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Oil Price Shocks, Monetary Policy and Aggregate Demand in Ghana

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Founded in 1963 by two prominent Austrians living in exile – the sociologist Paul F. Lazarsfeld and the economist Oskar Morgenstern – with the financial support from the Ford Foundation, the Austrian Federal Ministry of Education and the City of Vienna, the Institute for Advanced Studies (IHS) is the first institution for postgraduate education and research in economics and the social sciences in Austria. The **Economics Series** presents research done at the Department of Economics and Finance and aims to share "work in progress" in a timely way before formal publication. As usual, authors bear full responsibility for the content of their contributions.

Das Institut für Höhere Studien (IHS) wurde im Jahr 1963 von zwei prominenten Exilösterreichern – dem Soziologen Paul F. Lazarsfeld und dem Ökonomen Oskar Morgenstern – mit Hilfe der Ford-Stiftung, des Österreichischen Bundesministeriums für Unterricht und der Stadt Wien gegründet und ist somit die erste nachuniversitäre Lehr- und Forschungsstätte für die Sozial- und Wirtschafts-wissenschaften in Österreich. Die **Reihe Ökonomie** bietet Einblick in die Forschungsarbeit der Abteilung für Ökonomie und Finanzwirtschaft und verfolgt das Ziel, abteilungsinterne Diskussionsbeiträge einer breiteren fachinternen Öffentlichkeit zugänglich zu machen. Die inhaltliche Verantwortung für die veröffentlichten Beiträge liegt bei den Autoren und Autorinnen.

Abstract

The current study examines the relationship between the world oil price and aggregate demand in a developing country, Ghana, via the interest rate channel by means of cointegration analysis. Results of the study indicate that oil price—by impacting the price level positively—negatively impacts real output. The results also indicate that monetary policy is initially eased in response to a surge in the price of oil in order to lessen any growth consequences, but at the cost of higher inflation. The ensuing higher inflation, however, prompts a subsequent tightening of monetary policy leading to a further decline in output. In addition, output does not revert quickly to its initial level after an oil price shock, but declines over an extended period.

Keywords

Aggregate demand, inflation, monetary policy, oil

JEL Classification

C32, E50, O13

Comments
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1. Introduction

Since the seminal contribution of Hamilton (1983), several recent studies based on both theoretical and empirical models have made lucid insights into the macroeconomic consequences of oil price shocks.[1] A general finding from these studies—centred mainly on the U.S. economy—is that post-shock recessionary movements of GDP are largely attributable to oil price shocks, although a strand of studies (e.g., Ferderer, 1996; Bernanke et al., 1997; Hamilton and Herrera, 2004; and Balke et al., 2002) have provided mixed evidence about the role of post-shock monetary policy. In addition, respective non-linear (Hamilton, 2001) and asymmetric (Davis and Haltiwanger, 2001) specifications of oil price shocks have been found that yield stable oil price–GDP relations over the entire post World War II period.

Davis and Haltiwanger (op. cit.) distinguish between aggregate and allocative channels of the effects of oil price shocks. Their analysis suggests that the aggregate channels would increase job destruction and reduce creation in response to an oil price increase, while the allocative channels would increase both creation and destruction. Their discussion also emphasize the view that the aggregate channels should operate symmetrically while the allocative channels would operate asymmetrically because both oil price increases and decreases would alter firms' desired employment structures. Thus, if oil price shocks operate predominantly through aggregate channels, employment would respond roughly symmetrically to positive and negative oil price shocks.

Some studies have argued that the possible impact of energy use on growth will depend on the structure of the economy and the stage of economic growth of the country concerned. Solow (1978), Brendt (1980), Denison (1985) and Cheng (1995)—among others—suggest that as the economy grows its production structure is likely to shift towards services, which are not energy intensive activities. In this regard, developing country economies are expected to be more vulnerable to oil price shocks than those of the developed countries. Over time, however, as developing countries' technologies improve, conversion processes and end-use devices would progress along their learning curves and as inefficient technologies are retired in favour of more efficient ones, the amount of primary energy needed per unit of economic output—the energy intensity—would decrease, making their economies less vulnerable to oil price shocks (see, Nakicenovic et al., 1998).

[1] See Jones, Leiby, and Paik (2002) for a summary of the recent literature.

The current study examines the relationship between the world oil price and aggregate demand in a developing country, Ghana, via the interest rate channel by means of a full systems cointegration analysis. Specifically, we will explore the following issues: what is the relationship between the nominal world oil price, the price level and real domestic output; how does monetary policy influence the said relationship; what are the short-run responses to disequilibrium and long-run behaviour; how long do the effects of a shock to the world oil price last. In particular, we would like to ascertain whether output tends to revert quickly to its initial level after an oil price shock, or whether the effects of the shock persist—that is, lead to a changed level of output for an extended period. Consideration for the role of monetary policy distinguishes the current study from earlier research that has dealt with oil price-output relationships in the context of developing countries, notably Africa.

News in energy price trends have become topical in recent years and combined with the ongoing crises in the Middle East, a great deal of uncertainty concerning future oil price movements abound. Although Africa is endowed with the widest possible range of energy resources that would far exceed its energy requirements, many African countries are reliant on oil imports and Ghana is one of them. Ghana has made enormous economic progress in the last 20 years, although some years have been very turbulent. In recent years both political and macroeconomic stability have enabled the country to achieve annual growth rates of over five percent, making it one of the early developing nations to receive debt relief from the international finance institutions. In 2005, oil imports alone accounted for about 20 percent of the country's merchandise imports. The recent hikes in global oil prices, if sustained, could eventually jeopardize the accumulated economic gains. It is the presence of this oil price risk that provides the motivation for the current thesis.

The remainder of this paper is organized in the following fashion. Chapter 2 highlights the nature of the relationship between oil prices and the Ghanaian economic policy. Chapter 3 espouses the methodology whilst Chapter 4 discusses the results. Chapter 5 concludes.

2. Oil price and economic policy

An economy's sensitivity to changes in the price of oil can be traced to several factors. The first and most obvious is the importance of oil as a factor of production. The second is the macroeconomic situation of the economy and the third and perhaps not all that obvious is the country's trade balance. Oil is such an important input factor, such that developing country governments have often had to subsidize it. Until the second quarter of 2005, the Ghanaian government had been subsidizing petroleum product prices at an estimated annual average of 2.3 percent of GDP. Latest findings by Coady et al. (2006) for five developing countries—including Ghana—show that in all of those countries, energy subsidies have significant social and fiscal costs and are badly targeted. Following the recent hikes in world oil prices, the issue of petroleum product pricing has become increasingly important in developing countries. For instance, since the second quarter of 2005, the National Petroleum Authority Act of Ghana mandates that domestic petroleum prices should be closer to world prices and calls for the elimination of government subsidies on petroleum products.

Before the elimination of petroleum subsidies, the Ghanaian government was hypothetically confronted with two possibilities in the event of an increase in the world price of oil. The first option would be to raise the level of the oil price subsidy in order to protect households and firms. The second would be to step back from it, keep the subsidy at the same level and let consumers pay the higher price. Both possibilities are pretty unattractive.

The option to raise the subsidy, although politically popular, could also have adverse economic effects. A large subsidy redirects public expenditure away from more productive spending or can contribute to unsustainable budget deficits. An increase in a subsidy is obviously an increase in government spending. If, as a reaction to higher government spending, taxes are not raised or other government expenses reduced to balance the actual trend, government will have to face a higher budget deficit.

Generally, developing country governments are faced with three possibilities to finance their budget deficits. The first is to print additional money; the second is to issue public debt and the third is through foreign borrowing. In the past printing additional money was the main possibility. Ghana, although a developing country has developed a stable bond market since the mid 1980's (and is in the process of issuing Eurobonds) and due to continuous and far

reaching improvements in macroeconomic stability, issuing public debt has become more and more a better option for the Ghanaian government in recent years. In addition, the limited nature of Ghana's capital market and the existence of sovereign risk would imply that not all the public debt could have been financed through the domestic bond market or through external financing (at least for the time being). This might have necessitated acquiring additional funds through the printing of money with the resulting incidence of inflationary pressures. Akçay et al. (2002) argue that, even when a central bank does not monetize the deficit, adjustments in the private sector to higher deficit policies may very well lead to inflation. In this regard, they cite the real and/or financial sectors (Miller, 1983) or the "unpleasant monetarist arithmetic" (Sargent and Wallace, 1981) as mechanisms through which inflation can be transmitted.

Government's decision not to raise subsidies would impact the economy adversely. Higher domestic prices for petroleum products would affect households' real incomes through two channels, i.e., a direct one via increases in the prices paid by households for their direct consumption of petroleum products, and a more indirect one via increases in prices of other goods and services consumed by households as firms pass on the higher costs of fuel inputs. As remarked by Gramlich (2004), higher oil prices may hypothetically, even get through to continuing rates of inflation if they become incorporated into price and wage-setting behaviour.

According to the Bank of Ghana (2004), the dilemma of an oil price surge for central banks is that it is often problematic from a stabilisation policy perspective in the sense that higher oil prices not only push up inflation (thereby calling for a rise in interest rates), but also dampen growth (requiring rates to be lower than otherwise). Humpage and Pelz (2002) also argue that while monetary policy can do nothing about the way an oil price shock affects the relative prices of the numerous goods that use or substitute for oil, monetary policy does affect how these relative price changes influence aggregate price indexes. They cite three probable responses of the central bank to a rise in the energy price stemming from an energy shortage and the respective consequences of the bank's actions: The central bank may respond by expanding the money stock, causing a rise in the aggregate price level; the bank may respond instead by shrinking the money stock, causing a fall in the aggregate price level; or the bank may do nothing in response to the energy shortage, causing aggregate prices to rise if aggregate output falls, because any decline in output that accompanies energy price shocks

will reduce the demand for money relative to its supply. The Bank of Ghana (op. cit.) recommends that the appropriate policy must therefore be determined from case to case depending on: persistence of the rise in the oil price, cyclical position of the economy, how other prices in the economy are affected, and the factors that otherwise drive the inflation process.

Table 1 illustrates information on consumer price inflation, real GDP growth and the rates of change in oil prices for the years 1984, 1994 and 2004. The data for 1984 and 1994 clearly indicate that higher inflation and low output growth rates in those years were associated with higher oil price growth rates. The data for 2004, however, depicts an anomaly in the sense that while oil prices were increasing, inflation was modest and output growth was high. This can be explained by the prudent economic policies of the new Ghanaian government that has been in power since 2001. The new regime has been working extremely hard on budget consolidation. For example, during the period 2001 to 2005, while world oil prices increased at a compound annual growth rate of ca. 17.4 percent, the budget deficit and inflation decreased at corresponding rates of 22.7 percent and 27.6, respectively. This may be viewed as a flattening of the Phillips curve that has generally been observed across countries and which, if taken at face value suggests that fluctuations in resource utilization will have smaller implications for inflation than used to be the case. Alternatively, this apparent change in the inflation process suggests a reduction in the correlation between inflation and unemployment or other measures of resource utilization (see Atkeson and Ohanian, 2001; Roberts 2006; Mishkin, 2007, for the US case). Empirical evidence might indicate that this is, in part, also the case for Ghana. The implication here is that prolonged positive structural reforms can be a precursor for mitigating the adverse effects of higher oil prices.

Table 1: Macroeconomic effects of oil price changes in Ghana

Year	**1984**	**1994**	**2004**
Percentage change in petroleum price	139.7	32.1	34.5
Consumer price inflation (%)	33.4	22.2	11.9
Real GDP growth (%)	8.3	3.2	5.6

3. Methodology

3.1 The Model

We estimate a four-dimensional macroeconometric model $Y_t = (y_t, oil_t, i_t, p_t)^{/}$ that represents a 4×1 vector of real output, y_t, world oil price in nominal terms, oil_t, nominal interest rate, i_t, and the price level as indicated by the consumer price level in the form of a vector error correction (VEC) representation (see Johansen (1988; 1991):

$$\Delta Y_t = \Pi Y_{t-k-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i} + \Psi D_t + \varepsilon_t \qquad (1)$$

where the reduced rank, *r*, of the 4×4 matrix of $\prod$ equals the number of cointegration vectors $r \leq n-1$ in the system and n equals four—the number of (endogenous) series in cointegration equation (1). Thus, $\prod$ can be written as $\Pi = \alpha \beta^{/}$, where α and β are each of the dimension $4 \times r$ and rank r. The matrix β contains the cointegrating vectors β, i.e., $\beta = (\beta_t, ..., \beta_r)$ while the matrix of the adjustment coefficients α describes the speed of adjustment of each of the four individual series in Y_t to deviations from the cointegration relationships.

We also account for a set of weakly exogenous variables in the form of dummies, d_i: d_1 and d_2, respectively, for two interest rate shocks of 1982 and 1991; d_3, d_4, and d_5, respectively, for the three oil shocks of 1973 (OPEC oil export embargo), 1979 (Iranian revolution) and 1990 (first Gulf War). The dummy variable d_6 which had a (1, 0) representation was used to account for, respectively, the monetary policy that existed up to 1983 (for fear of devaluation after the collapse of the Bretton Woods system) and that which existed thereafter. Additionally, we used d_7 which also had a (1, 0) designation to account for, respectively, the monetary policy under central bank independence since 2002 or otherwise. These variables are all ***I***(0). Choice of the appropriate lag-length *k* was based on the issue of the absence of autocorrelation in the residuals.

3.2 Causality

Having established the number of cointegrating vectors, we performed Granger-causality tests (Granger, 1969) in order to verify the informational relationships between the four variables. Granger-causality from x_k to x_j means that the conditional forecast for x_j can be significantly improved by adding lagged x_k to the information set. The feasibility of the Granger-causality tests depends on the stationarity features of the system. If the series are stationary, the null hypothesis of no Granger causality can be tested by standard Wald tests (e.g., Lütkepohl, 1991).

In a cointegration model as in (1), however, two sources of causation come to light, i.e., through the error-correction term (ECT), $\Pi Y_{t-k-1} = \alpha\beta' Y_{t-k-1}$, if, $\alpha \neq 0$, or through the lagged dynamic terms, $\sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i}$, i.e., if all $\Gamma_i = 0$ (see Toda and Phillips, 1993). The ECT measures the long-run equilibrium relationship while the coefficients on lagged difference terms indicate the short-run dynamics. Thus, in a cointegration model (1) the proposition of x_k not Granger-causing x_j in the long run is equivalent to $\alpha_{jk} = 0$. In this context x_j is said to be weakly exogenous for the parameter β, i.e., x_j does not react to the equilibrium errors. Also from model (1) the proposition of x_k not Granger-causing x_j in the short run is equivalent to $\Gamma_{jk}(L) = 0$, where (L) is the lag operator.

3.3 Impulse response

We determine how each endogenous variable responds over time to a shock in oil price variable, i.e., the effects of a shock, or change, in the error term associated with the oil price equation in model (1). To calculate these impulse responses, we increase—for one period only—the error term in the equation for the world oil price by one standard deviation and then calculate the immediate and then future effects of this change on output, world oil price, interest rate and the price level. For this exercise, estimates of the covariances among the four error terms would be required.

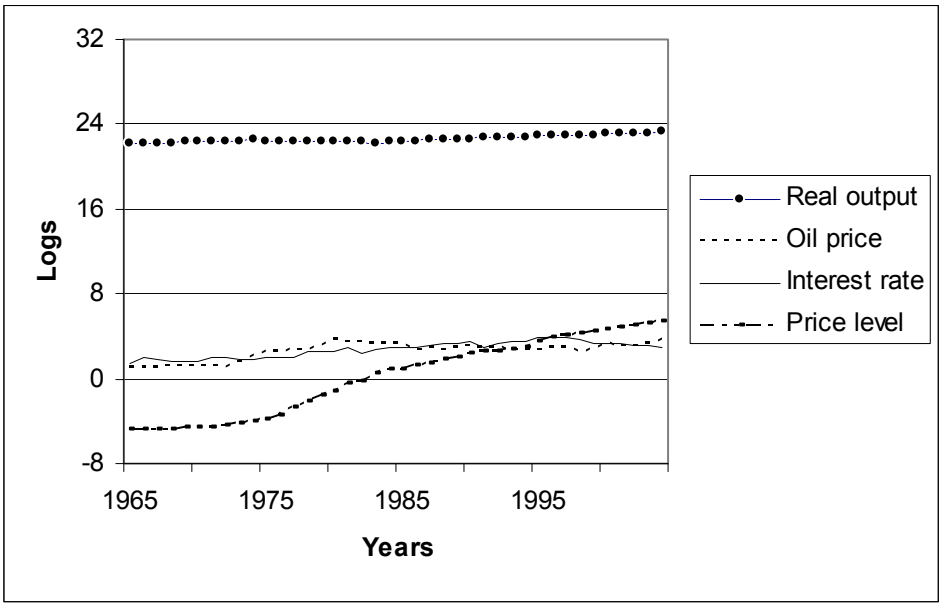
4. Results and discussion

4.1 Data description

We used annual time series data covering the period 1965–2004. GDP at constant 2000 prices in *cedis* as well as the consumer price index data were obtained from the World Bank's *World Development Indicators* data-base. As a measure of monetary policy stance, we used the discount rate obtained from the IMF International Financial Statistics data-base. Economic theory postulates that it is the real oil price rather than the nominal price that should matter for economic decisions, yet Hamilton (2005) has observed that many researchers use the nominal oil price change instead of the real oil price change as the explanatory variable in oil price related regressions, since the statistical exogeneity of the right hand variables is important for interpreting the regressions. Following these researchers, we use the nominal world oil price data in dollars. This was obtained from the *BP* Historical Data Series data-base. As discussed earlier, we also used dummy variables to account for incidences of oil price and interest rate shocks as well as for monetary policy regimes.

All the variables were used in their logarithmic form. The logarithmic data were deemed to permit a more parsimonious dynamics than non- logarithmic data (see Jumah and Kunst, 1996). Figure 1 illustrates developments in the respective logarithmic data series. The figure shows that all the variables are upward trending—with the price level being the most trending.

Figure 1: Trend of real output, oil price, interest rate and price level in logs



Results of the time series properties analyses of the data as presented in Table 2 reveal that all the variables involved in the analysis are first difference stationary.

Table 2: Unit root tests

Series	ADF		PP		KPSS	
	Levels	1st diff.	Levels	1st diff.	Levels	1st diff.
Oil price	-1.453(0)	-5.028(0)	-1.476(2)	-4.950(4)	0.496(5)	0.141(2)
CPI	0.109(0)	-3.637(0)	-0.103(4)	-3.637(3)	0.757(5)	0.149(4)
Interest	-1.837(0)	-8.234(0)	-1.827(3)	-8.265(3)	0.675(5)	0.305(3)
Real GDP	1.501(0)	-4.690(0)	1.276(1)	-4.716(1)	0.697 (5)	0.378 (2)

The 1 % critical values for the ADF, PP and KPSS tests are respectively -3.621, -3.616 and 0.739. The corresponding values for the 5% tests are respectively -2.943, -2.941 and 0.463.

4.2 Cointegration analysis

4.2.1 Cointegration tests

We present the results of the trace test-based cointegration analysis in Table 3. Choice of the appropriate lag-length k was based on the issue of whether the residuals were free of autocorrelation. A lag length of one was obtained in this regard. According to the table, the Lagrange Multiplier (LM) test for up to the fifth order residual serial correlation rejected the null hypothesis of no serial correlation at the 5% level of significance.

Table 3: Cointegration test

Unrestricted Cointegration Rank Test (Trace)		
Trace	Rank	Critical values
55.595	$r \geq 0$	47.856
15.613	$r \geq 1$	29.797

Statistics of the error process	
Autocorrelation test	P-value
LM (1)	0.580
LM (2)	0.858
LM (3)	0.091
LM (4)	0.891
LM (5)	0.342

The critical values are from Osterwald-Lenum (1992).

Table 4 presents evidence for the long-run behaviour of the variables. Oil price is positively related to the price level but negatively related to interest rate and output. The results may be interpreted as implying that monetary policy is eased in response to a surge in the price of oil in order to lessen any growth consequences, but at the cost of higher inflation. An alternative interpretation might be that monetary policy is tightened in response to a rise in inflation emanating from a surge in the price of oil, resulting in a crowding out of the private sector. Whichever of the two explanations predominates will be certified by the results of our impulse response analysis.

Table 4: Long-run cointegration vector estimates

	Real GDP	Oil price	Interest rate	CPI
β	1.000	0.708	0.382	-0.182
α	-0.084	-0.271	0.136	0.397
t-statistic for α	(-3.843)	(-1.641)	(1.193)	(4.931)

The figures in brackets represent t-statistics.

Also, from Table 4 the magnitudes of the short-run coefficients, i.e., estimates of the α coefficients attached to the error correction terms confirm that the speed of adjustment to the long-run change in real output is slow, while those of the other three variables are moderate. In addition, the oil price and interest rate coefficients are insignificant implying that these two variables are weakly exogenous to the cointegration vector.

Formally, the test of H: $\alpha_i = 0$ for $i = 2$ and 3, signifying that the oil price and interest rate are weakly exogenous involves: $\alpha' = [*, \quad 0, \quad 0, \quad *]$ for oil price and interest rate, where $*$ denotes an unrestricted coefficient. Results of the corresponding likelihood ratio (LR) tests based on 2 degrees of freedom are presented in Table 5. As can be seen from the table, the null hypothesis of the presence of weak exogeneity is not rejected at the 5 percent significant level.

Table 5: Restricted long-run cointegration vector estimates

	Real GDP	Oil price	Interest rate	CPI
β	1	0.603	0.439	-0.182
α *	0,021	0	0	-0,094
t-statistic for α	(0.005)	(0)	(0)	(0.018)

* P-value for the joint restrictions on the α coefficients is 0.124.
The figures in normal brackets represent t-statistics.

The EViews programme results of the short-run causality tests as shown in Table 6 clearly indicate that the price level Granger causes real output. Also, oil price is seen to Granger-cause the price level. The intuition here is that energy costs influence firms' price setting and even the relation between output and employment. Given wages, an increase in the price of oil increases the cost of production, forcing firms to increase prices, leading to an increase in the price level. To the extent that increases in the price of oil lead to a rise in the price level, they also reduce consumer-spending power through a reduction in the real money stock. The result is a fall in output.

The conclusion to be drawn from the weak exogeneity and Granger causality tests is that the interest rate and the world oil price are strongly exogeneous. This inference has important implications for econometric modelling of oil markets. For instance, Cavallo and Wu (2006) have observed that conventional measures of oil-price shocks based on oil-price changes suffer from the two obvious flaws of endogeneity and forecastability.

In order to examine the impulse responses or the short-run adjustments to a shock in the world oil price (i.e., a standard error increase in the structural residual of the equation determining the world oil price), we need to know the covariances among the four error terms. The estimated covariances are shown in Table 7. Note that, in general, the correlations among the residuals are low. The residual in the oil price equation is most correlated with that of the interest rate equation. Thus, a shock to oil price will have a more common component with the interest rate.

Figures 2a-2d show the response of each variable to a one-standard-deviation in the oil price, i.e., a one-period increase in the error in the oil price equation of $(0.0622)^{\frac{1}{2}} = 0.2494$ units. In

the next two periods, output declines sharply due to the negative covariance of $\hat{\varepsilon}_1$ and $\hat{\varepsilon}_2$ and then more gently thereafter. Oil price increases initially by 0.249 units, rises up to 0.280 units in the second period and then falls sharply subsequently. As regards the interest rate, there is a slight decline in the second period due to the negative covariance of $\hat{\varepsilon}_2$ and $\hat{\varepsilon}_3$, followed by a sluggish rise in third period and then a sharp rise thereafter. The price level also rises slightly in the second period because of the positive covariance of $\hat{\varepsilon}_2$ and $\hat{\varepsilon}_4$ and then brusquely afterwards. Ultimately, however, none of the variables approach zero as the effects of the shock dampen out. The results imply that the effects an oil price shock persists—leading to a decline in output over an extended period.

Portugal (2007), for instance, argues that if inflationary expectations are well anchored, a country can accommodate temporary supply shocks that may have a large short-term impact on inflation, but may not require an overreaction from monetary policy, because with well-anchored expectations, price shocks are less likely to have second-round effects. He emphasizes, however, that doing so would depend critically on inflation expectations being well anchored, which in turn depends critically on the credibility that the Central Bank might have already gained. Indeed, the Bank of Ghana is increasingly gaining credibility since it was granted independent status in 2002. It is envisaged that the future common central bank of the West African Monetary Zone (of which Ghana is a member) that is purported to adopt inflation targeting as its nominal anchor would be even more credible as regards the commitment to achieve its inflation target. This will go a long way to lessen the persistent effects of an oil price shock on the economy.

Table 6: VEC Granger Causality/Block Exogeneity Wald Tests

Dependent variable: Real GDP		Dependent variable: Oil price		Dependent variable: Interest rate		Dependent variable: CPI	
Variable excluded	P-value	Variable excluded	P-value	Variable excluded	P-value	Variable excluded	P-value
Oil price	0.927	Real GDP	0.787	Real GDP	0.075	Real GDP	0.288
Interest rate	0.390	Interest rate	0.075	Oil price	0.440	Oil price	0.029
CPI	0.001	CPI	0.203	CPI	0.074	Interest rate	0.074
All	0.009	All	0.278	All	0.122	All	0.012

Table 7: Residual covariance matrix

Covariance of	With			
	$\hat{\varepsilon}_1$	$\hat{\varepsilon}_2$	$\hat{\varepsilon}_3$	$\hat{\varepsilon}_4$
$\hat{\varepsilon}_1$	0.0011	-0.0009	-0.0007	-0.0002
$\hat{\varepsilon}_2$	-0.0009	0.0607	-0.0091	0.0031
$\hat{\varepsilon}_3$	-0.0007	-0.0091	0.0292	0.0059
$\hat{\varepsilon}_4$	-0.0002	0.0031	0.0059	0.0145

$\hat{\varepsilon}_1$, $\hat{\varepsilon}_2$, $\hat{\varepsilon}_3$ and $\hat{\varepsilon}_4$ are the respective residuals of the output, oil price, interest rate and price level equations.

Figure 2a: Response of output to 1-standard deviation shock in oil price

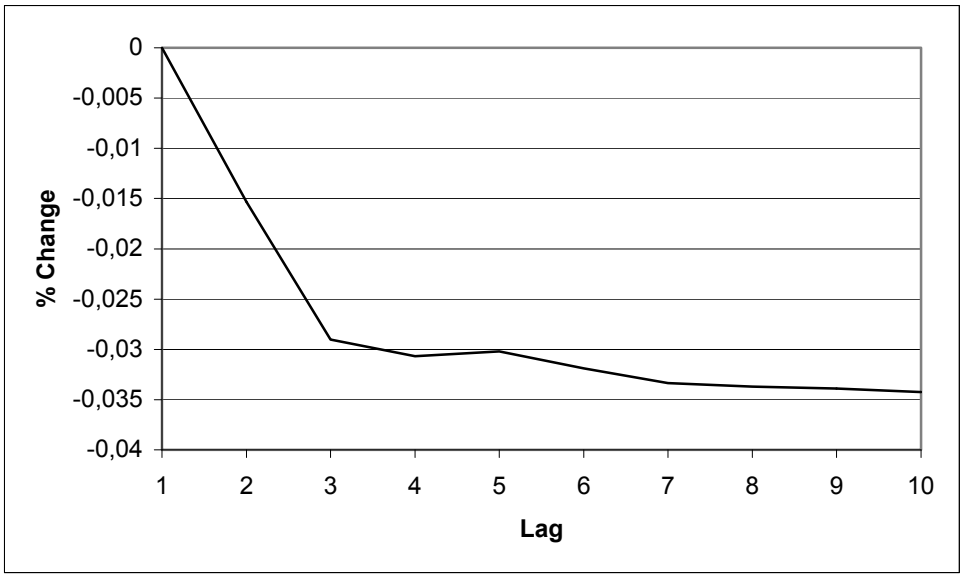


Figure 2b: Response of oil price to 1-standard deviation shock in oil price

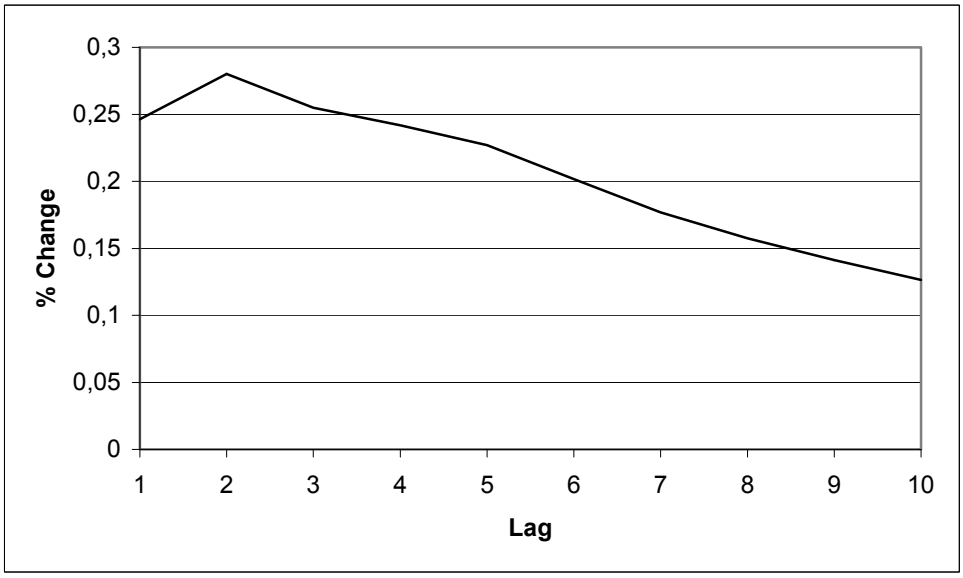


Figure 2c: Response of interest rate to 1-standard deviation shock in oil price

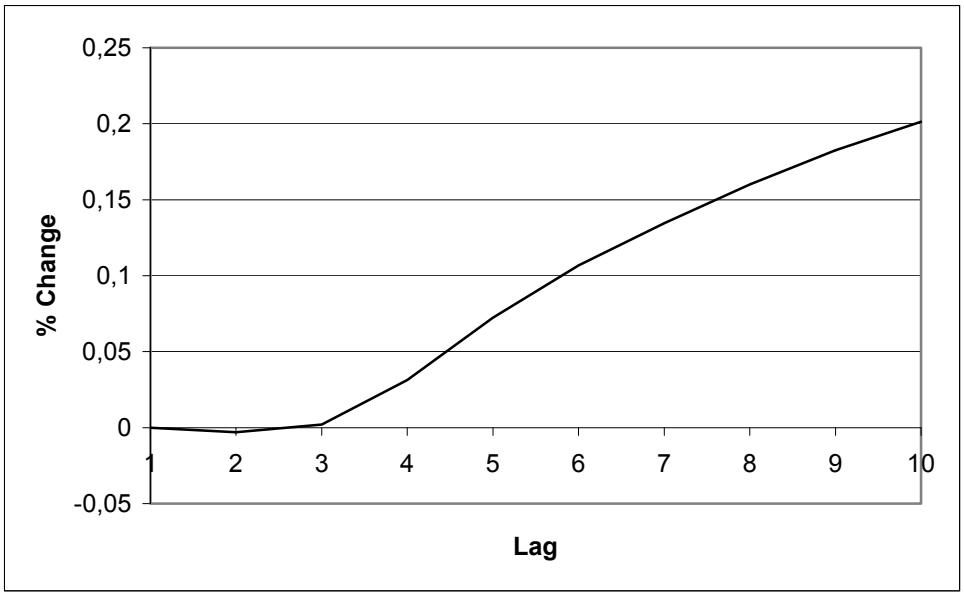
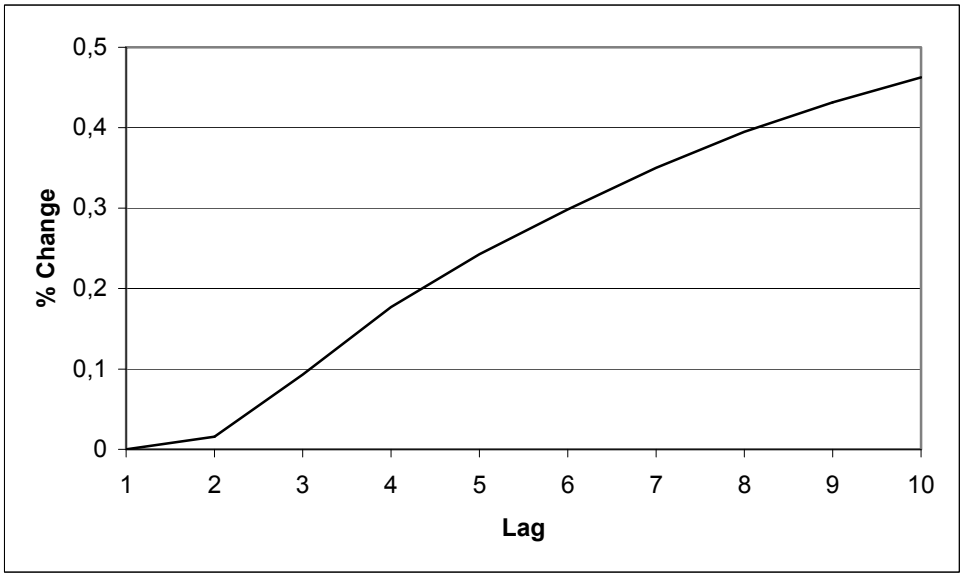


Figure 2d: Response of the price level to 1-standard deviation shock in oil price



5. Conclusion

The importance of understanding the relationship between the world oil price and aggregate demand is because oil shocks immediately raise prices of petroleum products that are key production inputs as well as essential consumer goods. Additionally, oil shocks are likely to push up prices in other energy markets as has been witnessed in recent times. These price increases are considerable enough that they characteristically show up as temporary spikes in the overall rate of inflation and may even get passed through to continuing rates of inflation. As far as increases in the price of oil lead to a rise in the price level, they also reduce consumer-spending power through a reduction in the real money stock. According to LeBlanc and Chinn (2004), the implications of higher energy prices on inflation depend, in part, on how important energy is in the economy. The importance of oil in production and consumption across countries (differences in energy intensities of production) may, however, be offset by differences in inflationary transmission mechanisms with respect to wage setting institutions, but that is not the essential point here.

The current study examines the relationship between the world oil price and aggregate demand in a developing country, Ghana, via the interest rate channel by means of cointegration analysis. Results of the study indicate that oil price—by impacting the price level positively—negatively impacts real output. The results also indicate that monetary policy is initially eased in response to a surge in the price of oil in order to lessen any growth consequences, but at the cost of higher inflation. The ensuing higher inflation, however, prompts a subsequent tightening of monetary policy. In addition, output does not revert quickly to its initial level after an oil price shock, but declines over an extended period.

The study, nevertheless, suggests that the adverse effect of higher oil prices on growth can be mitigated through prudent fiscal policies and structural reforms such as the dismantling of oil price subsidies as well as credible monetary policy. Lower government-controlled petroleum prices may not promote an efficient use of resources and may lower the incentives for households and firms to switch to other energy sources. By reducing the demand for oil products, higher petroleum prices could improve the foreign trade balance and reduce the harmful environmental effects that stem from oil consumption. Nevertheless, the gains in efficiency may be reduced when households switch expenditures to other goods that are heavily subsidized or that may have a greater environmental effect (see Kpodar, 2006).

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