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Inflation Targeting and Effects of Oil Price Shocks in ECO, Case Study of Iran, Kazakhstan and Turkey*

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The recent researches about the effects of oil price shocks on economy show that this kind of shocking 2000s unlike 1970s had had different results for importing and exporting economies. Experimental findings identified inflation control by more effective policies and more reliable central banks for fixing prices as one of the most reasons of this difference. This research intended to compare effects of oil price shocks between countries that have been successful or unsuccessful in controlling inflation rate. Selected countries were members of the Economic Cooperation Organization (ECO) and oil price shock effects on their economy were considered by structural vector autoregressive regression with seasonal time series during 1996-Q1 to 2012-Q4. The impulse response functions and variance decomposition analysis of prediction error showed that successful countries (Kazakhstan and Turkey) in controlling inflation rate versus the unsuccessful country (Iran) during the under-study period experienced a higher economic growth rate along with lower inflation rate. On the other hand, to confirm findings of Blanchard and Gali (2007) for both oil exporting and importing countries, reliable monetary policies of Central bank for controlling fluctuations of general level of prices more effectively is one of the factors of maintaining high average production growth rate and low inflation rate during creation of oil price shocks.

Key words: Oil Price Shock, Inflation, ECO, SVAR Model

Oil price shock is one of the most important effective factors on real variables of economy. In addition, this kind of shock by influencing nominal variable of public level of prices leads to the reaction of monetary policy with the aim of ultimate stable of price levels (Bernanke, Gertler and Watson, 1997, p.39). In this condition, the policy faces complex issues of trade-off between inflation and unemployment rates. Recent studies about the effect of this shock on countries' economy show that in contrast to the 1970s which oil shocks caused inflation coupled with recession in economy, in 2000s different results were observed, production growth rate was still remarkable and there was a less increase in inflation rate compared to 1970 (Brawn et.al, 2002, p.13). The most important reasons of this difference is that credible monetary policies of central banks have become more effective to control fluctuations of public price level than before (Blanchard & Gali, 2007, p.1).

Therefore, the present study intended to compare the effect of inflation control on economic growth aroused from oil shocks during the period 1996Q1-2012Q4 for Economic Cooperation Organization (ECO) countries. Innovation of this study in showing the effect of inflation control on economic growth of countries is through applied model and way of choosing sample countries. So,

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among countries of ECO, three countries Iran, Turkey and Kazakhstan were chosen. The share of these countries in gross domestic product (DGP) of ECO is more than 70%. Also examining real data shows that Turkey and Kazakhstan in implementation of monetary policy and inflation rate control were successful and Iran was unsuccessful (figure 1).

Theoretical foundations

In this part, theoretical foundations related to oil shock, its transmission channels and role of monetary policy in amount of shock effects on macro variables have been described briefly.

Oil price shocks

Oil price shocks as the most important production data play an important role in creating commercial cycles of exporting and importing countries. To consider effects of oil price shock, it is needed to pay attention to the reaction of endogenous oil price towards changes of international conditions. Experimental studies introduced lack of oil supply in 1970s and increase in demand in 2000s as factors of shock creation. When factor of shock creation is lack of supply, economic variables in both importing and exporting countries will be influenced by total supply channel due to the oil production factor and its increased price. But when shock factor is increase of oil demand due to any reason such as increased efficiency in production, economic variables will be influenced by more channels such as monetary policy channel and may bring different results compared to the fist state. Based on conducted studies, when increase in oil price shock is due to the increased oil demand, the small and importing country pays a more cost for importing. But because of production efficiency development, the country will benefit from importing cheaper goods and more export. Exporting country also will benefit from increased oil income and cheaper import. Thus, as it has been experienced in 2000s (contrast to 1970s), positive oil price shocks do not lead to the decrease of economic growth of countries especially oil importing countries and technology development leads to preserving high growth of production rate. Additionally, both countries can experience little changes in the public level of prices by implementation of a suitable monetary policy (such as targeting inflation rate which was very successful in 2000s) (Kilian, 2008, p.40; Kilian, 2009, p.17; Brawn, Youckle and Thompson, 2002, p.4).

Monetary policy

Observing different results of oil shocks in 2000s made role of monetary policies in considering effect of oil shock on economy became more important (Clarida, Gali and Gartler, 2000, p.147; Blanchard & Gali, 2007, p.1). Monetary policy can be in forms of approval and rule. Monetary policy based on approval causes inflation bias and based on rule causes social welfare (Kydland & Proscat, 1977, p.487; Barrow & Goorden, 1983, p.28; Clarida, Gali and Gartler, 1999, p.1676).

Review of related literature

Komeyjani et.al (2010) in a study entitled "assessment of the effect oil shocks and monetary policies on Iran economic growth" considered the amount of effect of oil shock and monetary policy shock on the effect of oil shock on gross domestic product of Iran. Results showed that positive oil shock has a remarkable and positive effect on gross domestic product of Iran. In a short term, 23% and in a long term, 14% of gross domestic product fluctuations of Iran are related to the oil shock. However, monetary shock has no remarkable effect. Farzinwash et.al (2012) in a study entitled "Asymmetric effects of monetary policy on production in economy of Iran" considered the effect of monetary policy on real variables in different times of recession and economic cycle boom of Iran. Results from model evaluation show that: transmission variable in Iran economy is oil incomes. In low growth condition of oil income, increase in volume of money as expansionary monetary policy with the coefficient of 21 percent will lead to the increase of GDP. While in high growth condition of oil income, increase in volume of money with the coefficient of 3 percent will lead to the increase of GDP. On the other hand, asymmetric hypothesis of the effect of monetary policy on production in Iran economy is accepted.

Unalmis et.al (2008) in a study entitled "oil shocks, economic stability and welfare in a micro and open economy" considered the effect of oil price shocks on Turkey economy in 2000s. The results of immediate response function show that effect of supply and demand shock on economy of Turkey is completely different. When production technology of Turkey is similar to other countries and there is no wealth effect, reduction in oil supply and its increased price will increase

consumer inflation index, domestic inflation rate, nominal interest rate and decrease production level.

Model and methodology

In this study, Structural Vector Auto Regressive (SVAR) model was used. When the shock under study influences economy from different channels this model is useful. The model includes five endogenous variables of real Gross Domestic Production (GDP), short-term nominal interest rate, nominal exchange rate, consumer price index and real world price of a barrel of crude oil. Type of selected variables in this model shows the New-Keynesian theoretical framework of a small and open country which was created by (Svensson, 2000, p. 160) and (Clarida, gali and Gertler, 2000, p. 169).

In this research Y_t vector with five in one dimensions represents an economic structure:

$$\acute{Y}_t = [\text{woil}_t, gdp_t, cpi_t, e_t, i_t]$$

Where: woil_t real world price per barrel of crude oil, gdp_t real gross domestic production[1], cpi_t consumer price index, e_t nominal exchange rate and i_t short-term nominal interest rate. Reduced or standard form of VAR of this vector is in form of a matrix.

$$A(L)Y_t = u_t \quad ...(1)$$

A(L) is matrix of summarized form coefficients with five in five dimensions and polynomial functions based on lag operator L. u_t vector of five in one of error terms that are a combination of structural forms of SVAR model. Distribution of error terms are known as $u_t \sim i.i.d(0,\Sigma)$ with zero mean and a positive definite covariance matrix Ó. provided the stability in the model, it is possible to obtain the relationship number (1) as relationship number (2). In this condition, endogenous variables of vector Y_t are a function of current and past value of error terms in the system:

$$Y_t = \sum_{i=0}^{\infty} B_t u_{t-i} = B(L)u_t \quad ...(2)$$

Assuming that A(L) is reversed and Y_t is Covariance Stationary, matrix B(L) is indeed $A(L)^{-1}$ and represents the effect of different disorder sentences on time procedure of each variable. On the other hand, relation number (2) represents immediate response functions in moving average state. Now, it is possible to replace in relation number (2) with its equivalent from relation number (3) and reach relation number (4):

$$u_t = \theta\varepsilon_t \quad ...(3)$$

$$Y_t = \sum_{i=0}^{\infty} \emptyset_i e_{t-i} = \emptyset(L)\varepsilon_t \quad ...(4)$$

Relation number (4) shows model of moving average (VMA) based on structural shocks. In this relation, equals . By using coefficients of a five in five matrix which are named Impact Multipliers coefficients, it is possible to consider the effect of structural shocks on endogenous variables.

Problem Identification and Cholesky decomposition

Since estimated parameters from equation (1) are lower than structural model, adverbs with number of will be imposed on matrix in order the model changed from the state lower than clearness to a complete clear state. In traditional method of Cholesky decomposition, is a lower triangular matrix in which all main diameters are positive. This matrix has been made from (matrix based on Cholesky decomposition method and is used for

Table 1. Variance decomposition of gross domestic production cycles of Iran

Di	E	LnINF	LnGDP	LnWOIL	SE	Period
.00	.00	.00	98.649	1.350	.0068	1
.1871	.6622	5.4716	93.3507	.3282	.0228	4
1.2323	6.8931	15.4460	76.0827	.3457	.0408	8
2.4266	18.7759	16.4399	62.1470	.2103	.0529	12
2.3005	36.9834	11.2799	49.3067	.1284	.0737	24

Reference: research findings

identification of the method. Using this method in addition to determining limitations also makes orthogonal structural shocks. In this model, five types of structural forms have been defined. Shocks include respectively: () oil shock, () production shock, () inflation rate shock or pressure of cost, () exchange rate shock and () monetary policy shock. According to the aim of this study which is considering the effect of oil shocks and reaction of monetary policy against it, structural shock (form) vector is defined as below:

$$\acute{\varepsilon}_t = \left[\varepsilon_{\text{woil},t}, \varepsilon_{gdp,t}, \varepsilon_{\text{cpi},t}, \varepsilon_{\text{ex},t}, \varepsilon_{i,t}\right] \quad ...(5)$$

The existing respectively between structural shocks and macroeconomic variables imposes the following limitation on matrix in relation number (4) by traditional method of Cholesky decomposition in order to reach relation number (6):

$$\begin{bmatrix} \text{woil}_t \\ y_t \\ P_t \\ \text{ex}_t \\ i_t \end{bmatrix} = B(L) \begin{bmatrix} \theta_{11,0} & 0 & 0 & 0 & 0 \\ \theta_{21,0}\theta_{22,0} & 0 & 0 & 0 & 0 \\ \theta_{31,0}\theta_{32,0}\theta_{33,0} & 0 & 0 & 0 & 0 \\ \theta_{41,0}\theta_{42,0}\theta_{43,0}\theta_{44,0} & 0 & 0 & 0 & 0 \\ \theta_{51,0}\theta_{52,0}\theta_{53,0}\theta_{54,0}\theta_{55,0} & 0 & 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} \varepsilon_{\text{oil},t} \\ \varepsilon_{y,t} \\ \varepsilon_{\text{cpi},t} \\ \varepsilon_{\text{ex},t} \\ \varepsilon_{i,t} \end{bmatrix}$$

...(6)

Here, each member of vector Y_t is referred to its structural equation. Thus, structural shocks will have economic interpretation (Line Nesse Ødegaard 2012).

$$\text{woil}_t = \theta_{11,0}\varepsilon_{\text{woil},t} \ldots + \text{lags}$$

$$\text{gdp}_t = \theta_{21,0}\varepsilon_{\text{woil},t} + \theta_{22,0}\varepsilon_{\text{gdp},t} \ldots + \text{lags}$$

$$\text{cpi}_t = \theta_{31,0}\varepsilon_{\text{woil},t} + \theta_{32,0}\varepsilon_{\text{gdp},t} + \theta_{33,0}\varepsilon_{\text{cpi},t} \ldots + \text{lags}$$

$$e_t = \theta_{41,0}\varepsilon_{\text{woil},t} + \theta_{42,0}\varepsilon_{\text{gdp},t} + \theta_{43,0}\varepsilon_{\text{cpi},t} + \theta_{44,0}\varepsilon_{e,t} \ldots + \text{lags}$$

$$i_t = \theta_{51,0}\varepsilon_{\text{woil},t} + \theta_{52,0}\varepsilon_{\text{gdp},t} + \theta_{53,0}\varepsilon_{\text{cpi},t} + \theta_{54,0}\varepsilon_{e,t} + \theta_{55,0}\varepsilon_{i,t} \ldots + \text{lags}$$

Structural Decomposition

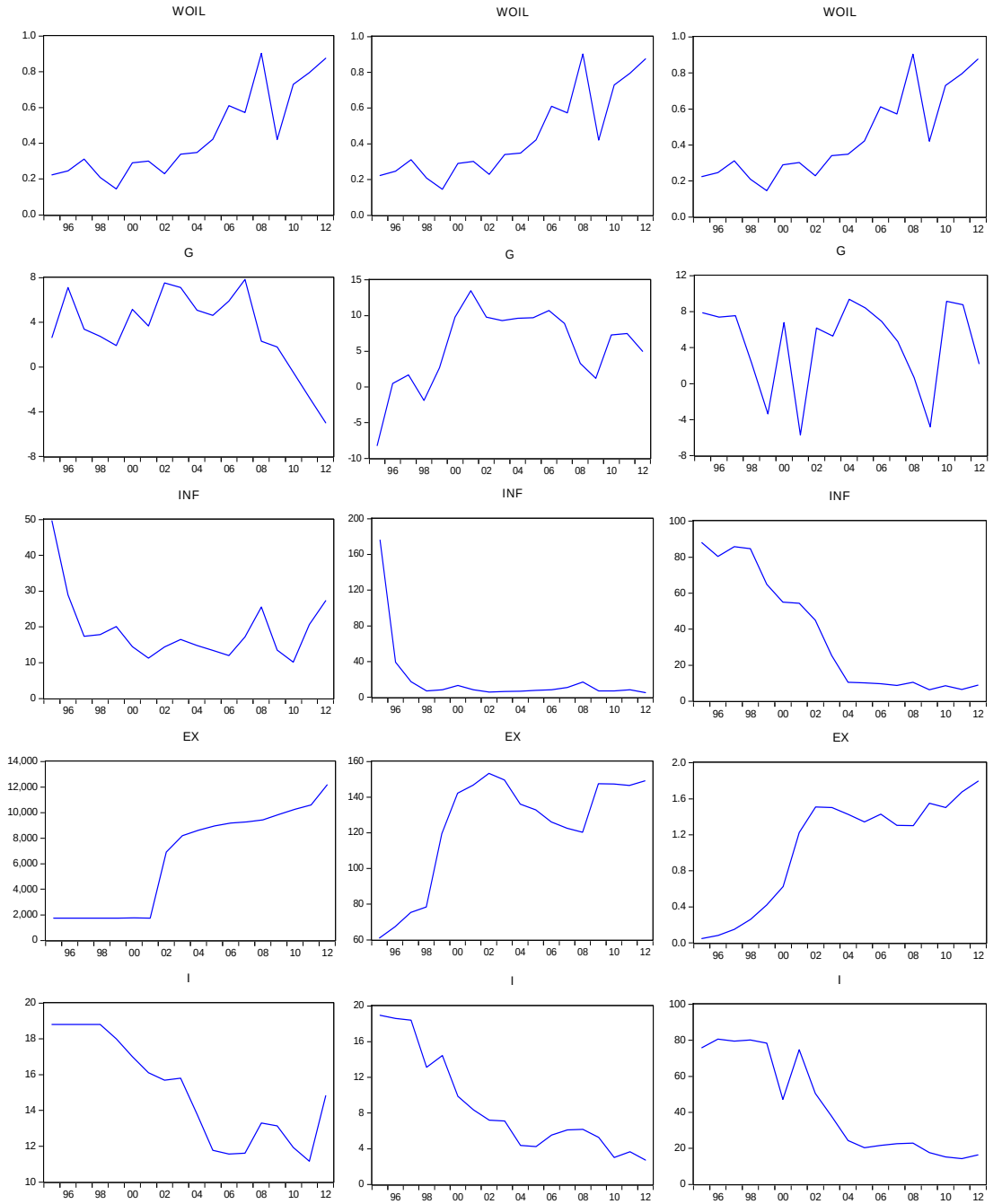
Structural decomposition method was offered against Cholesky method for modeling dynamics of economy based on structural shocks (Sims, 1986, p.9; Bernanke, 1986, p.3). In this method, triangular structure (matrix θ in relation number 6) which is present in Cholesky method is no more used. If the exchange rate is an asset price Currency, information related to monetary policy will change expected efficiency rate of exchange assets. Therefore, identification process of the model, it is better to consider limitations of the model in a way that full simultaneity relationship be appeared between the two variables of nominal exchange rate and short-term nominal interest rate. Another adjustment that is possible in structural analysis is imposing limitation of the lack of response of monetary policy in the short-term production shock. Fragetto and Giovanni (2011, p.2) show that monetary policy with a delay of one quarter receives information of GDP shock and therefore cannot react it simultaneously. If impose the two above limitations on complete clear system of number (6) with Cholesky decomposition structure , then , triangular structure and relation number (7) is created (Line Nesse degaard 2012).

$$\begin{bmatrix} \text{woil}_t \\ gdp_t \\ cpi_t \\ e_t \\ i_t \end{bmatrix} = B(L) \begin{bmatrix} \theta_{11,0} & 0 & 0 & 0 & 0 \\ \theta_{21,0}\theta_{22,0} & 0 & 0 & 0 & 0 \\ \theta_{31,0}\theta_{32,0}\theta_{33,0} & 0 & 0 & 0 & 0 \\ \theta_{41,0}\theta_{42,0}\theta_{43,0}\theta_{44,0}\theta_{45,0} & & & & \\ \theta_{51,0} & 0 & \theta_{53,0}\theta_{54,0}\theta_{55,0} & & \end{bmatrix} \begin{bmatrix} \varepsilon_{\text{oil},t} \\ \varepsilon_{gdp,t} \\ \varepsilon_{\text{cpi},t} \\ \varepsilon_{e,t} \\ \varepsilon_{i,t} \end{bmatrix}$$

Experimental findings

Accuracy tests of the data

Figure (1) show's the fluctuations of real data between the three selected ECO countries during 1995-2012. Augmented Dickey–Fuller (ADF) and Kwiatkowski Philips Schmitz and Shin (KPSS) were used for test of unit root. For Iran except the variable nominal exchange rate and for Kazakhstan except the variable gross domestic production which are I(2) and for Turkey except the variable consumer price index which is I(0), other variables of the model are I(1). Consequently, for Iran, nominal interest rate was used with one difference in the model. For Kazakhstan, growth variable was used instead of GDP variable and for Turkey, consumer price index was assumed I(1). Optimal lag number was selected for the three countries by SIC, AIC statistics and based on principle parsimony we chose three lags in model for all countries. Due to the non-stationary in data, presence or absence cointegration relationship was studied by max eigenvalue (λ_{max}) and Johansen's trace (λ_{trace}) tests. Results showed the existence of cointegration vectors in the model of all three selected countries. To consider behavior of residuals, Serial autocorrelation and heteroskedasticity tests were used. Results accept



Reference: The National Bank of the Republic of Kazakhstan, Central Bank of the Republic of Turkey and Central Bank of Islamic Republic of Iran.
Note: first row shows change procedure of world oil price during the under-study period which is the same for the three countries.

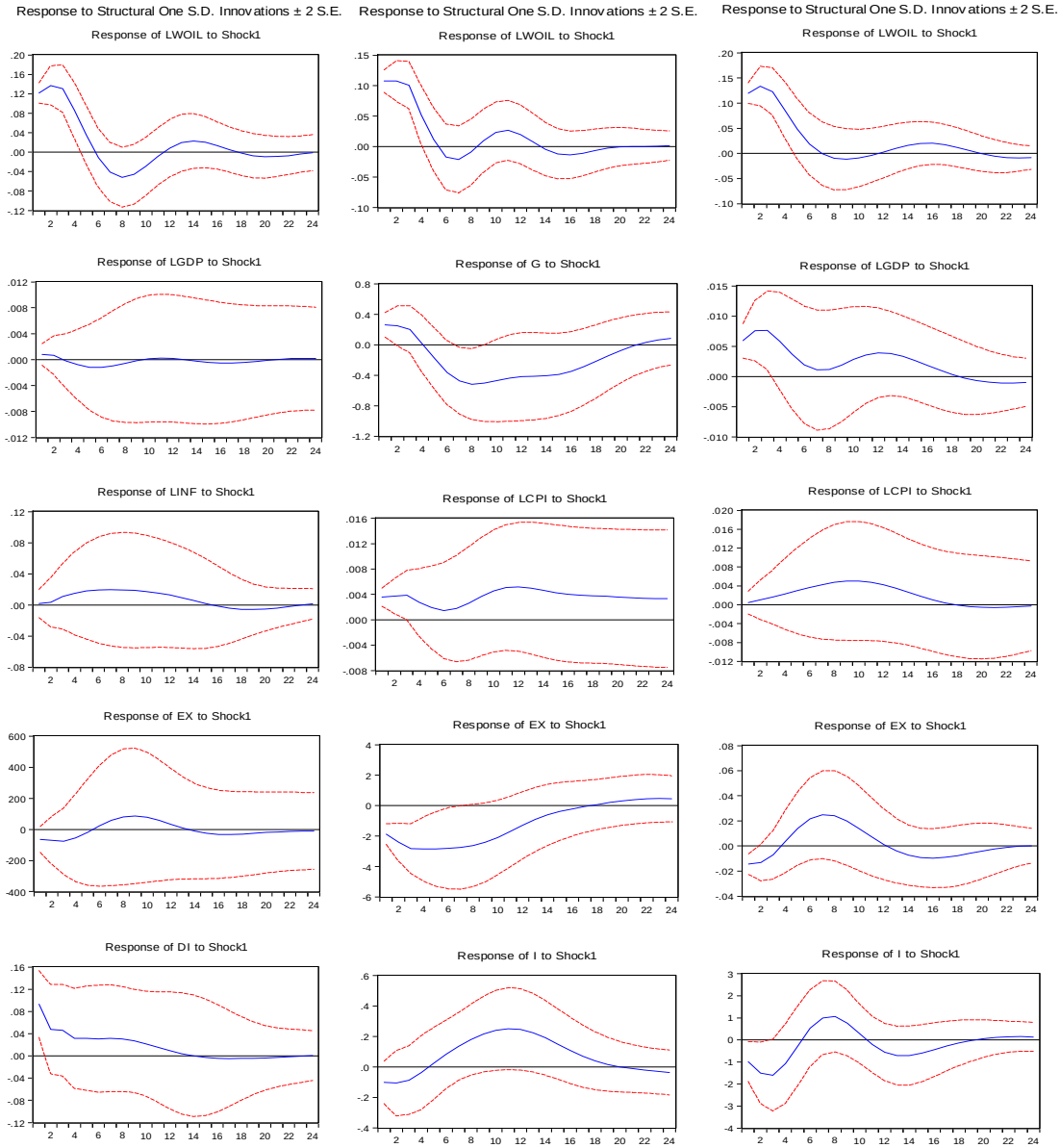
Fig. 1. Fluctuations of model's variables between the three selected countries during 1995-2012. From left to right the first column is Iran, second Kazakhstan and third Turkey.

the absence of serial autocorrelation and heteroskedasticity. Note that to establish stable condition of Iran's model, inflation rate was used instead of consumer price index.

Impulse esponse functions and Variance decomposition

Impulse response functions (IRFs)

Figure (2) shows dynamic response of model's variables towards positive oil price shock with a one standard deviation. Functions were drawn for 24 periods based on structural analysis of equation number (7). Line folds show the



Reference: research findings

Note: first row shows change procedure of world oil price during the under-study period which is the same for three countries

Fig. 2. Comparison of IRFs model's variables against positive structural shock of oil price with one standard deviation

positive and negative area of the two standard errors.

First row shows the cyclic behavior for oil price in the three countries. In the three countries, the oil price shows a positive deviation from its initial value for 6 periods. The least positive deviation in the period is two and in long-term (after 24 periods), deviation value is zero and oil price is returned to its initial steady state value. As it is seen, changes for all three countries were the same and all three countries faced a similar oil shock.

Second row shows dynamic behavior of real GDP for Iran, Turkey and economic growth for Kazakhstan. Positive oil price shock as it is expected has a positive effect on production and economic growth of exporting countries that are Iran and Kazakhstan in short-term. While, for Turkey as an importing country is unexpected. Positive effect of oil price shock on Turkey's production and remarkable economic growth of Kazakhstan was in line with the results of Kilian (2008, 2009) that indicated preserving high rate of production growth in 2000s.

Third row shows response of inflation rate for Iran and consumer price index for Turkey and Kazakhstan against positive oil price shock. In all three countries, the mentioned variable as it is expected had a positive deviation from its long-term balanced- value. Deviation value of consumer price index for Kazakhstan and Turkey was little and in its highest value was 0.0052 and 0.0051 respectively. Inflation rate for Iran also reached its maximum value (0.019) after 7 seasons. Little deviation for Kazakhstan and Turkey confirmed results of Kilian (2008, 2009) indicated little changes of prices in 2000s. However, results for Iran was reversed, means that low growth rate is along with significant changes of general level of prices.

Fourth row shows cyclic behavior of nominal exchange rate for the three selected countries. Positive oil price shock makes negative deviation of nominal exchange rate from steady state in the three countries. Comparison of deviation of nominal exchange rate for exporting countries of Iran and Kazakhstan with managed floating exchange rate regime shows a more continuation of negative deviation and as a result role of a more automatic stabilizer of exchange rate for Kazakhstan. Nominal exchange rate for the importing country (Turkey) also an automatic stabilizer is first reduced from its steady state value and balances inflation pressure. But due to floating exchange rate regime in the track of returning to its initial value plays a role in confirming findings of Edwards (2006) about hump-shaped. It means that exchange rate in the track of returning to its initial value faces overshooting appreciation, in a way

Table 2. Variance decomposition of economic growth cycles of Kazakhstan

I	E	LnCPI	G	LnWOIL	SE	Period
.00	.00	.00	86.452	13.9547	.6971	1
3.0472	.3200	.0787	90.4516	6.1023	1.6704	4
23.1944	4.8464	1.8508	56.0819	14.0263	2.4379	8
21.1512	22.7752	4.5331	35.9869	15.5534	3.2828	12
15.4908	35.9189	3.6393	28.6813	16.2695	3.8850	24

Reference: research findings

Table 3. Variance decomposition of real gross domestic production cycles of Turkey

I	E	LnCPI	LnGDP	LnWOIL	SE	Period
.00	.00	.00	77.8000	22.2000	.0125	1
6.9975	.1837	1.0233	75.5246	16.2708	.0337	4
15.1734	.3506	.7586	74.6318	9.0854	.0475	8
14.8732	1.6287	.7041	73.7926	9.0011	.0512	12
15.5657	4.0201	1.353	70.0558	9.3228	.0554	24

Reference: research findings

that deviation changes from negative balance value to positive. Comparison of continuation and deviation of nominal exchange rate of the three countries show that response of nominal exchange rate against positive oil price shock in Iran was lower than two other countries due to continuation and lower fluctuation; on the other hand, automatic stabilizer role of this variable was lower than Kazakhstan and Turkey.

Fifth row shows response of monetary policy against inflation rate changes. Nominal interest rate for Iran has been increased but for Kazakhstan and Turkey have been decreased. Due to the fact that positive oil price shock and increased world demand of oil has been caused by efficiency development, monetary policy of Turkey and Kazakhstan due to their credibility among economic agents, decrease interest rate to increase expansion of production.

Variance decomposition

In this part, results of variance decomposition for the important variable of production were considered and compared between selected countries. Tables (11) to (13) represent variance analysis of gross domestic production (GDP) for Iran and Turkey and economic growth for Kazakhstan. Considering share of different variables on fluctuations of GDP for Iran (table 11) shows that in long-term after the production (49.30%), exchange rate (36.98%), inflation (11.27%), nominal interest rate (2.30) and oil price (0.12%) have the most effect respectively. Little share of nominal interest rate was in line with other experimental findings for Iran and indicated little effect of this monetary policy mean on real economic variables in Iran. Significant share of nominal exchange rate (36.98%) also have an important role on fluctuations of real economic variables (due to the large share of oil production in its economy and dependence of Iran industry on importing). Also significant share of inflation shows that this variable is among important factors of reducing positive effect of the shock increasing oil price on production. Table (2) shows share of different variables in economic growth fluctuation of Kazakhstan. In long-term, nominal exchange rate (35.91 %), economic growth (28.68%), oil price (16.25%), nominal interest rate (15.49%) and price index (3.63%) had the most effect. Table (13) shows role of different variables of the model on GDP fluctuations of Turkey. The most effect after the production variable was related to nominal interest rate (15.56%), oil price (9.23%), nominal exchange rate (4.02%0 and price index (1.03%) respectively.

Comparison of results between the three countries in long-term represented that the most role of oil price on economic growth fluctuations of Kazakhstan was 16.25% and Turkey production was 9.32% and Iran was 0.12%. The most effect of nominal interest rate on economic growth fluctuations of Kazakhstan was 15.49 percent and Turkey production was 15.56 percent compared to Iran which was 2.30%, it shows more efficiency of interest rate channel in these countries than Iran. Due to the role of reliable monetary policy channel of targeting inflation rate on oil shock effect, one of the reasons that role of oil price shock is more can be related to the more efficiency of monetary policy in Kazakhstan and Turkey. In a way that policies controlling inflation rate has made negative role of this variable be decreased when economy of such countries faces positive oil price shocks.

CONCLUSION

Obtained results of IRFs in confirming collected results from all around the world show that Kazakhstan and Turkey used opportunities created by positive oil shocks due to the increased demand of oil and could control inflation rate successfully during the under-study periods; moreover, such countries experienced high average rate of economic growth along with little inflation rate. Results of variance decomposition also confirmed the importance of monetary policy channel in the value and quality of effects of positive oil price shocks on real economic variable. Comparison of the results between the three countries in long-term showed that the most role of oil price shock on economic growth fluctuations of Kazakhstan was 16.25% and Turkey production was 9.32% and Iran was 0.12% also most role of nominal interest rate on economic growth fluctuations of Kazakhstan was 15.49% and Turkey production was 15.56% compared to Iran which was 2.30%. Additionally, success of such countries in controlling inflation rate made decrease in its negative effect on production.

Findings of this study showed that if priority of policies was fixing prices by controlling

inflation rate, average production growth rate aroused by positive oil shocks would be increased for both exporting and importing countries. However, economic policies of Iran by choosing to decrease unemployment rate as the first priority and paying less attention to price fluctuations reduction do not benefit from the positive effect of monetary policy on economic growth aroused by oil shock; moreover, sever fluctuations of prices will lead to the disability of policies in benefiting from positive oil shocks to increase average growth rate and decrease unemployment rate. Consequently, it is recommended that in parallel with the development of state financial discipline, the central bank place ultimate aim of fixing price fluctuations in its first priority by removing existing barriers, decrease inflation rate and fix prices by implementing targeting policy of inflation rate in order to create economic stability, increase trust of economic agents and by controlling their inflation expectations increase investment, develop production process and achieve a higher production growth rate.

REFERENCES

1. Barro, R.J., and Gordon, D.B., Rules, Discretion and Reputation in a Model of Monetary Policy, *Journal of Monetary Economics,* 1983; **12**: pp. 101-121.
2. Bernanke Ben S. Gertler Mark and Watson Mark. Systematic Monetary Policy and the Effects of Oil Price Shocks, New York University, Department of Economics, 1997; RR# 97-25.
3. Bernanke, Ben., Alternative Explanation of Money-Income Correlation, Carnegie-Rochester Conference Series on Public Policy, 1986; **25**: 49-100.
4. Blanchard, O.J., and Galí, J. The Macroeconomic Effects of Oil Shocks: Why Are the 2000s So Different from the 1970s?, National Bureau of Economic Research, Working Paper, 2007; 13368 (September).
5. Brown S.P.A., Yücel M.K., and Thompson J., Business Cycles: The Role of Energy Prices,Federal Reserve Bank of Dallas, Research Department, Working Paper, 2002; 0304.
6. Clarida, R., Gali, J. and Gertler, M., The Science of Monetary Policy: A New Keynesian Perspective, *Journal of Economic Literature*, 1999; Vol. XXXVII, pp.1661-1707.
7. Clarida, R., Gali, J. and Gertler, M., Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory, *The Quarterly Journal of Economic,* 2000; **115**(1): pp.147-180
8. Edwards, S. The relationship between exchange rates and inflation targeting revisited, National Bureau of Economic Research, Working Paper, 2006; No 12163.
9. Farzinvash, A., Ehsani, M., Jafari, A., Qolami, Z. Asymmetric effects of monetary policy on production in economy of Iran. *Journal of economic policies and Research,* 2012; **61**; pp. 5-28.
10. Fragetto Matteo and Giovanni Melina, Identification of Monetary Policy in SVAR Model: A data Oriented Perspective, School of Economics Discussion Paper, No 0811, University of Surrey 2011.
11. Kilian, L., The Economic Effects of Energy Price Shocks, *Journal of Economic Literature,* 2008; **46**(4): pp. 871-909.
12. Kilian Lutz, Oil Price Shocks, Monetary Policy and Stagflation, Conference on Inflation in an Era of Relative Price Shocks to be Held in Munster, Sydney 2009.
13. Komeyjani, A., Mehmandoust, E. Assessment of the effect oil shocks and monetary policies on Iran economic growth. *Economic Research,* 2010; **45**: p. 262-239.
14. Kydland, F., and Prescott, E.C., Rules Rather than Discretion: The Inconsistency of Optimal Plans. *Journal of Political Economy,* 1977; **85**: pp. 473-92.
15. Line Nesse Ødegaard, Oil Price and Monetary Policy in The Nordic-A Study of Denmark, Norway and Sweden, Catolica Lisbon School of Business and Economics 2012,
16. Sims, Christopher. Are Forecasting Models Usable for Policy Analysis?, Federal Reserves Bank of Minneapolis Quarterly Review, 1986; 3-16.
17. Svensson, L., Open Economy Inflation Targeting, *Journal of International Economics*, 2000; **50**: pp:155-183.
18. The National Bank of the Republic of Kazakhstan, www.national**bank**.kz
19. The Central Bank of the Republic of Turkey, www.tcmb.gov.tr
20. The Central Bank of Islamic Republic of Iran, www.cbi.ir
21. Unalmis Deren, Unalmis Ibrahim, Filiz Unsal Derya, (2008), Oil Price Shocks, Macroeconomics Stability and Welfare in a Small Open Economy, The Central Bank of the Republic of Turkey, Working Paper No: 08/02.