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THE EFFECTS OF FALLING CRUDE OIL PRICES ON MACROECONOMIC PERFORMANCE AND POLITICAL STABILITIES IN THE FIRST SEVEN NET OIL EXPORTERS' COUNTRIES

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Abstract

The fluctuations in oil prices have potentially significant effect on macroeconomic money meters of countries. At the present time, production and economic growth ease off especially in China and in the world, the USA started to produce oil shale, a substitute for conventional crude oil. In the meantime, OPEC decided to keep production quotas intact and consequently crude oil prices declined to 33 USD in January 2016 with respect to 147 USD in June 2008. In this case, Russian Ruble significantly weakened against U.S. dollar and Euro; then, Saudi Arabia has declared a huge deficit in its budget. Therefore changes in oil prices should be monitored closely as an important macroeconomic variable.

In this study, the effects of oil prices in first seven net oil exporters' countries (Saudi Arabia, Russia, Canada, Nigeria, Kuwait, Kazakhstan and Venezuela) on national income, export and political risk structure were analyzed with a new generation of panel data analysis for the period 1998-2015. At the end, it was found that change of oil prices impacts macroeconomic variables of countries simultaneously but it impacts political stability of countries in different directions.

Keywords: *Oil Prices, Politic Risk, Export, GDP.*
Jel Codes: *G32, O13.*

Introduction

Fluctuations in oil prices have been encountered as a complicated phenomenon in the agenda of policy makers and primary players in the business world for years. Since WWII, shock waves in both supply and demand sides have evolved survey of the world economy persistently; intensified the stress on oil and relevant alternative energy prices. As a latest development in our contemporary world, commodity prices have decreased by 38% afterwards of September 1st, 2014; and the most significant decrease was observed with crude oil by 43% among energy prices. Such that, while barrel price was 147 USD in June 2008, it fell to 28 USD by January 2016 (www.wrtrg.com). Decrease in oil prices has reached 80% levels.

Such significant decrease in oil prices along recent periods has especially influenced oil exporter countries, companies, governments and consumers considerably. Oil exporter countries were adversely affected from this situation because of various impacts such as stress on income, budget and foreign trade balance. Developed and developing importer countries have gained important opportunity in terms of low input cost, superior competitive upper hand in foreign trade, decreasing inflation rate in domestic markets or higher tax income from oil products by increasing tax income so that they could improve their budget balance.

It was observed that various causes such as slowing growth rate across the world and especially in China, the second largest energy importer of the world, unexpected energy production growth in countries such as Iraq and Libya, unanticipated decrease in demand, increasing pace of exploration and production of alternative energy e.g. shale gas and developments in international money markets have resulted in decrease in oil prices. Although the U.S. is the largest net oil importer of the world, its share in the world oil production has grown since 2010; and according to the U.S. Energy Information Administration (EIA), it was ranked as the first place in 2014. All these developments have shifted the balance between supply and demand dynamics of the economy and required an investigation into the extent of the effect of change in oil prices on macroeconomic variables.

From the theoretical point of view, there are numbers of causes reported on the effect of changes in oil prices on macroeconomic variables. Increasing oil prices result in increase in prices of oil-intensive produced goods; and this situation stimulates inflation rates upward (Ball and Mankiw, 1992:7). When it is taken from the production point of view, intensive energy consumer industries especially oil refineries and chemistry industries have imposed limitations on production due to increasing production costs; this situation cause loss of efficiency on capital and labor; and decrease in potential output level (Lee and Ni, 1992; Cunado and De Gracia, 2005). Negative impact of decreasing efficiency of production factors on real wages resulted in decrease in supply of labor to the industry. In sum, increase in oil prices negatively affected productivity and cause decease in overall labor supply.

Increasing oil prices also caused income transfer between importer countries and exporter countries. In recent years, in parallel to the decreasing oil prices, advantageous position between oil importer and exporter countries shifted. In periods when oil prices were in rise, while exporter countries were taking advantage of the high prices, in circumstances when oil prices decreased, importer countries gained an upper hand by cutting import cost. Accordingly, expectations among importer countries have emerged regarding decreasing production costs and inflation rates. However, this strong expectation displayed difference among countries with respect to oil dependency of production capacity of countries, to their money policies, inflation transition mechanisms and policies of their labor offices regarding determination of minimum wage (Leblanc and Chinn, 2004; Conti et al., 2015).

The extent of the effect caused by decreasing oil prices has become more significant on exporter countries than importers; and this impact was in negative direction. Russian Ruble depreciated in with respect to the US Dollar and Euro. Whine USD and Ruble exchange rate was 23.43 in the beginning of July 2008; it was 75.52 on the first day of 2016 (www.tr.investing.com). 222% depreciation experienced with the Russian Ruble and shrinking economy subject to the decreasing oil prices along the last two years have fed the pessimistic expectations concerning the long term persistence of difficult economic conditions of the country. On the other hand Saudi Arabia, one of the major oil producers of the world, has given considerable amount of budget deficit. While the size of this budget deficit was 98 billion US Dollars in 2015, it put the country in a risky position. In the report published by the International Money Fund (IMF) in October 2015, Saudi Arabia was included among the countries which might bankrupt in the next five-year period because 90% of its income obtained from oil sales. Based on this report, cash reserve of the country has eroded with a great pace; and it was estimated that all of its financial assets will disappear in case decreasing trend in oil prices continues. Thus, change in oil prices is considered as a significant macroeconomic variable that needs to be monitored closely.

The primary purpose of the present study is to investigate the effects of oil prices on export, national income and political risk structure in the first net oil exporter countries (Saudi Arabia, Russia, Canada, Nigeria, Kuwait, Kazakhstan and Venezuela) through new generation panel data analysis methods by running data from the period of 1998-2015. Within this framework, whereas the reasons for decrease in oil prices were probed in the second section, empirical studies from the relevant literature were reviewed in the third section. In the fourth section, an empirical analysis was conducted and acquired results and suggestions were shared. It was expected that this study to draw attention of the countries with oil-weighted economies to the aforesaid risks; and to emphasize the necessity of taking precaution for diversifying their production and export items.

2. CAUSES OF DECREASING OIL PRICES

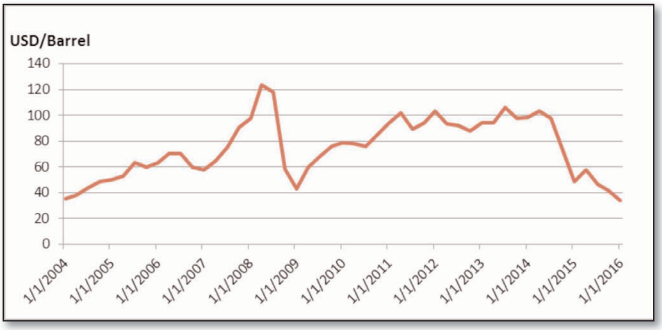
2008 financial crisis was directly influent on oil prices such that whereas oil price was 147 USD in June 2008, it fell to 43 USD in the beginning of 2009.

Figure 1:

Crude Oil Prices for period 2004-2016 (Quarterly, USD)

Resource:

US. Energy Information Administration (EIA)



Thereafter, oil price was again in increasing trend from the end of 2009 until April 2014 subject to limited supply of the OPEC and increasing demand of countries with high oil demand such as the U.S. and China. Afterwards of April 2014, a sharp decrease was observed with the oil prices because of number of factors relevant with supply and demand. These factors could be given as slowing production and economic growth across the world and especially in China; introduction of shale gas production in the U.S. as an alternative to oil; improving energy efficiency and finally OPEC's initiative not to limit oil production quota.

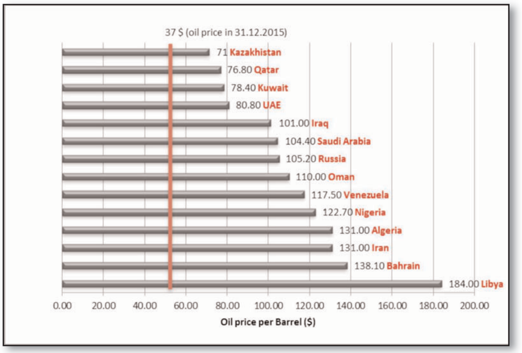
2.1. OPEC's Initiative to Maintain Production Quota

In the general assembly of the OPEC comprised of primary oil exporter countries in the world in November 2014, no any limitation was imposed on oil production quotes of member countries although significant decrease has been experienced in oil prices. While Venezuela and Iran were the members backing up limitation on production quote; Saudi Arabia and other gulf countries suppressed on the opposite side. Existing trend towards alternative energy resources such as shale gas pushed Saudi Arabia and other gulf countries to take such a step to ensure not to lose their market share. The OPEC displays its weight as balance producer in determination of oil price in the global markets since it supplies 40% of world oil production alone. However, the view that decision of the organization is in conformity with interests of certain member countries without any legal foundation has been prevailed. Based on this characteristic, although the organization exhibits a cartel quality, it does not have official format to consider it as a cartel (Eğilmez, 2014). On the other hand, expectation that limitation on oil production could stimulate oil prices upward could elevate the pace towards alternative energy resources further (Gürses, 2014).

However, views of other OPEC countries such as Saudi Arabia regarding production quota in 2016 are in the public interest. Oil exporter countries such as Saudi Arabia, Russia and Venezuela will continue to give budget deficit in every day as oil price is below 100 USD.

Figure 2:

Breakeven Price of Oil Production Costs for 2015 (USD/Barrel)



Resource: http://knoema.com/vhzbeig/oil-statistics-production-costs-breakeven-price

According to the Chart 2 above, oil price that would maintain budget balance of oil exporter countries survey rather above the current oil price level. Sustainability of this situation depends on the decisions of the OPEC in the future.

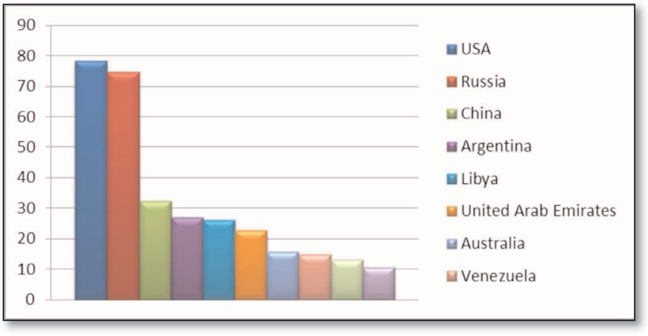
2.2. Alternative Energy Resources

Increasing production of alternative energy resources such as shale gas is considered as another downward factor effective on oil prices. Especially new shale gas reserves explored in the U.S. have increased oil production of the country. New technology investments of the U.S. (horizontal drill and hydraulic fracturing) for developing new oil drill methods have been a factor reducing the processing costs. However, shale gas exploration process is still taken as an expensive method. In comparison with the oil production costs in Saudi Arabia which ranges from 10 USD to 27 USD in some regions, shale gas production cost is in the range of 42 to 80 USD in the U.S. (Rystad Energy, 2015a).

Figure 3:

Shale Gas and Oil Resources of First Ten Countries (Technically Recoverable/Billion Barrel) (2014)

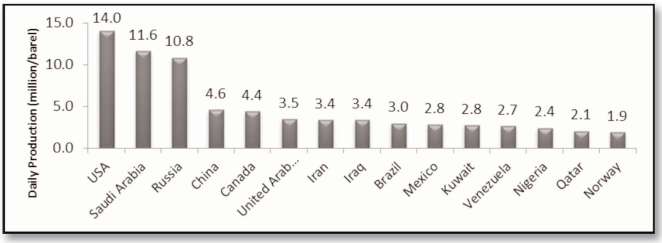
Resource: EIA



Whereas accessible shale gas resources of the U.S. were 58 billion barrel in 2013, as a result of recent discoveries, this figure has reached to 78.2 billion barrel 2015 (EIA, 2015). Although Russia and Venezuela have usually been the first ten countries in the world in terms of shale gas reserves, higher production costs of shale gas in comparison with conventional oil production costs has been viewed as an obstacle before further production efforts. Explorations of new reserves and technological advancements have placed the U.S. the largest producer position in the world.

Figure 4:

The Largest 15 Oil Producers (2014)



Resource: EIA

As the U.S. has taken the first place in oil production over from the Saudi Arabia, it reduced the dependency to the oil import. Increasing oil supply in the U.S. with the first place in world oil consumption has also been influent on the demand side; and this situation puts decreasing effect on oil prices.

2.4. Growth Survey Across the World

Slowing growth in the economies of the world and especially China, the largest economy of the world, has been the factor, cause of decreasing demand towards oil and its derivatives.

Table 1: World Oil Demand and Supply (Nationalon Barrels per day)

	2011	2012	2013	2014	2015	2016*
OECD Demand	46.4	45.9	46	45.7	46.1	46.2
Non-OECD Demand	43.1	44.8	45.9	47.1	48.3	49.4
Total Demand	89.5	90.7	91.9	92.8	94.4	95.6
OECD Supply	18.9	19.8	21	22.9	23.8	23.3
Non-OECD Supply	29.9	32.7	32.9	33.3	33.9	33.8
OPEC Supply	35.8	38.4	37.5	37.5	38.7	39.25
Total Supply	88.6	90.9	91.4	93.7	96.4	96.44
Stock Exchange	-0.9	0.2	-0.5	0.9	2	

* Data estimated for 2016

Resource: EIA, Oil Market Report,09.02.2016

When global oil demand and supply are taken into consideration, economic slowdown observed all around the world suggests that there would not be a pressure on the demand side. Especially, although countries under geo-political risk such as Iraq and Libya have been supplying oil production under their 2012 levels, oil stock change was reported as positive for 2015. That is, oil supply continues to give two million barrel/day surplus with respect to demand. In 2015, China, the second largest oil importer of the world after the U.S., has recently been one of the important determinants on oil prices due to its increasing oil demand. Thus, slowing growth in China has negative impact on oil prices which accelerates decrease of prices.

Decreasing oil consumption due to concerns relevant with environmental deterioration and national energy security is considered as another factor stimulating fall of oil prices. Subject to different political practices and technological infrastructures, oil exporter countries are not affected by the demand shocks in the same direction. Countries with higher political instability are more vulnerable against the aforesaid shocks with respect to other countries (Rowland and Mjelde, 2016).

In general, whether decreasing trend in oil prices, which depends on multiple factors, would continue or not, depends on the persistence of the same factors. A pressure that might arise on the demand side in the global market would result in an increase in oil prices once again.

3. LITERATURE REVIEW

Mork, Olsen and Mysen (1994) analyzed changes in national incomes of the U.S., Canada, Japan, West Germany, France, the G.B. and Norway that arise as a result of fluctuations in oil prices for the 1967-1992 period. As a result of their study, increases in oil prices have negative impact on the change in the national income of countries except Norvay; and findings were statistically significant. On the other hand, decreases in oil prices were usually positively effective on countries; but the results were only statistically significant for the findings with the U.S. and Canada. Obtained findings suggest that effect of oil prices on national incomes of some countries is asymmetric. Whereas two-way direction of the oil prices in the U.S. could affect the economic development negatively, Japan could be affected by increasing oil prices in negative way and be affected by decreasing oil prices positively. It was observed by the researchers that the positive impact of decreasing oil price on national income would be more moderate with respect to the situation experienced during decreasing.

Kandil (1999) analyzed the effect of oil supply and oil price shocks experienced in 18 Arab countries on their national income, budget balances and current deficit for the period of 1971-1997 by means of the panel VAR analysis method. In this regard, regarding the eight oil exporter countries covered by the study (Algeria, Bahrain, Kuwait, Libya, Oman, Qatar, Saudi Arabia and the United Arab Emirates), it was emphasized that when oil price increased, their national incomes increased and accordingly positive expansion effect in these countries arise because of the increase in oil prices. However, when oil price decreased in the aforesaid countries, their economies experienced that export income decreased and this eventually caused a serious depression.

Dibooğlu and Aleisa (2004) investigated in the effect of Saudi Arabia on real oil prices and the extent of the effect of fluctuations in oil prices on the S.A. For the long term, it was concluded that fragile structure of the national income of Saudi Arabia has persisted against the incidents experienced in oil prices; commercial shocks were largely result of changes in oil prices; and shocks in commercial figures could result in 35% change in national income on the long run.

In the study of Mehrara and Oskousi (2007), origins of the macroeconomic fluctuations occurred in oil exporter countries (Iran, Saudi Arabia, Kuwait and Indonesia) were analyzed by means of the VAR model for the period of 1970-2002. In the mentioned study, it was reported that especially Iran and Saudi Arabia were crucially sensitive to against the shocks experienced with oil prices. Due to intense dependency of economies of both countries to oil, it was observed that effect of increasing oil price was positive on their national incomes. On the other hand, while shocks experienced with oil prices resulted in 13% change on national income of Kuwait, supply shocks caused change on national income by 87%.

Brückner et al. (2012) investigated effect of fluctuations in oil prices along the period of 1960-2007 on democratic and political phenomenon such as political democracy, administrative restrictions and political competition measurements by means of the two-stage least squares method. It was reported that a 1% increase in oil prices in the oil exporter OPEC countries and 1% increase in the GDP would result in 0.2% increase in political democracy score. In the aforesaid study, fluctuations in oil prices emerge as a determinant factor in democratization process of countries whose export relies heavily on oil products.

Göçer and Bulut (2015) analyzed the effect of changes in oil prices on Russian economy through multiple structural break cointegration and symmetrical causality test methods. At the end of the study covering the period of 1992Q1-2014Q3, it was concluded that fluctuations in oil prices were significantly effective on Russia's macroeconomic parameters. It was observed that a 1% increase in oil prices would result in 1.01% increase in export, 0.27% on foreign trade balance and 0.13% in national income of Russia.

Liu et al. (2016) analyzed the effect of fluctuation in oil prices on country risk (political, economic and financial risk) evaluations for oil exporter countries. Periods of 1999-2006, 2007-2009 and 2010-2014 were individually analyzed by means of the panel data analysis method; and it was concluded that shocks experienced especially in the 2008 global crisis were effective directly on country risk. Whereas decreases in oil prices caused economic losses among oil exporter countries, in the meantime adversely affected risk evaluations of aforesaid countries.

In this study, the other empirical literatures aforesaid above and were also considered and results motivated us to use panel data analysis methods similar to those used by Liu et al. (2016) in their work. While using the first and second generation of panel data analysis, test series procured lapsed results when structural breaks ensued. A shock that could happen in oil prices has potential to affect macroeconomic figures of countries comprising the panel simultaneously. Therefore, this study provides a significant contribution to the existing field of knowledge because new generation of panel data analysis methods which take horizontal cross-sectional dependency and structural breaks into consideration were preferred.

4. ECONOMETRIC ANALYSIS

4.1. Data Set

In the present study, in order to investigate the effects of changes in oil prices on macroeconomic figures of the first seven net oil exporter countries,[3] 1998-2015 period, Gross Domestic Product (Billion $, *GDP*), total export (Billion $, *X*), crude oil price (Brent oil, $, P_{oil}) and political stability index (*PIST*) data were employed[4].

In this study, GDP and X were preffered as the macroeconomc parameters of countries because GDP component of selected countries mainly relies on oil products sector. For this reason, oil prices fluctuations could have a significant impact on oil exporter countries. The economic welfare of these countries is mainly dependent on oil prices because it may affect politic risk structures of countries. Therefore, the relationship between oil prices and political risk index of countries were analyzed for the new perspective. Political risk index (published in the range of 1 to 100) acquired from the website of the "Heritage" (www.heritage.org/index/explore) as they are estimated based on weighted variables such as property rights, corruption, economic liberty and business freedom in the relevant countries. As the index score close to 100, it indicates positive status with the relevant country about the considered variable. Whereas the GDP data was obtained from the World Bank (www.worldbank.org), export data was from the IMF (www.data.imf.org), crude oil prices were acquired from the U.S. Energy Information Office (www.eia.doe.gov). Logarithm of all of time series was calculated before included in analysis.

4. 2. Model

In this study, in order to investigate the effect of the changes in oil prices on macroeconomic parameters of countries, studies of Dibooğlu and Aleisa (2004)[5] and Brückner et al. (2012) were followed and the relevant models were structured as below:

Model 1: $GDP_{it} = \beta_{0i} + \beta_{1i} Poil_t + u_{it}$ (1)

Model 2: $X_{it} = \alpha_{0i} + \alpha_{1i} Poil_t + \varepsilon_{it}$ (2)

Model 3: $PIST_{it} = \gamma_{0i} + \gamma_{1i} Poil_t + \epsilon_{it}$ (3)

Since oil prices employed in these models are the same across the world, they remain unchanged according to countries. Therefore, individual impacts (i) on "Poil" variable were not included.

3) Saudi Arabia, Russia, Canada, Nigeria, Kuwait, Kazakhstan and Venezuela.

4) In preference of the analysis period, the period with abundant available data was taken into consideration.

5) Dibooğlu and Aleisa (2004) analyzed vulnerable effects of oil price fluctuations on term of trade and GDP of Saudi Arabia. Although their empirical methods were different from our studies, we used the relationship between oil prices and GDP and export accordingly their results.

4.3. Method

In the study, first, dependency among horizontal cross-sections (countries) which comprised panel was investigated by means of the $CDLM_{adj}$ (Adjusted Cross-sectional Dependence Lagrange Multiplier) test developed by Breusch and Pagan (1980) and adjusted by Pesaran et al. (2008). Stability of series was tested by the second-generation unit root test of the PANKPSS (Panel Kwiatkowski-Phillips-Schmidt-Shin) method developed by Carrion-i-Silvestre et al. (2005). Cointegration coefficients' homogeneity was analyzed by the test method developed by Pesaran and Yamagata (2008). Existence of cointegration relationships among series was analyzed by means of the presence of both cross-sectional dependence and multiple structural breaks method developed by Basher and Westerlund (2009) and which considers horizontal cross-sectional dependency and structural breaks in the cointegration vector. Cointegration coefficients were estimated through the AMG (Augmented Mean Group) method developed by Eberhart and Bond (2009) and which considers horizontal cross-sectional dependence.

5.3. Cross-Sectional Dependence

Whether horizontal cross-sectional dependency among series is taken into consideration, or not is crucially important on results (Breusch and Pagan, 1980). Therefore, before the analysis, it is necessary to determine horizontal cross-sectional dependency in series and cointegration equation because during selection of unit root and cointegration tests this situation must be taken into consideration. Otherwise, conducted analyses could yield erroneous results (Pesaran, 2004, P.14).

Studies on existence of horizontal cross-sectional dependency were introduced by Berusch and Pagan's (1980) CDLM test. This test yields deviated results when group average is zero and individual averages are different than zero. Pesaran, Ullah and Yamagata (2008) corrected this deviation by adding variance and average onto the test statistic. Therefore, it is referred as corrected CDLM ($CDLM_{adj}$) test. The preliminary form of the CDLM test statistic is given below:

$$CDLM = T\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}^2 \sim \chi^2_{\frac{N(N-1)}{2}} \quad (2)$$

Afterwards of the correction, following equitation is obtained:

$$CDLM_{adj} = \left(\frac{2}{N(N-1)}\right)^{1/2}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}^2\frac{(T-K-1)\hat{\rho}_{ij}-\hat{\mu}_{Tij}}{\upsilon_{Tij}} \sim N(0,1) \quad (3)$$

Where μ_{Tij} refers the average; ν_{Tij}

Where μ_{Tij} refers the average; ν_{Tij} refers variance. Test statistic that will be obtained from here exhibits asymptotically standard normal distribution. H_0 hypothesis of test was determined as "*there is no horizontal cross-sectional dependency*" (Pesaran, et al. 2008). In the present study, existence of horizontal cross-sectional dependency among variables and in the cointegration equation was tested with the $CDLM_{adj}$ method and obtained results were exhibited in Table 2.

Table 2: Results of Cross-Sectional Dependence Test

Variables	CDLMadj	P- values
GDP	1.515*	0.065
X	2.180**	0.015
PIST	9.101***	0.000
Poil	5.286***	0.000
Model 1	17.227***	0.000
Model 2	16.227***	0.000
Model 3	55.710***	0.000

Note: *, ** and *** denote, respectively, significance at the 10%, 5% and 1% levels. *, ** and *** refer existence of horizontal cross-sectional dependency at following significance levels 10%, 5% and 1%, respectively.

According to results in Table 2, concerning the variables and models, H_0 hypothesis was rejected; and it was concluded that there was horizontal cross-sectional dependency among countries.[6] Thus, an economic shock encountered by aforesaid countries could affect the others as well. It was considered that this dependency is result of the fact that oil prices are set by international market and oil producer countries were accepting bids. Change in oil prices affects macroeconomic figures of countries simultaneously.Therefore, it could be stated that developments relevant with other oil exporter countries must be taken into consideration while oil production policies of mentioned countries are determined. Additionally, regarding the selection of methods that will be employed in further stages of the analysis, methods which take horizontal cross-sectional dependency into consideration were preferred.

5.4. Panel Unit Root Test

The first issue encountered with the panel unit root test is that whether horizontal cross-sections which constitute panel are independent from each other. At this point, panel unit root tests are classified into two groups: the first and the second generation tests. Of the first generation tests, there are group of tests introduced by Maddala and Wu (1999); Hadri, (2000); Choi (2001); Levin, Lin and Chu (2002); Im, Pesaran and Shin (2003) and Breitung (2005). These tests rely on the assumption that horizontal cross-sectional units comprising the panel are independent and that a shock that affect one of the units constituting the panel would affect all horizontal cross-sectional units at the same level. Nevertheless, it would be more realistic approach that individual units comprising the panel are affected by a shock at different levels. In order to resolve this deficiency, the second generation unit root tests were developed, which analyze stability by taking dependency among the horizontal cross-section units into consideration. Among the prominent second generation unit root tests, there are the MADF (Multivariate Augmented Dickey Fuller) introduced by Taylor and Sarno (1998); the SURADF (Seemingly Unrelated Regression Augmented Dickey Fuller) introduced by Breuer, Mcknown and Wallace (2002); and the CADF (Cross-sectional Augmented Dickey Fuller) introduced by Bai and Ng (2004) and Pesaran (2006a).

However, these tests series provide deviated results as if there is unit root when structural break occur (Charemza and Deadman, 1997: 119). In order to fix this problem of the tests, Carrion-i-Silvestre et al. (2005) developed a second generation unit root test, the PANKPSS test, to check stability of series effectively in case horizontal cross-section dependency and multi structural breaks exist. Aforesaid test could test stabili-

6) Normally, horizontal cross-sectional dependency was not expected among these countries with different economic characteristics in different geographic regions. However, it was considered that these countries could be affected from each other since common ground of these countries is that they are all oil producer and exporter and oil prices are determined jointly around the World; and these tests were conducted. Test result confirmed our assumption.

ty of series when structural breaks exist with the average and trend of series comprising the panel. Furthermore, it allows different number of structural breaks on different dates in each horizontal cross-section unit comprising the panel. Thus, stability of series could be estimated for panel generally and for each horizontal cross-section separately (Güloğlu and İspir, 2011, P. 209). Test model is given as follows:

$$Y_{it} = \alpha_{it} + \beta_{it}t + \varepsilon_{it} \qquad i = 1,2,\ldots,N \;\; ve \;\; t = 1,2 \tag{4}$$

$$\alpha_{i,t} = \sum_{k=1}^{m} \theta_{i,k} K1_{i,t} + \sum_{k=1}^{m} \gamma_{i,k} K2_{i,t} + \alpha_{i,t-1} + u_{i,t} \tag{5}$$

$$\beta_{i,t} = \sum_{k=1}^{n} \varphi_{i,k} K1_{i,t} + \sum_{k=1}^{n} \delta_{i,k} K2_{i,t} + \beta_{i,t-1} + v_{i,t} \tag{6}$$

Where, K_1 and K_2 are dummy variables; they could be described as below:

$$K_1 = \begin{cases} 1, & t = T_B + 1 \\ 0, & otherwise \end{cases} \qquad K_2 = \begin{cases} 1, & t > T_B + 1 \\ 0, & otherwise \end{cases}$$

In this equation, T_B refers break point; it allows m and n number of structural breaks with fixed term and trend, respectively. Carrion-i-Silvestre et al. (2005) organized the test as it would allow maximum five structural breaks. This test determines structural break dates as the points which minimize error sum of squares by following Bai-Perron (1998) procedure. Bai-Perron (1998) suggested two different processes for determination of structural break dates: the first process depends on modified information criterions developed by Liu, Wu and Zidek (1997); the second process depends on the F-statistic. In determination of number of structural break, Carrion-i-Silvestre et al. (2005: 164) employ the first process for the model with trend; and the second process for the model without trend. H_0 hypothesis of the test was determined as "*series is stable*". Estimated test statistics were compared with the critical values estimated by means of the bootstrap (Carrion-i-Silvestre, et al. 2005: 164). In the present study, stability of series was tested by means of the PANKPSS method; obtained test statistics and critical values were exhibited in Table 3.

Table 3: Results of Unit Root Tests

	GDP	*Break Dates*	*GDP*	*X*	*Break Dates*	*X*	*PIST*	*Break Dates*	*PIST*	*Poil*	*Break Dates*	*Poil*
Saudi Arabia	0.195 (0.131)	2004 2010	0.178* (4.050)	0.199 (0.184)	2004	0.183* (0.194)	2.536 (1.882)	2000	0.066* (0.347)	0.167 (0.159)	2004	0.105* (0.208)
Russia	0.168 (0.158)	2003 2006	1.298* (2.227)	0.127 (0.091)	2003 2006	0.125* (0.203)	1.726 (1.591)	1999	0.087* (0.209)	0.167 (0.159)	2004	0.105* (0.208)
Canada	0.167 (0.156)	2003 2006	0.054* (4.365)	0.194 (0.185)	2004	0.092* (0.336)	1.381 (0.453)	2001 2006	0.110* (0.163)	0.167 (0.159)	2004	0.105* (0.208)
Nigeria	0.149 (0.132)	2003 2009	0.145* (2.545)	0.113 (0.101)	2003 2009	0.134* (0.271)	2.480 (2.141)	2000 2006	0.075* (0.185)	0.167 (0.159)	2004	0.105* (0.208)
Kuwait	0.175 (0.165)	2002 2005	0.297* (4.770)	0.211 (0.180)	2004	0.156* (0.176)	2.132 (1.610)	2001 2011	0.099* (0.213)	0.167 (0.159)	2004	0.105* (0.208)
Kazakhstan	0.226 (0.155)	2003 2006	3.027* (5.505)	0.166 (0.093)	2003 2006	0.172* (0.232)	2.282 (2.222)	1998 2005	0.226* (0.287)	0.167 (0.159)	2004	0.105* (0.208)
Venezuela	0.158 (0.157)	2006 2012	0.103* (5.150)	0.229 (0.180)	2004	0.144* (0.237)	2.210 (1.513)	2003 2008	0.168* (0.332)	0.167 (0.159)	2004	0.105* (0.208)
Panel	7.313 (4.185)	-	91.118* (77.339)	5.158 (2.108)	-	5.054* (5.717)	17.253 (17.053)	-	1.341* (2.340)	3.489 (2.048)	-	1.312* (6.066)

Note: Critical values were produced through 1000 iteration by means of bootstrap with 5% significance level. *; 5% significance level refers that series was stable. As the test model, the model which allows structural break either in stable or trend was selected. Since time dimension of dataset is short, maximum three structural breaks were allowed.

According to the results in Table 3, it was observed that series were not stable for countries and for overall panel; it became stable when their first difference was taken; that is, they were *I(1)*. This situation suggests that economies of the relevant countries were not stable; and that there were significant fluctuations in oil prices, national income, export and political stability. In this case, it was decided that cointegration test could be conducted among these series. The test method successfully determined the structural breaks in countries. According to the obtained results, in 2004, when monetary expansion period applied between 2002 and 2004 was ended in the U.S., corresponds to the global economic crisis in the period of 2008-2009.

5.5. Homogeneity Test of Cointegration Coefficients

Preliminary studies for determination whether the slope coefficient was homogenous or not was introduced by Swamy (1970). Pesaran and Yamagata (2008) developed the Swamy test. In this test, whether slope coefficients in cointegration equation were different with respect to horizontal cross-sections. H_0 hypothesis of the test was given as "*slope coefficients are homogenous*". Pesaran and Yamagata (2008) developed two different test statistics to test the hypotheses:

For large sampling groups: $\hat{\Delta} = \sqrt{N}\left(\frac{N^{-1}\tilde{S}-k}{2k}\right) \sim \chi^2_k$ (7)

For small sampling groups: $\hat{\Delta}_{adj} = \sqrt{N}\left(\frac{N^{-1}\tilde{S}-k}{v(T,k)}\right) \sim N(0,1)$ (8)

Where, *N* refers number of horizontal cross-section; *S* refers statistic of the Swamy test; *k* refers number of explanatory variable and $\upsilon\ (T,\ \kappa)$ refers standard error. For Equation (3), homogeneity test was conducted for the slope coefficient and obtained results were summarized in Table 4.

Table 4: The Homogeneity Test

		S	P-Values
Model 1	$\tilde{\Delta}$	7.566	0.000
	$\tilde{\Delta}_{adj}$	8.244	0.000
Model 2	$\tilde{\Delta}$	9.642	0.000
	$\tilde{\Delta}_{adj}$	10.507	0.000
Model 3	$\tilde{\Delta}$	12.217	0.000
	$\tilde{\Delta}_{adj}$	13.313	0.000

According to the results in Table 4, H_0 hypothesis was rejected strongly and it was considered that slope coefficient was not homogenous in the cointegration equation. In this case, cointegration comments about the general panel may not be valid. Instead, individual results must be taken into consideration.

5.6. Panel Cointegration Test with Structural Break

This test developed by Basher and Westerlund (2009) was to determine cointegration relationship among nonstationary series in level with existence of horizontal cross-section dependency ve multiple structural. The method allows breaks in fixed term and in trend. The test statistic developed by Basher and Westerlund (2009: 508) was given as below:

$$Z(M) = \frac{1}{N}\sum_{i=1}^{N}\sum_{j=1}^{M_i+1}\sum_{t=T_{ij-1}+1}^{T_{ij}} \frac{S_{it}^2}{(T_{ij}-T_{ij-1})^2\hat{\sigma}_i^2} \quad (9)$$

Where, $S_{it} = \sum_{s=T_{ij-1}+1}^{t} \hat{W}_{st} \cdot \hat{W}_{it}$ is type of least squares not altered fully; they are residual vector obtained from an effective estimator. $\hat{\sigma}_i^2$ is long-term variance estimator based on $\hat{W}_{it}$. When *Z(M)* reduced to the equation below by averaging horizontal cross-sections:

$$Z(M) = \sum_{t=T_{ij-1}+1}^{T_{ij}} \frac{S_{it}^2}{(T_{ij}-T_{ij-1})^2\hat{\sigma}_i^2} \sim N(0,1) \quad (10)$$

This test statistic displays standard normal distribution. H_0 hypothesis of the test was determined as "*There is cointegration relationship among series*". In the study, Basher and Westerlund's (2009) cointegration test was conducted and obtained results were summarized in Table 5.

Table 5: Results for Panel Cointegration Test with Structural Breaks

	Test Method	*Z (M)*	Asymptotic P-Values	Bootstrap P-Values	Decision
Model 1	Constant (No breaks)	0.008	0.497	0.578	Cointegration √
	Constant and Trend (No breaks)	-0.157	0.562	0.522	Cointegration √
	Constant (Breaks)	1.097	0.136	0.877	Cointegration √
	Constant and Trend (Breaks)	-93.880	1.000	0.887	Cointegration √
Model 2	Constant (No breaks)	-0.096	0.538	0.767	Cointegration √
	Constant and Trend (No breaks)	-1.034	0.850	0.937	Cointegration √
	Constant (Breaks)	5.828	0.000	0.444	Cointegration √
	Constant and Trend (Breaks)	-18.943	1.000	0.795	Cointegration √
Model 3	Constant (No breaks)	-1.059	0.855	0.945	Cointegration √
	Constant and Trend (No breaks)	-1.754	0.960	0.868	Cointegration √
	Constant (Breaks)	-0.437	0.669	0.927	Cointegration √
	Constant and Trend (Breaks)	-42.687	1.000	0.894	Cointegration √

Note: Probability values were obtained by means of bootstrap after 1000 iteration.

According to the results in Table 5, cointegration relationship was observed among series. Based on this result, it was concluded that these series act together on the long run; long-term analysis conducted on level values would not include false regression problem; and obtained results would be reliable. Furthermore, in the cointegration equations of the countries comprising the panel, method with break in constant and determined structural break dates were exhibited in Table 6.

Table 6: Estimated Breaks

Country	Model 1	Model 2	Model 3
Saudi Arabia	2010	2010	-
Russia	2006	2010	2003
Canada	2008	2013	-
Nigeria	2009	2013	2006
Kuwait	2011	2010	-
Kazakhstan	2008	2008	-
Venezuela	-	-	2008

Note: These are the sates determined by means of the model allowing structural break in its constant. Since time scope of the panel is not extensive, a structural break was allowed in the cointegration test.

Structural break points in Table 6 were included in analysis in estimation of cointegration coefficients with dummy variables.

5.7. Estimation of Cointegration Coefficients and Error Correction Model

In case of existence of horizontal cross-section dependency, the first estimator developed for estimation of the cointegration coefficients was Pesaran's (2006) CCE (Common Correlated Effects) method. After individual cointegration coefficients were estimated; it estimated cointegration coefficient of the general panel by means of the CCMGE (Common Correlated Mean Group Effects) method by averaging coefficients. Nevertheless, it is more reasonable that individual effect of each country on the general panel differs from each other with respect to their individual economic figures. While dependency among horizontal cross-sections was taken into consideration in the Panel AMG (Augmented Mean Group) method developed by Eberhardt and Bond (2009), in the meantime, the result with the general panel was estimated through weighting individual coefficients. In this respect, it is considered as more reliable than the CCMGE (Eberhardt and Bond, 2009). Panel AMG method could also take joint factors in series and joint dynamic effects into consideration; effective results could be produced in unbalanced panels and they could be used in the existence of internality problem relevant with error term (Eberhardt and Bond, 2009). In this study, cointegration coefficients were estimated with the Panel AMG method and obtained results were exhibited in Table 7.

Table 7: Coefficients of Cointegration

	Model 1			Model 2			Model 3		
Country	Poil	D1	Invariable	Poil	D2	Invariable	Poil	D3	Invariable
S. Arabia	0.63***	-0.067	3.37***	1.10***	0.01	0.72***	-0.024**	-	4.24***
	[18.52]	[-1.24]	[25.92]	[50.60]	[0.45]	[8.58]	[-1.89]		[82.75]
Russia	0.98***	0.089	2.79***	0.99***	-0.15	1.52***	-0.015*	0.80	4.00***
	[18.14]	[1.11]	[13.34]	[38.32]	[-0.15]	[15.05]	[-1.34]	[0.25]	[87.17]
Canada	0.47***	-0.045**	5.19***	0.36***	0.17	4.41***	0.80***	-	4.02***
	[3.13]	[-2.04]	[89.48]	[14.93]	[1.25]	[46.71]	[8.97]		[113.77]
Nigeria	0.93***	-0.18*	1.28***	1.04***	0.01	-0.35**	0.055***	-0.14	3.75***
	[10.10]	[-1.28]	[3.55]	[22.12]	[0.39]	[-1.92]	[2.55]	[-0.58]	[43.62]
Kuwait	0.86***	-0.027	0.96***	1.20***	-0.45*	-1.01***	-0.006	-	4.21***
	[24.57]	[-0.47]	[7.38]	[40.95]	[-1.39]	[-8.90]	[-0.78]		[21.14]
Kazakhstan	0.92***	0.024	0.57***	1.34***	0.06	-1.94***	0.18***	-	3.29***
	[24.21]	[0.42]	[4.07]	[34.11]	[0.78]	[-12.71]	[8.46]		[37.62]
Venezuela	0.66***	-	2.53***	0.79***	-	0.73***	-0.19***	0.59	4.55***
	[4.63]		[4.15]	[19.79]		[4.66]	[-4.94]	[0.45]	[29.84]
Panel	0.78***	-0.029	2.38***	0.98***	0.87	0.58	0.012	0.15	4.01***
	[10.83]	[0.029]	[3.90]	[8.16]	[0.45]	[0.75]	[0.28]	[1.02]	[26.45]

Note: Problems with autocorrelation and varying variance results in estimations were fixed with the Newey-West method. *, ** and *** refer significance at 10%, 5% and 1% levels. Values in squared brackets are *t*-statistics and they were estimated by means of the Newey-West standard error. D_i is the dummy variable which receives 1 for determined structural break date at each model; otherwise 0.

According to the results in Table 7, while increase in oil prices positively contribute in national income and export figures of countries included in analysis, it has various impact on countries' political stability. For example, while increasing oil prices distorted political stability in Saudi Arabia, Russia and Venezuela, it improved political stability in Canada, Nigeria and Kazakhstan. The rationale behind this finding was that whether these countries transfer some of these surplus incomes to the stability funds when they gain extra income because of increasing oil prices. For instance, Russia established a cautionary fund against the risk caused by fluctuations in oil prices on January 30th, 2008; aimed to transfer 10% of their GDP to this fun. However, based on the data from April 1st, 2016, transfers to this fund have reduced after 2009 and total transfer to this fund sum up to only 6.3% of total income (Russian Ministry of Finance, 2016). Obtained results are conforming to the findings in the relevant literature reported by Kandil (1999), Dibooğlu and Aleisa (2004), Brückner et al. (2012) and Liu et al. (2016).

CONCLUDING REMARKS

In the present study, effect of changes in oil prices on countries' national incomes, exports and political stabilities by utilizing from the first seven net oil exporter countries' 1998-2015 data under horizontal cross-section dependency by means of panel unit root and panel cointegration methods with structural break.

The results show that 1% increase in oil prices would increase national incomes of S.Arabia by 0.63%, Russia by 0.98%, Canada by 0.47%, Nigeria by 0.93%, Kuwait by 0.86%, Kazakhstan by 0.92% and Venezuela by 0.66%. Especially, it was determined that national incomes of Russia, Nigeria and Kazakhstan were highly sensitive towards oil prices. Although this situation seemed positive, it is important in terms of revealing the potential of effects of changes in oil prices on country economies.

Additionally, 1% increase in oil prices would increase export incomes of S. Arabia by 1.10%, Russia by 0.99%, Canada by 0.36%, Nigeria by 1.04%, Kuwait by 1.20%, Kazakhstan by 1.34% and Venezuela by 0.79%. Of the obtained findings, largeness of the ones relevant with Kazakhstan, Kuwait, S.Arabia, Nigeria and Russia was remarkable. Although these countries gain considerable amount of income from oil export, there is potential of harm subject to the decrease in oil prices in the meantime. Accordingly, it will be beneficent for aforesaid countries to diversify their export products.

It was observed that increasing oil prices were effective on political stability in different directions. While increasing oil prices were distorting political stability in Saudi Arabia, Russia and Venezuela, they contribute in stability in Canada, Nigeria and Kazakhstan. It was considered that negative impact of increasing oil prices on political stability of countries could be result of the Dutch Disease. Accompanied with the increase in oil prices, improving political stability could be related with appropriate utilization from surplus income from oil by aforesaid countries.

Based on the findings of the present study, it was concluded that oil exporter countries in pursuit of increasing their export and national income, acquiring balanced and high economic growth and maintaining political stability must diversify their export items, market oil in value-added forms rather than the crude type. Additionally, they must reserve a stability fund from the surplus income when they make subject to high oil prices so that they could utilize from this fund when they experience negative incidents with oil prices to obtain stable domestic economic atmosphere. Otherwise, they could not avoid a fragile status against the shocks experienced in oil prices and in other countries. Especially international organizations like OPEC are expected to ensure stability in oil prices so that they could contribute into stability of the economies of their member countries.

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