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Impact of Oil and Gas Prices on Stock Returns: Evidence from Pakistan's Energy Intensive Industries*

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Abstract

Recent hikes in oil prices have increased the concerns of policy makers to find the factors that drive them, and the factors that are affected by them. Previous studies have shown that high oil prices adversely influenced the macroeconomy and firm's profit where oil is consumed as an input. This study examined the impact of oil and gas prices on the stock returns of energy intensive industries of Pakistan. To conduct the study quarterly data of 3 energy intensive industries, namely chemicals, fertilizer, and textile were obtained for the period of January, 2009-December, 2013. Based on the multifactor model and panel regression analysis, the findings indicated that oil price changes had a negative impact on the stock returns of chemicals, and textile, whereas the gas price factor was significant only in the case of textile. Furthermore, a significant impact of stock market index returns was observed on the stock returns of each industry. Finally, the general analysis[1] was conducted; its findings showed that oil prices, gas prices, exchange rate, and interest rate had a negative impact on the stock returns. However, the impact of stock market index returns was significant with the positive coefficient. The findings of this study suggest that the investors should keep an eye on the changes of oil and gas prices in order to make sound investment portfolios in Pakistan. Also, the policy makers and management of those industries should make effective plans to reduce their fuel costs.

Key Words: *Oil Price, Energy Intensive Industry, Gas Price, Multifactor Model, Panel Regression.*

Introduction

Recent years have beheld the dynamic changes in the oil prices. Due to which it has become an important factor concerning to the stock valuation and the macroeconomy of a country. Crude oil has been considered as the cornerstone in building the modern economy; it is used as an input for generating electricity, to lighten up the cities and powering homes, to fuel vehicles, and to run industries and machineries. It is a global commodity, whose price is determined by the global demand and supply, geopolitical conditions, OPEC policies, and fluctuations of the futures market (Basher & Sadorsky, 2006).

Another important fuel, natural gas is continuously gaining importance in the electricity, and industrial sector (EIA, 2009) because of low carbon intensity as compared to crude oil and coal (EIA, 2012).

* Energy intensive industries are consuming energy or gas extensively; on average they are annually consuming 100,000 MWh of electricity and 20 million therms of gas (Friends of the Earth, 2011).
[1] By considering the three energy intensive industries (chemicals, fertilizer and textile) as one panel.

According to EIA (2012) the world consumption of natural gas has been increased by 53 trillion cubic feet (Tcf) in 1980 to 113 trillion cubic feet in 2010. EIA (2013) report mentions natural gas as "the world's fastest-growing fossil fuel", with the increase in world consumption from 113 Tcf in 2010 to 185 Tcf in 2040.

The area of oil prices and macroeconomy has got great attention by the researchers (Hamilton, 1983; Mussa, 2000; Cunado & Garcia, 2001; Jones et al., 2004; Jimenez-Rodriguez & Sanchez, 2005; Cologni & Manera, 2008; Kilian, 2008; Cologni & Manera, 2009). In a study Hamilton (1983) indicates that high oil prices adversely influences the macroeconomy. According to the researcher the high oil prices are somehow responsible for the post World War-II recession in the U.S. Some other studies (Mory, 1993; Mork et al., 1994) show that, changes in oil prices negatively affect GDP, but decrease in oil prices do not essentially lead to a positive impact on output. According to Mussa (2000) an increase in oil prices by $5/barrel causes 0.25% decrease in global output. Papapetrou (2001) demonstrate that oil price changes negatively affect industrial production and employment. The EIA report (2007) specifies that high oil prices affect the economy of a country, both internally and externally (by their relationships with other countries through imports and exports).

The impact of oil prices depends on whether the country is oil importing or oil exporting. If the country is oil importing, then high oil prices will negatively influence the stock returns, but if the country is oil exporting then the results will be different (Park & Ratti, 2008). Oil prices can affect stock returns and the macroeconomy of an oil importing country in different ways: First, when prices of oil increase; the cost of production increase, create a transfer of wealth from oil consumers to the producers, causes inflation, affect interest rates, create low production, unemployment and low GDP growth in the country (Mussa, 2000; Nandha & Faff, 2008; Nandha & Brooks, 2009). Second, an increase in oil prices negatively affects government earnings, increase the expenditures of government budget and imports, decrease oil imports and its local demand (Anciaes, 2012). Third, high oil prices affect the industries' stock returns, depends upon their type of operations and nature. Different researchers (Faff & Brailsford, 1999; McSweeney & Worthington, 2008; Nandha & Faff, 2008; Ghoilpour, 2011) indicate that industries are not homogenous. For an industry whose output is oil like industry of oil and gas can generate more profit when prices of oil increased. But on the other side of the coin industries that are using oil as their input in production can face less profit and low production due to the boosted production cost (Nandha & Faff, 2008; Ghoilpour, 2011). Fourth, high oil prices can affect stock values, because when there is less profit showed by the firms a rational investor will be reluctant to invest in the market, which will create a downward pressure on the stock prices (Faff & Brailsford, 1999; Oberndorfer, 2009; Ghoilpour, 2011).

Previous studies (focused on the U.S., the UK, Canada, OECD, Australia, Emerging markets, Eurozone and GCC countries) have shown that oil prices affect stock returns, across industries/countries (Faff & Brailsford, 1999; Sadorsky, 1999; Papapetrou, 2001; Sadorsky, 2001; El-Sharif et al., 2005; Boyer & Filion, 2007; Henriques & Sadorsky, 2008; Oberndorfer, 2009; Arouri et al., 2010; Aloui et al., 2012). In case of gas prices, Boyer and Filion (2007), Ghoilpour (2011), and Acaravci et al., (2012) found that gas prices affect the stock returns. In contrast, Oberndorfer (2009) indicated that gas prices did not have a significant impact on the stock returns.

Pakistan

Crude oil has played an important role in the economy of Pakistan and represents a 30.8 % share in the total energy supply mix (Hydrocarbon Development Institute of Pakistan_HDIP, 2012). Pakistan is a net importer of crude oil. According to the economic survey of Pakistan (2013), in 2012 the Pakistan government has spent 13 million dollars to import 47,104 thousand barrels of crude oil, whereas the local production was half of that with 24,573 thousand barrels.

In Pakistan, natural gas is the main source of fuel for the industrial sector. It is used in different industries, especially in electricity, and industrial sector (cement, fertilizer, general Industry, transport) with 27.8% share in the former and 48.7% share in the latter sector (HDIP, 2012). Currently, natural gas is not exported or imported from other countries, due to which its prices are frequently not changing. Both the production and consumption of natural gas were 1,382 billion cubic feet in 2012 (EIA, 2013). Government of Pakistan is supporting different industrial sectors (fertilizer, and electricity) by subsidizing natural gas (Pak Tribune, 2011).

The purpose of this paper is to study the impact of oil and gas prices on the quarterly stock returns of Pakistan's energy intensive industries for the period of January 2009-December 2013. The remainder of this paper is organized as follows: Section 2 reviews some of the related literature. Section 3 explains the econometric model. Section 4 provides the description of the data employed. Section 5 explains the analysis procedure. Section 6 presents the empirical results, including descriptive statistics, and regression results. Section 7 includes the discussion of the regression results and section 8 concludes.

Literature Review

Now there is a growing body of literature driven on the relationship between oil prices and stock returns. Those studies could be divided into two categories: (i) oil prices and stock market returns, and (ii) oil prices and industry stock returns. In case of oil prices and stock market returns, different researchers have concluded different findings. For instance, Sadorsky (1999) found that changes in oil prices affect economic activity (industrial production) and real stock market returns, but changes in the economic activity did not have that much effect on the oil prices. Employing multivariate VAR model, Papapetrou (2001) indicated that oil price shocks had a positive impact on the interest rates, whereas they had a negative impact on the stock market returns, employment and industrial production. Maghyereh (2004) found that oil price shocks did not have a significant impact on the stock returns of emerging economies. Hammoudeh and Choi (2006) indicated that oil prices had not predicted the stock market returns of the GCC countries in the short run. Applying multifactor model, Basher and Sadorsky (2006) found that oil price risk influenced the stock market returns of the emerging economies. Park and Ratti (2008) found a positive relationship between oil prices and stock market returns of Norway, but a negative relationship was found in other European countries. Lescaroux and Mignon (2008) found positive causality running from oil prices to stock market returns for oil exporting countries. In case of OECD countries, O'Neil et al. (2008) found that higher oil prices had a negative impact on the major oil consumers, *i.e.* U.S., France, and the UK, whereas they had a positive impact on the oil exporting countries including Canada and Australia. In contrast, Miller and Ratti (2009) indicated a negative relationship between high oil prices and stock market returns of OECD countries. Arouri et al. (2010) found a non-linear relationship between oil prices and stock market returns of Oman, Qatar, Saudi Arabia and UAE, depends upon the oil price values, but no such relationship was found in the case of Kuwait and Bahrain. Oskooe (2012) studied the relationship between weekly stock market returns of Iranian stock exchange and international oil market prices. Results suggested that changes in international oil prices affected the mean of stock market returns. Moreover, the researcher also indicated that the variance of international oil price changes did not cause the variance of stock market returns. Aloui et al. (2012) found that increase in oil prices had a positive correlation with stock market returns of moderately oil dependent countries during bullish market conditions, whereas a negative correlation was found in case of oil exporting countries during bearish market conditions, but no such relationships were found for oil importing countries. By estimating Granger causality models, Acaravci et al. (2012) studied the long-run relationship between gas prices and stock prices of 15 European countries. The researchers found a long term relationship between gas prices and stock prices of Austria, Luxembourg, Denmark, Germany, and Finland. But no such relationship was found in the remaining 10 countries.

The major drawback of the previously mentioned studies is that they have focused on the whole stock market despite its industries. Because there are different industries in the stock market that have different exposures to the oil price risk (Faff & Brailsford, 1999; Nandha & Brooks, 2009; Ghoilpour, 2011). For example, Faff and Brailsford (1999) studied the impact of oil prices on the stock returns of 24 Australian industries, for the period of 1983-1996. They found that oil and gas, and diversified resource firms had a positive relationship with oil prices, whereas a negative relationship was found for paper and packaging, and transportation industries. Sadorsky (2001) employed the multifactor market model to examine the risk factors that can affect the stock returns of oil and gas companies of Canada. Employing monthly data, results suggested that crude oil prices had a positive impact on the stock returns. The researcher also concluded that increase in exchange rates and interest rate dampens the stock returns. Using daily data, Hammoudeh and Li (2005) examined the sensitivity of the stock returns of two oil sensitive industries (oil and transportation) and two oil exporting countries (Mexico and Norway) with oil prices and the world capital market. Findings showed that world capital market and oil price growth had a negative relationship. In contrast, stocks of oil exporting countries and oil sensitive industries had a positive relationship with oil price growth, with the aspect that the oil industry has shown more sensitive behavior toward oil prices. By adding the financial determinants, Boyer and Filion (2007) found a positive relationship between the stock returns of Canadian oil and gas firms and market index; when prices of oil and gas, internal reserves, and cash flows increased, whereas they had a negative relationship with interest rate. Henriques and Sadorsky (2008) researched at the alternative energy and technology firms for the period of January 3, 2001 to May 30, 2007. According to the results changes in the stock value of technology firms had a larger impact on the stock prices of alternative energy firms, than the oil prices had. Nandha and Faff (2008) examined the effects of oil price changes and their intensity of affecting 35 global indices' industry returns. Their findings suggested that the increase in oil prices negatively influenced stock returns of all industries except oil & gas and mining. Cong et al. (2008) estimated the vector autoregression (VAR) model to investigate the impact of oil price shocks on the industries' stock returns of China. Findings suggested that oil price shocks haven't played an important role in determining the stock returns of most of the stock market indices of China, but they did for the manufacturing index and some oil firms. McSweeney and Worthington (2008) defined the stock market return as the systematic risk that provides information about the behavior of stock prices. By using multifactor model the researchers found that stock market return was the most prominent factor as compared to oil prices in explaining the industries' stock returns of the Australian economy. Oberndorfer (2009) studied the impact of energy market developments (crude oil, gas, and coal prices) on the energy stocks (oil & gas companies, and energy utilities). The empirical analysis revealed a negative relationship between increased oil prices and stock returns of energy utilities, in contrast a positive relationship was found between boosted oil prices and oil and gas companies' stock returns. In case of gas prices no relationship was found, while coal price changes had a little influence on the stock prices of European energy utilities. Furthermore, the researcher indicated that the exchange rate had a positive relationship with the stock returns of both Eurozone portfolios. Using daily data, Eryiğit (2009) researched on the impact of oil prices on the sector indices of Istanbul stock exchange. By using the OLS method, the researcher found that oil prices had significant impacts on basic metal, electricity, insurance, metal products, paper & printing, wood, and wholesale & retail trade. Furthermore, the researcher concluded that oil prices had a positive impact on the sub-sectors of electricity and insurance, paper & printing, and wood. Nanda and Brooks (2009) studied the contribution of oil prices in explaining the transportation industry' stock returns of 38 countries (Developed, Europe, G-7, Asia Pacific, Latin America, and Emerging countries). The researchers concluded that oil price risk is an important factor to be considered for the stock returns of Developed, Europe, and G-7 countries, while, no such indication was found for the countries of Asia Pacific, Emerging countries, and Latin America. Ghoilpour (2011) examined the effect of energy prices on the stock returns of 35 industries' listed on Tehran Stock Exchange (TSE). The results indicated that oil prices had a significant negative impact on the stock returns of basic metals, banks, electric machinery & apparatus, and credit & other financial institutions. Moreover, a positive significant impact was found on the industry of petroleum. Furthermore, the researcher indicated that gas prices negatively affect the stock returns of motor vehicles and auto parts industry. Sadorsky

(2012) used the multivariate GARCH models to examine the impact of oil price volatility on the stock returns of clean energy and technology firms. Results showed a higher conditional correlation between the stock prices of clean energy and technology firms as compared to the conditional correlation between oil prices and clean energy stock prices.

There are some gaps in the existing literature: First, the researches which have been conducted on the relationship between crude oil prices and stock returns mostly have focused on crude oil prices and macroeconomic variables, but that much attention has not been given to the gas prices. Second, the target population of those studies (crude oil prices and stock returns) is the whole stock market, some industries/industry, or one industry and its firms. But, to the best of our knowledge, no one has considered the energy intensive industries to study, as they are more sensitive toward the changes in oil and gas prices. So, this study will contribute to the existing literature in three ways: The first, main contribution of this study is to extend the literature on gas prices. Second, in this study the impact of oil and gas prices is analyzed on the stock returns of each energy intensive industry (industry-wise analysis) and on all energy intensive industries (general analysis). Third, in Pakistan, to the best of our knowledge, no work has been done on oil and gas prices related to industry stock returns.

Econometric Model

The main aim of this study is to find out the impact of oil and gas prices on the stock returns of energy intensive industries. According to Sharpe (1964), Lintner (1965), and Mossin (1966) the market return is enough to explain variations in stock returns. However, the literature (Sadorsky, 1999; Sadorsky, 2001; Papapetrou, 2001; Boyer & Filion, 2007, Park & Ratti, 2008; Henriques & Sadorsky, 2008; Oberndorfer, 2009; Arouri et al., 2010; Ghoilpour, 2011; Acaravci et al., 2012) indicated that there are also some other factors that have played an important role in predicting the stock returns.

The econometric model of this study is based on the multifactor models used by Faff and Brailsford (1999), Sadorsky (2001), Basher and Sadorsky (2006), Boyer and Filion (2007), Henriques and Sadorsky (2008), McSweeney and Worthington (2008), and Ghoilpour (2011).

$$R_{it} = \alpha_i + \beta_{i1}OIL_t + \beta_{i2}GAS_t + \beta_{i3}MKT_t + \beta_{i4}EXC_t + \beta_{i5}IR_t + e_{it} \quad (1)$$

Where R_{it} is representing the quarterly excess stock returns of the *i*th industry at the time *t*, defined as LN ($FIRM_{it}/FIRM_{it-1}$), where $FIRM_{it}$ and $FIRM_{it-1}$ are the stock prices of *i*th firm at the time *t* and *t-1*. OIL_t is the quarterly change in the West Texas Intermediate (WTI) crude oil futures prices, measured as LN (WTI_t/WTI_{t-1}), where WTI_t and WTI_{t-1} are the WTI crude oil futures prices at the time *t* and *t-1*. GAS_t is the quarterly change in gas prices, calculated as LN (GAS_t/GAS_{t-1}), where GAS_t and GAS_{t-1} are the gas prices at the time *t* and *t-1*. MKT_t is the quarterly excess returns of the stock market index (KSE-100), measured as LN ($KSEIN_t/KSEIN_{t-1}$), where $KSEIN_t$ and $KSEIN_{t-1}$ are the values of KSE-100 index at the time *t* and *t-1*. EXC_t is the quarterly change in the exchange rates of Pakistan Rupee-U.S. dollar, utilized as LN (EXC_t/EXC_{t-1}), where EXC_t and EXC_{t-1} are the exchange rates of Pakistan Rupee-U.S. dollar at the time *t* and *t-1*. IR_t is the quarterly change in the 3-month T-bill rate, defined as LN ($T.BILL_t/T.BILL_{t-1}$), where $T.BILL_t$ and $T.BILL_{t-1}$ are the T-bill rate at the time *t* and *t-1*. α_i and β_i are the parameters and e_{it} is the disturbance term.

Sample and Data Set

This study is designed to examine the impact of oil and gas prices on the stock returns of energy intensive industries of Pakistan. Khan (2013), the CEO of Engineering Development Board (EDB) of Pakistan

specified that there are some energy intensive industries in Pakistan, including ceramics, chemicals, fertilizer, steel, and textile.

From the population of five energy intensive industries of Pakistan the sample of three industries (chemicals, fertilizer, and textile) is drawn. The industries of ceramics and steel are not included in this study, due to incomplete data on share prices.

The number of firms included are 54, which are also selected on the basis of data availability on share prices. The firms which have missing data for more than 9 months have not been included in this analysis, because those data gaps can bring errors in the analysis. In this study quarterly data (Boyer & Filion, 2007; Acaravci et al., 2012) are used for the period of January, 2009 to December, 2013.

Analysis Procedure

The analysis of the study is done in two steps:

Step 1 | Industry-wise Analysis: Industry-wise analysis is conducted because industries are not homogenous. They have different factors, indicators and risks that affect their stock returns. Oil and gas price factors can affect the stock returns of each energy intensive industry, depends upon their type of operations.

Step 2 | General Analysis: The general analysis is carried out in order to check the impact of factors and returns on the stock returns of all energy intensive industries, by converting the panel of 3 industries into 1.

Empirical Results

Descriptive Statistics

The names of the industries and summary of descriptive statistics of the quarterly excess stock returns (R), changes in oil prices (OIL), changes in gas prices (GAS), excess stock market index returns (MKT), and the changes in exchange rate (EXC) and interest rate (IR) are presented in table-1. In which the results of mean, standard deviation (SD), skewness, kurtosis, Jarque-Bera (JB) test statistics for normality, and Augmented Dickey Fuller (ADF) unit root test statistics are reported.

Table-1: Descriptive Statistics of Returns and Factors

Returns & Factors	Mean	SD	Skewness	Kurtosis	JB statistics	JB *p*-value	ADF Statistics	ADF *p*-value
Chemicals	0.021940	0.227606	0.408744	5.064948	57.71890	0.000000	116.219	0.0000
Fertilizer	0.016162	0.138319	-0.610840	3.576018	2.862862	0.238967	16.6118	0.0023
Textile	0.023327	0.299503	0.225578	4.474252	41.66843	0.000000	478.696	0.0000
General Analysis	0.023048	0.285332	0.254314	5.157356	223.5087	0.000000	613.972	0.0000
Oil prices	0.015812	0.160612	-1.467833	6.631916	981.4026	0.000000	793.847	0.0000
Gas Prices	0.021169	0.160612	6.329269	86.63080	321945.7	0.000000	675.742	0.0000
Market Index	0.045930	0.138386	-2.838763	12.03754	5126.013	0.000000	435.533	0.0000
Exchange Rate	0.015086	0.013999	0.517192	2.716080	51.77530	0.000000	176.065	0.0000
Interest Rate	-0.015694	0.052220	-1.148776	4.888584	398.0474	0.000000	709.923	0.0000

According to the descriptive statistics, textile industry (0.0233) has the highest quarterly mean (return), whereas the fertilizer industry (0.0161) has the lowest. Also, the textile industry has the highest quarterly standard deviation (0.2995), while the fertilizer industry has the lowest (0.1383). The returns of all panels (industries) are significantly positively skewed except of fertilizer. The peakedness of the quarterly return series of all panels is significantly large, indicating leptokurtic distribution.

Furthermore, the table-1 reports that gas prices and exchange rate are significantly positively skewed, whereas the oil prices, market index, and interest rate are significantly negatively skewed. The data distribution of oil prices, gas prices, market index, and interest rate are leptokurtic in nature, whereas exchange rate is platykurtic. The JB statistics indicate that the residuals of the returns of all panels are not normal, except fertilizer. The ADF statistics suggest that the unit root exists in the returns and factors. For whom they are tested at first difference level. The results indicate that all returns and factors are stationary at first difference level.

Regression Analysis

The table-2 presents the panel regression results of chemicals, fertilizer, textile, and general analysis of all before mentioned industries. To conduct the analysis quarterly data are obtained to cover the period of January, 2009-December, 2013.

Before applying the panel regression method, different assumptions were checked in order to avoid spurious regression. Durbin-Watson (DW) statistics (not shown) were used for the detection of autocorrelation. According to the literature, autocorrelation does not exist if the value of DW statistics lies in between 1.5-2.5. The obtained values of DW statistics indicated that there is no serial correlation in the residuals of all four models (chemicals, fertilizer, textile, general analysis). Then, Breusch-Pagan test (not shown) was employed to detect the issue of hetroscedasticity. The results of the test indicated the presence of hetroscedasticity in the panel of textile. In order to tackle that issue, white period test was applied. Finally, to detect multicollinearity, Variance Inflationary Factors (VIF) were obtained (not shown). The VIF factors of all panels showed that multicollinearity is not a big issue for all four panels, as the VIF<10 (critical value).

Table-2: Regression Results[2]

Industry	α	OIL	GAS	MKT	EXC	IR	Adj.R_2	F-Statistics
Chemicals	-0.0046 *0.8165*	-0.3547 *0.0262***	-0.0760 *0.7652*	1.1338 *0.0000****	-1.4134 *0.1512*	-0.1874 *0.4557*	0.2210	14.56741 *0.0000*
Fertilizer	0.0304 *0.2746*	0.2415 *0.2604*	0.0969 *0.2833*	0.4290 *0.1013**	-2.6901 *0.0477***	0.1977 *0.5639*	0.3558	5.308895 *0.0010*
Textile	-0.0423 *0.0022*	-0.7643 *0.0000****	-0.4796 *0.0002****	1.5935 *0.0000****	-1.5043 *0.0004****	-1.1361 *0.0000****	0.1952	39.75912 *0.0000*
General Analysis	-0.0342 *0.0046*	-0.619478 *0.0000****	-0.291656 *0.0150****	1.427799 *0.0000****	-1.220439 *0.0388***	-0.874841 *0.0000****	0.1839	46.62922 *0.0000*

*Significant variable at 10%.
** Significant variable at 5%.
***Significant variable at 1%.

[2] Values in italic are the *p*-values of the coefficients.

Discussion of Results

Industry-Wise Analysis

Results indicate a negative impact of oil prices on the stock returns of chemicals, and textile industry, but no such impact is found in case of the fertilizer industry. The regression results of textile are consistent with Nandha & Faff (2008), but inconsistent with Cong et al. (2008). Cong et al. (2008) argues that oil prices do not affect the stock returns of the textile industry. This inconsistent result could be explained by the reason that in Pakistan textile is deemed as the major industry. In a report, International Resources Group (2011) mentioned that textile industry consumes more than 20% of the total final energy (oil, gas, coal, electricity) consumed by the industrial sector. One possible reason for the insignificant results of fertilizer is that in Pakistan the production of fertilizer is highly depending upon natural gas. According to the sectoral update reports published by JCR-VIS Credit Rating Company Ltd. (2011), natural gas has 80% share in the total fuel cost of the fertilizer industry. Oil is not much used by the fertilizer firms for feedstock or for fuel.

Regarding the gas price factor, only one case (textile) showed significant impact. One plausible explanation for the insignificant impact of gas prices on the stock returns of chemicals is that in Pakistan prices of gas are not frequently changing. If they are, then producers are shifting those changes to the consumers by increasing their products' prices (JCR-VIS Credit Rating Company Ltd., 2013). In case of fertilizer industry, natural gas which is regarded as the major fuel input also fails to explain the variation in R, due to the reason that Pakistan government is supporting the fertilizer industry for perking up the agriculture sector. For this, the government of Pakistan is providing subsidy on gas by reason of which its prices are less as compared to the gas prices imposed on other sectors (PACRA, 2011). Moreover, when there is any increase in gas prices, producers shift that increase to the consumers by increasing the per bag price of fertilizer (JCR-VIS Credit Rating Company Ltd., 2011). In that way producers' profits remain intact by the changes in gas prices.

Consistent with the Capital asset pricing model (CAPM), the stock market return has shown a significant impact on the stock returns of all industries. Also, it is interesting to notice that the coefficient of market index has exceeded the unity in case of chemicals (1.1338), and textile (1.5935), indicating that these industries are more sensitive toward the stock market index fluctuations as compared to other factors.

According to the results exchange rate factor has shown a negative impact on the stock returns of fertilizer and textile. Also, the coefficient of EXC is significant, especially in case of fertilizer (2.6901). In Pakistan, urea is imported from other countries because the supply of natural gas to urea manufacturing plants is not enough, causing decrease in their production. During 2012-13, 904 thousand tonnes of urea were imported from other countries, in order to meet its demand (Ministry of Finance, 2013). Since, the chemical industry of Pakistan has relied on the imported raw material for its production. These raw materials become expensive when value of Pakistan rupee (PKR) devaluated. But according to the analysis the impact is insignificant. It might be the reason that the producers of chemicals are shifting the increase in exchange rate to the consumers through increasing the prices of their final products. According to Dorosh and Valdes (1990) exchange rate has played an important role in determining the domestic price of imported goods. The increase in the prices of input and then output would make a balance and keep producers' profits safe from decreasing. In case of textile, Pakistan is a net exporter, but still EXC showed negative impact. This result could be explained through different aspects. One aspect is the indirect impact of exchange rate on stock returns. When PKR devaluated, it creates inflation in the market. Now producers have to pay more for purchasing raw material, which will also increase the price of textile products. In global market Pakistan is already facing tough competition regarding the prices of textile products. When producers try to sell their high priced products in the international markets, customers shift to the other affordable products. That shift creates less sales for textile firms and also create downward pressure on profit and stock returns. Another aspect is the imports of printing and finishing machinery from other countries (JCR-VIS Credit Rating

Company Ltd., 2010). Third aspect is the imports of cotton, which is the basic raw material of textile industry. Firms are importing cotton from other countries because in Pakistan there is a production-consumption gap for cotton. In 2010, its production was 1.92 million metric tons (MT) with 2.09 million metric tons of consumption. Also, in 2011 Pakistan has faced a shortage of cotton supply due to heavy rains (JCR-VIS Credit Rating Company Ltd., 2011). All the above mentioned reasons collectively make Pakistan "the exporter of final textile products" to the "importer of raw material, and machinery and equipment", turning the foreign exchange receipts into the foreign exchange payments. According to Muhammad and Rasheed (2002), the impact of exchange rate on stock returns of exporting firms becomes negative when they use imported material in their production.

The factor of interest rate is significant in the case of textile. However, according to the data of interest rate a decreasing trend has been observed since the second quarter of 2011, but still it is negatively affecting the stock returns. The economic survey of Pakistan (2013) has mentioned that textile industry have consumed over 40% of manufacturing industry's total credit, borrowed from banks. The debt financing burden instigated a reduction in profit of textile firms (Hussain, 2011). The insignificant result of chemicals could be explained by the reason that chemical firms (excluding fertilizer) are changing their capital structure by adding more equity financing. In 2010 their debt-to-equity ratio was 2.05, whereas it became 1.90 in 2011 (State Bank of Pakistan, 2011). Moreover, chemical firms are paying comparatively less amount due to the downward trend of interest rate. The reduction of debt, and decrease in interest rate make their profit intact from it. In case of fertilizer industry, PACRA (2011) indicated that fertilizer firms have more debt in their capital structure as compared to equity, but their credit quality is good for the reason that producers are earning stable margins on sales. In this way the fertilizer firms can pay their interest expenses efficiently despite the changes in interest rates.

General Analysis

According to the results, oil prices showed a negative impact on the stock returns of energy intensive industries, with the significant coefficient (0.6194). Energy intensive industries are consuming more crude oil as compared to other industries. So, the price hikes will increase their production cost and will reduce their profits. According to Faff and Brailsford (1999), Nandha and Faff (2008), Eryiğit (2009), and Ghoilpour (2011), increase in oil prices had a negative impact on the consumer industries.

Concerning the gas prices, a negative impact is found on the stock returns of energy intensive industries. This result is consistent with the findings of Ghoilpour (2011), and Acaravci et al. (2012).

Results mentioned a positive impact of stock market index on the stock returns. Also, it is noted that the coefficient of MKT (1.4277) exceeds the unity, which means that the stock market index has more power to explain the variations in stock returns as compared to other factors.

In case of exchange rate factor, the results showed a negative impact on the stock returns with a significant coefficient (1.2204). The firms included in energy intensive industries are relying on the imported material for production. However, the textile industry is producing the most exporting commodities, but still the collective impact of EXC is negative. Because textile industry is importing machinery (JCR-VIS Credit Rating Company Ltd., 2010), and raw material (JCR-VIS Credit Rating Company Ltd., 2011) from other countries.

The reported results mentioned a negative impact of Interest rate on the stock returns, with the significant coefficient (0.8748). However, the interest rate is decreasing in Pakistan since the second quarter of 2011, but still it is negatively affecting the stock returns. Because fertilizer (PACRA, 2011), and textile (Ministry of Finance, 2013) are the major users of bank loans. So, the extensive usage of bank credit by those

industries has made the collective impact of IR negative. This negative impact will result in the drop of profit and stock returns.

Conclusion and Recommendations

Over recent years, extensive research has been carried out to determine the potential macroeconomic and financial factors that serve as risks in affecting the stock returns. This study extends the literature by focusing on oil and gas prices.

The main aim of this study was to examine the impact of oil and gas prices on the stock returns of energy intensive industries, individually, and generally. Based on the multifactor model, the findings of the industry-wise analysis considered the oil price factor as an important determinant for stock valuation of chemicals, and textile over the covered period of the study (January, 2009-December, 2013). In case of gas prices, a negative impact was found on the stock returns of the textile industry. Moreover, it was interesting to notice that the stock market index had played an important role in explaining the variations of each energy intensive industry's stock returns. Also, a negative impact of the exchange rate factor was observed on the stock returns of fertilizer, and textile, because both industries are importing raw material, machinery and equipment from other countries. Finally, the interest rate showed a negative impact on the stock returns of textile industry because of more debt financing burden in its capital structure. In addition to the industry-wise analysis the general analysis of energy intensive industries was also conducted. According to the analysis, factors of oil price, gas price, exchange rate, and the interest rate had a negative impact on the stock returns, while a positive impact of stock market index was found.

On the basis of the findings of the study it has been concluded that the macroeconomic information has not provided much amplified information regarding the stock valuation of energy intensive industries, despite the stock market index returns. Also, the findings of the general analysis were different from the industry-wise analysis, because each industry has responded differently to the factors. So, the results of general analysis could not be generalized on the industries of chemicals, fertilizer, and textile.

This study has some future implications for the investors (foreign and domestic), policy makers, and for the management of the energy intensive industries. The investors should keep an eye on the changes in oil prices when they are going to make investments in the chemicals, and textile industry, because those industries have been considered sensitive to the oil prices. Gas price factor has also been considered as a risk for textile industry, so investors should not ignore the changes in them. Since, the stock market index has played the most important role in determining the stock returns of energy intensive industries, so investors should consider the market portfolio as the main stock pricing factor in the context of Pakistan.

The policy makers should also give some attention to the energy intensive industries by making strategic plans to reduce their energy costs. Because the industries of chemicals, and textile have responded to the changes in oil prices by means of their stock returns, and also the changes in the gas prices have negatively affected the textile industry's stock returns. Moreover, the management of chemicals, and textile should reduce their fuel costs by using the effective technologies and processes, and the alternative energy sources.

This study examines the impact of oil and gas prices on the stock returns of energy intensive industries. For further research, there are a lot more areas to be considered, *e.g.* the energy sensitive industries (defined by the literature), manufacturing, agriculture, and service sector of Pakistan. Furthermore, this research can be extended internationally, by choosing industries of Pakistan and other country/countries in order to make comparisons. Besides the oil and gas prices, the prices of other energy sources like electricity and coal can also be considered for further research.

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