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Abstract

This study explores the impact of fluctuations in oil prices on Turkey's economy. The data used in this study covers the years from 1991 to 2008. Macro-economic variables used in this study are GNP, inflation, unemployment and the ratio of exports to imports. VAR model is used in estimating the macro-economic impact of oil prices.

Based on the results of the analysis conducted, a meaningful relationship of oil prices with inflation, unemployment and the ratio of exports to imports is estimated. However, it is observed that a rise in oil prices do not have any substantial impact on macro-economic variables. While an inverse relationship of oil prices with the ratio of exports to imports and unemployment is estimated, a direct relationship between oil prices and inflation emerged. The results of impulse-response analysis shows that the responses of macro-economic variables to oil price shocks become stable only after one year.

Keywords: Oil prices, VAR, Macroeconomics, Turkey

1. Introduction

Developments in crude oil prices are closely watched in world markets, and they have a significant impact on the world economic conjuncture. Being the most basic energy source, oil is of great importance due to its role in providing inputs to other sectors. Therefore, it can be said that oil price fluctuations have a potential to affect the overall level of input prices and production through its reflection on input prices. Furthermore, oil import with a level of 202

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billion dollars in Turkey, an oil importer country, has become one of the most important import items. 90% of Turkey's oil needs are met through imports (Ugurlu and Ünsal, 2007). This situation turned Turkey into a country dependent on the oil, and consequently it is considered that the rise on oil prices has a considerable effect on Turkey's macro-economic variables. Turkey has a strategic importance as being located on the crossroads of oil and natural gas pipelines. The objective of this study is to explore the relationship between crude oil import prices and macro-economic variables.

The impact of crude oil prices on the global economy has become an important issue drawing attention of politicians and economists. Researchers have often focused on the effects of oil price shocks on developed, net oil importing countries. However, studies for net oil-exporting countries have recently gained intensity. The impact of oil price shocks can show variations depending on the countries' institutional structures, compositions and economic development positions. Countries are examined under sub-headings as countries exporting and importing oil in the literature scan of this study.

1.1 **Oil Importing Countries**

After the oil crisis of 1970s, oil prices caused significant changes especially on the macro-economic balances of oil importing countries. By acting upon the results of many studies on the impact of oil prices on macro-economic variables, Hoel (1981) reveals in his study the fact that oil prices creates negative effects on the balance of trade and employment (Hoel, 1981).

Sharp rises in oil prices usually have a significant impact on economic activity and macro-economic policies. Numerous economic studies have investigated the channels by which oil price shocks affect the economic variables. Many economists developed theoretical explanations presenting an inverse relationship between variations in oil prices and the level of economic activities. Oil price shocks are an indication of an increase in the scarcity of energy. Oil price rises do not only slow the economic growth, but also lead to a rise in inflation. (Cologne, Monera, 2008). Cologne and Monera (2008) studied the direct impact of oil price shocks on product output and product prices along with the responses of monetary variables to external shocks for G-7 countries by creating a model based on VAR method. The results of the study showed that in countries except Japan and UK, any impact of oil prices on inflation could be rejected.

Jimenez and Rodriguez (2008) wanted to measure the impact of oil price shocks on product outputs in basic manufacturing industries by using VAR model based on the data coming from six OECD countries. According to the findings of their study, while the impact of oil price shocks on industrial product output is varied for four EU member countries, they are similar for UK and US (Jimenez Rodriguez, 2008).

Darby (1981) tested the belief that a real rise in oil prices throughout 1973-1984 was a significant cause of inflation in US and many other countries. He also studied the impact of a real rise in oil prices on national income. However, his findings showed no satisfactory impact of selected data on that period's world recession (Darby,1981).

Hamilton (1983) found a statistically meaningful relationship between GNP growth and fluctuations in oil prices in US economy for the periods of 1948-1972 and 1973-1980. The negative correlation between oil price movements and economic growth reflects a negative correlation from oil prices to aggregate economic activity. Some other studies have also confirmed the findings of Hamilton.

Burbidge and Harrison (1984) measured the responses given to fluctuations in oil prices by using VAR analysis. According to the evidence they obtained, a causal relationship exists from fluctuations in oil prices toward some economic indicators. However, the size of this relationship can be in different sizes depending on the economic structures of countries.

Kumar (2004) analyzed the impact of oil price shocks on India as an oil importer country. According to the findings of the study, a rise in real oil prices affects the industrial production negatively in direct and indirect amounts. A 100% percent rise in real oil prices for India's economy decreased the growth in industrial production by 1%. Furthermore, the same study revealed that inflation rate and short term interest rates were affected positively from a rise in real oil prices. Kumar (2004) states in the conclusion section of his study that an oil shock occurring in a more stable economy will cause wider economic consequences than an oil shock occurring in a volatile economy (Kumar, 2004).

Most of the analyses on the impact of oil shocks begin with a production function based on the relationship between capital, labor, energy inputs and the output. While a decrease in external energy supply directly decreases output by causing a drop in productivity, other factors such as mark-up pricing, capacity use rates and lower wages indirectly decrease the output. Based on these models, a linear relationship exists between a lag in real GNP and a lag in real oil prices. These models show the recessions being pushed by supply rather than being driven by demand. Besides, relatively fewer numbers of economic analyses refer to the impact of rises in oil prices in terms of their impact on the demand. In these models, a rise in oil prices will increase the overall prices according to the Keynesian theory's assumption of wage rigidity (Hamilton, 2003).

Zhang (2008) examined the relationship between oil price shocks and economic growth for Japan. Zhang (2008) estimated that negative oil price shocks (a rising trend in prices) had a wider impact on growth than the impact of positive oil price shocks (Zhang, 2008).

Oil price behaviors were examined through consumer prices, inflation and Philips curves. Basky and Kilian (2004) claims that the rise on oil prices is largely responsible for the high inflation in US since 1970s. In another study in contrast to their previous one , they found that oil prices had only a small impact on inflation in G-5 countries (France, Germany, Britain, Japan and US). They also found that inflation in European countries was less sensitive to fluctuations in oil prices than the inflation in US (Ewing and Thompson, 2007).

In a study carried out by Faria, Mollick, Albuquerque and Leon-Ledesma (2009), the impact of oil prices on China's foreign trade was explored. It was expressed that recent rises in oil prices were related with the increase in demand resulting from economic development of China. However, rises in oil prices could affect China's exports negatively as China being a net oil importer country. In the study mentioned above, it is aimed to obtain results regarding the issue of how China's economy compared to its rivals is affected by the rise in energy costs. According to results obtained, China has the capability to change the places of oil and workforce in production function while his rivals do not have this capability. An increase in China's relative workforce productivity may create an increase in China's exports, and a rise in oil prices occurs due to an increase in demand (Faria, Mollick, Albuquerque, and Leon-Ledesma, 2009).

Jayaraman and Choong (2009) estimated the relationship between economic growth and oil prices in their studies involving four Pacific Island Countries of Samoa, Solomon Islands, Tonga and Vanuata. All of these countries are oil importer countries. Based on the findings of their study, oil prices, GNP and international reserves are simultaneously integrated both in the short-term and in the long-term. In other words, an inverse relationship between oil prices and economic growth emerges. Rises in oil prices adversely affect economic growth in all of these countries (Jayaraman and Choong, 2009).

Kibritçioğlu and Kibritçioğlu (1999) researched the topic of how fluctuations in the oil prices around the world affected sectoral and general price levels in Turkey's economy as a crude oil importing country. In this context, they studied the degree of impact caused by rises in imported crude oil prices on the inflation for the period 1986-1999 by using VAR analysis method. According to the results of their study, the indirect impact of crude oil import price rises on the inflation is very low.

1.2 Oil Exporting Countries

Farzanegan and Markwardt (2009) revealed in their study focused on Iran as a major oil exporter country that fluctuations in oil prices causes a high vulnerability on macroeconomics. It is estimated that a tight relationship between rises in oil prices and industrial growth exists. However, a rise in oil prices increases public consumption spending and leads to overall supply increase. Thus, a rise in the general level of prices emerges (Farzanegan, Reza, Markwardt, 2009; 134).

In their studies focused on two small oil producer countries, Trinidad and Tobago, Lorde, Jackman and Thomas (2009) found out that oil prices were the most basic factor in determining these countries' economic activities. In the conducted impulse-response functions, it was estimated that positive shocks in oil prices affected the production negatively for two years, and they affected the production positively and in an increasing direction in the years following these first two years. Lorde, Jackman and Thomas (2009) also examined the impact of oil shocks on net exports. Their results shows that a rise in oil prices causes a jump in net exports for the first years, but causes a deficit after the fourth year. Moreover, a rise in oil prices causes rises in total investment, public spending, public revenues and average price level (Lorde, Jackman and Thomas 2009).

The studies made on this subject shows that oil prices are generally considered as a significant input, and they can be expressed as the defining factor in the movements of various macro-economic variables.

2. Econometric application

2.1. Methods and Data Set

VAR model, developed by Sims (1980) and based on Granger causality test, allows the analysis of the relationship of selected variables with each other. Each variable in VAR model are written as a function of both their own values and past values of other variables. Determination of the lag orders of variables entering into the model comes first among important decision stages in VAR analysis. Lag order to be selected should be adequate to catch dynamic relationship between variables. In general, it is observed that estimations made with short lag orders are more successful than the estimations made with long lag orders.

VAR model treats all the selected sizes as a whole. In other words, variables or sizes in econometric studies conducted with the help of VAR model are examined simultaneously. Pagan (1987) summarizes VAR model in four stages. Accordingly, data is firstly converted to a form suitable for VAR model. It means that data is stabilized. The reason for this action is the fact that probability theories developed for the analysis of time series are only valid for stabilized time series. [2]Because, traditional hypothesis test procedures based on t, F, χ^2 tests and used for active time series becomes dubious (Gujarati, 1995).

In this study, impacts of oil price fluctuations on GNP, unemployment, inflation and foreign trade is studied with the help of VAR analysis. Interaction and the direction of causality among variables are being tried to be presented by using VAR analysis. Impact-response functions are also used. Other variables' responses to a shock in oil prices can be measured in impulse-response analysis. In other words, impulse-response functions show the dynamic responses of each variable in VAR model to shocks when a structural shock emerges. Impulse-response coefficients are calculated based on the coefficients of VAR model (Kilian, 1998). Before moving to VAR analysis, stationariness of series is examined with the Dickey-Fuller Unit Root Test, then the first difference of the series are taken out and they made stationary.

In the selection of variables used in the model, theoretical and empirical studies in the literature are taken as a starting point. The selected variables are crude oil barrel prices, WPI for the representation of inflation rate, real GNP (1995 prices) for the representation of real growth, unemployment rate, ratio of exports to imports for the representation of foreign trade balance. All data are used in quarterly series as GNP and unemployment data is issued quarterly. Our data set covers the period of 1991:02-2008:02. Data belonging to the second quarter of 2008 is not taken due to global financial crisis after the second quarter of 2008. During the analysis, virtually no change is observed in the results when the places of variables are changed.

2.2. VAR Model Results

Many macro-economic time series contains a unit root. Therefore, the data need to be made stationary in order to make a VAR analysis. Unit root tests are important in the examination of the stationarity of a time series. Because, the presence of non-stationary regressors makes many standard hypothesis tests invalid. In this study, Augmented Dickey-Fuller unit root test (ADF) is used to measure the stationarity of series. Test results are shown in Table 1. Accordingly, our all series are not stationary in their level values. Therefore, the values to be used in VAR model are first degree difference values of the series. P values of variables' first-degree difference values are revealed to be stationary on a statistical basis.

Table here

Regarding the impacts of oil price fluctuations on macro-economic variables, impulse-response functions obtained from VAR analysis' dynamic averages section can be used to provide additional support. Impact-response functions presents the response of other variables when a one unit shock is applied to one of the variables in the system.

Table 2 shows the lag order selection criteria for VAR model formed by GNP, PR, UNP, INF, DR variables. Table 2 exhibits that appropriate lag order corresponding to the lowest value of LR, FPE, AIC, SC and HQ data criteria is 4 (four).

Table 2 here

Variance decomposition offers an alternative approach in revealing the dynamics of VAR system. Variance decomposition application is used to determine the percentage of changes, which have their own lags, occurring in the variation of each variable and the percentage of changes resulting from other variables. In this way, reactions of impulse-response function and endogenous variables against shocks are determined, and relative importance of shocks is revealed with the use of variance decomposition (Sever and Demir, 2007).

Another way of exploring the relationship between some variables and oil prices in Turkey is impulse-response functions. Figure 1 demonstrates the changes occurring in GDP, inflation, unemployment and ratio of exports to imports when a standard deviation shock emerges in the oil price series. When a one unit shock is applied on the oil prices, an observation on the impact of this shock on macro-economic variables constituting the subject of this study shows that a response in the direction of balancing is formed in the fourth or fifth period.

Figure 1 here

It is observed that GNP in Turkey is not affected much by these shocks. Existing literature concludes that oil prices affect oil importing countries such as Turkey negatively. In the periods of rising oil prices during the last ten years, the GNP of Turkey entered into a rising trend due to the implementation of stabilization programs in Turkey. Therefore, the impacts of increases in oil prices on GNP in Turkey are not similar with the results observed on other countries. However, when we look at the ratio of exports to imports, impulse-response analysis results show that shocks in oil prices decrease the ratio of exports to imports. This situation is leading to increases in Turkey's current account deficit problem as well as making the economy more fragile. Oil price shocks are creating a response in the direction of increasing inflation and creating a drop in the unemployment rate in Turkey.

Table 3 demonstrates the variance decomposition results we obtained from four lag order VAR model. Variance decomposition table (Table 3) depicts the extent of explanation provided by fluctuations in oil prices regarding the movements in macro-economic variables. According to the results of variance decomposition, all the variables are explained by their own changes during the first period. As the number of periods increase, the importance of volatility of oil prices on NX, inf, and unp increases.

Table 3

3. Conclusion and evaluation

Significant impacts of oil prices on the countries' macro-economic stability have emerged due to a rapid increase in oil consumption all over the World. According to the present literature, while a rise in oil prices has a positive impact on the macro-economic balances of oil producing countries, oil importing countries are adversely affected from this situation. In this study, the impacts of oil prices on the macro-economy of Turkey, an oil importer country, are estimated by using VAR model.

It is observed that rises in oil prices do not have a significant impact on macro-economic variables in Turkey. However, responses of macro-economic variables against oil price shocks becomes stationary only after one year. Therefore, it can be said that oil price shocks have a short-term impact on macro-economic variables in Turkey.

Statistically meaningful results between oil prices and other variables except GNP are obtained from the VAR analysis conducted. Accordingly, while a negative relationship exists between unemployment, the ratio of exports to imports and oil prices, a positive relationship between oil prices and inflation exists.

GNP also increases in parallel with energy consumption in developing countries like Turkey. Therefore, fluctuations in oil prices affect other macro-economic variables in addition to GNP. Fluctuations in oil prices especially affect the ratio of exports to imports. We can say that countries having a current account deficit problem such as Turkey are more sensitive to oil prices.

Table 1: Test Results For Stationariness

Variables	ADF (Logarithmic Values)	ADF (First Degree Difference Values)	P (Probability) Values
GDP	0,58	-4,45	0,0049
INF	-3,85	-4,96	0,0010
PF	-2,08	-5,41	0,0000
UNP	-2,68	-3,10	0,03
NX	-3,05	-7,50	0,0000

Figure 1: Impulse-Response Functions Graphic

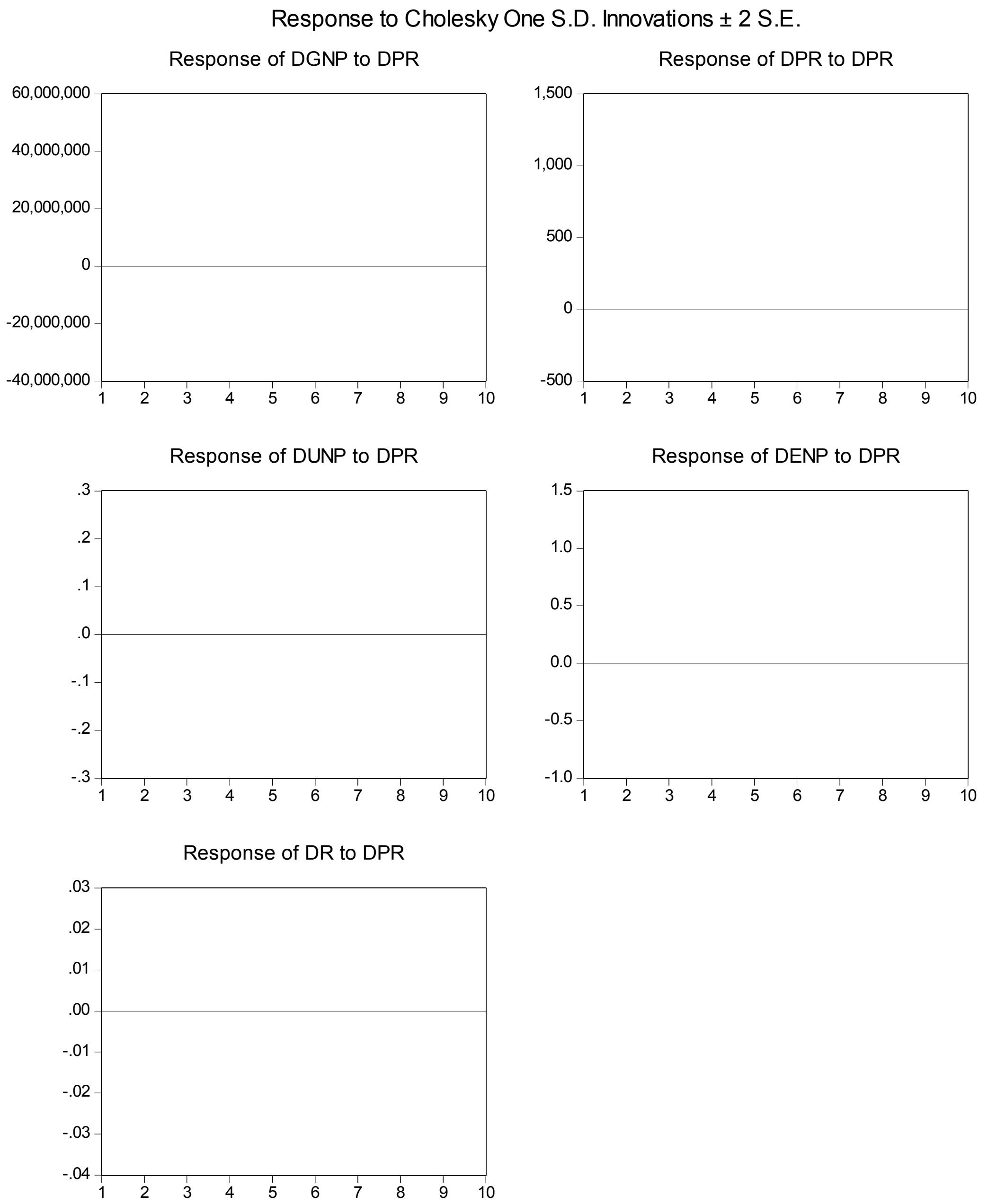

Table 2: The lag order selection criteria for VAR model formed by GNP, PR, UNP, INF,

DR variables

VAR Lag Order Selection Criteria						
Endogenous variables: DGNP DPR DUNP DENP DR						
Exogenous variables: C						
Sample: 1991Q1 2008Q2						
Included observations: 67						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2199.259	NA	2.59e+22	65.79878	65.96331	65.86389
1	-2155.407	79.85046	1.48e+22	65.23603	66.22320	65.62665
2	-2090.069	109.2212	4.50e+21	64.03192	65.84174	64.74807
3	-2007.602	125.5468	8.35e+20	62.31648	64.94895*	63.35816
4	-1955.895	71.00096*	4.00e+20*	61.51925*	64.97437	62.88645*
5	-1940.741	18.54725	5.97e+20	61.81315	66.09091	63.50587
6	-1918.368	24.04178	7.62e+20	61.89159	66.99200	63.90984
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

Table 3: Variance Decomposition with Oil Price in VAR

Dependent Variable	Period	Standard Error	GDP	Oilp	UNP	INF	NX
Output	1	1.35E+08	100,00	0,00	0,00	0,00	0,00
	4	1.42E+08	89,17	2,05	0,54	2,36	5,85
	8	1.47E+08	79,59	1,34	3,23	2,45	13,36
Oilp	1	1100.413	0,31	99,68	0,00	0,00	0,00
	4	1186.897	0,34	89,06	2,23	5,83	2,52
	8	1253.931	0,97	80,68	5,30	7,88	5,14
UNP	1	0.6205	2,02	2,09	95,88	0,00	0,00
	4	0.7418	1,46	6,01	77,75	10,13	4,00
	8	0.9034	3,13	5,01	76,07	11,84	3,93
INF	1	2.2194	0,09	7,46	6,14	86,29	0,00
	4	3.2717	9,50	5,02	12,31	65,85	7,30
	8	3.7511	19,77	4,95	12,98	56,05	6,23
NX	1	0,0587	17,06	0,29	0,00	0,31	82,32
	4	0.0672	19,02	6,86	4,37	1,75	67,97
	8	0.0722	20,10	8,36	6,23	2,15	63,14

Table 4. Vector Autoregression Estimates

Sample (adjusted): 1991Q2 2008Q2

Included observations: 69 after adjustments

	DGNP	DPR	DUNP	DINF	DR
DGNP(-1)	-0.274992	8.18E-07	-1.02E-10	4.37E-09	1.48E-11
	(0.11758)	(9.6E-07)	(5.4E-10)	(1.9E-09)	(5.1E-11)
	[-2.33868]	[0.85254]	[-0.18885]	[2.25994]	[0.28945]
DGNP(-2)	-0.322585	9.29E-07	2.20E-10	5.84E-09	9.14E-11
	(0.12199)	(1.0E-06)	(5.6E-10)	(2.0E-09)	(5.3E-11)
	[-2.64440]	[0.93394]	[0.39284]	[2.90899]	[1.72003]
DGNP(-3)	-0.218857	7.02E-07	-1.20E-10	4.16E-09	-2.40E-11
	(0.12218)	(1.0E-06)	(5.6E-10)	(2.0E-09)	(5.3E-11)
	[-1.79132]	[0.70428]	[-0.21436]	[2.06859]	[-0.45004]
DGNP(-4)	0.718326	7.47E-07	-1.32E-10	5.19E-09	6.89E-11
	(0.12324)	(1.0E-06)	(5.7E-10)	(2.0E-09)	(5.4E-11)
	[5.82861]	[0.74306]	[-0.23232]	[2.55802]	[1.28244]
DPR(-1)	19763.70	-0.114929	-0.000187	-0.000292	-6.25E-06
	(16900.8)	(0.13787)	(7.8E-05)	(0.00028)	(7.4E-06)
	[1.16939]	[-0.83359]	[-2.39923]	[-1.05134]	[-0.84920]
DPR(-2)	5747.516	0.091231	-0.000203	0.000486	1.44E-06
	(17613.5)	(0.14368)	(8.1E-05)	(0.00029)	(7.7E-06)
	[0.32631]	[0.63494]	[-2.50608]	[1.67836]	[0.18710]
DPR(-3)	19172.33	0.229703	-0.000178	-9.32E-05	-1.59E-05
	(16085.5)	(0.13122)	(7.4E-05)	(0.00026)	(7.0E-06)
	[1.19190]	[1.75051]	[-2.41201]	[-0.35197]	[-2.26396]
DPR(-4)	8584.527	0.023578	-1.92E-05	0.000218	-3.23E-06
	(16634.2)	(0.13570)	(7.7E-05)	(0.00027)	(7.2E-06)
	[0.51608]	[0.17375]	[-0.25079]	[0.79576]	[-0.44507]
DUNP(-1)	8183880.	127.0497	-0.429455	0.770494	0.018507
	(2.7E+07)	(222.904)	(0.12570)	(0.44957)	(0.01191)
	[0.29951]	[0.56998]	[-3.41652]	[1.71384]	[1.55450]
DUNP(-2)	8002994.	401.5957	-0.454150	0.069227	-0.012880
	(2.8E+07)	(230.176)	(0.12980)	(0.46424)	(0.01229)
	[0.28363]	[1.74473]	[-3.49882]	[0.14912]	[-1.04773]
DUNP(-3)	9987184.	331.9930	-0.357619	0.545314	0.004833
	(2.9E+07)	(236.451)	(0.13334)	(0.47690)	(0.01263)
	[0.34456]	[1.40407]	[-2.68202]	[1.14346]	[0.38273]
DUNP(-4)	35992083	-50.31397	0.450856	-0.196905	-0.012563
	(2.7E+07)	(216.518)	(0.12210)	(0.43669)	(0.01156)
	[1.35606]	[-0.23238]	[3.69254]	[-0.45090]	[-1.08637]
DINF(-1)	-9752459.	3.318178	0.090420	0.694731	0.001167
	(9429001)	(76.9187)	(0.04338)	(0.15514)	(0.00411)
	[-1.03430]	[0.04314]	[2.08458]	[4.47819]	[0.28405]
DINF(-2)	5664377.	-148.2167	0.032078	-0.138892	0.001118
	(1.1E+07)	(91.6942)	(0.05171)	(0.18494)	(0.00490)
	[0.50394]	[-1.61642]	[0.62036]	[-0.75102]	[0.22827]
DINF(-3)	4280692.	8.527725	-0.054262	-0.166245	-0.000819
	(1.1E+07)	(88.2953)	(0.04979)	(0.17808)	(0.00472)
	[0.39550]	[0.09658]	[-1.08979]	[-0.93353]	[-0.17359]

DINF(-4)	-4400697.	99.56274	0.020142	0.318930	-0.000966
	(8894842)	(72.5612)	(0.04092)	(0.14635)	(0.00388)
	[-0.49475]	[1.37212]	[0.49224]	[2.17926]	[-0.24924]
DR(-1)	-4.52E+08	2478.307	0.027425	6.096017	0.249127
	(3.3E+08)	(2652.31)	(1.49569)	(5.34943)	(0.14166)
	[-1.39061]	[0.93439]	[0.01834]	[1.13956]	[1.75863]
DR(-2)	-4.64E+08	2536.097	2.615742	6.189480	-0.141159
	(3.1E+08)	(2555.39)	(1.44104)	(5.15395)	(0.13648)
	[-1.48201]	[0.99245]	[1.81518]	[1.20092]	[-1.03426]
DR(-3)	-22940757	869.6552	1.727463	7.852743	-0.052000
	(3.4E+08)	(2752.24)	(1.55204)	(5.55097)	(0.14700)
	[-0.06800]	[0.31598]	[1.11303]	[1.41466]	[-0.35375]
DR(-4)	7.27E+08	-3878.664	1.613284	-3.020564	-0.167369
	(3.2E+08)	(2611.07)	(1.47243)	(5.26624)	(0.13946)
	[2.27031]	[-1.48547]	[1.09566]	[-0.57357]	[-1.20016]
C	51221970	54.26170	-0.119080	0.141860	-0.005627
	(2.9E+07)	(232.887)	(0.13133)	(0.46971)	(0.01244)
	[1.79423]	[0.23300]	[-0.90673]	[0.30202]	[-0.45236]
R-squared	0.974938	0.334436	0.803504	0.599578	0.488500
Adj. R-squared	0.964495	0.057118	0.721631	0.432735	0.275375
Sum sq. resids	8.73E+17	58123633	18.48360	236.4383	0.165803
S.E. equation	1.35E+08	1100.413	0.620544	2.219414	0.058773
F-statistic	93.36184	1.205965	9.814017	3.593676	2.292083
Log likelihood	-1377.066	-568.6239	-52.46258	-140.3963	110.1648
Akaike AIC	40.52365	17.09055	2.129350	4.678153	-2.584486
Schwarz SC	41.20360	17.77049	2.809296	5.358099	-1.904541
Mean dependent	40698728	120.8116	0.019275	2.359155	-0.000854
S.D. dependent	7.16E+08	1133.254	1.176149	2.946765	0.069043
Determinant resid covariance (dof adj.)		9.80E+19			
Determinant resid covariance		1.60E+19			
Log likelihood		-2015.027			
Akaike information criterion		61.45006			
Schwarz criterion		64.84979			

References

Barsky, Robert, Lutz Kilian, 2004. "Oil and the Macroeconomy Since the 1970s," *CEPR Discussion Papers* *4496, C.E.P.R. Discussion Papers.*

Burbidge, John, Alan Harrison, 1984. "Testing for the Effects of Oil-Price Rises Using Vector Autoregressions," International Economic Review, Department of Economics, University of Pennsylvania and Osaka University Institute of Social and Economic Research Association, Vol. 25(2), 459-84, June.

Cologni, A., Matteo Manera, 2008. "Oil Prices, Inflation and Interest Rates in a Structural Cointegrated VAR Model for the G-7 Countries", *Energy Economics* 30, 856-888.

Darby, Michael R., 1981. "The Real Price of Oil and the 1970's World Inflation", *NBER Working Paper Series* No. 629.

Ewing, Bradley T., Mark A. Thompson, 2007. "Dynamic Cyclical Comovements of Oil Prices with Industrial Production, Consumer Prices, Unemployment and Stock Prices", *Energy Policy* 35, 5535-5540.

Faria, Joao Ricardo, A. V. Mollick, P. H. Albuquerque, M. A. Ledesma, 2009. "The Effect of Oil Price on China's Exports", *China Economic Review.*

Farzanegan, Mohammad Reza, Gunther Markwardt, 2009. "The Effect of Oil Price Shocks on the Iranian Economy", *Energy Economics* 31, 134-151.

Gujarati, D.N., 1995. Basic Econometrics, Third Edition, McGraw-Hill Inc., Singapore.

Hamilton, James D.,2003. "Oil and the Macroeconomy since World War II.", Journal of Political Economy 91, 228-248, Hamilton, James D., "What is an Oil Shock?", Journal of Econometrics 113, 363-398.

Hoel, Michael, 1981. "Employment Effects of Increased Oil Price in an Economy with Short-Run Labor Immobility", *The Scandinavian Journal of Economics*, Vol. 83, No. 2, The Impact of Rising Oil Prices on the World Economy, pp. 269-276.

Jayaraman, T.K., Chee-Keong Choong, 2009. "Growth and Oil Price: A Study of Causal Relationship in Small Pasific Island Countries", *Energy Policy* 37, 2182-2189.

Jimenez-Rodriguez, Rebeca, 2008. "The Impact of Oil Price Shocks: Evidence From the Industries of Six OECD Countries", *Energy Economics* 30, 3095-3108.

Kibritçioğlu, Aykut ve Kibritçioğlu,Bengi.,1999. "Ham Petrol ve Akaryakıt Ürünü Fiyat Artışlarının Türkiye'deki Enflasyonist Etkileri", *Hazine Müsteşarlığı Araştırma İnceleme Dizisi* No:21, Nisan.

Kilian, L.,1998. "Small Sample Confidence Intervals for Impulse Response Functions", *Review of Economics and Statistics* 80, 213-230.

Kumar, Surender.,2009. "The Macroeconomic Effects of Oil Price Shocks: Emprical Evidence for India", *Economics Bulletin* 29.1: 14-37.

Lorde, Troy., Mahalia Jackman, Chrystol Thomas, 2009. "The Macroeconomic Effects of Oil Price Fluctuations on a Small Open Oil-Producing Country: The Case of Trinidad and Tobago", *Energy Policy* 37, 2708-2716.

Pagan, A.R., 1987. "Three Econometric Metedologies: A Critical Appraisal", *Journal of Economic Survey*, Vol.1.

Sever, Erşan, Demir, Murat.,2007. "Türkiye'de Bütçe Açığı ile Cari Açık Arasındaki İlişkilerin VAR Analizi ile İncelenmesi", *Eskişehir Osmangazi Üniversitesi İİBF Dergisi*, 2(1) Nisan.

Sims, C.A., 1980. "Macroeconomics and Reality", *Econometrica* 48, No.1: 1-48.

Uğurlu, Erginbay ve Ünsal, Aydın.,2009. "Ham Petrol İthalatı ve Ekonomik Büyüme: Türkiye", *http://iletisim.atauni.edu.tr/eisemp/html/tammetinler/144.pdf*

Zhang, Dayong, 2008. "Oil Shock and Economic Growth in Japan: A Nonlinear Approach", *Energy Economics* 30, 2374-2390