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EFFECT OF INCREASE IN OIL PRICE ON INFLATION IN PAKISTAN

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ABSTRACT

This paper aims to examine the expected future inflation in Pakistan. Expected Inflation has given grave concerns among the policy makers and economist all around the world, because of its undesirable brunt in the developing countries. Oil prices and changing currency exchange rate are determinants of inflation in Pakistan. The effort is focused in this paper to analyze the impact of rising oil prices along with the changing currency exchange rate on inflation using the variables which has been checked by Jarque-Bera test under the null hypothesis of normal distribution for prices in Pakistan. Oil prices and inflation are found to be strongly related, and to a great extent this relationship is linear, for the calculations simple multiple regression model was used, the estimation of this model is taken through ordinary least square (OLS) method. The correctness of data set is judged by applying unit root test for testing the stationarity of data. For testing the time series data, Augmented Dickey Fuller (ADF) unit root test has been used. Lower real effective exchange rate and the existence of foreign exchange reserves and capital investment in Oil Exploration will help to reduce inflation in Pakistan. There is no close alternate of oil in Pakistan and Pakistan is also facing energy crises. It shows that in future inflation will be increase.

Introduction

Expected future inflation play an important role in determining an efficient distribution of resources in a market system. Firms respond to changing market conditions due to change in price that regulates surpluses and shortage prevalence. In market phenomena price change plays significant role in economic world. In general price change gives a positive signal to producers but this change effect pass on to consumers in different ways. Specifically specific price hike is considered a positive signal and more to this level creates severe problems. What is an optimal level that is necessary varies in different economics. Price hike may arise due to many reasons in the economy. Producer might raise prices when they find that some necessary inputs are costly and there is not possible to manage without price increase. Most specifically, when input price increase the burden necessary shift over the consumers as in case of increase in oil price. World oil price showed significant movements in the last decade and so in general world price level has changed significantly. This is due to the inelastic nature of demand for oil and its supply is fixing in short run that cause to push up the price. Higher oil price will lead to an improvement in the current account position of oil exporting countries (OPEC) like (Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates and Venezuela.) but will lead to decline in the current account position of Oil importers (Hakan, Basak and Ceylan, 2005).

Oil prices are very important for the health of the economy, if the Oil price rises; it also raises individual and national expenses. Literature shows that Oil prices affect the economy through a variety of ways; shift in income from Oil importer's to Oil exporter's countries, decrease in GDP and increase in inflation, lower investment, deterioration in trade balance, decrease in business and consumer confidence, rise in cost of production of goods and services, direct and indirect impact on financial markets, increase in unemployment. (Sulaiman D. Muhammad. 2010).

As Pakistan is Oil importing country increase in Oil price affects many macroeconomic variables which are discussed above. In this empirical investigation our focus is to examine the impact of increased oil prices on inflation in Pakistan. Theoretically if we observe patterns of oil prices a causal relationship is fairly clear. In the second half of 2000 an increase in oil prices causes an inward shift in short run aggregate supply and puts upward pressure on the price level of all the products and other goods in the market. In other words a sharp jump in the price of crude oil caused an exogenous inflationary shock and the impact was greater for those countries which are large-scale importers of oil and has many industries that use oil as an essential input in the production process such as Pakistan.(Gonzalez, A and S. Nabiyev.2010).

In these waves of current financial position of world will one not fear that high oil price and possible depletion of petro-resources may damage the global economy completely? Is high Oil price is shifting income from Oil importer's to Oil exporter's countries? Is there any relationship between High Oil price and rise in cost of production of goods and services? How increase in Oil price is related to exchange rate? Is there any relationship between Oil price and GDP growth of a country? Would it be possible to draw any relationship between Oil price and inflation?

What will be possible problems of financial and energy crises for countries that are deficient in energy and poor in financial health? Will the Pakistan, which is facing steep increase in inflation

and severe shortage of energy, stand on the pace of economic development? This inquiries urges mind to find an empirical analysis will oil prices, which is major source of energy is a serious cause of inflation?

Considering reasoning drawn above following objective has been set. To examine empirically effects of increasing oil prices on inflation in the Pakistan's economy, with the view of possibly drawing some recommendations.

LITERATURE REVIEW

The relationship is first estimated by Ordinary Least Square to examine the effect of oil price on GDP growth on along with other variables. The oil prices have negative and significant impact on GDP which is expected. As regards other variables investment, exchange rate, consumption expenditure, government spending and foreign direct investment have positive impact on GDP when included with oil prices. Inflation is also affecting GDP negatively but insignificantly at 5% but if tested at 10 % level its impact is significant. The negative relationship of oil with GDP indicates that as prices of oil increases the standard of living of the general public including the government decline as shown by Abbas et al. (2001). The relationship of Average Exchange Rates (EL) and GDP is also positive and direct. When Pak Rupee devalues in comparison with USD it decreases the export prices and increases the import prices (Iqbal, 2010).

There is negative relation between oil price and export earning of an economy due to which export earning of an economy suffers badly. He further added that development and growth of Pakistan has badly effected due to the high oil prices. Obviously, when prices of oil increases, it lead to increase the cost of production, and resultantly, prices of the newly produced goods and services become higher (Sulaiman, 2008).

Being an important macroeconomic variable, high oil price can damage substantially the global economies as a whole. Oil price surge during the years 1999-2000 had slowdown the economic growth, international trade and investment process of the global world. It has also been mentioned that due to the high oil prices, firms are helpless to compete in the world market because of increase in cost of production of various goods and services. This phenomenon encourages inflation rather to increase profits of the individual firms (International Energy Agency, 2004).

It is concluded that oil price volatility has a retorted effect on output, the magnitude of an oil shock will depend on the share that oil has on the overall energy production, and the initial oil shock might initiate in at different times on different countries. It has further added that high oil prices have potential effects on the economies through different ways, transfer of wealth from oil consumers to oil producers, rise in cost of production, impact of inflation, consumer confidence, policy adjustment and financial markets (Gonzalez and Nabiyev, 2009).

It is found the influence of crude oil prices on output and concluded that oil prices and output are exactly correlated with each other. However, this relationship becomes non-linear to a greater extent. Although oil prices are receding yet still are high for Pakistan given the state of our economy. The oil is second largest source of energy in Pakistan after the natural gas. This increase has direct bearing upon GDP growth along with other macroeconomics indicators. The

countries having large foreign exchange reserves and running in surplus have the capacity to make adjustments so that the GDP growth should not suffer adversely. However in case of Pakistan neither we have enough foreign exchange reserves nor is any surplus in balance of payment, therefore, its GDP growth is vulnerable to the increase in oil prices. The other possibility to absorb the oil price shock is the sustainable GDP growth. However, in case of Pakistan, for last few years GDP growth is not yet sustainable (Malik, 2006).

Research Method

Quarterly time series data is used in this paper, from the period of January, 2002 to December, 2011. The data is of macro level and for the collection of this data secondary sources have been used. All the data which is used in this study, has been taken from the index mundi and state bank of Pakistan.

The variables that are used in this study are inflation, oil prices and exchange rate. The data for these variables is linear as well as normally distributed. The linearity means that independent variables are linearly related with dependent variables. The normality of the variables has been checked by Jarque-Bera test under the null hypothesis of normal distribution; the value of Jarque-Bera is not statistically significant so we can accept the null hypothesis of normal distribution.

Model Specification

Functional form :

$Y = A(X_1, X_2)$

Infl = A (O.P,E.R)

Description of variables:

Infl = inflation

O.P = oil price

E.R = exchange rate

Dependent variable: Inflation

Independent variable: Oil price & exchange rate.

Econometric model:

$Y = \beta 0 + \beta 1(O.P) + \beta 2 (E.R) + \varepsilon$

$\beta 0$ = Constant

$\beta 1$ & $\beta 2$ = Slope coefficients.

E.R = Exchange rate

O.P = Oil Prices

Y = Inflation

ε = Error term

The above mentioned model reveals that inflation is an endogenous variable while oil price and inflation is exogenous variable. $\beta 0$ is the intercept and $\beta 1$ & $\beta 2$ are slope coefficients.

Results and Discussion

The above mentioned model is simple multiple regression model, the estimation of this model is taken through ordinary least square (OLS) method which states that parameters are chosen in such a way that residual sum of square is minimum. For ordinary least square method the

parameters and variables should be linear; the model in this study satisfies this assumption so it is the justification of using OLS method. The correctness of data set is judged by applying unit root test for testing the stationarity of data. It is important to decide whether the time series is level or difference. The data is stationary when its mean and variance are constant over time.
For testing the time series data, Augmented Dickey Fuller (ADF) unit root test has been used. The results obtained from unit root test are as follows with the null hypothesis of unit root.

UNIT ROOT TEST.

Variables	ADF Test at level	Stationarity Level		
		1%	5%	10%
Inflation	-4.022280	-3.6228	-2.9446	-2.6105
Oil Prices	-4.074479	-3.6228	-2.9446	-2.6105
Exchange Rate	-4.291452	-3.6289	-2.9472	-2.6118

Analysis of the above mentioned tables is that all the variables are found stationary at level and intercept. The variables become stationary when the calculated value is more negative than the critical value. Consequently, ADF (Augmented Dicky Fuller) test has been used to check the stationarity of the variables. However, all the variables are stationary at level and intercept at 1%, 5% and 10% level of significance. It is important to mention here that if the stationary variables are used, then the results achieved, would be considerable and non-spurious.

As this study contains two independent variables so there can be a problem of multicollinearity which means that there is a linear relationship between two independent variables. The correlation matrix has been used to see linear relationship between variables. The correlation matrix is as follows.

Correlation matrix

	X1	X2
X1	1.000000	0.015633
X2	0.015633	1.000000

The variance inflation factor has also been used to detect the multicollinearity; the value of VIF is 6.25 which is less than 10; so it shows that there is no multicollinearity exists in the independent variables. Another problem that can exist in the presence of two independent variables is heteroscedasticity which means variance of error terms differs across observations but heteroscedasticity is the problem of cross-sectional data but here time series data has been used, so there is no need of heteroscedasticity check. The other problem which is associated with the time series data is autocorrelation, which means correlation between members of observation ordered in time (as in time-series data) or space (as in cross- sectional data). The problem of autocorrelation is detected in the data so in order to remove this problem; the computer program has been used along with the desired results.

Results of OLS Model

SUMMARY STATISTICS

Variables	Coefficients	Std. Error	T. Statistics	Prob.
Constant	1294.981	482.6373	2.683135	0.0111
O.P	1.551482	0.496435	3.125245	0.0036
E.R	-21.79877	8.415578	-2.590288	0.0139
Ar(1)	0.671366	0.126468	5.308602	0.0000

R Square = 0.841267
Adjusted R Square = 0.827661
Akaike Criterion = 8.451860
Durbin-Watson stat = 1.276181
F-Statistics = 61.83205
Significance F stat = 0.00000
Schwarz Criterion = 8.622482

$Y = \beta 0 + \beta 1\ (O.\ P) + \beta 2\ (E.R) + \varepsilon$

$Y = 1294.981 + 1.55(O.\ P) - 21.79(E.R) + \varepsilon$

$Y^* = 1294.981 + 1.55\ X1^* - 21.79X2^* + \varepsilon$

The result shows that oil price has a positive and significant effect on inflation. The value of the co-efficient of oil price is 1.55 which means that if there is 1 unit increase in oil price than on the average inflation increases by 1.017. The exchange rate has negative and significant effect on inflation. The value of the co-efficient of exchange rate is 21.79 which mean that if there is 1 unit increase in exchange rate than on the average inflation decreases by 21.79 units. Value of the coefficient of constant shows that if the oil price and exchange rate is zero than on the average it is the inflation value. Error term shows the effect of other variables on inflation which is not included in this model.

The value of R^2 is 0.84 percent which means that 84% variation in the dependent variable is explained by its linear relationship with the independent variables included in the model; oil price and exchange rate and 16% variation are due to other factors. P_value for the oil price and exchange rate is 0.0036 and 0.0139 simultaneously that shows that the result of the model are significant. For significance of the model p_value must be less than 0.05 and t-statistics must be greater than 2, both these criteria are fulfilled in this model. As the value of the Durbin Watson is 1.276 which is greater than the value of R^2 so there is no autocorrelation in this model.

CONCLUSION

In this study we have taken into consideration inflation and other macroeconomics variables like oil price and exchange rate with reference to Pakistan. Inflation plays significant role in economic world. Oil prices are very important for the health of the economy, if the Oil price rises; it also raises individual and national expenses. Literature shows that inflation affects the economy through a variety of ways. We conclude that oil price has a positive effect on inflation, it is because when price of oil increase, prices of other things like transportation increase which lead to increase the average price level in the country. This is due to the inelastic nature of demand for oil and its supply is fixing in short run that cause to push up the price. There is no

close alternate of oil in the country. Furthermore, exchange rate has negative relation with inflation the basic phenomenon behind this logic is that when currency of the domestic currency has devaluation, it become cheaper for the foreigners, and foreign currency i.e dollar becomes expensive for the domestic economy. Therefore, exports of the domestic economy increases and imports of the domestic economy falls. Here, increasing trend in exports is more as compare to decreasing trend in imports. This is the reason to increase the inflation in the country and it will continue in future if the government not taken the right decision. There will be a slight increase in inflation in future.

POLICY IMPLICATION

There are certain policy recommendations about the control in inflation with respect to Oil price and Exchange rate on the basis of literature review and analysis. There should be alternate energy sources which can by utilized as oil alternate. As when oil prices increases, alternate sources of energy can be utilized to control the Inflation. Government should use the price ceiling system to control the Inflation. Government should control the depreciation in the money. It pertinent to mention here that Govt. should pay special attention towards the problem of inflation in the country.

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