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Relationship between oil prices and stock market indexes in developed and developing countries :an empirical study

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Abstract

The economies of most Arab countries rely on oil rents, making their financial markets vulnerable to volatility. The aim of this study is to test the relationship between oil prices and the stock prices indexes in the exporting and non-exporting Arab countries and compare this effect with the developed countries.
We used weekly data during the period from June 28th2015 to January 9th2019 for nine stock market indexes, including five Arab countries: Abu Dhabi, Oman, Bahrain, Lebanon, Saudi Arabia and four developed countries: the United Kingdom, Germany and the United States.

The study concluded that there is a strong and significant correlation between oil prices and the stock indices of the Arab exporting countries (Saudi Arabia Abu Dhabi) while the correlation is negative for non-oil countries. Developed countries also correlate their financial market index positively and significant. There is a co-integration relationship between oil price and stock indexes; the causality test indicates that the US S&P and the British FTSE are the cause of oil prices, while the oil-exporting countries consider the price of oil as a cause of their share prices. Non-oil Arab countries Oil prices are not the cause of their stock indices.

Keywords: Oil prices, stock indexes, developed-developing countries, Co-integration test, Arab stock markets.

I. Introduction

Over the past decade, many papers have been investigating the relationships between oil prices and macroeconomic variables. They provide evidence proving that oil price fluctuations exert large impacts on economic activity in developed and emerging economies.

The oil prices characterized by the high fluctuations in global markets because of many reasons such as the oil production in all of the word, the demand of the importing countries the political crises and other factors which influence the oil prices. In spite of developing alternative sources of energy, oil is still the most commonly uses energy source and it still plays an important

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role in global economic development. Today's economies and industries depend on oil and its distillates. Oil prices fluctuations are hardly predictable and keep changing because they are affected by many different factors including the current supply of oil as set by OPEC, the demand for oil especially by emerging economies.

Perhaps the Gulf region is best known for oil production and many petrol companies around the world had and still race to operate in the Gulf region. Since Arab Gulf countries are major exporters and producers of oil, oil price proved to have significant consequences on those economies and considered one of the most important sources of macroeconomic fluctuations.

There are some reasons for studying the GCC region. Firstly, these countries are large suppliers of oil for the global economy, so their stock markets may be influenced by oil price movements. Secondly, GCC markets are, to some extent, segmented from international markets, but very sensitive to regional political events. Thirdly, GCC markets are unique, very promising places for international portfolio diversification. Finally, only a few studies have investigated the dynamic conditional correlation GARCH approach between oil prices and stock markets in the GCC region and developed countries.

The dynamic interactions between oil prices and stock markets have been extensively investigated for many countries but the empirical results are rather conflicting. Wherein some studies find a negative relationship between oil prices and stock markets, while others documents showed a positive link using more recent datasets. Several studies have also examined the oil-stock market nexus in emerging and developing countries. Our paper will investigate on the impact of the oil prices on the stock markets.

Literature Review:

The study of Abderahmane Adnan and Ahmed Alhayky 2016 investigated on the impact of the Oil Prices on Stock Markets: Evidence from Gulf Cooperation Council (GCC) Financial Markets. The authors aimed to evaluate the effect of the oil prices in GCC countries in the long and short term and to examine the effect of the stock markets on the economics of the GCC countries. To achieve this investigation they used the ARDL model to analyze the monthly data of the variables during the period of 2006 to 2015; the sample of the study concluded Kuwait, Bahrain, Saudi Arabia, Oman, Quatar and UAE, the main results showed that there are no evidence for co-integration between the oil prices and the stock markets in all the GCC countries except Oman. In other hand there is a short relationship between the oil prices and the stock market.

While the study of Mohamed at all 2014 investigated on the returns linkages and volatility transmission between oil prices and stock markets in the GCC markets over the period of 2005-

2010, the authors applied the VAR-GARCH approach, the main results showed the existence of substantial return and volatility spillovers between world oil prices and GCC stock Markets and appear the be crucial for international portfolio management in the presence of oil price risk.

Other paper of Reem Khamis et all 2018 tested the reaction of the Saudi Arabia stock markets between the oil prices fluctuations the study covered the period of 4 years (2012-2015), using low and high oil prices and the Granger causality test and the regression test the results showed the Saudi Arabia stock markets proposed that they faced the current oil chops bravely although certain sectors need to unbind or decrease their relation with oil markets to reduce the consequences of the low oil prices on them.

II. Data and Methodology:

Our data consists weekly data during the period from June 28th2015 to January 9th2019 for nine stock market indexes, including five Arab countries: Abu Dhabi, Oman, Bahrain, Lebanon, Saudi Arabia and four developed countries: the United Kingdom, Germany and the United States. In order to achieve our investigation we will apply the Co-integration test for testing the relationship between the variables.

Methodology

- **Unit Root Test**

The co-integration test among the study variables requires a previous test for the existence of a unit root for each variable, using the Augmented Dickey–Fuller (ADF) (1979) test on the following regression:

The ADF regression tests for the existence of unit root of, namely in all model variables at time *t*. The variable expresses the first differences with lags, and is a variable that adjusts the errors of autocorrelation. The coefficients are to be estimated. The null and the alternative hypothesis for the existence of a unit root in variable is: $H_0 = 0$ vs $H_1 \prec 0$

- **Co-integration and Johansen test**

Granger and Newbold (1974) have highlighted that, in terms of time series, if the variables are non-stationary in their levels, they can be integrated with integration order 1, when their first differences are stationary. These variables can be co-integrated as well, if there are one or more linear combinations among the variables that are stationary. If these variables are co-integrated, then there is a constant long-run linear relationship among them. There are two important ways to test for co-integration. The Engle and Granger methodology (1987) seeks to determine whether the residuals of the equilibrium relationship are stationary. The Johansen (1988) and Stock-Watson (1988) methodologies determine the rank of (π) which equals the number of co-integration vectors.

Enders (2004) explained the Engle-Granger testing procedure; he began with the type of problem likely to be encountered in applied studies. Suppose that two variables and are believed to be $I(1)$ and we want to determine whether there exists an equilibrium relationship between these two variables. Therefore, we need to estimate the long-run equilibrium relationship in the form:

In order to determine if the variables are actually co-integrated denote the residual sequence from this equation $\{\}$. Thus, the $\{\}$ series are the estimated values of the deviation from the long-run relationship. If these deviations are found to be stationary, the $\{\}$ and $\{\}$ sequences are co-integrated of order 1. It would be convenient if we could perform ADF test on these residuals to determine their order of integration in the form:

Since the $\{\}$ sequence is a residual from a regression equation, there is no need to indicate an intercept term; the parameter of interest in is, where$= p - 1$. If we cannot reject the null hypothesis, we can conclude that the residual series contain a unit root. Hence, we conclude that $\{\}$ and $\{\}$ sequences are not co-integrated. Instead, the rejection of the null hypothesis implies that the residual sequence is stationary and we conclude that $\{\}$ and $\{\}$ sequences are co-integrated. If the variables are co-integrated, the residual from the equilibrium regression can be used to estimate the error correction model (ECM) Million N, 2004).

Additionally, according to Johansen (1988), the Johansen test can be seen as a multivariate generalization of the augmented Dickey-Fuller test. The generalization is the examination of linear combinations of variables for unit roots. The Johansen test and estimation strategy – maximum likelihood – makes it possible to estimate all co-integrating vectors when there are more than two variables. If there are three variables each with unit roots, there are at most two v vectors. For example, let r be the rank of (π) which equals the number of co-integrating vectors. There are two tests: 1. the maximum Eigen value test, and 2. the trace test. For both test statistics, the initial Johansen test is a test of the null hypothesis of no co-integration against the alternative of co-integration. The maximum Eigen value test examines whether the rank of the matrix (π) is zero. The null hypothesis is that rank $(\pi) = 0$and the alternative hypothesis is that rank$(\pi) = 1$. If the rank of the matrix is zero, the largest Eigen value (λ) is zero, there is no co-integration and tests are done. If the largest Eigen value (λ) is nonzero, the rank of the matrix is at least one and there might be more co-integrating vectors. The test of the maximum (remaining) Eigen value is a likelihood ratio test. The test statistic is:

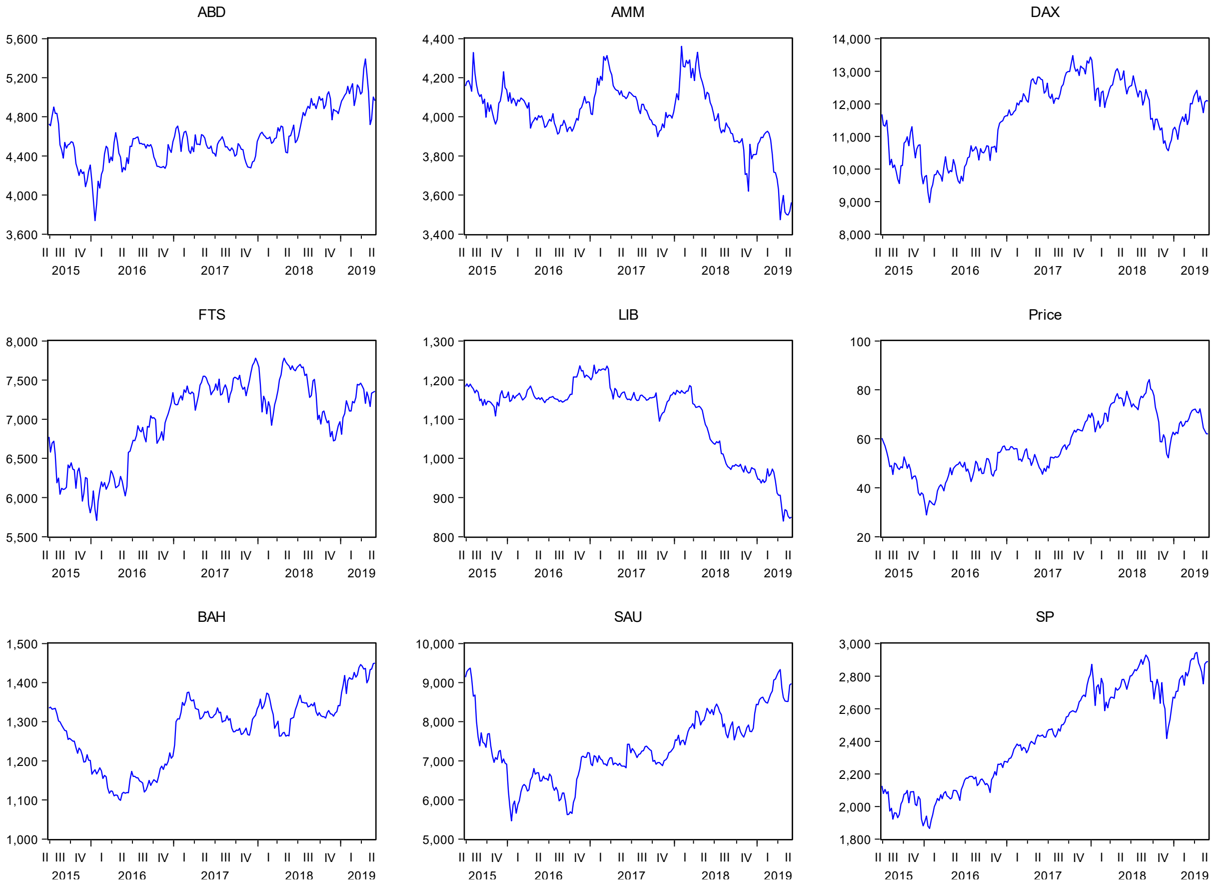
Where is the likelihood ratio test statistic for testing whether rank (π) =versus the alternative hypothesis that rank(π)=+1.

Moreover, Johansen (1988) explained the trace test. It is a test whether the rank of the matrix (π) is. The null hypothesis is that rank(π) =. The alternative hypothesis is thatrank$(\pi) \leq n$, where n is the maximum number of possible co-integrating vectors. For the succeeding test if this null hypothesis is rejected, the next null hypothesis is that rank(π)=+1, and the alternative hypothesis is that+1 $\prec$ rank(π) $\leq n$. The test statistic is:

Where is the likelihood ratio statistic for testing whether rank $(\pi) = r$ versus the alternative hypothesis that rank $(\pi) \leq n$. This paper will utilize the Johansen methodology to test for co-integration. (Paleologos J. and Georgantelis .S; 1996)

III. Results and discussion

Figure 01: The oil and stock prices fluctuations



Source: Authors.

The graph above showed the fluctuations of the stock and oil prices during the period of study; both of developed and developing countries in addition to the oil prices characterized by the trend and no stationary.

Table 01: the descriptive statistics of the prices

	ABD	AMM	DAX	FTS	LIB	PRICE	BAH	SAU	SP
Mean	4584.578	4014.155	11511.25	6998.178	1111.910	57.15621	1279.168	7373.057	2427.081
Median	4538.010	4019.030	11640.81	7162.925	1150.900	55.50500	1306.430	7258.930	2432.460
Maximum	5391.880	4360.580	13478.86	7778.790	1238.280	84.16000	1449.760	9372.740	2945.640
Minimum	3736.950	3473.360	8967.510	5707.600	839.5800	28.94000	1098.750	5463.600	1864.780
Std. Dev.	268.6875	165.9526	1104.174	529.1774	95.79562	12.12313	89.47046	876.1727	315.5180
Skewness	0.309252	-0.894413	-0.259107	-0.630870	-1.148544	0.134020	-0.321217	0.210562	-0.040795
Kurtosis	3.258680	4.510037	1.924868	2.240743	3.216496	2.251839	2.226723	2.586528	1.619886
Jarque-Bera	3.857895	47.03758	12.22656	18.61258	45.69325	5.421153	8.674984	2.989613	16.40593
Probability	0.145301	0.000000	0.002213	0.000091	0.000000	0.066498	0.013069	0.224292	0.000274
Observations	206	206	206	206	206	206	206	206	206

Source : Authors.

The descriptive statistics confirmed the result of the graph, according to standard deviation the DAX index has the high level of variation following by the SAU and the FTS indexes and the SP index. While the oil prices showed the lowest level of fluctuations.

Table 02: the correlation result of the perices

Covariance Analysis: Ordinary
Date: 10/05/19 Time: 07:54
Sample: 6/28/2015 6/02/2019
Included observations: 206

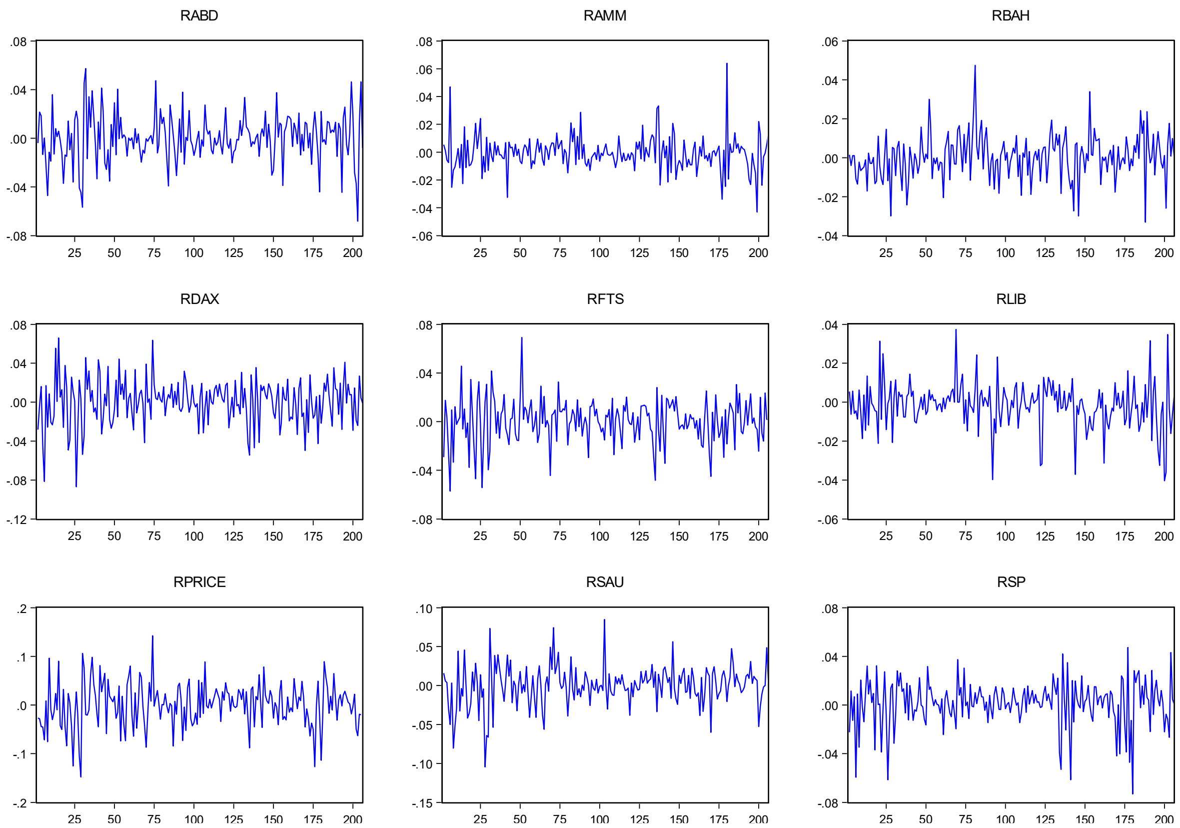
Correlation t-Statistic	ABD	AMM	DAX	FTS	LIB	PRICE	BAH	SAU	SP
ABD	1.000000								

AMM	-0.501733	1.000000							
	-8.284390	-----							
DAX	0.284528	0.045414	1.000000						
	4.239078	0.649314	-----						
FTS	0.405661	-0.079636	0.918446	1.000000					
	6.338995	-1.141060	33.16435	-----					
LIB	-0.741000	0.786685	-0.134202	-0.228342	1.000000				
	-15.76101	18.20043	-1.934289	-3.349872	-----				
PRICE	0.646122	-0.224819	0.681353	0.724507	-0.540689	1.000000			
	12.09126	-3.295412	13.29543	15.01306	-9.180181	-----			
BAH	0.686563	-0.218954	0.629359	0.605057	-0.560438	0.638465	1.000000		
	13.48710	-3.205061	11.56721	10.85422	-9.665174	11.84836	-----		
SAU	0.748381	-0.267574	0.408989	0.378800	-0.615283	0.679395	0.792390	1.000000	
	16.11567	-3.966351	6.401396	5.846006	-11.14796	13.22440	18.55299	-----	
SP	0.662567	-0.369288	0.764309	0.816583	-0.649562	0.887688	0.750779	0.621624	1.000000
	12.63460	-5.675678	16.92875	20.20543	-12.20243	27.53577	16.23377	11.33461	-----

Source : Authors

The correlation matrix of the indexes prices showed a positive and significant correlation with ABD, DAX, FTS, SAU, SP and BAH indexes, while AMM and LIB are correlated negatively with the oil prices.

Figure: 02 the presentation of the indexes returns.



Source : Authors.

Table 03: the descriptive statistics of the indexes returns.

	RABD	RAMM	RBAH	RDAX	RFTS	RLIB	RPRICE	RSAU	RSP
Mean	0,000279	-0,000821	0,000401	0,000174	0,000396	-0,001640	0,000135	-0,000106	0,001498
Median	0,000226	-0,001179	0,000568	0,002742	0,002016	-0,001443	0,001610	0,001483	0,002703
Maximum	0,057232	0,063977	0,047509	0,066067	0,069094	0,037365	0,142225	0,084971	0,047336
Minimum	-0,068291	-0,043146	-0,033063	-0,086851	-0,057023	-0,040383	-0,147812	-0,104616	-0,073122
Std, Dev,	0,019743	0,012335	0,011237	0,023622	0,018179	0,011756	0,044714	0,025690	0,018936
Skewness	-0,183702	0,797967	0,137849	-0,424661	-0,300088	-0,304642	-0,197505	-0,369401	-0,984350
Kurtosis	3,969510	7,827074	4,738846	4,051918	4,312825	5,368321	3,812777	5,132928	5,259671
Jarque-Bera	9,136955	219,7050	26,34655	15,53698	17,71161	50,83143	6,941429	43,30928	76,34607
Probability	0,010374	0,000000	0,000002	0,000423	0,000143	0,000000	0,031095	0,000000	0,000000
Observations	204	204	204	204	204	204	204	204	204

Source : Authors.

The figure and the table presented the fluctuations of the returns, according to the standard deviation the oil prices are the most fluctuation than the other indexes with 4% followed by the SAU, DAX indexes by 2.5% and 2.3% respectively.

Table 04: covariance analysis of returns.

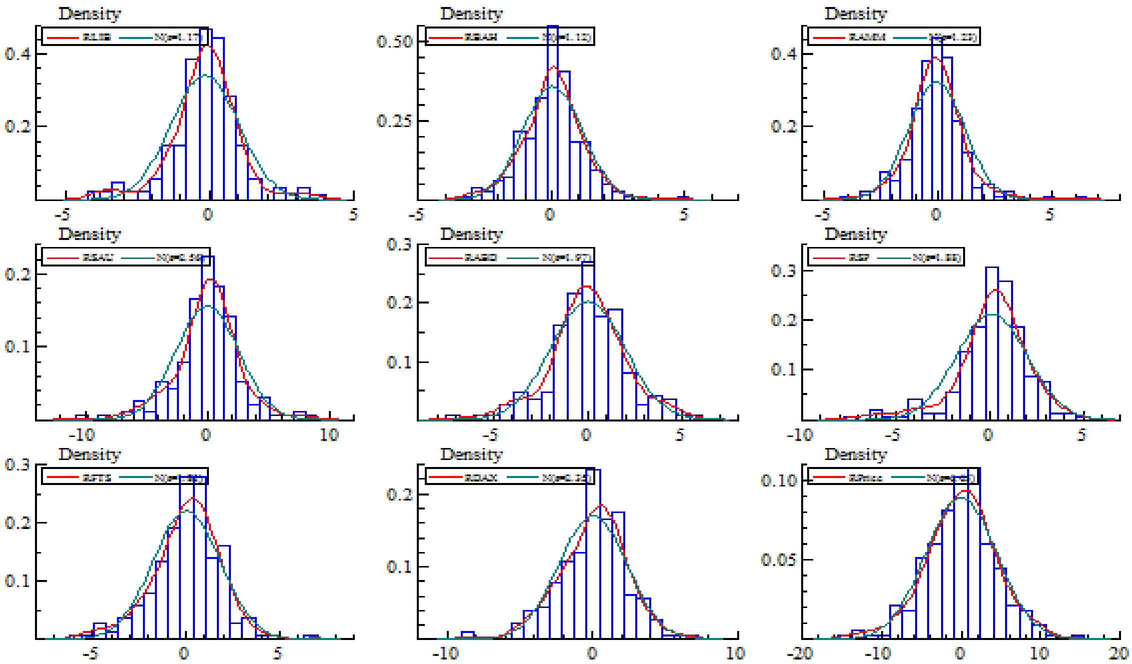
Correlation t-Statistic	RABD	RAMM	RBAH	RDAX	RFTS	RLIB	RPRICE	RSAU	RSP
RABD	1.000000								

RAMM	0.034356	1.000000							
	0.488579	-----							
RBAH	0.064277	0.070980	1.000000						
	0.915446	1.011370	-----						
RDAX	0.064348	-0.006020	0.062500	1.000000					
	0.916449	-0.085567	0.890035	-----					
RFTS	0.028229	-0.043173	0.025312	0.746389	1.000000				
	0.401374	-0.614173	0.359863	15.93995	-----				
RLIB	-0.000326	-0.011548	-0.018872	0.011394	-0.009414	1.000000			
	-0.004637	-0.164140	-0.268268	0.161948	-0.133804	-----			
RPRICE	**0.130651**	-0.012130	-0.010819	**0.132752**	0.046971	-0.050069	1.000000		
	1.872952	-0.172419	-0.153780	1.903602	0.668316	-0.712507	-----		
RSAU	0.321911	0.057137	0.046928	0.064368	0.010615	0.080134	**0.257194**	1.000000	
	4.832438	0.813403	0.667713	0.916749	0.150870	1.142595	3.782664	-----	
RSP	0.065426	-0.103912	0.145980	0.715341	0.699772	0.012545	**0.145100**	0.068168	1.000000
	0.931878	-1.484901	2.097238	14.54960	13.92230	0.178311	2.084318	0.971112	-----

Source :Authors

The correlation matrix of returns showed a weak and positive correlation between oil prices and the indexes returns SAU, SP, DAX and ABD with 25.7% 14.51% 13.27 and 13.06 repectively.

Figure 03 : the density test



Source : Authors.

The Figure showed that all the variables do not follow the normal distribution.

Table 05: the unit root tests

Group unit root test: Summary
Series: ABD, AMM, BAH, DAX, FTS, LIB, PRICE, SAU, SP
Date: 10/05/19 Time: 09:17
Sample: 6/28/2015 6/02/2019
Exogenous variables: Individualeffects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	1.97255	0.9757	9	1845
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	1.42999	0.9236	9	1845
ADF - Fisher Chi-square	10.4564	0.9160	9	1845
PP - Fisher Chi-square	10.4868	0.9149	9	1845

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Source: Authors.

Table 06: the unit root tests

Group unit root test: Summary
Series: ABD, AMM, BAH, DAX, FTS, LIB, PRICE, SAU, SP
Date: 10/05/19 Time: 09:18
Sample: 6/28/2015 6/02/2019
Exogenous variables: Individualeffects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-43.7539	0.0000	9	1833
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-41.9340	0.0000	9	1833
ADF - Fisher Chi-square	897.907	0.0000	9	1833
PP - Fisher Chi-square	954.331	0.0000	9	1836

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

source: Authors.

Table 5 and 6 represent the unit root test using the ADF, PP and LLC tests the initial results in table 5 highlighted that the variables are not stationary in at level, so we passed the testing the first difference; the result is clear in table 6 that all the variables are all stationary at the first difference according to P value.

Table 07: VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: ABD AMM DAX FTS LIB PRICE BAH SAU SP
Exogenous variables: C
Date: 10/05/19 Time: 08:06
Sample: 6/28/2015 6/02/2019
Included observations: 198

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-10852.49	NA	3.59e+36	109.7120	109.8615	109.7725
1	-8929.702	3651.355	**2.99e+28***	**91.10810***	**92.60276***	**91.71309***
2	-8880.926	88.18941	4.16e+28	91.43360	94.27347	92.58308
3	-8819.114	**106.1424***	5.11e+28	91.62741	95.81248	93.32139
4	-8759.524	96.90977	6.49e+28	91.84367	97.37394	94.08214
5	-8695.694	98.00150	8.02e+28	92.01711	98.89257	94.80007
6	-8643.627	75.20754	1.14e+29	92.30936	100.5300	95.63682
7	-8590.965	71.28023	1.64e+29	92.59560	102.1615	96.46755
8	-8524.467	83.96168	2.13e+29	92.74209	103.6532	97.15853

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final predictionerror
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Authors.

Table 07 included the selection of the optimum lag according to the criteria's as the table showed lag order selected is the first.

Table 08: the Co-integration test (Trace)

Date: 10/05/19 Time: 08:01
Sample (adjusted): 8/02/2015 6/02/2019
Included observations: 201 afteradjustments
Trend assumption: Linear deterministic trend
Series: ABD AMM DAX FTS LIB PRICE BAH SAU SP
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.287839	223.3658	197.3709	0.0013
Atmost 1	0.190258	155.1359	159.5297	0.0845
Atmost 2	0.152276	112.7170	125.6154	0.2326
Atmost 3	0.113598	79.51170	95.75366	0.3811
Atmost 4	0.096197	55.27427	69.81889	0.4076
Atmost 5	0.088527	34.94431	47.85613	0.4509

Atmost 6	0.050391	16.31305	29.79707	0.6901
Atmost 7	0.028064	5.920428	15.49471	0.7049
Atmost 8	0.000989	0.198892	3.841466	0.6556

Trace test indicates 1 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source : Authors.

Table 09 : The Co-integration test (Maximum Eigenvalue)

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
<u>None *</u>	<u>0.287839</u>	<u>68.22982</u>	<u>58.43354</u>	<u>0.0042</u>
Atmost 1	0.190258	42.41899	52.36261	0.3549
Atmost 2	0.152276	33.20526	46.23142	0.5778
Atmost 3	0.113598	24.23743	40.07757	0.8130
Atmost 4	0.096197	20.32996	33.87687	0.7334
Atmost 5	0.088527	18.63126	27.58434	0.4435
Atmost 6	0.050391	10.39263	21.13162	0.7072
Atmost 7	0.028064	5.721536	14.26460	0.6492
Atmost 8	0.000989	0.198892	3.841466	0.6556

Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source : Authors.

The tables 08 and 09 showed the co-integration test which are highlighted that there is a co-integration according to the critical value at 5% is more than the trace statistical so we can say that the variables move together in the long run in other word the variables have the one equation for the long run relationship.

Table 10: the VectorError Correction test

VectorError Correction Estimates

Date: 10/05/19 Time: 08:08
Sample (adjusted): 7/12/2015 6/02/2019
Included observations: 204 afteradjustments
Standard errors in ( ) & t-statistics in [ ]

CointegratingEq:	CointEq1
ABD(-1)	1.000000
AMM(-1)	0.486885
	(0.21762)
	[2.23728]
DAX(-1)	0.399065
	(0.04973)
	[8.02493]
FTS(-1)	-0.687052
	(0.10528)

	[-6.52573]								
LIB(-1)	-0.996325								
	(0.63046)								
	[-1.58031]								
PRICE(-1)	0.150624								
	(4.25321)								
	[0.03541]								
BAH(-1)	-0.804037								
	(0.47497)								
	[-1.69281]								
SAU(-1)	-0.138860								
	(0.04599)								
	[-3.01933]								
SP(-1)	-0.449356								
	(0.25787)								
	[-1.74260]								
C	-2082.285								
Error Correction:	D(ABD)	D(AMM)	D(DAX)	D(FTS)	D(LIB)	D(PRICE)	D(BAH)	D(SAU)	D(SP)
CointEq1	-0.245644	-0.003508	-0.458345	-0.073720	-0.000107	-0.001822	-0.021430	-0.194482	-0.067555
	(0.04105)	(0.02418)	(0.12863)	(0.06090)	(0.00623)	(0.00116)	(0.00686)	(0.08900)	(0.02251)
	[-5.98349]	[-0.14509]	[-3.56333]	[-1.21054]	[-0.01714]	[-1.57135]	[-3.12556]	[-2.18530]	[-3.00144]
D(ABD(-1))	0.143796	-0.021624	0.284539	0.091859	-0.024403	0.003127	0.015810	0.084063	0.041946
	(0.06930)	(0.04082)	(0.21714)	(0.10280)	(0.01051)	(0.00196)	(0.01157)	(0.15024)	(0.03800)
	[2.07488]	[-0.52977]	[1.31039]	[0.89354]	[-2.32212]	[1.59727]	[1.36596]	[0.55954]	[1.10398]
D(AMM(-1))	0.015784	-0.154856	-0.217911	-0.035014	0.030164	-0.000573	0.015196	0.316258	-0.027457
	(0.12009)	(0.07073)	(0.37626)	(0.17814)	(0.01821)	(0.00339)	(0.02006)	(0.26032)	(0.06584)
	[0.13144]	[-2.18943]	[-0.57916]	[-0.19656]	[1.65651]	[-0.16891]	[0.75768]	[1.21486]	[-0.41703]
D(DAX(-1))	0.012727	-0.026267	0.094073	0.022087	0.005275	-0.000854	0.001793	0.009904	0.034636
	(0.03694)	(0.02176)	(0.11574)	(0.05480)	(0.00560)	(0.00104)	(0.00617)	(0.08008)	(0.02025)
	[0.34453]	[-1.20730]	[0.81281]	[0.40308]	[0.94180]	[-0.81820]	[0.29063]	[0.12368]	[1.71023]
D(FTS(-1))	-0.135367	-0.021351	-0.148517	0.096854	0.004481	-3.07E-05	0.008041	-0.116072	0.004896
	(0.07641)	(0.04500)	(0.23941)	(0.11335)	(0.01159)	(0.00216)	(0.01276)	(0.16564)	(0.04189)
	[-1.77154]	[-0.47441]	[-0.62034]	[0.85448]	[0.38673]	[-0.01423]	[0.63007]	[-0.70073]	[0.11688]
D(LIB(-1))	-0.473688	0.297758	-0.262687	0.351957	-0.018309	0.001088	-0.047146	0.715200	-0.048930
	(0.46361)	(0.27306)	(1.45258)	(0.68771)	(0.07030)	(0.01310)	(0.07743)	(1.00501)	(0.25418)
	[-1.02173]	[1.09046]	[-0.18084]	[0.51178]	[-0.26045]	[0.08310]	[-0.60889]	[0.71163]	[-0.19250]
D(PRICE(-1))	-0.188336	-1.441498	-4.795198	-2.855192	-0.204988	0.116504	-1.010990	**10.24578**	-2.093420

	(2.61531)	(1.54036)	(8.19426)	(3.87952)	(0.39658)	(0.07388)	(0.43679)	(5.66945)	(1.43385)
	[-0.07201]	[-0.93582]	[-0.58519]	[-0.73597]	[-0.51690]	[1.57693]	[-2.31460]	[1.80719]	[-1.46000]
D(BAH(-1))	-0.366231	0.157565	-1.712042	-0.258786	0.133822	0.009959	-0.042820	1.126072	0.065409
	(0.43051)	(0.25356)	(1.34886)	(0.63861)	(0.06528)	(0.01216)	(0.07190)	(0.93325)	(0.23603)
	[-0.85070]	[0.62141]	[-1.26925]	[-0.40524]	[2.04997]	[0.81892]	[-0.59555]	[1.20662]	[0.27713]
D(SAU(-1))	0.017044	0.011174	-0.015037	0.014618	0.004036	-0.001035	0.003041	0.058713	0.004245
	(0.03467)	(0.02042)	(0.10861)	(0.05142)	(0.00526)	(0.00098)	(0.00579)	(0.07515)	(0.01901)
	[0.49166]	[0.54726]	[-0.13844]	[0.28427]	[0.76786]	[-1.05664]	[0.52519]	[0.78130]	[0.22334]
D(SP(-1))	0.146275	0.265795	-0.623931	-0.544198	-0.037843	0.005621	0.044449	0.295717	-0.299409
	(0.19089)	(0.11243)	(0.59808)	(0.28316)	(0.02895)	(0.00539)	(0.03188)	(0.41380)	(0.10465)
	[0.76630]	[2.36415]	[-1.04323]	[-1.92190]	[-1.30742]	[1.04246]	[1.39425]	[0.71464]	[-2.86098]
C	0.355917	-3.934328	5.642558	6.051032	-1.522515	-0.014828	0.344336	-0.896790	4.762088
	(5.86249)	(3.45288)	(18.3683)	(8.69633)	(0.88896)	(0.16561)	(0.97911)	(12.7086)	(3.21411)
	[0.06071]	[-1.13943]	[0.30719]	[0.69581]	[-1.71269]	[-0.08953]	[0.35168]	[-0.07057]	[1.48162]
R-squared	**0.197792**	0.076013	0.073200	0.035963	0.076747	0.062345	0.132677	0.099742	0.091289
Adj. R-squared	0.156227	0.028138	0.025179	-0.013987	0.028910	0.013762	0.087738	0.053096	0.044205
Sum sq. resids	1311257.	454869.5	12872404	2885331.	30150.27	1046.396	36574.90	6162008.	394135.0
S.E. equation	82.42618	48.54726	258.2564	122.2698	12.49876	2.328463	13.76616	178.6827	45.19016
F-statistic	4.758605	1.587742	1.524345	0.719982	1.604355	1.283271	2.952370	2.138290	1.938865
Log likelihood	-1183.838	-1075.847	-1416.816	-1264.281	-799.0380	-456.2321	-818.7412	-1341.674	-1061.229
Akaike AIC	11.71410	10.65537	13.99820	12.50275	7.941549	4.580707	8.134718	13.26151	10.51205
Schwarz SC	11.89301	10.83428	14.17711	12.68167	8.120468	4.759625	8.313636	13.44043	10.69097
Meandependent	1.253676	-3.026765	3.619461	3.811275	-1.668578	0.016029	0.552549	-1.500637	3.970686
S.D. dependent	89.73304	49.24504	261.5705	121.4236	12.68345	2.344653	14.41296	183.6240	46.22336

Determinant resid covariance (dof adj.)	2.96E+28
Determinantresid covariance	1.80E+28
Log likelihood	-9241.095
Akaike information criterion	91.65780
Schwarz criterion	93.41445

Source: Authors.

The table 10 presented the VECM test we passed to this test because there is a co-integration between the variables; according the results we can say that variables have the same lag and there is long causality running from dependent to independent variables.

Table 11: Granger causality test.

Date: 10/05/19 Time: 08:24		
Sample: 6/28/2015 6/02/2019		
Lags: 2		
ABD does not Granger Cause PRICE	0.95937	0.3849
AMM does not Granger Cause PRICE	0.27505	0.7598
BAH does not Granger Cause PRICE	1.49145	0.2276
DAX does not Granger Cause PRICE	1.51608	0.2221
FTS does not Granger Cause PRICE	3.20608	**0.0426**
LIB does not Granger Cause PRICE	0.05467	0.9468
SAU does not Granger Cause PRICE	0.12487	0.8827
SP does not Granger Cause PRICE	6.25435	**0.0023**
PRICE does not Granger Cause ABD	3.93956	**0.0210**
PRICE does not Granger Cause AMM	0.89353	0.4108
PRICE does not Granger Cause BAH	3.09587	**0.0474**
PRICE does not Granger Cause DAX	0.20572	0.8142
PRICE does not Granger Cause FTS	0.44416	0.6420
PRICE does not Granger Cause LIB	2.34823	0.0982
PRICE does not Granger Cause SAU	5.09597	**0.0069**
PRICE does not Granger Cause SP	0.56475	0.5694

Source: Authors.

According the result of VECM test we passed to Granger causality test the table showed that that the US S&P and the British FTSE are the cause of oil prices, while the oil-exporting countries consider the price of oil as a cause of their share prices. Non-oil Arab countries Oil prices are not the cause of their stock indices.

IV. Conclusion

The aim of this research is to determine whether a relationship exists between oil prices and the stock markets price in developed and developing countries. This investigation applies the Co-integration model to investigate the relationship between oil prices and the stock market price for period of 2015- 2019, using weekly data. It is concluded that there is a strong and significant correlation between oil prices and the stock indices of the Arab exporting countries (Saudi Arabia Abu Dhabi) while the correlation is negative for non-oil countries, other finding showed that there is long run co-integration between oil prices and the stock markets.

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