DYNAMIC RELATIONS AND SHARIA STOCK MARKET INTEGRATION WITH OIL PRICES

(Studies: Indonesia, Malaysia, USA, UK, Japan 2012-2016)

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ABSTRACT

The purpose of this research is to analyze the relationship of dynamic and integration between world sharia stock market with world crude oil price. This research can find out the integration relationship between world sharia stock market with world crude oil price. The object of this research is sharia stock market in Indonesia, Malaysia, United States, UK, Japan during period 2012-2016.

The research method is Dynamic Coditional Correlation Multivariate-GARCH method is used to test the hypothesis in order to know the relationship of sharia stock market integration in world with world oil price. In this case to test the conditional correlation multivariate-GARCH method, reasearcher have taken any steps is descriptive statistical testing, heteroskedasticity testing, stationary test, and GARCH univariate testing.

The result of the research shows that there is a significant dynamic correlation in world sharia stock price (Indonesia, Malaysia, United States, United Kingdom, Japan) and significant dynamic relationship between world sharia stock market with world crude oil price. It can be explained indirectly proves the existence of integration relationship between world sharia stock market with world crude oil price.

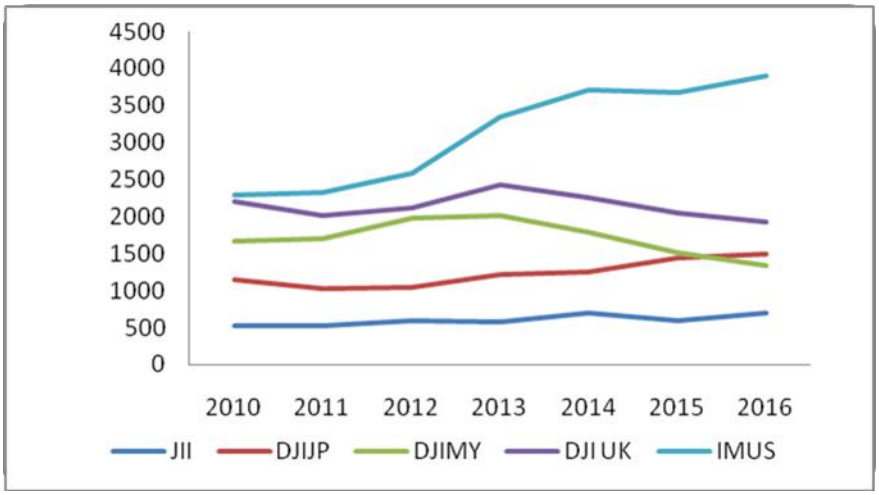
Keywords: sharia stocks integration, sharia stock price, world crude oil price, Dynamic Conditional Correlation Multivariate-GARCH (DCC-MGARCH).

INTRODUCTION

Sharia capital market is one of the interesting phenomena in the capital market industry in the world especially in developing countries. This happens because the population is predominantly Muslim. Muslims in developing countries with excessive funds want an Islamic sharia-based investment so the funds can be produced continuously. The Muslim population doesn't choose to invest in existing conventional stock markets because the Muslim population considers the conventional capital market tends to be filled with speculative transactions. The products of the sharia capital market are sukuk (sharia bonds), sharia mutual funds, and sharia stocks. Sharia stocks can be interpreted as having a proof of ownership to publish stocks with filled up criteria for sharia stocks exchange. Sharia stock indexes consist of the Jakarta Islamic Index (JII) JII consisting of 30 preferred stocks where the activities of these stocks are in accordance with sharia principles by looking at market capitalization and liquidity. In addition to Sharia JII stocks, there are other Sharia stokcs in the United States, the Islamic Market US (IMUS), Dow Jones Islamic Index Malaysia (DJIMY), Dow Jones Islamic Japan (DJIJP), and Dow Jones Islamic UK (DJIUK).

Figure 1

Sharia Stocks Price Index Movement (USD)



Source: Bloomberg, 2017

Figure 1 shows the sharia stocks price movement of JII, DJIJP, DJIM, DJI UK, and IMUS each year starting from 2010 to 2016. The picture above explains the increase of each year in sharia stokcs. The country have gotten continuous improvement of 532,901 USD in Indonesia in 2010 increased by 694,137 USD in 2016. Japan also got an annual increase starting from the year 2010 amounting to 1148.83 USD until the year 2016 amounted to 1489.02 USD. United States even experienced a fairly high increase in 2010 in the amount of 2295.07 USD and reached 3892.85 USD in 2016. Increases that happens in the three countries are not experienced by the Malaysian and British countries. Malaysia State in 2010, its stocks price of 1660.9 USD and decreased to 1330.54 in the year 2016 but had an increase from 2010 to 2013 amounted to 2005.18 USD. The British states has experienced price of fluctuations every year but reached the highest increased in the year 2013 amounted to 2424.93 USD and decreased 1922.31 in 2016. Sharia stock price movements can be seen where sharia stocks are good or bad in the long term. Lim (2007) explains how to important for investors in knowing the Sharia stock movement information from the relationship between the stock market sharia.

Previously there was an empirical study support will be the importance of market share integration relationships such as research conducted by Karim, Kassim and Arip (2010) that examined the relationship of sharia stock market integration at the time before and after the subprime crisis. The stock market used is the sharia stock market of Indonesia, Malaysia, United States, Japan, and England. The result of the research explains that there isn't integration relationship between sharia stock market before and after the subprime crisis so can be giving the benefit of international portfolio diversification. Siskawati (2011) studied about the co-integration between Jakarta Islamic Index, Kuala Lumpur Shariah Index, and Dow Jones Islamic Market Index. The results shows that there is long-term equilibrium relationship of Jaksil, KLSI and DJIM so there is co-integration between the stock market.

Ikrima and Muharam (2014) describe the co-integration and contagion effect between the sharia stock market in Indonesia, Malaysia, Europe and America during the Greek crisis. The results of the study explains that the Greek crisis hasn't effect on the movement of Islamic stock

prices in the US, Malaysia, Indonesia, and Europe. But there is co-integration and contagion is impacting Islamic stock prices in four regions as the Greek crisis took place.

Commodities are important in world economic growth one of them is crude oil. World crude oil is considered to important because it has such great benefits as transportation of fuel and asphalt, clothing material, plastic material, fertilizer, pesticide in agriculture, medicine in pharmacy, food, power plant. This crude oil has fluctuating prices. The fluctuation of world crude oil prices can be related to the movement of stocks in world stock markets that can be seen if the world crude oil price is good then investors will increasingly invest their wealth by buying oil stocks. The growth of crude oil prices can be seen in the following table:

Table 1
Average The Growth Of World Crude Oil Prices

Tahun	Average The Growth Of World Crude Oil Prices (USD per Barel)
2008	100.01
2009	58
2010	77.11
2011	91.39
2012	88.95
2013	92.41
2014	89.08
2015	50.01
Jan 2016	20

Source: Bloomberg, 2016

Table 1 shows that there is fluctuation in the price of crude oil commodity of the year. Year 2008 experienced peak period of 100.01 USD per barrel. The crisis caused world crude oil prices to be shaken to a decrease of 58 USD per barrel, but in 2010 again rose to reach 77.11 USD per barrel and fluctuated in the following years. However, in 2015 decreased the world crude oil price by 50.01 USD per barrel and decreased again at the beginning of 2016 this amounted to 20.00 USD per barrel. Fluctuations in world crude oil prices have a relationship to the movement of world stocks including the stock of sharia. This can be seen in Chinese countries that buy shares of national oil companies and establishing oil companies in Africa so the world oil prices can have relationships with world stocks.

Research on the price of crude oil is conducted by Alaitani et al (2011) examines the relationship between the development of the stock market with the movement of oil prices. The results explain that there is a relationship between the movement of crude oil prices with stock returns in Gulf Cooperation Council (GCC) countries. In the GCC countries except Kuwait, the stock market is significantly positive on crude oil price movements. This study also explains that the movement of crude oil prices gives asymmetric effect on stock returns on GCC countries.

Omran (2012) also examines long-term and short-term relationships between stock market returns and OPEC oil price movements for the six Gulf Cooperation Council countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates) two non-oil producing countries In the region (Egypt and Jordan) in 2002-2011. The results show that in the short term, it has less relationship between stock market return and OPEC oil price but there is a relation between stock return and crude oil price in long term. The strengthening of stock returns with oil prices shows the long-term benefits of diversification for investors in the short term. .

Hussin et al (2013) who conducted research on the relationship of influence between strategic commodity that is gold price and oil price in sharia stock market Malaysia. This study uses the VAR methods and it can be concluded that the sharia stock market in Malaysia has an influence with strategic commodities in the long term. Only this study affects the sharia stock market in Malaysia with short-term oil prices and the price of gold hasn't effect on the sharia stock market in Malaysia.

The existence of an interesting phenomenon can be interconnected because each on sharia stock index in the country there is an oil or mining exporting company so it is interesting to do research on the integration of both the relationship of integration of Sharia shares with world oil prices. Other that research gap from previously research, there are various kinds of controversy so there was necesary for better research and measurement again. The research will be very interesting and it is necessary to know and verify whether the sharia stock market is feasible with world crude oil price.

LITERATURE REVIEW

1. Sharia Stock Integration

Husnan (2004) explains that theoretically, the fully integrated international stock market will create a lower capital cost than the unintegrated or segmented stock market. This fully integrated stock market means no obstacles in capital inflow / outflow.

2. Sharia Stock Relation with World Oil Price

Index in sharia stocks are oil exporters or mining companies so there is a connection to world oil prices. When world oil prices decline or increase will cause the movement of Islamic stock prices. This can be explained in Table 2.

Table 2
Merger of Sharia Price Shares with World Oil Prices

Year	JII Price	IMUS Price	DJIUK Price	DJIMY Price	DJIJP Price	WTI Price
2016	694.127	3892.85	1922.31	1330.54	1489.02	55.43
2015	603.349	3670	2044.3	1501.84	1439.42	50.01
2014	691.039	3702.96	2252.46	1780.24	1246.97	89.08
2013	585.11	3341.45	2424.93	2005.18	1217.37	92.41
2012	594.789	2590.76	2116.82	1976.84	1049.81	88.95
2011	537.031	2330.15	2002.81	1685.36	1032.34	91.39
2010	532.901	2295.07	2201.15	1660.9	1148.83	77.11

Source: Data processed, 2017

Table 2 explains that the 2010 sharia share price increase during 2011 will increase world oil price in 2010 to 2011 on index of JII, IMUS, DJIMY. In 2012 to the year 2013 the sharia stock index (JII, DJIUK, DJIMY, DIJJP) increased which caused the world oil price also increased. Sharia-based stock indexes are increasing in relation to world oil prices caused by oil or mining exporting companies in the country's index so they can be interconnected between the two.

3. International Diversification

Diversification is done in order to minimize the risk of portfolio that will be obtained by investors. Markowitz (1952) for the first time introduces modern portfolio theory with the concept of portfolio risk. Markowitz's diversification of portfolios is included in the integration of the capital market to the degree of simultaneous movement (comovement) of capital markets in international stock portfolios. The high degree of movement simultaneously can provide the benefits of portfolio diversification is declining and if the degree of simultaneous movement is low then it will cause the benefit of an increasingly potential portfolio investment and is said to be potential.

The above theoretical foundations can be explained by previous research conducted by Saiti et al (2014) explaining through the Dynamic Multivariate GARCH approach that sharia capital markets applied to the countries of Japan, Saudi Arabia, Indonesia, Malaysia and Taiwan provide better diversification benefits Compared with Korea, Hongkong, China and Turkey. Islamic countries tend to provide better diversification benefits compared to the Eastern countries with strong policy implications they have set so as to minimize unexpected risks for domestic investors and overseas investors.

Masih et al (2015) examines the impact of crude oil prices on the Islamic stock index of Southeast Asian countries: evidence from the MGARCH-DCC and Wavelet approach. This study explains the existence of volatilities and correlations between Islamic stock indexes selected from Southeast Asian countries and selected commodities to increase the profitability of portfolio diversification. Consistent with the results of VECM, an analysis based on the application of the recent MODWT wavelet technique, shows that Singapore's Islamic index leads the Islamic index compared to other countries' Islamic stock indexes on commodities. From the point of view of the benefits of portfolio diversification, the results of dynamic correlations between variables, it is suggested that investors should be aware that the Philippine Islamic stock index is less correlated with crude oil in the short term (as shown in wavelets) and investors can diversify the Malaysian Islamic stock index in portfolio (As shown in the MGARCH-DCC analysis). Trichili and Abbes (2015) examined using multivariate cointegration testing to explain the equilibrium of sharia equity market relationships from similar economic groupings over the long term. Results from the Vector Error Correction Model provide the lowest level on the model of integration grouped on Europe-Asia in the short term. In addition, the degree of consistency of sharia-based stock market integration tends to change over time especially during the period of financial crisis. Based on the theoretical foundation and previous research, the researcher can draw hypothesis in the form of: (1) H1: There is an integration relationship between Indonesia Sharia stock market to Malaysia, United States, England, Japan. (2) H2: There is an integration relationship between Malaysian sharia stock market to Indonesia, US, UK, Japan stock market. (3) H3: There is an integration relationship between the Sharia stock market of United States to Malaysia, Indonesia, UK, Japan stock market. (4) H4: There is an integration relationship between the UK sharia stock market to the Malaysian, US, Indonesian, Japanese market. (5) H5: There is an integration relationship between Japanese sharia stock market to Malaysia, US, UK, Indonesia stock market. (6) H6: There is an integration relationship between sharia stock market in the world (Indonesia, Malaysia, United States, United Kingdom, Japan). (7) H7: There is an integration relationship between sharia stock market in the world (Indonesia, Malaysia, United States, UK, Japan) with world crude oil price.

RESEARCH METHODS

The population of this study is the world Sharia stock index (JII, DJIMY, IMUS, DJIUK, DJIJP) and world oil prices in 2012-2016 in the form of daily data obtained from bloomberg.

Table 3
State and Sharia Stock Price Index

Country	Index	Symbol
Indonesia	Jakarta Islamic Indeks	JII
Malaysia	Dow Jones Islamic Market Malaysia	DJIMY
Amerika Serikat	Islamic Market US	IMUS
Inggris	Dow Jones Islamic Market UK	DJIM UK
Jepang	Dow Jones Islamic Jepang	DJIJP

Source: Bloomberg, 2016

Analysis Method

This analysis is assisted by Eviews 9 and OxMetrics programs. Testing data in this research is by using descriptive statistic test, heteroskedasiticity test, stationarity test, univariate test GARCH, and Dynamic Conditional Correlation M-GARCH test.

RESULTS AND DISCUSSION

This process and analysis will explain the process in order to obtain research results that is to show the relevance of sharia share price index among countries (Indonesia, Malaysia, United States, UK, Japan) with world oil price in order to reflect the possibility of integration.

Table 4
Descriptive statistics

	JII	DJIMY	IMUS	DJIUK	DJIJP	WTI
Mean	638.6733	1781.398	3291.295	2180.222	1254.825	71.94672
Median	640.1310	1850.940	3430.010	2156.140	1234.620	82.04000
Maximum	758.1570	2124.010	3974.310	2636.920	1579.490	94.62000
Minimum	498.0300	1318.180	2361.390	1780.580	973.6800	36.39000
Std. Dev.	54.91834	224.2021	489.3732	178.6743	163.3721	16.75434
Skewness	0.112869	-0.492179	-0.446513	0.376431	0.159813	-0.507018
Kurtosis	2.131477	1.879229	1.711142	2.603908	1.818360	1.635508
Jarque-Bera	43.78760	120.9891	133.6890	39.35067	81.47728	157.1496
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	833468.6	2324725.	4295140.	2845190.	1637546.	93890.47
Sum Sq. Dev.	3932895.	65547623	3.12E+08	41629542	34804348	366042.9
Observations	1305	1305	1305	1305	1305	1305

Source: Data processed, 2017

Table 4 describes the stock market of sharia that has norm of distribution seen from the value of skewness and kurtoris or jarque-bera and probability. Table 4 shows the skewness of Islamic stock market JII, DJIUK and DJIJP experienced positive skewness (positively skewed) and on sharia stock market DJIMY, IMUS and WTI experienced negative skewness. The value of the curator in table 4 gives a value of less than 3 which is called as platykurtic. Kutoris shaped like this show signs of autoregressive conditional heteroscedasticty. Table 4 also explains that the Jarque-Bera value is greater than the five percent real level, so it can be said that there is not enough evidence to reject H0 which means that the residual is normally distributed.

Table 5
Heteroskedasticity Test

	F-statistic	Obs*R-squared	Prob.F	Prob Chi-square
JII	8355.455	1208.951	0.0000	0.0000
DJIMY	37413.05	1280.749	0.0000	0.0000
IMUS	50001.95	1286.279	0.0000	0.0000
DJIUK	16145.97	1252.574	0.0000	0.0000
DJIJP	20480.86	1262.919	0.0000	0.0000
WTI	35948.11	1279.858	0.0000	0.0000

Source: Data processed, 2017

Table 5 describes the probability value of chi-square that is close to zero or smaller than the five percent real level so it can be said that the model has a heteroskedasticity element so the next estimate is GARCH.

Table 6
Residual Stationableity Cointegration Test Augmented Dickey Fuller (ADF) on 1st Difference

Variabel	t-statistic	Prob.*
Residual JII	-21.48750	0.0000
Residual DJIMY	-32.16785	0.0000
Residual IMUS	-36.09805	0.0000
Residual DJIUK	-34.41362	0.0001
Residual DJIJP	-45.30018	0.0001
Residual WTI	-39.85547	0.0000

Source: Data processed, 2017

Description: data processed using EViews 9 with MacKinon critical value on 1st Difference of 1%, 5%, 10% is -3.435157; -2.863550; -2.567890

Stationary is determined by comparing the statistical value of ADF with the critical value of MacKinnon. Table 6 explains the probability that the sharia stock index analysis has been stationary at five percent. H0 is rejected because the probability value = 0.0000 $<\alpha = 0.05$ or the value of τ in the output compared with the critical value of Augmented Dickey Fuller with the value of t-Statistic <Test critical value 5% level = -2.863556.

Table 7
Univariate GARCH Test

Variable	Coefficent	Std.Error	z-Statistic	Prob.
GARCH (-1) (JII)	0.100512	0.048638	2.066553	0.0388*
GARCH (-1) (DJIMY)	-0.011948	0.046215	-0.258523	0.7960
GARCH (-1) (IMUS)	-0.092992	0.071704	-1.296900	0.1947
GARCH (-1) (DJIUK)	-0.022828	0.043334	-0.526791	0.5983
GARCH (-1) (DJIJP)	0.247699	0.124257	1.993448	0.0462*
GARCH (-1)(WTI)	0.297349	0.057096	5.207856	0.0000*

Source: Data processed, 2017
Description: * is significant α = 5%

Table 7 explains that the stock price of sharia JII, DJIJP and WTI has a visible GARCH-effect of significant GARCH coefficient (-1) with a trust rate of α = 5%. Univariate GARCH modeling of sharia share price JII, DJIJP and WTI can be seen that variables are affected by shock and volatility of the past from itself. While the price of sharia shares DJIMY, IMUS, and DJIUK is not significant at α = 5% because the variable is not affected by shock and volatility of the past itself but influenced by other external factors.

Tabel 8
Dynamic Conditional Correlation Multivarite-GARCH Test

Coefficient	Std.Error	t-value	t-prob	
rho_21	0.410111	0.024783	16.55	0.0000*
rho_31	0.124813	0.027965	4.463	0.0000*
rho_41	0.225832	0.027804	8.122	0.0000*
rho_51	0.222354	0.024531	9.064	0.0000*
rho_61	0.045923	0.028164	1.631	0.1032
rho_32	0.169055	0.027785	6.084	0.0000*
rho_42	0.305360	0.027310	11.18	0.0000*
rho_52	0.254882	0.029346	8.685	0.0000*
rho_62	0.076336	0.028367	2.691	0.0072*
rho_43	0.522363	0.021403	24.41	0.0000*
rho_53	0.008247	0.031135	0.2649	0.7911
rho_63	0.259383	0.028712	9.034	0.0000*
rho_54	0.164479	0.031711	5.187	0.0000*
rho_64	0.241133	0.027109	8.895	0.0000*
rho_65	-0.003166	0.032089	-0.09866	0.9214

Source: Data processed, 2017
Description: * is significant α = 5%

Table 8 shows the results of residual volatility testing of Islamic stock prices with world crude oil prices. The result of DCC MGARCH test of sharia stock price with world oil price can be pointed from coefficient value. The DCC MGARCH test can be determined by probability. The probability of significance is found in the relationship of JII stock price to DJIMY, JII against IMUS, JII against DJIUK, JII against DJIJP. DJIMY against JII, DJIMY

against IMUS, DJIMY against DJIUK, DJIMY against DIJP. After that, IMUS against JII, IMUS against DJIMY, IMUS against DJIUK, but IMUS is not related to DJIJP.

Significant probability is also found on DJIUK to JII, DJIUK to DJIMY, DJIUK to IMUS, DJIUK to DJIJP. After that, DJIJP against JII, DJIJP against DJIMY, DJIMY against DJIUK, but DJIJP not related to IMUS.World crude oil price (WTI) is related to syriah stock of DJIMY, IMUS, and DJIUK but not related to JII and DJIJP. Interrelated variables showed significant variables using a five percent significance level. The DCC M-GARCH coefficient describes a positive correlation relationship between residual volatility of sharia stock and volatility of world oil price variable. Relationships that happen unidirectional so that if the stock price of sharia experienced a movement or jolt then it will happen also at the price of other related shares so that it can be taken conclusion that both stock market of sharia has been integrated.

Discussion

JII (Jakarta Islamic Index) is integrated significantly with other sharia market namely DJIMY, IMUS, DJIUK, and DJIJP. H1 proven This is defined as the price of JII stocks experiencing a hike will cause the surplus of other sharia stock market also experienced movement so that it can provide benefits for investors ie investors not only invest funds in ordinary sharia shares can be covered in sharia shares internationally. It can provide more profit and can reduce risk for investors. DJIMY (Dow Jones Islamic Malaysia) is integrated significantly with other sharia markets namely JII, IMUS, DJIUK, and DJIJP. H2 proven This is defined when the stock price DJIMY because of the rush will cause other sharia market also experienced a movement so that it can provide benefits for investors that investors not only invest in Islamic equity shares can affect each other Shariah shares internationally. It can provide more profit and can reduce risk for investors.

IMUS (Islamic Market United States) is closely related to the sharia market that is JII, DJIMY, and DJIUK. This is interpreted when stock prices will continue to occur because the other sharia stock market also experienced movement so that it can provide benefits for investors that investors not only invest funds in ordinary sharia shares can be covered in sharia shares internationally. It can provide more profit and can reduce risk for investors. IMUS is not integrated with the DJIJP sharia market. This can be interpreted by investors who have sharia shares in IMUS better not to invest their shares in DJIJP in order to still be able to gain profit. DJIUK (Dow Jones Islamic United Kingdom) is significantly integrated with the other four sharia stock markets namely JII, DJIMY, IMUS, and DJIJP so that H4 is proven. This means that when the stock price DJIUK experiencing a rift will cause the other four sharia stock market also experienced a movement that can provide benefits for investors that investors not only invest funds in local Sharia stocks but can embed the stock of sharia internationally. It can provide more benefits and can minimize risk for investors.

DJIJP (Dow Jones Islamic Japan) is significantly integrated with the other three sharia stock markets namely JII, DJIMY, and DJIUK. This means that when the price of DJIJP shares is in a hurry, it will cause the other three sharia stock markets to experience movement so that it can provide benefits for investors, investors not only invest in local sharia shares but also can invest in sharia shares internationally. It can provide more benefits and can minimize risk for investors. DJIJP is not integrated in the sharia stock market IMUS. It can be interpreted that investors who have sharia shares in DJIJP better not to invest their shares in IMUS in order to remain profitable. The world sharia stock market (Indonesia, Malaysia, United States, United

Kingdom and Japan) is integrated so that international diversification can be done. H6 proven. It can be interpreted that investors can invest shares not only in one country but on Islamic stocks in other countries. Investors can diversify internationally because the integrated sharia stock market is better than the segmented sharia stock market. This is done to minimize the risks to be gained by investors.

World crude oil prices are significantly integrated against the three sharia stock markets namely DJIMY, IMUS, and DJIUK. This means that investors should pay attention to the movement of world crude oil prices when having sharia shares in these three markets in order to remain profitable. WTI is not integrated with JII and DJIJP sharia stock markets. This means that investors do not need intesitas in paying attention to the movement of world crude oil prices because it does not affect the movement of Islamic stock market in both countries.

Conclusions and Suggestion

Conclusion

This research is conducted to test whether there is any relationship between sharia stock market with world oil price. Based on the results showed that the occurrence of a significant dynamic relationship in stock prices islamic world (Indonesia, Malaysia, USA, UK, Japan) or a significant dynamic relationship between Islamic stock market world with crude oil prices. It can be explained that indirectly proves the existence of integration relationship between world sharia stock market with world crude oil price.

Suggestion

Future research may involve more suggested other indicators not only crude oil prices alone, it can be used in more and other countries, can use data processing software better.

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