Theoretical and Applied Economics
Volume XXIX (2022), No. 4(633), Winter, pp. 21-40

The nexus between global oil prices and Islamic and conventional stock markets in the developed and developing countries

Tuğba KAYHAN
Yeditepe University, Istanbul, Turkey
tugba.erdogan@yeditepe.edu.tr
Mustafa UYSAL
Artvin Coruh University, Turkey
muysal@artvin.edu.tr

Abstract. *This study examines the co-movement of coherence between global oil prices, and Islamic and conventional stock markets which has noteworthy substance for faith-oriented investors and participants in oil market for developed and developing countries between the period May:2002 and November:2019. To achieve the objective of this study, Pedroni cointegration test and Dumitrescu-Hurlin causality tests are implemented. The results show us that there is a long-term relationship between the global oil prices and Islamic stock market of developed and developing countries. On the other hand, the cointegration relationship between conventional stock markets and oil prices has been realized only for developing countries. No such relationship has been found for developed countries. In addition, the causality relationship has been reached for the conventional and Islamic stock markets of both country groups with oil prices. This study will be an alternative investment avenue for investors, portfolio and risk managers; they will use for setting the portfolio diversity. In addition, this study will enlighten the portfolio and fund managers, policy makers and investors who examine the relationship between the global oil prices, and Islamic and conventional stock indices for developed and developing countries' stock markets.*

Keywords: Islamic index, conventional index, MSCI, Pedroni panel cointegration, Dumitrescu-Hurlin causality tests.

JEL Classification: C22, C58, E44, G15, Q43.

1. Introduction

Nobody would have thought that when the oil was used in industries instead of coal fuel at the end of the 19th century, it would be the main energy source of the 20th century. With the use of oil as fuel for the army during the 20th century World War I, oil became the owner of power (Yergin, 2008). Oil, which changed the fate of the countries, brought power to those who sometimes had it become a curse. Oil is still one of the most used energy sources in the world. Oil prices still persist in all areas of our lives.

While oil is substantial for the countries as it is used for providing energy both in industry and in the automobile sector. On the other hand, it has a crucial economic and financial position in investment markets as a commodity product. Oil is one of the international price indicator and one of the most traded commodity product in the world. Considering the price inelasticity of oil demand, the change in oil price affects strictly global financial markets. Oil prices, which had been operating steadily until 1973, had various effects on both the countries and the world economics with the changes that have emerged since 1973. When we consider that oil prices increased by 76% between March 2007 and June 2008, and then prices dropped by 48% between July 2008 and October 2008, it is of particular importance to investigate the impact of the change in oil prices on macroeconomic variables. In studies conducted for various developed and developing countries to date, the effect of the change in oil prices on economic activity has been examined. Although there are studies investigating the effect of the change in oil prices on economic activity, it is seen that the effect of oil prices on stock markets is becoming more popular (Basher and Sadorsky, 2006). Especially the fact that these studies are focused on a few industrialized and gulf countries reveals the necessity of analyzing this relationship in developing countries such as Japan, Europe, US (Sadorsky, 1999), (Huang et al., 1996). Despite ineffective researches with Japan, Europe, US, (Papapetrou, 2001) proposes a significant result for emerging countries. More specifically, some investors want to invest a faith-based ethical index created for private investors, wherefore private investors want to invest according to SHARIAH rules, taking into account the RIBA, MAYSIR and GHARAR states. Even so, most of the empirical studies are exploring either cross-country traditional stock market connections or cross-country traditional stock market goods dependency. Furthermore, researchers (Hammoudeh and Aleisa, 2004), (Bashar, 2006) mostly wonder the nexus between stock market and oil price, wherefore oil is mostly purveyed from GCC countries. Literature (Mezghani and Boujelbène, 2018), (Rijckeghem and Weder, 2001), (Eichengreen et al., 1996) defence that price changes and transmission are intercountry, financial and economic. The contagiousness of upward or downward sharp price turnover in oil prices is not only substantial of conventional and Islamic market, it is substantial of global markets. In this context, determining the direction and severity of contagion is key point of such studies.

In this research, aim is to understand if there exist a connection between oil prices and both conventional and Islamic stock markets. If there exist a connection, direction of connection is determined. In this context, the data which is between oil prices and both conventional and Islamic stock markets for developed and developing countries as the Morgan Stanley Capital Index (MSCI) are used. Furthermore, 211 monthly data from May 2002 to November 2019 were used in this study. 23 of the countries that make up the conventional

stock market data are developed and 21 are developing countries. Similarly, Islamic stock market data belongs to groups of 21 developed and 21 developing countries. Stability of variables Choi (2001), Levin et al. (2002) and Im et al. (2003) were examined by panel unit root tests and all variables were found to be stationary at first differences. Then, the cointegration relationship between variables was analyzed by Pedroni (2004) panel cointegration test. Finally, causality relationship between variables was investigated by Dumitrescu-Hurlin (2012) panel causality test. According to the cointegration analysis results obtained in the study, a long-term relationship has been reached between oil price and the Islamic stock market of developed and developing countries. However, the cointegration relationship between conventional stock markets and oil prices has been realized only for developing countries. No such relationship has been found for developed countries.

Comprehending the typicals of financial market volatility, returns and interdependence assures substantial details for investors interested in portfolio diversification and risk management, specifically during periods of crises and financial distress. While the findings we obtained in this study will be an alternative investment avenue for investors, portfolio and risk managers they will help set the portfolio diversity. This study will enlighten the portfolio and fund managers, policy makers and investors who examine the connection between the Islamic and conventional stock indices and the price of oil.

Our study consists of six sections. In the first part, we explained reasons that we examined the connection between the global oil prices and Islamic versus conventional stock market indices for developed and developing countries and what is the importance of our study in global sense and how we created this study. In the second part, we looked at what the literature said about it. Data in the third part, methodology is introduced in the fourth part. In the fifth part, we talked about our findings. In the last and sixth part, the result was explained and who and how to benefit this study.

2. Literature

The connection between oil price and stock market index has been undertaken by various authors. This section is composed of three parts. Initially, studies focusing primarily on the relavance between oil prices and non-Islamic and non-conventional stock markets. The next section discusses the findings and results of studies that address more specific research, such as oil price and Islamic and conventional stock markets. The third and final chapter is designed for deep discussions, results and sub-results about the connection between oil price and all stock markets.

Perry Sadorsky is a one of the main researchers who study on the oil prices. He is curios about the connection between stock market returns and oil market movement. Results seems that oil price changes more effective than interest rate on stock market movements. (Park and Ratti, 2008) consider to effect of oil price shocks on U.S.A. and 13 European countries between 1986 and 2005. They find that oil price shocks have significant effect on the stock returns. (Nandha and Faff, 2008) try to investigate the effect of oil prices on stock market returns based on various industries from April 1983 to September 2005. Except mining, oil and gas industries, oil price increasingly movement have a negative

bounce on equity returns. (Apergis and Miller, 2009) investigate the impact of explicit structural shocks of oil price affect Australia, Canada, France, Germany, Italy, Japan, U.K. and U.S.A. stock market returns. Oil price shifts stems from three components: oil supply shocks, global aggregate demand shocks and global oil demand shocks. They found that oil structural shocks played an important role in giving an explanation of the corrections in stock returns. In particular, oil supply and global aggregate demand shocks can not significantly describe stock returns in Australia, but unique demand shocks influence stock returns in Canada weakly. (Oberndorfer, 2009) studies on the relationship between Eurozone energy firms' stocks prices and oil, gas, coal price movements. Forecastable oil market volatility has a negative effect European oil and gas stocks. (Basher et al., 2012) investigate that the dynamic relationship with each other of oil prices, exchange rates and emerging stock markets using vector autoregressive model. In short run, positive shocks to oil prices influence the emerging market stock prices and US dollar exchange rates. In addition, increasing of emerging market stock prices cause an increase of oil prices. (Asteriou and Bashmakova, 2013) investigate the oil price on Central and Eastern European Countries stock markets. Oil price beta is significantly negative. There is no statistically significant linear dependence between market risk and market stock returns or oil price risk and returns. According to conditional models, it determines the positive reaction of rising stock returns to the upward movements of the market. The reaction of stocks to the up and down movements of the oil market is also negative, but it is more important when oil prices are low. (Hammoudeh et al., 2016) investigate the volatility of dynamic linkages of BRICS stock markets with those of US and EU region between the years 2008 and 2009. (Ahmad et al., 2018) are working on dynamic linkages of BRICS markets with the US and EU markets. They found the presence of leverage effects and fractional integration in conditional volatility for all markets. (Wen et al., 2019) show for all markets have positive effects on the return volatility of oil, country-specific variables (i.e. oil production growth, stock market volatility) and US economic policy uncertainty. (Miller and Ratti, 2019) study on the long-run relationship between the world price of crude oil and international stock markets between the years 1971 AND 2008. They found that there is an obviously long-run relationship between OECD countries for 1971:1, 1980:5 and 1999:9.

(Balcilar et al., 2015) try to understand that the presence of long run relationship between the Dow Jones Islamic finance index DJIM with three other conventional global equity market indices. They approve that there is a nonlinear long run relationship between DJIM and conventional stock market indices by using cointegration test analysis. (Mensi et al., 2017) investigate that the nonlinear relation between GCC stock markets and country risk ratings with major macroeconomic factors. GCC stock markets are influenced significantly by the financial risk ratings. MSCI Global Islamıc Index and oil price variation affect GCC stock market performance increasingly. On the other hand, gold prices, the 3-months US treasury bills rate, US treasury bond rate reduced the performance of GCC stock markets. (Shahzad et al., 2018) analyze that the relationship between oil and five Islamic stock markets which is most crucial for faith-oriented investors. They found that oil price and Islamic stock market have lower tail dependency of time-varying. Furthermore, they propose that the evidence of asymmetric down and up-side risk transmission between oil price and Islamic stock indices. (Ahmed, 2019) investigated the direction, strength and

presence with respect of causality in mean and variance between Morgan Stanley Capital International All Country World Index MSCI ACWI and conventional part of US, developer and GCC markets. This study is also investigated structural breaks in the volatility process. He emphasizes that uncertainty in US economy affects Shariah - compliant and conventional equity market. (Trabelsi, 2019) explores in this research that the interconnectedness of Islamic stock volatility in several global markets (namely GCC, US, EU, UK and APAC) and between different groups of assets (i.e. golds, crude oil and bonds. Some evidence has been put forward for the time-varying nature of the link between regions. Moreover, the UK and EU markets are the countries that have contributed the most to the spread of volatility. Islamic stock indices have a slightly higher volatility spread index than conventional stock indices. Changing in long run and short run the condition of nexus create uncertain conditions in market. Finally, the system center on gold, crude oil and Islamic financial markets on origin is not well integrated and therefore less resistant to systemic risk. (Mongi, 2019) explores the impact of oil futures prices on DJIM stock indices in the GFC. The results affirm the existence of a long-term relationship for the DJIM emerging markets index when compared to other global and sub-regional developed Islamic index. Short-term causality is twofold, but long-term Granger causality does not go from refined oil futures prices to crude oil and Islamic stock. Also, there is no short-term causality between crude oil and refined oil futures markets.

For instance, one of the prior published paper which was written by (Arouri et al., 2011). They investigate the volatility transmission between global oil prices and GCC stock markets between the years 2005 and 2010. They found that return and volatility spillover between global oil prices and GCC stock markets. (Dewandaru et al., 2014) explore US, UK, EU, Asia-Pacific regions stock market co-movements and Islamic stock market with their conventional counterparts using wavelet decomposition to present the multi-horizon nature of co-movement. While the recent subprime crisis reveals fundamental contamination, shocks are transmitted through excessive connections. Islamic markets response the recent crisis less than other markets because of low leverage effect. (Bouri, 2015) builds up a study about risk spillover effects between global oil prices and Jordanian stock market returns between the years 2003 and 2014. Study includes pre-crises and post-crises periods. According to study results, there is no risk spillover effect pre-crises period. Despite this result, there is still one directional risk spillover from global oil market to Jordanian stock market. (Gazdar et al., 2019) study on the effect of oil terms of trade growth volatility on economic growth of five GCC countries between the years from 1996 to 2016. Moreover, they investigate the effect of oil terms of trade growth volatility on Islamic financial system. They found that the oil terms of trade growth volatility have a significant positive effect on economic growth and significantly reinforced by the development of Islamic financial system. (Alqahtani et al., 2019) consider the impact of oil price uncertainty on GCC stock markets. Oil price uncertainty has negatively significant and time- varying effect on the GCC stock returns. Sub results demonstrate that Bahrain and Oman stock markets are relatively less sensitive to the oil price uncertainty. (González et al., 2019) study on the sector portfolio comparison between Islamic and conventional stock market between the years January 1996 and December 2015. Islamic Sector portfolios have the best performance with respect to conventional market sector portfolios. In this research,

they found that the post crises sub-period has a bets performance. Health care is the best performance, otherwise financials is the worst performance for Islamic and conventional stock market. (Mensi et al., 2019) research the relationship between oil and gold and the Islamic and conventional bank stock indices for GCC countries. They found that weak average conditional relation between GCC countries bank stock indices and oil and gold prices.

3. Methodology

In this study, it is aimed to investigate whether the changes in oil prices make a difference in investors' behavior. For this purpose, the long-term connection between oil prices and both conventional and Islamic stock markets of developed and developing countries created by the Morgan Stanley Capital Index (MSCI) was examined. The cointegration relationship between variables was investigated using Pedroni panel cointegration analysis. Before the cointegration analysis, the stationarity of the series was examined. Numerous unit root tests used in panel data analysis are based on the expansion of the ADF test. Each individual, which is handled differently from the time series in panel unit root tests, may differ in terms of whether it is stationary or not. This difference, the resulting heterogeneous state, will complicate performing the unit root test in panel data analysis (Astedrıou and Hall, 2007). Therefore, in the study, (Choi, 2001), (Levin et al., 2002) and (Im et al., 2003) developed by the unit root tests.

3.1. Unit root tests

(Choi, 2001), (Levin et al., 2002) and (Im et al., 2003) for unit root tests, equations (1), (2) and (3) are used, respectively.

$$\Delta y_{it} = \beta_0 + \sum_{i=1}^{k} \beta_{im_i} t^{m_i} + \delta_i x_{i(t-1)} + e_{it} \quad (1)$$

$$\Delta \text{yit} = \gamma y_{it-1} + \sum_{K=1}^{Li} \delta_{iK} \Delta_{y_{it-K}} + \theta_{it} \alpha + \epsilon_{it} \quad (2)$$

$$\Delta_{y_{it}} = \varphi_i + \propto_i t + \omega_i y_{i,t-1} + \sum_{j=1}^{l} \beta_{ij} \Delta y_{i,t-j} + v_{it} \quad (3)$$

In equations (1), (2) and (3); i = 1, 2, 3…., N demonstrate cross-sectional data. t = 1, 2, 3,…, T are time period, θ_{it} indicate the individual exogenous trend component or fixed effect and e_{it}, ϵ_{it}, v_{it} indicate the error term components. $Li,\ l,\ k$ show the lag length. In all three unit root tests, the null hypothesis H_0= Series are not stationary, while the alternative hypothesis is H_1= At least one series stationary, (Levin et al., 2002), (Choi, 2001) and (Im et al., 2003) H_1= All series are stationary.

3.2. Panel cointegration tests

After investigating unit roots, (Pedroni, 2004) panel cointegration test was used to investigate the cointegration between variables. Pedroni made test suggestions that allow heterogeneity in cointegration analysis between variables in the years 1997, 1999, 2000 and 2004 (Astedrıou and Hall, 2007). The hypotheses of the Pedroni panel cointegration test are as follows (Pedroni, 2004) H_0= There is no cointegration relation for all variables in panel data.

H_1 = There is cointegration relation for all variables in panel data.

Pedroni has developed seven different test statistics to investigate the presence of cointegration among the variables for panel data. These tests consist of two different groups. Seven different cointegration analysis are applied to contain four "within" cross-section effects and three "between" cross-section effects in the Pedroni panel cointegration analysis. These tests are shown below (Astedrıou and Hall, 2007):

Panel v Statistic

$$z_v = T^2 N^{3/2} / (\sum_{i=1}^{N} \sum_{t=1}^{T} \widehat{L_{11i}^{-2}} \hat{k}^2{}_{i,t-1})$$

Panel p Statistic

$$z_p = TN^{1/2} \sum_{i=1}^{N} \sum_{t=1}^{T} \widehat{L_{11i}^{-2}} (\hat{k}_{i,t-1}^2 \Delta \hat{k}_{i,t}^2 - \hat{\lambda}_i) / (\sum_{i=1}^{N} \sum_{t=1}^{T} \widehat{L_{11i}^{-2}} \hat{k}_{i,t}^2)$$

Panel t Statistic (Non- Parametric)

$$z_t = (\hat{\sigma}^2{}_{N,T} \sum_{i=1}^{N} \sum_{t=1}^{T} \widehat{L_{11i}^{-2}} \hat{k}^2{}_{i,t-1})^{1/2} \sum_{i=1}^{N} \sum_{t=1}^{T} \widehat{L_{11i}^{-2}} (\hat{k}_{i,t-1} \Delta \hat{k}_{i,t} - \hat{\lambda}_i)$$

Panel t Statistic (Parametric)

$$z^*{}_t = (\hat{S}^{*2}{}_{N,T} \sum_{i=1}^{N} \sum_{t=1}^{T} \widehat{L_{11i}^{-2}} \hat{k}_{i,t-1}^{*2})^{1/2} \sum_{i=1}^{N} \sum_{t=1}^{T} \widehat{L_{11i}^{-2}} (\hat{k}^*{}_{i,t-1} \Delta \hat{k}^{*2}{}_{i,t} - \hat{\lambda}_i)$$

Grup p Statistic (Parametric)

$$\tilde{z}_\rho = T\sqrt{N} \sum_{t=1}^{T} \hat{k}_{i,t-1}^2 \Delta \hat{k}_{i,t}^2 - \hat{\lambda}_i) / \sum_{i=1}^{N} (\sum_{t=1}^{T} \hat{k}^2{}_{i,t-1})$$

Grup t Statistic (Non-Parametric)

$$\tilde{z}_t = N^{1/2} \sum_{i=1}^{N} (\hat{\sigma}_i{}^2 \sum_{t=1}^{T} \hat{k}^2{}_{i,t-1})^{1/2} \sum_{t=1}^{T} \hat{k}_{i,t-1}^2 \Delta \hat{k}_{i,t}^2 - \hat{\lambda}_i)$$

Grup t Statistic (Parametric)

$$\tilde{z}^*{}_t = \sqrt{N} \sum_{i=1}^{N} (\sum_{t=1}^{T} \hat{S}_i{}^{*2} \hat{k}^{*2}{}_{i,t-1})^{1/2} \sum_{t=1}^{T} \hat{k}_{i,t-1}^{*2} \Delta \hat{k}_{i,t}^{*2}$$

Panel v, Panel Phillips-Peron (PP)(rho) and Panel (PP)(t) statistics in the first group of the above tests are non-parametric tests. The fourth, Panel–ADF(t) statistics is a parametric test. Among the tests in the second group, Group (rho), Group (PP) and Group ADF statistics are similar to PP(rho), PP(t), ADF(t) statistics, respectively (Güvenek and Alptekin, 2010). To determine a cointegration relationship between the variables, the test statistics got from the cointegration analysis must be larger than the critical values.

3.3. Panel causality test

The existence of interaction between variables was examined by (Dumitrescu and Hurlin, 2012) panel causality test. In this test, the linear heterogeneous model presented below is taken into account (Dumitrescu and Hurlin, 2012):

$$y_{i,t} = \delta_i + \sum_{l=1}^{L} \omega_i^{(l)} y_{i,t-l} + \sum_{l=1}^{L} \rho_i^{(l)} x_{i,t-l} + u_{i,t} \quad (10)$$

The basic and alternative hypotheses tested using equation (10) are as follows (Dumitrescu and Hurlin, 2012):

$H_0 = \rho_i = 0 \qquad \forall i = 1, 2,\ldots, N$

$H_1 = \rho_i = 0 \qquad \forall i = 1, 2,\ldots, N1$

$\rho_i \neq 0 \qquad \forall i = N1 + 1, N1 + 2,\ldots, N$

In this causality test, the basic hypothesis states that there is no Granger causality between the variables of all units, while the alternative hypothesis states that there is a causal relationship between these two variables in at least one unit. In addition, it has been observed that this test statistic obtained have efficient and strong test results in panels with a small sample of individuals, and are quite strong even if the lag length is determined incorrectly (Bozoklu and Yılancı, 2013).

4. Data

In the study, the connection between oil prices and conventional and Islamic stock markets of developed and developing countries was examined. Brent oil prices are used for oil prices, and stock indices closing prices are used for stock prices. Country groups used in conventional and Islamic stock markets are presented in Table 1 and Table 2. Depending on stock markets data which is generated by MSCI are used for developed and developing countries. In the study, 211 monthly data from May 2002 to November 2019 were analysed. Since the beginning of the index data prepared by MSCI regarding Islamic stock markets is May 2002, the data range for both index groups is limited to 2002-2019. Thus, more country groups were included in the analysis.

Table 1. *Developed and developing countries for conventional stock markets*

Developed countries	Australia	Austria	Belgium	Canada	Germany	Denmark	Finland	France	Hong Kong	Ireland	Italy
	Netherlands	New Zealand	Norway	Singapore	Spain	Sweden	Switzerland	United Kingdom	Japan	USA	
Developing countries	Argentina	Brazil	China	Chile	Colombia	Czech Republic	Greece	Hungary	India	Indonesia	Korea
	Malaysia	Mexico	Peru	Philippines	Poland	Russia	South Africa	Taiwan	Thailand	Turkey	

While obtaining data on both Islamic and conventional stock markets, religious structures of the countries were not taken into account. The mentioned classification for the countries used in the study for both markets was made by MSCI. The data regarding the stock market and oil prices implemented in the research were obtained from www.msci.com and www.investing.com, respectively.

Table 2. *Developed and developing countries for Islamic stock markets*

Developed countries	Australia	Austria	Belgium	Canada	Germany	Denmark	Finland	France	Hong Kong	Ireland	Italy
	Netherlands	New Zealand	Norway	Singapore	Spain	Sweden	Switzerland	United Kingdom	Japan	USA	
Developing countries	Argentina	Brazil	China	Chile	Colombia	Czech Republic	Greece	Hungary	India	Indonesia	Korea
	Malaysia	Mexico	Peru	Philippines	Poland	Russia	South Africa	Taiwan	Thailand	Turkey	

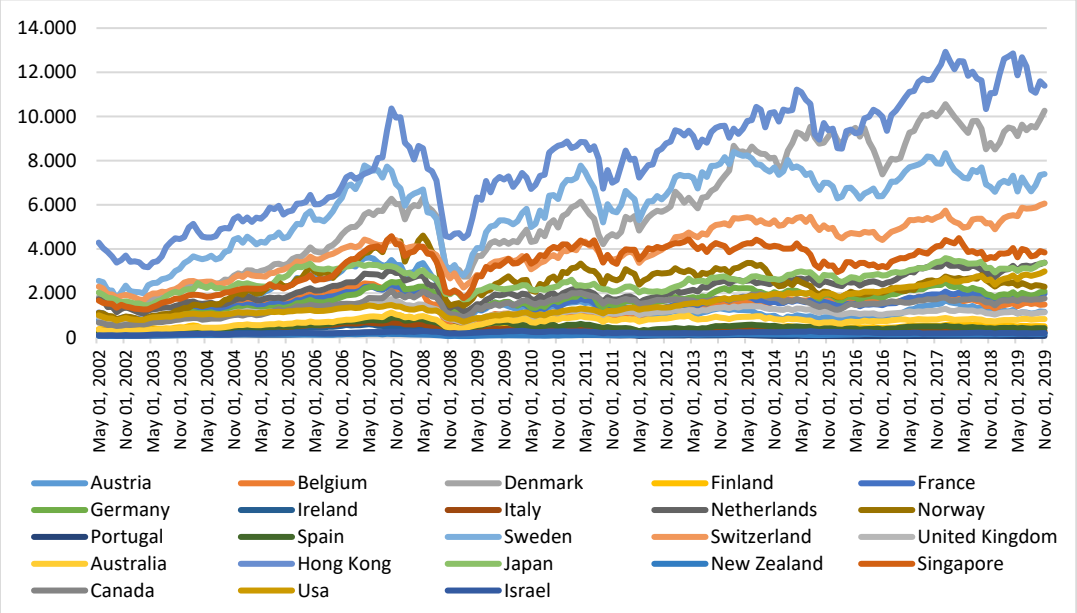
Descriptive statistics on oil prices and conventional and Islamic stock markets are shown in Table 3.

Table 3. *Descriptive statistics*

	Developing countries Conventional stock market	Developing countries Islamic stock market	Developed countries Conventional stock market	Developed countries Islamic stock market	Oil
Mean	792.800	788.818	70.557	829.710	70.557
Median	448.763	761.634	66.030	782.249	66.030
Maximum	7.538.040	2.303.797	139.830	3.581.815	139.830
Minimum	13.629	18.378	23.680	136.973	23.680
Std. Deviation	1.134.183	407.469	27.990	400.337	27.991
Skewness	3.377	0.466	0.297	2.076	0.297
Kurtosis	15.384	2.840	2.118	11.562	2.118

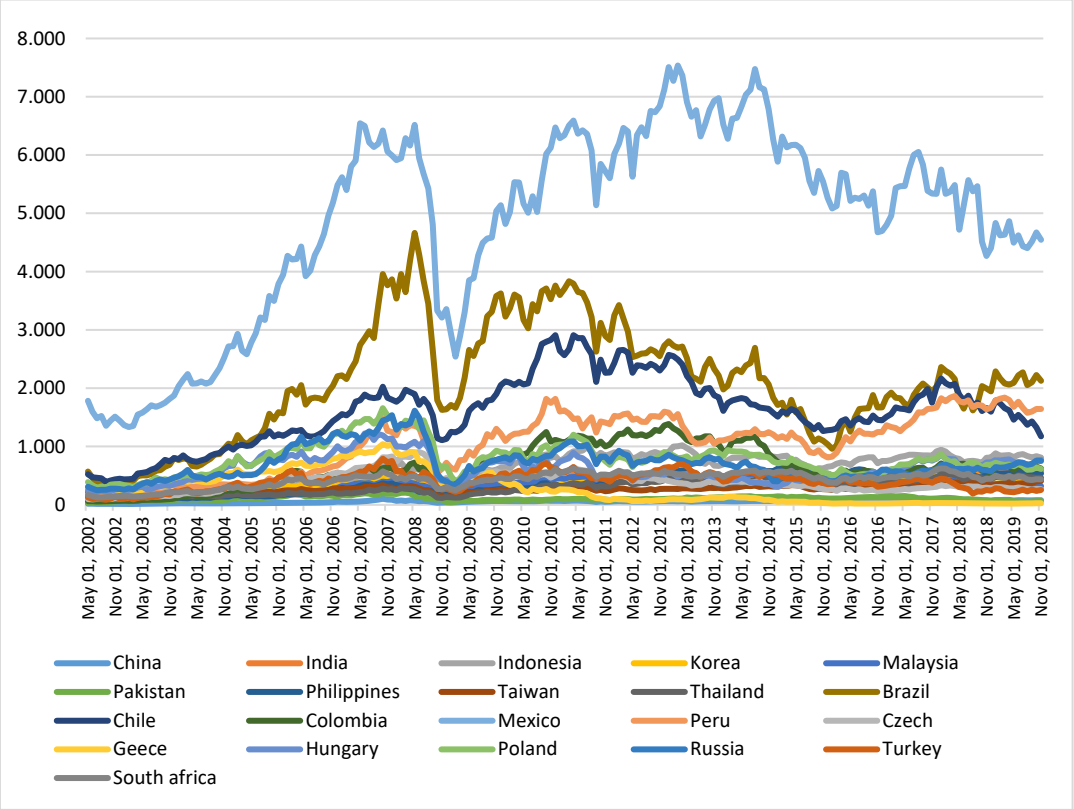
In Table 3, it is seen that the conventional stock market of developing countries is the market with the highest and lowest value. Similarly, the highest standard deviation value also belongs to this market. On the other hand, developed countries, another country group representing the conventional stock market, was determined to have the lowest standard deviation. However, it can be said that Islamic stock markets are quite reasonable for investors in terms of both high price and low risk.

Figure 1. *Developed countries conventional stock markets*



When Figure 1 is analysed, it is seen that conventional stock markets of developed countries before 2008 global financial crisis were at high levels, but these markets generally decreased significantly during the global financial crisis period. However, after the global financial crisis, the markets of this country experienced a rapid recovery. In the developed country conventional stock markets, it is seen that the highest price level belongs to Hong Kong and the lowest price level belongs to Israel.

Figure 2. *Developing countries conventional stock markets*



In Figure 2, it is seen that the conventional stock market of developing countries decreased to lower levels than they were in the pre-2008 global financial crisis, similar to the developed country stock market. Although these markets had recovered for a while in the post-2008 global financial crisis, they were unable to maintain this situation and generally followed a volatile process. In these markets, it is seen that the Mexican conventional stock market has significantly differentiated positively in other markets.

Figure 3 shows the development of Islamic stock markets of developed countries. It is observed that the 2008 global financial crisis has affected these markets as well, so investors have experienced significant losses. In the post-crisis period, there has been a recovery throughout this market. Especially, it is determined that the Danish Islamic stock market has reached very high price levels, while Austria and Finland have not been able to recover. The Irish Islamic stock market, on the other hand, experienced a significant decline in the second half of 2019, falling behind its level in the 2008 global financial crisis.

When Figure 4, which presents the development of Islamic stock markets belonging to developing countries, is analyzed, similar losses occurred in 2008 global financial crisis period, similar to developed country Islamic stock markets. In the post-crisis period, a slow and steady recovery was observed in all markets except Greece and Argentina Islamic stock markets.

Figure 3. *Developed countries Islamic stock markets*

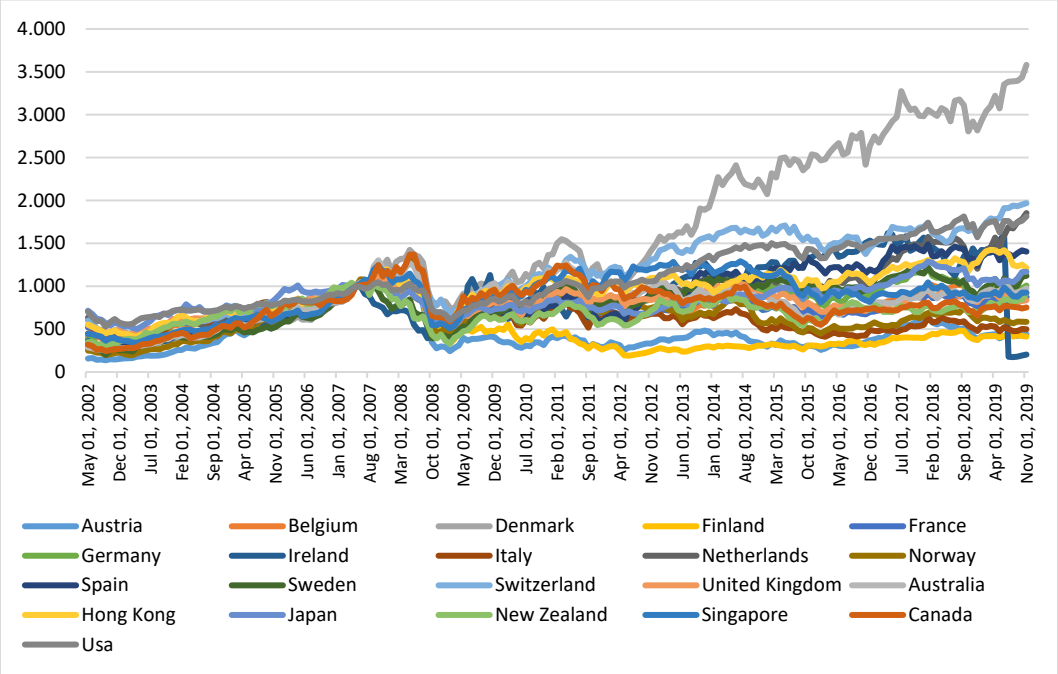
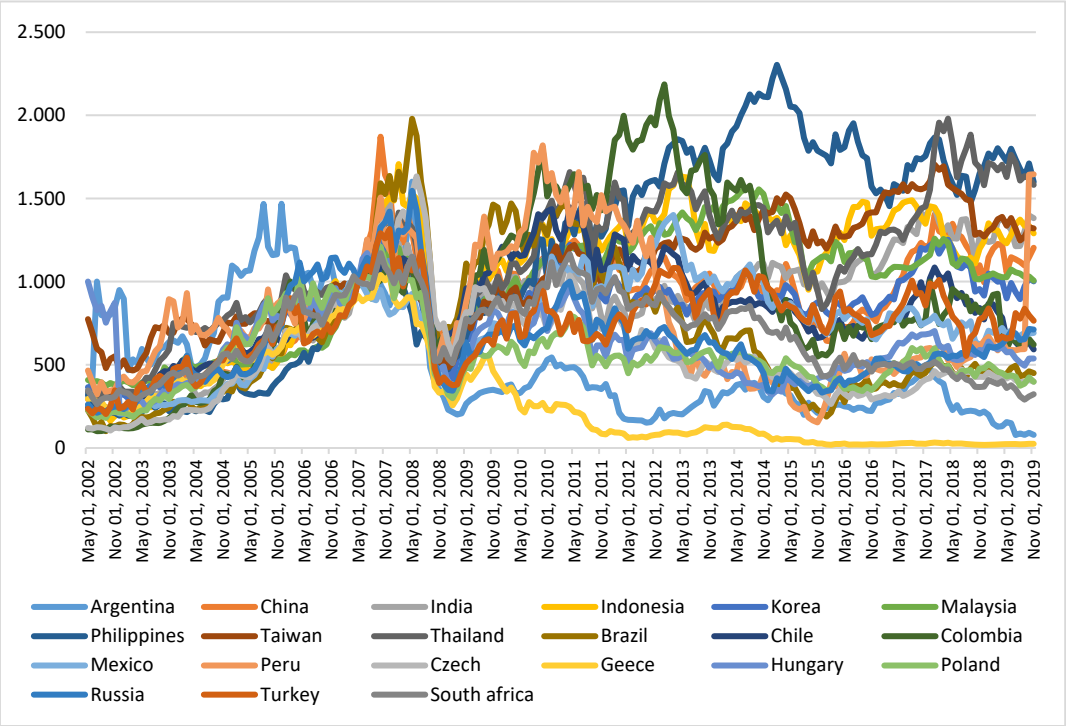
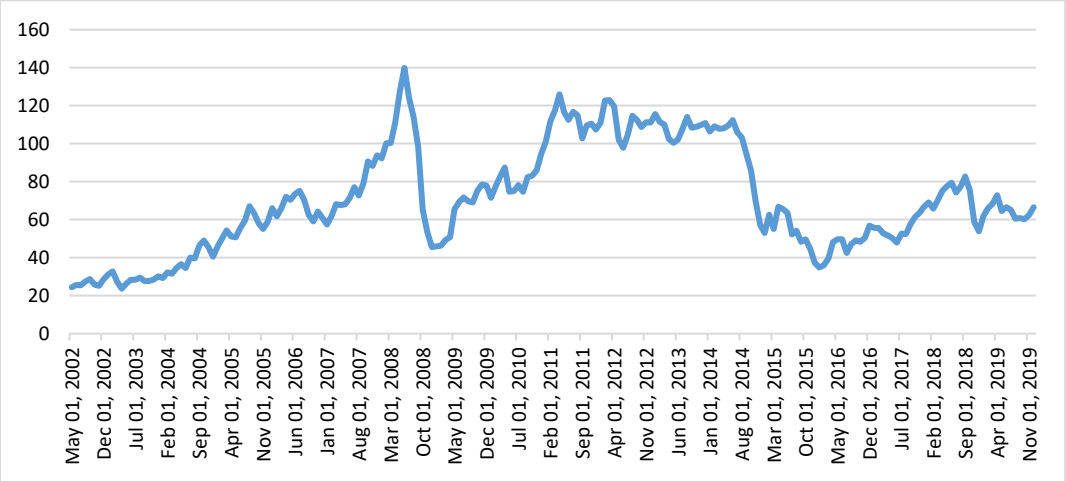


Figure 4. *Developing countries Islamic stock markets*



It is observed that each market mentioned in Figures 1, 2, 3 and 4 above similarly experienced a significant loss in the crisis period and decreased to a lower level from the high price levels they had in the pre-2008 global financial crisis period. However, in the post-crisis period, each market experienced different recovery stages and separated from each other. In Figure 5, Brent oil prices change is presented.

Figure 5. *Brent oil futures prices*



In Figure 5, oil prices had the highest level before the 2008 global financial crisis in the period during which the investigation was conducted. The decreases in prices with the global financial crisis showed a rapid recovery after 2009. However, the decline in oil prices that started in the second half of 2014 brought prices back to the level after the global financial crisis in early 2016.

5. Results

In the findings part, stationary analyzes were carried out to determine the levels of the variables used in the study, then Pedroni panel cointegration test, and finally Dumitrescu-Hurlin panel causality analysis applied to determine the causality relationship between the variables. Before starting the analysis, all the natural logarithms of the variables were taken.

Table 4. *Unit root test results for variables*

Variables		Choi	Levin, Lin and Chu	Im, Pesaran and Shin
ECCSM	I (0)	0.575 (0.717)	-0.453 (0.325)	0.898 (0.815)
	I (1)	-44.413[a] (0.000)	-83.483[a] (0.000)	-66.675[a] (0.000)
ECISM	I (0)	-0.158 (0.437)	-0.483 (0.314)	0.466 (0.679)
	I (1)	-44.800[a] (0.000)	-82.114[a] (0.000)	-65.296[a] (0.000)
DCCSM	I (0)	-1.468[c] (0.070)	1.149 (0.874)	-0.063 (0.474)
	I (1)	-44.395[a] (0.000)	-82.254[a] (0.000)	-64.184[a] (0.000)

Variables		Choi	Levin, Lin and Chu	Im, Pesaran and Shin
DCISM	I (0)	-1.559[c] (0.059)	0.675 (0.750)	-0.419 (0.337)
	I (1)	-44.311[a] (0.000)	-83.970[a] (0.000)	-66.125[a] (0.000)
Oil	I (0)	0.108 (0.543)	-4.376[a] (0.000)	-0.683 (0.247)
	I (1)	-39.527[a] (0.000)	-70.265[a] (0.000)	-54.027[a] (0.000)

Note: a, b, c show significance at the level of 1%, 5% and 10%, respectively. Values in parentheses indicate P-values. The appropriate lag length was selected according to the Schwarz information criterion. In the LLC test, the Barlett Kernel method was used and the bandwidth was determined by the Newey-West method. ECCSM, ECISM, DCCSM, DCISM, Oil are the developing countries conventional stock market, developing countries Islamic stock market, developed countries conventional stock market, developed countries Islamic stock market, oil prices, respectively.

According to the results obtained from Table 4, it is seen that the variables used for all three panel unit root tests are not at the level of I (0) unit rooted. Therefore, the first differences I (1) of the variables were taken and the relevant tests were applied again, and it was seen that all variables were stationary. After the unit root analysis, Pedroni panel cointegration analysis was conducted to determine whether there is a long-term relationship between the variables. Equations created for Pedroni panel cointegration analysis of each variable can be expressed as follows.

Equation (11) is for developed countries conventional stock markets and oil prices. Equation (12) is for developing countries conventional stock markets and oil prices. Equation (13) is for Islamic stock markets and oil prices in developed countries. Last equation (14) is created for the Islamic stock market and oil prices in developing countries is presented as below.

$$\text{Developed Conventional Stock Market}_{it} = x_{it} + \alpha_1 OIL_{it} + k_{it} \quad (11)$$

$$\text{Developing Conventional Stock Market}_{it} = x_{it} + \alpha_1 OIL_{it} + k_{it} \quad (12)$$

$$\text{Developed Islamic Stock Market}_{it} = x_{it} + \alpha_1 OIL_{it} + k_{it} \quad (13)$$

$$\text{Developing Islamic Stock Market}_{it} = x_{it} + \alpha_1 OIL_{it} + k_{it} \quad (14)$$

As before we mentioned, Panel Pedroni cointegration test is conducted. Furthermore, panel Pedroni cointegration test results are presented in Table 5 and Table 6.

Table 5. *Conventional and Islamic stock markets of developing countries Pedroni Panel cointegration test results*

Developing countries conventional stock markets					**Developing countries Islamic stock markets**				
Within-Dimension					**Within-Dimension**				
	t-Statistic	**Prob.**	**Weighted Statistic**	**Prob.**		**t-Statistic**	**Prob.**	**Weighted Statistic**	**Prob**
Panel v-Statistic	2.802	0.002[a]	3.333	0.000[a]	Panel v-Statistic	3.416	0.000[a]	3.085	0.001[a]
Panel rho-Statistic	-3.309	0.000[a]	-4.000	0.000[a]	Panel rho-Statistic	-3.736	0.000[a]	-3.923	0.000[a]
Panel PP-Statistic	-2.853	0.002[a]	-3.309	0.000[a]	Panel PP-Statistic	-2.989	0.001[a]	-3.188	0.000[a]
Panel ADF-Statistic	-2.479	0.006[a]	-2.801	0.002[a]	Panel ADF-Statistic	-2.383	0.008[a]	-2.698	0.003[a]

Developing countries conventional stock markets					**Developing countries Islamic stock markets**				
Between-Dimension					**Between-Dimension**				
	t-Statistic	**Prob.**	**Weighted Statistic**	**Prob.**		**t-Statistic**	**Prob.**	**Weighted Statistic**	**Prob**
Group rho-Statistic	-2.614	0.004[a]			Group rho-Statistic	-2.440	0.007[a]		
Group PP-Statistic	-2.734	0.003[a]			Group PP-Statistic	-2.569	0.005[a]		
Group ADF-Statistic	-2.053	0.020[b]			Group ADF-Statistic	-1.854	0.031[b]		
Developing Conventional Stock Marketit = αit + β1 OILit + eit					Developing Islamic Stock Marketit = αit + β1 OILit + eit				

Note: a, b, c represent significance at the levels of 1%, 5% and 10%, respectively. The appropriate lag length was selected according to the Schwarz information criterion.

According to the results obtained from Table 5, it was determined that the cointegration relationship for models 12 and 14 was realized for seven different statistics. That is, H_0 hypothesis was rejected. In other words, it can be said that the conventional and Islamic stock markets of developing countries and oil prices move together in the long term.

Table 6 presents the cointegration test results obtained from the stock markets of developed countries. It is seen that the Pedroni panel cointegration test for Model 11 is not valid for seven different statistics, that is, the H_0 hypothesis is accepted. This result shows that the conventional stock market of developed countries does not have a long-term relationship with oil prices. However, for model 13, the cointegration relationship was found to be valid for five different statistics, i.e. the H_0 hypothesis was rejected. For this reason, it can be stated that Islamic stock markets of developed countries and oil prices move together for a long time.

Table 6. *Conventional and Islamic stock markets of developed countries Pedroni Panel cointegration test results*

Developed countries conventional stock markets					**Developed countries Islamic stock markets**				
Within-Dimension					**Within-Dimension**				
	t-Statistic	**Prob.**	**Weighted Statistic**	**Prob.**		**t-Statistic**	**Prob.**	**Weighted Statistic**	**Prob**
Panel v-Statistic	0.405	0.342	1.226	0.110	Panel v-Statistic	2.944	0.001[a]	2.196	0.014[b]
Panel rho-Statistic	-0.129	0.448	-0.908	0.181	Panel rho-Statistic	-0.925	0.177	-1.879	0.030[b]
Panel PP-Statistic	-0.326	0.372	-0.975	0.164	Panel PP-Statistic	0.040	0.516	-1.766	0.038[b]
Panel ADF-Statistic	0.328	0.628	0.109	0.456	Panel ADF-Statistic	0.708	0.760	-1.300	0.096[c]
Between-Dimension					Between-Dimension				
Group rho-Statistic	0.205	0.581			Group rho-Statistic	-0.943	0.172		
Group PP-Statistic	-0.312	0.377			Group PP-Statistic	-1.312	0.094[c]		
Group ADF-Statistic	0.688	0.754			Group ADF-Statistic	-0.672	0.250		
Developed Conventional Stock Marketit = αit + β1 OILit + eit					Developed Islamic Stock Marketit = αit + β1 OILit + eit				

Note: a, b, c represent significance at the levels of 1%, 5% and 10%, respectively. The appropriate lag length was selected according to the Schwarz information criterion.

Table 7 shows the results of (Dumitrescu and Hurlin, 2012) panel causality test. According to the results obtained, from the conventional stock markets of developing countries to oil prices, there is a one-way causality relationship in all three lag lengths, while in first lag length this relationship is bi-directional. There is a bilateral causality relationship between the Islamic stock markets of developing countries and oil prices. On the other hand, there is a one-way causality relationship in all three lag lengths, from conventional and Islamic stock markets of developed countries, to oil prices.

Table 7. *Dumitrescu and Hurlin panel causality test results*

	K=1		K=2		K=3	
	W-Stat	**Zbar-Stat**	**W-Stat**	**Zbar-Stat**	**W-Stat**	**Zbar-Stat**
Oil≠> ECC Stock Markets	1.745	2.342 (0.019)[b]	2.331	0.700 (0.483)	3.515	0.888 (0.374)
ECC Stock Markets ≠> Oil	4.063	9.727 (0.000)[a]	8.209	13.905 (0.000)[a]	10.351	13.391(0.000)[a]
Oil≠> ECI Stock Markets	2.274	4.029 (0.000)[a]	3.028	2.264 (0.023)[b]	4.090	1.938 (0.052)[c]
ECI Stock Markets ≠>Oil	5.381	13.925 (0.000)[a]	10.014	17.960 (0.000)[a]	11.995	16.398 (0.000)[a]
Oil≠> DCC Stock Markets	1.940	3.102 (0.001)[a]	1.924	-0.225 (0.821)	3.215	0.355 (0.722)
DCC Stock Markets ≠> Oil	1.874	2.882 (0.003)[a]	7.268	12.339 (0.000)[a]	9.092	11.604 (0.000)[a]
Oil≠> DCI Stock Markets	1.713	2.241 (0.025)[b]	1.666	-0.792 (0.428)	2.803	-0.414 (0.678)
DCI Stock Markets ≠> Oil	2.658	5.251 (0.000)[a]	7.238	11.722 (0.000)[a]	9.223	11.329 (0.000)[a]

Note: a, b, c indicate significance at 1%, 5% and 10% levels, and values in parentheses indicate P- values, respectively. K denotes the length of the lag.

According to the results in Table 7, it can be said that price changes in both conventional and Islamic stock markets of developed and developing countries can be used as a useful component in explaining the change in oil prices. In addition, changes in oil prices can be used to explain the price changes in the stock markets of both countries for first lag.

To sum up all results, assortment of investments are primary notion of portfolio and investment decision making management. Logical and powerful diversification entail comprehending the long-term relationship between investment asset and asset which is used for hedging. Recent studies about effective investment strategies research these kinds of relations. Emergence of Islamic and conventional market added the noteworthy view of hedging strategies for portfolio managers and investment decision makers.

In this study, we found that global oil prices affect the Islamic market than conventional market. Both developed and developing countries Islamic market has a long run relation with global oil prices. In this context, results of (Trabelsi, 2019) support our findings in terms of spillover effect of oil prices to İslamic market than conventional market. Furthermore, study of (Miller and Ratti, 2019) supports our findings that there is a long run relation between oil prices and OECD stock markets. (Park and Ratti, 2008) also says that increasing oil prices significantly make to decrease the real stock returns for U.S.A. and Eurozone countries. (Shahzad et al., 2018) study on risk spillover effect and structure between various Islamic stock market and indices and oil prices and support our results. They propose the presence of time-dependent relation between oil and Islamic exchanges. In addition, the authors provide supporting evidence of asymmetrical up and down risk spreads from oil to Islamic exchanges and vice versa.

In specifically, (Mongi, 2019) supports our results in terms of studying on the relation between oil future prices and Dow Jones Islamic equity indices with ARDL bound testing

approach and vector error correction model. Study of (Mongi, 2019) results confirm the long run relation between DJIM emerging markets index and the other global and sub-regional indices.

6. Conclusion

Oil is one of the important inputs used in many sectors in terms of both developed and developing countries today. Therefore, the dependence of oil countries with limited oil resources and more imports and their emphasis on oil as an input in production makes them more sensitive to changes in oil prices. As a result of this, the values of companies of many countries, especially the companies that use and import oil intensely, and therefore the stock markets are affected.

For this purpose, in this study, long-term relationship and causality between oil prices and both conventional and Islamic stock markets of developed and developing countries were investigated. Thus, comparison of both country groups and their different stock markets were provided. In this context, 211 monthly data from May 2002 to November 2019 were used in the study. 23 of the countries that make up the conventional stock market data are developed and 21 are developed countries. Similarly, Islamic stock market data belongs to groups of 21 developed and 21 developing countries. Stability of variables, (Levin et al., 2002), (Choi, 2001) and (Im et al., 2003) were examined by panel unit root tests and all variables were found to be stationary at first awareness. Then, the cointegration relationship between variables was analyzed by (Pedroni, 2004) panel cointegration test. Finally, causality relationship between variables was investigated by (Dumitrescu and Hurlin, 2012) panel causality test.

According to the cointegration analysis results obtained in the study, a long-term relationship has been reached between the prices in the Islamic stock market of developed and developing countries and oil prices. However, the cointegration relationship between conventional stock markets and oil prices has been realized only for developing countries. No such relationship has been found for developed countries. In other words, the emerging economies' need for crude oil as an input in both energy and production activities caused stock prices to be more fragile in the face of fluctuations in oil prices. Therefore, the fact that stock prices and oil prices move together in the long run shows that one change that may occur in one may affect the other. For developed economies, unlike conventional stock markets, the fact that prices in Islamic stock markets move together with oil prices in the long run may be due to the industry's use of crude oil as an input.

According to the results obtained from the panel causality analysis, first of all, a causality relationship has been reached from the conventional and Islamic stock markets of both country groups towards oil prices. In addition, a causality relationship has been determined from the oil prices towards the Islamic stock market of the developing country. However, a weaker causality relationship has been observed towards all stock prices considered from oil prices. Therefore, it can be said that oil prices may affect stock prices in emerging

economies rather than developed economies. Particularly, investors who follow stock markets follow oil prices while investing in Islamic stock markets in developing economies, which may contribute to their position.

These results can give ideas specially to developing country politicians and entrepreneurs about the energy resources of the country and the energy sources used by companies operating in the country, such as water, natural gas or solar, which are alternative sources. It also gives shareholders an idea that investing in multiple countries and stocks of different structures rather than a particular country market may reduce the risks that may arise from oil prices. This study can be developed by analyzing stock markets belonging to country groups prepared by different institutions such as Dow Jones, Standard & Poor, and different commodities such as oil and natural gas and using different methods.

References

Ahmad, W., Rais, S. and Shaik, A.R., 2018. Modelling the directional spillovers from DJIM Index to conventional benchmarks: Different this time? *The Quarterly Review of Economics and Finance*, pp. 14-27.

Alaoui, A.O., Dewandaru, G., Rosly, S.A. and Masih, M., 2015. Linkages and co-movement between international stock market returns: Case of Dow Jones Islamic Dubai Financial Market index. *Journal of International Financial Markets, Institutions & Money*, pp. 53-70.

Chau, F. and Deesomsak, R., 2014. Does linkage fuel the fire? The transmission of financial stress across the markets. *International Review of Financial Analysis*, pp. 57-70.

Miller, J.I. and Ratti, R.A., 2019. Crude oil and stock markets: Stability, instability, and bubbles. *Energy Economics*, pp. 559-568.

Ni, Y., Wu, M., Day, M.-Y. and Huang, P., 2020. Do sharp movements in oil prices matter for stock markets? *Physica A*, pp. 1-11.

Ahmed, W.M., 2019. Islamic and conventional equity markets: Two sides of the same coin, or not? *The Quarterly Review of Economics and Finance*, pp. 191-205.

Alqahtani, A., Klein, T. and Khalid, A., 2019. The impact of oil price uncertainty on GCC stock markets. *Resources Policy*, pp. 1-9.

Apergis, N. and Miller, S.M., 2009. Do structural oil-market shocks affect stock prices? *Energy Economics*, pp. 569-575.

Arouri, M. and Fouquau, J., 2009. On the short-term influence of oil price changes on stock markets in gcc countries: linear and nonlinear analyses. *Economics Bulletin*, pp. 795-804.

Arouri, M.E., Lahiani, A. and Nguyen, D.K., 2011. Return and volatility transmission between world oil prices and stock markets of the GCC countries. *Economic Modelling*, pp. 1815-1825.

Astedrıou, D. and Hall, S.G., 2007. *Applied Econometrics: A Modern Approach Using Eviews and Microfit Revised Edition.* New York: Palgrave Macmillan.

Asteriou, D.H., 2007. *Applied Econometrics: A Modern Approach Using Eviews and Microfit.* Newyork: Revisited Edition, Palgrave Macmillan.

Asteriou, D. and 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*, pp. 204-211.

Balcilar, M., Jooste, C., Hammoudeh, S., Gupta, R. and Babalos, V., 2015. Are there long-run diversification gains from the Dow Jones Islamic finance index? *Applied Economics Letters*, pp. 945-950.

Bashar, Z., 2006. Wild oil prices, but brave stock markets! The case of Gulf Cooperation Council (GCC) stock markets. *Operational Research*, pp. 145-162.

Basher, S.A. and Sadorsky, P., 2006. Oil Price Risk and Emerging Stock Markets. *Global Finance Journal*, pp. 224-251.

Basher, S.A., Haug, A.A. and Sadorsky, P., 2012. Oil prices, exchange rates and emerging stock markets. *Energy Economics*, pp. 227-240.

Bouri, E., 2015. A broadened causality in variance approach to assess the risk dynamics between crude oil prices and the Jordanian stock market. *Energy Policy*, pp. 271-279.

Bozoklu, Ş. and Yılancı, V., 2013. Finansal Gelişme ve İktisadi Büyüme Arasındaki Nedensellik İlişkisi: Gelişmekte Olan Ekonomiler İçin Analiz. *Dokuz Eylül Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, pp. 161-187.

Choi, I., 2001. Unit Root Tests for Panel Data. *Journal of International Money and Finance*, pp. 249-272.

Cong, R.-G., Wei, Y.-M., Jiao, J.-L. and Fan, Y., 2008. Relationships between oil price shocks and stock market: An empirical analysis from China. *Energy Policy*, pp. 3544-3553.

Dewandaru, G., Rizvi, S.A., Masih, R., Masih, M. and Alhabsh, S.O., 2014. Stock market co-movements: Islamic versus conventional equity indices with multi-timescales analysis. *Economic Systems*, pp. 553-571.

Dumitrescu, E.I. and Hurlin, C., 2012. Testing for Granger non-causality in heterogeneous panels. *Economic Modelling*, pp. 1450-1460.

Eichengreen, B., Rose, A. and Wyplosz, C., 1996. Contagious Currency Crises: First Tests. *Scandinavian Journal of Economics*, pp. 463-484.

Filis, G., 2010. Macro economy, stock market and oil prices: Do meaningful relationships exist among their cyclical fluctuations? *Energy Economics*, pp. 877-886.

Gazdar, K., Hassan, M.K., Safa, M.F. and Grassa, R., 2019. Oil price volatility, Islamic financial development and economic growth in Gulf Cooperation Council (GCC) countries. *Borsa İstanbul Review*, pp. 197-206.

González, M., Jareño, F. and Haddouti, C., 2019. Sector Portfolio Performance Comparison between Islamic and Conventional Stock Markets. *Sustainability*, pp. 1-23.

Güvenek, B. and Alptekin, V., 2010. Enerji Tüketimi ve Büyüme İlişkisi: OECD Ülkelerine İlişkin Bir Panel Veri Analizi. *Enerji, Piyasa ve Düzenleme*, pp. 172-193.

Hammoudeh, S., Kang, S.H., Mensi, W. and Nguyen, D.K., 2016. Dynamic Global Linkages of the BRICS Stock Markets with the United States and Europe under External Crisis Shocks: Implications for Portfolio Risk Forecasting. *The World Economy*, pp. 1703-1727.

Hammoudeh, S. and Aleisa, E., 2004. Dynamic relationship among GCC stock markets and NYMEX oil futures. *Contemporary Economic Policy*, pp. 250-269.

Han, L., Lv, Q. and Yin, L., 2019. The effect of oil returns on the stock markets network. *Physica A*, pp. 1-17.

Huang, R.D., Masulis, R.W. and Stoll, H.R., 1996. Energy Shocks and Financial Markets. *Journal of Futures Markets*, pp. 1-27.

Im, K.S., Pesaran, M.H. and Shin, Y., 2003. Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, pp. 53-74.

Jouini, J. and Harrathi, N., 2014. Revisiting the shock and volatility transmissions among GCC stock and oil markets: A further investigation. *Economic Modelling*, pp. 486-494.

Levin, A., Lin, C. and Chu, C., 2002. Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of Econometrics*, pp. 1-24.

Mensi, W., Hammoudeh, S., Wanas Al-Jarrah, I.M., Hamed Al-Yahyaee, K. and Kang, S.H., 2019. Risk spillovers and hedging effectiveness between major commodities, and Islamic and conventional GCC banks. *Journal of International Financial Markets, Institutions & Money*, pp. 68-88.

Mensi, W., Hammoudeh, S., Yoon, S.M. and Balcilar, M., 2017. Impact of macroeconomic factors and country risk ratings on GCC stock markets: evidence from a dynamic panel threshold model with regime switching. *Applied Economics*, pp. 1255-1272.

Mezghani, T. and Boujelbène, M., 2018. The contagion effect between the oil market, and the Islamic and conventional stock markets of the GCC country Behavioral explanation. *Islamic and Conventional Stock Market*, pp. 157-181.

Mongi, A., 2019. The global influence of oil futures-prices on Dow Jones Islamic stock indexes Do energy-volatility's structural breaks matter? *International Journal of Emerging Markets*, pp. 523-549.

Nandha, M. and Faff, R., 2008. Does oil move equity prices? A global view. *Energy Economics*, pp. 986-997.

Oberndorfer, U., 2009. Energy prices, volatility, and the stock market: Evidence from the Eurozone. *Energy Policy*, pp. 5787-5795.

Papapetrou, E., 2001. Oil Price Shocks, Stock Market, Economic Activity and Employment. *Energy Economics*, pp. 511-532.

Park, J. and Ratti, R.A., 2008. Oil price shocks and stock markets in the U.S. and 13 European countries. *Energy Economics*, pp. 2587-2608.

Pedroni, P., 2004. Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric Theory*, 597-625.

Rijckeghem, C.V. and Weder, B., 2001. Sources of contagion: is it finance or trade? *Journal of International Economics*, pp. 293-308.

Sadorsky, P., 1999. Oil price shocks and stock market activity. *Energy Economics*, pp. 449-469.

Sadorsky, P., 1999. Oil Price Shocks and Stock Market Activity. *Energy Economics*, pp. 449-469.

Shahzad, S.J., Mensi, W., Hammoudeh, S., Rehman, M. and Yahyaee, K.H., 2018. Extreme dependence and risk spillovers between oil and Islamic stock markets. *Emerging Markets Review*, pp. 42-63.

Trabelsi, N., 2019. Dynamic and frequency connectedness across Islamic stock indexes, bonds, crude oil and gold. *International Journal of Islamic and Middle Eastern Finance and Management*, pp. 306-321.

Tuna, G., 2019. Interaction between precious metals price and Islamic stock markets. *International Journal of Islamic and Middle Eastern Finance and Management*, pp. 96-114.

Tursoy, T. and Faisal, F., 2018. The impact of gold and crude oil prices on stock market in Turkey: Empirical evidences from ARDL bounds test and combined cointegration. *Resources Policy*, pp. 49-54.

Wen, X., Bouri, E. and Cheng, H., 2019. The Crude Oil–Stock Market Dependence and Its Determinants: Evidence from Emerging Economies. *Emerging Markets Finance & Trade*, pp. 2254-2274.

Yergin, D., 2008. *The Prize: The Epic Quest for Oil, Money & Power.* New York: Simon & Schuster.