Asian Economic and Financial Review

journal homepage: http://aessweb.com/journal-detail.php?id=5002

GLOBAL ENERGY PRICES AND THE BEHAVIOR OF ENERGY STOCK PRICE FLUCTUATIONS

Ugur Ergun

International Burch University, Sarajevo

Azizah Ibrahim

International Burch University, Sarajevo

ABSTRACT

This study investigates the impact of global crude oil and global natural gas prices on the stocks price movements of the energy companies using multivariate regression and impulse response function analysis. Our data sets consist of global crude oil prices, global natural gas prices, stock market index and the stock prices of selected energy companies operating in Turkey. Our findings imply that, (a) market index is the most important factor in energy stock price movements, (b) a shock in the market index gives permanent positive impact on the energy stock price while, global crude oil and global natural gas prices give positive impact for one year and negative impact after one year.

Keywords: Energy stock prices, Market model, Impulse response function.

1. INTRODUCTION

Scarcity and political issues stipulate the cost of energy for the consumers. Which one is have greater impact on the determining of energy prices are not known well. This impact cause unexpected fluctuations and high volatility in energy prices. High degree of volatility and uncertainty draw the potential investors away from the market. This study attempts to clarify the role of global energy prices on the fluctuations of stock prices of energy companies.

The main issue which is handled in this paper is the impact of market index, global oil price and global natural gas prices on energy stock price movements. The reason Turkey is chosen for its dynamic and strong economic growth unlike other countries which are suffering from financial crises in Europe. There are plenty of studies in the literature regarding the stock price movements of Energy companies. Among them, Boyer and Filion (2007) assessed the financial determinants of Canadian oil and gas company stock returns. They found that Canadian energy stock is positively associated with the Canadian stock market return, crude oil and natural gas prices supporting the market theory. Kavussanos and Marcoulis (1997) investigated the stock market perception of risk

factors on the profitability of petroleum refining companies over the period July 1984 - June 1995. They found the market return (S&P 500) has the largest impact on the share price of refineries.

Aleisa *et al.* (2003) showed that price fluctuations of West Texas Intermediate barrel 1-month to 4-month futures explain share price movements of firms operating in exploration, refinery and marketing of oil. They have noted that the degree of co-integration varies between crude oil prices and the firm type. Sadorsky (2001) examined the Canadian oil and gas industry and he found that Canadian market return, crude oil prices, the Canada–US exchange rate and the short term Canadian interest rates have an influence on Canadian energy stocks, although the first two factors have a much larger impact. He also found that crude oil prices and market return have a positive effect on stock prices. Unlike Sadorsky (2001), Ferson and Harvey (1991) found that real interest rates and market return are the most important determinants in explaining the return of American petroleum shares.

Manning (1991) used market model and oil price changes and find strong positive relationship between the prices of London quoted oil company shares and spot oil prices for those firms operating in exploration and weak relationship for integrated oil companies over the period January 1986 to June 1988. Sadorsky (2012) studied the correlations and volatility spillovers between oil prices and the stock prices of clean energy and technology companies. He found that the stock prices of clean energy companies highly correlated with (correlate more highly with) technology stock prices compared with (than with) oil prices.

Oberndorfer (2009) studied the relationship between energy market developments and the pricing of European energy stocks and found that oil price negatively impact on stock returns of European oil and gas stocks. He has suggested that the oil price is the main indicator for energy price developments for the European stock market.

Galvani and Plourde (2010) found that futures for crude oil, natural gas and unleaded gasoline fail to enhance the performance of representative energy stocks in terms of return to risk, but do decrease the overall level of risk exposure borne by passive equity investors. They also suggested that futures contracts on energy commodities are valuable to market participants with an interest in hedging against price fluctuations in energy markets by buy-and-hold strategies.

2. DATA AND METHODOLOGY

We employ the monthly and daily stock price data from two of the largest energy companies AYGAZ and TUPRS operating in Turkey and monthly data consist of import, ISE100 index, Crude oil prices, and natural gas prices over the six years spans from 2005 to 2011.

At first we use three-variables factor model includes market index, global crude oil prices and global natural gas prices in order to better explain the stock movements of energy companies. A factor model relates the return on an asset to the values of a limited number of *factors*, with the relationship described by an equation. In its most generic form, such a model can be written as:

$$r_i = \beta_0 + \beta_{i1} f_1 + \beta_{i2} f_2 + \beta_{i3} f_3 + e_i$$

We select ISE100 index, global crude oil price, and global natural gas price which are expected to have significant impact on the stock returns of energy companies and estimate multivariate regression (the term was first used by Pearson, 1908) to examine the relationship between the three factors and stock returns of energy companies.

In the second step we apply forecast error Impulse Response Function (IRF) to see the variations resulted from any impulse in the factors. IRF analysis is used to analyze dynamic interactions between endogenous variables of a VAR (p) process (see (Lutkepol, 1991) for further discussion). It analyses the effect of a primitive impulse of a variable to another variable (Hamilton, 1994).

3. EMPIRICAL RESULTS

We form the regression equation based on the factor model in order to investigate the impact of Stock Market, global crude oil price and global natural gas price movements on the stock return of an energy company as follows;

$$SR = \beta_0 + \beta_1 ISE100 + \beta_2 OIL + \beta_3 GAS$$

Where, SR denotes the stock market returns of energy companies

ISE100 denotes index performance for Istanbul Stock Exchange National 100 Index

OIL denotes global crude oil prices

GAS denotes global natural gas prices

Estimation results based on the regression equation above is summarized in Table 1. Results indicate that ISE100 index movements have significant positive impact on the share prices of selected Energy companies. High R^2 gives strong evidence with regard to the role of market index on determining the fluctuations in the energy company's stock prices. However, no relationship has been detected between Stock Returns of the Energy companies and global oil and gas price movements supporting the single index model to some extent.

Table-1. Regression Estimation Results

	C	**DlnISE100**	**DlnOIL**	**DlnGAS**	**Adj R^2**
DLnAYGAZ	.0002	1.232	-.068	.076	.857
	(.077)	(21.54)*	(-.779)	(1.361)	
DLnTUPRS	.0009	1.075	-.037	.002	.906
	(.422)	(27.41)*	(-.624)	(.052)	

Note: the values in the brackets are the t- values and * denotes significant at the 1% level

According to the single index model stock price movements follow the market index variations, and the stocks of the companies in the same industry follow same trend. This is not enough to identify driving forces of the stocks movements.

In the second stage, we estimate the Impulse Response Function and analyze the effect of innovations in ISE100 stock market index, Global Crude Oil and Global Natural Gas prices on the stock returns of two largest Energy companies selected as the proxy for Energy sector.

Estimation results in Figure 1 and 2 show the impulse responses of the stock returns of selected energy companies to the one-standard deviation of ISE 100, Global Crude Oil and Global Natural Gas price shocks. The result implies existence of response in stock returns of energy companies caused by innovation in the ISE 100 index, global crude oil and global natural gas prices impact energy company's stock returns over the long period. It is also observed that impact is permanent in the long run. Stock price of the selected energy companies give quick response to shock in the global gas prices and ISE 100 market index. However they respond global crude oil price shocks in one month time.

The impact of global crude oil and global natural gas prices turn to negative after one year. This support supply-demand theory which is, increased prices tend to decrease demand over time.

4. CONCLUSION

Our empirical result shows that stock price movements of energy companies are affected by the stock market index and it provides enough evidence to market model approach to equity fluctuations. Global crude oil and natural gas prices have very limited impact during the stable economic conditions. Shocks in the market index, global crude oil prices and global natural gas prices impact the stock market movements of energy companies.

An innovation in the stock market index gives sudden positive impact. It is observed that this impact is permanent. An innovation in the global crude oil prices also gives positive impact. However it takes one month to respond this impact and turn to negative in one year time. Sudden response to innovations in global natural gas prices turn to negative in one year time.

The result of this study has useful implications to the portfolio investors, shareholders of the energy companies and policy makers.

REFERENCES

Aleisa, E., S. Dibooglu and D. Hammoudeh, 2003. Relationships among u.S. Oil prices and oil industry equity indices. International Review of Economics & Finance 15: 1-29.

Boyer, M.M. and D. Filion, 2007. Common and fundamental factors in stock returns of canadian oil and gas companies. Energy Economics 29: 428-453.

Ferson, W.E. and C.R. Harvey, 1991. The variation of economic risk premiums. Journal of Political Economy 99: 385-415.

Galvani, V. and A. Plourde, 2010. Portfolio diversification in energy markets. Energy Economics 32(2): 257-268.

Hamilton, J.D., 1994. Time series analysis Princeton University Press, Princeton, NJ.

Kavussanos, M.G. and S.N. Marcoulis, 1997. The stock market perception of industry risk and microeconomic factors: The case of the us water transportation industry versus other transport industries. Transportation Research. Part E, Logistics and Transportation Review 33: 147-158.

Lutkepol, H., 1991. Introduction to multiple time series analysis. Springer Verlag, Berlin.

Manning, N., 1991. The uk oil industry: Some inferences from the efficient market hypothesis. Scottish Journal of Political Economy 38: 324-334.

Oberndorfer, U., 2009. Energy prices, volatility, and the stock market. Evidence from the Eurozone. Energy Policy, 37: 5787-5795.

Sadorsky, P., 2001. Risk factors in stock returns of canadian oil and gas companies. Energy Economics 23: 17-28.

Sadorsky, P., 2012. Correlations and volatility spillovers between oil prices and the stock prices of clean energy and technology companies. Energy Economics 34(1): 248-255.

Appendix

Figure-1. Estimated Error Impulse Function for AYGAZ

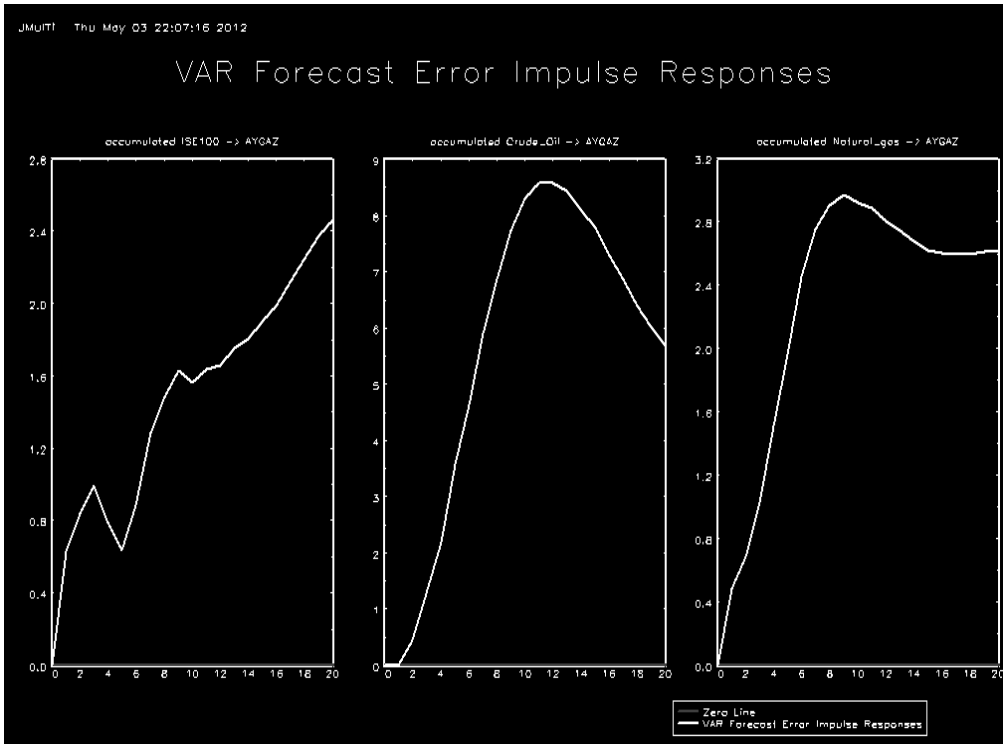

Figure-2. Estimated Error Impulse Function for TUPRS