International Journal of Innovation and Applied Studies
ISSN 2028-9324 Vol. 10 No. 3 Mar. 2015, pp. 943-952

http://www.ijias.issr-journals.org/

Modeling Dynamic Correlation between Crude Oil Price and Stock Price of Petrochemical and Refining companies (Using DCC-MGARCH)

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ABSTRACT: The present research is seeking for finding the answer to these questions that is there a negative, significant dynamic conditional correlation between stock price return of the petrochemical companies registered in Tehran Stock Exchange and West Texas Intermediate crude oil price return? Is there a positive, significant dynamic conditional correlation between stock price return of the petrochemical companies registered in Tehran Stock Exchange and West Texas Intermediate crude oil price return? The correlation between West Texas Intermediate crude oil price with stock price of the petrochemical companies registered in Stock Exchange including Abadan Petrochemical Co, Arak Petrochemical, Isfahan Petrochemical, Khark Petrochemical, Farabi Petrochemical, Tabriz Oil Refining, Bandar E Abbas Oil refining and Isfahan Oil refining were studied, following the above mentioned questions were replied , through DCC method. According to research results, the petrochemical companies, in general, have negative, significant conditioned correlation with the crude oil price meaning the overflowing of crude oil price over petrochemical companies' stock price. Of the petrochemical companies' stock prices only Isfahan Petrochemical Co stock price was positively correlated with the crude oil global price; however, this positive estimated effect is not statistically significant. Thus, the first hypothesis of the conditioned negative correlation varying over time between stock prices of petrochemical companies registered in the stock exchange and the crude oil global price cannot be rejected.

On the other hand, it is on the contrary to the refining companies registered in Tehran Stock Exchange such that the stock prices of all three refining companies are positively correlated with the crude oil global price. Its significance indicates the correlation variability overtime. It means that correlation is some days positive and some days negative; therefore, the median impact will be positive. However, the stock price of Tabriz refinery with the overflow symbol lacks any significant correlation; whereas, this correlation was positively estimated, too. Finally, according to research findings, research second hypothesis that there is a positive, significant relation between the refineries' stock prices and the crude oil global price cannot be rejected.

KEYWORDS: Conditioned dynamic correlation; conditioned volatility; stock price; petrochemical and refinery companies; crude oil price.

1 INTRODUCTION

Today, many studies have been carried out that studied the spread of fluctuations among financial properties and even financial markets such as spreading the fluctuations within stock markets of different countries, gold in the stock market, interest rate on stock market and spreading even oil market fluctuations into stock market. The scope of spreading fluctuations has been increased through developing communication equipment's and the strong interdependence of the

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financial markets. Identifying return spreading mechanism and the fluctuations of various properties are significant due to several reasons.

The studies indicate that the data associated to the financial variables will spread over together over time. This issue becomes more important by developing the communication systems and the increasingly interdependence of the financial markets. The returns' spreading mechanism and properties' fluctuation is important due to several reasons including the spreading mechanism gives some data of the market efficiency. Spreading of the assets' returns shows a profitable trading strategy and if the interest of this trading strategy is higher than its operational costs, it potentially gives the evidences of market inefficiency. Second, spreading mechanisms are critical component of the property portfolio as being informed of the returns' spread impact can influence on selecting return portfolio and reducing its risk. And the third one, the data of spreading properties' fluctuations and turbulences can be used in predicting the turbulence [2].

Spreading properties' fluctuations provides us some information of the market efficiency. A property return must not be predicted in an efficient market through using the previous returns of other properties. The existence of spreading among properties' returns may provide the possibility of using a profitable trading strategy and if the interest of this trading strategy is higher that its operational cost; then, it is regarded as the potential cause of inefficiency in the market.

Studying the effect of oil market on Iran's capital market can be considered as the most critical economic issues in Iran. Since, on one hand, stock market is the source of collecting people's savings and establishing a proper foundation for investment; and on the other hand, is the oil price as a good which supply the country's major income. Oil market as a good with a globally determined price has been probably affected by financial-economic crises and experienced strong and weak fluctuations.

On one side, these fluctuations has caused economic activities' volume oscillation which may influence on investment and consequently on the stock market. The effect of crude oil price, on the other hand, on the stock prices of stock companies may be probably different according to the company's type. Crude oil is the raw material of the petrochemical companies and the final product of the refinery companies. Hence, the crude oil price can reversely influence on the aforementioned companies' stock prices. Thus, it is critically important to know the correlation structure between crude oil price and the petrochemical companies' stock prices. Therefore, this research main problem is to study the relation and correlation between petrochemical and refinery companies' stock price registered in Tehran stock exchange with the crude oil global price. So, research hypotheses are presented as follows:

- First hypothesis: there is a negative, significant conditioned dynamic correlation between stock price return of the petrochemical companies registered in Tehran Stock Exchange and the West Texas Intermediate crude oil price return.
- Second hypothesis: there is a positive, significant conditioned dynamic correlation between stock price return of the petrochemical companies registered in Tehran Stock Exchange and the West Texas Intermediate crude oil price return.

2 LITERATURE OF CRUDE OIL PRICE IMPACT ON THE STOCK MARKET

Capital market consists of two major sectors including banking sector and the financial market. The capital market itself is classified into two parts of the primary and secondary markets. The issuer of the securities, in the primary market, directly offers its securities for sale. This part of the capital market allows the possibility of transforming savings to investments. The current securities are exchanged in the secondary market. In other word, securities holders in the secondary market are allowed to sell the securities to each other which in turn ensure the funds flow in the primary markets. Supplying enterprises' required sources from securities is much easier than banking sector. However, it is worth mentioning that banking sector and securities market operates as complementary to meet the financial requirements of the enterprises; though, as it was previously mentioned, the major role of directing public savings and scattered capitals toward the desired investment depends on the securities market [3].

However, oil is considered as one of the production elements of any country and the world strategic commodity. As a result, strong fluctuations of oil price which is called oil shock (positive and negative effects) may significantly influence on the economy of developed or developing countries. On the other side, once a high share of GDP and annual budgets, in Iran economy, were attributed to oil incomes; then, Iran's economy was founded based upon a monoproduct economy indicating that oil price and revenues are regarded as an exogenous, simulating factor of prosperity and downturn in Iran such that

uncontrolled fluctuation of this factor cause oscillation of most economic variables. Thus, it is significant to study the effect of crude oil price on Iran's economy as an oil-rich, oil exporter and mono-product country.

Oil in oil-importing countries is considered as one of effective factors on commodity production. Hence, this impact will be manifested in companies' financial statements as the final cost. It is clear that the cost of product increases, the less profit and finally stock price decreases. Chen, Roll and Ross(1986) in a study named 'Economic factors and stock market' viewed oil as an effective factor in the product final cost; whereas, crude oil price changes may influence on the producing countries' foreign currency incomes. It can be expected that higher foreign currency incomes, if it is properly planned and applied, may lead to higher earnings in which industries are highly prospered and the companies' production and sales will increase; then finally, the firm's profitability and stock price will also increase. On the other hand, since oil is known as the major source of GDP of oil-producing countries, it can be also expected to have the same relation of GNP and price index in oil price and price index in oil-producing companies.

Different market participants, investors and financial experts as well as economic planners and policy makers, particularly in oil-exporting countries like Iran, require to study the effect of oil price changes on domestic markets and its interaction with property prices such as stock price in different conditions in policy making; in addition, they ask for a framework that represents how oil price change can affect stock price. Stock value equals to the sum of discounted value of the future cash flows which are influenced by the macroeconomic events and later by the oil stimulus (impulse). Iran is known as an important oil exporting country in which oil revenues are exclusive state possession. These two features can reveal oil market developments in the country's financial and budgetary policies such that once oil price increases, the earned oil currency will be deposited in the foreign currency account. If there is no sufficient demand for the currency at the target price; then, the central is forced to purchase the currency and convert it in to monetary resources (in Rials) for the budget goals. This policy can cause the central bank's foreign assets as well as increasing the country's monetary basis. Moreover, in the case of reduced oil price as the state will not reduce its costs and expenditures, the emerged budget deficit forces the government to borrow from central bank. So, government's net debt to the central bank increases which in turn enhances (strengthens) monetary basis. Therefore, the government fiscal policy in either increasing or decreasing oil price may cause increased monetary volume. When liquidity increases due to reduced monetary purchase, the financial investors are potentially motivated and encouraged to review the assets portfolios to keep the asset's value.

Investment property portfolio contains currency, stock, housing and etc. Increasing liquidity of monetary investors followed by increased inflation can cause discouraging of holding cash; so, more investments are flown toward assets markets. Assets market including stock market is a type of market that quickly changes monetary investments cash in to securities; so, it is highly sensitive and effective. In fact, reduced oil price can cause enterprises' investment plans to be subjected to uncertainty and since firms' profitability is influenced by oil revenues; then, stock price can decrease. On the other hand, if oil price and, as its consequence, the country revenue increases, optimistic expectations of prosperity and increased profitable activities will be created leading into positive growing of stock price index; therefore, it is not surprising that oil price significantly influence on this market through transferring individuals' capitals.

2.1 LITERATURE REVIEW

Giuwanini et al (2004), in a study, tested how stock market returns fluctuations are correlated with oil market. They answered this question that how much the current and future oil indices are conditionally correlated with stock market index, and whether this conditioned correlation is high or low.

Sung Hun (2006) and Seung Min (2006), in a study named 'Variance sudden changes and fluctuations of foreign currency markets' within a time period of 1990-2008, through ICSS algorithm showed that 1997 financial crisis of south East Asia and the west current recession significantly cause a structural rupture in the currency markets fluctuations. Tansochat et al (2009) , in a paper, studied the effect of crude oil future price fluctuations and oil companies returns' fluctuations overflow on several oil companies such as Royal Dutch Shell, Chorven, BP, Axon Mobile, as well as the current and future crude oil prices through using econometric techniques of constant conditioned correlation(CCC-GARCH), VARMA-GARCH and VARMA-AGARCH. Research findings demonstrated that the constant conditioned correlation between West Texas Intermediate future price and oil stock indices returns is extremely low. However, using VARMA-AGARC and VARMA-GARCH techniques showed no overflowing impact.

Babiker et al (2010) analyzed the impact of structural changes on the South Africa's stock market fluctuations. They found out 5 structural rapture points in the fluctuations non-conditioned variance leading to change GARCH model coefficients, through using ICSS algorithm and GARCH model, for price index daily data.

3 RESEARCH METHODOLOGY

Research statistical samples include all the petrochemical companies registered in Tehran stock exchange for within March 25, 2007 to June 21, 2014. So, the participants consist of stock exchange petrochemical and refinery companies. The present research, regarding the limited statistical participants, studied stock price dynamic conditioned correlation of the all aforementioned companies with crude oil global price (WTI). Petrochemical and refinery companies are, then, classified in the chemical material group as following:

Table 1. The present petrochemical and refinery companies in the stock exchange

Details	Co name	Stock symbol	Research Symbol	Beginning of the period
Petrochemical companies of the Tehran Stock Exchange	Abadan Petrochemical	Shepetro	Shepetro	March 26, 2007
	Arak Petrochemical (Shazand)	Sharak	Sharak	March 26, 2007
	Isfahan Petrochemical	Shasfha	Shasfha	March 25, 2007
	Khark Petrochemical	Shekhark	Shekhark	March 26, 2007
	Farabi Petrochemical	Shefara	Shefara	March 25, 2007
Refinery companies of Tehran Stock Exchange	Tabriz oil refinery	Shabriz	Shabriz	November 13, 2010
	Bandare Abbas oil refinery	Shebandar	Shebandar	June 24, 2012
	Isfahan oil refinery	Shapna	Shapna	June 29, 2008

3.1 MULTIVARIATE GARCH MODELS

Followed by the Angel early paper (1982), disregarding the importance of modeling financial and economic variables' fluctuations, extensive attempts were done to understand how financial assets' returns simultaneously move which resulted in introducing multivariate GARCH models. These models were initially applied for the effect of covariance on the asset pricing in the monetary assets' portfolios. The significant characteristic of these models is its adequate flexibility in modeling variance and covariance dynamics. Let's consider random vector $\{r_t\}$ with the order of $N \times 1$ and zero mean $(Er_t = 0)$ assuming that there is no linear correlation. According to the available data, matrix $H_t = [h_{ijt}]$ with the order of $N \times N$ is a conditioned covariance matrix r_t up to t time (i.e. Ω_{t-1}) and ε_t is the error vector in which $E\varepsilon_t\varepsilon_t' = I$ is as follows:

$$r_t = H_t^{1/2}\varepsilon_t \quad (1)$$

It stipulates general multivariate GARCH literature. Now, several methods are proposed to solve the model and estimate H_t matrix elements.

3.1.1 CCC-GARCH MODEL

Correlation model are based upon analyzing conditioned covariance matrix with the conditioned standard deviation and correlation.

The simplest multivariate correlation is Conditioned Constant Correlation (CCC) introduced by Bollerslev (1990). In this model, the conditioned correlation matrix is constant over time; and as a result, the conditioned covariance matrix can be written as follows[1]:

$$H_t = D_t R D_t = \left(\rho_{ij}\sqrt{h_{iit}h_{jjt}}\right),\ D_t = diag\left(h_{11t}^2,\ldots,h_{NNt}^2\right)$$

[1] *Bauwens, L and els, (2006),"Multivariate GARCH Models: a Survey", Journal of Applied Econometrics, NO 21, PP 79-109.*

$$\boldsymbol{R} = \begin{bmatrix} 1 & \dots & \rho_{1N} \\ \dots & \dots & \dots \\ \rho_{N1} & \dots & 1 \end{bmatrix}$$

Where ρij is the correlation coefficient of i and j assets; and the conditioned fluctuations diagonal matrix (standard deviation) changing within time $\mathrm{D_t}$ cane be represented as follows:

$$D_t = \begin{bmatrix} \sqrt{b_{11,t}} & 0 & 0 \\ 0 & \sqrt{b_{22,t}} & 0 \\ 0 & 0 & \sqrt{b_{NN,t}} \end{bmatrix} = \begin{bmatrix} \hat{\sigma}_{t,1} & 0 & 0 \\ 0 & \hat{\sigma}_{t,2} & 0 \\ 0 & 0 & \hat{\sigma}_{t,N} \end{bmatrix}$$

Any elements on the matrix main diagonalD_t, indeed, show fluctuations (standard deviations) of each asset at time t which is obtained in a non-matrix expression by GARCH (1, 1) process.

$$h_{ii,t} = \omega_{\cdot} + \alpha_i \varepsilon_{i,t-1}^2 + \beta_i h_{ii,t-1}$$

$h_{ii,t}$ variances are, indeed, that σ_t^2in the GARCH process which are shown by $h_{ii,t}$ here.

3.1.2 DCC-GARCH MODEL

Angel, in 2002, provided DCC model which is referred the heart (center) of dynamic conditioned correlations by rejecting the constant assumption of conditioned correlation. The correlation matrix, in this model, is allowed to change over time. This model is widely used for further calculations. There is no significant difference between CCC and DCC in definingH_t matrix; H_t matrix in this model is also a covariance-variance matrix:

$$\varepsilon_t|\varphi_{t-1} \sim N(0, H_t) \sim N(0, D_t R_t D_t)$$

$$H_t = D_t R_t D_t$$

Conditioned fluctuations diagonal matrix (standard deviation) changing with time D_t in DCC model is like CCC model extracted from a univariate GARCH process which can be rewritten in the matrix expression as follows:

$$D_t^2 = diag(a_{0,i}) + diag(a_{1,i}) o \varepsilon_t \varepsilon_{t-1} + diag(b_{1,i}) o D_{t-1}^2$$

Where, o is the matrices member operators (corresponding members). Moreover, $u_t = D_t^{-1}\varepsilon_t$. The only difference of DCC and CCC models is in the time variable of residuals conditioned correlation matrix i.e. R_t.

4 RESEARCH FINDINGS

Studying research variables graphs reveals that research variables are not reliable. Thus, variables' reliability was verified through the extended Dickey-Fouler reliability test which the results showed the unreliability of the studied variables. Test results are presented in Table (4-1).

Table (4-1) - Test results of unit root of the extended Dickey-Fouler and Fillips Prone at data level

Variable	Wti	Shepetro	Shekharak	Shesafa	Shefara	Sharak	Shapna	Shebandar	Shabriz
ADF statistic	-1.78	-1.69	-2.32	-2.12	-1.54	-1.84	-2.85	-2.54	-1.58
Prob	0.71	0.75	0.41	0.52	0.24	0.48	0.75	0.54	0.75

Source: the present research findings using Eviews 7 software package

The estimated statistic for Wti variable was -1.783 which is larger than its critical value at the confidence level of 95%; thus, the hypothesis of no unit root is rejected. This is the same for all other indices. Once the unit root is established in the all studied indices, Dickey-Fouler and Fillips Prone test is conducted for the first-order difference. The results are shown in Table (4-2).

Table 4-2- Test results of unit root of the extended Dickey-Fouler test for the variables' first-order difference

Variable	Wti	Shepetro	Shekharak	Shesafa	Shefara	Sharak	Shapna	Shebandar	Shabriz
ADF statistic	-10.17	-20.95	-21.02	-19.15	-21.79	-19.38	-14.87	-17.25	-20.2
Prob	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: the present research findings using Eviews 7 software package

The variables' first-order difference assuming the no intersect, the procedure, as well as Dickey-Fouler and Fillips Prone extended test results demonstrate the reliability of research variables. Therefore, it can be stated that research variables are I(1) meaning that they can be reliable by only one subtraction.

Reliability test revealed that research variables are I(1); hence, data level cannot be applied in GARCH models. So, difference log research variables were used. Reliability test results showed variables' reliability which is provided in Table (4-3).

Table 4-3- test results of the extended Dicky-Fouler unit root for the variables' returns

Variables	Wti	RShepetro	RShekharak	RShesafa	RShefara	RSharak	RShapna	RShebandar	RShabriz
ADF statistic	-9.80	-20.95	-22.35	-15.25	-26.25	-20.71	-8.25	-10.25	-15.25
Prob	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: the present research findings using Eviews 7 software package

4.1 STATISTICAL DESCRIPTION OF RESEARCH VARIABLES

The statistical properties of research variables must be identified. To do this, research variables returns are statistically described in the following table.

Table 4-4- Research variables descriptive statistic

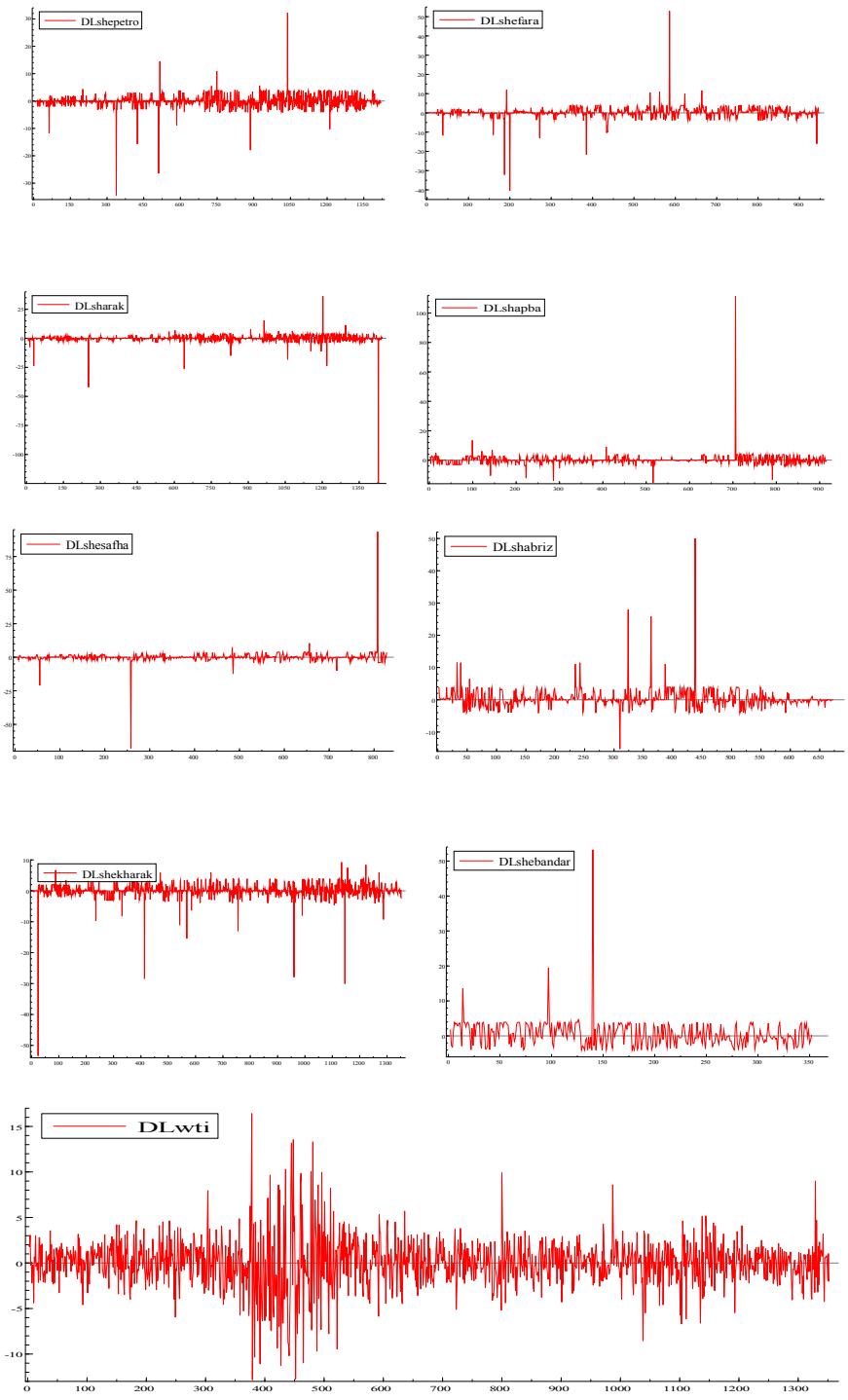
Variable	Minimum	Median	Maximum	Standard deviation
$\boldsymbol{Rwti}$	-12.82	0.025	16.41	2.70
$\boldsymbol{R}$**Shepetro**	-34.41	0.020	32.17	2.41
$\boldsymbol{R}$**Shekharak**	-53.41	0.059	9.25	2.68
$\boldsymbol{R}$**Shesafa**	-67.95	0.017	93.51	4.42
$\boldsymbol{R}$**Shefara**	-40.41	0.199	52.95	3.26
$\boldsymbol{R}$**Sharak**	-124.59	-0.016	36.19	4.24
$\boldsymbol{R}$**Shabriz**	-15.25	0.394	50.06	3.27
$\boldsymbol{R}$**Shebandar**	-4.08	0.638	53.24	4.00
$\boldsymbol{R}$**Shapba**	-15.33	0.168	111.5	4.25

Source: the present research findings using EViews 7 software packag

It is known that applying GARCH models requires the variance heterogeneity in the series. Thus, it is necessary to refer the series graphs before any test is done. The graphs show the clustered fluctuations in the series indicating that low fluctuations are accompanied with low fluctuations and, in return, high fluctuations with high ones. This feature prevalent in the financial markets can be also considered as the variance heterogeneity.

4.2 VARIANCE HETEROGENEITY TEST

To ensure the variance heterogeneity of the GARCH models' estimation, it is required to conduct ARCHLM test. Research variables returns' graphs are shown in the following.



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Graph 1- Research variables return graph within studied time interval

Though, the above graphs show variance heterogeneity in the model's residuals, ARCH LM test is done to ensure variance heterogeneity. The test results are presented in Table 4-5.

Table 4-5- ARCH LM test results

Variable	F statistic	Probability	Result
$Rwti$	14.21	0.00	Variance heterogeneity
RShepetro	29.78	0.00	Variance heterogeneity
RShekharak	8.13	0.00	Variance heterogeneity
RShesafa	58.77	0.00	Variance heterogeneity
RShefara	54.25	0.00	Variance heterogeneity
RSharak	20.25	0.00	Variance heterogeneity
RShabriz	20.21	0.00	Variance heterogeneity
RShebandar	15.22	0.00	Variance heterogeneity
RShapba	10.23	0.00	Variance heterogeneity

Source: the present research findings using EViews 7 software package

Variance heterogeneity in the returns series was ultimately determined according to ARCH LM test and graph. Now, it is possible to use conditioned heterogeneous variance models. DCC-GARCH technique can be used considering research goal stating that there is a significant relation between Tehran stock exchange and oil market. This technique was founded based on this hypothesis that the conditioned correlation between financial markets is not always a constant number (figure); rather, it increases or decreases in various periods. Furthermore, this correlation can be negative or positive in some periods. In contrast to the conventional models which regard a constant figure as the correlation between two or more variables, this technique estimates one figure per any time interval. Therefore, it allows us to evaluate the relation between various financial markets in various periods. For instance, maybe the correlation of two or more series can change following a monetary crisis.

4.3 ANALYZING THE SPREAD BETWEEN CRUDE OIL PRICE AND STOCK PRICE INDEX RETURNS OF PETROCHEMICAL AND REFINERY COMPANIES

As it was previously mentioned, estimating multivariate GARCH models requires two defaults of variables reliability and variance heterogeneity which analyzing the defaults indicated this. Now, research hypotheses are tested. So, DCC-APARCH bivariate model is estimated through OX/Metrics software as its usage facility and high efficacy in simulating and predicting financial variables. Table 4-6 shows non-conditioned and constant correlation between research data. Therefore, the estimated conditioned correlation by DCC-EGARCH pattern is not a constant figure and a different number is estimated per each period.

Table 4-6- Conditioned correlation coefficients between sample companies' stock price with crude oil global price

	Stock exchange Petrochemical companies					Stock exchange Refinery companies		
Variable	**Shepetro**	**Shekharak**	**Shesafa**	**Shefara**	**Sharak**	**Shapna**	**Shebandar**	**Shabriz**
WTI	-0.061	-0.041	0.015	-0.059	-0.06	0.17	0.070	0.011
Prob	0.10	0.00	0.56	0.08	0.08	0.06	0.09	0.73

Source: present research findings using OX/Metrics software package

As research findings demonstrate, petrochemical companies, in general, have negative, significant conditioned correlation with crude oil price which means crude oil price overflow over petrochemical companies' stock price. Of the petrochemical stock prices, only Isfahan petrochemical Co was positively correlated with the crude oil global price; however, this positive estimated effect is not statistically significant. So, the first hypothesis stating the negative conditioned correlation changing overtime between stock exchange petrochemical companies' stock price with the crude oil global price cannot be rejected.

On the other hand, it is the opposite in the refinery companies registered in Tehran stock exchange. Such that stock price in all three refinery companies is positively correlated with crude oil global price which its significance reveals the correlation variability over time. It means that correlation can be positive in some days and negative in other days; however, the mean effect is positive. Tabriz Refinery Company's stock price lacks any significant correlation with Shabriz symbol; though, it is also positive. Finally, research second hypothesis, regarding research findings, on the significant positive correlation between refinery companies' stock price with crude oil global price is maintained.

5 CONCLUSIONS AND RECOMMENDATIONS

The present research was seeking for finding the answer to these questions that is there a negative, significant dynamic conditional correlation between stock price return of the petrochemical companies registered in Tehran Stock Exchange and West Texas Intermediate crude oil price return? Is there a positive, significant dynamic conditional correlation between stock price return of the petrochemical companies registered in Tehran Stock Exchange and West Texas Intermediate crude oil price return?

The correlation between West Texas Intermediate crude oil price with stock price of the petrochemical companies registered in Stock Exchange including Abadan Petrochemical Co, Arak Petrochemical, Isfahan Petrochemical, Khark Petrochemical, Farabi Petrochemical, Tabriz Oil Refining, Bandar E Abbas Oil refining and Isfahan Oil refining were studied, following the above mentioned questions were replied , through DCC method. According to research results, the petrochemical companies, in general, have negative, significant conditioned correlation with the crude oil price meaning the overflowing of crude oil price over petrochemical companies' stock price. Of the petrochemical companies' stock prices only Isfahan Petrochemical Co stock price was positively correlated with the crude oil global price; however, this positive estimated effect is not statistically significant. Thus, the first hypothesis of the conditioned negative correlation varying over time between stock prices of petrochemical companies registered in the stock exchange and the crude oil global price cannot be rejected.

On the other hand, it is on the contrary to the refining companies registered in Tehran Stock Exchange such that the stock prices of all three refining companies are positively correlated with the crude oil global price. Its significance indicates the correlation variability overtime. It means that correlation is some days positive and some days negative; therefore, the median impact will be positive. However, Tabriz Refinery Company's stock price lacks any significant correlation with Shabriz symbol; whereas, this correlation was positive, too. Finally, according to research findings, research second hypothesis that there is a positive, significant relation between the refineries' stock prices and the crude oil global price cannot be rejected.

5.1 RECOMMENDATIONS

Increased integration of financial markets in addition to information flow rate is the proper explanation in perceiving the effect of turbulences overflow of the global oil market to Tehran stock exchange. Overflows turbulences can lead to surrounded cross markets and changing in the common information; moreover, it can simultaneously influence the expectations throughout the markets. According to Tehran stock exchange structure, the fact that oil price fluctuations in the global markets can influence country's capital may not be such impossible. Since, up to 50% of Iran's stock exchange consists of oil and metal companies; so, increased oil price followed by metal market affecting can also influence on the more than 50% profit margin in the market. Therefore, according the aforementioned and research results, oil price monitoring will be more manifested in predicting petrochemical and refinery companies' stock price.

5.2 FURTHER RESEARCH

- It is recommended that future researches study and test the dynamic correlation of crude oil price with various industries' stock prices.
- It is suggested that further researches use other econometric methods such as BEKK to study crude oil price fluctuations spread into stock market fluctuations and in particular stock prices of petrochemical and refinery companies.

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