The effect of long and short time oil shocks on economic growth in Iran

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Oil is one of the strategic good so that price fluctuations and shocks of it have major effects on economic growth and recession in depended countries to revenues of it. In this study, it is tried that the effect of oil price shocks investigated in two types (short and long time) on Economic growth in Iran. Its Period is from 1974 to 2006. According it, oil price uncertainty is quantized by GARCH model and is determined the effects of oil price shocks on economic growth in Iran during a short and extended time by Vector Auto-regression Estimates (VAR), Vector Error Correction Estimates (VECM), Unrestricted Co-integration Rank Test (Trace) tests. The results of these estimations have shown that the effect of oil price shocks in short and prolonged course on economic growth in Iran had been negative.

Keywords: Economic growth -oil price shock- GARCH model- VAR model- VECM model
JEL Classifications: E32, O47, Q33

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1. Introduction

With discovery and injection of its revenues to government budget, the significance of oil in Iranian Economy found a new form; so that until that time, macroeconomic imbalances were compensated through credits or borrowing (funds), and Iranian economy was always in a situation where commercial balance has been moderated with the exit of old gold and metals. Finally, the largest shares of exports will be appropriated to imports, and this characteristic caused to variation in the foreign sector of Iranian economy, especially. In the one hand, imbalances in this sector could offset by oil incomes and on the other hand, due to the unpredictable foreign-currency, revenues along with decreasing or increasing in oil prices or oil earnings created imbalance unexpectedly. In the past years, the share of oil exports from total exports was 80% (average). Thus, oil revenues were considered as the most important part of foreign-currency revenues in Iranian economy.

As oil prices determine by exterior factors (factors that are out of economic policies and domestic political scope), fluctuations in oil universal prices had a substantial and undeniable impact on foreign-currency incomes and partial balance of external economy. The most effective factors on oil price are economical, exclusive and political factors. Economic factors are including of oil supply and demand and Production cost of this goods. Exclusive factors refer to the obligations of participation within the OPEC framework relate to the market adjustment and Participation with head companies through the production process and oil supply. Principal elements are in result of political reactions of producer and consumer countries and their Efforts to protect their interests in this arena. As for to these factors, incomes from oil exports will be very uncertain and unreliable; furthermore, it can influence fluctuations in oil revenues, foreign-currency incomes and the external part of the Iranian economy, unexpectedly.

Obviously, economic growth is as one of the progress signs in every country. Economic Growth occurs in the following of the increasing production or national per capita income. In other words, other words, when the production of goods or services increases for each country; this case can be explanatory of economic growth in that country. In a state, Growth of production is one of the most important factors on economic growth. Therefore; studying of effective factors in a dependent country such as Iran is very crucial.
Iranian economy is one of the dependent economies on oil and its revenues. Clearly, oil as strategic and influent goods has influenced on economic growth and prosperity and stagnation. So it can be claimed that the situation of oil market may be caused to effective oil shocks on growth. One of the most fundamental of instability reasons are oil shocks, particularly in dependent government. So, any kind of sudden changes in oil price in the frame of endogenous and exogenous shocks that come from the economic development and existing policies will be considered. For this study, we wanted to answer to the two basic questions: first question: Are there long-term and short-term oil shock prices in Iran? Second question was: Have these shocks had positive effects or not? To answer to these two questions, the framework of this article is according to this format (in the first part: the literature, in the second and third part: It is expressed the principles for investigation and theoretical model, in the fourth part: It is described model estimate and also at the end: results will be presented.

2. Previous literature

In domestic and international literature has been done the numerous studies about the effect of change in oil prices on economic growth that here, are mentioned to some of them. such as:Tayeb Nia and Ghasemi (2006) have done with title of the role of oil shocks in the process of trade of Iranian economy, and the research shows that our economy has passed seven of the commercial course, among the many

efficacious factors, oil has had an effective role in flourishing and stagnation in Iranian economy. In this economy, the period of economic prosperity has always been the same time with periods that oil price and oil incomes in comparison with before and after it, have been a maximum amount. The effect of various impulses on production fluctuations in the use of VAR model has shown. By estimating a model between impulse, oil price impulses are effective at a long time in making of business cycle and its impacts will decrease gradually. Furthermore, these impulses will be able to justify 25 percent of production fluctuations, while share of instability in the other variables on production variable is very trivial.

In the same direction, the effect of oil shocks on housing price in Iran has worked by Abbasi Nezhad and Yari (2009). The result of it has indicated that despite impact of factors on the housing sector, with emphasis on relation of oil shocks and increase the price of housing, the positive and negative shock on growth of housing price has been significant and also, agrees with the theory. The effect of rate of inflation on growth of housing price has been meaningless throughout this study.

Mehr Ara and Niki Oskuyi (2007) have studied on oil shock and its effects on macroeconomic variables. Results have shown that degree of exogenously for oil price in Saudi Arabia and Kuwait to Iran and Indonesia is lower. Furthermore, oil price shock is the most important source of oil price fluctuation and gross domestic product fluctuations and import in Saudi Arabia and Iran, While in Indonesia and Kuwait, import impulse is the main source of change in this two variables. Economical vulnerability and dependence to oil resource in Saudi Arabia and Iran are more than two other countries. This result can be attributed to correct economic policies in both of countries (Indonesia and Kuwait), particularly using the mechanism of foreign currency reserve. Finally, it has been said that the effect of oil price shock on import, gross domestic product and price index have been positive for

all countries and increase them. In this research, the external impulses have been the main source of long-term changes in all variables.
In the field of oil shocks, Komaijani and Asadi Mehmandoosti (2008) have done research with subject of quantitative impact of oil shocks and the monetary policy on economic growth. This result has pointed (that) oil shock has been effective on economic growth to a considerable degree in Iran, but despite the effectiveness of oil shock on liquidity and monetary policy result of it, the monetary shocks have not been effective on economic growth. Hosseini and Tahami pour (2009) have measured the effect of energy (oil) price shock in Iran. The result of it has shown that with regard to the effect of oil price shock on inflation by proper management of surplus oil revenues, improving the country is monetary policy and providing appropriate infrastructure to increase the competitiveness of domestic manufacturers, can be prevented of inflationary effects of oil shocks.
Another survey has been done by Komaijani and Nad Ali (2005), select a suitable foreign-currency system for economy with considering oil shocks and results showed that floating management system with balance of trade balance and equality purchasing power will be a best performance of stabilization of target variables [gross domestic production (non-oil) and inflation]. In contrast, quasi-floating exchange rate system is located which the only deviation in the real exchange rate is determined based on the trade balance, And entering oil shock doesn't indicate appropriate performance in relation to stability of target variable. Furthermore, several studies have been done worldwide that in this section, some of them are expressed.
Jose Garcia-Solannes and et al (2011) have done "Demand shocks and trade balance dynamics." This paper has studies the current account dynamics in the G-7 countries plus Spain and estimates an S-VAR model which allows identifying three different shocks: supply shocks, actual demand shocks and nominal shocks... Estimates from a structural VAR show that real demand shocks explain most of the

variability of current account imbalances, whereas, contrary to previous findings, nominal shocks play no role. The results illustrated that demand policies are the main responsible to trade imbalances.

Marcela Veselkova and Julius Horvath (2008) have studied "Trade Balance and Income Shocks: Experience of Transition Economies." This paper has investigated the major sources of changes in the trade balance of four Central European and three Baltic transition economies with an emphasis on the difference between permanent and transitory disturbances to income. In all seven countries, the findings support the hypothesis that transitory disturbances to income were the principal determinants of changes in the trade balance. These results seemed to be fairly consistent with inter-temporal models of trade balance, which view transitory shocks to income as the main source of variations in the trade balance. These results didn't seem to support the view that productivity shocks alone generate most of the variation in the trade balance.

Martin Bodenstein & et al (2011) have done "Oil shocks and external adjustment." This study has examined the effects of endogenously determined oil price fluctuations in a two-country DSGE model. Under incomplete financial markets, an oil market-specific shock that boosts the oil price results in a wealth transfer toward oil exporters, depresses the oil importer's consumption, and causes the oil importer's real exchange rate to depreciate. Although the oil importer experiences deterioration in the oil component of its trade balance, an improvement on the non-oil balance substantially dampens the effects on the overall trade balance.

Anna Kormilitsina (2011) has studied "Oil Price Shocks and the Optimality of Monetary Policy." The observed tightening of interest rates in the aftermath of the post-World War II oil price hikes led some to argue that U.S. monetary policy exacerbated the recessions induced by oil price shocks. This paper has provided a critical evaluation of this claim. Within an estimated dynamic stochastic

general equilibrium model of the demand for oil, in contrast Ramsey optimum with calculated monetary policy and has founded that monetary policy amplified the negative effect of the oil price shock. The optimal response to the shock would have been to raise inflation and interest rates.

Dayong Zhang (2008) has worked "Oil shock and economic growth in Japan: A nonlinear approach." This paper has investigated the relationship between oil price shock and economic growth based on the nonlinear approach developed by Hamilton [Hamilton, J, 2001. "A parametric approach to flexible nonlinear inference". Econometric 537-573]. The idea is that negative oil price shocks (price increase) tend to have the larger impact on growth than positive shocks do. Their empirical evidence confirmed the existence of nonlinearity between these two variables, and a flexible nonlinear model is estimated. Additionally, several other forms of nonlinearity were estimated and tested.

Mohammad Reza Farzanegan and Gunther Markwardt (2009) have studied "The effects of oil price shocks on the Iranian economy." This paper has analyzed the dynamic relationship between oil price shocks and major macroeconomic variables in Iran by applying a VAR approach. The study pointed out the asymmetric effects of oil price shocks; for instance, positive as well as negative oil price shocks significantly increase inflation. They found a strong positive relationship between positive oil price changes and industrial output growth. They have identified a marginal impact of oil price fluctuations on real government expenditures. Furthermore, they observed the "Dutch Disease" syndrome through significant appreciation in the really effective exchange rate.

Bwo-Naung Huang & et al (2005) have done "The asymmetry of the impact of oil price shocks on economic activities: An application of the multivariate threshold model." This paper has applied the multivariate threshold model to investigate the impacts of an oil price

change and its volatility on economic activities (changes in industrial production and real stock returns). The statistical test for the existence of a threshold effect indicated that a threshold value did exist. They concluded (i)the optimal threshold level seemed to vary according to how an economy depended on imported oil and the attitude towards adopting energy-saving technology; (ii) an oil price change or its volatility had a limited impact on the economies if the change was below the threshold levels; (iii) if the change is above threshold levels, it appeared that the change in oil price more than explained macroeconomic variables than the volatility of the oil price; and (iv) if the change is above threshold levels, a change in oil price or its volatility explained the model better than the real interest rate.

Akin Iwayemi and Babajide Fowowe (2011) have worked "Impact of oil price shocks on selected macroeconomic variables in Nigeria." This study has conducted an empirical analysis on the effects of oil price shocks on a developing country oil-exporter-Nigeria. Their findings showed that oil price shocks do not have a major impact on most macroeconomic variables in Nigeria. The results from the Granger-causality tests, impulse response functions, and variance decomposition analysis all showed that different measures of linear and positive oil shocks have not caused output, government expenditure, inflation, and the actual exchange rate. The tests supported the existence of asymmetric effects of oil price shocks because negative oil shocks significantly cause output and the real exchange rate.

Chaker Aloui and Rania Jammazi (2009) have worked "The effects of crude oil shocks on stock market shifts behavior: A regime switching approach." They have developed a two regime Markov-switching EGARCH model (Regime switching expresses the relationship between equity returns and short-term interest rates).the plausible results, including of two episodes of series behavior one relative to low mean/high variance regime and the other to a high mean/low variance

regime. Furthermore, there was evidence that common recessions coincide with the low mean/high variance regime. In addition, both real stock returns and probability of transitions from one regime to another to depend upon increasing in net oil price. The findings showed that rises in oil price have a significant role in determining both the volatility of stock returns and the probability of transition across regimes.

Nicholas Apergis and Stephen M. Miller (2009) have done "Do structural oil-market shocks affect stock prices?" This paper has investigated how explicit structural shocks that characterize the endogenous character of oil price changes affect stock-market returns from a sample of eight countries: Australia, Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States. They employed a vector error-correction or vector auto regressive model to decompose oil-price changes into three components: oil-supply shocks, universal aggregate-demand shocks, and global oil-demand shocks. The last component related to specific idiosyncratic features to the oil market, such as changes in the precautionary demand concerning the uncertainty regarding the availability of future oil supplies. Second, recovering the oil-supply shocks, international aggregate-demand shocks, and worldwide oil-demand shocks from the first analysis, they then employed a vector auto regressive model to determine the effects of these structural shocks on the stock market returns in our sample of eight countries and had found international stock market returns didn't respond in a large way to oil market shocks.

K.Doroodian and Roy Boyd (2003) have done "The linkage between oil price shocks and economic growth with inflation in the presence of technological advances: a CGE model." This study has examined whether oil price shocks are inflationary in the US. They increased the price of oil in the year 2000 in a manner consistent with the oil price shock of 1973–74 and let the economy experience a Hicksian

technological change and also, used a dynamic computable general equilibrium (CGE) model. They conducted their analyses under two separate cases: (1) regular economic growth, and (2) low economic growth and also, ran three technological scenarios: (1) no technology change, (2) technological advances in the manufacturing and refining sectors, and (3) technological advances in the manufacturing, refining, chemical, and service sectors. The effects of these changes were analyzed over the next 20 years until the year 2020. At first the structure to the US economy has changed remarkably since the early 1970s. Rather than a manufacturing based economy. The US is largely a service-based economy today, and hence it is more protected from raw material's shortages. Second: the economy has had a steady history of strong growth and the faster an economy grows the quicker disruptions to that economy are dissipated. Our economy was experiencing rapid technological advances in information systems, which have served to reduce costs and maintain output in a wide number of economic sectors.

Weiqi Tang & et al (2010) have studied "Oil price shocks and their short- and long-term effects on the Chinese economy." This paper has attempted to fill this gap by answering how and to what the impact of extent oil-price shocks China's economy, emphasizing on the price transmission mechanisms. They have developed a structural vector auto-regressive model. Their results showed that an oil-price increase negatively affects output and investment, but positively affects inflation rate and interest rate. Their decomposition results also showed that the short-term impact, namely output decrease induced by the cut in capacity–utilization rate, was greater in the first six periods (namely half a year), but the portion of the long-term impact, defined as the impact realized through an investment change, increased steadily and exceeded that of short-term impact in the 7th period. Afterwards, the long-term impact dominated, and maintained for quite some time.

Rafik Jbir and Sonia Zouari-Ghorbel (2009) have surveyed "Recent oil price shock and Tunisian economy." This paper has studied the oil prices–macro economy relationship by the analysis on the role of subsidy policy. The vector auto regression (VAR) method was employed to analyze the data over the period 1993 Q1 2007 Q3. The results from the model using both linear and non-linear specifications indicated that there is no direct impact of oil price shock on the economic activity. The shock of oil prices has affected economic activity indirectly. The most significant channel by which the effects from the shock were transmitted is the government's spending.
Christian Baumeistert and Gert peersman (2007) have studied ""Time-varying effects of oil supply shocks to the U.S. economy." They have investigated how the dynamic effects of oil supply shocks in the US economy have changed over time. They first documented a remarkable structural change in the oil market itself, a considerably steeper, hence, fewer elastic oil demand curves since the mid-eighties. Accordingly, a typical oil supply shock was currently characterized by a much smaller impact on world oil production and a greater effect on the real price of crude oil, but had a similar impact on US output and inflation as in the 1970s. Second, they have found a smaller role for oil supply shocks in accounting for real oil price variability over time, implying that current oil price. Fluctuations were more demand driven. Finally, while unfavorable oil supply disturbances explained little of the "Great Inflation," they seemed to have contributed to the 1974/75, early 1980s and 1990s recessions but also dampened the economic boom at the end of the millennium.

3. Data and Methodology

Economic growth is one of the major topics of modern economics. Economic growth generally means a measure or estimates the quantity or quality of Production results and their factors. In other words,

economic growth includes increasing the capacity and actual national product in the promotion of national power, the country and the region. Indicator usually used to measure the growth consists of two related indicators: Real gross domestic product growth and per-capita national product growth.

Adam Smith and Karl Marx have proposed. Considerable discussions about economic growth after that, The issue of economic growth is considered within the growth patterns and in a frame of the static, dynamic, short-term and long term Especially after World War I, long-term economic growth has attracted economical attention to themselves, in a way that economic growth is considered as a function of internal resources, population growth rates, saving rates, methods of organization, economic management and technology that influence on capital accumulation and increase production.

For modeling, the relationship between economic growth and its determining factors has been done many studies. The first simple model is attributed to Harrod and Dumar that in it, most fundamental determining factors of growth, investment and labor force growth will be considered. The relationship between production growth and capital stock and labor force is extracted from a general production function with constant coefficients. Solow removed the flexibility of above model by using of a general production function with substitution Capability. Thereafter, Solow growth model became as a basis for other studies. The most important features in the Solow model are including: Considering a total production function with capital and labor substitution (Cobb-Douglas), constant returns to scale and descending Ultimate output (Torkmani Haji Rahimi, 2006).

The Solow model hypotheses: 1. Labor force growth rate is constant and is equal to a population growth rate. (L//L=n) 2. It is one part. 3. Saving is a constant coefficient of production. 4. Total production function is continuous and there is the possibility of substitution for production factors technically.

Solow growth model is based on two axes:
1. The production function
2. Capital accumulation equation
Based upon the Solow growth model is assumed that the products function is the following:
$Y= F (K, L)$ (1)
L: work force
K: capital
All firms, according to presented production function in above, maximize their interests and according to following condition, they maximum their production.

Target function	Max F (K, L)	(2)
Restriction	$Y=w L+ r K_1$	(3)

As a result, labor force employment continues until that payment to this factor (wage) is the same to the marginal production of last worker capital is used until that the ultimate production of capital is equal to the rental the price.
$w= {}^{\delta}F/ {}^{\delta}L= (1-\alpha) L^{-\alpha}K^{\alpha}= 1-\alpha (K/L)^{\alpha}$ (4)
$w= {}^{\delta}F/ {}^{\delta}L= (1-\alpha) L^{-\alpha}K^{\alpha}= 1-\alpha (K/L)^{\alpha}$ (5)
In a particular case, we consider this production function as Cobb - Douglas:
$Y= K^{\alpha} L^{1-\alpha}$ (6)
If we divide both sides of on L, It can write it according to per-capita production and per-capita capital:
$Y/L= (K/L)^{\alpha}$ or $y= AK^{\alpha}$ (7)
K and Y respectively show capital per-capita and production per capital marginal production of capital is the following:
$\Delta Y/\Delta K= \alpha K^{\alpha-1} L^{1-\alpha} = \alpha K^{\alpha-1} = f (K)$ (8)
The second equation is the capital accumulation that indicates over time how to save capital. Changing rate for capital indicates is equal to investment that is in equilibrium with saving.

$K^{/}=d\ K/d\ t=I=s\ y$ (9)
It is deemed that labor force growth rate is constant over time.
$L^{/}/L=\lambda$ (10)
At investment equation, put instead of y:
$K^{/}=I=s\ y \rightarrow K^{/}=s\ L\ f\ (K)$ (11)
On the other hand, as regards to K=k L, we can write $K^{/}$ Following:
$K^{/}=k^{/}\ L + k\ L^{/}=k^{/}\ L + k\ L^{/}/L*L=k^{/}L + k\ \lambda\ L$ (12)
Now with the placement instead of $K^{/}$ will have:
$K^{/}=s\ L\ f\ (K) \rightarrow k^{/}\ L + k\ \lambda\ L=s\ L\ f\ (K)$ (13)

By removing L from both sides of this equation and arranging it, have the equation of capital accumulation on the Solow model that shows how to save capital accumulation over time.
$K^{/}$: changes in the amount of per-capita capital
s y = L f (K): amount of investment per capita
λ K: depreciatory rate that is performed during the process.
The equilibrium condition is where $k^{/}=0$, the capital stock per capita does not change.
$K^{/}=0 \rightarrow sf\ (K) =\lambda\ k$ (15)
By dividing both sides of capital accumulation equation on k will have:
$K^{/}/k=s\ f\ (K)/k - \lambda \rightarrow K^{/}/k=s\ y/k–\lambda$ (16)
If capital accumulation rewrites according to capital per capita, will have:
$K^{/}/k=K^{/}/k–L^{/}/L=K^{/}/k–n \rightarrow K^{/}/k=k^{/}/k + n$ (17)
With a combination both of equation, will have the main equation of Solow model:
$K^{/}=s\ f\ (K) - (\lambda + n)\ k$ (18)
s y=s f (K): labor force investment per – capita
λ k: depreciation of per-capita workforce
In equilibrium, we have $k^{/}=0$ and we will have:
s y= (n + d) K (19)

At this point, the amount of capital per capita for a worker is constant and is called the equilibrium conditions.

$Y=K^{\alpha}$ (20)

$K^{/}=s\,K^{\alpha}-(n+d)\,k,\ s\,K^{\alpha}=(n+d)\,k \rightarrow,\ s\,K^{\alpha-1}(n+d)\,k$ (21)

$[K^{\alpha}-1=(n+d)/s]^{1-\alpha},\ k^{/}=[s/(n+d)]^{1/1-\alpha}$ (22)

Now by replacing this relationship for the production function, can be achieved production rate per capita for a worker in the stable condition.

$y^{/}=[s/(n+d)]^{\alpha/(1-\alpha)}$ (23)

Due to expressed the contents, can study effects of oil price shock (short and long term) on economic growth in Iran, and we can analyze the effect of three variables on economic growth. Economic growth is introduced as a dependent variable in the model and is a function of inflation rate, labor, capital stock and its equation can be expressed following:

GY=F (INF, K, L) (24)

Here the effect on the price uncertainty enters into this model as a shock and in the frame of a variable (in a frame of shock variable) therefore, we will have:

GY= F (INF, K, L, SHOCK) (25)

GY: economic growth rate (an increase in GDP)

K: capital stock

L: available work force

SHOCK: the shock of the price uncertainty

INF: inflation rate

In this paper, shock variable has been obtained from quantification of the price uncertainty in GARCH model.

The data related in this study is selected from Statistical Center at Iran and time series database (The Central Bank of Iran), and for the period 1974 to 2006 has been chosen.

The estimation model:

in Garch model, at first is determined the level of static for variable and after it, according to them, behavior equation obtained that here, we used of general square least estimation and in the next step, observed that there is heteroscedasticity and finally after removing it, oil price variable entered on the form of GARCH model (in the frame of Shock variable). To estimate the model and to provide accurate and appropriate analysis, at first must be sure about the stability for variables over time. This paper has been used from the unit root test and also, is done based on generalized Dickey Fuller statistic.

The results of it are like this that inflation rate variable inflation rate was static in level and capital stock, and labor forces were not stationary in level of theme selves, and by Subtracting in two times became static.

In Table 1, has been investigated stability for variables by using of generalized Dickey Fuller test.

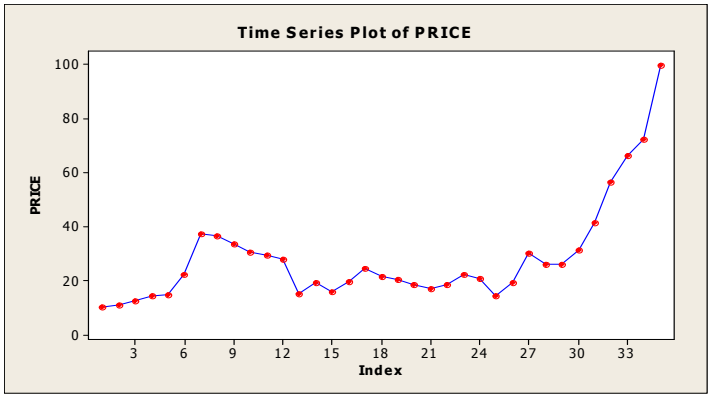
Table 1

Stationary test for variables

Variables		critical values f dickey Fuller (ADF)	statistic
Variable value in level	GY*	-2.95	-4.77
	L	-2.96	0.77
	K	-2.95	1.48
	INF*	-2.95	-3.6
	SHOCK*	-2.95	-3.32
first order difference	DL	-2.96	-1.43
	DK	-2.95	-1.29
Second order difference	DDL*	-2.96	-5.02
	DDK*	-2.95	-5.91

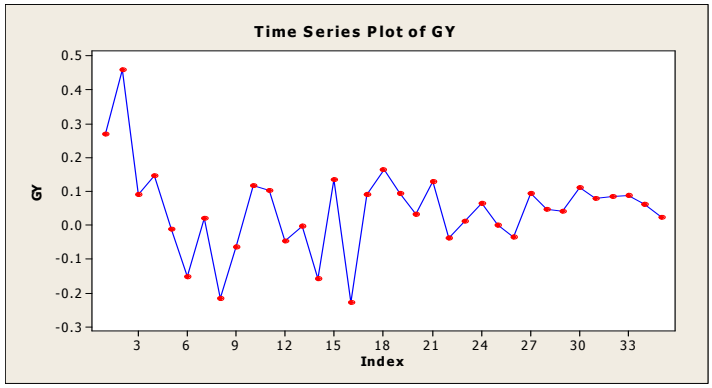
Stationary signs, resource: research calculations

Figure 1
Trend of change in oil prices during the period 1974-2006(Based on dollars per barrel)



Source: research calculations

Figure 2
The trend of change for GDP growth in Iran during the period 1974 to 2006, without unit.



Source: research calculations

It performed the test for this study is to demonstrate the effect of oil price shocks on economic growth and are including of auto regression model, vector error correction model and Johnson test and also; the results of them are presented in the following sections.
VAR equation:
After the determination of Stability for variables and With regard to stationary rank, were performed regression GY variable on itself and other variables.
GY = 0.136 -0.304GY (-1) -0.112GY (-2) -0.00041DDL (-1) -0.00012DDL (-2) +0.00003DDK (-1) +0.00001DDK (-2) -0.295INF (-1) +0.024INF (-2) -0.0004SHOCK (-1) -0.0007SHOCK (-2) (26)
R^2=0.338
F=1.024

As equation (26) shows, the effect of oil shocks and work force on economic growth in Iran in course of the first and second difference had been negative. And also, the effect of capital stock in course of the first and second difference had been positive.at last, the effect of inflation rate on economic growth has estimated negative in course of the first and positive in course of the second.
To determine the impact of oil shocks in the long run has been used VECM method.

VECM pattern:
In vector error correction test, is displayed error correction equation that includes relationships between variables and also, obtains error correction coefficient or adjustment coefficient.
GY=0.1179-0.0024DDL (-1) +0.000062DDK (-1)-0.004SHOCK (-1) +0.314INF (-1) (27)

Equation (27) shows that in the long term, impact of oil shocks on economic growth is negative.

Inflation and Capital stock variables have had a positive effect on economic growth in the long-term and labor force inflation has had a negative impact on economic growth in the long term at Iran.
Adjustment coefficient also indicates that in any period, about 0.13 of occurred changes become adjustment.
Error correction coefficient = -0.126386

The estimation of long-term model: Determining a co-integrated vector
To determine the number of co-integrated vector uses of trace test (λ Trace) and the maximum eigenvalue (λ Max).

Table 3

Eigenvalue test (λ max)

Null hypothesis	statistic λmax	possibility
None *	36.61	0.023
At most 1 *	27.51	0.051
At most 2	19.47	0.083
At most 3	15.13	0.036
At most 4	7.9	0.005

Resource: research calculations

Tables 2 and 3 show that the model 25 can be estimated by the maximum of co-integrated five-vector at 5% level. Determining of the number of the co-integrated vectors was evaluated by λ max test and λ trace test.

Johnson test
After estimating the VAR model using of co-integrating test command, is obtained the long-term relationships between variables in the form of Johnson test.
GY= 0.00006DDK (-1)-0.0024DDL (-1) +0.314INF (-1)-0.004 SHOCK (-1)(28)

Johnson's test has shown that long-term impact of oil shocks on economic growth is negative. The result from this test can be provided oil shocks analysis, and making effective economic policy.

Conclusion and Discussion

In this article, by using of tests and to calculate the shock, was demonstrated that there is oil shock in Iran. The numbers obtained from the GARCH method showed that there have been oil shocks had an impact on macro variables in the economic system during this period in our country. After determining the oil shock, have placed it in a model of economic growth in Iran and result of it has shown that oil price shocks has had a negative effect on economic growth. In the other word, oil price fluctuations cause to reduce economic growth. This subject is important because in sometimes shocks has been positive but anyway oil prices fluctuations have reflected negatively on economic growth in Iran. On this basis, the answer to two main questions caused to by Economic models be shown that the relative stability in oil prices can help to economic growth. It can be very important in creation of Economic policies. Specifically, in some analyzes may increase in oil prices, be considered a good event in the economy. So, this survey showed stability in the price of a Strategic commodity for economic growth is better than the Cross sectional fluctuations.

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