and financial and macroeconomic factors towards all the countries, it was possible to group the related variables in relation to the countries belonging to OECD in terms of interactions among each other.

Keywords: Global oil prices, Stock market returns, Cointegration, Causality, OECD

ÖZET

KÜRESEL PETROL FİYATLARINDAKİ DALGALANMALARIN HİSSE SENEDİ PİYASA GETİRİLERİ ÜZERİNDEKİ ETKİLERİ: OECD ÜLKELERİNDE AMPİRİK BİR ANALİZ

Memiş, Ayyüce

Yüksek Lisans, Bankacılık ve Finans Bölümü

Danışman: Doç. Dr. Ayhan KAPUSUZOĞLU

Mart, 2015

Çalışmanın amacı ulusal ve uluslararası petrol fiyat dalgalanmalarının, 19 OECD Ülkesinin (Almanya, Avusturya, Belçika, Birleşik Krallık, Danimarka, Finlandiya, Fransa, Güney Kore, Hırvatistan, Hollanda, İrlanda, İspanya, İsrail, İsviçre, İtalya, Kanada, Norveç, Polonya, Portekiz) finansal göstergeleri (Hisse Senedi Fiyat Endeksi (RSP)) ve makroekonomik faktörleri (Kısa Dönem Faiz Oranı (IR), Endüstriyel Üretim Endeksi (IPR)) üzerindeki etkisini araştırmaktır. Çalışmada, yukarıda verilen ülkelerin 1994-2013 dönemi aylık verileri kullanılmıştır. Bu verilerin analizi için birim kök, eş bütünleşme ve Granger nedensellik testleri kullanılmıştır. Ülkeler bazında sunulun bulgular doğrultusunda, tüm ülkelere yönelik olarak, enerji ile finansal ve makroekonomik faktörler arasında kesin çıkarımlar ortaya koymak mümkün olmamakla birlikte, OECD kapsamında yer alan ülkelere ilişkin olarak ilgili değişkenlerin arasındaki etkileşimler açısından gruplamalar yapmak mümkün olmuştur.

Anahtar Kelimeler: Küresel petrol fiyatları, Hisse senedi piyasa getirisi, Eşbütünleşme, Nedensellik, OECD

DEDICATION

TO MY FAMILY

ACKNOWLEDGEMENTS

I would like to extend my gratitude to;

...Assoc. Prof. Dr. Ayhan KAPUSUZOĞLU for his guidance, advice, criticism, encouragement, supervision and patience throughout my studies…

… the examining committee members, Assist. Prof. Dr. Erhan ÇANKAL and Assoc. Prof. Dr. Ali İhsan AKGÜN for their precious contributions and criticisms…

…my friends Şeyma Nur MUTLU, Vesile Gülnur KARADAĞ and Nurhan TÜRE for their encouragement and invaluable friendship…

…past and present members of Banking and Finance Department; where I learned a lot and made great friends during the last 3 years...

… the Scientific and Research Project Coordination of Yildirim Beyazıt University (BAP) (Project Code: 1348)…

…my parents; Elif and Adil; my sister Emine and my brothers Ertuğrul and Ali Kutalmış for their continuous support and help.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES/ GRAPHS

LIST OF ABBREVIATIONS

BP	British Petroleum
GDP	Gross Domestic Product
IEA	International Energy Agency
OECD	Organization for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
UAE	United Arab Emirates
U.S.A	United States of America

1 INTRODUCTION

With the mechanization and industrial revolution, using energy source as an input in production made industry an indispensable factor for human life moreover, it become one of the significant inputs of economic and social development and one of the main factors of industrialization. Because of unequal distribution of energy sources –whose importance increases day by day - in earth geography, foreign-source dependency of energy importing countries raises and due to raise of energy prices, economic balance of foreign-energy dependent countries is adversely affected.

Petrol which is one of the earth primary energy sources qualified as nonrenewable energy source. Petrol is an important energy source which is used for different purposes in human life since from previous periods meets the 33% of energy consumption. In addition to this, due to establishment of OPEC, Arabian-Israel warfare which broke out after 1970 and petrol embargo applied by OPEC to Western Countries, petrol prices raised 300% in a sort time and it caused a world-wide economic stagnation as a result of countries which necessarily wanted to maintain their economic developments and continued to consume energy.

Change in oil prices which has manufacturing factors such as capital and labor affects the cash flow and increases the production cost. Raising production cost decreases cash flow thereby, it causes a decrease in stock yield. Besides, as an outcome of Central Bank raises the rate of interest in order to control increasing petrol prices and increasing inflation stock yields decreases (Basher, Sadorsky, 2006). In literature it can be frequently encountered with studies which analyze the effect of growth of petrol prices especially after 1980 (Hamilton, 1983); Burbidge and Harrison, (1984); Darby (1982), Gisser and Goodwin, (1986); Cunado and Gracia (2005), Prasad, Narayan and Narayan (2007), Farzanegan and Markwardt (2008) and so on).

Based on abovementioned reasons, purpose of this study is to analyze the effect of fluctuations occurred in national and world oil prices to financial (Equity Share Price Index (RSP)) and macroeconomic factors (Inflation Rate (IR), Industrial Production Rate (IPR)) within the scope of 19 OECD countries (Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Ireland, Israel, Italy, Netherland, Norway, Poland, Portugal, South Korea, Spain, Switzerland, United Kingdom) and to contribute to empiric studies which take place in field literature.

Study consists of 3 main parts. In first part, we look at the world energy market from a wide perspective and deal with petrol production, consumption, distribution of reserve and relationship between energy consumption and economic growth. In second part, we lay stress on petrol, history of petrol, reasons of petrol price fluctuations and its macroeconomic effects. At the end of this part, we give a place to findings of empirical study related with this study. In third part, data which is used in study, methodology and obtained empirical findings are presented. In conclusion part, obtained findings are evaluated and the comments are presented.

2 ENERGY

In this section the importance of energy was explained by making the definition of the term "energy". Then, the energy sources are stated and hence the explanation of the world energy market was provided by presenting the current data of primary energy consumption.

2.1 ENERGY: CONCEPTUAL FRAMEWORK, ENERGY SOURCES

2.1.1 The Definition and Importance of Energy

Energy is the capacity for work in a scientific sense. It was derived from the combination of the Greek words activity (energia) and work (ergon) (www.thefreedictionary.com/energy). In 1997, Stern defined the energy as the main factor of production, whereas Chontanawat and the others (2006), defined energy as a consumable that the consumer decides to buy in order to maximize the benefit in terms of demand, and as basic production inputs such as capital, labor and raw materials in terms of supply. Keskin (2007), expressed that the energy is the most important input of the economy, the conductor of world political policy and will be one of the most important determinants of social, geographical and economical order factors.

Energy, one of the most important parts of nature and the universe, is older than the history of mankind. Prior to the 1800s, people had met their energy needs with solar energy and wood burning fossil fuels at first, and then they had learnt to use the vegetable and animal sources. Magnetism, which means electricity and is located in the energy concept, was discovered by Chinese in the years 3000 BC. Oil was used without being processed for the first time in embalming the dead in ancient Egypt (Dahl, 2004:16).

The importance of energy has increased at the end of 18th century and in the beginning of the 19th century due to the growing population, rapidly developing technology with the Industrial Revolution. As a result of the outlaw of slavery and the prevalence of industrialization and mechanization, the usage of energy as an input in production factors became important (Beaudreau, 2005:212; Küçükaksoy; 2002:6).

Pokrovski (2003), expressed that the tools working with power have replaced the labor and a production output is determined by capital stock, labor and energy production factors which provide the service in the capital cases that have all characteristics of production factor.

As the distribution of energy sources are not equal in the geography of the world, some countries that have reserves are producers and most of the other countries which are facing with economic problems and demanding to obtain these energy sources are the consumers and they are affected by energy price increases. For that reason, what lies beneath the experienced hot and cold wars are the efforts to control the energy trade by owning the subject matter energy sources (Pamir, 2003). Prugh, Flavin and Sawin (2005), specified that the issue of how to meet the growing energy needs in the future pushed the countries to search new energy fields. Thus; energy, which is the significant component of power struggle, conflicts and cooperation among the countries, acquired an international dimension.

Energy is also counted as the most important component beside the human, technology and capital for the growth and development of countries. As t energy sources are hard to find and expensive and affect the price of final goods, transnational competition is reduced. For that reason obtaining the energy in a cheap or expensive way affects the transnational competition (Kaynak, 2003:69).

Alam (2006), also indicated that energy is important in planning and taking strategic decisions in countries' pre-creating the energy policies as a result of planning. Moreover, Lee and Chang (2005 and 2007), pointed out that economic downturns in the economies of countries due to the two big global energy crisis in 1974 and 1979 forced the governments to develop their energy policies, thus the relation between energy and the economy became visible.

Energy is an important component which affects the economic and social life and social welfare of the countries. For that reason, the energy consumption varies due to the economic and social development of countries. Today, the energy consumption of developing countries is half of the rich countries, and this consumption is doubled every 15 years. One of the striking points in this regard is the increase in the demand for energy depending on the population growth in developing countries whereas there are no significant changes in the total population of the developed rich countries therefore on the need for energy per capita (Anderson, 1996:10).

The cause and effect in the classification of countries such as developed, developing and underdeveloped can be new conditions in informatics technologies, the inequality in the distribution of energy sources in the geography of the world and the inequality in the distribution of energy production and consumption in the geography of the world (Kaynak, 2005:533).

2.1.2 Energy Sources

As the Constant of economic development has increased, the kinds of energy sources were increased and they were subjected to various classifications (Berberoglu, 1982:11). They have three basic characteristics such as being scarce of energy sources and their unequal distribution in the world, and causing of energy conversion to the environmental pollution (Bilginoglu, 1991:123).

The most common classification in the classification of energy sources is primary and secondary energy sources. While the primary energy sources are oil, coal, lignite, geothermal energy, natural gas and solar energy which are used as they are found in the nature without making any changes, secondary energy sources are the kinds of energy such as electrics, gas, liquefied petroleum gas which is formed through various processes of primary energy sources (Ertugrul, 2006:13; Demirbas, 2002:5).

Energy sources can be classified as renewable and nonrenewable energy sources as well. Cebeci and Gencoglu (2000), classified the renewable energy sources as water, sun, wind, biomass which are ready found in the nature. The renewable energy sources can be divided into two among themselves according to the state of matter (solid, liquid, gas) and their origin (inorganic compounds and organic compounds) (Aydın, 1999:19). The sources such as oil, natural gas and uranium, which have very limited reserves and cannot be renewed after first usage, are considered as nonrenewable sources.

Another classification can be made as commercial energy sources (coal, lignite, uranium, and oil) and non-commercial energy sources (biomass and wood) (Acikgoz, 1998:13).

Doganay (1991), also classified the energy sources as follows:

a) Underground Sources of Energy: Underground energy sources are also called as “fossil fuels”. Fossil fuels can be considered as oil, natural gas and coal. Moreover, there are some underground sources which are not fossil fuels. These are uranium, thorium and geothermal sources.

b) Surface Energy Sources: Wood, animal and plant residues can be defined as surface sources.

2.2 WORLD ENERGY PERSPECTIVE

2.2.1 Energy Consumption

2.2.2 Primary Energy Sources

According to the world energy statistics report prepared by British Petroleum (BP), the global energy consumption has increased 2.3% in 2013 according to 2012 but this percentage has been below the ten-year average which is 2.5%. Although the consumption growth, which is 3,1%, is below the average and represents the 80% of global growth in energy consumption, the consumption in OECD countries is over the average with 1,2% (BP, 2014). The International Energy Agency (IEA) predicts that the global energy demand will decrease to 1% from 2% after 2025 and in 2040, the demand will increase to 37% and the energy consumption in Europe, Japan, Korea and North America will decrease whereas it will increase in the rest of Asia, Africa, Middle East and Latin America (IEA, 2014). On the other hand, Organization of the Petroleum Exporting Countries (OPEC) predicts that there will be a 60% increase in the energy demand in 2040 (OPEC, 2014).

The production, export and import data regarding to the primary energy sources which are crude oil, natural gas, electricity and coal are provided and explained in the related tables.

The data related to the production, export and import tonnages of crude oil producer, exporter and importer countries is presented in Table 1. When Table 1 is examined, it is seen that some of the crude oil producing countries such as Saudi Arabia have realized 13.1%, Russia has realized 12.8% and the USA has realized 10.7% production which formed 36.6% world crude oil production which was 4117 million tons in 2013. When we look at the 2012 data related to oil exporting countries, we see Saudi Arabia in the first place, followed by Russia and Nigeria in second and third places and these three countries have met about 40% of the world trade amount which was 1985 million tons. When we look at the crude oil importing countries the first threes are the USA, China and India and they have met the 43.8% of world crude oil import which was 2051 million tons. Moreover, when we look at the table, we see that the USA could not meet its own crude oil need and prefers to import and is in the first place with a 21.6% in import.

Table 1 The Crude Oil Producer-Exporter-Importer Countries (Million Tons)

PRODUCER	QUANTITY (2013)	%	EXPORTER	QUANTITY (2012)	%	IMPORTER	QUANTITY (2012)	%
Saudi Arabia	540	13.1	**Saudi Arabia**	371	18.7	**USA**	442	21.6
Russia	525	12.8	**Russia**	239	12.1	**China**	269	13.1
USA	440	10.7	**Nigeria**	124	6.2	**India**	185	9,1
China	208	5.1	**Iraq**	119	6	**Japan**	179	8.7
Canada	195	4.7	**U.A.E**	118	5.9	**Korea**	128	6.2
Kuwait	165	4.0	**Kuwait**	103	5.2	**Germany**	93	4.5
Venezuela	155	3.8	**Venezuela**	93	4.7	**Italy**	74	3.6
U.A.E	153	3.7	**Canada**	90	4.6	**Spain**	60	2.9
Iraq	153	3.7	**Angola**	84	4.2	**Netherland**	57	2.8
Iran	151	3.7	**Mexico**	66	3.3	**France**	57	2.8
Others	1434	34.7	**Others**	578	29.1	**Others**	507	24.7
Total	4117	100	**Total**	1985	100	**Total**	2051	100

Source: (IEA, 2014)

According to the BP Energy Statistics report, the average price per barrel of Brent oil was 108, 66 USD in 2013 and the global oil consumption has reached to 1.4 million barrels with an increase of 1.4% compared to the previous year. The countries except OECD have met 51% of global oil consumption. Moreover, the USA has passed the growth in China since 1999 with 400.000 barrels per day in 2013 (BP, 2014). According to the world energy perspective report of the International Energy Agency (IEA), it is predicted that the oil demand will be increased from 90 million barrels per day to 104 million barrels per day with a 15.5% increase in 2040 as a result of the oil usage increase in transportation and Petro chemistry industry. OPEC predicts that the oil basket price will be 105.7 USD in 2015, 95.4 USD in 2020, 100 USD in 2035, 101,6 USD in 2040 and the oil nominal price will be 110 USD in 2015, 157.3 USD in 2035 and 177.4 USD in 2040 (OPEC,2014).

The data related to the production, export and import cubic meters of natural gas producer, and exporter and the importer countries in the world is presented in Table 2. When we examine Table 2, we see that the first three countries, the USA (19.8%), Russia (19.3%) and Qatar (4, 6%), have met the world natural gas production which was 3479 million cubic meters in 2013. Besides, 50% of global natural gas exportation was realized by Russia (23.9%), Qatar (14.3%) and Norway (12.1%) in 2013. When we look at the import data of 2013, we see that the first three countries are Japan (14.7%), Germany (9.1%) and Italy (7.4%) which form.

Table 2 Natural Gas Producer-Exporter-Importer Countries (2013 Data- Million m^3)

PRODUCER	**QUANTITY (2013)**	**%**	**EXPORTER**	**QUANTITY (2013)**	**%**	**IMPORTER**	**QUANTITY (2013)**	**%**
USA	689	19.8	**Russia**	203	23.9	**Japan**	123	14.7
Russia	525	19.3	**Qatar**	121	14.3	**Germany**	76	9.1
Qatar	161	4.6	**Norway**	103	12.1	**Italy**	62	7.4
Iran	159	4.6	**Canada**	54	6.4	**Korea**	53	6.3
Canada	155	4.5	**Algeria**	45	5.3	**China**	49	5.9
China	115	3.3	**Turkmenistan**	45	5.3	**Turkey**	45	5.4
Norway	109	3.1	**Netherland**	40	4.7	**France**	43	5.1
Netherland	86	2.5	**Indonesia**	35	4.1	**United Kingdom**	39	4.7
Arabia	84	2.4	**Australia**	26	3.0	**USA**	37	4.4
Algeria	80	2.3	**Nigeria**	22	2.6	**Spain**	30	3.6
Others	1170	33.6	**Others**	156	18.3	**Others**	279	33.4
Total	3479	100	**Total**	850	100	**Total**	836	100

Source: (IEA, 2014)

According to the BP World Energy Statistics report, the natural gas has met the 23.7% of global energy demand in 2013, and the natural gas consumption has increased 1.4% when compared with 2012. Moreover, the demand for natural gas has increased 1.8% in OECD countries as well. (BP, 2014). According to the 2014 IEA report, it is predicted that the demand for natural gas will have the fastest increase among the fossil fuels until 2040 with the contributions of China and Middle East.

The data related to the production, export and import amounts of world electricity producer, exporter and importer countries is presented in Table 3. When we examine Table 3, we see that the 45.8% of total world electricity production have been met by China (22%), the USA (18.8%) and India (5%) with a production of 22668 terawatt hours in 2012. According to the world electricity production, export data of 2012, we see that the 44.3% of 316 terawatt export was realized by Paraguay (15.2%), Canada (14.9%) and France (14.2%). When we look at the electricity importing countries, we see that about 41% of the world electricity import (totaling 320 terawatt hours) was realized by the USA (41%), Italy (13.4%) and Brazil (12.5%).

Table 3 Electricity Producer-Exporter-Importer Countries (2012 data- Terawatt Hour)

PRODUCER	QUANTITY (2012)	%	EXPORTER	QUANTITY (2012)	%	IMPORTER	QUANTITY (2012)	%
China	4985	22.0	**Paraguay**	48	15.2	**USA**	47	14.7
USA	4271	18.8	**Canada**	47	14.9	**Italy**	43	13.4
India	1128	5.0	**France**	45	14.2	**Brazil**	40	12.5
Russia	1069	4.7	**Germany**	21	6.6	**Finland**	17	5.3
Japan	1026	4.5	**Sweden**	20	6.3	**Netherland**	17	5.3
Canada	634	2.8	**Norway**	18	5.7	**U. Kingdom**	12	3.8
Germany	623	2.7	**C. Republic**	17	5.4	**Hong Kong**	10	3.1
France	559	2.5	**Russia**	16	5.1	**Belgium**	10	3.1
Brazil	552	2.4	**Ukraine**	11	3.5	**Thailand**	8	2.5
Korea	531	2.3	**Spain**	11	3.5	**Iraq**	8	2.5
Others	7290	32.3	**Others**	62	19.6	**Others**	108	33.8
Total	22668	100	**Total**	316	100	**Total**	320	100

Source: (IEA, 2014)

According to International Energy Agency report, 2.1% increase is predicted in the demand for electricity until 2040.

The data related to the production, export and import amounts of coal producer, exporter and importer countries is presented in Table 4. When we look at Table 4, we see that about 65% of world coal production (totaling 7823 million tons) was provided by China (45.5%), the USA (11.6%) and India (7.8%). Moreover, about 70% of world coal exportation was realized by the first three coal exporter countries: Indonesia (34.4%), Australia (27.2%) and Russia (9.2%). When we look at the coal importing countries 55% of world coal import (totaling 1270 million tons) was realized by China (25.2%), Japan (15.4%) and India (14%). When we examine the table it is seen that China is the first both production and import. Here we see that China cannot meet its own coal consumption need with its own sources and prefer to import coal.

Table 4 Coal Producer-Exporter-Importer Countries (2013 Data- Million Tons)

PRODUCER	**QUANTITY (2013)**	**%**	**EXPORTER**	**QUANTITY (2013)**	**%**	**IMPORTER**	**QUANTITY (2013)**	**%**
China	3561	45.5	**Indonesia**	426	34.4	**China**	320	25.2
USA	904	11.6	**Australia**	336	27.2	**Japan**	196	15.4
India	613	7.8	**Russia**	114	9.2	**India**	178	14.0
Indonesia	489	6.3	**USA**	99	8.0	**Korea**	127	10.0
Australia	459	5.9	**Colombia**	74	6.0	**Taiwan**	68	5.4
Russia	347	4.4	**South Africa**	69	5.6	**Germany**	50	4.0
South Africa	256	3.3	**Kazakhstan**	32	2.6	**U. Kingdom**	49	3.9
Germany	191	2.4	**Canada**	28	2.2	**Turkey**	28	2.2
Poland	143	1.8	**Mongolia**	17	1.4	**Malaysia**	23	1.8
Kazakhstan	120	1.5	**North Korea**	16	1.3	**Italy**	20	1.5
Others	740	9.5	**Others**	26	2.1	**Others**	211	16.6
Total	7823	100	**Total**	1237	100	**Total**	1270	100

Source: (IEA, 2014)

According to the report prepared by BP, although the 3% Constant of coal consumption in 2013 is below the 3.9% of 10 year average, it kept its place as the fastest growing fossil fuel. The share of coal (30.1%) in global energy consumption has reached the highest Constant since 1970. (BP, 2014). According to the report of the IEA, it is predicted that there will be a 15% increase in global coal demand until 2040.

2.3 ENERGY CONSUMPTION AND ECONOMIC GROWTH

2.3.1 THEORETICAL APPROACHES

There are two contrasting growth model in the literature which explain the relation between energy consumption and economic growth. In the first opinion, energy is considered to be independent from the economic growth process, whereas it is put forward that energy consumption has an influence on economic growth in the second opinion (Mehrara, 2007; Ghali and El Sakka, 2004:226).

Whilst the classical economists such as Adam Smith and David Ricardo see the energy as a free good in their studies related to the growth, Maltus insists on that the population will create pressure on limited land areas, whereas Ricardo puts forward that natural sources are subject to the Law of Diminishing Returns (Bergh; 1996:12). Besides, the classics have put forward that the net output was formed by two sectors including agriculture and industry, moreover the nature is processed by labor in agriculture and nature has no importance in industry (Alam, 2006:4).

According to the neoclassical approach, as the share of energy costs in GDP is small, the effect of energy on economic growth is neutral (Ghali and El Sakka, 2004:226). According to the neoclassical economists such as Hamilton (1983) and Burbridge and Harisson (1984), energy has a great role in the economy and they assume that if the energy amount used in industry increases, the output will increase (Aytac, 2010:483). They have seen the energy sources as intermediate goods since they asserted that the energy such as oil, electricity and plant food which are obtained from the soil are same with steel and cotton (Stern, 1999:382).

According to the economists who defend the classical view, the economic activities have a limit due to the soil and this causes diminishing returns in the factors of capital and labor.

Thus, energy is not a production factor (Alam 2006:4-6). The idea of the classical economists as the economic growth and technological developments will prevent the depletion of natural resources, including energy, market failures can be corrected through the pricing of natural sources costs and man-made capital will meet the natural capital in an unlimited manner caused them to ignore the idea that the energy consumption will affect the economic growth (Bergh, 1996: 12; Bartelmus, 2008: 39; Keong, 2003: 680-681).

In 1970s, the ecological economists such as Boulding and Georgescu-Roegen have come up with The Physical Production Theory. According to this theory, energy is accepted as a basic production factor. Unlike the idea of neoclassical economists as the economic growth will increase the energy consumption, they defended that the energy has been realizing the economic growth (Ma and Stern, 2006:494; Alam, 2006:1-2).

Whilst the first law of Thermodynamics, also known as Equivalence Principle, expresses that the total amount of all various types of energy is constant in a closed system, on the other hand the second law (productivity law) defends that an amount of energy is necessary for conversion. Except some service industry activities, all economic processes need energy and also according to the second law, usable energy and material will be unusable in a continuous and irreversible way in closed and isolated systems (Yucel, 1994; Stern 2003; Rees, 1990:19).

In 2004, Hussen put forward that the ecological economists caused environmental pollution and the depletion of natural resources as the technological developments decreased the material and energy usage. According to the biophysical production theory put forward by the ecological economists, the economic activities rendered the available energy unusable and, thus the economic growth becomes bounded (Hussen, 2004:250-252; Georgescu-Roegen, 1995:177). According to this approach, as the energy is used in the production of final goods directly, and it can be substituted for labor and labor and capital without energy is dysfunctional, energy is accepted as a basic production factor (Ghali and El-Sakka, 2004:226). However, the biophysical production theory is criticized as it sees the energy as the only production input and ignores the substitution relation between energy and other production factor in some cases and disregards the technological development (Cheveland and Stern, 1997:11-12).

Energy Value Theory was developed by Odum and Sakka and according to this theory, the value of a good is equal to the total energy used in the production. The value of energy used in the production is determined according to the (Ramos-Martin, 2002:29).

The relation between energy consumption and economic growth is examined in literature with four hypotheses (growth hypothesis, protection hypothesis, two-way hypothesis and impartiality) in terms of causality (Yilanci and Bozoklu, 2013). According to growth hypothesis, if the way of causality relation is from energy consumption to economic growth, the growth changes depending on the energy (Squalli, 2007:6). According to the protection hypothesis, if the causality is from economic growth to energy consumption, economic growth does not depend on the energy. The interaction between economic growth and energy consumption is called a two-way hypothesis. If there is no causality relation between the variables, it is called as impartiality hypothesis.

3 OIL

In this chapter, firstly the definition and general features of oil was mentioned, then the history of the fluctuations in oil prices in the world, the components that affect the oil prices and the affect channels of fluctuations of macroeconomics was explained. Finally, the theoretical approaches between energy consumption and economic growth were explained and the realized literature researches were given in tables.

3.1 OIL, THE HISTORY OF OIL, WORLD OIL RESERVES

3.1.1 The Definition and General Features of Oil

The word oil (petroleum) was derived from “petra” which means stone in Latin and “oleum” which means oil in Greek It is called as oil since it can be found in the limestone and sandstones in the underground and is a dark, adhesive and a flammable liquid. It is formed from the combination of hydrocarbons such as methane, ethane, propane and butane (Yildirim , 2003:2).

It is accepted that oil was formed by the collapse of the accumulation of strata over the animals and plants on the seabed and with the help of bacteria in a fug environment under the heat and pressure millions of years ago. Oil cannot be used to define a specific fuel such as gasoline, diesel, fuel oil, but it is a word to define the crude oil which is naturally occurring and found beneath the earth’s surface (Bayrac, 2005:2; Acar, 2007:2). Acikgoz (1998), also expressed that oil is between a layer formed from gaseous hydrocarbons and a saltwater layer which is denser than itself.

The oil produced in the world is classified by considering the features of oil such as gravity, viscosity and the amount of sulfur contained. The API (American Petroleum Industry) gravity definition is one of the basic classifications of oil. According to this, the Constant of gravity is inversely proportional to density. When the gravity is higher, the density is lower, thus it increases the quality of the oil. Gravity varies between 10 and 48 and the density of oil is calculated with the formula as follows: the density of oil = 141.5 / (131.5 + the gravity of the oil). The low viscosity oil is preferred in the world trade as it is easy to produce, transport and process. If the amount of sulfur contained in the oil is below than 0.5%, the oil is accepted as sulfur free (http://www.petform.org.tr/?lang=tr&a=2&s=1).

3.1.2 The History of Oil

The semi-solid and muddy substance seen by the people in the Middle East seeping through the cracks, which was called as 'bitumen' had been seen in Mesopotamia in the years 3000 BC. The most famous of these cracks is Hit which was near the city of Babylon, todays region of Baghdad. It was used as cement in the walls of Babylon and Jericho, paste in Noah's Ark and in the basket of Moses, and asphalt paving of the roads (Yergin, 2014; 21, 22). While the Americans used oil as a medicine to treat digestion problems, the Greek and the Romans used oil as a weapon. This weapon called as Greek fire had been used in the wars for centuries (Stern, 2011; 13).

Acar, Bulbul, Gumrah, Metin and Parlaktuna pointed out in their studies in 2007 that the first oil wells were drilled by the Chinese to obtain salt by leashing the bamboo sticks in the 4th century. The Pennsylvania Rock Oil Company thought to use this method for searching for oil in 1857 and hired Engineer Edwin Drake to search the oilfields. Finally the first contemporary oil well was drilled on 27th of August, 1859. The production, which was 450.000 barrels in 1860, reached 3 million barrels in 1862 (Yergin, 2014: 24-26).

John D. Rockefeller, established the Standard Oil that he had 27% of it on January 10th, 1870. The USA had 75% of the refining capacity in 1875. The trustify had started in the world market since the 20th century, but this sovereignty was weakened in the beginning of the 20th century and 35 companies were separated due to a court order in order to prevent monopolization (Stern, 2011:17-25).

Samuel brothers, who manufactured safe tankers for overseas transport of the oil, united with Royal Dutch Company and established the company known as Shell today in 1907 (Acar and the Others, 2007:29).

William Knox D'Arcy, who got permission from the Shah of Iran to search for oil, kept searching for oil with the financial assistance of the Burmah Oil Company and found a large oil layer in Masjed Soleyman. And in 1909 todays BP had established the Anglo-Persian Oil Company and owned 97% of it (Stern, 2011:44).

The companies defined by the Italian politician, which dominated the world oil market since 1970s comprised New Jersey Standard Oil (Exxon), New York Standard Oil (Socony later Mobil), California Standard Oil (Socal later Chevron)- these are some of the 34 companies which came up after the separation of Standard Oil owned by the Rockefeller family due to the anti-cartel law - two British Companies; Royal Dutch Shell and Anglo-Persian (BP) and two other American companies Gulf Oil and Texaco had almost tied the world to ransom (Stern, 2011:55).

The representatives of five big oil exporting countries (Saudi Arabia, Venezuela, Kuwait, Iraq, Iran) met in a conference on September 10th, 1960 and established the OPEC (Organization of Petroleum Exporting Countries) as a result of the refrain of these multinational corporations while taking a decision about the price of their own and to prevent an another discount decision for the prices which were reduced on August 9th1960 (Yergin, 2014: 493-495).

Some precautions were taken by OECD countries in order to activate the required cohesion policy rapidly and reduce the dependence of their economies on oil after the 1973-1974 oil crisis and IEA (International Energy Agency) was founded on November 15th, 1974 (Bayrac, 1999:149).

3.1.3 Oil Prices

The crude oil was classified into four different classes as it is in different quality and standard according to the extraction area (Acar and the others, 2007:44; Fattouh, 2007).

a)Brent Oil (API 38˚): this oil, which has a 38˚ gravity degree and 0.45% sulfur amount, is in the sweet oil class and formed by 15 different oil mixtures extracted from the East Shetland basin and North Sea. The price of Brent oil is determined by the International Petroleum Exchange (IPE) (Acar and the others, 2007:44; Fattouh, 2007).

b) WTI (West Texas Intermediate) Oil (API 40˚): Platts (2012) says that WTI oil is also in sweet class as it contains 0.3% sulfur and it is extracted from Texas and Oklahoma States in the USA. Its price is determined by NYMEX (Acar and the Others, 2007: 44; Fattouh, 2007; Milonas and Henker, 2001).

c) Dubai (API 32˚): the oil flowing from the Middle east to the Asia Pacific region (Acar and the Others, 2007: 44).

d) OPEC Reference Basket, in OPEC basket price the average of seven different countries' (which are the members of the organization of petroleum exporting countries) such as Saudi Arabia -Arabian Light, Dubai- Fateh, Nigeria- Bonny Light, Algeria - Saharan Blend, Indonesia- Minas, Venezuela- Tia Juana, Mexico- Isthmus is used. The six of reference oil is produced by the members of OPEC, but the seventh one (Isthmus) is produced by Mexico (http://www.tpao.gov.tr/tpfiles/userfiles/files/petrolmerak.pdf).

3.1.4 Oil Reserves

It is estimated that the life of world oil reserves is 53.3 years. The amount of reserves has increased to 1.687,9 trillion barrels with a 1.1% increase in 2013 (BP Statistical Review of World Energy, 2014).

In Table 5, the reserve amounts of country groups based on the barrel measurement as years are given according to the world energy report published by BP in June 2014.

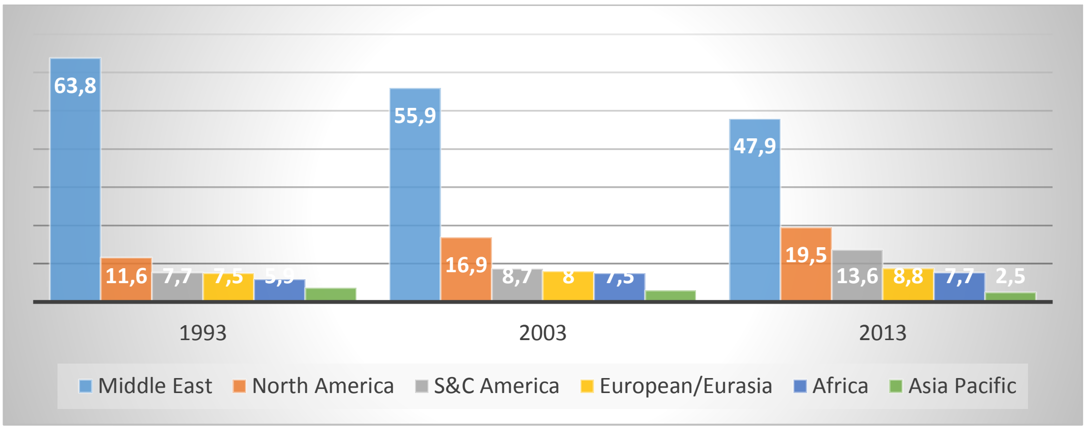
Table 5 Proven Reserve Amounts of Country Groups (Billion Barrels)

	1993	2003	2012	2013	2013 Oil Reserve Rate
OECD	140.8	2475	249.6	248.8	14.7
Non-OECD	900.6	1086.6	1437.7	1439.1	85.3
OPEC	774.9	912.1	1213.8	1214.2	71.9
Non-OPEC	206.3	325.2	342.6	341.9	20.3
European Union	8.1	8.0	6.8	6.8	0.4
Former Soviet Union	60.1	96.8	130.9	131.8	7.8

Source: (BP, 2014)

When the proved reserve amounts of country groups are examined, it is seen that the first place was taken by the countries which are not the members of the Organization for Economic Co-operation and Development in the years 1993, 2003, 2012 and 2013. And this ratio meets the 85.3% of 1.687,9 trillion barrels- the total reserve amount in 2013. On the other hand, OPEC met about 72% of world oil reserve amount, the EU member countries and former Soviet Russia countries met 7.8% with a 131.8 billion barrels reserve and the oil reserve amount of EU member countries was 0.4% with a 6.8 billion barrels reserves in 2013. In general, it is seen that there is an increase tendency in the oil reserves.

Figure 1 **The Shares of Regions in World Total Reserves (%)**



Source: BP Statistical Review of World Energy, 2014

Graph 1 was formed depending on the information in the report published by BP in 2014. The world oil reserve was 1041.4 billion barrels in 1993, 1334, 1 billion barrels in 2003 and 1687.9 billion barrels in 2013. The share of the Middle East in the total proven oil reserves was 63.8% in 1993. This share decreased to 55.9% in 2003 and 47.9% in 2013 and its share in total reserves has fallen steadily.

When we examine the Graph 1 which shows the last 20 years reserve amount of North America, South-Central America, Europe/ Asia and Africa, it is seen that the oil reserve amounts seem to be increasing whereas the oil reserves in Pacific Asia seem to be decreasing.

Table 6 The Proven Oil Reserve Amounts According to the Countries (Billion Barrels)

	2003	**2012**	**2013**	**2013 Oil Reserve Rate**
Venezuela	77.2	297.6	298.3	%17.7
Saudi Arabia	262.7	265.9	265.9	%15.8
Canada	180.4	174.3	174.3	%10.3
Iran	133.3	157.0	157.0	%9.3
Iraq	115	150	150	%8.9
Kuwait	99	101.5	101.5	%6.00
UAE	97.8	97.8	97.8	%5.8
Russia	79.0	92.1	93.0	%5.5

Source: (BP, 2014)

In Table 6, the countries which have significant shares on world oil reserves and their reserve amounts in 2013 were given. According to the table, Venezuela is in the first place in 2012 and 2013 as it realized a significant increase in its oil reserve amount. Saudi Arabia, a Middle East country with its significant oil reserves, is in the second place and it is seen that the oil reserve amounts of Saudi Arabia and all other countries was increased in the last ten years.

3.2 OIL PRICE FLUCTUATIONS, CAUSES AND MACROECONOMIC EFFECTS

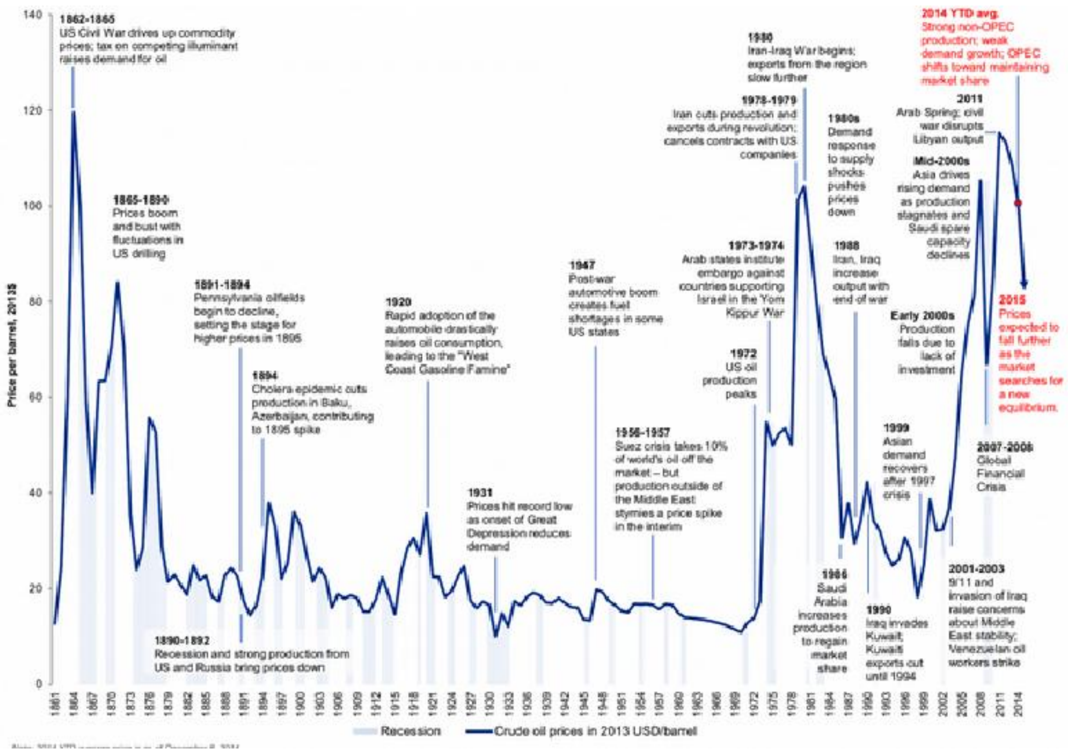
3.2.1 Oil Price Fluctuations

3.2.1.1 Oil Price Fluctuations between 1861 and 2014

The change in crude oil prices between 1861 and December 2014 was given in Figure 1. When we look at the figure, it is seen that the oil prices which were increasing until 1860s, started decreasing rapidly after the discovery of Pennsylvania oil fields. Although the oil prices seem to be in a reduced tendency with the production start of Sumatra in 1890 and the discovery of the Spindletop Texas oil field and East Texas Oil fields until 1970s, in general it is in a fixed tendency. The special reasons such as war, crisis, occupation and political instabilities became effective on oil prices since 1970s.

The first oil crisis was a result of the embargo decision of OPEC representative countries to the countries which helped to Israel after gathering in Baghdad at the end of the Arab-Israeli Conflict that started with the air raids of Egypt to Israel in 1973 which was an extension of six-day war in 1967. The oil price increased up to 11 USD from 2 USD (Hamilton, 2010; Dunstan, 2008:44).

Figure 2 Crude Oil Prices (1861-2014)



Source: (http://www.businessinsider.com/annotated-history-crude-oil-prices-since-1861-2014-12)

The overthrow of the Shah in 1978-1979, Iran's withdraw of its actives in the US financial system, the USA-Iran hostage crisis, and the famine expectation in Iraq-Iran war in 1980 caused to the second oil crisis and the oil prices increased to 34 USD from 12 USD per barrel in June 1978 and October 1981 (Pala, 2001:175).

Non-OPEC countries increased their daily production up to 10 million barrels and the demand for oil decreased 11%. Since the OPEC countries increased their production and a price of a barrel rejected to 10 USD. When Iraq occupied Kuwait in 1990, the oil price increased to 24 USD from 18 USD and due to the Asian Financial Crisis, the oil price rejected to 12 USD in 1998s (Hamilton, 2010:18).

Kohl expressed that the reason for the decline in oil prices was the remains of demand under supply, Southeast Asia Financial Crisis, the warm winter in North America and Japan, Russia's increase the oil export due to financial crisis in 1998.

When Iraq was occupied in 2003, the oil prices increased to 56 USD from 28 USD. The chaos in Iraq, Nigeria and Venezuela, Hurricane Katrina and the increasing demands of China and India caused the increase in oil prices in 2006. Towards the concerns that the US economy will have receded slowly in 2008, and because of the aggressive interest rate cuts of FED in order to prevent a recession, the oil prices increased to 130 USD from 60 USD (Acar and the Others, 2010).

The world oil price, which was 147 USD per barrel in July 2008, - average of two months was 40 USD per barrel - increased to the end of 2009 and reached 80 USD due to the demand and supply effect.

Riots and internal conflicts of people against the repressive and authoritarian regimes which started in Tunisia on November 17th, 2010 and spread to the Arab countries in North Africa and Middle East as a result of domino effect is called Arab Spring (Masetti, Korner, Forster and Friedman, 2013: 2). Due to the political instability in the Arab countries which have a significant share in world oil production and experienced Arab Spring, a decrease had happened in the oil production, thus caused an increase in oil prices (Masetti and the Others , 2013:6).

3.2.1.2 Recent Oil Price Reduction

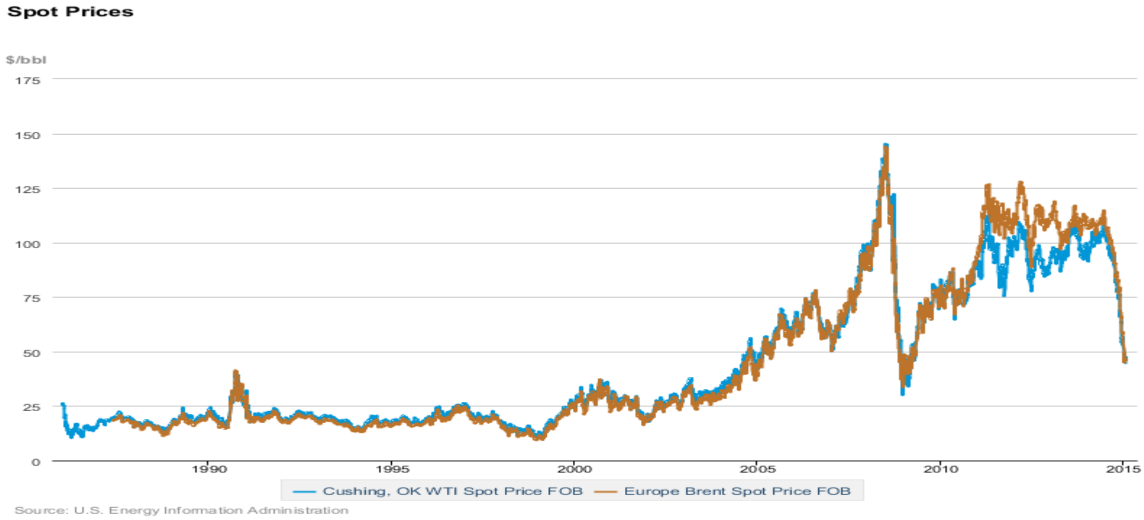
The reasons for about 50% reduction in oil prices at the end of 2014 which reached the highest oil Constant per barrel in June 2014 is divided into three as the developments in the supply-side, demand-side and international money market (Eraydin, 2015:2).

Supply-side Developments; According to the data of 2012 provided by the US Energy Information Administration the US oil production left behind the Saudi Arabia with a 13.7% production share with the developments such as geological mapping studies in horizontal drilling in shale gas and hydraulic fracturing. It is considered that the USA, which decreased the depending on oil import, will be an oil exporting country in a couple of years. The oil production increase in the south of Iraq despite the decrease in oil production in the Kirkuk region as a result of the activities of the ISIS terrorist organization under the name of the Islamic State in Iraq, the increase in oil production relative to the previous years, despite the political uncertainty in Lebanon which has a greater potential, newly discovered oil fields in the offshore region of Brazil are the supply-side developments which reduced the oil prices (Eraydin, 2015:2-4); Yildiz, Ekinci, 2015:2).

Demand-side Developments; The demand for oil have begun to decrease with the increasing energy efficiency, the policies encouraging the use of renewable energy sources in the developed countries, particularly the USA and have created an impact which lowered the price of oil (Eraydin, 2015:6).

Developments in the international money market; The USD has appreciated currency against the other currencies due to the rate hike expectation of the FED, thus it caused a price reduction primarily oil prices and other commodities (Eraydin, 2015: 9).

Figure 3 World Oil Prices (Prices of WTI and Brent $/barrel)



When we look at the course of Brent Oil and West Texas oil, which are the international oil prices in general in Figure 2, a common course is seen in both serials. It is possible to say that the effects of the oil crisis occurred in 1970s go on in the beginnings of the 1990s. A reduction in oil prices, which gathered strength at the end of 1990, draws the attention. In both two serials, the oil prices went on about 15-20 $/barrel from the second half of 1987s to the end of 1997. Here, the remarkable point is the serious increase in the oil prices since the 2000s. The oil prices, which were about 25 $/barrel in the beginnings of the 2000s have reached the 130 $/barrel in the middle of 2008 in both oil. Just a reduction as a result of the effects of the global economic crisis in 2009 draws the attention in this process. The Brent type crude oil, which reached the highest Constant of 2014 (115 $/barrel) in the middle of June, has experienced an almost 50% recession (56 $/barrel) at the end of the year. This recession has continued in January 2015.

3.2.2 The Causes of Oil Price Fluctuations

The factors that affect the oil prices are short-term (2 years), medium term (7 years) and long-term (8-20 years) according to their affecting term. The factors that affect the oil prices are supply and demand balance, the geopolitical situation, speculative news, OPEC, stocks, global crisis in the short-term; economic growth, sectorial investments, OPEC in medium-term, economic growth, alternative energy sources, climate changes, sectoral investments and OPEC in the long-term (Oktem and Demirkul, 2009:5).

The balance between the supply and demand is the most significant factor in determining the price of oil traded in the oil market, which is complex with many players and parameters as it happens in determining the price of merchandise (Tsoskounoglu and the others 2008:3798-3799). Since OPEC did not consider the increasing demand effect of economic crisis, which started in Asia between the years 1998 and 2000, and increased their production capacities, the balance between supply and demand was broken down, thus it caused a reduction in the oil prices (Kohl: 2002).

Geopolitical factors are the policies and geographical characteristics of the countries. The geopolitical factors affected the reduction in oil prices in 2008 are the events such as the failure of Iraq to provide stability at the end of the occupation, increasing nationalization as a result of the policies implemented by Venezuela, the terrorist attacks in Nigeria, continuation of nuclear activities of Iran, the increasing uneasiness as a result of Russia's intervention in Georgia in Caucasus, and occupation of Gaza (Oktem and Demirkul, 2009:7).

Financial Markets and Speculation; In 2009, Oktem and Demirkul put forward Dollar, Euro/Dollar rate, interest rate, hedge fund, mortgage crisis, financial indicators and events affected the oil prices. Also, in 2009, Kaufmann and Ulman came up with that there is a weak relation between the prices that are formed in the futures market as the oil prices are formed in the spot market.

The establishment aims of *OPEC,* founded by Saudi Arabia, Venezuela, Kuwait, Iraq and Iran on September 10th, 1960, are to protect the interests of producers and consumers in the oil market, forming a price system which guarantees the producer countries and to provide price stability by preventing the changes made by the oil corporations on the official prices without asking (Chalabi, 2004:755; Yergin, 2014:495).

As the member states of OPEC did not liaise, OPEC could not be fully effective (Hamilton: 2009, 196). The member countries of OPEC have the 71% of world oil reserves, according to the BP 2014 data. OPEC, the dominant producer in the world, creates a negative impact on the oil prices with its spare production capacity. The factors such as OPEC's being a buffer in oil supply, demand shocks, peaking or will be peaking of the non-OPEC production capacity to peak oil very soon, the lack of discovery of new reserves despite the technological developments will decrease the oil production, thus all these factors will increase the risk of global (Möbert, 2007; Horn, 2004:270-271).

When there is an oil supply safety issue, the *stocks* come into the continuity of the oil flow in the supply chain in the cases of is experienced. If the OECD countries increase their oil stocks, OPEC decreases their production quotas to prevent the decrease of the prices to previously determined Constants and not to increase the prices (Solak, 2012:122; Ortem and Demirkul, 2009:9).

In 2009, Örtem and Demirkul stated that the global financial crisis arose as the mortgage crisis in the USA in 2007 caused a liquidity shortage, thus the on the demand for oil and a price reduction of it, and also if the Constant of development of countries increases, the demand for oil will increase as well, thus there is a positive relation between economic growth and oil prices.

In 2007, Gholz and Press declared that oil research, development and made and planned investments in the production sector are sectoral investments, and these are effective on the oil price fluctuations because of finding new reserves by using the technological developments and making improvements on current reserves, however the recycling of these investments will be years later.

As oil is a scarce source, the demand for alternative energy resources have been increased, yet the natural gas prices have a parallel course to oil prices, thus the prices of alternative energy sources have affected the oil prices in medium and long-term, moreover, the natural disasters depending on the climate change such as Hurricane Katrina occurred in the USA affects the oil prices in the short-term (Solak, 2012:22).

3.2.3 The Macroeconomic Effects of Oil Price Fluctuations

The relation between oil price fluctuations and financial activity is explained with channels such as the classical supply-side effect, transfer effect, real balance effect, monetary policy, sectoral shifts, regulatory costs and uncertainty in the literature (Brown and Yucel: 2002; Brown and the Others, 2002; Lardic and Mignon, 2006).

According to the ***Classical supply-side effect;*** the increased oil prices affect the economic activity by decreasing the access to production inputs. High oil prices are the indicator that the energy, which is one of the basic inputs of production, increases the famine. As a result of this the growth and efficiency in the production output decrease. The unemployment rate, which will accelerate the inflation, will increase due to the decrease in efficiency and the growth in real wages becomes smaller. If the consumers know that the increase in oil prices is temporary or think that the short-term effect is a bigger long-term effect, they will keep their consumption constant by saving less or getting into more debt. The more getting into debt by consumers will increase the interest rate. The decrease in the production output and the increase in the real interest rate will affect a decrease in the demand for real money and an increase in the inflation rate. As a result, the increasing oil prices will cause a decrease in GDP and an increase in inflation and real interest rate. If the nominal wages are down strict, the decrease in the growth of GDP will increase the unemployment, thus decreases the growth in GDP more. The first decrease in GDP takes its source from the decrease in the labor efficiency (Brown and Yucel, 2002:195).

Income Transfer and Total Demand; The shift of purchasing power from the oil importing countries to oil exporting countries, thus the decrease in total demand in oil exporting countries and the increase in total demand in oil exporting countries is an effect of oil prices on the financial activity. Referring to the history, it is seen that the demand increase in exporting countries is less than the demand increase in importing countries. The decrease of demand in importing countries creates an impact that increases world saving supply and decreases real interest rates. The effects of decrease in the consumption are removed by the decrease of interest rate that will increase the investments and the total demand remains unchanged (Brown and Yucel, 2002:195; Brown and the others, 2002).

If the prices are down strict, the decrease in GDP increases with the decrease in the consumption of the merchandise of the oil exporting countries and the decrease in the consumption expenditures requires a lower price Constant. If the prices do not decrease, the consumption expenditures will be more than the investment expenditures, thus the economic growth will slow down. (Brown and Yucel, 2002:195-196)

The decrease in total demand requires a lower price Constant to form the new balance. If the real price Constant does not decrease, the consumption expenditures will decrease higher than the increase in the investment expenditures, thus there will be a decrease in demand and the Constant of output. The unexpected inflation increase in the decrease Constant of GDP growth is the only mechanism that provides the decrease in nominal prices and real prices (Brown and the Others, 2002:4).

Real balance effect: The increase in oil prices causes the increase in money demand. In the case that the increased money demand due to the increase in oil prices and meeting the money supply by the monetary authority, the interest rates will increase, thus the economic growth will be affected negatively (Brown and Yucel, 2002:195-196).

The Role of Monetary Policy; Money policy shapes the effects of oil price shocks. If the monetary authority keeps the growth in nominal GDP constant, inflation rate will increase in the deceleration rate in the growth in GDP (Brown and Yucel, 2002:196).

The velocity of money increases with the increase of the real interest rate due to the oil shocks, and monetary authority will increase the interest rates in order to keep the growth rate of nominal GDP constant, thus the monetary growth rate will decrease. If the monetary authority keeps monetary growth rate constant whilst the velocity of money increases, the growth rate in GDP will increase. If the monetary authority keeps the real interest rates constant the inflation and monetary growth rate will increase. If the oil price shocks do not affect the real interest rates, constant interest rate, the nominal GDP growth rate and monetary growth rate are provided with the same monetary policy (Brown and Yucel, 2002:196).

The oil price shocks increase the error potential of monetary policy at the same time. The increasing oil prices and anti-inflation monetary policy causes a slowdown in the growth rate of nominal GDP. If the wages are down strict nominal, there will be a decrease in real wages as well as efficiency, thus the unemployment will increase, there will be a decrease in total consumption and there will be a slowdown in the growth rate of GDP as well (Brown and Yucel, 2002:198).

Regulatory Costs: The increasing oil prices worsen the financial activity, but if the oil prices decrease, the situation is the opposite. However, adjustment is made due to the changing oil prices, the cost increases, and its reasons are the sectoral imbalances, coordination problems among the firms or the energy-output rate embedded in the capital stock (Brown and Yucel, 2002:199). In the case that the oil prices increase, although the individual firms know how this situation will affect their outputs and pricing decisions, they cannot predict the situation of other firms in this situation, thus the coordination problem gets bigger, the cost increases as they go edit according to their movements and leads to negative effects on economic activity (Brown and the others, 2002:8).

Uncertainty; Oil price volatility increases the uncertainty in the future oil prices and this uncertainty leads to a decrease in the investments or firms to postpone their investments. If the technology is embedded in the capital, the firms need to determine the energy density in the production process while they are purchasing capital. If the firms have higher energy prices, the investors' trust decreases and the interest rate that the firms need to pay for capital increases as well (Brown and the others, 2002:8).

3.3 THE FINDINGS OF THE EMPIRICAL STUDY

In this section, the studies related to the oil price fluctuations, and their effects on the stock market, then energy and economic growth will be presented.

3.3.1 Empirical Studies on the Impact of Oil Price Fluctuations on Stock Market

3.3.1.1 Empirical Study Findings of Conducted on Single Country

Hamilton (1983), formed a six-variable VAR model which contains three-month real GDP of 1948:2-1980:3, unemployment, M1 money supply and three price variables in the USA. Granger has concluded that the increase in oil prices has led to a decrease in real GDP growth.

Gisser and Goodwin (1986) have investigated the effects of oil price shocks on macroeconomic indicators with the help of Granger causality test, Chow test and Geweke-Sims causality tests by using the quarterly data of 1961:1-1982:4. In the study it is concluded that the crude oil prices have a significant effect on several indicators beside its real and inflationist effect.

Considine (1988) has investigated the macroeconomic effects of the decrease in oil prices in the USA by using the Simulation Method and annual data in the periods 1960-1979. He identified that the most important effect of the decrease in oil price is the exact but the temporary decrease in the inflation.

Brown and Yucel (1999) have examined the relation between oil price shocks and total financial activity in the USA with impulse response function and variance research methods by using the annual data in the periods 1965:1-1997:12. They found that according to the impulse response analysis the increase in oil prices caused a decrease in GDP, and increase in federal funds and interest rates as well as price levels.

Sadorsky (2001) has investigated the relationship between the exchange rate, oil prices, interest rates and stock returns by using the multi factor market model for Canada in the period 1983:4-1999:4 and has concluded that the subject matter variables have affected the returns in the oil and gas sectors significantly.

Papapetrou (2001) has investigated the relationship between oil prices, stock prices, real financial activity and employment in Greece by using Cointegration, VAR Model, impulse response function, variance research methods and the annual data in 1989:1-1999:6. The Empirical results showed that the oil price has a negative impact on industrial production and employment; moreover the oil price effect on the change in the stock prices is significant.

Cong and the others (2008) have investigated the interaction between oil prices and Chinese Stock Market by using the VAR model and monthly data for the period 1996-2007 and have concluded the study that many of the Chinese stock indexes were affected by the oil price shocks except the manufacturing index and some oil companies.

Iscan (2010) has examined the relation between oil prices and stocks by following up the BIST100 index daily data and using the Cointegration and VAR based Granger causality test in the period 03.12.2001-31.12.2009. It is identified in the study that there is no relation between oil prices and stock prices.

Guler and the others (2010) have implemented the Cointegration and Granger causality tests to investigate the impact of fluctuations in oil prices on energy companies in IMKB (Istanbul Stock Exchange) for the periods 2000:7-2009:8 and as a result, they came across that there was a long-term relationship between Brent oil and stocks.

Kapusuzoglu (2011) has examined the long and short-term relations between international Brent oil and BIST100, 50 and 30 by using the Cointegration test of Johansen and Juselius and Granger causality tests for the period 04.01.2000-04.01.2010. In the study, it is identified that there is a long-term relation between international Brent oil and the selected indexes of BIST, and a unidirectional causality from Brent oil price to the indexes.

Berk and Aydogan (2012) have examined the relation between Brent oil prices, global financial liquidity conditions and BIST100 index by using VAR model for the period 02.01.1990-01.11.2011 by dividing it into three sub-periods (02.01.1990-15.11.2001, 16.11.2001-11.07.2008, 14.07.2008-1.11.2011). In the study, stock market returns of global financial liquidity are explained in the best way and it is identified that the impact of oil prices is less than the liquidity constraints.

Adaramola (2012) has examined the relation between the oil prices in Nigeria and the stock returns by using a Cointegration test of Johansen and Granger causality tests for the period

1985:01-2009:04. In the study, it is identified that the stock returns against the oil price shocks gave a positive response in short-term but negative response in the long-term.

Dagher and Hariri (2013) have examined the interaction between the daily oil prices and prices of various Lebanese stocks by using VAR models and impulse response analysis test for the period 16.10.2006-07.10.2012. In the study, it is identified that the oil prices are the Granger cause of stock prices and the attitudes of all stocks against the oil shocks were on the same day and the following day that the oil shock occurred.

Yildirim, Bayar, Kaya (2014), have examined the effects of international crude oil and natural gas prices on the stocks of the industrial companies in BIST by using the Cointegration test of Johansen and Juselius, Granger causality tests and regression analysis for the period 1991:01-2013:11. As a result of the study it is identified that there is a long-term relation between crude oil and natural gas indexes and BIST industry index.

Kumar (2014) has studied the impact of oil prices on Indian stock market and exchange rate by using the monthly data and unit root test and Cointegration tests for the period 2003:01-2012:01. In the study, it is identified that the exchange rate, prices of oil and stock are not cointegrated. Moreover, Kumar also used the diffusion index method of Diebold and Yılmaz to analyze the diffusion volatility effects between oil price, stock market and exchange rate and returns. In the study, it is identified that the oil prices affect the stock market and exchange rate according to the diffusion results, and also oil prices just affect the stock market according to the diffusion volatility.

3.3.1.2 Empirical Study Findings of Conducted on Countries

Lienert (1981) has done simulation studies to examine the short-term effects of oil price increases in Denmark, Finland, Norway and Sweden by using INTERLINK Model and he concluded that the output loss of Finland is less than the other three countries due to the increase in oil prices in 1979-1980.

Le and Chang (2011) have examined the response of Japanese, Singapore, South Korean and Malaysian stock prices to the volatility in oil prices for the period 1986:01-2011:02. In the study, it is identified that the Japanese stock prices responded positively, whereas it responded negatively in Malaysia and the response in Singapore and Korea was uncertain.

Dhaoui and Khraief (2014) have examined the connection between oil prices and stock returns of selected 8 countries by using GARCH and EGARCH-M model tests and the monthly data for the period 1991:01-2013:10. In the study it is identified that there is a strong negative connection between oil prices and stock returns in the selected 7 countries, but the changes in oil prices have no significant effect on the Singapore stock market.

3.3.1.3 Empirical Study Findings of Conducted on Country Groups

Darby (1982) has tested the significance of oil price changes for 8 countries (the USA, England, Canada, France, Germany, Italy, Japan and Netherlands) with Lucas-Barro real income equation by using the quarterly data for the period 1957-1976 and predicted the impact of 1973-1974 oil crisis on real income and price Constant by using the Mark IV Simulation Model in 1982. According to the results of regression study, it is concluded that the increase in oil prices in 1973:1-1976:4 caused a decrease in the real incomes of investigated eight countries, according to the simulation, when the oil price shocks are included in the total production function, it creates significant changes in the GDP of 5 OECD countries except France, Italy and Japan.

Burbidge and Harrison (1984) have examined the impact of increasing oil prices of the economies of 5 OECD countries which are the USA, Japan, Germany, England and Canada by using the VAR Model and impulse response function and the monthly data of the period 1861:1-1982:6. In the study, they have concluded that the impact of oil price shocks has a significant impact on the economies of the USA and Canada, and the impact is also significant, but less for the other countries and the oil price has a greater impact in the US and English industrial production.

Cunado and Gracia (2003) have examined the impact of oil prices on macroeconomics for 15 European Countries by using the Cointegration, Granger, VAR, impulse response analysis and the quarterly data of the period 1960-1999 and as a result, they have obtained the findings that the oil prices have a permanent impact on inflation and asymmetrical effect on growth in production in the short-term.

Lardic and Mignon (2006) have investigated the relation between oil prices and GDP for 12 European Countries by using the Linear and Asymmetrical Cointegration tests and the quarterly data for the period 1970:1-2003:4 and as a result it is found that there is an asymmetrical cointegration between oil prices and GDP in most of the countries examined. Lardic and Migron, in another study in the same year, have investigated the relation between oil prices and GDP by using the Linear and Asymmetrical Cointegration tests on the economies of the USA, G-7 countries, Europe and Eurozone and the quarterly data for the period 1970:1-2004:3 and determined an Asymmetrical Cointegration between these two variables as a result of the study.

Basher and Sadorsky (2006) have measured the relation between the oil prices and stock returns of developing countries by using the International Multi-factor method and the daily data for the period 1992:12-2005:10 and as a result, they have extrapolated that the oil price risks impact the stock returns in developing countries.

Magyereh and Al-Kandari (2007), have measured the relation between oil prices and the stocks in the Gulf countries by using the nonlinear cointegration analysis in the period of 1996:1-2003:12 and the nonlinear long-term relation between the variables was identified in the study.

Arouri and Rault (2010) have investigated in the countries of the Cooperation Council for the Arab States of the Gulf by using the Granger causality analysis and weekly data of the period 2005:6-2010:5 and as a result of the investigation, they concluded that there is a bi-directional causality relation between the stock market and the oil prices in Saudi Arabia and on the other hand, oil prices are the Granger cause of the stock price changes in other countries.

Talukdar and Sunyaeva (2012) have examined the impact of oil shocks on the stock returns in 11 OECD countries by using VAR models and the impulse response test in the period of 1980:01-2010:12. In the study, they identified that the shocks on oil prices have a negative effect on the real stock returns depending on the oil exporting and importing countries.

Asteriou, Dimitrasu and Londewig (2013) have examined the impact of oil price fluctuation on stock market and exchange rate in oil importing and exporting countries by using VAR models and Granger causality tests in the period of 1998:01-2008:12. In the study, they have identified that the oil prices affect stock market more than interest rates in short and long-terms and oil prices have more impact on the stock market in oil importing countries than oil exporting countries.

Asteriou and Bashmakova (2013) have examined the relation between oil price risk and stock market returns in 10 Middle East and Eastern European countries by using the International Multi-factor model in the period of 22.10.1993-23.08.2007. As a result of the study, they identified that oil price is a significant factor in the determination of stock returns.

Cunado and Gracia (2014) have examined the impact of oil shocks on stock returns in 12 European oil importing countries by using VAR and VECM tests in the period of 1973:02-2011:12. In the study, they have identified that the changes in oil prices have a negative and significant impact on stock markets in many European countries and stock markets are directed by the oil supply shocks.

3.3.2 Empirical Study Findings on Relationship Between Energy and Economic Growth

3.3.2.1 Empirical Study Findings of Conducted on USA

The first study to measure the relation between Energy and Economic growth in the USA was made by Kraft and Kraft (1978) by using the SIMS Technique for the periods of 1947-1974. As a result of the study, a one-way relation from growth to energy consumption was identified. However, unlike the studies of Kraft and Kraft in 1978, Bowden and Payne (2009) have determined a one-way relation from energy consumption to economic growth by using the data of the period of 1949-2006 in the USA.

As a result of data obtained from the studies of (Akarca and Long, 1980) who used Granger causality test for the period of 1973-1978, Yu and Jin (1992) who used Cointegration test for the period of 1974-1989, Cheng (1995) who used Cointegration and Granger causality test for the period of 1947-1990, they failed to reach the causality relation between energy consumption and growth.

Stern (1993) has identified a two-way relation between energy and the growth as a result of the data of the period of 1947-1990 used in Granger test in the USA, on the other hand, Stern also identified that there is a cointegration between energy consumption and economic growth as a result of the data of the period of 1948-1994 used in Cointegration test in 2000.

3.3.2.2 Empirical Study Findings of Conducted on Single Country

Chang and Lai (1997) failed to reach a two-way relation between economic growth and energy consumption as a result of the data of the period of 1955-1993 used in Cointegration and Granger tests in Taiwan.

Terzi (1998) has identified a two-way relation between energy consumption and economic growth by using Granger and VECM tests in the period of 1950-1991, Jober and Karanfil (2007) have concluded a relation from economic growth to energy consumption by using Granger test in the period of 1960-2003, Yalta (2011) has identified a neutral relation between energy consumption and economic growth by using Cointegration test in the period of 1950-2006 in the studies realized for Turkey.

Gahli and El-Sakka (2004) have identified a two-way relation between energy consumption and economic growth by using the Cointegration and Causality tests as a result of the study realized in Canada including the data for the period of 1961-1997.

Paul and Bhattacharia (2004) have determined a two-way relation between energy consumption and economic growth by using the Cointegration and Granger tests as a result of the study realized for India including the data for the period of 1950-1996.

Zamani (2007) has determined a causality relation from economic growth to energy consumption by using the Cointegration and Granger tests to analyze the data obtained for the period of 1967-2003 as a result of the study realized for Iran.

Ang (2008) has identified a causality relation from economic growth to energy consumption by using the Cointegration and VECM tests in the period of 1971-1999 as a result of the study realized in Malaysia.

Tsani (2010) has identified a one-way causality from energy consumption to economic growth by using the Granger, VAR tests for the period of 1960-2006 as a result of the study realized in Greece.

3.3.2.3 Empirical Study Findings of Conducted on Country Groups and Multiple Countries

Yu and Choi (1985) have identified a causality relation from energy to growth in the Philippines and a causality relation from growth to energy in the Republic of Korea by using the Granger Causality test in the period of 1954-1976 as a result of the studies realized for the Philippines and Republic of Korea.

Glasure and Lee (1997) have identified a one-way causality from energy consumption to economic growth in Singapore but failed to reach the existence of a relation in South Korea by using the Cointegration test in the period of 1901-1990 as a result of the study realized for South Korea and Singapore.

Soytas and Sarı (2003) have determined a causality relation from energy to economic growth by using the Granger and VECM analysis in the period of 1950-1992 as a result of the study realized for 10 countries and G7 (totally 16 countries).

Lee and the others (2008) have determined a two-way relation between energy consumption and economic growth by using Panel Cointegration and Panel VECM analysis in the period of 1960-2001 as a result of the study realized for 22 OECD countries.

Bozoklu and Yilanci (2013) have determined causality from energy consumption to economic growth by using the Causality test in the period of 1970-2011 as a result of the study realized for 22 OECD countries.

Table 7 The studies for explaining the relation between oil price fluctuations and their impact on the stock market

Author(s)	Year	Period	Countries	Used Method	Conclusion
Lienert	1981	1979-1980	Denmark, Finland, Norway, Sweden	Simulation	It is obtained that the oil prices increase in 1979-80 and the output loss of Finland is less than the other three countries.
Darby	1982	1957-1976	The USA, England, Canada, France, Germany,Italy, Japan,Netherlands	Simulation	The increase in oil prices causes a decrease in real income.
Hamilton	1984	1948:2-1980:3	The USA	VAR, Granger	The increase in oil prices causes a decrease in GDP.
Burbdge and Harrison	1984	1861:1-1981:6	The USA, Japan, Germany, Canada, England	-VAR - impulse Response	The impact of oil prices to economy: -It is important for the economies of the USA and Canada -The impact is important but less in other countries
Gisser and Goodwin	1986	1961:1-1982:4	The USA	Granger, Chow Test	Crude oil prices; - Real and inflationist effect -a significant effect on many macroeconomic indicators
Considine	1988	1960-1979	The USA	Simulation	The reduction in oil prices; - causes an exact but temporary decrease.

Brown and Yucel	1999	1965:1-1997:12	The USA	Impulse Response Function Variance	The increase in oil prices causes; -a decrease in GDP, -an increase in Federal fund and interest rates as well as price Constants.
Sadorsky	2001	1983:4-1999:4	Canada	Multifactor Market Model	Exchange rate, oil prices and interest rates, -affect the oil and gas sectors significantly.
Papapetrou	2001	1989:1-1999:6	Greece	- Cointegration -VAR Model -Impulse Response Function -Variance Research	Oil prices, -have a negative effect on industrial production and employment -have a significant effect on stock price changes.
Cunado and Gracia	2003	1960-1999	15 European Countries	-Cointegration -Granger -VAR -Impulse Response Analysis	Oil prices, -have a permanent effect on inflation -have an asymmetric effect on the growth rate in short-term production.

Lardic and Mignon	2006	1970:1-2003:4	12 European Countries	-Linear and Asymmetric Cointegration	-There is an asymmetric cointegration relation between oil prices and GDP.
Lardic and Mignon	2006	1970:1-2004:3	The USA G-7 Countries, Europe, Eurozone	-Linear and Asymmetric Cointegration	- There is an asymmetric cointegration relation between oil prices and GDP.
Basher and Sadorsky	2006	1992:12-2005:10	Developing Countries	-International Multi-Factor	-The oil price risks affect the stock returns.
Magyereh and Al-Kandari	2007	1996:1-2003:12	Gulf Countries	-Nonlinear Cointegration	-There is a nonlinear long-term relation between oil price risks and stock returns.
Cong and the Others	2008	1996-2007	China	-VAR	Oil price shocks, -affect the Chinese stock indexes except the manufacturing index and some oil companies
Iscan	2010	03.12.2001-31.12.2009	Turkey (BIST100)	- Cointegration -VAR based Granger	- There is no relation between oil prices and stock prices

Guler and the Others	2010	2000:7-2009:8	Turkey	- Cointegration - Granger	-There is a long-term relationship between Brent oil prices and stocks.
Arouri and Rault	2010	2005:6-2010:5	Cooperation Council for the Arab States of the Gulf	- Granger	Saudi Arabia; bi-directional causality between stock market and oil prices - Oil prices are the Granger cause of the stock price changes in other countries.
Le and Chang	2011	1986:01-2011:02	Japan, Singapore, South Korea, Malaysia	- Impulse Response -Variance	The respond of stock prices to the volatility in oil prices - Japan (+) - Malaysia (-) -Singapore and Korea (uncertain)
Kapusuzoglu	2011	04.01.2000-04.01.2010	Turkey (BIST100, 50 and 30 indexes)	-Johansen and Juselius Cointegration -Granger	- A long-term relationship between Brent Oil prices and BIST indexes -unidirectional causality from Brent oil price to the indexes

Berk and Aydogan	2012	02.01.1990-01.11.2011	Turkey (BIST100)	-VAR	- Stock market returns of global financial liquidity are explained in the best way and it is identified that the impact of oil prices is less than the liquidity constraints
Adaramola	2012	1985:01-2009:04	Nigeria	-Johansen Cointegration, Granger	Against the oil price shocks stock returns in short-term(+) Long-term (-)
Talukdar and Sunyaeva	2012	1980:01-2010:12	11 OECD countries	-VAR	- They identified that the shocks on oil prices have a negative effect on the real stock returns depending on the oil exporting and importing countries.
Asteriou, Dimitrasu and Londewig	2013	1998:01-2008:12	Oil Exporting and Oil Importing Countries	-VAR -Granger	- They have identified that the oil prices affect stock market more than interest rates in short and long-terms and oil prices have more impact on the stock market in oil importing countries than oil exporting countries
Asteriou and Bashmakova	2013	22.10.1993-23.08.2007	10 Middle East and Eastern Europe Countries	- Multiple Factors	-They identified that oil price is a significant factor in the determination of stock returns.
Cunado and Gracia	2013	1973:02-2011:12	12 European Countries	-VAR -VECM	The changes in oil prices

					- have a negative and significant impact on stock markets in many European countries and stock markets are directed by the oil supply shocks.
Dagher and Hariri	2013	16.10.2006-07.10.2012	Lebanon	-VAR - Impulse Response	- The oil prices are the Granger cause of stock prices and the attitudes of all stocks against the oil shocks were on the same day and the following day that the oil shock occurred
Yildirim, Bayar, Kaya	2014	1991:01-2013:11	Turkey	-Johansen-Juselius Cointegration - Granger	-They have identified that there is a long-term relation between crude oil and natural gas indexes and BIST industry index.
Kumar	2014	2003:01- 2012:01	India	-Impulse Response -Diffusion index of Diebold and Yılmaz	-The exchange rate, prices of oil and stock are not cointegrated. -The oil prices affect the stock market and exchange rate. -Oil prices just affect the stock market, according to the diffusion volatility
Dhaoui and Khraief	2014	1991:01- 2013:10	8 Countries	-GARCH and EGARCH-M model	- There is a strong negative connection between oil prices and stock returns in the selected 7 countries. -The changes in oil prices have no significant effect on the Singapore stock market

Table 8: The studies for explaining the relation between energy consumption and economic growth

Author(s)	**Year**	**Period**	**Countries**	**Used Method**	**Conclusion**
Kraft and Kraft	1978	1947-1974	The USA	Sims Technique	A one-way relation from growth to energy consumption was identified.
Akarca and Long	1980	1973-1978	The USA	Granger Causality	There is no causality relation between energy consumption and growth.
Yu and Choi	1985	1954-1976	Philippines and Republic of Korea	Granger Causality	There is a causality relation from energy to growth in the Philippines and a causality relation from growth to energy in the Republic of Korea.
Yu and Jin	1992	1974-1989	The USA	Cointegration Test	There is no causality relation between energy consumption and growth.
Stern	1993	1947-1990	The USA	Granger Causality	There is a two-way relation between energy and economic growth
Cheng	1995	1947-1990	The USA	Cointegration and Granger Causality	There is no relation between energy consumption and growth.

Glasure and Lee	1997	1961-1990	South Korea Singapore	Cointegration	There is no relation between energy and economic growth in South Kore but there is a one-way causality from energy consumption to economic growth in Singapore.
Cheng and Lai	1997	1955-1993	Taiwan	Cointegration, Granger	There is a two-way relation between energy and economic growth.
Terzi	1998	1950-1991	Turkey	VECM, Granger	There is a two-way relation between energy and economic growth.
Stern	2000	1948-1994	The USA	Cointegration	There is a cointegration between energy and growth.
Soytaş and Sarı	2003	1950-1992	10 Developing Countries and G7 (16 Countries)	Granger, VECM	There is a causality relation from energy consumption to economic growth.
Ghali and El-Sakka	2004	1961-1997	Canada	Cointegration, Causality	There is a two-way relation between energy consumption and economic growth.
Paul and Bhattacharia	2004	1950-1996	India	Cointegration and Granger	There is a two-way relation between energy consumption and economic growth.
Zamani	2007	1967-2003	Iran	Cointegration and Granger	There is causality from economic growth to energy consumption.
Jober and Karanfil	2007	1960-2003	Turkey	Granger	There is causality from economic growth to energy consumption.
Ang	2008	1971-1999	Malaysia	Cointegration and VECM	There is causality from economic growth to energy consumption.
Lee and the others	2008	1960-2001	22 OECD Countries	Panel Cointegration and Panel VECM	There is a two-way relation between energy consumption and economic growth.

Bowden and Payne	2009	1949-2006	The USA	Causality	There is a one-way causality from energy consumption to economic growth.
Aytac	2010	1975-2006	Turkey	Granger, VAR	There is no causality between total primary energy consumption and economic growth.
Tsani	2010	1960-2006	Greece	Granger, VAR	There is a one-way causality from total energy consumption to economic growth.
Yalta	2011	1950-2006	Turkey	Cointegration	There is a neutral relation between energy consumption and economic growth.
Bozoklu and Yilanci	2013		20 OECD Countries	Causality	There is causality from energy consumption to economic growth.

4 DATA SET AND METHODOLOGY

This chapter contains information related to the analyzed data in the study and the econometric method and models applied in the analysis of these data.

4.1 Data Set

In the study monthly data set of the period of 1994-2013 of 19 OECD countries (Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Ireland, Israel, Italy, Netherland, Norway, Poland, Portugal, South Korea, Spain, Switzerland, United Kingdom) was used. Other countries in the OECD are excluded from the study due to lack of data related to the period.

The basic variables used in the study are Stock Price Index, Inflation Rate, Industrial Production Index, Short-term Interest Rate, Brent Oil Price (USD per barrel), Exchange Rate, Consumer Price Index and Producer Price Index. The data related to stock price index, inflation rate, industrial production index, short-term interest rate and producer price index of these variables were obtained from OECD database, the data related to the exchange rate was obtained from the USDA data service, Brent Oil prices were taken from the International Energy Agency databank, and the data on Producer Price Index were obtained from the US Department of Labor: Bureau of Labor Statistics.

The variables obtained were made real before the empirical study. Brent oil price and exchange rate of each country were deflated with the consumer price index for real local oil prices, and Brent Oil price is deflated with the producer price index for real world oil prices.

For real stock returns for each country, firstly the joint return was calculated then the logarithm of the difference of consumer price index compared to the previous month was taken (Ex. Sadorsky, 1999, Park and Ratti 2008, Cunado and Gracia 2014). The real stock returns were obtained by taking the difference of the first-degree logarithm of consumer price index from the logarithm of joint stock returns.

For real industrial production, nominal industrial production was deflated with the consumer price index for each country. The short-term nominal interest rate was used as the interest rate. E-Views 7.0 package program was used to analyze the data.

4.2 Econometric Methods

In this section, the econometric methods and the models to be used in the implementation while examining the impact of oil price fluctuations on the stock market in the OECD countries will be explained.

Variables must be stationary in time serials. Studying the variables in time serials which are not stationary will cause a spurious regression which means that the obtained results will not reflect the reality (Gujarati, 2006:722). For that reason the first methodological implementation should be stationary analysis of the serial. After the explanations of the Augmented Dickey Fuller (ADF) test, Philips-Peron (PP), Kwaitowski, Phillips, Schmidt and Shin (KPSS) tests which will be used in examining the stationary of its serial, the existence of the long-term relation among variables will be investigated with Johansen Juselius Cointegration test and then Granger Causality Analysis methods will be examined to determine the direction of the relation.

4.2.1 Stationary Analysis- Unit Root Test

If the average and variance do not change with time and only if there is a process of common variance between two periods which does not depend on the period that the common variance was calculated, but the distance between two periods, it is called stationary (Gujarati, 2006: 713). If the Yt serial should be stationary, it should have the following conditions.

$$\text{Constant Arithmetic Mean: } E(Y_t) = \mu \qquad \textbf{(1)}$$

$$\text{Constant variance: } Var(Y_t)=E(Y_t - \mu)^2=\sigma^2 \qquad \textbf{(2)}$$

$$\text{Covariance depending on the delay distance: } \gamma_k = E\ [(Y_t - \mu)(Y_{t+k} - \mu) \qquad \textbf{(3)}$$

(For all t values) k is the delay distance and if the time serial does not have the above conditions, it is not stationary (Gujarati, 2006:713-714).

A way to test the stationary is a Unit Root test. While testing, $Yt=Y_{t-1}+ \mu_t$ (AR1) model is used. Here, μt is used for the term error 'white noise', with constant variance, corresponding to the classical assumptions. In this regression, finding the P coefficient as one, in other words the regression's being $Y_t = pY_{t-1} + \mu_t$ indicates that there is a unit root problem in the serial. It means that this serial is not constant and the trend of serial over time is stochastic. A time serial which has a unit root is called as random walk. The number of unit roots in a serial is equal to the number of differences that should be taken till the serial becomes constant. If the Yt serial becomes constant when its first-degree difference is taken, the serial becomes constant from the first-degree and indicated as I (1). In general, if the serial becomes constant when the number of difference is taken d times, the serial becomes constant from the d degree and indicated as I (d) (Gujarati, 2006:718-719).

H_0: $\beta = 0$ hypothesis means that the serial is constant and tau (τ) statistics developed by Dickey Fuller (1979) is used instead of t test which cannot be used as it is not dispersed around zero while testing this hypothesis. If the absolute value of tau statistics is bigger than the absolute value of MacKinnon critical values in various significance levels, then the time serial is constant, in other words the basic hypothesis is rejected and the alternative hypothesis is accepted.

Augmented Dickey-Fuller (ADF, 1991) is obtained by adding the delay difference values to Dickey Fuller test and thus it corrected the Dickey-Fuller test against the autocorrelation problem. The regression of ADF test is given below. The variables in the equation are: Δ first difference operator, t time trend, m lag length, $\mathcal{E}$ term error, α and δ coefficient parameters.

$$\Delta Y_{t=} \alpha_0 + \alpha_1 t + \delta Y_{t-1} + \delta_i \sum_{t=1}^{m} \Delta Y_{t-i} + \mathcal{E}_t \qquad \textbf{(4)}$$

The most important topic is the determination of lag length while implementing the ADF test and main criteria are used. The most referenced lag length criteria are Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), Hannan-Quinn (HQ) Information Criterion and Akaike's Final Prediction Error (FPE) Information Criterion.

Philips-Perron (PP, 1988) has developed a nonparametric unit root test to measure the stationaries of time series. This test allows the error term weakly dependent and heterogeneous dispersion (Enders, 1995). In the regression model equation developed for PP test, Δ indicates the first difference operator; t indicates a time trend, ε indicates term error, α indicates coefficient parameters.

$$\Delta Y_{t=} \alpha_0 + \alpha_1 Y_{t-i} + \varepsilon_t \quad \textbf{(5)}$$

Here, lack of internal connection among the error terms or homogeneity assumption is not required. The test statistics are compared with critical table values used for Augmented Dickey Fuller (ADF) test statistic in Phillips-Perron unit root test. Similar to ADF test, if the absolute value of tau statistic is bigger than the absolute value of MacKinnon critical values, the H_0 hypothesis which indicates that there is a unit root problem is rejected, namely the serial is stationary, and if the absolute value of tau statistic is smaller than the absolute value of MacKinnon critical values, the basic hypothesis which puts forward that there is a unit root problem in the serial is accepted.

The objective of the KPSS unit root test put forward by Kwiatkowski-Phillips-Schmidt-Shin (KPSS, 1992) is to ensure the stationary of the serial by purging the deterministic trend in the observed time serial. However, the hypothesized unit root hypothesis in KPSS test is different from the hypothesis in ADF and PP tests. In this test, on one hand H_0 puts forward that the serial is stationary and does not include unit root, on the other hand H_1 defends that there is a unit root in the serial and it is not stationary. The lack of a unit root in the serial which was purged from the trend indicates the stationary of the trend. For that reason, the variance of obtained the random walk hypothesis will be zero. Similar to LM test, KPSS test is determined as given below. Here, w_t represents the random walk of the model; t represents the deterministic trend, and e_t represents the stationary residuals.

$$Y_t = \beta_t + w_t + e_t \quad \textbf{(6)}$$

$$w_t = w_{t-1} + w_t \, (\sigma_u^2 = 0) \quad \textbf{(7)}$$

The situation of whether the residuals of the given above serial regression and its purged deterministic trend is equal to zero is checked in order to calculate the KPSS test. In the given below tests statistics, S_t represents the cumulative total of the residuals and $S^2(\ell)$ represents the long-term variance predictions between residuals.

$$\bar{\eta}_{\mu} = T^{-2}\sum_{t=1}^{T} S_t^2 / s^2(\ell) \tag{8}$$

In this study, whether the time serials have unit root or not was examined primarily by the unit root tests of Augmented Dickey-Fuller (ADF, 1979), Phillips-Perron (PP, 1988) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS, 1992). The tested hypotheses for unit root for ADF and PP are given below. The hypotheses for the KPSS test represent the opposite of the below given hypotheses.

H_0: The serial is not stationary (There is a unit root)

H_1: The serial is stationary (There is no unit root)

In the first phase, the stationary of the serials was tested at the level I (0), and for the serials which are not stationary in level, their 1st degree I(1) Stationaries were realized within the scope of two different models (fixed, fixed-trend) of ADF, PP and KPSS tests. The PP and KPSS tests were realized to support the results obtained from ADF test. According to Schwarz Information Criterion (SIC) which makes the problem of autocorrelation minimum and according to Newey-West predictor in PP and KPSS tests, the lag numbers implemented in ADF unit root test are determined lag values.

4.2.2 Cointegration Analysis

Cointegration puts forth the equilibrium relationship where two or more non stationary variables act together in the long-term. The terms cointegration and error correction were put forward by Granger (1981) for the first time. While Eangle-Grager (1987) was investigating the long-term relation between two variables, they presumed that each variable used in the model is integrated from the first degree after implementing the unit root tests. Eangle-Grager (1987) were known as a two-step process in the literature as the parameters of cointegration vector are predicted in the first step and the predicted parameters in the first step are used in error correction model in this test (Enders, 2004; Sevüktekin, Nargileçekenler, 2010). However, if there are more than two variables, this test ignores more than one cointegration relation and thus the results are not efficient (Çetin, 2006).

One of the tests used for cointegration analysis is Durbin-Watson (Cointegration Regression Durbin-Watson- CRDW) test which was put forth by Sargan and Bhargava (1983) as well.

However, this test was criticized by Banerjee, Hendry and Smith (1986) as they are not reliable in small samples.

Philips and Loretan (1991) put forth that Engle-Granger (1987) ignored the lag values of variables while making the cointegration analysis and found the AutoRegressive Distributed Lag (ARDL) model in the determination of cointegration relation.

The Johansen cointegration analysis method used in this study is the extended version with multivariate representation of Dickey-Fuller test. Johansen has developed the multiple equation approach in his studies in 1988, 1990 and 1995 and put forward that there are more than one cointegration relationships between the variables. This approach admits all the variables in the model as internal, and it does not require the variable selection for normalization and depends on the relation between the rank of a matrix and its characteristic roots. A VAR model in k degree is written as given below.

$$Y_t = \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \ldots\ldots \alpha_k Y_{t-k} + \varepsilon_t \qquad \textbf{(9)}$$

A multivariate model is expressed with a high degree autoregressive process in Johansen and Juselius (1990) method and Y_t represents the internal variable vector, $\alpha_1;\alpha_k$ represents n dimensional coefficients, k represents the lag number and ε_t represents the error terms vector.

Johansen has developed the method as given below by adding constant coefficients and shade variables which express the trend or seasonality to VAR model in cointegration vector.

$$\Delta Y_t = \Gamma_1 \Delta Y_{t-1} + \ldots\ldots + \Gamma_{k-1}\Delta Y_{t-k} + \Pi\, Y_{t-k} + \varepsilon_t \qquad \textbf{(10)}$$

$$\Gamma_i = I + \Pi_1 + \ldots. + \Pi_i \ ,(\ i=1,\ldots.k) \qquad \textbf{(11)}$$

Here the rank of Π matrix (coefficient matrix) gives the number of cointegrated relation between the variables. Whether the characteristic roots (Eigenvalue) are equal to zero to determine the number of cointegrated relation is calculated with the Trace statistics and Maximum Eigenvalue statistics. (Bozkurt, 2013:124)

$$\lambda_{Trace}(r) = -T \sum_{i=r+1}^{n} \ln(1 - \hat{\lambda}_i) \qquad \textbf{(12)}$$

$$\lambda_{max}(r,r+1) = -T\ln(1-\hat{\lambda}_{r+1}) \qquad \textbf{(13)}$$

The H_0 hypothesis, which puts forward that there is a cointegration vector which is equal to r or less than it against the general alternative, is evaluated in the first trace statistics. The alternative hypothesis which puts forward that there is r+1 cointegrated vectors against the hypothesis which says that there are cointegrated vectors in the number of H_0, is tested. If the characteristic roots are equal to zero, the value of test is zero in the first test, and the λ_{max} value is smaller in the second test. The tested hypotheses are given below.

H_0: 'X' variable is not the cause of 'Y' variable.

H_1: 'X' variable is the cause of 'Y' variable.

4.2.3 Granger Causality

The determination of the direction and lag structure of the relation between the variables is called the Granger Causality Test and its objective is the determination of the one-way or two-way relations between two or more variables in the model.

Engle and Granger defend that the existence of long-term relation between the variables should be investigated and thus, the features of the time serials should be determined with the aid of unit root and cointegration tests, firstly, then the Granger causality test should be implemented by using one of the equations given below. α.. α_i and β … β represent the lag coefficients, k represents the joint expansion degree of all variables, ε_i represents the error terms in the given tests. Standard Granger causality test for the two variables is given below:

$$X_t = \alpha_0 + \sum_{i=1}^{k} \alpha_i X_{t-i} + \sum_{i=1}^{k} \beta_i Y_{t-i} + \varepsilon_i \qquad \textbf{(14)}$$

$$Y_t = \beta_0 + \sum_{i=1}^{k} \alpha_i Y_{t-i} + \sum_{i=1}^{k} \beta_i X_{t-i} + \varepsilon_i \qquad \textbf{(15)}$$

The first equation indicates causality from Y to X (Y→X) and also the second equation indicates causality from X to Y (X →Y).

$$H_0=\sum_{i=1}^{k} \beta_i=0$$

$$H_1=\sum_{i=1}^{k} \beta_i\neq 0$$

The above given basic hypothesis puts forward that Y variable is not the Granger cause of X variables, the alternative hypothesis puts forward that Y variable is the Granger cause of the X variable.

Granger (1969), expressed that if there is a cointegration relation between the serials, it should be at least one causality relation, and if there is a long-term relationship between the variables, the variables should be analyzed by using a model which has an error correction term as the standard errors of prediction by using VAR models in the series which are not stationary are not reliable.

Eangle and Granger (1988), put forward that if the variables in the serial are co-integrated, there will be a causality relation between these variables and if there is a cointegration relation, an error correction model will be used. The equation formed for two variables and related to Granger causality test which depends on the VECM (vector error correction) model is given below. Δ represents the first difference operator, ECT represents an error correction term, i represents the lag length in the equation.

$$\Delta X_t= \alpha_0+\sum_{i=1}^{k} \alpha_i \Delta X_{t-i}+\sum_{i=1}^{k} \beta_i \Delta Y_{t-i}+ \theta_x ECT_{t-i}+ \varepsilon_i \qquad \textbf{(16)}$$

$$\Delta Y_t= \beta_0+\sum_{i=1}^{k} \alpha_i \Delta Y_{t-i}+\sum_{i=1}^{k} \beta_i \Delta X_{t-i}+ \theta_x ECT_{t-i}+\varepsilon_i \qquad \textbf{(17)}$$

The hypotheses tested in the Granger causality tests depending on Granger and VECM models are given below.

H_0: X variable is not the cause of Y variable.

H_1: X variable is the cause of Y variable.

4.3 EMPIRICAL RESULTS

4.3.1 AUSTRIA

4.3.1.1 The Results of Unit Root Test

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 9.

When Table 9, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 10. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.1.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 11 and 12. When the related tables are examined, lag number was determined as two (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz and Hannan-Quinn information criteria.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 13 and Table 14. When tables are examined, the findings of trace and maximum value statistics put forward that there is no long-term relation (cointegration) among the variables as a result of the test realized within the scope of national oil price. In the same way, it is encountered that there is no long-term relation among the variables as a result of test realized within the scope of world oil price as well.

4.3.1.3 The Results of Causality Test

As a result of the lack of existence of cointegration vector, in other words, the lack of existence of long-term relation among the variables in the result of the Johansen cointegration test, VAR based Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the short-term causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 15.

It is concluded that the 5% and 1% statistical significance level of IPR and RSP variables are the Granger cause of IR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RNP variable is not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RNP and RSP variables are not the cause of IPR and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IR and RSP variables are the Granger cause of RNP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR variable is not the cause of RNP and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RNP variables are not the cause of RSP and the H_0 hypothesis could not be rejected.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 16.

It is concluded that the 1% statistical significance level of RSP variable is the Granger cause of IR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RWP and IPR variables are not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RWP and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 5% and 1% statistical significance level of IR and RSP variables has accordingly been the Granger cause of RWP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR variable is not the cause of RWP and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but it is seen that the IPR and RWP variables are not the cause of RSP and the H_0 hypothesis could not be rejected.

4.3.2 BELGIUM

4.3.2.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great

importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 17.

When Table 17, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in constant and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 18. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.2.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 19 and 20. When the related tables are examined, lag number was determined as one (1) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 21 and Table 22. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of both national oil price and world oil price.

4.3.2.3 The Results of Causality Test

As a result of the finding of cointegration vector, in other words, the existence of long-term relation among the variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price and world oil

price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 23.

It is concluded that the 5% statistical significance level of IPR and RSP variables are the Granger cause of IR, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Moreover, it is seen that RNP variable is not the cause of IR and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IR variable of IPR, RNP and RSP variables.

It is concluded that the variables of IR, RNP and RSP are not Granger cause of IPR, and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RNP and RSP variables.

It is concluded that the variables of IR and IPR are not Granger cause of RNP and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. The findings are obtained that the RSP variable is in the 5% statistical significance level of IPR variable. There is no long-term causality as well.

IR, IPR and RNP variables are not the cause of RSP and the H_0 could not be rejected. Besides, there is no causality relation in the long-term.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 24.

It is concluded that the 5% statistical significance level of IPR variable is Granger cause of IR, thus the H_0 hypothesis is rejected as it puts forward that there is no causality relation. On the other hand, it is concluded that the variables of RWP and RSP are not the Granger cause of IR variable. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IR variable of IPR, RWP and RSP variables.

It is concluded that the variables of IR, RWP and RSP are not Granger cause of IPR and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. The findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RWP and RSP variables.

It is concluded that the variables of IR, IPR and RSP are not Granger cause of RWP and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. There is not any causality relation in the long-term.

It is concluded that the variables of IR, IPR and RWP are not Granger cause of RSP and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. There is not any causality relation in the long-term.

4.3.3 CANADA

4.3.3.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious regression relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 25.

When Table 25, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 26. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.3.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 27 and 28. When the related tables are examined, lag number was determined as one (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 29 and Table 30. When tables are examined, the findings of trace and maximum value statistics put forward that there is no long-term relation (cointegration) among the variables as a result of the test realized within the scope of national oil price. In the same way, it is encountered that there is no long-term relation among the variables as a result of test realized within the scope of world oil price as well.

4.3.3.3 The Results of Causality Test

As a result of the lack of existence of cointegration vector, in other words, the lack of existence of long-term relation among the variables in the result of the Johansen cointegration test, VAR based Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the short-term causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 31.

IR, IPR and RNP variables are not the cause of RSP and the H_0 could not be rejected.

It is concluded that the 1% and 5% statistical significance level of IR and RNP variables has accordingly been the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RSP variable is not the cause of IPR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of RSP variable is the Granger cause of RNP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IR and IPR variables are not the cause of IPR and the H_0 hypothesis could not be rejected.

It is concluded that the variables of IR, IPR and RNP are not cause of RSP, and the H_0 hypothesis could not be rejected.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 32.

It is concluded that the 5% statistical significance level of IPR variable is the Granger cause of IR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RWP and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% and 5% statistical significance level of IR and RWP variables has accordingly been the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RSP variable is not the cause of IPR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of RSP variable is the Granger cause of RWP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IR and IPR variables are not the cause of RWP and the H_0 hypothesis could not be rejected.

It is concluded that the variables of IR, IPR and RWP are not cause of RSP, and the H_0 hypothesis could not be rejected.

4.3.4 CZECH REPUBLIC

4.3.4.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 33.

When Table 33, which demonstrates the unit root test results realized at the constant for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 34. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.4.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 35 and 36. When the related tables are examined, lag number was determined as one (1) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 37 and Table 38. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of both national oil price and world oil price.

4.3.4.3 The Results of Causality Test

As a result of the finding of cointegration vector, in other words, the existence of long-term relation among the variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 39.

It is concluded that the variables of IPR, RNP and RSP are not Granger cause of IR, and the H_0 hypothesis could not be rejected as it puts forward that there is no long-term causality relation.

It is concluded that the 5% statistical significance level of RNP variable is Granger cause of IPR, thus the H_0 hypothesis is rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RNP and RSP variables.

It is concluded that the 5% statistical significance level of RSP variable is Granger cause of RNP, thus the H_0 hypothesis is rejected as it puts forward that there is no causality relation, it is concluded that the variables of IR and RWP are not the Granger cause of IR variable. . Besides, there is no causality relation in the long-term.

IR, IPR and RNP variables are not the cause of RSP and the H_0 could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RSP variable of IR, IPR and RNP variables.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 40.

IPR, RWP and RSP variables are not the cause of IR and the H_0 could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 5% statistical significance level of IR variable of IPR, RWP and RSP variables.

It is concluded that the 5% statistical significance level of RWP variable is Granger cause of IPR, thus the H_0 hypothesis is rejected as it puts forward that there is no causality relation. On the other hand, it is concluded that the variables of IR and RSP are not the Granger cause of IR variable. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RWP and RSP variables.

It is concluded that the 5% statistical significance level of RSP variable is Granger cause of RWP, thus the H_0 hypothesis is rejected as it puts forward that there is no causality relation. On the other hand, it is concluded that the variables of IR and IPR are not the Granger cause of RWP variable. There is not any causality relation in the long-term.

It is concluded that the variables of IR, IPR and RWP are not Granger cause of RSP and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. The findings are obtained that there is a long-term causality in the 1% statistical significance Constant of RSP variable of IR, IPR and RWP variables.

4.3.5 DENMARK

4.3.5.1 The Results of Unit Root Test

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 41.

When Table 65, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 42. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.5.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 43 and 44. When the related tables are examined, lag number was determined as one (1) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz and Hannan-Quinn information criteria.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 45 and Table 46. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of national oil price. In the same way, it is encountered that there is no long-term relation among the variables as a result of test realized within the scope of world oil price as well.

4.3.5.3 The Results of Causality Test

As a result of the findings of cointegration vector, in other words, the existence of long-term relation among variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price. But, the lack of existence of long-term relation among the variables in the result of the Johansen cointegration test, VAR based Granger causality test was implemented separately to the variables of world oil price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 47.

It is concluded that IPR, RNP and RSP variables are not the Granger cause of IR, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, there is no long- term causality as well.

It is concluded that IR, RNP and RSP variables are not the Granger cause of IPR, thus the H_0 hypothesis could not be as it puts forward that there is no causality relation. Besides, there is no long- term causality as well.

It is concluded that IR, IPR and RSP variables are not the Granger cause of RNP, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, there is no long- term causality as well.

It is concluded that IR, IPR and RNP variables are not the Granger cause of RSP, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, there is no long- term causality as well.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 48.

It is concluded that the IPR, RWP and RSP variables are not the Granger cause of RWP, thus the H_0 Hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of RSP variable is the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IR and RWP variables are not the cause of IPR and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance constant of IR variable is the Granger cause of RWP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RSP variables are not the cause of RWP and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance constant of IR variable is the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but it is seen that the IPR and RWP variables are not the cause of RSP and the H_0 hypothesis could not be rejected.

4.3.6 FINLAND

4.3.6.1 The Results of Unit Root Test

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 49.

When Table 49, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but

H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 50. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested

4.3.6.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 51 and 52. When the related tables are examined, lag number was determined as two (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz and Hannan-Quinn information criteria.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 53 and Table 54. When tables are examined, the findings of trace and maximum value statistics put forward that there is no long-term relation (cointegration) among the variables as a result of the test realized within the scope of national oil price. In the same way, it is encountered that there is no long-term relation among the variables as a result of test realized within the scope of world oil price as well.

4.3.6.3 The Results of Causality Test

As a result of the lack of existence of cointegration vector, in other words, the lack of existence of long-term relation among the variables in the result of the Johansen cointegration test, VAR based Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the short-term causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 55.

It is concluded that the 1% and 5% statistical significance level of IPR and RSP variables are the Granger cause of IR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RNP variable is not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RNP and RSP variables are not the cause of IPR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of RNP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RSP variables are not the cause of RNP and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR and RNP variables are the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR variable is not the cause of RSP and the H_0 hypothesis could not be rejected.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 56.

It is concluded that the 1% statistical significance level of IPR and RSP, 5% statistical significance constant of RWP variables are the Granger cause of IR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RWP and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RWP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RSP variables are not the cause of RWP and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR and RWP variables are the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but it is seen that the IPR variable is not the cause of RSP and the H_0 hypothesis could not be rejected.

4.3.7 FRANCE

4.3.7.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 57.

When Table 57, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 58. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.7.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 59 and 60. When the related tables are examined, lag number was determined as two (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen Cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 61 and Table 62. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of both national oil price and world oil price.

4.3.7.3 The Results of Causality Test

As a result of the finding of cointegration vector, in other words, the existence of long-term relation among the variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 63.

It is concluded that the 5% statistical significance level of RNP variable is the Granger cause of IR, thus the H_0 hypothesis is rejected Moreover, it is seen that IPR and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, there is no long-term causality as well.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of IPR, thus the H_0 hypothesis is rejected. Moreover, the variables of IR, RNP and RSP are not Granger cause of IPR, and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance Constant of IPR variable of IR, RNP and RSP variables.

It is concluded that the variables of IR, IPR and RSP are not Granger cause of RNP and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, the findings are obtained that there is a long-term causality in the 5% statistical significance level of RNP variable of IR, IPR and RSP variables.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RSP, thus the H_0 hypothesis is rejected. Moreover, it is seen that IPR and RNP variables are not the cause of RSP and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, there is no long-term causality as well.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 64.

It is concluded that the 5% statistical significance level of RWP variable is Granger cause of IR, thus the H_0 hypothesis is rejected as it puts forward that there is no causality relation. On the other hand, it is concluded that the variables of IPR and RSP are not the Granger cause of IR variable. Besides, there is no long-term causality as well.

It is concluded that the 1% statistical significance level of IR and RWP variables are the Granger cause of IR, thus the H_0 hypothesis is rejected. Moreover, the variable of RSP are not Granger cause of IPR, and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RWP and RSP variables. It is concluded that the variables of IR, IPR and RSP are not Granger cause of RWP and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. There is not any causality relation in the long-term.

It is concluded that the variables of IR, IPR and RWP are not Granger cause of RSP and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. There is not any causality relation in the long-term.

4.3.8 GERMANY

4.3.8.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great

importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 65.

When Table 65, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 66. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.8.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 67 and 68. When the related tables are examined, lag number was determined as two (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen Cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 69 and Table 70. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of both national oil price and world oil price.

4.3.8.3 The Results of Causality Test

As a result of the finding of cointegration vector, in other words, the existence of long-term relation among the variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price and world oil

price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 71.

It is concluded that the 1% and 5% statistical significance level of RNP and RSP variables are the Granger cause of IR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IPR variable is not the cause of IR and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, there is no long-term causality as well.

It is concluded that the 1% and 5% statistical significance level of IR and RNP variables are the Granger cause of IPR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that RSP variable is not the cause of IPR and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RNP and RSP variables.

It is concluded that the 1% statistical significance level of RSP variable is the Granger cause of RNP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IR and IPR variables are not the cause of IR and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that the variables of IR, IPR and RNP are not Granger cause of RSP and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RSP variable of IR, IPR and RNP variables.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 72.

It is concluded that the 1% and 5% statistical significance level of RWP and RSP variables are the Granger cause of IR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IPR variable is not the cause of IR and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that the 1% statistical significance level of IR and RWP variables are Granger cause of IPR, thus the H_0 hypothesis is rejected as it puts forward that there is no causality relation. On the other hand, it is concluded that the variable of RSP is not the Granger cause of IPR variable. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RWP and RSP variables.

It is concluded that the 5% statistical significance level of RSP variable is the Granger cause of RWP, thus the H_0 hypothesis is rejected. Moreover, the variables of IR and IPR are not Granger cause of RWP, and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, there is no long-term causality as well.

It is concluded that the variables of IR, IPR and RWP are not Granger cause of RWP and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. There is not any causality relation in the long-term.

4.3.9 IRELAND

4.3.9.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 73.

When Table 73, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 74. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but

H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested..

4.3.9.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 75and 76. When the related tables are examined, lag number was determined as two (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 77 and Table 78. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of both national oil price and world oil price.

4.3.9.3 The Results of Causality Test

As a result of the finding of cointegration vector, in other words, the existence of long-term relation among the variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 79.

It is concluded that the 5% statistical significance level of RSP variable is the Granger cause of IR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IPR and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. Besides, there is no long-term causality as well.

It is concluded that IR, RNP and RSP variables are not the Granger cause of IPR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation. Besides, there is no long-term causality as well.

It is concluded that the 5% statistical significance Constant of RSP variable is the Granger cause of RNP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IR and IPR variables are not the cause of RNP and the H_0 hypothesis could not be rejected. . Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RNP variable of IR, IPR and RSP variables.

It is concluded that the 1% statistical significance level of IPR variable is the Granger cause of RSP accordingly, thus the H_0 hypothesis was rejected. Moreover, it is seen that IR and RNP variables are not the cause of RSP and the H_0 hypothesis could not be rejected. . Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RSP variable of IR, IPR and RNP variables.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 80.

It is concluded that the 1% and 5% statistical significance level of RWP and RSP variables are the Granger cause of IR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IPR variable is not the cause of IR and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that the variables of IR, RWP and RSP are not Granger cause of RSP and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RWP and RSP variables.

It is concluded that the variables of IR, IPR and RSP are not Granger cause of RWP and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RWP variable of IR, IPR and RSP variables.

It is concluded that the 5% statistical significance level of IPR variables the Granger cause of RSP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IR and RWP variable is not the cause of RSP and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RSP variable of IR, IPR and RWP variables.

4.3.10 ISRAEL

4.3.10.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 81.

When Table 81, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in Constant and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 82. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.10.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 83 and 84. When the related tables are examined, lag number was determined as one (1) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 85 and Table 86. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of both national oil price and world oil price.

4.3.10.3 The Results of Causality Test

As a result of the finding of cointegration vector, in other words, the existence of long-term relation among the variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 87.

It is concluded that IPR, RSP and RNP variables are not the Granger cause of IR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, besides, there is no long-term causality as well.

It is concluded that the 5% statistical significance level of RSP and RNP variable is the Granger cause of IPR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IR variable is not the cause of IPR and the H_0 hypothesis could not be rejected. . Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RNP and RSP variables.

It is concluded that the 1% statistical significance level of RSP variable is the Granger cause of RNP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IR and IPR variables are not the cause of RNP and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that IR, IPR and RNP variables are not the Granger cause of RSP accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation, besides, there is no long-term causality as well.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 88.

It is concluded that IPR, RWP and RSP variables are not the Granger cause of IR accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation, besides, there is no long-term causality as well.

It is concluded that the 1% statistical significance level of RWP and RSP variables are the Granger cause of IPR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IR variable is not the cause of IR and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RWP and RSP variables.

It is concluded that the 1% statistical significance level of RSP variable is the Granger cause of RWP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IR and IPR variables are not the cause of RWP and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that the variables of IR, IPR and RWP are not Granger cause of RSP and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

4.3.11 ITALY

4.3.11.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 89.

When Table 89, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 90. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.11.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 91 and 92. When the related tables are examined, lag number was determined accordingly as one (1) lag and two (2) lag within the scope of basic variables national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 93 and Table 94. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of national oil price. But test results for world oil price shows that there is no long-term relation (cointegration) among the variables.

4.3.11.3 The Results of Causality Test

As a result of the findings of cointegration vector, in other words, the existence of long-term relation among variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price. But, the lack of existence of long-term relation among the variables in the result of the Johansen cointegration test, VAR based Granger causality test was implemented separately to the variables of world oil price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 95.

It is concluded that the 5% statistical significance level of RNP variable is the Granger cause of IR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IPR and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality

It is concluded that the 1%, 5% and 1% statistical significance level of IR, RNP and RSP variables are the Granger cause of IPR accordingly, thus the H_0 hypothesis was rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RNP and RSP variables.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RNP accordingly, thus the H_0 hypothesis was rejected. Moreover, it is seen that IPR and RSP variables are not the cause of RNP and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RNP variable of IR, IPR and RSP variables.

It is concluded that IR, IPR and RNP variables are not the Granger cause of RSP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RSP variable of IR, IPR and RNP variables.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 96.

It is concluded that the 5% statistical significance level of RWP variable is the Granger cause of IR thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IPR and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR, RWP and RSP variables are the Granger cause of IPR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation

It is concluded that IR, IPR and RSP variables are not the Granger cause of RWP accordingly, thus the H_0 hypothesis could not be rejected.

It is concluded that the 1% and 5% statistical significance level of IR and RWP variables are the Granger cause of RSP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation.

4.3.12 NETHERLAND

4.3.12.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 97.

When Table 97, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 98. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.12.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 99 and 100. When the related tables are examined, lag number was determined as two (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 101and Table 102. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of both national oil price and world oil price.

4.3.12.3 The Results of Causality Test

As a result of the finding of cointegration vector, in other words, the existence of long-term relation among the variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 103.

It is concluded that the 5% statistical level Constant of RSP and RNP variables are the Granger cause of IR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IPR variable is not the cause of IR and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that IR, RNP and RSP variables are not the Granger cause of IPR accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. . Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RNP and RSP variables.

It is concluded that the 1% statistical significance level of RSP variable is the Granger cause of RNP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IR and IPR variables are not the cause of RNP and the H_0 hypothesis could not be rejected. . Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RNP variable of IR, IPR and RSP variables.

It is concluded that IR, RNP and RSP variables are not the Granger cause of IPR accordingly, thus the H_0 hypothesis was rejected. Besides, there is no long-term causality as well.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 104.

It is concluded that the 5% statistical significance level of RWP variable is the Granger cause of IR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IPR and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that the variables of IR, RWP and RSP are not Granger cause of RSP and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RWP and RSP variables.

It is concluded that the 5% and 1% statistical significance level of IPR and RSP variables are the Granger cause of RWP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IR variable is not the cause of IR and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RWP variable of IR, IPR and RSP variables.

It is concluded that the variables of IR, IPR and RWP are not Granger cause of RSP and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

4.3.13 NORWAY

4.3.13.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great

importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 105.

When Table 105, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 106. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.13.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 107 and 108. When the related tables are examined, lag number was determined as two (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 109 and Table 110. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of both national oil price and world oil price.

4.3.13.3 The Results of Causality Test

As a result of the finding of cointegration vector, in other words, the existence of long-term relation among the variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price and world oil

price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 109.

It is concluded that IPR, RSP and RNP variables are not the Granger cause of IR accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation, besides, there is no long-term causality as well.

It is concluded that IR, RNP and RSP variables are not the Granger cause of IPR accordingly, thus the H_0 hypothesis could not be rejected, as it puts forward that there is no causality relation, besides, there is no long-term causality as well.

It is concluded that the 5% statistical significance level of RSP variable is the Granger cause of RNP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IR and IPR variables are not the cause of RNP and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of RSP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IPR and RNP variables are not the cause of RSP and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 110.

It is concluded that IPR, RWP and RSP variables are not the Granger cause of IR accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation, Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IR variable of IPR, RWP and RSP variables.

It is concluded that IPR, RWP and RSP variables are not the Granger cause of IR accordingly, thus the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that IR, IPR and RSP variables are not the Granger cause of RWP accordingly, thus the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of RSP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IPR and RWP variables are not the cause of RSP and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

4.3.14 POLAND

4.3.14.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 113.

When Table 113, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 114. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.14.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 115 and 116. When the related tables are examined, lag number was determined as two (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 117 and Table 118. When tables are examined, the findings of trace statistic puts forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of both national oil price and world oil price. But, maximum value statistics puts forward that there is no long-term relation (cointegration) among the variables as a result of the test realized within the scope of both national oil price and world oil price.

4.3.14.3 The Results of Causality Test

As a result of the finding of cointegration vector, in other words, the existence of long-term relation among the variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 119.

It is concluded that IPR, RNP and RSP variables are not the Granger cause of IR accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. . Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IR variable of IPR, RNP and RSP variables.

It is concluded that IR, RNP and RSP variables are not the Granger cause of IPR accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. . Besides, the findings are obtained that there is a long-term causality in the 5% statistical significance level of IPR variable of IR, RNP and RSP variables.

It is concluded that IR, and IPR variables are not the Granger cause of IPR accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation. It is seen that, 5% statistical significance level of IPR variable is the Granger cause of RNP. Besides, the findings are obtained that there is a long-term causality in the 5% statistical significance level of RNP variable of IR, IPR and RSP variables.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IPR and RNP variables are not the cause of RSP and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RSP variable of IR, IPR and RNP variables.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 120.

It is concluded that the variables of IPR, RWP and RSP are not Granger cause of IR and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 5% statistical significance level of IR variable of IPR, RWP and RSP variables.

It is concluded that the variables of IR, RWP and RSP are not Granger cause of IPR and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RWP and RSP variables.

It is concluded that the variables of IR, IPR and RSP are not Granger cause of RWP and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that the variables of IR, IPR and RWP are not Granger cause of RSP and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RSP variable of IR, IPR and RWP variables.

4.3.15 PORTUGAL

4.3.15.1 The Results of Unit Root Test

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great

importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 121.

When Table 121, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 122. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested

4.3.15.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 123 and 124. When the related tables are examined, lag number was determined as two (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz and Hannan-Quinn information criteria.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 125 and Table 126. When tables are examined, the findings of trace and maximum value statistics put forward that there is no long-term relation (cointegration) among the variables as a result of the test realized within the scope of national oil price. In the same way, it is encountered that there is no long-term relation among the variables as a result of test realized within the scope of world oil price as well.

4.3.15.3 The Results of Causality Test

As a result of the lack of existence of cointegration vector, in other words, the lack of existence of long-term relation among the variables in the result of the Johansen cointegration test, VAR based Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the short-term causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 127.

It is concluded that the variables of IPR, RNP and RSP are not Granger cause of IR and the H_0 hypothesis could not be rejected**.**

It is concluded that the 5% statistical significance level of RNP variable is the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IR and RSP variables are not the cause of IPR and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RNP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RSP variables are not the cause of RNP and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RNP variables are not the cause of RSP and the H_0 hypothesis could not be rejected.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 128.

It is concluded that the 5% statistical significance level of RWP variable is the Granger cause of IR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of RWP variable is the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IR and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RWP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RSP variables are not the cause of RWP and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but it is seen that the IPR and RWP variables are not the cause of RSP and the H_0 hypothesis could not be rejected.

4.3.16 SOUTH KOREA

4.3.16.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 129.

When Table 129, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 130. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.16.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 131 and 132. When the related tables are examined, lag number was determined as one (1) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 133 and Table 134. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of both national oil price and world oil price.

4.3.16.3 The Results of Causality Test

As a result of the finding of cointegration vector, in other words, the existence of long-term relation among the variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 135.

It is concluded that IPR, RSP and RNP variables are not the Granger cause of IR accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation, besides, the findings are obtained that there is a long-term causality in the 5% statistical significance level of IR variable of IPR, RNP and RSP variables.

It is concluded that the 1% statistical significance level of IR and RNP variables are the Granger cause of RSP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IR and RNP variables are not the cause of IPR and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that IR, IPR and RSP variables are not the Granger cause of RNP accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation, besides, the findings are obtained that there is a long-term causality in the 5% statistical significance level of RNP variable of IR, RNP and RSP variables.

It is concluded that IR, IPR and RNP variables are not the Granger cause of RSP accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation, besides, there is no long-term causality as well.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 136.

It is concluded that IPR, RWP and RSP variables are not the Granger cause of IR accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation, Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IR variable of IPR, RWP and RSP variables.

It is concluded that the 5% and 1% statistical significance level of RWP and RSP variables are the Granger cause of IPR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IR variable is not the cause of IPR and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RWP accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IPR and RSP variables are not the cause of RSP and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of RWP variable of IR, IPR and RSP variables.

It is concluded that IR, IPR and RWP variables are not the Granger cause of RWP accordingly, thus the H_0 hypothesis could not be rejected. Besides, there is no long-term causality as well.

4.3.17 SPAIN

4.3.17.1 Unit Root Test Results

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 137.

When Table 137, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 138. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested.

4.3.17.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 139 and 140. When the related tables are examined, lag number was determined accordingly as two (2) lag and two (2) lag within the scope of basic variables national oil price and world oil price through the Schwarz information criterion.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 141 and Table 142. When tables are examined, the findings of trace and maximum value statistics put forward that there is a long-term relation (cointegration) among the variables as a result of the test realized within the scope of national oil price. In the same way, it is encountered that there is no long-term relation among the variables as a result of test realized within the scope of world oil price.

4.3.17.3 The Results of Causality Test

As a result of the findings of cointegration vector, in other words, the existence of long-term relation among variables in the result of the Johansen cointegration test, Granger causality test was implemented separately to the variables of national oil price. But, the lack of existence of long-term relation among the variables in the result of the Johansen cointegration test, VAR based Granger causality test was implemented separately to the variables of world oil price to examine the causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 143.

It is concluded that the 1% and 5% statistical significance level of RNP and RSP variables are the Granger cause of IR accordingly , thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that IPR variable is not the cause of IR and the H_0 hypothesis could not be rejected. Besides, there is no long-term causality

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of IPR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, Moreover, it is seen that RNP and RSP variables are not the cause of IPR and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 1% statistical significance level of IPR variable of IR, RNP and RSP variables.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RNP accordingly, thus the H_0 hypothesis was rejected. Moreover, it is seen that IPR and RSP variables are not the cause of RNP and the H_0 hypothesis could not be rejected. Besides, the findings are obtained that there is a long-term causality in the 5% statistical significance level of RNP variable of IR, IPR and RSP variables.

It is concluded that IR, IPR and RNP variables are not the Granger cause of RSP accordingly, thus the H_0 hypothesis could not be rejected as it puts forward that there is no causality relation, besides, the findings are obtained that there is a long-term causality in the 5% statistical significance level of RSP variable of IR, IPR and RNP variables.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 144.

It is concluded that the 5% statistical significance level of RWP variable is the Granger cause of IR thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IPR and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR and RWP variables are the Granger cause of IPR; it is seen that RSP variable is not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RWP thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IPR and RSP variables are not the cause of RWP and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RSP thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, it is seen that IPR and RWP variables are not the cause of RSP and the H_0 hypothesis could not be rejected.

4.3.18 SWEDEN

4.3.18.1 The Results of Unit Root Test

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 145.

When Table 145, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 146. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested

4.3.18.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 147 and 148. When the related tables are examined, lag number was determined as two (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz and Hannan-Quinn information criteria.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 149 and Table 150. When tables are examined, the findings of trace and maximum value statistics put forward that there is no long-term relation (cointegration) among the variables as a result of the test realized within the scope of national oil price. In the same way, it is encountered that there is no long-term relation among the variables as a result of test realized within the scope of world oil price as well.

4.3.18.3 The Results of Causality Test

As a result of the lack of existence of cointegration vector, in other words, the lack of existence of long-term relation among the variables in the result of the Johansen cointegration test, VAR based Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the short-term causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 151.

It is concluded that the 1% and 5% statistical significance level of IPR and RSP variables are the Granger cause of IR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RNP variable is not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RNP and RSP variables are not the cause of IPR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of RNP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RSP variables are not the cause of RNP and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR and RNP variables are the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR variable is not the cause of RSP and the H_0 hypothesis could not be rejected.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table152.

It is concluded that the 1% statistical significance level of IPR and RSP, 5% statistical significance level of RWP variables are the Granger cause of IR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation.

It is concluded that the 1% statistical significance level of IR variable is the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RWP and RSP variables are not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IR variable is the Granger cause of RWP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RSP variables are not the cause of RWP and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR and RWP variables are the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but it is seen that the IPR variable is not the cause of RSP and the H_0 hypothesis could not be rejected.

4.3.19 UNITED KINGDOM

4.3.19.1 The Results of Unit Root Test

The stationaries of the serials belonging to the related variables should be examined before proceeding to the basic analysis, because serials' being stationary expresses the great importance to avoid such a spurious relationship in the analysis realized with time serials. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were implemented accordingly to examine the stationaries of the serials belonging to the related variables. As the stationaries of the serials expresses the great importance, just a unit root test was not implemented, but other main unit root tests were implemented as well. The obtained findings were presented in Table 153.

When Table 153, which demonstrates the unit root test results realized at the level for variables, is examined, it is seen that the series of variables are not stationary in level and have unit root. In other words, H_0 hypothesis could not be rejected in ADF and PP tests, but H_0 hypothesis was rejected in KPSS test. For that reason, unit root tests were realized once more by taking the first differences of the serials of all variables to enable the stationary of variables and the obtained findings were presented in Table 154. When the related table was examined, if the first differences of serials belonging to the variables, they become stationary and have no unit root. In other words, H_0 hypothesis was rejected in ADF and PP tests, but H_0 hypothesis could not be rejected in KPSS test. As a result, it is believed that when all variables are stationary in the same level, the existence of long-term relation among the variables can be tested

4.3.19.2 The Results of Cointegration Test

As Johansen cointegration test, which will be realized to examine the existence of long-term relations among the serials related to the variables, is sensitive to the lag length of related series, the lag length was identified by the formed VAR model and presented in Table 155 and 156. When the related tables are examined, lag number was determined as two (2) lag within the scope of basic variables- both national oil price and world oil price through the Schwarz and Hannan-Quinn information criteria.

After the determination of lag lengths, the Johansen cointegration test was implemented in order to examine the existence of long-term relation among the related variables, and the obtained findings were presented in Table 157 and Table 158. When tables are examined, the findings of trace and maximum value statistics put forward that there is no long-term relation (cointegration) among the variables as a result of the test realized within the scope of national oil price. In the same way, it is encountered that there is no long-term relation among the variables as a result of test realized within the scope of world oil price as well.

4.3.19.3 The Results of Causality Test

As a result of the lack of existence of cointegration vector, in other words, the lack of existence of long-term relation among the variables in the result of the Johansen cointegration test, VAR based Granger causality test was implemented separately to the variables of national oil price and world oil price to examine the short-term causality relations among the variables in this phase and the findings obtained from the test results for national oil price are presented in Table 159.

It is concluded that the 1% statistical significance level of RNP and RSP variables are the Granger cause of IR accordingly, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR variable is not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR and RNP variables are the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RSP variable is not the cause of IPR and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of RNP variable is the Granger cause of RNP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RSP variables are not the cause of RNP and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IPR variable is the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IR and RNP variables are not the cause of RSP and the H_0 hypothesis could not be rejected.

In the second phase, the Granger causality test was carried out again within the scope of world oil price variable and the obtained findings were presented in Table 160.

It is concluded that the 1% statistical significance level of RWP and RSP variables are the Granger cause of IR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR variable is not the cause of IR and the H_0 hypothesis could not be rejected.

It is concluded that the 1% statistical significance level of IR and RWP variables are the Granger cause of IPR, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the RSP variable is not the cause of IPR and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IR variables are the Granger cause of RWP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but also it is seen that the IPR and RSP variables are not the cause of RWP and the H_0 hypothesis could not be rejected.

It is concluded that the 5% statistical significance level of IPR variable is the Granger cause of RSP, thus the H_0 hypothesis was rejected as it puts forward that there is no causality relation, but it is seen that the IR and RWP variables are not the cause of RSP and the H_0 hypothesis could not be rejected.

5 CONCLUSION

According to researches of BP and OPEC (2014) demand to energy which is one of the most important inputs of economic growth and societal development will continue to raise in the forthcoming years.

Petrol meets the 33% of primary energy source usage of world. While looking at the data of 2013; it can be seen that Arabia, Russia and USA meet the 36% of petrol production of world, while looking at the data of 2012, Arabia, Russia and Nigeria meet the %40 of petrol export of world and USA, China and India meet the 43,8% of crude petrol import of world. Depending on these datum, although USA takes place in the first third countries for petrol production, it also takes place on the top for petrol import which means that petrol which USA produces is not enough for consumption of USA and it falls back upon import.

Even though petrol prices are formed with balance of offer-demand in free market, there are many factors which affect petrol prices in the long (economic growth, alternative energy, climate, sectorial investments, OPEC) and short (geopolitical situation, speculative news, OPEC, stocks, crisis, economic growth, sectorial investments) turn. When looking at petrol price index between 1861 and 2014, it can be seen that war, crisis, occupation and political unrest causes fluctuations in petrol prices. For the recent years, it is assumed that decrease in the petrol will continue as result of supply directed developments (increase of USA shale gas, actions of ISIS, occupation of Lebanon, not reducing the production by OPEC), demand directed developments (raising energy efficiency) and developments in national money market (raise of dollar).

Within the scope of study as a result of the analyses, on the basis of national oil prices, an existence of equal integrated relationship between the variables in Belgium, Czech Republic, Denmark, France, Germany, Ireland, Israel, Italy, Holland, Norway, Poland, South Korea and Spain was determined, while an existence of equal integrated relationship between Denmark, Italy and Spain within the scope of international oil prices could not be found.

As a result of the empirical study, on the basis of national oil price; in a short period in Austria and Finland; bidirectional causality relationship was found between the industrial production and interest rate. This result bears resemblance with the works of Hamilton (1983) and Sadorsky (1999). In the short period, a unidirectional causality relationship from share price index to national oil price was determined in Austria, Canada, Denmark and Finland.

Within the scope of national and international oil prices, the variable among the variables used in the analysis that has the most effect in a short and long term as expected is the oil prices.

In the countries, whose share indexes are affected by the oil prices, there is a dual Causality between share index and short term interest rate. In addition to the countries' share indexes affected by this causality within the scope of international oil prices, there are dual Causalities between inflation rate and industrial production index, inflation and international oil prices.

In the study, the relation that is most encountered as a result of the findings acquired from the analysis conducted within the scope of national oil prices is the one-way Causality relation from inflation rate towards industrial production rate. In other words, the inflation rate of nine (9) countries with this relation, the short term interest rate is an important variable in explaining the industrial production index.

In the study, the second most encountered relation that came out within the scope of national oil prices is the Causality relation from short term interest rate towards national oil price. In other words, short term interest rate rate is an important variable in explaining the changes in oil prices within eight (8) countries. The countries with this relation are Austria, Denmark, Finland, France, Portugal, Spain, Sweden and United Kingdom.

In this study in accordance with the date acquired as a result of the analysis conducted within the international oil prices the most encountered relation is the one-way Causality relation from short term interest rate towards industrial production index, while the second most encountered relation is the one-way Causality relation from international oil prices towards industrial production index.

Within the context of the study, the countries with the abovementioned relations within the scope of national and international oil prices are the top 30 countries listed in the inter country life quality prepared by "The Economist Intelligence Unit" in the year 2013.

In line with the findings offered on the basis of countries, even though it is not possible to come up with a certain deduction between the energy and financial and macroeconomic factors towards all the countries, it was possible to group the related variables in relation to the countries belonging to OECD in terms of interactions among each other.

The most important feature that makes this research different from the other studies in the related field is that countries within OECD are analyzed separately and within a comprehensive framework, and therefore more detailed and healthy results are acquired.

REFERENCES

Acar, Ç. , Bülbül, S., Gümrah, F., Metin, Ç., Parlaktuna, M. (2007). Petrol ve doğal gaz. Ankara : ODTÜ *Geliştirme Vakfı Yayıncılık ve İletişim A.Ş.*

Açıkgöz, Ömer (1998). Alternatif politikalar Açısından Türkiye, Türkmenistan ve Azerbaycan Enerji Sektörlerinin Analizi. Yayımlanmış Doktora Tezi. Marmara Üniversitesi Orta Doğu ve İslam Ülkeleri Enstitüsü. İstanbul.

Adaramola, A. O. (2012). Oil Price Shocks and Stock Market Behaviour: The Nigerian Experience. *J Economics* , 3 (I), 19-24.

Akarca, A. T., & Long, T. V. (1980). Relationship between energy and GNP: a reexamination. *J. Energy Dev.;(United States)*, *5*(2).

Alam, M.S. (2006), Economic Growth with Energy. Munich Personal RePEc Archive, *MPRA Paper* No: 1260.

Ali, B. M. (1991). Gelişmekte Olan Ülkelerde Enerji Sorunu ve Alternatif Enerji Politikaları. *Erciyes Üniversitesi İİBF Dergisi*, 9-122.

Anderson, D. (1996). Energy and the environment: Technical and economic possibilities. *Finance and Development*, *33*, 10-13.

Ang, J. B. (2008). Economic development, pollutant emissions and energy consumption in Malaysia. *Journal of Policy Modeling*, *30*(2), 271-278.

Apergis, N., & Payne, J. E. (2010). Renewable energy consumption and economic growth: Evidence from a panel of OECD countries. *Energy Policy*, *38*(1), 656–660. doi:10.1016/j.enpol.2009.09.002

Arora, V., & Tanner, M. (2013). Do oil prices respond to real interest rates? *Energy Economics*, *36*, 546–555. doi:10.1016/j.eneco.2012.11.001

Arouri, M., Lahiani, A., & Bellalah, M. (2010). Oil Price Shocks and Stock Market Returns in Oil-Exporting Countries: The Case of GCC Countries. *International Journal of Economics and Finance* , Vol. 2 (No. 5).

Asteriou, D., & Bashmakova, Y. (2013). Assessing the impact of oil returns on emerging stock markets: A panel data approach for ten Central and Eastern European Countries. *Energy Economics*, *38*, 204-211.

Asteriou, D., Dimitras, A., & Lendewig, A. (2013). The Influence of Oil Prices on Stock Market Returns: Empirical Evidence from Oil Exporting and Oil Importing Countries. *International Journal of Business and Management*, *8*(18), p101.

Aydın, N. (1999). Orta Asya-Hazar-Ceyhan Boru Hattı ve Milli Güce Etkileri. İstanbul: *Harp Akademileri Yayınları.*

Aytaç, D. (2010). Enerji ve ekonomik büyüme ilişkisinin çok değişkenli VAR yaklaşımı ile tahmini. *Maliye Dergisi*, *158*, 482-495.

Barsky, Robert B. ve Killian, Lutz (2004). Oil and the Macroeconomy Since the 1970s. *The Journal of Economic Perspectives*, 18, 115- 134.

Bartelmus, P. (2008), Quantitative Economics: How Sustainable Are Our Economies, *Springer Publishing*, New York.

Basher, S. A., & Sadorsky, P. (2006). Oil price risk and emerging stock markets. *Global Finance Journal*, *17*(2), 224-251.

Bayar, Y., Kaya, A., & Yildirim, M. (2014). Effects of stock market development on economic growth: Evidence from Turkey. *International Journal of Financial Research*, *5*(1), p93.

Bayraç H. Naci (1999). Uluslararası Doğalgaz Piyasasının Ekonomik Analizi, Türkiye'deki Gelişimi ve Eskişehir Uygulaması, Eskişehir: Anadolu Üniversitesi Sosyal Bilimler Enstitüsü, Yayınlanmamış Doktora Tezi.

Bayraç, H. N. (2005). Uluslararasi Petrol Piyasasinin Ekonomik Analizi.

Beaudreau, B. C. (2005). Engineering and economic growth. *Structural Change and Economic Dynamics*, *16*(2), 211-220.

Berberoğlu, C. N. (1982). *Türkiye'nin ekonomik gelişmesinde elektrik enerjisi sorunu*. Eskişehir İktisadi ve Ticari İlimler Akademisi.

Bergh, J. C. J. M. (1996). *Ecological economics and sustainable development: theory, methods and applications*. Cheltenham: Edward Elgar.

Berk, I., & Aydogan, B. (2012). *Crude Oil Price Shocks and Stock Returns: Evidence from Turkish Stock Market under Global Liquidity Conditions* (No. 12/15). EWI Working Paper

Bilginoglu, M.A. (1991). Gelişmekte Olan Ülkelerde Enerji Sorunu ve Alternatif Enerji Politikaları. *Erciyes Üniversitesi İİBF Dergisi*, 9-122.

Bowden, N., & Payne, J. E. (2009). The causal relationship between US energy consumption and real output: a disaggregated analysis. *Journal of Policy Modeling*, *31*(2), 180-188.

Bozkurt, H. (2013). *Zaman Serileri Analizi*. Bursa, Osmangazi: Ekin Basım Yayın Dağıtım.

Bozoklu, S., & Yilanci, V. (2013). Energy consumption and economic growth for selected OECD countries: Further evidence from the Granger causality test in the frequency domain. *Energy Policy*, *63*, 877-881.

Bozoklu, S., & Yilanci, V. (2013). Energy consumption and economic growth for selected OECD countries: Further evidence from the Granger causality test in the frequency domain. *Energy Policy*, *63*, 877-881.

BP (2014). Statistical Review of World Energy. Retrieved from http://www.bp.com/content/dam/bp/pdf/Energy-economics/statistical-review-2014/BP-statistical-review-of-world-energy-2014-full-report.pdf

Broadstock, D. C., Cao, H., & Zhang, D. (2012). Oil shocks and their impact on energy related stocks in China. *Energy Economics*, *34*(6), 1888-1895.

Brown, Stephen P.A. ve Yücel, Mine K. (1999). Oil Prices and U.S. Aggregate Economic activity: A Question of Neutrality. Economic and Financal Review, 16-23.

Brown, Stephen P.A. ve Yücel, Mine K. (2002). Energy Prices and Aggregate Economic Activity: An Interpretative Survey. Quarterly Review of Economics and Finance, 42, 1-28.

Brown, Stephen P.A., Yücel, Mine K. ve Thompson, John (2002). Business Cycles: The Role of Energy Prices. Federal Reserve Bank of Dallas, Working Paper 030

Burbidge, John ve Harrison, Alan (1984). Testing for the Effects of Oil Price Rises Using Vector Autoregressions. International Economic Review, 25, Haziran, 459-484.

Chalabi, F. J. (2004). History of OPEC. *Encyclopedia of Energy*, *4*, 753-765.

Chang, Youngho ve Wong, Joon F. (2003). Oil Price Fluctuations and Singapore Economy. Energy Policy, 31, 1151-1165.

Cheng, B. S. (1995). An investigation of cointegration and causality between energy consumption and economic growth. *Journal of Energy and Development*, *21*(1).

Cheng, B. S., & Lai, T. W. (1997). An investigation of co-integration and causality between energy consumption and economic activity in Taiwan. *Energy Economics*. doi:10.1016/S0140-9883(97)01023-2

Chontanawat, J., Hunt, L., & Pierse, R. (2006). Causality between Energy Consumption and GDP: Evidence from 30 OECD and 78 non-OECD Countries. *Surrey Energy Economics Centre*, *113*. Retrieved from http://ideas.repec.org/p/sur/seedps/113.html

Cleveland, C. J., & Stern, D. I. (1997). Indicators of natural resource scarcity: review, synthesis, and application to US agriculture. In *Theory and Implementation of Economic Models for Sustainable Development* (pp. 113-138). Springer Netherlands.

Cong, R. G., Wei, Y. M., Jiao, J. L., & Fan, Y. (2008). Relationships between oil price shocks and stock market: An empirical analysis from China. *Energy Policy*, 36, 3544–3553. doi:10.1016/j.enpol.2008.06.006

Considine, T. J. (1988). Oil price volatility and US macroeconomic performance. *Contemporary Economic Policy*, *6*(3), 83-96.

Cunado, J., & Perez de Gracia, F. (2003). Do Oil Price Shocks Matter? Evidence for Some European Countries. *Energy Economics*, *25*, 137–154.

Cunado, J., & Perez de Gracia, F. (2005). Oil prices, economic activity and inflation: Evidence for some Asian countries. *Quarterly Review of Economics and Finance*, *45*, 65–83. doi:10.1016/j.qref.2004.02.003

Cunado, J., & Perez de Gracia, F. (2014). Oil price shocks and stock market returns: Evidence for some European countries. *Energy Economics*, *42*, 365–377. doi:10.1016/j.eneco.2013.10.017

Dagher, L., & El Hariri, S. (2013). The impact of global oil price shocks on the Lebanese stock market. *Energy*, 63, 366–374. doi:10.1016/j.energy.2013.10.012

Dahl, C. A. (2004). *International energy markets: understanding pricing, policies, and profits*. PennWell Books.

Darby, Michael R. (1982). The Price of Oil and World Inflation and Recession. The American Economic Review, 72, 738-751.

Dées, S., Karadeloglou, P., Kaufmann, R. K., & Sánchez, M. (2007). Modelling the world oil market: Assessment of a quarterly econometric model. *Energy Policy*, *35*, 178–191. doi:10.1016/j.enpol.2005.10.017

Demirbaş, Lütfiye (2002). Türkiye'de Enerji Sektörü, Sektörün Problemler, Avrupa Birliği ve Türkiye'de Enerji Politikaları. Yayımlanmamış Yüksek Lisans Tezi. Süleyman Demirel Üniversitesi Sosyal Bilimler Enstitüsü. Isparta.

Dhaoui, A., & Khraief, N. (2014). Empirical linkage between oil price and stock market returns and volatility: Evidence from international developed markets (No. 2014-12). *Economics Discussion Papers*.

Dickey, D. A., and W. A. Fuller (1979). Distribution of estimators for autoregressive time series with a unit root. J. Am. Stat. Assoc. 74, 427–431

Doğanay, H. (1991). *Enerji Kaynakları*. Erzurum: Atatürk Üniversitesi Yayınları (No:707) , Kazım Karabekir Eğitim Fakültesi Yayınları (No:13)

Dunstan, S. (2008). *The Yom Kippur War: The Arab-Israeli War of 1973*. Osprey Publishing.

Enders, W. (2008). Applied Econometric Time Series. New York: John Wiley & Sons.

Energy (n.d). Retrieved June 8, 2014 from www.thefreedictionary.com/energy.

Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, 251-276.

Eraydin, (2015). Petrol Fiyatlarındaki Düşüşün Nedenleri ve Etkileri. İş Bankası Yayınları. (https://ekonomi.isbank.com.tr/TR/RaporGoster.aspx?link=/UserFiles/pdf/ar_01_2015.pdf)

Ertuğrul, Murat (2006). Türkiye'de Sanayi Katma Değeri ve Enerji Tüketimi Đlişkisi. Yayımlanmamış Yüksek Lisans Tezi. Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü. Balıkesir.

Farzanegan, M. R., & Markwardt, G. (2008). The effects of oil price shocks on the Iranian economy. *Energy Economics*, *31*, 134–151. doi:10.1016/j.eneco.2008.09.003

Fattouh, B. (2007). OPEC pricing power: The need for a new perspective, in Helm, D. (ed.), The new energy paradigm. Oxford University Press, Oxford, UK. forthcoming.

Gençoğlu, M. T., & Cebeci, M. (2000). Türkiye 'nin enerji kaynakları arasında güneş enerjisinin yeri ve önemi, Türkiye 8. *Enerji Kongresi*, *2*, 63-73.

Georgescu Roegen, Nicholas (1995). The Entropy Law and the Economic Problem, A Survey of Ecological Economics. Eds. Rajaram Krishnan, Jonathan M. Haris, Neva R. Goodwin. Island Press. Washington 177-179.

Ghali, K. H. , El-Sakka, M. I. T. (2004), " Energy use and output growth in Canada: a multivariate cointegration analysis", Energy Economics C.26 No:2, s 225-238.

Ghali, K. H., & El-Sakka, M. I. (2004). Energy use and output growth in Canada: a multivariate cointegration analysis. *Energy Economics*, *26*(2), 225-238.

Gisser, M., & Goodwin, T. H. (1986). Crude oil and the macroeconomy: Tests of some popular notions: Note. *Journal of Money, Credit and Banking*, 95-103.

Glasure, Y. U. & Lee, A.-R. (1998). Cointegration, error-correction, and the relationship between GDP and energy: *Resource and Energy Economics*. doi:10.1016/S0928-7655(96)00016-4

Granger, C.W.J. (1988). Some Recent Developments in a Concept of Causality. Journal of Econometrics, 39, 199-211.

Granger, Clive W.J. (1969). Investigating Causal Relations By Econometric Models and Cross-Spectral Methods. Econometrica, 37.

Granger, Clive W.J. ve Engle, Robert F. (1987). Co-Integration and Error Correction: Representation. Estimation and Testing. Econometrica, 55, Mart: 251-276.

Gujarati, Damodar N. (2006). Temel Ekonometri. Çev.: Ümit ve Gülay G. Şenesen. İstanbul: Literatür Yayıncılık.

Güler, S., Tunç, R., & Orçun, Ç. (2010). Petrol Fiyat Riski ve Hisse Senedi Fiyatları Arasındaki İlişkinin Belirlenmesi: Türkiye'de Enerji Sektörü Üzerinde Bir Uygulama. *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi*, *24*(4).

Hamilton, J. D. (1983). Oil and the Macroeconomy Since World War II. The Journal of Political Economy, 91,Nisan: 228-248.

Hamilton, J. D. (2003). What is an oil shock? *Journal of Econometrics*. doi:10.1016/S0304-4076(02)00207-5

Hamilton, J. D. (2005). Oil and the Macroeconomy. The New Palgrave Dictionary of Economics, 1–17. doi:10.1086/261140

Hamilton, J. D. (2009). Understanding Crude Oil Prices. *The Energy Journal*. doi:10.5547/ISSN0195-6574-EJ-Vol30-No2-9

Hamilton, J. D. (2010). Nonlinearities and the Macroeconomic Effects of Oil Prices. *Nber*, *No. 16186*, 1–24. doi:10.1017/S1365100511000307

Hamilton, J. D. (2012). Oil Prices, Exhaustible Resources, and Economic Growth. *Production*, 1–63. Retrieved from http://www.nber.org/papers/w17759

Hammoudeh, S., & Choi, K. (2006). Behavior of GCC stock markets and impacts of US oil and financial markets. *Research in International Business and Finance*, *20*(1), 22–44. doi:10.1016/j.ribaf.2005.05.008

Horn, M. (2004). "OPEC's Optimal Crude Oil Price", Energy Policy, 32(2): 269-280.

Hussen, A. M. (2004). *Principles of environmental economics*. Psychology Press.

IEA (2014). International Energy Agency Key World Energy Statistics. Retrieved December 25, 2014 from http://www.iea.org/publications/freepublications/publication/keyworld2014.pdf

İscan, E. (2010). Petrol fiyatının hisse senedi piyasası üzerindeki etkisi. *Maliye Dergisi*, *158*, 607-617.

Jobert, T., & Karanfil, F. (2007). Sectoral energy consumption by source and economic growth in Turkey. *Energy Policy*, *35*(11), 5447-5456.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration—with applications to the demand for money. *Oxford Bulletin of Economics and statistics*, *52*(2), 169-210.

Kapusuzoglu, A. (2011). Relationships between Oil Price and Stock Market: An Empirical Analysis from Istanbul Stock Exchange (ISE). *International Journal of Economics and Finance*, *3*(6), p99.

Kaufmann, R. K., & Ullman, B. (2009). Oil prices, speculation, and fundamentals: Interpreting causal relations among spot and futures prices.*Energy Economics*, *31*(4), 550-558.

Kaynak, S.Ö. (2003). Ekonomik Krizler ve Enerji. Retrieved June 15, 2014 from http://www.emo.org.tr/etkinlikler/enerji/etkinlik_bildirileri_detay.php?etkinlikkod=20&bilkod=594

Kaynak, S.Ö. (2005). Enerjinin Verimli Kullanımına Bir Yaklaşım. Retrieved June 15, 2014 from http://www.emo.org.tr/etkinlikler/enerji/etkinlik_bildirileri_detay.php?etkinlikkod=3&bilkod=66

Keong, C. Y. (2003). Energy demand, economic growth, and energy efficiency—the Bakun dam-induced sustainable energy policy revisited. *Energy policy*,*33*(5), 679-689.

Keskin, T. (2007). Avrupa Birliğinde ve Türkiye'de Enerji Verimliliğinin Enerji Sektöründeki Beklenen Etkileri. Retrieved June 28, 2014 from www.dektmk.org.tr/pdf/enerji_kongresi_10/tulinkeskin.pdf

Kohl, W. L. (2002). OPEC behavior, 1998–2001. *The Quarterly Review of Economics and Finance*, *42*(2), 209-233.

Kraft, J., & Kraft, A. (1978). Relationship between energy and GNP. *J. Energy Dev.;(United States)*, *3*(2).

Kumar, Manish (2014). The Impact of Oil Price Shocks on Indian Stock and Foreign Exchange Markets. ICRA Bulletin: Money & Finance: 57-88. Retrieved July 25, 2014 from http://www.icra.in/Files/MoneyFinance/Manish%20Kumar.pdf

Küçükaksoy, İ. (2002) Türkiye'nin Enerji Politiği ve Hazar Enerji Havzası. Yüksek Lisans Tezi. Dumlupınar Üniversitesi Sosyal Bilimler Enstitüsü. Kütahya.

Kwiatkowski, D., Phillips, P. C., Schmidt, P., & Shin, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root?. *Journal of econometrics*,*54*(1), 159-178.

Lardic, Sandrine ve Mignon, Valerie (2006a). The Impact of Oil Prices on GDP in European Countries: An Empirical Investigation Based on Asymmetric Cointegration. Energy Policy, 1- 5. 88

Lardic, Sandrine ve Mignon, Valerie (2006b). Oil Prices and Economic Activity: An Asymmetric Cointegration Approach. Energy Economics.

Le, T. H., and Chang, Y. 2011. The impact of oil price fluctuations on stock markets in developed and emerging economies. MPRA Paper. Retrieved May 7, 2014, http://mpra.ub.unimuenchen.de/id/eprint/31753

Lee, C. C., & Chang, C. P. (2005). Structural breaks, energy consumption, and economic growth revisited: evidence from Taiwan. *Energy Economics*, *27*(6), 857-872.

Lee, C. C., & Chang, C. P. (2007). The impact of energy consumption on economic growth: evidence from linear and nonlinear models in Taiwan.*Energy*, *32*(12), 2282-2294.

Lee, C. C., Chang, C. P., & Chen, P. F. (2008). Energy-income causality in OECD countries revisited: The key role of capital stock. *Energy Economics*,*30*(5), 2359-2373.

Lienert, Ian (1981). The Macroeconomic Effects of the 1979/ 80 Oil Price Rise on Four Nordic Economies. The Scandinavian Journal of Economics, 83, 201-219.

Ma, C., & Stern, D. I. (2006). Environmental and ecological economics: A citation analysis. *Ecological Economics, 58*(3), 491-506.

Maghyereh, A., & Al-Kandari, A. (2007). Oil prices and stock markets in GCC countries: new evidence from nonlinear cointegration analysis. *Managerial Finance*, *33*(7), 449-460.

Masetti, O., Körner, K., Forster, M., Friedman, J., Lanzeni, M. L., AG, D. B., & Speyer, B. (2013). Two years of Arab Spring. *Deutche Bank Research*, 1-14.

Mehrara, M. (2007). Energy consumption and economic growth: the case of oil exporting countries. *Energy policy*, *35*(5), 2939-2945.

Milonas, N. T., & Henker, T. (2001). Price spread and convenience yield behaviour in the international oil market. *Applied Financial Economics*, *11*(1), 23-36.

Mohanty, S. K., Nandha, M., Turkistani, A. Q., & Alaitani, M. Y. (2011). Oil price movements and stock market returns: Evidence from Gulf Cooperation Council (GCC) countries. *Global Finance Journal*, *22*(1), 42–55. doi:10.1016/j.gfj.2011.05.004

Mollick, A. V., & Assefa, T. A. (2013). U.S. stock returns and oil prices: The tale from daily data and the 2008–2009 financial crisis. *Energy Economics*, *36*, 1–18. doi:10.1016/j.eneco.2012.11.021

Möbert, J. (2007). *Crude oil price determinants* (No. 186). Darmstadt discussion papers in economics.

Nandha, M., & Faff, R. (2008). Does oil move equity prices? A global view. *Energy Economics*, *30*(3), 986–997. doi:10.1016/j.eneco.2007.09.003

Narayan, P. K., & Smyth, R. (2008). Energy consumption and real GDP in G7 countries: New evidence from panel cointegration with structural breaks. *Energy Economics, 30*(5), 2331–2341. doi:10.1016/j.eneco.2007.10.006

OECD. (2013). *World Energy Outlook 2013*. *World Energy Outlook*. Organisation for Economic Co-operation and Development. doi:10.1787/weo-2013-en

OPEC (2014, December). Monthly Oil Market Report. Retrieved December 25, 2014 from http://www.opec.org/opec_web/flipbook/MOMRDecember2014/MOMRDecember2014.html

Öktem, E. ve Demirkul, Z. (2009). Petrol fiyatlarının dinamikleri ve geleceği. Türkiye 11. Enerji Kongresi Bildirileri, İzmir

Pala, Cenk (2001). Sanayileşme Sürecinde Enerjinin Yeri ve Önemi. Yayımlanmamış Doktora Tezi. Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü. Ankara.

Pamir, A. N. (2003). Dünyada ve Türkiye'de Enerji, Türkiye'nin Enerji Kaynakları ve Enerji Politikaları. *Metalurji Dergisi*, (134).

Papapetrou, Evangelia (2001). Oil Price Shocks, Stock Market, Economic Activity and Employment in Greece. Energy Economics, 23, 511- 532.

Park, J., & Ratti, R. A. (2008). Oil price shocks and stock markets in the US and 13 European countries. *Energy Economics*, *30*(5), 2587-2608.

Paul, S., & Bhattacharya, R. N. (2004). Causality between energy consumption and economic growth in India: a note on conflicting results. *Energy economics*,*26*(6), 977-983.

Petrol Nedir? (n.d). Retrieved September 10, 2014 from http://www.petform.org.tr/?lang=tr&a=2&s=1

Petrole Dair Merak Edilenler. (n.d). Retrieved September 10, 2014 from http://www.tpao.gov.tr/tpfiles/userfiles/files/petrolmerak.pdf

Phillips P. C. B. ve P. Peron (1988). Testing for a Unit Root in Time Series Regression. Biometrika, 75(2), 335-346.

Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. Biometrica, 75: 335-346. *Phillips33575Biometrica1988*.

Pokrovski, V. N. (2003). Energy in the theory of production. *Energy*, *28*, 769–788. doi:10.1016/S0360-5442(03)00031-8

Prasad, A., Narayan, P. K., & Narayan, J. (2007). Exploring the oil price and real GDP nexus for a small island economy, the Fiji Islands. *Energy Policy*,*35*(12), 6506-6513.

Press, D. G., & Gholz, E. (2007). Energy Alarmism: The Myths that Make Americans Worry about Oil (PA 589). *Cato Institute Policy Analysis Series*, (589).

Prugh, T., Flavin, C., & Sawin, J. L. (2005). Changing the oil economy. *State of the World*, 100-120.

Ramos-Martín, J. (2002). *Analysing the energy metabolism of economies from a complex-systems perspective* (Doctoral dissertation, MPhil dissertation. Keele University).

Rees, W. (1990). Sustainable development and the biosphere. *Teilhard Studies*, *23*.

Sadorsky, P. (1999). Oil price shocks and stock market activity. *Energy Economics*, *21*(5), 449–469. doi:10.1016/S0140-9883(99)00020-1

Sadorsky, P., & Henriques, I. (2001). Multifactor risk and the stock returns of Canadian paper and forest products companies. *Forest Policy and Economics*,*3*(3), 199-208.

Sevüktekin, M., & Nargeleçekenler, M. (2010). Ekonometrik Zaman Serileri Analizi EVievs Uygulamalı, Geliştirilmiş 3. *Baskı, Nobel Yayın Dağıtım, Ankara*.

Solak, A. O. (2012). Petrol Fiyatlarını Belirleyici Faktörler. *Uluslararası Alanya İşletme Fakültesi Dergisi*, *4*(2).

Soytas, U., & Sari, R. (2003). Energy consumption and GDP: causality relationship in G-7 countries and emerging markets. Energy economics, 25(1), 33-37.

Squalli, J. (2007). Electricity consumption and economic growth: bounds and causality analyses of OPEC members. *Energy Economics*, *29*(6), 1192-1205.

Stern D. I. (2003). The environmental Kuznets curve, Retrieved August 19, 2014 from http://econpapers.repec.org/article/blaajarec/v_3A47_3Ay_3A2003_3Ai_3A3_3Ap_3A325-347.htm

Stern, D. I. (1993). Energy and economic growth in the USA: a multivariate approach. *Energy Economics*, *15*(2), 137-150.

Stern, D. I. (1997). Limits to substitution and irreversibility in production and consumption: a neoclassical interpretation of ecological economics. *Ecological Economics*, *21*(3), 197-215.

Stern, D. I. (1999). Is energy cost an accurate indicator of natural resource quality?. *Ecological Economics*, *31*(3), 381-394.

Stern, D. I. (2011). The role of energy in economic growth. *Annals of the New York Academy of Sciences*, *1219*(1), 26-51.

Stern, D. I., & Cleveland, C. J. (2003). Energy and economic growth. *Encyclopedia of energy*, *2*, 35-51.

Stevens, P. (1995). The determination of oil prices 1945–1995. *Energy Policy*, *23*(10), 861–870. doi:10.1016/0301-4215(95)00092-W

Talukdar, K. H., & Sunyaeva, A. (2012). Oil Price Shocks And Stock Market Returns: Evidence From 11 Member Countries Of Organization Of Economic Cooperation And Development (OECD).

Terzi, H. (1998). Türkiye"de Elektrik Tüketimi Ve Ekonomik Büyüme İlişkisi: Sektörel Bir Karşılaştırma. *Iktisat Isletme ve Finans*, *13*(144), 62-71.

Tsani, S. Z. (2010). Energy consumption and economic growth: a causality analysis for Greece. *Energy Economics*, *32*(3), 582-590.

Tsoskounoglou, M., Ayerides, G., & Tritopoulou, E. (2008). The end of cheap oil: Current status and prospects. *Energy Policy*, *36*(10), 3797-3806.

Van den Bergh, J. C. (1996). Ecological economics and sustainable development. Theory, methods and applications. *Edward Elgar Publishing Ltd.*

Wang, Y., Wu, C., & Yang, L. (2013). Oil price shocks and stock market activities: Evidence from oil-importing and oil-exporting countries. *Journal of Comparative Economics*, *41*(4), 1220–1239. doi:10.1016/j.jce.2012.12.004

Yalta, A. T. (2011). Analyzing energy consumption and GDP nexus using maximum entropy bootstrap: The case of Turkey. *Energy Economics*, *33*(3), 453-460.

Yergin, D. (2014). Petrol: Para ve Güç Çatışmasının Epik Öyküsü. *Çev: Kamuran Tuncay,* İstanbul: *Türkiye İş Bankası Kültür Yayınları*.

Yıldırım M., Bayar B. and Kaya A. (2014). Enerji Fiyatlarının Sanayi Sektörü Hisse Senedi Fiyatları Üzerindeki Etkisi: Borsa İstanbul Sanayi Sektörü Şirketleri. Retrieved Nowember 18, 2014 from http://journal.mufad.org.tr/index.php?option=com_content&view=article&id=737%3Aenerji-fiyatlarinin-sanayi-sektoru-hisse-senedi-fiyatlari-uzerindeki-etkisi-borsa-istanbul-sanayi-sektoru-sirketleri&catid=944%3Asayi-62-nisan-2014&Itemid=55&lang=tr

Yıldırım, R. G. (2003). Dünyada ve Türkiye'de Biyokütle Enerji. *TMMOB Makina Mühendisleri Odası Yeni ve Yenilenebilir Enerji Kaynakları Sempozyumu ve Sergisi, Kayseri*.

Yıldız, D. & Ekinci E. (2015). Petrol Fiyatlarındaki Düşüş ve Bölgesel Güvenliğe Etkileri. Retrieved February 1, 2015 from https://www.academia.edu/9263963/Petrol_Fiyat%C4%B1ndaki_D%C3%BC%C5%9F%C3%BC%C5%9F_ve_B%C3%B6lgesel_G%C3%BCvenli%C4%9Fe_Etkileri

Yu, E. S., & Choi, J. Y. (1985). Causal relationship between energy and GNP: an international comparison. *J. Energy Dev.; (United States)*, *10*(2).

Yu, S. H., & Jin, J. C. (1992). Cointegration tests of energy consumption, income, and employment. *Resources and Energy*, *14*(3), 259-266.

Yücel F.B. (1994). Enerji Ekonomisi. Ankara: Akay Ofset Matbaacılık

Zamani, M. (2007). Energy consumption and economic activities in Iran. *Energy Economics*, *29*(6), 1135-1140.

Zhang, D. (2008). Oil shock and economic growth in Japan: A nonlinear approach. *Energy Economics*, *30*, 2374–2390. doi:10.1016/j.eneco.2008.01.006

APPENDICIES

APPENDIX 1- AUSTRIA

Table 9 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	Constant-Trend	Constant	Constant-Trend	Constant	Constant-Trend
IR	-1.775 [1] (0.392)	-2.548 [1] (0.304)	-1.607 [9] (0.477)	-2.355 [9] (0.402)	1.146 [11] ***	0.121 [11]
IPR	-2.113 [2] (0.239)	-1.245 [2] (0.898)	-1.568 [1] (0.497)	-1.699 [5] (0.748)	1.841 [12] ***	0.363 [11] ***
RNP	-1.058 [0] (0.732)	-3.385 [1] (0.055)	-1.151 [2] (0.695)	-3.385 [4] (0.055)	1.929 [11] ***	0.046 [11]
RSP	-1.354 [1] (0.604)	-1.921 [1] (0.640)	-1.299 [7] (0.630)	-1.888 [7] (0.657)	1.390 [11] ***	0.201 [11] **
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 10 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-7.585 [0] (0.000)***	-7.568 [0] (0.000)***	-7.578 [4] (0.000)***	-7.562 [4] (0.000)***	0,052 [9]	0.051 [9]
IPR	-15.214 [1] (0.000)***	-15.403 [1] (0.000)***	-21.809 [5] (0.000)***	-22.191 (0.000)***	0.168 [1]	0.020 [0]
RNP	-13.348 [0] (0.000)***	-13.320 [0] (0.000)***	-13.353 [2] (0.000)***	-13.325 [2] (0.000)***	0.028 [2]	0.027 [2]
RSP	-10.614 [0] (0.000)***	-10.592 [0] (0.000)***	-10.744 [6] (0.000)***	-10.721 [6] (0.000)***	0.085 [7]	0.083 [7]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 11 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-320.3158	NA	0.000205	2.857408	2.917760	2.881761
1	1295.758	3160.954	1.54e-10	-11.24015	-10.93840	-11.11839
2	1374.180	150.6264	8.91e-11	-11.79013	**-11.24697***	**-11.57096***
3	1398.487	45.82952	**8.28e-11***	**-11.86332***	-11.07875	-11.54673
4	1413.855	28.43375	8.33e-11	-11.85775	-10.83177	-11.44375
5	1426.452	22.86418	8.60e-11	-11.82777	-10.56039	-11.31636
6	1435.188	15.54726	9.18e-11	-11.76377	-10.25498	-11.15495
7	1451.342	**28.18040***	9.18e-11	-11.76512	-10.01493	-11.05890
8	1459.522	13.98221	9.87e-11	-11.69623	-9.704628	-10.89259
9	1468.052	14.27977	1.06e-10	-11.63042	-9.397409	-10.72937
10	1476.962	14.60067	1.13e-10	-11.56795	-9.093532	-10.56948
11	1493.287	26.17824	1.13e-10	-11.57081	-8.854993	-10.47494
12	1507.138	21.72164	1.16e-10	-11.55188	-8.594650	-10.35859

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 12 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-359.4660	NA	0.000289	3.202344	3.262695	3.226696
1	1302.815	3251.333	1.45e-10	-11.30233	-11.00057	-11.18057
2	1385.690	159.1793	8.05e-11	-11.89154	**-11.34838***	**-11.67237***
3	1410.474	46.72996	**7.45e-11***	**-11.96894***	-11.18437	-11.65235
4	1424.803	26.51197	7.57e-11	-11.95421	-10.92824	-11.54022
5	1438.103	24.13823	7.76e-11	-11.93042	-10.66304	-11.41901
6	1447.264	16.30494	8.25e-11	-11.87017	-10.36138	-11.26135
7	1463.636	**28.56051***	8.24e-11	-11.87345	-10.12325	-11.16722
8	1472.908	15.84878	8.77e-11	-11.81417	-9.822571	-11.01053
9	1481.438	14.27865	9.40e-11	-11.74835	-9.515346	-10.84730
10	1489.490	13.19544	1.01e-10	-11.67833	-9.203914	-10.67987
11	1504.552	24.15154	1.03e-10	-11.67006	-8.954239	-10.57419
12	1519.440	23.34968	1.04e-10	-11.66027	-8.703042	-10.46698

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 13 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.073933	42.48774	47.85613	0.145
At most 1	0.067221	24.36087	29.79707	0.185
At most 2	0.021743	7.938460	15.49471	0.472
At most 3	0.011588	2.750624	3.841466	0.097
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.073933	18.12687	27.58434	0.4846
At most 1	0.067221	16.42241	21.13162	0.2011
At most 2	0.021743	5.187836	14.26460	0.7179
At most 3	0.011588	2.750624	3.841466	0.0972

****MacKinnon-Haug-Michelis (1999) p-values**

Table 14: Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.085022	40.13118	47.85613	0.2179
At most 1	0.045053	19.16129	29.79707	0.4814
At most 2	0.026164	8.281852	15.49471	0.4358
At most 3	0.008544	2.025043	3.841466	0.1547
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.085022	20.96989	27.58434	0.2781
At most 1	0.045053	10.87944	21.13162	0.6593
At most 2	0.026164	6.256809	14.26460	0.5805
At most 3	0.008544	2.025043	3.841466	0.1547

****MacKinnon-Haug-Michelis (1999) p-values**

Table 15 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	8.203490	2	0.0165
RNP	2.948368	2	0.2290
RSP	18.37147	2	0.0001
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	12.02424	2	0.0024
RNP	0.955405	2	0.6202
RSP	4.373252	2	0.1123
Dependent Variable: RNP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	7.404714	2	0.0247
IPR	3.761761	2	0.1525
RSP	6.954516	2	0.0309
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	9.670787	2	0.0079
IPR	1.869566	2	0.3927
RNP	4.623515	2	0.0991

Table 16 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	5.276258	2	0.0715
RWP	1.851255	2	0.3963
RSP	17.71802	2	0.0001
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	13.97003	2	0.0009
RWP	0.414967	2	0.8126
RSP	4.212495	2	0.1217
Dependent Variable: RWP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	6.025857	2	0.0491
IPR	1.387317	2	0.4997
RSP	10.58957	2	0.0050
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**Df**	**Olasılık Value (p)**
IR	10.85458	2	0.0044
IPR	1.260136	2	0.5326
RWP	4.598732	2	0.1003

APPENDIX 2- BELGIUM

Table 17 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	Constant-Trend	Constant	Constant-Trend	Constant	Constant, Trend
IR	-1.878 [2] (0.341)	-2.630 [2] (0.267)	-2.015 [8] (0.279)	-2.577 [8] (0.29101)	1.143 [11] ***	0.114 [11]
IPR	-1.101 [0] (0.715)	-2.354 [0] (0.010)	-0.882 [25] (0.7926)	-3.534 [4] (0.03)	1.903 [12] ***	0.133 [11]
RNP	-1.226 [1] (0.663)	-3.404 [1] (0.053)	-1.140 [2] (0.700)	-3.383 [4] (0.056)	1.929 [11] ***	0.046 [11]
RSP	-1.895 [1] (0.333)	-1.947 [1] (0.626)	-1.892 [8] (0.335)	-2.012 [8] (0.590)	0.911 [11]	0.196 [11]
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 18 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-10.517 [0] (0.000)***	-10.497 [0] (0.000)***	-10.998 [6] (0.000)***	-10.984 [6] (0.000)***	0.073 [8]	0.070 [8]
IPR	-20.586 [0] (0.000)***	-20.547 [0] (0.000)***	-21.071 [10] (0.000)***	-21.057 [10] (0.000)***	0.088[28]	0.070 [28]
RNP	-13.199 [0] (0.000)***	-13.171 [0] (0.000)***	-13.201 [2] (0.000)***	-13.174 [2] (0.000)***	0.028 [2]	0.027 [2]
RSP	-10.955 [0] (0.000)***	-10.953 [0] (0.000)***	-11.156 [5] (0.000)***	-11.148 [5] (0.000)***	0.093 [8]	0.062 [7]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 19 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-243.6960	NA	0.000104	2.182343	2.242695	2.206696
1	1351.896	3120.894	9.41e-11	-11.73477	**-11.43301***	-11.61301
2	1380.531	54.99772	8.42e-11	-11.84608	-11.30292	**-11.62691***
3	1403.383	43.08794	7.93e-11	-11.90646	-11.12189	-11.58988
4	1420.763	32.15687	**7.84e-11***	**-11.91862***	-10.89264	-11.50462
5	1430.480	17.63619	8.30e-11	-11.86326	-10.59588	-11.35186
6	1440.337	17.54222	8.77e-11	-11.80914	-10.30035	-11.20032
7	1451.646	19.72768	9.16e-11	-11.76780	-10.01761	-11.06157
8	1469.180	**29.97165***	9.06e-11	-11.78133	-9.789725	-10.97769
9	1477.604	14.10110	9.72e-11	-11.71457	-9.481566	-10.81352
10	1490.348	20.88467	1.00e-10	-11.68589	-9.211474	-10.68743
11	1504.048	21.96859	1.03e-10	-11.66562	-8.949805	-10.56975
12	1513.411	14.68381	1.10e-10	-11.60715	-8.649923	-10.41386

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 20 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-231.4495	NA	9.35e-05	2.074445	2.134797	2.098798
1	1363.102	3118.858	8.53e-11	-11.83349	**-11.53174***	-11.71173
2	1394.308	59.93854	7.46e-11	-11.96747	-11.42431	**-11.74830***
3	1416.547	41.93026	7.06e-11	-12.02244	-11.23787	-11.70585
4	1432.742	29.96393	**7.06e-11***	**-12.02416***	-10.99818	-11.61016
5	1442.888	18.41583	7.44e-11	-11.97258	-10.70520	-11.46118
6	1453.479	18.84922	7.81e-11	-11.92493	-10.41614	-11.31611
7	1463.315	17.15883	8.26e-11	-11.87062	-10.12042	-11.16439
8	1481.904	**31.77305***	8.10e-11	-11.89343	-9.901827	-11.08979
9	1490.007	13.56476	8.71e-11	-11.82385	-9.590845	-10.92280
10	1501.058	18.10971	9.14e-11	-11.78025	-9.305834	-10.78179
11	1514.597	21.70960	9.39e-11	-11.75856	-9.042742	-10.66269
12	1524.562	15.62805	9.97e-11	-11.70539	-8.748165	-10.51211

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 21 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.148348	70.97677	47.85613	0.0001
At most 1 *	0.094135	32.92005	29.79707	0.0211
At most 2	0.037400	9.488949	15.49471	0.3221
At most 3	0.001919	0.455231	3.841466	0.4999
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None *	0.148348	38.05672	27.58434	0.0016
At most 1*	0.094135	23.43111	21.13162	0.0233
At most 2	0.037400	9.033718	14.26460	0.2834
At most 3	0.001919	0.455231	3.841466	0.4999

****MacKinnon-Haug-Michelis (1999) p-values**

Table 22 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.183204	78.37169	47.85613	0.0000
At most 1 *	0.084746	30.41100	29.79707	0.0425
At most 2	0.037483	9.423785	15.49471	0.3276
At most 3	0.001558	0.369487	3.841466	0.5433
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None*	0.183204	47.96068	27.58434	0.0000
At most 1	0.084746	20.98722	21.13162	0.0524
At most 2	0.037483	9.054297	14.26460	0.2816
At most 3	0.001558	0.369487	3.841466	0.5433

****MacKinnon-Haug-Michelis (1999) p-values**

Table 23 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	4.253717	1	0.0392
RNP	1.704937	1	0.1916
RSP	4.504930	1	0.0338
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.016	0.002	-5.777(0.000)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.965168	1	0.0851
RNP	0.115324	1	0.7342
RSP	0.707129	1	0.4004
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.064	0.024	-2.684(0.007)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	1.378693	1	0.2403
IPR	0.017482	1	0.8948
RSP	4.190762	1	0.0406
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RNP (ECT)	-0.024	0.021	-1.179(0.239)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.597984	1	0.4393
IPR	0.337961	1	0.5610
RNP	0.455695	1	0.4996
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP (ECT)	-0.008	0.010	-0.876(0.381)

Table 24 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	6.011553	1	0.0142
RWP	0.865224	1	0.3523
RSP	2.256790	1	0.1330
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.026	0.004	-6.287(0.000)
Dependent Variable: RWP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	1.947925	1	0.1628
IPR	0.039486	1	0.8425
RSP	6.225308	1	0.0126
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RWP (ECT)	-0.036	0.022	-1.600(0.110)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**Df**	**Prob.(p)**
IR	0.265407	1	0.6064
IPR	0.452622	1	0.5011
RWP	0.272842	1	0.6014
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP(ECT)	-0.003	0.012	-0.291(0.771)

APPENDIX 3-CANADA

Table 25 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant, Trend**
IR	-1.815 [1] (0.372)	-3.357 [1] (0.059)	-1.381 [6] (0.591)	-3.014 [6] (0.130)	1.391 [11] ***	0.061 [11]
IPR	-2.344 [3] (0.159)	-2.036 [3] (0.578)	-2.627 [8] (0.088)	-2.107 [8] (0.538)	0.967 [11] ***	0.431 [11] ***
RNP	-1.155 [0] (0.693)	-3.591 [1] (0.032)	-1.155 [0] (0.693)	-3.481 [3] (0.043)	1.961 [11] ***	0.079 [11]
RSP	-1.614 [1] (0.473)	-2.660 [1] (0.254)	-1.488 [3] (0.538)	-2.568 [4] (0.295)	1.771 [11] ***	0.155 [11]
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 26 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-8.268 [0] (0.000)***	-8.251 [0] (0.000)***	-7.902 [9] (0.000)***	-7.890 [9] (0.000)***	0.074 [6]	0.054 [6]
IPR	-6.468 [2] (0.000)***	-6.572 [2] (0.000)***	-15.958 [8] (0.000)***	-16.049[8] (0.000)***	0.340 [8]	0.089 [7]
RNP	-13.385 [0] (0.000)***	-13.357 [0] (0.000)***	-13.366 [4] (0.000)***	-13.338 [4] (0.000)***	0.025 [1]	0.024 [1]
RSP	-12.809 [0] (0.000)***	-12.798 [0] (0.000)***	-12.805 [1] (0.000)***	-12.794 [1] (0.000)***	0.055 [3]	0.033 [3]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.

The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.

*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 27 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-154.4473	NA	4.75e-05	1.396012	1.456363	1.420365
1	1425.984	3091.241	4.90e-11	-12.38753	-12.08577	-12.26576
2	1496.304	135.0639	3.04e-11	-12.86612	**-12.32295***	**-12.64694***
3	1521.830	48.12823	**2.79e-11***	**-12.95005***	-12.16548	-12.63346
4	1536.649	27.41729	2.82e-11	-12.93964	-11.91366	-12.52564
5	1548.803	22.05954	2.93e-11	-12.90575	-11.63837	-12.39434
6	1556.504	13.70638	3.15e-11	-12.83264	-11.32385	-12.22382
7	1571.824	**26.72473***	3.18e-11	-12.82664	-11.07645	-12.12041
8	1580.351	14.57582	3.40e-11	-12.76080	-10.76920	-11.95716
9	1587.001	11.13086	3.71e-11	-12.67842	-10.44541	-11.77737
10	1597.136	16.61046	3.92e-11	-12.62675	-10.15234	-11.62829
11	1607.051	15.89772	4.16e-11	-12.57313	-9.857315	-11.47726
12	1613.015	9.353960	4.57e-11	-12.48472	-9.527490	-11.29143

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 28 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-199.1076	NA	7.04e-05	1.789494	1.849846	1.813847
1	1423.812	3174.345	5.00e-11	-12.36839	-12.06663	-12.24662
2	1499.992	146.3195	2.94e-11	-12.89861	**-12.35544***	**-12.67943***
3	1526.505	**49.98949***	**2.68e-11***	**-12.99123***	-12.20666	-12.67465
4	1539.978	24.92820	2.74e-11	-12.96897	-11.94299	-12.55497
5	1552.031	21.87633	2.84e-11	-12.93420	-11.66681	-12.42279
6	1559.627	13.51741	3.07e-11	-12.86015	-11.35136	-12.25133
7	1574.437	25.83615	3.10e-11	-12.84966	-11.09947	-12.14343
8	1583.061	14.74202	3.32e-11	-12.78468	-10.79308	-11.98104
9	1590.240	12.01697	3.60e-11	-12.70696	-10.47395	-11.80591
10	1599.823	15.70493	3.83e-11	-12.65043	-10.17601	-11.65196
11	1609.326	15.23721	4.08e-11	-12.59318	-9.877359	-11.49731
12	1613.534	6.599145	4.55e-11	-12.48928	-9.532058	-11.29600

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 29 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.062123	35.38612	47.85613	0.4278
At most 1	0.049726	20.25004	29.79707	0.4061
At most 2	0.028953	8.212832	15.49471	0.4429
At most 3	0.005405	1.279104	3.841466	0.2581
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.062123	15.13608	27.58434	0.7374
At most 1	0.049726	12.03721	21.13162	0.5440
At most 2	0.028953	6.933727	14.26460	0.4970
At most 3	0.005405	1.279104	3.841466	0.2581

****MacKinnon-Haug-Michelis (1999) p-values**

Table 30 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.061119	34.34601	47.85613	0.4830
At most 1	0.048686	19.46238	29.79707	0.4601
At most 2	0.027767	7.683304	15.49471	0.4999
At most 3	0.004387	1.037667	3.841466	0.3084
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.061119	14.88363	27.58434	0.7574
At most 1	0.048686	11.77907	21.13162	0.5696
At most 2	0.027767	6.645637	14.26460	0.5319
At most 3	0.004387	1.037667	3.841466	0.3084

****MacKinnon-Haug-Michelis (1999) p-values**

Table 31 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	5.665003	2	0.0589
RNP	4.575090	2	0.1015
RSP	2.073560	2	0.3546
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	10.67917	2	0.0048
RNP	6.796172	2	0.0334
RSP	2.539804	2	0.2809
Dependent Variable: RNP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.618852	2	0.2700
IPR	0.296948	2	0.8620
RSP	14.73880	2	0.0006
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	1.255469	2	0.5338
IPR	3.699201	2	0.1573
RNP	2.702240	2	0.2590

Table 32 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	6.460215	2	0.0396
RWP	4.176127	2	0.1239
RSP	2.129723	2	0.3448
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	10.62991	2	0.0049
RWP	8.387136	2	0.0151
RSP	3.157287	2	0.2063
Dependent Variable: RWP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.581070	2	0.2751
IPR	0.854073	2	0.6524
RSP	17.73374	2	0.0001
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Olasılık Value (p)**
IR	1.124137	2	0.5700
IPR	4.226143	2	0.1209
RWP	3.771652	2	0.1517

APPENDIX 4-CZECH REPUBLIC

Table 33 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	Constant-Trend	Constant	Constant-Trend	Constant	Constant, Trend
IR	-0.730 [4] (0.835)	-1.985 [4] (0.605)	-1.343 [26] (0.609)	-2.806 [18] (0.196)	1.514 [11] ***	0.217 [11]
IPR	-1.342 [1] (0.610)	-2.195 [1] (0.489)	-1.446 [9] (0.558)	-3.091 [0] (0.110)	1.844 [12] ***	0.190 [11]
RNP	-1.277 [0] (0.640)	-3.493[1] (0.042)	-1.277 [0] (0.640)	-3.377 [3] (0.056)	1.841 [11] ***	0.048 [11]
RSP	-1.240 [2] (0.657)	-3.018 [1] (0.129)	-1.469 [6] (0.547)	-2.890 [6] (0.167)	1.286 [11] ***	0.204 [11]
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significiance Constant respectively.**

Table 34 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-10.917 [3] (0.000)***	-10.907 [3] (0.000)***	-14.252 [45] (0.000)***	-14.194[45] (0.000)***	0.083 [36]	0.085 [36]
IPR	-21.361 [0] (0.000)***	-21.348 [0] (0.000)***	-21.481 [2] (0.000)***	-21.475 [2] (0.000)***	0.092 [10]	0.044 [3]
RNP	-13.404 [0] (0.000)***	-13.376 [0] (0.000)***	-13.380 [4] (0.000)***	-13.352 [4] (0.000)***	0.025 [1]	0.025 [1]
RSP	-10.210 [1] (0.000)***	-10.201 [1] (0.000)***	-10.445 [1] (0.000)***	-10.465 [1] (0.000)***	0.210 [6]	0.164 [6]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 35 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-487.1273	NA	0.000890	4.327113	4.387464	4.351465
1	780.0989	2478.627	1.45e-08	-6.696906	**-6.395149***	-6.575143
2	814.9559	66.95011	1.23e-08	-6.863048	-6.319884	-6.643873
3	858.9509	82.95091	**9.61e-09***	**-7.109700***	-6.325130	**-6.793114***
4	864.5913	10.43601	1.05e-08	-7.018426	-5.992450	-6.604429
5	883.6074	**34.51375***	1.03e-08	-7.044999	-5.777617	-6.533592
6	895.2526	20.72534	1.07e-08	-7.006631	-5.497842	-6.397812
7	902.0423	11.84456	1.16e-08	-6.925482	-5.175288	-6.219253
8	910.7843	14.94239	1.24e-08	-6.861536	-4.869935	-6.057896
9	920.0032	15.43241	1.32e-08	-6.801790	-4.568783	-5.900739
10	927.2528	11.88047	1.43e-08	-6.724694	-4.250281	-5.726232
11	942.4829	24.42190	1.45e-08	-6.717911	-4.002092	-5.622039
12	955.0405	19.69377	1.51e-08	-6.687581	-3.730356	-5.494298

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 36 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-501.3709	NA	0.001009	4.452607	4.512959	4.476960
1	787.5004	2520.964	1.36e-08	-6.762118	**-6.460361***	-6.640355
2	825.1850	72.38099	1.12e-08	-6.953172	-6.410008	-6.733998
3	868.3034	81.29812	**8.85e-09***	**-7.192101***	-6.407531	**-6.875515***
4	874.2275	10.96072	9.68e-09	-7.103326	-6.077349	-6.689329
5	895.5372	**38.67666***	9.24e-09	-7.150107	-5.882725	-6.638700
6	909.9553	25.66056	9.39e-09	-7.136170	-5.627382	-6.527352
7	917.8539	13.77905	1.01e-08	-7.064792	-5.314598	-6.358563
8	928.5274	18.24354	1.06e-08	-7.017862	-5.026261	-6.214222
9	938.1078	16.03773	1.13e-08	-6.961302	-4.728295	-6.060251
10	946.5817	13.88676	1.21e-08	-6.894993	-4.420580	-5.896531
11	961.9733	24.68073	1.22e-08	-6.889632	-4.173813	-5.793759
12	973.6347	18.28846	1.28e-08	-6.851407	-3.894182	-5.658123

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 37 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None*	0.115902	55.71748	47.85613	0.0077
At most 1	0.075556	26.52196	29.79707	0.1139
At most 2	0.028457	7.902520	15.49471	0.4759
At most 3	0.004464	1.060395	3.841466	0.3031
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None*	0.115902	29.19552	27.58434	0.0308
At most 1	0.075556	18.61944	21.13162	0.1084
At most 2	0.028457	6.842126	14.26460	0.5080
At most 3	0.004464	1.060395	3.841466	0.3031

****MacKinnon-Haug-Michelis (1999) p-values**

Table 38 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None*	0.115430	55.48003	47.85613	0.0082
At most 1	0.075794	26.41121	29.79707	0.1169
At most 2	0.027739	7.730800	15.49471	0.4946
At most 3	0.004478	1.063771	3.841466	0.3024
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None*	0.115430	29.06882	27.58434	0.0320
At most 1	0.075794	18.68041	21.13162	0.1065
At most 2	0.027739	6.667030	14.26460	0.5292
At most 3	0.004478	1.063771	3.841466	0.3024

****MacKinnon-Haug-Michelis (1999) p-values**

Table 39 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.688867	1	0.4065
RNP	0.606151	1	0.4362
RSP	0.465976	1	0.4948
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.011	0.006	-1.803(0.072)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.491557	1	0.4832
RNP	4.441550	1	0.0351
RSP	1.414001	1	0.2344
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.071	0.018	-3.777(0.0002)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.379223	1	0.5380
IPR	1.685702	1	0.1942
RSP	4.376914	1	0.0364
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	Std. Error	t-Statistic (Prob.)
RNP (ECT)	0.005	0.006	0.788(0.4310)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.526688	1	0.4680
IPR	0.007001	1	0.9333
RNP	0.251975	1	0.6157
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP(ECT)	-0.037	0.012	-2.967(0.003)

Table 40 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.796059	1	0.3723
RWP	0.596636	1	0.4399
RSP	0.608024	1	0.4355
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.021	0.010	-2.039(0.042)
Dependent Variable: IPR(Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.220172	1	0.6389
RWP	5.408080	1	0.0200
RSP	0.979549	1	0.3223
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.052	0.015	-3.336(0.001)
Dependent Variable: RWP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.028310	1	0.8664
IPR	1.372795	1	0.2413
RSP	6.140681	1	0.0132
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RWP (ECT)	-0.000	0.0004	-1.872(0.062)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob. (p)**
IR	0.741921	1	0.3890
IPR	0.000373	1	0.9846
RWP	1.285208	1	0.2569
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP(ECT)	-0.033	0.012	-2.616(0.009)

APPENDIX 5-DENMARK

Table 41 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	Constant-Trend	Constant	Constant-Trend	Constant	Constant, Trend
IR	-1.287 [1] (0.635)	-1.999 [1] (0.598)	-1.521 [8] (0.520)	-2.316 [9] (0.423)	1.176 [11] ***	0.108 [11]
IPR	-2.185 [3] (0.212)	-1.878 [3] (0.662)	-2.803 [9] (0.059)	-2.552[9] (0.302)	0.586 [11] ***	0.452 [11] ***
RNP	-2.926 [3] (0.043)	-14.110 [0] (0.054)	-9.668 [9] (0.000)	-14.261 [5] (0.000)	1.898 [11] ***	0.054 [6]
RSP	-1.164 [1] (0.689)	-2.263 [1] (0.451)	-1.106 [7] (0.713)	-2.369 [8] (0.394)	1.721 [11] ***	0.169 [11] ***
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.

The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.

*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 42 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-10.958 [0] (0.000)***	-10.935 [0] (0.000)***	-11.553 [7] (0.000)***	-11.532 [7] (0.000)***	0.057 [8]	0.057 [8]
IPR	-12.597 [2] (0.000)***	-12.694 [2] (0.000)***	-23.527 [30] (0.000)***	-26.582 [35] (0.000)***	0.373 [25]	0.063[28]
RNP	-12.727 [3] (0.000)***	-12.699 [0] (0.000)***	-127.131 [85] (0.000)***	-126.824 [85] (0.000)***	0.500 [37]	0.505 [37]
RSP	-11.413 [0] (0.000)***	-11.390 [0] (0.000)***	-11.610 [5] (0.000)***	-11.586 [5] (0.000)***	0.047 [7]	0.045 [7]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 43 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-460.4917	NA	0.000704	4.092438	4.152789	4.116791
1	677.9213	2226.676	3.57e-08	-5.796663	**-5.494906***	-5.674900
2	709.7766	61.18463	3.10e-08	-5.936358	-5.393194	**-5.717183***
3	723.6235	26.10789	3.17e-08	-5.917388	-5.132818	-5.600803
4	743.3598	36.51636	**3.06e-08***	**-5.950306***	-4.924330	-5.536310
5	750.3061	12.60743	3.32e-08	-5.870538	-4.603156	-5.359131
6	767.1767	30.02528	3.30e-08	-5.878209	-4.369421	-5.269391
7	785.3176	31.64664	3.25e-08	-5.897071	-4.146877	-5.190842
8	794.6735	15.99160	3.45e-08	-5.838533	-3.846932	-5.034893
9	808.3313	22.86318	3.54e-08	-5.817897	-3.584890	-4.916846
10	823.4371	24.75497	3.58e-08	-5.810019	-3.335605	-4.811557
11	844.4714	33.72895*	3.44e-08	-5.854373	-3.138554	-4.758501
12	852.5862	12.72637	3.71e-08	-5.784901	-2.827675	-4.591617

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 44 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-302.2188	NA	0.000175	2.697963	2.758314	2.722316
1	1161.920	2863.777	5.02e-10	-10.06097	**-9.759209***	-9.939203
2	1197.199	67.76063	4.24e-10	-10.23083	-9.687662	**-10.01165***
3	1212.433	28.72345	4.27e-10	-10.22408	-9.439508	-9.907493
4	1235.813	43.25791	**4.00e-10***	**-10.28910***	-9.263123	-9.875103
5	1244.810	16.33016	4.26e-10	-10.22740	-8.960020	-9.715995
6	1265.183	36.25776	4.10e-10	-10.26593	-8.757139	-9.657109
7	1279.578	25.11182	4.17e-10	-10.25179	-8.501591	-9.545556
8	1289.329	16.66740	4.42e-10	-10.19673	-8.205130	-9.393091
9	1301.079	19.66985	4.60e-10	-10.15929	-7.926280	-9.258236
10	1317.440	26.81087	4.61e-10	-10.16246	-7.688049	-9.164001
11	1336.349	30.32139*	4.52e-10	-10.18809	-7.472275	-9.092222
12	1346.831	16.43977	4.77e-10	-10.13948	-7.182258	-8.946200

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 45 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None*	0.255174	102.4520	47.85613	0.0000
At most 1*	0.079199	32.63080	29.79707	0.0230
At most 2	0.047194	13.07551	15.49471	0.1121
At most 3	0.006803	1.617925	3.841466	0.2034
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None*	0.255174	69.82116	27.58434	0.0000
At most 1	0.079199	19.55529	21.13162	0.0819
At most 2	0.047194	11.45758	14.26460	0.1327
At most 3	0.006803	1.617925	3.841466	0.2034

****MacKinnon-Haug-Michelis (1999) p-values**

Table 46 Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.096960	43.21080	47.85613	0.1275
At most 1	0.039192	19.14146	29.79707	0.4828
At most 2	0.035617	9.706028	15.49471	0.3040
At most 3	0.004849	1.147048	3.841466	0.2842
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.096960	24.06934	27.58434	0.1323
At most 1	0.039192	9.435433	21.13162	0.7958
At most 2	0.035617	8.558980	14.26460	0.3247
At most 3	0.004849	1.147048	3.841466	0.2842

MacKinnon-Haug-Michelis (1999) p-values

Table 47 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.295278	1	0.5869
RNP	0.082092	1	0.7745
RSP	3.604422	1	0.0576
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t- Statistics (Prob.)**
IR (ECT)	-0.000	0.001	-0.523(0.601)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.173512	1	0.1404
RNP	0.067765	1	0.7946
RSP	0.177691	1	0.6734
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t- Statistics (Prob.)**
IPR (ECT)	0.002	0.008	0.265(0.790)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.002626	1	0.9591
IPR	0.383906	1	0.5355
RSP	0.334127	1	0.5632
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t- Statistics (Prob.)**
RNP (ECT)	-0.758	0.085	-8.835(0.000)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.179348	1	0.6719
IPR	0.001869	1	0.9655
RNP	0.780618	1	0.3770
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t- Statistics (Prob.)**
RSP(ECT)	-0.001	0.008	-0.213(0.831)

Table 48 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.705859	1	0.4008
RWP	1.758790	1	0.1848
RSP	3.572906	1	0.0587
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.202140	1	0.6530
RWP	3.630429	1	0.0567
RSP	5.826988	1	0.0158
Dependent Variable: RWP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	6.166237	1	0.0130
IPR	0.469271	1	0.4933
RSP	1.572692	1	0.2098
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob. Value (p)**
IR	23.36561	1	0.0000
IPR	0.011833	1	0.9134
RWP	0.578955	1	0.4467

APPENDIX 6-FINLAND

Table 49 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	Constant-Trend	Constant	Constant-Trend	Constant	Constant, Trend
IR	-1.443 [1] (0.560)	-2.414 [1] (0.370)	-1.431 [9] (0.566)	-2.419 [9] (0.368)	1.170 [11] ***	0.105 [11]
IPR	-2.640 [1] (0.086)	-1.313 [2] (0.882)	-2.600 [1] (0.094)	-1.691 [0] (0.752)	1.573 [11] ***	0.363 [11] ***
RNP	-0.994 [0] (0.755)	-3.396 [1] (0.054)	-1.100 [2] (0.715)	-3.383 [4] (0.056)	1.924 [11] ***	0.048 [11]
RSP	-2.159 [1] (0.221)	-1.902 [1] (0.064)	-1.979 [3] (0.295)	-1.644 [3] (0.772)	0.821 [11] ***	0.329 [11] **
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.

The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.

*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 50 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-8.265 [0] (0.000)***	-8.252 [0] (0.000)***	-8.450 [6] (0.000)***	-8.441 [6] (0.000)***	0.048 [9]	0.041 [9]
IPR	-19.054 [0] (0.000)***	-19.363 [0] (0.000)***	-18.941 [5] (0.000)***	-19.571 [3] (0.000)***	0.474 [1]	0.031[3]
RNP	-13.274 [0] (0.000)***	-13.219 [0] (0.000)***	-13.254 [2] (0.000)***	-13.226 [2] (0.000)***	0.029 [2]	0.029 [2]
RSP	-10.540 [0] (0.000)***	-10.553 [0] (0.000)***	-10.358 [6] (0.000)***	-10.377 [6] (0.000)***	0.212 [4]	0.069 [3]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 51 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-427.0563	NA	0.000524	3.797853	3.858204	3.822206
1	1178.012	3139.429	4.36e-10	-10.20275	-9.900992	-10.08099
2	1266.333	169.6391	2.30e-10	-10.83994	**-10.29678***	-10.62077
3	1293.510	51.24102	**2.09e-10***	**-10.93842***	-10.15385	**-10.62183***
4	1302.423	16.49148	2.22e-10	-10.87598	-9.850002	-10.46198
5	1312.412	18.12831	2.35e-10	-10.82301	-9.555628	-10.31160
6	1319.970	13.45257	2.53e-10	-10.74864	-9.239849	-10.13982
7	1337.379	30.36859	2.51e-10	-10.76105	-9.010851	-10.05482
8	1346.111	14.92507	2.68e-10	-10.69701	-8.705409	-9.893370
9	1360.315	23.77773	2.73e-10	-10.68119	-8.448179	-9.780135
10	1366.634	10.35529	2.99e-10	-10.59589	-8.121478	-9.597429
11	1381.113	23.21814	3.04e-10	-10.58249	-7.866674	-9.486621
12	1398.076	**26.60199***	3.04e-10	-10.59097	-7.633749	-9.397690

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 52 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-461.0000	NA	0.000707	4.096917	4.157268	4.121269
1	1182.629	3214.851	4.18e-10	-10.24343	-9.941668	-10.12166
2	1275.135	177.6765	2.13e-10	-10.91749	**-10.37432***	-10.69831
3	1302.642	51.86302	**1.93e-10***	**-11.01887***	-10.23430	**-10.70228***
4	1312.209	17.70268	2.04e-10	-10.96220	-9.936221	-10.54820
5	1322.058	17.87584	2.16e-10	-10.90800	-9.640622	-10.39660
6	1329.496	13.23757	2.33e-10	-10.83257	-9.323779	-10.22375
7	1346.082	**28.93412***	2.32e-10	-10.83773	-9.087536	-10.13150
8	1355.761	16.54264	2.46e-10	-10.78203	-8.790432	-9.978393
9	1368.908	22.00926	2.53e-10	-10.75690	-8.523895	-9.855851
10	1375.726	11.17223	2.76e-10	-10.67600	-8.201585	-9.677536
11	1390.622	23.88611	2.80e-10	-10.66627	-7.950452	-9.570399
12	1406.037	24.17604	2.83e-10	-10.66112	-7.703897	-9.467839

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 53 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.102760	46.12067	47.85613	0.0721
At most 1	0.043498	20.53074	29.79707	0.3876
At most 2	0.037046	10.03535	15.49471	0.2780
At most 3	0.004762	1.126462	3.841466	0.2885
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.102760	25.58993	27.58434	0.0880
At most 1	0.043498	10.49539	21.13162	0.6972
At most 2	0.037046	8.908888	14.26460	0.2938
At most 3	0.004762	1.126462	3.841466	0.2885

****MacKinnon-Haug-Michelis (1999) p-values**

Table 54 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.096960	43.21080	47.85613	0.1275
At most 1	0.039192	19.14146	29.79707	0.4828
At most 2	0.035617	9.706028	15.49471	0.3040
At most 3	0.004849	1.147048	3.841466	0.2842
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.096960	24.06934	27.58434	0.1323
At most 1	0.039192	9.435433	21.13162	0.7958
At most 2	0.035617	8.558980	14.26460	0.3247
At most 3	0.004849	1.147048	3.841466	0.2842

****MacKinnon-Haug-Michelis (1999) p-values**

Table 55 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	9.880442	2	0.0072
RNP	5.890369	2	0.0526
RSP	8.494370	2	0.0143
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	17.25579	2	0.0002
RNP	4.002726	2	0.1352
RSP	4.831341	2	0.0893
Dependent Variable: RNP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	9.673629	2	0.0079
IPR	0.254771	2	0.8804
RSP	2.770064	2	0.2503
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	17.02966	2	0.0002
IPR	3.737203	2	0.1543
RNP	11.37558	2	0.0034

Table 56 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	10.64774	2	0.0049
RWP	7.639062	2	0.0219
RSP	9.342599	2	0.0094
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	16.04345	2	0.0003
RWP	5.653488	2	0.0592
RSP	4.925586	2	0.0852
Dependent Variable: RWP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	6.203505	2	0.0450
IPR	0.026754	2	0.9867
RSP	0.691990	2	0.7075
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob. (p)**
IR	16.33287	2	0.0003
IPR	4.060299	2	0.1313
RWP	10.92193	2	0.0042

APPENDIX 7-FRANCE

Table 57 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant, Trend**
IR	-1.964 [8] (0.302)	-3.111 [8] (0.106)	-1.755 [8] (0.402)	-2.532 [8] (0.312)	1.239 [11] ***	0.102 [11]
IPR	-1.593 [1] (0.484)	-2.020 [1] (0.586)	-1.912 [7] (0.326)	-2.179 [6] (0.498)	0.483 [11] **	0.410 [11] ***
RNP	-1.050[0] (0.735)	-3.363 [1] (0.058)	-1.146 [1] (0.697)	-3.370 [4] (0.057)	1.926 [11] ***	0.047 [11]
RSP	-1.843 [1] (0.358)	-1.819 [1] (0.692)	-1.718 [6] (0.420)	-1.763 [6] (0.719)	0.805 [11] ***	0.269 [11]
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 58 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		**Phillips-Perron (PP)**		**Kwiatkowski Phillips-Schmid-Shin (KPSS)**	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-4.600 [7] (0.000)***	-4.590 [7] (0.001)***	-12.165 [4] (0.000)***	-12.143 [4] (0.000)***	0.054 [6]	0.053 [6]
IPR	-20.778 [0] (0.000)***	-21.009 [1] (0.000)***	-19.961 [7] (0.000)***	-20.190 [7] (0.000)***	0.310 [6]	0.047 [5]
RNP	-13.349 [0] (0.000)***	-13.322 [0] (0.000)***	-13.349 [1] (0.000)***	-13.321 [1] (0.000)***	0.028 [2]	0.028 [2]
RSP	-11.491 [0] (0.000)***	-11.488 [0] (0.000)***	-11.436 [2] (0.000)***	-11.432 [2] (0.000)***	0.102 [6]	0.067 [6]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 59 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-183.9428	NA	6.16e-05	1.655884	1.716236	1.680237
1	1286.876	2876.843	1.67e-10	-11.16190	**-10.86014***	-11.04014
2	1327.137	77.33096	1.35e-10	-11.37566	-10.83250	**-11.15649***
3	1345.838	35.25994	**1.32e-10***	**-11.39946***	-10.61489	-11.08287
4	1361.433	**28.85280***	1.32e-10	-11.39588	-10.36991	-10.98189
5	1371.351	18.00113	1.40e-10	-11.34230	-10.07492	-10.83089
6	1379.853	15.13098	1.49e-10	-11.27623	-9.767446	-10.66742
7	1389.473	16.78305	1.58e-10	-11.22003	-9.469833	-10.51380
8	1401.272	20.16752	1.65e-10	-11.18302	-9.191414	-10.37938
9	1408.926	12.81197	1.78e-10	-11.10948	-8.876470	-10.20843
10	1417.046	13.30792	1.92e-10	-11.04006	-8.565643	-10.04159
11	1430.557	21.66417	1.97e-10	-11.01812	-8.302302	-9.922248
12	1442.269	18.36787	2.06e-10	-10.98034	-8.023117	-9.787058

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 60 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-223.7736	NA	8.74e-05	2.006816	2.067167	2.031168
1	1292.291	2965.343	1.59e-10	-11.20962	-10.90786	-11.08785
2	1337.739	87.29145	1.23e-10	-11.46907	**-10.92590***	**-11.24989***
3	1356.083	34.58742	**1.20e-10***	**-11.48972***	-10.70515	-11.17313
4	1372.078	**29.59476***	1.20e-10	-11.48968	-10.46370	-11.07568
5	1382.484	18.88545	1.27e-10	-11.44039	-10.17300	-10.92898
6	1391.711	16.42127	1.35e-10	-11.38071	-9.871922	-10.77189
7	1401.712	17.44648	1.42e-10	-11.32785	-9.577660	-10.62163
8	1414.846	22.45033	1.46e-10	-11.30261	-9.311008	-10.49897
9	1423.139	13.88208	1.57e-10	-11.23470	-9.001696	-10.33365
10	1431.123	13.08341	1.69e-10	-11.16408	-8.689662	-10.16561
11	1443.299	19.52508	1.76e-10	-11.13039	-8.414567	-10.03451
12	1454.880	18.16302	1.84e-10	-11.09146	-8.134231	-9.898173

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 61 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.107278	49.34179	47.85613	0.0360
At most 1	0.053041	22.44699	29.79707	0.2743
At most 2	0.039412	9.530629	15.49471	0.3186
At most 3	3.58E-06	0.000849	3.841466	0.9777
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.107278	26.89480	27.58434	0.0611
At most 1	0.053041	12.91636	21.13162	0.4599
At most 2	0.039412	9.529780	14.26460	0.2447
At most 3	3.58E-06	0.000849	3.841466	0.9777

****MacKinnon-Haug-Michelis (1999) p-values**

Table 62 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.115061	45.27740	47.85613	0.0856
At most 1	0.041422	16.42947	29.79707	0.6818
At most 2	0.026937	6.445734	15.49471	0.6428
At most 3	5.47E-06	0.001290	3.841466	0.9705
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None*	0.115061	28.84793	27.58434	0.0343
At most 1	0.041422	9.983733	21.13162	0.7462
At most 2	0.026937	6.444443	14.26460	0.5569
At most 3	5.47E-06	0.001290	3.841466	0.9705

****MacKinnon-Haug-Michelis (1999) p-values**

Table 63 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	1.213607	1	0.2706
RNP	5.565377	1	0.0183
RSP	1.402311	1	0.2363
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	0.005	0.007	0.781(0.435)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	11.64090	1	0.0006
RNP	3.164191	1	0.0753
RSP	3.402578	1	0.0651
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.027	0.008	-3.080(0.002)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.263951	1	0.1324
IPR	0.720113	1	0.3961
RSP	0.689816	1	0.4062
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RNP (ECT)	-0.030	0.010	-2.834(0.05)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	4.281859	1	0.0385
IPR	0.102302	1	0.7491
RNP	0.809802	1	0.3682
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP (ECT)	0.012	0.003	3.628(0.000)

Table 64 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	2.150733	2	0.3412
RWP	8.461868	2	0.0145
RSP	1.633610	2	0.4418
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	0.005	0.007	0.799(0.425)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	16.07372	2	0.0003
RWP	18.24900	2	0.0001
RSP	4.858618	2	0.0881
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.028	0.007	-3.741(0.000)
Dependent Variable: RWP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.789768	2	0.2479
IPR	1.350452	2	0.5090
RSP	5.101133	2	0.0780
Dependent Variable: RWP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RWP (ECT)	-0.012	0.008	-1.511(0.132)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	4.176155	2	0.1239
IPR	1.637394	2	0.4410
RWP	1.874411	2	0.3917
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP(ECT)	0.001	0.0004	3.871(0.000)

APPENDIX 8-GERMANY

Table 65 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	Constant-Trend	Constant	Constant-Trend	Constant	Constant, Trend
IR	-1.932 [1] (0.317)	-2.611 [1] (0.275)	-1.818 [9] (0.370)	-2.440 [9] (0.357)	1.126 [11] ***	0.120 [11]
IPR	-1.301 [3] (0.629)	-3.296 [2] (0.069)	-1.286 [2] (0.636)	-3.094 [8] (0.110) ***	1.815 [11] ***	0.065 [11]
RNP	-1.059 [0] (0.731)	-3.396 [1] (0.054)	-1.152 [2] (0.694)	-3.389 [4] (0.055)	1.929 [11] ***	0.046 [11]
RSP	-1.963 [1] (0.303)	-2.195 [1] (0.489)	-1.921 [6] (0.322)	-2.153 [6] (0.513)	0.620 [11]	0.129 [11]
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.

The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.

*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 66 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-7.546 [0] (0.000)***	-7.531 [0] (0.000)***	-7.527 [4] (0.000)***	-7.514 [4] (0.000)***	0.061 [9]	0.061 [9]
IPR	-6.714 [2] (0.000)***	-6.697 [2] (0.000)***	-18.139 [8] (0.000)***	-18.108 [8] (0.000)***	0.032 [7]	0.030 [7]
RNP	-13.341 [0] (0.000)***	-13.313 [0] (0.000)***	-13.344 [2] (0.000)***	-13.316[2] (0.000)***	0.029 [1]	0.029 [1]
RSP	-11.223 [0] (0.000)***	-11.200 [0] (0.000)***	-11.236 [1] (0.000)***	-11.214 [1] (0.000)***	0.072 [6]	0.068 [6]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 67 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-149.2176	NA	4.53e-05	1.349935	1.410286	1.374287
1	1346.353	2925.256	9.89e-11	-11.68593	-11.38417	-11.56416
2	1422.505	146.2659	5.82e-11	-12.21590	**-11.67274***	**-11.99673***
3	1444.507	41.48379	5.52e-11	-12.26878	-11.48421	-11.95220
4	1461.215	30.91424	**5.49e-11***	**-12.27502***	-11.24905	-11.86103
5	1468.844	13.84562	5.92e-11	-12.20127	-10.93388	-11.68986
6	1479.263	18.54336	6.22e-11	-12.15210	-10.64331	-11.54328
7	1491.964	22.15711	6.42e-11	-12.12303	-10.37284	-11.41680
8	1503.205	19.21326	6.71e-11	-12.08110	-10.08950	-11.27746
9	1516.580	22.39088	6.89e-11	-12.05798	-9.824970	-11.15693
10	1526.424	16.13109	7.31e-11	-12.00373	-9.529321	-11.00527
11	1544.429	**28.87201***	7.22e-11	-12.02140	-9.305583	-10.92553
12	1557.360	20.27945	7.46e-11	-11.99436	-9.037137	-10.80108

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 68 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-171.7220	NA	5.53e-05	1.548212	1.608563	1.572565
1	1355.783	2987.719	9.10e-11	-11.76901	-11.46725	-11.64725
2	1435.477	153.0696	5.19e-11	-12.33020	**-11.78703***	**-12.11102***
3	1456.957	40.49893	4.95e-11	-12.37847	-11.59390	-12.06189
4	1473.716	**31.00752***	**4.92e-11***	**-12.38516***	-11.35918	-11.97116
5	1480.727	12.72615	5.33e-11	-12.30597	-11.03859	-11.79456
6	1492.083	20.20945	5.56e-11	-12.26505	-10.75626	-11.65623
7	1504.563	21.77113	5.75e-11	-12.23403	-10.48384	-11.52780
8	1517.758	22.55438	5.91e-11	-12.20932	-10.21772	-11.40568
9	1530.604	21.50344	6.09e-11	-12.18153	-9.948522	-11.28048
10	1538.749	13.34839	6.56e-11	-12.11233	-9.637912	-11.11386
11	1553.824	24.17241	6.65e-11	-12.10417	-9.388352	-11.00830
12	1566.266	19.51341	6.90e-11	-12.07283	-9.115603	-10.87954

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 69 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.130112	56.91170	47.85613	0.0056
At most 1	0.055070	24.01543	29.79707	0.1998
At most 2	0.042391	10.64744	15.49471	0.2341
At most 3	0.001799	0.424859	3.841466	0.5145
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None *	0.130112	32.89627	27.58434	0.0094
At most 1	0.055070	13.36799	21.13162	0.4189
At most 2	0.042391	10.22258	14.26460	0.1977
At most 3	0.001799	0.424859	3.841466	0.5145

****MacKinnon-Haug-Michelis (1999) p-values**

Table 70 Johansen Cointegration Test Results-Trace Statistic (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.133207	57.36122	47.85613	0.0050
At most 1	0.057446	23.62393	29.79707	0.2168
At most 2	0.038662	9.661765	15.49471	0.3077
At most 3	0.001509	0.356360	3.841466	0.5505
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None *	0.133207	33.73729	27.58434	0.0071
At most 1	0.057446	13.96216	21.13162	0.3681
At most 2	0.038662	9.305405	14.26460	0.2616
At most 3	0.001509	0.356360	3.841466	0.5505

****MacKinnon-Haug-Michelis (1999) p-values**

Table 71 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	5.983890	2	0.0502
RNP	11.41025	2	0.0033
RSP	6.924837	2	0.0314
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	0.003	0.005	0.675(0.499)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	37.44658	2	0.0000
RNP	6.069051	2	0.0481
RSP	5.541141	2	0.0626
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.041	0.010	-3.827(0.000)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	4.807336	2	0.0904
IPR	1.733316	2	0.4204
RSP	9.544621	2	0.0085
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RNP (ECT)	0.003	0.004	0.774(0.439)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	5.116485	2	0.0774
IPR	2.258263	2	0.3233
RNP	2.062135	2	0.3566
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP (ECT)	-0.007	0.001	-4.138(0.000)

Table 72 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	5.388095	2	0.0676
RWP	13.02254	2	0.0015
RSP	7.317872	2	0.0258
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	0.002	0.004	0.561(0.575)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	37.66353	2	0.0000
RWP	9.787466	2	0.0075
RSP	4.842631	2	0.0888
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.058	0.014	-4.074(0.000)
Dependent Variable: RWP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	3.751729	2	0.1532
IPR	1.379485	2	0.5017
RSP	7.231226	2	0.0269
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RWP (ECT)	0.002	0.006	0.306(0.759)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Olasılık Value (p)**
IR	4.496688	2	0.1056
IPR	1.979407	2	0.3717
RWP	1.935089	2	0.3800
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP(ECT)	0.001	0.0003	4.039(0.000)

APPENDIX 9- IRLAND

Table 73 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	Constant-Trend	Constant	Constant-Trend	Constant	Constant, Trend
IR	-1.469 [1] (0.835)	-2.616 [1] (0.273)	-1.406 [9] (0.578)	-2.688 [9] (0.242)	1.505 [11] ***	0.095 [11]
IPR	-3.196 [2] (0.021)	-1.269 [2] (0.892)	-3.147 [46] (0.024)	-1.551 [18] (0.809)	1.763 [11] ***	0.514 [11]
RNP	-1.042[0] (0.738)	-3.298 [1] (0.068)	-1.130 [2] (0.704)	-3.333[4] (0.063)	1.928[11] ***	0.051 [11]
RSP	-1.976 [1] (0.297)	-1.795[1] (0.704)	-1.900 [8] (0.332)	-1.738 [8] (0.731)	0.423 [11]	0.360 [11] ***
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 74 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-9.549 [0] (0.000)***	-9.527 [0] (0.000)***	-9.931[8] (0.000)***	-9.912[8] (0.000)***	0.035[9]	0.035[9]
IPR	-15.541 [1] (0.000)***	-16.061 [1] (0.000)***	-29.857 [18] (0.000)***	-53.795[43] (0.000)***	0.619 [36] **	0.236[119] ***
RNP	-13.573[0] (0.000)***	-13.545 [0] (0.000)***	-13.571 [1] (0.000)***	-13.543 [1] (0.000)***	0.028 [2]	0.028 [1]
RSP	-11.042[0] (0.000)***	-11.096 [0] (0.000)***	-11.315 [6] (0.000)***	-11.335[6] (0.000)***	0.195[8]	0.087 [8]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.

The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.

*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 75 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-585.1466	NA	0.002111	5.190719	5.251070	5.215071
1	1009.222	3118.501	1.93e-09	-8.715613	-8.413855	-8.593849
2	1078.128	132.3487	**1.21e-09***	**-9.181748***	**-8.638584***	**-8.962573***
3	1089.739	21.89127	1.26e-09	-9.143074	-8.358504	-8.826489
4	1104.780	27.82896	1.27e-09	-9.134624	-8.108648	-8.720628
5	1115.964	20.29818	1.33e-09	-9.092190	-7.824807	-8.580782
6	1132.398	29.24948	1.32e-09	-9.096020	-7.587231	-8.487202
7	1148.400	**27.91451***	1.32e-09	-9.096033	-7.345838	-8.389804
8	1159.196	18.45303	1.39e-09	-9.050183	-7.058582	-8.246543
9	1171.359	20.36061	1.44e-09	-9.016375	-6.783368	-8.115324
10	1181.285	16.26767	1.53e-09	-8.962866	-6.488453	-7.964404
11	1192.721	18.33664	1.60e-09	-8.922648	-6.206828	-7.826775
12	1197.207	7.036451	1.78e-09	-8.821209	-5.863984	-7.627925

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterio

Table 76 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-628.6343	NA	0.003096	5.573871	5.634222	5.598223
1	1012.413	3209.803	1.87e-09	-8.743731	-8.441973	-8.621967
2	1085.583	140.5378	**1.13e-09***	**-9.247430***	**-8.704266***	**-9.028256***
3	1098.458	24.27407	1.16e-09	-9.219891	-8.435321	-8.903306
4	1113.000	26.90735	1.18e-09	-9.207052	-8.181076	-8.793056
5	1124.035	20.02788	1.23e-09	-9.163306	-7.895924	-8.651899
6	1141.120	30.40617	1.22e-09	-9.172862	-7.664074	-8.564044
7	1159.717	**32.44184***	1.20e-09	-9.195741	-7.445546	-8.489512
8	1171.005	19.29534	1.25e-09	-9.154232	-7.162631	-8.350592
9	1184.531	22.64156	1.29e-09	-9.132429	-6.899422	-8.231378
10	1194.500	16.33668	1.36e-09	-9.079292	-6.604878	-8.080830
11	1204.426	15.91687	1.44e-09	-9.025778	-6.309958	-7.929905
12	1210.595	9.675457	1.58e-09	-8.939165	-5.981940	-7.745881

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 77 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None*	0.134766	72.86833	47.85613	0.0001
At most 1*	0.109234	38.70613	29.79707	0.0036
At most 2	0.035721	11.40718	15.49471	0.1877
At most 3	0.011889	2.822659	3.841466	0.0929
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None*	0.134766	34.16220	27.58434	0.0062
At most 1*	0.109234	27.29895	21.13162	0.0060
At most 2	0.035721	8.584522	14.26460	0.3224
At most 3	0.011889	2.822659	3.841466	0.0929

****MacKinnon-Haug-Michelis (1999) p-values**

Table 78 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None*	0.118640	65.53698	47.85613	0.0005
At most 1*	0.099648	35.73270	29.79707	0.0092
At most 2	0.034375	10.95980	15.49471	0.2140
At most 3	0.011395	2.704616	3.841466	0.1001
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None*	0.118640	29.80428	27.58434	0.0255
At most 1*	0.099648	24.77290	21.13162	0.0147
At most 2	0.034375	8.255188	14.26460	0.3533
At most 3	0.011395	2.704616	3.841466	0.1001

****MacKinnon-Haug-Michelis (1999) p-values**

Table 79 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	2.077140	2	0.3540
RNP	5.355725	2	0.0687
RSP	15.57470	2	0.0004
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	0.009	0.003	3.293(0.001)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.761755	2	0.6833
RNP	1.012207	2	0.6028
RSP	0.113737	2	0.9447
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.0006	0.012	-0.052(0.9582)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	5.739433	2	0.0567
IPR	5.684633	2	0.0583
RSP	6.941924	2	0.0311
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RNP (ECT)	-0.059	0.016	-3.528(0.0005)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.860418	2	0.6504
IPR	10.54587	2	0.0051
RNP	2.036289	2	0.3613
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP(ECT)	-0.017	0.006	-2.790(0.005)

Table 80 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.985540	2	0.6109
RWP	8.954181	2	0.0114
RSP	14.75273	2	0.0006
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	0.009	0.007	1.208(0.228)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.756253	2	0.2521
RWP	2.980423	2	0.2253
RSP	0.530827	2	0.7669
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.005	0.002	-1.959(0.051)
Dependent Variable: RWP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	3.270721	2	0.1949
IPR	3.466090	2	0.1767
RSP	4.634639	2	0.0985
Dependent Variable: RWP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RWP (ECT)	-0.024	0.009	-2.693(0.007)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.893585	2	0.6397
IPR	9.203015	2	0.0100
RWP	1.306861	2	0.5203
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP(ECT)	-0.004	0.001	-3.848(0.0002)

APPENDIX 10-ISRAEL

Table 81 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		**Philips-Perron (PP)**		**Kwiatkowski-Philips-Schmidt-Shin (KPSS)**	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant, Trend**
IR	-1.361 [4] (0.600)	-1.877 [4] (0.663)	-1.634 [11] (0.463)	-2.426 [7] (0.364)	1.555 [11] ***	0.201 [11]
IPR	-1.026 [1] (0.744)	-2.844 [1] (0.183)	-0.822 [5] (0.810)	-3.440 [5] (0.048)	1.997 [11] ***	0.145 [11] ***
RNP	-1.256 [0] (0.649)	-3.169 [1] (0.093)	-1.256 [0] (0.649)	-3.045 [3] (0.122)	1.988 [11] ***	0.144 [11]
RSP	-0.963 [1] (0.766)	-2.623 [1] (0.270)	-0.686 [5] (0.846)	-2.851 [6] (0.180)	1.784 [12] ***	0.192 [11]
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.

The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.

*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 82 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-9.588 [3] (0.000)***	-9.577 [3] (0.000)***	-17.759 [9] (0.000)***	-17.737 [9] (0.000)***	0.082 [13]	0.067 [13]
IPR	-21.121 [0] (0.000)***	-21.083 [0] (0.000)***	-21.286 [1] (0.000)***	-21.083 [0] (0.000)***	0.035 [6]	0.035 [6]
RNP	-13.248 [0] (0.000)***	-13.232 [0] (0.000)***	-13.225 [4] (0.000)***	-13.208 [4] (0.000)***	0.048 [1]	0.030 [1]
RSP	-11.618 [0] (0.000)***	-11.588 [0] (0.000)***	-11.589 [2] (0.000)***	-11.559 [2] (0.000)***	0.073 [5]	0.075 [5]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 83 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-320.7105	NA	0.000205	2.860885	2.921237	2.885238
1	930.7670	2447.824	3.85e-09	-8.024379	**-7.722621***	-7.902615
2	962.5336	61.01424	**3.35e-09***	**-8.163291***	-7.620128	**-7.944117***
3	973.5761	20.82017	3.50e-09	-8.119613	-7.335043	-7.803027
4	982.5734	16.64700	3.72e-09	-8.057915	-7.031939	-7.643919
5	995.3778	23.23981	3.83e-09	-8.029761	-6.762378	-7.518353
6	1007.266	21.15830	3.98e-09	-7.993535	-6.484747	-7.384717
7	1019.048	20.55253	4.14e-09	-7.956367	-6.206172	-7.250138
8	1031.503	21.28878	4.28e-09	-7.925134	-5.933533	-7.121494
9	1056.576	**41.97323***	3.97e-09	-8.005076	-5.772069	-7.104025
10	1064.182	12.46401	4.29e-09	-7.931118	-5.456705	-6.932656
11	1078.565	23.06431	4.38e-09	-7.916876	-5.201056	-6.821003
12	1088.316	15.29091	4.65e-09	-7.861811	-4.904585	-6.668527

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 84 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-343.7516	NA	0.000252	3.063891	3.124243	3.088244
1	941.1405	2513.181	3.51e-09	-8.115775	**-7.814018***	-7.994012
2	975.6226	66.23002	**2.98e-09***	**-8.278614***	-7.735450	**-8.059439***
3	987.0071	21.46488	3.11e-09	-8.237948	-7.453378	-7.921362
4	996.8634	18.23631	3.28e-09	-8.183818	-7.157842	-7.769822
5	1009.626	23.16367	3.38e-09	-8.155294	-6.887912	-7.643887
6	1020.752	19.80122	3.54e-09	-8.112351	-6.603562	-7.503532
7	1033.944	23.01354	3.63e-09	-8.087611	-6.337417	-7.381382
8	1045.368	19.52715	3.79e-09	-8.047298	-6.055697	-7.243658
9	1071.741	**44.14773***	3.47e-09	-8.138685	-5.905678	-7.237634
10	1079.942	13.43979	3.74e-09	-8.069973	-5.595559	-7.071511
11	1093.692	22.04796	3.83e-09	-8.050146	-5.334327	-6.954273
12	1102.217	13.37045	4.12e-09	-7.984292	-5.027066	-6.791008

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 85 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.100652	51.98820	47.85613	0.0194
At most 1	0.088105	26.84589	29.79707	0.1055
At most 2	0.017625	4.987322	15.49471	0.8102
At most 3	0.003256	0.772925	3.841466	0.3793
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.100652	25.14231	27.58434	0.0995
At most 1 *	0.088105	21.85857	21.13162	0.0395
At most 2	0.017625	4.214397	14.26460	0.8361
At most 3	0.003256	0.772925	3.841466	0.3793

****MacKinnon-Haug-Michelis (1999) p-values**

Table 86 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.127587	52.05471	47.85613	0.0191
At most 1	0.059245	19.70591	29.79707	0.4430
At most 2	0.019065	5.231817	15.49471	0.7837
At most 3	0.002823	0.669905	3.841466	0.4131
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None *	0.127587	32.34880	27.58434	0.0113
At most 1	0.059245	14.47409	21.13162	0.3274
At most 2	0.019065	4.561912	14.26460	0.7958
At most 3	0.002823	0.669905	3.841466	0.4131

****MacKinnon-Haug-Michelis (1999) p-values**

Table 87 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR(Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	1.498705	1	0.2209
RNP	0.866511	1	0.3519
RSP	1.729196	1	0.1885
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	0.104	0.0838	1.244(0.214)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.130671	1	0.1444
RNP	4.678331	1	0.0305
RSP	5.161554	1	0.0231
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.105	0.024	-4.297(0.000)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.263587	1	0.6077
IPR	0.659465	1	0.4167
RSP	13.97668	1	0.0002
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.011	0.019	-0.569(0.569)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.103188	1	0.7480
IPR	0.026722	1	0.8702
RNP	0.052798	1	0.8183
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP (ECT)	0.091	0.102	0.897(0.370)

Table 88 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.559912	1	0.4543
RWP	0.023443	1	0.8783
RSP	3.180943	1	0.0745
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.014	0.013	-1.143(0.253)
Dependent Variable: IPR(Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.659721	1	0.1029
RWP	9.725434	1	0.0018
RSP	9.453237	1	0.0021
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.144	0.027	-5.197(0.000)
Dependent Variable: RWP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.118127	1	0.7311
IPR	1.485755	1	0.2229
RSP	12.52288	1	0.0004
Dependent Variable: RWP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RWP (ECT)	0.001	0.016	0.104(0.916)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.215748	1	0.6423
IPR	1.863874	1	0.1722
RWP	2.887556	1	0.0893
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP (ECT)	-0.016	0.012	-1.379(0.169)

APPENDIX 11-ITALY

Table 89 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant, Trend**
IR	-1.267 [3] (0.644)	-2.249 [3] (0.459)	-1.335 [9] (0.613)	-2.426 [9] (0.364)	1.481 [11] ***	0.232 [11] ***
IPR	-1.214 [3] (0.668)	-2.163[3] (0.507)	-1.246 [8] (0.654)	-2.291 [8] (0.436)	0.817 [11] ***	0.383 [11] ***
RNP	-1.107 [0] (0.713)	-3.361 [1] (0.059)	-1.170 [1] (0.687)	-3.303 [3] (0.068)	1.926 [11] ***	0.050 [10]
RSP	-1.859 [1] (0.351)	-1.675 [1] (0.759)	-1.819 [6] (0.370)	-1.618[6] (0.782)	0.413 [11]	0.360 [11] ***
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 90 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		**Phillips-Perron (PP)**		**Kwiatkowski Phillips-Schmid-Shin (KPSS)**	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-5.899 [2] (0.000)***	-5.884 [2] (0.000)***	-11.053 [7] (0.000)***	-11.039 [7] (0.000)***	0.067 [9]	0.053 [9]
IPR	-6.646 [2] (0.000)***	-6.608 [2] (0.000)***	-16.801 [9] (0.000)***	-16.847 [8] (0.000)***	0.301 [8]	0.031 [8]
RNP	-13.316 [0] (0.000)***	-13.289 [0] (0.000)***	-13.350 [3] (0.000)***	-13.323 [3] (0.000)***	0.033 [0]	0.033 [0]
RSP	-12.066 [0] (0.000)***	-12.126 [0] (0.000)***	-12.045 [4] (0.000)***	-12.069 [3] (0.000)***	0.225 [6]	0.063 [6]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 91 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-341.0128	NA	0.000246	3.039761	3.100112	3.064113
1	1270.311	3151.663	1.93e-10	-11.01595	**-10.71419***	-10.89419
2	1312.274	80.59940	1.54e-10	-11.24470	-10.70154	**-11.02553***
3	1332.592	38.30869	1.48e-10	-11.28275	-10.49818	-10.96616
4	1351.237	**34.49694***	**1.45e-10***	**-11.30605***	-10.28007	-10.89205
5	1362.207	19.91065	1.51e-10	-11.26173	-9.994352	-10.75033
6	1368.604	11.38446	1.65e-10	-11.17712	-9.668336	-10.56831
7	1376.624	13.99220	1.77e-10	-11.10682	-9.356628	-10.40059
8	1390.830	24.28015	1.81e-10	-11.09101	-9.099408	-10.28737
9	1399.822	15.05414	1.93e-10	-11.02927	-8.796265	-10.12822
10	1414.020	23.26655	1.97e-10	-11.01339	-8.538979	-10.01493
11	1429.493	24.81100	1.99e-10	-11.00875	-8.292928	-9.912874
12	1440.068	16.58425	2.10e-10	-10.96095	-8.003722	-9.767664

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 92 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-376.0962	NA	0.000335	3.348865	3.409217	3.373218
1	1277.007	3233.383	1.82e-10	-11.07495	-10.77320	-10.95319
2	1322.371	87.13070	1.41e-10	-11.33367	**-10.79050***	**-11.11449***
3	1341.673	36.39319	1.37e-10	-11.36276	-10.57819	-11.04617
4	1359.339	32.68525	**1.35e-10***	**-11.37743***	-10.35146	-10.96344
5	1370.160	19.64069	1.41e-10	-11.33181	-10.06443	-10.82040
6	1377.042	12.24707	1.53e-10	-11.25147	-9.742679	-10.64265
7	1386.049	15.71276	1.63e-10	-11.18986	-9.439661	-10.48363
8	1403.281	**29.45426***	1.62e-10	-11.20071	-9.209112	-10.39707
9	1416.266	21.73688	1.67e-10	-11.17415	-8.941141	-10.27310
10	1431.471	24.91717	1.69e-10	-11.16714	-8.692729	-10.16868
11	1446.763	24.52154	1.71e-10	-11.16091	-8.445088	-10.06503
12	1457.777	17.27244	1.79e-10	-11.11697	-8.159748	-9.923690

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 93 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.120109	45.64975	47.85613	0.0794
At most 1	0.043751	15.32378	29.79707	0.7587
At most 2	0.019616	4.721096	15.49471	0.8377
At most 3	0.000109	0.025863	3.841466	0.8722
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None *	0.120109	30.32597	27.58434	0.0217
At most 1	0.043751	10.60268	21.13162	0.6867
At most 2	0.019616	4.695233	14.26460	0.7797
At most 3	0.000109	0.025863	3.841466	0.8722

****MacKinnon-Haug-Michelis (1999) p-values**

Table 94 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.109805	40.51371	47.85613	0.2046
At most 1	0.038787	13.06340	29.79707	0.8887
At most 2	0.015649	3.727353	15.49471	0.9243
At most 3	2.12E-05	0.005005	3.841466	0.9426
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.109805	27.45031	27.58434	0.0520
At most 1	0.038787	9.336049	21.13162	0.8044
At most 2	0.015649	3.722348	14.26460	0.8874
At most 3	2.12E-05	0.005005	3.841466	0.9426

****MacKinnon-Haug-Michelis (1999) p-values**

Table 95 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	2.222801	1	0.1360
RNP	4.019576	1	0.0450
RSP	2.935158	1	0.0867
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	0.006	0.003	1.884(0.0608)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	25.34281	1	0.0000
RNP	4.490381	1	0.0341
RSP	9.844435	1	0.0017
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.021	0.006	-3.101(0.002)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	5.980070	1	0.0145
IPR	0.021319	1	0.8839
RSP	1.123958	1	0.2891
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RNP (ECT)	-0.036	0.011	-3.147(0.001)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	1.793473	1	0.1805
IPR	0.304958	1	0.5808
RNP	2.193769	1	0.1386
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP (ECT)	-0.029	0.006	-4.939(0.000)

Table 96 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	2.298050	2	0.3169
RWP	6.159188	2	0.0460
RSP	3.410501	2	0.1817
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	25.48658	2	0.0000
RWP	14.90224	2	0.0006
RSP	13.46111	2	0.0012
Dependent Variable: RWP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	5.602320	2	0.0607
IPR	0.480275	2	0.7865
RSP	1.835480	2	0.3994
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	9.297136	2	0.0096
IPR	1.922857	2	0.3823
RWP	8.894874	2	0.0117

APPENDIX 12-NETHERLAND

Table 97 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		**Philips-Perron (PP)**		**Kwiatkowski-Philips-Schmidt-Shin (KPSS)**	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant, Trend**
IR	-1.798 [1] (0.380)	-2.457 [1] (0.348)	-1.646 [9] (0.457)	-2.323 [9] (0.419)	1.068 [11] ***	0.129 [11]
IPR	-1.869 [2] (0.346)	-3.545 [2] (0.037)	-2.183 [2] (0.213)	-6.585 [8] (0.000) ***	1.941 [12] ***	0.275 [11] ***
RNP	-1.230 [1] (0.661)	-3.389 [1] (0.055)	-1.172 [2] (0.686)	-3.385 [4] (0.055)	1.930 [11] ***	0.046 [11]
RSP	-2.338 [1] (0.160)	-2.163 [1] (0.507)	-2.188 [6] (0.211)	-2.022 [6] (0.585)	0.293 [11]	0.243 [11] ***
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 98 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-7.757 [0] (0.000)***	-7.740 [0] (0.000)***	-7.852 [4] (0.000)***	-7.835 [6] (0.000)***	0.054 [9]	0.053 [9]
IPR	-16.251 [1] (0.000)***	-16.247 [1] (0.000)***	-26.469 [5] (0.000)***	-26.597 [8] (0.000)***	0.085 [1]	0.023 [0]
RNP	-13.224 [0] (0.000)***	-13.197 [0] (0.000)***	-13.224 [1] (0.000)***	-13.197 [2] (0.000)***	0.028 [2]	0.027 [2]
RSP	-11.449 [0] (0.000)***	-11.497 [0] (0.000)***	-11.454 [3] (0.000)***	-11.455 [2] (0.000)***	0.181 [6]	0.084 [6]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 99 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-131.3051	NA	3.87e-05	1.192115	1.252467	1.216468
1	1274.989	2750.637	1.85e-10	-11.05717	-10.75541	-10.93541
2	1330.216	106.0746	1.31e-10	-11.40278	**-10.85962***	**-11.18361***
3	1352.540	42.09163	1.24e-10	-11.45850	-10.67393	-11.14192
4	1370.655	**33.51544***	**1.22e-10***	**-11.47713***	-10.45116	-11.06314
5	1382.566	21.61852	1.27e-10	-11.44111	-10.17373	-10.92970
6	1394.371	21.00949	1.31e-10	-11.40415	-9.895358	-10.79533
7	1405.633	19.64763	1.37e-10	-11.36241	-9.612213	-10.65618
8	1414.335	14.87344	1.47e-10	-11.29811	-9.306505	-10.49447
9	1429.276	25.01066	1.49e-10	-11.28877	-9.055764	-10.38772
10	1439.424	16.63078	1.57e-10	-11.23721	-8.762802	-10.23875
11	1451.914	20.02859	1.63e-10	-11.20629	-8.490474	-10.11042
12	1460.727	13.82143	1.75e-10	-11.14297	-8.185747	-9.949689

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 100 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-163.6739	NA	5.15e-05	1.477303	1.537655	1.501656
1	1284.432	2832.418	1.71e-10	-11.14037	-10.83861	-11.01860
2	1340.627	107.9347	1.20e-10	-11.49451	**-10.95135***	**-11.27534***
3	1363.484	43.09615	1.13e-10	-11.55493	-10.77036	-11.23834
4	1381.969	34.20004	**1.10e-10***	**-11.57682***	-10.55084	-11.16282
5	1395.064	23.76844	1.13e-10	-11.55123	-10.28384	-11.03982
6	1405.239	18.10823	1.19e-10	-11.49990	-9.991114	-10.89108
7	1418.770	23.60514	1.22e-10	-11.47815	-9.727957	-10.77192
8	1427.707	15.27484	1.31e-10	-11.41592	-9.424318	-10.61228
9	1443.575	**26.56429***	1.31e-10	-11.41476	-9.181754	-10.51371
10	1453.965	17.02585	1.38e-10	-11.36533	-8.890916	-10.36687
11	1466.021	19.33272	1.44e-10	-11.33058	-8.614764	-10.23471
12	1475.723	15.21482	1.53e-10	-11.27509	-8.317865	-10.08181

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 101 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.150480	72.87393	47.85613	0.0001
At most 1 *	0.093978	34.38625	29.79707	0.0138
At most 2	0.043232	11.09510	15.49471	0.2057
At most 3	0.002815	0.665186	3.841466	0.4147
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None *	0.150480	38.48769	27.58434	0.0014
At most 1 *	0.093978	23.29115	21.13162	0.0245
At most 2	0.043232	10.42991	14.26460	0.1852
At most 3	0.002815	0.665186	3.841466	0.4147

****MacKinnon-Haug-Michelis (1999) p-values**

Table 102 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.1783228	79.29545	47.85613	0.0000
At most 1 *	0.093057	32.94183	29.79707	0.0210
At most 2	0.038521	9.890291	15.49471	0.2893
At most 3	0.002622	0.619494	3.841466	0.4312
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None *	0.178328	46.35362	27.58434	0.0001
At most 1 *	0.093057	23.05154	21.13162	0.0265
At most 2	0.038521	9.270797	14.26460	0.2643
At most 3	0.002622	0.619494	3.841466	0.4312

****MacKinnon-Haug-Michelis (1999) p-values**

Table 103 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR(Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.905006	2	0.6360
RNP	6.509137	2	0.0386
RSP	7.643076	2	0.0219
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.004	0.003	-1.485 (0.138)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	3.421249	2	0.1808
RNP	0.589890	2	0.7446
RSP	2.355274	2	0.3080
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.001	0.0005	-2.845 (0.004)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.686200	2	0.2610
IPR	5.570753	2	0.0617
RSP	21.29357	2	0.0000
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.054	0.0189	-2.885(0.004)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.185954	2	0.9112
IPR	1.284968	2	0.5260
RNP	1.030602	2	0.5973
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	0.014	0.004	3.505(0.0005)

Table 104 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.356772	2	0.8366
RWP	8.735614	2	0.0127
RSP	5.225404	2	0.0733
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.007	0.003	-2.132(0.03)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	1.795931	2	0.4074
RWP	1.311291	2	0.5191
RSP	0.965143	2	0.6172
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.195	0.06	-3.22 (0.0015)
Dependent Variable: RWP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.706362	2	0.2584
IPR	6.759036	2	0.0341
RSP	23.00552	2	0.0000
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RWP (ECT)	-0.061	0.018	-3.368 (0.0009)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.267531	2	0.8748
IPR	1.729034	2	0.4213
RWP	0.957622	2	0.6195
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP(ECT)	0.032	0.009	3.590 (0.0004)

APPENDIX 13-NORWAY

Table 105 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	Constant-Trend	Constant	Constant-Trend	Constant	Constant, Trend
IR	-1.990 [1] (0.290)	-2.728 [1] (0.226)	-1.684 [8] (0.437)	-2.432 [8] (0.361)	0.905 [11] ***	0.108 [11]
IPR	-0.869 [3] (0.796)	-2.296 [4] (0.433)	-2.139 [10] (0.229)	-3.311 [7] (0.066)	1.034 [11] ***	0.457 [11] ***
RNP	-0.936 [0] (0.775)	-3.366 [1] (0.058)	-0.994 [1] (0.755)	-3.292 [3] (0.070)	1.949 [11] ***	0.058 [11]
RSP	-1.000 [1] (0.752)	-2.834 [3] (0.186)	-0.950 [4] (0.770)	-2.359 [5] (0.399)	1.818 [11] ***	0.101 [11]
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.

The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.

*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 106 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-7.917 [0] (0.000)***	-7.908 [0] (0.000)***	-7.848[5] (0.000)***	-7.839[5] (0.000)***	0.062 [8]	0.042 [8]
IPR	-13.745 [2] (0.000)***	-12.291 [3] (0.000)***	-25.976[65] (0.000)***	-86.532[236] (0.000)***	0.361 [102]	0.500 [237] ***
RNP	-13.619[0] (0.000)***	-13.590 [0] (0.000)***	-13.601 [4] (0.000)***	-13.572 [4] (0.000)***	0.028 [1]	0.028 [1]
RSP	-13.227[0] (0.000)***	-13.199 [0] (0.000)***	-13.207 [2] (0.000)***	-13.179[2] (0.000)***	0.047 [4]	0.047 [4]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.

The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.

*****, ** expresses 1% and 5% statistical significances Constant respectively.**

Table 107 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-290.9362	NA	0.000158	2.598557	2.658909	2.622910
1	1071.974	2665.780	1.11e-09	-9.268493	-8.966736	-9.146730
2	1135.496	122.0075	7.30e-10	-9.687192	**-9.144028***	**-9.468017***
3	1159.489	45.23753	**6.80e-10***	**-9.757613***	-8.973043	-9.441027
4	1172.670	24.38736	6.98e-10	-9.732774	-8.706798	-9.318778
5	1191.139	33.52041	6.83e-10	-9.754525	-8.487143	-9.243118
6	1206.531	**27.39517***	6.88e-10	-9.749176	-8.240387	-9.140358
7	1211.351	8.408429	7.61e-10	-9.650673	-7.900479	-8.944444
8	1222.608	19.24000	7.95e-10	-9.608880	-7.617279	-8.805239
9	1230.059	12.47338	8.61e-10	-9.533560	-7.300553	-8.632509
10	1237.076	11.49951	9.36e-10	-9.454416	-6.980003	-8.455954
11	942.4829	24.42190	1.45e-08	-6.717911	-4.002092	-5.622039
12	955.0405	19.69377	1.51e-08	-6.687581	-3.730356	-5.494298

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 108 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-299.1099	NA	0.000170	2.670572	2.730923	2.694925
1	1069.678	2677.276	1.13e-09	-9.248262	-8.946505	-9.126499
2	1137.525	130.3141	7.17e-10	-9.705064	**-9.161900***	**-9.485890***
3	1162.710	47.48529	**6.61e-10***	**-9.785989***	-9.001419	-9.469404
4	1177.787	27.89543	6.67e-10	-9.777855	-8.751879	-9.363859
5	1193.587	28.67669	6.69e-10	-9.776093	-8.508711	-9.264686
6	1209.444	**28.22180***	6.71e-10	-9.774836	-8.266047	-9.166018
7	1212.864	5.965816	7.51e-10	-9.663997	-7.913803	-8.957768
8	1224.429	19.76764	7.83e-10	-9.624923	-7.633322	-8.821283
9	1232.907	14.19235	8.39e-10	-9.558651	-7.325643	-8.657600
10	1241.432	13.97005	9.00e-10	-9.492789	-7.018376	-8.494327
11	1253.548	19.42904	9.37e-10	-9.458573	-6.742754	-8.362700
12	1261.207	12.01130	1.01e-09	-9.385083	-6.427857	-8.191799

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 109 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None*	0.118889	56.25147	47.85613	0.0067
At most 1	0.065522	26.38052	29.79707	0.1177
At most 2	0.042019	10.38735	15.49471	0.2521
At most 3	0.001086	0.256379	3.841466	0.6126
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None*	0.118889	29.87095	27.58434	0.0250
At most 1	0.065522	15.99317	21.13162	0.2252
At most 2	0.042019	10.13097	14.26460	0.2035
At most 3	0.001086	0.256379	3.841466	0.6126

****MacKinnon-Haug-Michelis (1999) p-values**

Table 110 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None*	0.136905	64.04266	47.85613	0.0008
At most 1	0.074409	29.29615	29.79707	0.0570
At most 2	0.044810	11.04808	15.49471	0.2086
At most 3	0.000968	0.228612	3.841466	0.6326
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None*	0.136905	34.74651	27.58434	0.0051
At most 1	0.074409	18.24807	21.13162	0.1208
At most 2	0.044810	10.81947	14.26460	0.1635
At most 3	0.004478	1.063771	3.841466	0.3024

****MacKinnon-Haug-Michelis (1999) p-values**

Table 111 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	4.435975	2	0.1088
RNP	3.039205	2	0.2188
RSP	0.878548	2	0.6445
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.021	0.009	-2.117(0.035)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.398792	2	0.8192
RNP	0.043957	2	0.9783
RSP	4.609282	2	0.0998
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.019	0.011	-1.630(0.104)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.037539	2	0.9814
IPR	0.468548	2	0.7911
RSP	8.375806	2	0.0152
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RNP (ECT)	-0.003	0.006	-0.519(0.604)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	10.82474	2	0.0045
IPR	0.057758	2	0.9715
RNP	2.401393	2	0.3010
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP (ECT)	0.011	0.002	4.113(0.0001)

Table 112 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	4.354640	2	0.1133
RWP	6.964106	2	0.0307
RSP	0.102075	2	0.9502
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.030	0.009	-3.390(0.0008)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.579510	2	0.7484
RWP	0.008613	2	0.9957
RSP	4.704700	2	0.0951
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.006	0.004	-1.386(0.167)
Dependent Variable: RWP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.176622	2	0.9155
IPR	0.289435	2	0.8653
RSP	5.512117	2	0.0635
Dependent Variable: RWP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RWP (ECT)	-0.014	0.013	-1.102(0.271)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob. (p)**
IR	14.08201	2	0.0009
IPR	0.176891	2	0.9154
RWP	4.840311	2	0.0889
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP (ECT)	0.033	0.008	3.809(0.0002)

APPENDIX 14-POLAND

Table 113 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	Constant-Trend	Constant	Constant-Trend	Constant	Constant, Trend
IR	-2.192 [3] (0.209)	-2.436 [3] (0.359)	-2.519 [8] (0.1121)	-2.305 [8] (0.4291)	1.805 [11] ***	0.398 [11] ***
IPR	--1.645 [1] (0.457)	-2.354 [1] (0.402)	-1.629 [6] (0.466)	-2.959 [4] (0.145)	1.920 [12] ***	0.147 [11] **
RNP	-1.46 [0] (0.551)	-3.174 [0] (0.092)	-1.478 [1] (0.542)	-3.517 [3] (0.039)	1.975 [11] ***	0.083 [11]
RSP	-0.825 [1] (0.809)	-3.371 [1] (0.057)	-0.776 [3] (0.823)	-3.178 [4] (0.091)	1.772 [11] ***	0.110 [11]
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significances Constant respectively.**

Table 114 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-5.639 [2] (0.000)***	-5.775 [2] (0.000)***	-13.927 [8] (0.000)***	-13.929 [7] (0.000)***	0.275 [9]	0.034 [8]
IPR	-24.091 [0] (0.000)***	-24.164 [1] (0.000)***	-24.257 [2] (0.000)***	-24.256 [1] (0.000)***	0.180 [6]	0.043 [7]
RNP	-13.793 [0] (0.000)***	-13.783 [0] (0.000)***	-13.772 [4] (0.000)***	-13.760 [4] (0.000)***	0.048 [2]	0.023 [2]
RSP	-12.881 [0] (0.000)***	-12.888 [0] (0.000)***	-12.927 [3] (0.000)***	-12.935 [2] (0.000)***	0.108 [2]	0.0818 [2]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significances Constant respectively.**

Table 115 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-597.7072	NA	0.002358	5.301385	5.361737	5.325738
1	920.6122	2969.753	4.21e-09	-7.934909	-7.633152	-7.813146
2	967.7260	90.49167	3.20e-09	-8.209040	**-7.665876***	-7.989865
3	995.5731	52.50459	**2.88e-09***	**-8.313419***	-7.528849	**-7.996834***
4	1007.500	22.06811	2.99e-09	-8.277536	-7.251560	-7.863540
5	1017.888	18.85343	3.14e-09	-8.228089	-6.960706	-7.716681
6	1022.165	7.612480	3.49e-09	-8.124805	-6.616016	-7.515987
7	1031.040	15.48089	3.73e-09	-8.062022	-6.311827	-7.355793
8	1036.293	8.979590	4.11e-09	-7.967339	-5.975739	-7.163699
9	1043.969	12.85014	4.43e-09	-7.894003	-5.660996	-6.992952
10	1053.978	16.40264	4.70e-09	-7.841220	-5.366806	-6.842758
11	1073.870	31.89586	4.56e-09	-7.875503	-5.159683	-6.779630
12	1098.287	**38.29340***	4.26e-09	-7.949665	-4.992439	-6.756381

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 116 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-622.3841	NA	0.002930	5.518803	5.579154	5.543156
1	921.5751	3019.903	4.17e-09	-7.943393	-7.641635	-7.821629
2	970.9961	94.92326	3.11e-09	-8.237851	**-7.694687***	-8.018677
3	999.9818	54.65147	**2.77e-09***	**-8.352263***	-7.567693	**-8.035677***
4	1010.928	20.25205	2.90e-09	-8.307732	-7.281756	-7.893736
5	1022.663	21.29949	3.02e-09	-8.270158	-7.002776	-7.758751
6	1028.504	10.39485	3.30e-09	-8.180649	-6.671860	-7.571831
7	1038.134	16.80044	3.50e-09	-8.124530	-6.374336	-7.418301
8	1042.861	8.079103	3.88e-09	-8.025206	-6.033605	-7.221566
9	1050.076	12.07882	4.20e-09	-7.947810	-5.714803	-7.046759
10	1059.654	15.69568	4.47e-09	-7.891226	-5.416813	-6.892764
11	1079.021	31.05592	4.36e-09	-7.920894	-5.205074	-6.825021
12	1102.708	**37.14737***	4.10e-09	-7.988618	-5.031392	-6.795334

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 117 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.117018	60.42394	47.85613	0.0022
At most 1 *	0.053913	31.05351	29.79707	0.0357
At most 2 *	0.042040	17.97429	15.49471	0.0207
At most 3 *	0.032668	7.838386	3.841466	0.0051
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None *	0.117018	29.37043	27.58434	0.0292
At most 1	0.053913	13.07922	21.13162	0.4450
At most 2	0.042040	10.13590	14.26460	0.2032
At most 3 *	0.032668	7.838386	3.841466	0.0051

****MacKinnon-Haug-Michelis (1999) p-values**

Table 118 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.092616	53.57579	47.85613	0.0132
At most 1 *	0.050904	30.63915	29.79707	0.0399
At most 2 *	0.044206	18.30919	15.49471	0.0183
At most 3 *	0.031850	7.638939	3.841466	0.0057
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.092616	22.93663	27.58434	0.1762
At most 1	0.050904	12.32996	21.13162	0.5154
At most 2	0.044206	10.67025	14.26460	0.1715
At most 3 *	0.031850	7.638939	3.841466	0.0057

****MacKinnon-Haug-Michelis (1999) p-values**

Table 119 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.835497	2	0.6585
RNP	2.395006	2	0.3019
RSP	1.144772	2	0.5642
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.0003	0.0001	-3.052(0.0025)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.700602	2	0.7045
RNP	4.898005	2	0.0864
RSP	0.521954	2	0.7703
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.042	0.018	-2.230(0.0267)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	3.837180	2	0.1468
IPR	1.345981	2	0.5102
RSP	6.133812	2	0.0466
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RNP (ECT)	-0.044	0.0213	-2.072(0.0394)
Dependent Variable: RSP(Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	8.011951	2	0.0182
IPR	3.766595	2	0.1521
RNP	2.343331	2	0.3099
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP (ECT)	-0.062	0.017	-3.572(0.0004)

Table 120 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	1.092594	2	0.5791
RWP	3.242108	2	0.1977
RSP	1.311596	2	0.5190
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.006	0.002	-2.367(0.0188)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.314532	2	0.8545
RWP	3.077511	2	0.2146
RSP	0.426482	2	0.8080
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.049	0.017	-2.813(0.0053)
Dependent Variable: RWP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	4.894075	2	0.0865
IPR	2.911732	2	0.2332
RSP	3.497885	2	0.1740
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RWP (ECT)	-0.013	0.012	-1.141(0.2550)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	4.223946	2	0.1210
IPR	3.899410	2	0.1423
RWP	0.898397	2	0.6381
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP(ECT)	-0.057	0.018	-3.176(0.0017)

APPENDIX 15-PORTUGAL

Table 121 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		**Philips-Perron (PP)**		**Kwiatkowski-Philips-Schmidt-Shin (KPSS)**	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant, Trend**
IR	-2.619 [3] (0.090)	-2.740 [3] (0.221)	-1.823 [2] (0.368)	-1.992 [8] (0.602)	1.438 [11] ***	0.251 [11] ***
IPR	-1.734 [2] (0.412)	-2.026 [2] (0.583)	-2.284 [14] (0.177)	-2.393 [18] (0.382)	0.509 [11] **	0.481[11] ***
RNP	-1.071 [0] (0.727)	-3.399 [1] (0.053)	-1.162 [2] (0.691)	-3.385 [4] (0.055)	1.930 [11] ***	0.047 [11]
RSP	-1.979 [1] (0.296)	-1.910 [1] (0.646)	-1.977 [7] (0.296)	-1.887 [7] (0.657)	1.037 [11] ***	0.224 [11] ***
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significances Constant respectively.**

Table 122 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-7.648 [2] (0.000)***	-7.754 [2] (0.000)***	-16.432 [4] (0.000)***	-16.434 [4] (0.000)***	0.149 [3]	0.074 [2]
IPR	-16.678 [1] (0.000)***	-16.979 [1] (0.000)***	-27.170 [15] (0.000)***	-33.154 [22] (0.000)***	0.392 [56]	0.312 [168] ***
RNP	-13.350 [0] (0.000)***	-13.322 [0] (0.000)***	-13.350 [2] (0.000)***	-13.323 [2] (0.000)***	0.029 [1]	0.029 [1]
RSP	-10.597 [0] (0.000)***	-10.620 [0] (0.000)***	-10.612 [4] (0.000)***	-10.625 [4] (0.000)***	0.135[7]	0.054 [7]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significances Constant respectively.**

Table 123 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-385.5499	NA	0.000364	3.432158	3.492509	3.456510
1	1174.270	3050.925	4.50e-10	-10.16978	-9.868019	-10.04801
2	1234.073	114.8647	3.06e-10	-10.55571	**-10.01255***	**-10.33653***
3	1252.730	35.17699	2.99e-10	-10.57912	-9.794549	-10.26253
4	1271.868	35.40919	2.91e-10	-10.60676	-9.580789	-10.19277
5	1285.878	25.42764	2.97e-10	-10.58923	-9.321848	-10.07782
6	1293.675	13.87625	3.19e-10	-10.51696	-9.008167	-9.908138
7	1300.400	11.73295	3.47e-10	-10.43524	-8.685049	-9.729015
8	1306.801	10.94083	3.79e-10	-10.35067	-8.359070	-9.547031
9	1314.277	12.51542	4.10e-10	-10.27557	-8.042565	-9.374522
10	1364.094	81.63765	3.06e-10	-10.57352	-8.099102	-9.575054
11	1386.761	**36.34733***	**2.90e-10***	**-10.63226***	-7.916437	-9.536384
12	1398.218	17.96759	3.03e-10	-10.59223	-7.635004	-9.398945

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 124 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-410.9377	NA	0.000455	3.655839	3.716190	3.680191
1	1183.260	3118.167	4.16e-10	-10.24899	-9.947230	-10.12722
2	1244.858	118.3110	2.78e-10	-10.65073	**-10.10757***	**-10.43155***
3	1263.603	35.34265	2.72e-10	-10.67491	-9.890342	-10.35833
4	1281.998	34.03563	2.66e-10	-10.69602	-9.670042	-10.28202
5	1295.855	25.14935	2.72e-10	-10.67713	-9.409750	-10.16573
6	1304.387	15.18627	2.91e-10	-10.61134	-9.102555	-10.00252
7	1310.261	10.24640	3.18e-10	-10.52212	-8.771929	-9.815894
8	1317.520	12.40686	3.45e-10	-10.44511	-8.453506	-9.641467
9	1325.396	13.18425	3.72e-10	-10.37353	-8.140522	-9.472478
10	1376.293	83.40982	2.74e-10	-10.68100	-8.206586	-9.682538
11	1397.632	**34.21709***	**2.63e-10***	**-10.72804***	-8.012217	-9.632164
12	1410.257	19.79892	2.73e-10	-10.69830	-7.741072	-9.505013

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 125 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.089628	41.29136	47.85613	0.1796
At most 1	0.053742	19.13045	29.79707	0.4836
At most 2	0.024629	6.093785	15.49471	0.6844
At most 3	0.000883	0.208514	3.841466	0.6479
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.089628	22.16092	27.58434	0.2122
At most 1	0.053742	13.03666	21.13162	0.4489
At most 2	0.024629	5.885271	14.26460	0.6280
At most 3	0.000883	0.208514	3.841466	0.6479

****MacKinnon-Haug-Michelis (1999) p-values**

Table 126 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.085548	39.77634	47.85613	0.2306
At most 1	0.047867	18.67075	29.79707	0.5168
At most 2	0.028668	7.094907	15.49471	0.5666
At most 3	0.000976	0.230409	3.841466	0.6312
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.085548	21.10559	27.58434	0.2699
At most 1	0.047867	11.57584	21.13162	0.5898
At most 2	0.028668	6.864498	14.26460	0.5053
At most 3	0.000976	0.230409	3.841466	0.6312

****MacKinnon-Haug-Michelis (1999) p-values**

Table 127 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.023607	2	0.9883
RNP	5.797209	2	0.0551
RSP	3.020467	2	0.2209
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	4.818852	2	0.0899
RNP	6.880823	2	0.0321
RSP	1.248896	2	0.5356
Dependent Variable: RNP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	8.800482	2	0.0123
IPR	3.426263	2	0.1803
RSP	2.253465	2	0.3241
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	7.229351	2	0.0269
IPR	0.028484	2	0.9859
RNP	5.519769	2	0.0633

Table 128 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.058215	2	0.9713
RWP	6.205953	2	0.0449
RSP	3.754707	2	0.1530
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	4.469031	2	0.1070
RWP	8.865839	2	0.0119
RSP	1.813607	2	0.4038
Dependent Variable: RWP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	7.886669	2	0.0194
IPR	2.248569	2	0.3249
RSP	2.074445	2	0.3544
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	6.309632	2	0.0426
IPR	0.001524	2	0.9992
RWP	2.927027	2	0.2314

APPENDIX 16-SOUTH KOREA

Table 129 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant, Trend**
IR	-1.361 [4] (0.600)	-1.877 [4] (0.663)	-1.634 [11] (0.463)	-2.426 [7] (0.364)	1.555 [11] ***	0.201 [11] **
IPR	-1.326 [2] (0.617)	-2.761 [0] (0.213)	-1.322 [2] (0.619)	-2.938 [3] (0.152)	1.916 [12] ***	0.211 [11]
RNP	-1.208 [0] (0.671)	-4.347 [1] (0.003)	-1.237 [1] (0.658)	-4.132 [3] (0.006)	2.045 [11] ***	0.060 [10]
RSP	-1.363 [1] (0.600)	-2.807 [1] (0.196)	-1.108 [4] (0.712)	-2.5822 [4] (0.288)	1.507 [11] ***	0.274 [11] ***
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significances Constant respectively.**

Table 130 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-9.588 [3] (0.000)***	-9.577 [3] (0.000)***	-17.759 [9] (0.000)***	-17.737 [9] (0.000)***	0.082[13]	0.067 [13]
IPR	-15.739 [0] (0.000)***	-15.751 [0] (0.000)***	-15.738 [1] (0.000)***	-15.747 [2] (0.000)***	0.095 [2]	0.024 [2]
RNP	-13.632 [0] (0.000)***	-13.612 [0] (0.000)***	-13.580 [1] (0.000)***	-13.559 [4] (0.000)***	0.029 [2]	0.019 [2]
RSP	-10.781 [0] (0.000)***	-10.777 [0] (0.000)***	-10.631 [5] (0.000)***	-10.620 [5] (0.000)***	0.105 [3]	0.048 [3]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significances Constant respectively.**

Table 131 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-464.1523	NA	0.000727	4.124690	4.185041	4.149042
1	844.3208	2559.304	8.24e-09	-7.262738	**-6.960981***	-7.140975
2	871.4817	52.16807	7.47e-09	-7.361072	-6.817908	**-7.141898***
3	894.5531	43.50034	**7.02e-09***	**-7.423376***	-6.638806	-7.106790
4	906.2658	21.67106	7.30e-09	-7.385602	-6.359626	-6.971606
5	922.7364	29.89363	7.27e-09	-7.389748	-6.122365	-6.878340
6	931.8160	16.15937	7.74e-09	-7.328775	-5.819987	-6.719957
7	950.9611	33.39851	7.55e-09	-7.356485	-5.606291	-6.650256
8	958.0339	12.08918	8.18e-09	-7.277832	-5.286231	-6.474192
9	979.9984	36.76882	7.79e-09	-7.330383	-5.097376	-6.429332
10	989.9083	16.23997	8.26e-09	-7.276725	-4.802312	-6.278263
11	997.9896	12.95861	8.90e-09	-7.206957	-4.491138	-6.111084
12	1021.234	**36.45317***	8.40e-09	-7.270781	-4.313555	-6.077497

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 132 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-482.6183	NA	0.000855	4.287385	4.347737	4.311738
1	863.2733	2632.493	6.97e-09	-7.429721	**-7.127963***	-7.307957
2	895.0254	60.98627	6.07e-09	-7.568505	-7.025342	**-7.349331***
3	920.1480	47.36773	**5.60e-09***	**-7.648881***	-6.864311	-7.332295
4	931.6948	21.36425	5.83e-09	-7.609646	-6.583670	-7.195650
5	948.3067	30.15019	5.81e-09	-7.615037	-6.347655	-7.103630
6	955.7201	13.19388	6.27e-09	-7.539384	-6.030596	-6.930566
7	973.3520	30.75872	6.19e-09	-7.553762	-5.803567	-6.847533
8	980.0625	11.46995	6.74e-09	-7.471916	-5.480316	-6.668276
9	997.9708	29.97871	6.65e-09	-7.488730	-5.255723	-6.587679
10	1005.765	12.77227	7.18e-09	-7.416429	-4.942016	-6.417967
11	1018.194	19.93030	7.45e-09	-7.384967	-4.669147	-6.289094
12	1046.953	**45.10269***	6.70e-09	-7.497384	-4.540158	-6.304100

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 133 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.161156	61.16351	47.85613	0.0018
At most 1	0.049033	19.51541	29.79707	0.4563
At most 2	0.023385	7.600070	15.49471	0.5091
At most 3	0.008370	1.992109	3.841466	0.1581
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None *	0.161156	41.64810	27.58434	0.0004
At most 1	0.049033	11.91534	21.13162	0.5561
At most 2	0.023385	5.607961	14.26460	0.6639
At most 3	0.008370	1.992109	3.841466	0.1581

****MacKinnon-Haug-Michelis (1999) p-values**

Table 134 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None *	0.171143	63.50345	47.85613	0.0009
At most 1	0.047593	19.01666	29.79707	0.4917
At most 2	0.021067	7.459847	15.49471	0.5248
At most 3	0.010132	2.413597	3.841466	0.1203
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None *	0.171143	44.48679	27.58434	0.0001
At most 1	0.047593	11.55681	21.13162	0.5917
At most 2	0.021067	5.046250	14.26460	0.7360
At most 3	0.010132	2.413597	3.841466	0.1203

****MacKinnon-Haug-Michelis (1999) p-values**

Table 135 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.224906	1	0.6353
RNP	1.045755	1	0.3065
RSP	1.949266	1	0.1627
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.004128	0.001796	-2.298128(0.0224)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.065525	1	0.7980
RNP	1.374944	1	0.2410
RSP	14.10161	1	0.0002
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	0.012	0.018	0.691(0.490)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	2.245207	1	0.1340
IPR	0.108999	1	0.7413
RSP	1.743229	1	0.1867
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.217	0.034	-6.310(0.000)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.915415	1	0.3387
IPR	0.232116	1	0.6300
RNP	0.122494	1	0.7263
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP (ECT)	0.006	0.004	1.421(0.156)

Table 136 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.247571	1	0.6188
RWP	0.863156	1	0.3529
RSP	3.719405	1	0.0538
Dependent Variable: IR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	-0.002	0.000	-2.831(0.0005)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	3.90E-05	1	0.9950
RWP	6.525105	1	0.0106
RSP	8.880456	1	0.0029
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	0.013	0.011	1.230(0.219)
Dependent Variable: RWP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	4.156629	1	0.0415
IPR	0.268090	1	0.6046
RSP	0.119691	1	0.7294
Dependent Variable: RWP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RWP (ECT)	-0.196	0.030	-6.559(0.000)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.436735	1	0.5087
IPR	1.083674	1	0.2979
RWP	3.054083	1	0.0805
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP(ECT)	0.015	0.017	0.886(0.3764)

APPENDIX 17-SPAIN

Table 137 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant, Trend**
IR	-1.317 [1] (0.621)	-1.856 [1] (0.673)	-1.678 [9] (0.440)	-2.256 [9] (0.455)	1.450 [11] ***	0.193 [11]
IPR	-1.674 [7] (0.443)	-1.063 [1] (0.931)	-1.091 [4] (0.719)	-1.186 [1] (0.910)	0.465 [11] **	0.462 [11] ***
RNP	-1.083 [0] (0.722)	-3.377 [1] (0.057)	-1.175 [2] (0.685)	-3.377 [4] (0.056)	1.933 [11] ***	0.046 [11]
RSP	-1.980 [1] (0.295)	-1.627 [1] (0.779)	-1.818 [5] (0.371)	-1.444 [5] (0.845)	1.156 [11] ***	0.311 [11] **
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significances Constant respectively.**

Table 138 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-9.601 [0] (0.000)***	-9.586 [0] (0.000)***	-10.326 [7] (0.000)***	-10.320 [7] (0.000)***	0.082 [9]	0.053 [9]
IPR	-19.747 [0] (0.000)***	-20.337 [0] (0.000)***	-19.192 [6] (0.000)***	-20.154 [4] (0.000)***	0.857 [3] ***	0.060 [3]
RNP	-13.314 [0] (0.000)***	-13.287 [0] (0.000)***	-13.322 [2] (0.000)***	-13.295 [2] (0.000)***	0.028 [2]	0.027 [2]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significances Constant respectively.**

Table 139 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-415.1494	NA	0.000472	3.692946	3.753298	3.717299
1	1290.818	3336.782	1.61e-10	-11.19663	-10.89488	-11.07487
2	1345.168	104.3892	1.15e-10	-11.53452	**-10.99135***	**-11.31534***
3	1368.461	43.91855	1.08e-10	-11.59877	-10.81420	-11.28219
4	1390.857	41.43876	**1.02e-10***	**-11.65513***	-10.62916	-11.24113
5	1399.270	15.26922	1.09e-10	-11.58828	-10.32090	-11.07688
6	1408.679	16.74410	1.16e-10	-11.53021	-10.02142	-10.92139
7	1421.937	23.12864	1.19e-10	-11.50605	-9.755854	-10.79982
8	1433.971	20.57057	1.24e-10	-11.47111	-9.479513	-10.66747
9	1442.501	14.27862	1.32e-10	-11.40530	-9.172288	-10.50424
10	1451.234	14.31082	1.42e-10	-11.34127	-8.866853	-10.34280
11	1473.194	**35.21385***	1.35e-10	-11.39378	-8.677960	-10.29791
12	1479.108	9.274725	1.49e-10	-11.30492	-8.347690	-10.11163

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 140 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-447.3254	NA	0.000627	3.976435	4.036787	4.000788
1	1296.078	3410.006	1.54e-10	-11.24298	-10.94122	-11.12122
2	1354.643	112.4849	1.06e-10	-11.61800	**-11.07483***	**-11.39882***
3	1379.286	46.46437	9.81e-11	-11.69415	-10.90958	-11.37757
4	1402.198	42.39088	**9.24e-11***	**-11.75504***	-10.72907	-11.34105
5	1411.495	16.87519	9.81e-11	-11.69599	-10.42861	-11.18459
6	1422.120	18.90850	1.03e-10	-11.64863	-10.13984	-11.03981
7	1435.115	22.67072	1.06e-10	-11.62216	-9.871965	-10.91593
8	1449.337	24.30787	1.08e-10	-11.60649	-9.614888	-10.80285
9	1459.355	16.77113	1.14e-10	-11.55379	-9.320782	-10.65274
10	1468.479	14.95208	1.22e-10	-11.49321	-9.018794	-10.49475
11	1490.588	**35.45207***	1.16e-10	-11.54703	-8.831211	-10.45116
12	1495.513	7.724647	1.29e-10	-11.44946	-8.492232	-10.25617

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 141 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.112905	39.68222	47.85613	0.2341
At most 1	0.026994	11.40863	29.79707	0.9505
At most 2	0.020456	4.950553	15.49471	0.8140
At most 3	0.000309	0.072968	3.841466	0.7870
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None*	0.112905	28.27359	27.58434	0.0408
At most 1	0.026994	6.458081	21.13162	0.9720
At most 2	0.020456	4.877585	14.26460	0.7572
At most 3	0.000309	0.072968	3.841466	0.7870

****MacKinnon-Haug-Michelis (1999) p-values**

Table 142 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.107390	37.69506	47.85613	0.3155
At most 1	0.025680	10.88409	29.79707	0.9639
At most 2	0.019656	4.744410	15.49471	0.8353
At most 3	0.000252	0.059487	3.841466	0.8073
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.107390	26.81097	27.58434	0.0625
At most 1	0.025680	6.139680	21.13162	0.9800
At most 2	0.019656	4.684923	14.26460	0.7810
At most 3	0.000252	0.059487	3.841466	0.8073

****MacKinnon-Haug-Michelis (1999) p-values**

Table 143 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	0.039451	2	0.9805
RNP	15.37238	2	0.0005
RSP	8.304447	2	0.0157
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IR (ECT)	0.002	0.004	0.621(0.534)
Dependent Variable: IPR (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	10.53685	2	0.0052
RNP	1.779692	2	0.4107
RSP	4.392662	2	0.1112
Dependent Variable: IPR (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
IPR (ECT)	-0.007	0.001	-4.509(0.000)
Dependent Variable: RNP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	6.660611	2	0.0358
IPR	0.781294	2	0.6766
RSP	3.240704	2	0.1978
Dependent Variable: RNP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RNP (ECT)	-0.024	0.011	-2.228(0.0268)
Dependent Variable: RSP (Short Term Causality)			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.733697	2	0.6929
IPR	4.976748	2	0.0830
RNP	1.634591	2	0.4416
Dependent Variable: RSP (Long Term Causality)			
	Coefficient	**Std. Error**	**t-Statistic (Prob.)**
RSP (ECT)	-0.005	0.002	-2.583(0.0104)

Table 144 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	1.357317	2	0.5073
RWP	6.590102	2	0.0371
RSP	5.818081	2	0.0545
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	11.25892	2	0.0036
RWP	12.57405	2	0.0019
RSP	0.972011	2	0.6151
Dependent Variable: RWP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	7.448020	2	0.0241
IPR	1.170590	2	0.5569
RSP	3.234132	2	0.1985
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	8.650252	2	0.0132
IPR	5.394783	2	0.0674
RWP	1.101098	2	0.5766

APPENDIX 18-SWEDEN

Table 145 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	Constant-Trend	Constant	Constant-Trend	Constant	Constant, Trend
IR	-1.443 [1] (0.560)	-2.414 [1] (0.370)	-1.431 [9] (0.477)	-2.419 [9] (0.368)	1.170 [11] ***	0.105 [11]
IPR	-2.113 [2] (0.239)	-1.245 [2] (0.898)	-1.568 [1] (0.497)	-1.699 [5] (0.748)	1.573 [11] ***	0.438 [11] ***
RNP	-0.994 [0] (0.755)	-3.3396 [1] (0.054)	-1.100 [2] (0.715)	-3.383 [4] (0.056)	1.924 [11] ***	0.048 [11]
RSP	-2.159 [1] (0.604)	-1.902 [1] (0.640)	-1.979 [3] (0.295)	-1.644 [3] (0.772)	0.821 [11] ***	0.329 [11] ***
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significances Constant respectively.**

Table 146 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		Phillips-Perron (PP)		Kwiatkowski Phillips-Schmid-Shin (KPSS)	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-8.265 [0] (0.000)***	-8.252 [0] (0.000)***	-8.450 [6] (0.000)***	-8.441 [6] (0.000)***	0.048 [9]	0.041 [9]
IPR	-19.054 [1] (0.000)***	-19.363 [1] (0.000)***	-18.941 [5] (0.000)***	-19.571 [3] (0.000)***	0.474 [1]	0.031 [3]
RNP	-13.247 [0] (0.000)***	-13.219 [0] (0.000)***	-13.254 [2] (0.000)***	-13.226 [2] (0.000)***	0.029 [2]	0.029 [2]
RSP	-10.504 [0] (0.000)***	-10.553 [0] (0.000)***	-10.358 [6] (0.000)***	-10.377 [6] (0.000)***	0.212 [4]	0.069 [3]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significances Constant respectively.**

Table 147 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-427.0563	NA	0.000524	3.797853	3.858204	3.822206
1	1178.012	3139.429	4.36e-10	-10.20275	-9.900992	-10.08099
2	1266.333	169.6391	2.30e-10	-10.83994	**-10.29678***	-10.62077
3	1293.510	51.24102	**2.09e-10***	**-10.93842***	-10.15385	**-10.62183***
4	1302.423	16.49148	2.22e-10	-10.87598	-9.850002	-10.46198
5	1312.412	18.12831	2.35e-10	-10.82301	-9.555628	-10.31160
6	1319.970	13.45257	2.53e-10	-10.74864	-9.239849	-10.13982
7	1337.379	30.36859	2.51e-10	-10.76105	-9.010851	-10.05482
8	1346.111	14.92507	2.68e-10	-10.69701	-8.705409	-9.893370
9	1360.315	23.77773	2.73e-10	-10.68119	-8.448179	-9.780135
10	1366.634	10.35529	2.99e-10	-10.59589	-8.121478	-9.597429
11	1381.113	23.21814	3.04e-10	-10.58249	-7.866674	-9.486621
12	1398.076	**26.60199***	3.04e-10	-10.59097	-7.633749	-9.397690

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 148 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-461.0000	NA	0.000707	4.096917	4.157268	4.121269
1	1182.629	3214.851	4.18e-10	-10.24343	-9.941668	-10.12166
2	1275.135	177.6765	2.13e-10	-10.91749	**-10.37432***	-10.69831
3	1302.642	51.86302	**1.93e-10***	**-11.01887***	-10.23430	**-10.70228***
4	1312.209	17.70268	2.04e-10	-10.96220	-9.936221	-10.54820
5	1322.058	17.87584	2.16e-10	-10.90800	-9.640622	-10.39660
6	1329.496	13.23757	2.33e-10	-10.83257	-9.323779	-10.22375
7	1346.082	**28.93412***	2.32e-10	-10.83773	-9.087536	-10.13150
8	1355.761	16.54264	2.46e-10	-10.78203	-8.790432	-9.978393
9	1368.908	22.00926	2.53e-10	-10.75690	-8.523895	-9.855851
10	1375.726	11.17223	2.76e-10	-10.67600	-8.201585	-9.677536
11	1390.622	23.88611	2.80e-10	-10.66627	-7.950452	-9.570399
12	1406.037	24.17604	2.83e-10	-10.66112	-7.703897	-9.467839

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 149 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.102760	46.12067	47.85613	0.0721
At most 1	0.043498	20.53074	29.79707	0.3876
At most 2	0.037046	10.03535	15.49471	0.2780
At most 3	0.004762	1.126462	3.841466	0.2885
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.102760	25.58993	27.58434	0.0880
At most 1	0.043498	10.49539	21.13162	0.6972
At most 2	0.037046	8.908888	14.26460	0.2938
At most 3	0.004762	1.126462	3.841466	0.2885

****MacKinnon-Haug-Michelis (1999) p-values**

Table 150 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.096960	43.21080	47.85613	0.1275
At most 1	0.039192	19.14146	29.79707	0.4828
At most 2	0.035617	9.706028	15.49471	0.3040
At most 3	0.004849	1.147048	3.841466	0.2842
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.096960	24.06934	27.58434	0.1323
At most 1	0.039192	9.435433	21.13162	0.7958
At most 2	0.035617	8.558980	14.26460	0.3247
At most 3	0.004849	1.147048	3.841466	0.2842

****MacKinnon-Haug-Michelis (1999) p-values**

Table 151 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	9.880442	2	0.0072
RNP	5.890369	2	0.0526
RSP	8.494370	2	0.0143
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	17.25579	2	0.0002
RNP	4.002726	2	0.1352
RSP	4.831341	2	0.0893
Dependent Variable: RNP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	9.673629	2	0.0079
IPR	0.254771	2	0.8804
RSP	2.770064	2	0.2503
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	17.02966	2	0.0002
IPR	3.737203	2	0.1543
RNP	11.37558	2	0.0034

Table 152 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	10.64774	2	0.0049
RWP	7.639062	2	0.0219
RSP	9.342599	2	0.0094
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	16.04345	2	0.0003
RWP	5.653488	2	0.0592
RSP	4.925586	2	0.0852
Dependent Variable: RWP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	6.203505	2	0.0450
IPR	0.026754	2	0.9867
RSP	0.691990	2	0.7075
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Olasılık Value (p)**
IR	16.33287	2	0.0003
IPR	4.060299	2	0.1313
RWP	10.92193	2	0.0042

APPENDIX 19-UNITED KINGDOM

Table 153 Unit Root Test Results (Level)

	Augmented Dickey Fuller (ADF)		Philips-Perron (PP)		Kwiatkowski-Philips-Schmidt-Shin (KPSS)	
	Constant	Constant-Trend	Constant	Constant-Trend	Constant	Constant, Trend
IR	-0.736 [1] (0.834)	-2.541 [1] (0.307)	-0.760 [9] (0.827)	-2.485 [9] (0.335)	1.457 [11] ***	0.178 [11]
IPR	-0.434 [1] (0.899)	-2.294 [2] (0.434)	-0.646 [3] (0.856)	-2.424 [2] (0.366)	1.148 [11] ***	0.438 [11] ***
RNP	-0.798 [0] (0.817)	-2.773 [1] (0.208)	-0.862 [2] (0.798)	-3.108 [4] (0.106)	1.952 [11] ***	0.153 [11]
RSP	-2.073 [1] (0.255)	-2.112 [1] (0.535)	-1.864 [6] (0.348)	-2.012 [6] (0.591)	0.676 [11] **	0.158 [11] **
RWP	-1.083 [1] (0.722)	-3.147 [1] (0.09)	-1.042 [4] (0.738)	-3.086 [5] (0.111)	1.956 [11] ***	0.142 [11]
Critical Value %1	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value %5	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 154 Unit Root Test Results (First Difference)

	Augmented Dickey Fuller (ADF)		**Phillips-Perron (PP)**		**Kwiatkowski Phillips-Schmid-Shin (KPSS)**	
	Constant	**Constant-Trend**	**Constant**	**Constant-Trend**	**Constant**	**Constant-Trend**
IR	-8.914 [0] (0.000)***	-8.956 [0] (0.000)***	-9.129 [6] (0.000)***	-9.163 [6] (0.000)***	0.119 [9]	0.049 [8]
IPR	-20.670 [0] (0.000)***	-20.912 [1] (0.000)***	-20.507 [4] (0.000)***	-20.940 [2] (0.000)***	0.415 [1]	0.059 [2]
RNP	-14.062 [0] (0.000)***	-14.033 [0] (0.000)***	-14.062 [0] (0.000)***	-14.033 [0] (0.000)***	0.036 [2]	0.033 [2]
RSP	-13.137 [0] (0.000)***	-13.126 [0] (0.000)***	-13.127 [4] (0.000)***	-13.111 [6] (0.000)***	0.093 [6]	0.079 [6]
RWP	-12.300 [0] (0.000)***	-12.273 [0] (0.000)***	-12.298 [1] (0.000)	-12.272 [1] (0.000)	0.031 [4]	0.031 [4]
Critical Value 1%	-3.457	-3.997	-3.457	-3.997	0.739	0.216
Critical Value 5%	-2.873	-3.428	-2.873	-3.428	0.463	0.146

The values in ( ) expresses the MacKinnon (1996) one-sided p-values for ADF and PP tests, and Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1) values for KPSS test as well.
The lag values in [] were determined through the Schwarz Info Criterion (Automatic Selection) for ADF test, and Newey-West (Automatic Selection) Bandwidth for PP and KPSS tests as well.
*****, ** expresses 1% and 5% statistical significance Constant respectively.**

Table 155 Lag Length Criteria Results (National Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-88.01347	NA	2.64e-05	0.810691	0.871043	0.835044
1	1444.652	2997.812	4.16e-11	-12.55200	-12.25024	-12.43023
2	1519.910	144.5486	2.47e-11	-13.07409	**-12.53093***	**-12.85492***
3	1537.576	33.30842	**2.43e-11***	**-13.08877***	-12.30420	-12.77219
4	1549.164	21.44072	2.53e-11	-13.04990	-12.02393	-12.63591
5	1563.585	26.17324	2.57e-11	-13.03599	-11.76860	-12.52458
6	1575.114	20.52006	2.67e-11	-12.99660	-11.48781	-12.38778
7	1584.947	17.15322	2.83e-11	-12.94227	-11.19207	-12.23604
8	1591.085	10.49175	3.10e-11	-12.85538	-10.86378	-12.05174
9	1597.515	10.76342	3.38e-11	-12.77106	-10.53805	-11.87001
10	1608.196	17.50406	3.56e-11	-12.72420	-10.24978	-11.72573
11	1630.422	**35.63991***	3.38e-11	-12.77905	-10.06323	-11.68318
12	1640.541	15.86822	3.59e-11	-12.72723	-9.770004	-11.53395

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 156 Lag Length Criteria Results (World Oil Price)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-117.7536	NA	3.44e-05	1.072719	1.133071	1.097072
1	1451.618	3069.609	3.91e-11	-12.61338	-12.31162	-12.49162
2	1530.567	151.6358	2.25e-11	-13.16799	**-12.62482***	**-12.94881***
3	1547.927	32.73286	**2.22e-11***	**-13.17997***	-12.39540	-12.86339
4	1558.546	19.64750	2.33e-11	-13.13257	-12.10659	-12.71857
5	1572.278	24.92353	2.38e-11	-13.11258	-11.84520	-12.60118
6	1586.994	26.18944	2.41e-11	-13.10127	-11.59248	-12.49245
7	1596.419	16.44276	2.56e-11	-13.04334	-11.29315	-12.33711
8	1602.455	10.31639	2.80e-11	-12.95555	-10.96395	-12.15191
9	1610.586	13.61096	3.01e-11	-12.88622	-10.65321	-11.98517
10	1623.791	21.64132	3.10e-11	-12.86160	-10.38719	-11.86314
11	1645.906	**35.46141***	2.95e-11	-12.91547	-10.19965	-11.81960
12	1655.619	15.23320	3.14e-11	-12.86008	-9.902857	-11.66680

*** indicates lag order selected by the criterion**

LR: sequential modified LR test statistic (each test 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 157 Johansen Cointegration Test Results-Trace Statistics (National Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.088765	36.24243	47.85613	0.3842
At most 1	0.039786	14.30511	29.79707	0.8230
At most 2	0.019123	4.723601	15.49471	0.8374
At most 3	0.000707	0.166815	3.841466	0.6830
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.088765	21.93732	27.58434	0.2236
At most 1	0.039786	9.581511	21.13162	0.7829
At most 2	0.019123	4.556786	14.26460	0.7964
At most 3	0.000707	0.166815	3.841466	0.6830

****MacKinnon-Haug-Michelis (1999) p-values**

Table 158 Johansen Cointegration Test Results-Trace Statistics (World Oil Price)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	%5 Critical Value	Prob.**
None	0.080013	34.94993	47.85613	0.4506
At most 1	0.043557	15.26842	29.79707	0.7624
At most 2	0.019075	4.758477	15.49471	0.8339
At most 3	0.000904	0.213352	3.841466	0.6441
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**%5 Critical Value**	**Prob.****
None	0.080013	19.68151	27.58434	0.3636
At most 1	0.043557	10.50994	21.13162	0.6958
At most 2	0.019075	4.545124	14.26460	0.7978
At most 3	0.000904	0.213352	3.841466	0.6441

****MacKinnon-Haug-Michelis (1999) p-values**

Table 159 Granger Causality Test Results (National Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	4.944462	2	0.0844
RNP	13.05524	2	0.0015
RSP	13.78098	2	0.0010
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	14.95739	2	0.0006
RNP	11.82083	2	0.0027
RSP	3.007017	2	0.2223
Dependent Variable: RNP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	7.360209	2	0.0252
IPR	1.187990	2	0.5521
RSP	1.977404	2	0.3721
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.276600	2	0.8708
IPR	7.234974	2	0.0269
RNP	3.362481	2	0.1861

Table 160 Granger Causality Test Results (World Oil Price)

Dependent Variable: IR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IPR	5.089406	2	0.0785
RWP	15.24812	2	0.0005
RSP	14.34674	2	0.0008
Dependent Variable: IPR			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	13.62329	2	0.0011
RWP	10.93996	2	0.0042
RSP	2.527204	2	0.2826
Dependent Variable: RWP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	8.687696	2	0.0130
IPR	2.121656	2	0.3462
RSP	1.660631	2	0.4359
Dependent Variable: RSP			
Independent Variable	**Chi-Square Value**	**df**	**Prob.**
IR	0.230401	2	0.8912
IPR	7.094055	2	0.0288
RWP	1.954817	2	0.3763

Table 161 ADF, PP and KPSS Unit Root Tests (Level)

	IR		IPR		RNP		RSP		RWP	
	ADF	**PP**	**ADF**	**PP**	**ADF**	**PP**	**ADF**	**PP**	**ADF**	**PP**
Austria	-2.548	-2.355	-1.245	-1.699	-3.385	-3.385	-1.921	-1.888	-3.147	-3.086
Belgium	-2.630	-2.577	-2.354	-3.534	-3.404	-3.383	-1.947	-2.012	-3.147	-3.086
Canada	-3.357	-3.014	-2.036	-2.107	-3.591	-3.481	-2.660	-2.568	-3.147	-3.086
Czech Republic	-1.985	-2.806	-2.195	-3.091	-3.493	-3.377	-3.018	-2.890	-3.147	-3.086
Denmark	-1.999	-2.316	-1.878	-2.552	-14.110	-14.261	-2.263	-2.369	-3.147	-3.086
Finland	-2.414	-2.419	-1.313	-1.691	-3.396	-3.383	-1.902	-1.644	-3.147	-3.086
France	-3.111	-2.532	-2.020	-2.179	-3.363	-3.370	-1.819	-1.763	-3.147	-3.086
Germany	-2.611	-2.440	-3.296	-3.094	-3.396	-3.389	-2.195	-2.153	-3.147	-3.086
Ireland	-2.616	-2.688	-1.269	-1.551	-3.298	-3.333	-1.795	-1.738	-3.147	-3.086
Israel	-1.877	-2.426	-2.844	-3.440	-3.169	-3.045	-2.623	-2.851	-3.147	-3.086
Italy	-2.249	-2.426	-2.163	-2.291	-3.361	-3.303	-1.675	-1.618	-3.147	-3.086
Netherland	-2.457	-2.323	-3.545	-6.585	-3.389	-3.385	-2.163	-2.022	-3.147	-3.086
Norway	-2.728	-2.432	-2.296	-3.311	-3.366	-3.292	-2.834	-2.359	-3.147	-3.086
Poland	-2.436	-2.305	-2.354	-2.959	-3.174	-3.517	-3.371	-3.178	-3.147	-3.086
Portugal	-2.740	-1.992	-2.026	-2.393	-3.399	-3.385	-1.910	-1.887	-3.147	-3.086
South Korea	-1.877	-2.426	-2.761	-2.938	-4.347	-4.132	-2.807	-2.582	-3.147	-3.086
Spain	-1.856	-2.256	-1.063	-1.186	-3.377	-3.377	-1.627	-1.444	-3.147	-3.086
Sweden	-2.414	-2.419	-1.245	-1.699	-3.339	-3.383	-1.902	-1.644	-3.147	-3.086
United Kingdom	-2.541	-2.485	-2.294	-2.424	-2.773	-3.108	-2.112	-2.012	-3.147	-3.086

Table 162 ADF, PP and KPSS Unit Root Tests (First Differences)

	IR		IPR		RNP		RSP		RWP	
	ADF	**PP**	**ADF**	**PP**	**ADF**	**PP**	**ADF**	**PP**	**ADF**	**PP**
Austria	-7.568 ***	-7.562 ***	-15.403 ***	-22.191 ***	-13.320 ***	-13.325 ***	-10.592 ***	-10.721 ***	-12.273 ***	-12.272 ***
Belgium	-10.497 ***	-10.984 ***	-20.547 ***	-21.057 ***	-13.171 ***	-13.174 ***	-10.953 ***	-11.148 ***	-12.273 ***	-12.272 ***
Canada	-8.251 ***	-7.890 ***	-6.572 ***	-16.049 ***	-13.357 ***	-13.338 ***	-12.798 ***	-12.794 ***	-12.273 ***	-12.298 ***
Czech Republic	-10.907 ***	-14.194 ***	-21.348 ***	-21.475 ***	-13.376 ***	-13.352 ***	-10.201 ***	-10.465 ***	-12.273 ***	-12.272 ***
Denmark	-10.935 ***	-11.532 ***	-12.694 ***	-26.582 ***	-12.699 ***	-126.824 ***	-11.390 ***	-11.586 ***	-12.273 ***	-12.272 ***
Finland	-8.252 ***	-8.441 ***	-19.363 ***	-19.571 ***	-13.219 ***	-13.226 ***	-10.553 ***	-10.377 ***	-12.273 ***	-12.272 ***
France	-4.590 ***	-12.143 ***	-21.009 ***	-20.190 ***	-13.322 ***	-13.321 ***	-11.488 ***	-11.432 ***	-12.273 ***	-12.272 ***
Germany	-7.531 ***	-7.514 ***	-6.697 ***	-18.108 ***	-13.313 ***	-13.316 ***	-11.200 ***	-11.214 ***	-12.273 ***	-12.272 ***
Ireland	-9.527 ***	-9.912 ***	-16.061 ***	-53.795 ***	-13.545 ***	-13.543 ***	-11.096 ***	-11.335 ***	-12.273 ***	-12.298 ***
Israel	-9.577 ***	-17.737 ***	-21.083 ***	-21.083 ***	-13.232 ***	-13.208 ***	-11.588 ***	-11.559 ***	-12.273 ***	-12.272 ***
Italy	-5.884 ***	-11.039 ***	-6.608 ***	-16.847 ***	-13.289 ***	-13.323 ***	-12.126 ***	-12.069 ***	-12.273 ***	-12.272 ***
Netherland	-7.740 ***	-7.835 ***	-16.247 ***	-26.597 ***	-13.197 ***	-13.197 ***	-11.497 ***	-11.455 ***	-12.273 ***	-12.272 ***

Norway	-7.908 ***	-7.839 ***	-12.291 ***	-86.532 ***	-13.590 ***	-13.572 ***	-13.199 ***	-13.179 ***	-12.273 ***	-12.272 ***
Poland	-5.775 ***	-13.929 ***	-24.164 ***	-24.256 ***	-13.783 ***	-13.760 ***	-12.888 ***	-12.935 ***	-12.273 ***	-12.272 ***
Portugal	-7.754 ***	-16.434 ***	-16.979 ***	-33.154 ***	-13.322 ***	-13.323 ***	-10.620 ***	-10.625 ***	-12.273 ***	-12.298 ***
South Korea	-9.577 ***	-17.737 ***	-15.751 ***	-15.747 ***	-13.612 ***	-13.559 ***	-10.777 ***	-10.620 ***	-12.273 ***	-12.272 ***
Spain	-9.586 ***	-10.320 ***	-20.337 ***	-20.154 ***	-13.287 ***	-13.295 ***	-12.273 ***	-12.272 ***	-12.273 ***	-12.272 ***
Sweden	-8.252 ***	-8.441 ***	-19.363 ***	-19.571 ***	-13.219 ***	-13.226 ***	-10.553 ***	-10.377 ***	-12.273 ***	-12.272 ***
United Kingdom	-8.956 ***	-9.163 ***	-20.912 ***	-20.940 ***	-14.033 ***	-14.033 ***	-13.126 ***	-13.111 ***	-12.273 ***	-12.272 ***

Table 163 Johansen Cointegration Results (National Oil Prices)

National Oil Prices		r=0	r≤1	r≤2	r≤3
Austria	Trace	42.487	24.360	7.938	2.750*
	Max-Eigen	18.126	16.422	5.187	2.750*
Belgium	Trace	70.976***	32.920**	9.488	0.455
	Max-Eigen	38.056***	23.431**	9.033	0.455
Canada	Trace	35.386	20.250	8.212	1.279
	Max-Eigen	15.136	12.037	6.933	1.279
Czech Republic	Trace	55.717***	26.521	7.902	1.060
	Max-Eigen	29.195**	18.619	6.842	1.060
Denmark	Trace	102.452***	32.630**	13.075	1.619
	Max-Eigen	69.821***	19.555*	11.457	1.617
Finland	Trace	46.120	20.530	10.035	1.126
	Max-Eigen	25.589*	10.495	8.908	1.126
France	Trace	49.341**	22.446	9.530	0.000
	Max-Eigen	26.894*	12.916	9.529	0.000
Germany	Trace	56.911***	24.015	10.647	0.424
	Max-Eigen	32.896***	13.367	10.222	0.424
Ireland	Trace	72.868***	38.706***	11.407	2.822*
	Max-Eigen	34.162***	27.298***	8.584	2.822*
Israel	Trace	51.988**	26.845	4.987	0.772
	Max-Eigen	25.142*	21.858**	4.214	0.772
Italy	Trace	45.649*	15.323	4.721	0.025
	Max-Eigen	30.325**	10.602	4.695	0.025
Netherland	Trace	72.873*	34.386**	11.095	0.665
	Max-Eigen	38.487*	23.291**	10.429	0.665
Norway	Trace	56.251*	26.380	10.387	0.256
	Max-Eigen	28.870**	15.993	10.130	0.256
Poland	Trace	60.423***	31.053**	17.974**	7.838***
	Max-Eigen	29.370**	13.079	10.135	7.838***
Portugal	Trace	41.291	19.130	6.093	0.208
	Max-Eigen	22.160	13.036	5.885	0.208
South Korea	Trace	61.163***	19.515	7.600	1.992
	Max-Eigen	41.648	11.915	5.607	1.992
Spain	Trace	39.682	11.408	4.950	0.072
	Max-Eigen	28.273**	6.458	4.877	0.072
Sweden	Trace	46.120*	20.530	10.035	1.126
	Max-Eigen	25.589*	10.495	8.908	1.126
United Kingdom	Trace	36.242	14.305	4.723	0.166
	Max-Eigen	21.937	9.581	4.556	0.166

Table 164 Johansen Cointegration Results (World Oil Prices)

World Oil Prices		r=0	r≤1	r≤2	r≤3
Austria	Trace	40.131	19.161	8.281	2.025
	Max-Eigen	20.969	10.879	6.256	2.025
Belgium	Trace	78.371***	30.411**	9.423	0.369
	Max-Eigen	47.960***	20.987*	9.054	0.369
Canada	Trace	34.346	19.462	7.683	1.037
	Max-Eigen	14.883	11.779	6.645	1.037
Czech Republic	Trace	55.480***	26.411	7.730	1.063
	Max-Eigen	29.068**	18.680	6.667	1.063
Denmark	Trace	43.111	22.349	9.875	0.816
	Max-Eigen	20.761	12.474	9.058	0.816
Finland	Trace	43.210	19.141	9.706	1.147
	Max-Eigen	24.069	9.435	8.558	1.147
France	Trace	45.277*	16.429	6.445	0.001
	Max-Eigen	28.847**	9.983	6.444	0.001
Germany	Trace	57.361***	23.623	9.661	0.356
	Max-Eigen	33.737	13.962	9.305	0.356
Ireland	Trace	65.536***	35.732***	10.959	2.704
	Max-Eigen	29.804**	24.772**	8.255	2.704
Israel	Trace	52.054**	19.705	5.231	0.669
	Max-Eigen	32.348**	14.474	4.561	0.669
Italy	Trace	40.513	13.063	3.727	0.005
	Max-Eigen	27.450*	9.336	3.722	0.005
Netherland	Trace	79.295*	32.941**	9.890	0.619
	Max-Eigen	46.353*	23.051**	9.270	0.619
Norway	Trace	64.042*	29.296***	11.048	0.228
	Max-Eigen	34.764*	18.248	10.819	1.063
Poland	Trace	53.575**	30.639**	18.309**	7.638***
	Max-Eigen	22.936	12.329	10.670	7.638***
Portugal	Trace	39.776	18.670	7.094	0.230
	Max-Eigen	21.105	11.575	6.864	0.230
South Korea	Trace	63.503***	19.016	7.459	2.413
	Max-Eigen	44.486***	11.556	5.046	2.413
Spain	Trace	37.695	10.884	4.744	0.059
	Max-Eigen	26.810*	6.139	4.684	0.059
Sweden	Trace	43.210	19.141	9.706	1.147
	Max-Eigen	24.069	9.435	8.558	1.147
United Kingdom	Trace	34.949	15.268	4.758	0.213
	Max-Eigen	19.681	10.509	4.545	0.213

Table 165 Granger Causality Results (National Oil Price)

	Dependent Variable	Independent Variables			
		IR	**IPR**	**RNP**	**RSP**
Austria	IR	-	8.203**	2.948	18.371***
	IPR	12.024***	-	0.955	4.373
	RNP	7.404**	3.761	-	6.954**
	RSP	9.670***	1.869	4.623*	-
Belgium	IR	-	4.253**	1.704	4.504**
	IPR	2.965*	-	0.115	0.707
	RNP	1.378	0.017	-	4.190**
	RSP	0.597	0.337	0.455	-
Canada	IR	-	5.665*	4.575	2.073
	IPR	10.679***	-	6.796	2.539
	RNP	2.618	0.296	-	14.738***
	RSP	1.255	3.699	2.702	-
Czech Republic	IR	-	0.688	0.606	0.465
	IPR	0.491	-	4.441**	1.414
	RNP	0.379	1.685	-	4.376**
	RSP	0.526	0.007	0.251	-
Denmark	IR	-	0.295	0.082	3.604*
	IPR	2.173	-	0.067	0.177
	RNP	0.002	0.383	-	0.334
	RSP	0.179	0.001	0.780	-
Finland	IR	-	9.880***	5.890*	8.494**
	IPR	17.255***	-	4.002	4.831*
	RNP	9.673***	0.254	-	2.770
	RSP	17.029***	3.737	11.375***	-
France	IR	-	1.213	5.565**	1.402
	IPR	11.640***	-	3.164*	3.402*
	RNP	2.263	0.720	-	0.689
	RSP	4.281**	0.102	0.809	-
Germany	IR	-	5.983*	11.410***	6.924**
	IPR	37.446***	-	6.069**	5.541*
	RNP	4.807*	1.733	-	9.544***
	RSP	5.116*	2.258	2.062	-
Ireland	IR	-	2.077	5.355*	15.574***
	IPR	0.761	-	1.012	0.113
	RNP	5.739	5.684	-	6.941
	RSP	0.860	10.545	2.036	-
Israel	IR	-	1.498	0.866	1.729
	IPR	2.130	-	4.678**	5.161**
	RNP	0.263	0.659	-	13.976***
	RSP	0.103	0.026	0.052	-

Table 166 (Cont.) (National Oil Price)

	Dependent Variable	Independent Variables			
		IR	**IPR**	**RNP**	**RSP**
Italy	IR	-	2.222	4.019**	2.935*
	IPR	25.342***	-	4.490**	9.844***
	RNP	5.980**	0.021	-	1.123
	RSP	1.793	0.304	2.193	-
Netherland	IR	-	0.905	6.509**	7.643**
	IPR	3.421	-	0.589	2.355
	RNP	2.686	5.570*	-	21.293***
	RSP	0.185	1.284	1.030	-
Norway	IR	-	4.435	3.039	0.878
	IPR	0.398	-	0.043	4.609*
	RNP	0.037	0.468	-	8.375**
	RSP	10.824***	0.057	2.401	-
Poland	IR	-	0.835	2.395	1.144
	IPR	0.700	-	4.898*	0.521
	RNP	3.837	1.345	-	6.133**
	RSP	8.011**	3.766	2.343	-
Portugal	IR	-	0.023	5.797*	3.020
	IPR	4.818*	-	6.880**	1.248
	RNP	8.800**	3.426	-	2.253
	RSP	7.229**	0.028	5.519*	-
South Korea	IR	-	0.224	1.045	1.949
	IPR	0.065	-	1.374	14.101***
	RNP	2.245	0.108	-	1.743
	RSP	0.915	0.232	0.122	-
Spain	IR	-	0.039	15.372***	8.304**
	IPR	10.536***	-	1.779	4.392
	RNP	6.660**	0.781	-	3.240
	RSP	0.733	4.976*	1.634	-
Sweden	IR	-	9.880***	5.890*	8.494**
	IPR	17.255	-	4.002	4.831*
	RNP	9.673	0.254	-	2.770
	RSP	17.029***	3.737	11.375***	-
United Kingdom	IR	-	4.944*	13.055***	13.780***
	IPR	14.957***	-	11.820***	3.007
	RNP	7.360**	1.187	-	1.977
	RSP	0.276	7.234**	3.362	-

Table 167 Granger Causality Results (World Oil Price)

	Dependent Variable	Independent Variables			
		IR	**IPR**	**RWP**	**RSP**
Austria	IR	-	5.276*	1.851	17.718***
	IPR	13.970***	-	0.414	4.212
	RWP	6.025**	1.387	-	10.589***
	RSP	10.854***	1.260	4.598	-
Belgium	IR	-	6.011**	0.865	2.256
	IPR	1.877	-	0.011	0.185
	RWP	1.947	0.039	-	6.225**
	RSP	0.265	0.452	0.272	-
Canada	IR	-	6.460**	4.176	2.129
	IPR	10.629***	-	8.387	3.157
	RWP	2.581	0.854	-	17.733***
	RSP	1.124	4.226	3.771	-
Czech Republic	IR	-	0.796	0.596	0.608
	IPR	0.220	-	5.408**	0.979
	RWP	0.028	1.372	-	6.140**
	RSP	0.741	0.000	1.285	-
Denmark	IR	-	0.705	1.758	3.572*
	IPR	0.202	-	3.630*	5.826**
	RWP	6.166**	0.469	-	1.572
	RSP	23.365***	0.011	0.578	-
Finland	IR	-	10.647***	7.639**	9.342***
	IPR	16.043***	-	5.653*	4.925*
	RWP	6.203**	0.026	-	0.691
	RSP	16.332***	4.060	10.921***	-
France	IR	-	2.150	8.461**	1.633
	IPR	16.073***	-	18.249***	4.858*
	RWP	2.789	1.350	-	5.101*
	RSP	4.176	1.637	1.874	-
Germany	IR	-	5.388*	13.022***	7.317**
	IPR	37.663***	-	9.787***	4.842*
	RWP	3.751	1.379	-	7.231
	RSP	4.496	1.979	1.935	-
Ireland	IR	-	0.985	8.954**	14.752***
	IPR	2.756	-	2.980	0.530
	RWP	3.270	3.466	-	4.634*
	RSP	0.893	9.203***	1.306	-
Israel	IR	-	0.559	0.023	3.180*
	IPR	2.659	-	9.725***	9.453***
	RWP	0.118	1.485	-	12.522***
	RSP	0.215	1.863	2.887*	-

Table 168 (Cont.) (World Oil Price)

	Dependent Variable	Independent Variables			
		IR	IPR	RWP	RSP
Italy	IR	-	2.298	6.159**	3.410
	IPR	25.486***	-	14.902***	13.461***
	RWP	5.602*	0.480	-	1.835
	RSP	9.297***	1.922	8.894**	-
Netherland	IR	-	0.356	8.735**	5.225*
	IPR	1.795	-	1.311	0.965
	RWP	2.706	6.759	-	23.005***
	RSP	0.267	1.729	0.957	-
Norway	IR	-	4.354	6.964**	0.102
	IPR	0.579	-	0.008	4.704*
	RWP	0.176	0.289	-	5.512*
	RSP	14.082***	0.176	4.840*	-
Poland	IR	-	1.092	3.242	1.311
	IPR	0.314	-	3.077	0.426
	RWP	4.894*	2.911	-	3.497
	RSP	4.223	3.899	0.898	-
Portugal	IR	-	0.058	6.205**	3.754
	IPR	4.469	-	8.865**	1.813
	RWP	7.886**	2.248	-	2.074
	RSP	6.309**	0.001	2.927	-
South Korea	IR	-	0.247	0.863	3.719*
	IPR	3.900	-	6.525**	8.880***
	RWP	4.156**	0.268	-	0.119
	RSP	0.436	1.083	3.054*	-
Spain	IR	-	1.357	6.590**	5.818*
	IPR	11.258***	-	12.574***	0.972
	RWP	7.448**	1.170	-	3.234
	RSP	8.650**	5.394*	1.101	-
Sweden	IR	-	10.647***	7.639**	9.342***
	IPR	16.043***	-	5.653*	4.925*
	RWP	6.203**	0.026	-	0.691
	RSP	16.332***	4.060	10.921***	-
United Kingdom	IR	-	5.089*	15.248***	14.346***
	IPR	13.623***	-	10.939***	2.527
	RWP	8.687**	2.121	-	1.660
	RSP	0.230	7.094**	1.954	-

Table 169 Summary of Test Results (National Oil Price)

Country	Cointegration	Granger Causality Test																								
		Dependent Variable(IR)					Dependent Variable(IPR)					Dependent Variable(RNP)					Dependent Variable(RSP)									
		Independent Variables			Long-Term Causality		Independent Variables			Long-Term Causality		Independent Variables			Long-Term Causality		Independent Variables			Long-Term Causality						
		IPR	RNP	RSP	1%	5%	IR	RNP	RSP	1%	5%	IR	IPR	RSP	1%	5%	IR	IPR	RNP	1%	5%					
Austria		5%		1%			1%					5%		5%			1%									
Belgium	✓	5%		5%	✓					✓																
Canada							1%	5%						1%												
Czech Republic	✓							5%		✓				5%						✓						
Denmark	✓																									
Finland		1%		5%			1%					1%					1%		1%							
France	✓		5%				1%			✓						✓	5%									
Germany	✓		1%	5%			1%	5%		✓				1%						✓						
Ireland	✓			5%										5%	✓					✓						
Israel	✓							5%		✓				1%						✓						
Italy	✓		5%				1%	5%	1%	✓		5%			✓											
Netherland	✓		5%	5%						✓																

Norway	✓													5%				1%			
Poland	✓				✓								5%			✓	5%			✓	
Portugal								5%				5%					5%				
South Korea	✓																				
Spain	✓		1%	5%			1%			✓		5%				✓	1%		1%		✓
Sweden			1%	5%			1%					1%									
United Kingdom			1%	1%			5%						5%					5%			

Table 170 Summary of Test Results (World Oil Price)

Country	Cointegration	Granger Causality Test																								
		Dependent Variable(IR)					Dependent Variable(IPR)					Dependent Variable(RWP)					Dependent Variable(RSP)									
		Independent Variables			Long-Term Causality		Independent Variables			Long-Term Causality		Independent Variables			Long-Term Causality		Independent Variables			Long-Term Causality						
		IPR	RWP	RSP	1%	5%	IR	RWP	RSP	1%	5%	IR	IPR	RSP	1%	5%	IR	IPR	RWP	1%	5%					
Austria				1%			1%					5%		1%			1%									
Belgium	✓	5%			✓					✓																
Canada		5%					1%	5%						1%												
Czech Republic	✓					✓		5%		✓				5%						✓						
Denmark									5%			5%					1%									
Finland		1%	5%	1%			1%					5%					1%		1%							
France	✓		5%				1%	1%		✓																
Germany	✓		1%	5%			1%	1%		✓				5%												
Ireland	✓						5%	1%		✓					✓		5%			✓						
Israel	✓									✓										✓						
Italy			5%				1%	1%	1%					1%			1%		5%							
Netherland	✓			5%						✓			5%	1%	✓											

Norway	✓																	1%			
Poland	✓									✓										✓	
Portugal			5%					5%				5%					5%				
South Korea	✓							5%	1%								5%			✓	
Spain			5%				1%	1%				5%					5%				
Sweden		1%	5%	1%			1%					5%					1%		1%		
United Kingdom			1%	1%			1%	1%				5%						5%			