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Effect of Oil Global prices on Stock Prices of the Petrochemical Industry in Tehran Stock Exchange

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Abstract: The main objective of the present study is to investigate the effect of oil global prices on stock prices of the petrochemical industry in Tehran Stock Exchange. So the basic question of the research is whether there is any relationship between oil global prices and stock prices of petrochemical industry in Tehran Stock Exchange. To achieve this purpose, a 10-year period (2002-2012) has been considered. The present research regarding the goal is an applied one and causal – Ex-Post Facto.The population includes all the listed companies in Tehran Stock Exchange. The needed sample has been extracted using the elimination method and putting restriction in the research population. In order to analyze data in this study, parametric and nonparametric statistical methods have been used. To describe the data, using SPSS18, descriptive statistics such as frequency distribution, mean, standard deviation and so on is used, and to analyze data and test research hypotheses MICROFIT and EVIEWS software are used. Research findings indicate that there is a positive and significant relationship between global price of oil and all study variables, including investment, exchange income, and employment.
Keywords: OPEC, Refinery, Petrochemical Products

INTRODUCTION

If man's today lifestyle is compared with the past traditional life, we will realize that one of the most important differences between these two lifestyles is the manner of exploiting energy resources. In fact, during the last three centuries the main factor of changes in the pattern of human life can be largely attributed to the widespread use of new energy resources [1].

Oil and oil -industry play a vital role in economy infrastructure of countries that are producers of this precious material. Economy of Iran is also mainly based on oil. In Iran, firstly, oil as a source of energy, has evolved Iranian life and economy and has caused economic growth and development. Secondly, oil revenues have caused development and progress in all economic and social aspects [2].

Stock market on the one hand works within a larger system called Iran socio-economic system and on the other hand it is affected by global changes and prices. Therefore, it is affected by these factors severely. This affectability is significant, because Iran stock market is young and shaping. Therefore the environmental

changes will affect it too much. So, factors such as oil global prices, investment amount, foreign exchange income, inflation and exchange rates are important environmental factors that affect stock market and stock prices of stock exchange companies [3].

According to economic theories, stock prices should reflect expectations of economic units from future performance of the companies. If the stock price index reflects the correct information about future procedure of fundamental variables, then it can be used as a leading variable to predict fluctuations in economic activities.

RESEARCH THEORETICAL FOUNDATIONS

OPEC and petroleum pricing systems

In 1959 and 1960, factors such as oil prices decrease and preventing created multipolar monopoly in the world by the great companies that mastered more than 90 % of oil production and consumption for nearly sixty years, leaded to establishment of OPEC at 1960 [4].

Pricing system "plus Gulf"

In this pricing system, the price of petroleum products anywhere in the world was formed by the sum of the product FOB price in the Mexico Gulf and the oil transfer from the Mexico Gulf to the desired place. Therefore, this system is called "plus Gulf" system [5].

Petroleum "Official" Pricing Mechanisms

The prices of petroleum varieties of other manufacturers were determined due to quality differences and transportation costs based on the index price (OPEC reports set of various years).

Pricing method of "product reliance"

Prices of petroleum products will be determined from single shipment market. Naturally, by increasing the petroleum products price, the petroleum net recycling price will also increase, and vice versa by increasing costs of transport and refining, the net recycling price will be reduced. Also, by reducing the share of each petroleum product, and by assuming that other products remain constant or reduce, the petroleum net recycling price will decline [5].

Pricing method using “OPEC oil basket”

Usage of pricing method of product reliance caused oil prices to be out of control of even OPEC member countries, so that the downward trend in oil prices escalated in 1986. So, by the first of January 1987 the price of the OPEC Reference and Basket was introduced. The basket is composed of 7 different types of

petroleum. OPEC reference and basket price is determined by the price arithmetic average of a single shipment of them.

Pricing method of "relevant to market"

Oil buyer companies also welcomed market-related pricing, because the oil market was mainly dominated by them, was responsible for determining the index petroleum price [5].

Investment

Marx refers to capital as a "real or physical labor", because the means of production, raw materials, machinery, buildings and so on that are brought together in the process of production are post-production products [6].

Capital market due to numerous advantages plays a major role in improving economic conditions. Capital market provides the opportunity for investors to distribute their own capital among a large number of companies with diversified investments. Therefore, not only investment risk on a specific kind of stock is decreased, but many companies' capital sources will be increased [7].

Employment

The acuteness of unemployment problem in the third world and the extent and frequency of its reasons should already have made the scale and extent of the effort that is required to obtain the total employment in the near future, clear in advance .

These efforts have involved major changes in the government strategy at both national level and practical level, and also require large changes in the behavior of institutions and individuals in both public sector and private sector [8].

RESEARCH BACKGROUND

In this section a number of studies that have been conducted in Iran and abroad will be discussed.

Research conducted in Iran

Abunoori and Musharrafi have examined the effects of economic indicators on stock price index of the petrochemical industry in Iran, using multiple regression (least squares) econometric models. The obtained results suggest the existence of a long term equilibrium relationship between inflation, exchange rate, and oil price and stock price index of the petrochemical industry. Among macroeconomic variables, inflation, oil prices and exchange rates respectively, effect significantly and positively on stock index of the petrochemical industry[3].

Gasemzadeh has studied the long-term relationship between Tehran Stock Exchange stock price index and currency macro variables. Kind of long term relationship between the variables in the model is as follows that there is a positive correlation between Stock Exchange stock price index and liquidity, and it is

negatively correlated with the actual exchange rate and the real bank earnings rate[9].

Research conducted abroad

Gupta and Modis on their paper investigated the dynamic relationship between oil price shocks and stock market by VAR method and using monthly data from the first month of 1973 until the seventh month of 2011. Results show that for an oil-importing country like South Africa, stock prices, stock returns and petrochemical industry revenue increases[10].

MATEREALS AND METHOD

The present research regarding the goal is an applied one and causal ExPost Facto. In this study, to test the research hypotheses Tehran Stock Exchange data has been used seasonally and OPEC monthly and annual reports have been employed. Then the research hypotheses are tested in each case. Through the approval or rejection of assumptions, the most important assumptions are concluded, while the results of the study can be generalized to the entire population. Generally, in this study, the scientific method and the hypotheses testing that leads to derive the overall results are used.

In this study, library method is used to collect data. To achieve the research goal and the possibility of testing the research hypotheses, the total data of Tehran Stock Exchange and the Exchange database, yearbooks, magazines, monthly and weekly stock, time series statistics, economic reports, central bank data, and OPEC's monthly and annual reports are used .

To check the research variables and assumptions monthly data is applied. The variables in the model are studied in terms of reliability first, and then ARDL method is used to estimate the equations.

RESULTS

Research variables included oil price, investment, foreign exchange revenues, and employment and control variables such as exchange rate, the value added of industry and inflation .

To evaluate the parameters in terms of reliability generalized Dickey Fuller test is used. The null hypothesis in this test is the existence of unit root.

Generalized Dickey Fuller test results are performed on the research variables in two states of with intercept and with intercept and process.

Therefore, the reliability test has been conducted on first-order difference of the variables that have not been in reliable levels, the results of which are given in Table 1. As can be seen, in the first order difference of the monthly variables that have not been in reliable levels, the absolute magnitude of the calculated ADF statistic is greater than the absolute magnitude of the table ADF at 5% level. As a result the null hypothesis that is the existence of unit root in the first-order difference of the variables that have not been in reliable levels will be rejected and

the variables are reliable in first-order difference. Thus, the inflation variable that is in reliable level, is (0) I and the rest of the variables are (1) I. The final results of reliability test are presented in Table 2.

Table 1. The results of reliability test of variables in first difference

Variable	First difference with intercept			First difference with intercept and process		
	Calculated ADF	**Interruption**	**Result**	**Calculated ADF**	**Interruption**	Result
LP	-3.93	0	Reliable	-4.45	0	Reliable
LPOIL	-3.8	0	Reliable	-4.4	0	Reliable
LER	-6.9	0	Reliable	-3.9	0	Reliable
LVAD	-4.7	0	Reliable	-4.3	0	Reliable
LREV	-4.5	0	Reliable	-3.68	0	Reliable
LEMP	-3	0	Reliable	-3.99	0	Reliable
LI	-5	0	Reliable	-4.45	0	Reliable
ADF-2.97: table at 5% level				ADF-3.49: table at 5% level		

Table 2. The final results of reliability test on variables

Variable	Reliability test results
LP	I(1)
LINF	I(0)
LPOIL	I(1)
LER	I(1)
LVAD	I(1)
LREV	I(1)
LEMP	I(1)
LI	I(1)

The ARDL model is used because if we use the variable of inflation, the variables used in this study will be a combination of me (0) and me (1). Optimized interruption must be determined first.

In ARDL method the maximum model optimal interruption is selected by Schwartz -Bayesian (SBC) criterion. After estimating the model, the co-integration test is performed to determine whether estimated equation tends to the co-integration between variables. To achieve this purpose, the following statistics are calculated:

$$t = \frac{\sum_{i=1}^{\wedge} \alpha_i - 1}{\sum_{i=1}^{\wedge} S_i}$$

α_i s are the coefficients of the variables with interruption related to the dependent variable and S_i s are the standard deviation of these coefficients. This statistic is compared with its corresponding critical value offered by Banerjee and Dolado and Master. If the absolute magnitude of the calculated statistic is greater than the critical value absolute magnitude (long term relationship it is approved or otherwise it is not approved.

The longterm effect of the studied variables is examined afterwards. Using the long-term estimation by ARDL method the effectiveness of each dependent variable and type of relationship are characterized. Then, through the vector error correction model (ECM) the short-term relationship between the variables and the time to reach equilibrium of variables are estimated.

CONCLUSIONS

Based on the results of equations estimation, oil prices coefficient has a positive and significant impact on petrochemical industries stock price. Thus, the research first hypothesis is confirmed. Based on the results, following the rise in oil prices, the average of petrochemical industries stock price increases, too. Therefore, the oil prices volume increasing by one percent, leads to the increase of the average of petrochemical industries stock price 29.0 percent. The present study result is consistent with the research results of Gupta et al [10]. They also concluded that the rise in oil prices increases stock price. The result of this study is inconsistent with the study of Robert et al [11].

The results showed that the oil price coefficient has a positive and significant effect on the stock foreign exchange revenues of petrochemical industries.

Therefore, the second hypothesis is confirmed. Actually, following the rise in oil prices, the foreign exchange revenues of petrochemical industries increase, too. Therefore, the oil prices volume increasing by one percent, leads to the increase of the foreign exchange revenues of petrochemical industries 2.0 percent. The coefficient of this variable is also significant.

The results also showed that the oil price coefficient has a positive and significant effect on the employment of petrochemical industries. Therefore, the third hypothesis is confirmed. Therefore, the oil prices volume increasing by one percent, leads to the increase of the employment of petrochemical industries 0.96 percent. The coefficient of this variable is also significant. The results of this study are consistent with those of [12].

The present research results showed that the oil price coefficient has a positive and significant effect on the investment of petrochemical industries. Therefore, the forth hypothesis is confirmed. Therefore, the oil prices volume increasing by one percent, leads to the increase of the investment rate of petrochemical industries 0.13 percent. The coefficient of this variable is also significant. The result of this hypothesis is the same as [13] in Ethiopia.

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