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THE NEED TO RECONSIDER ECONOMIC POLICIES DURING SANCTIONS

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ABSTRACT

How to deal with the shocks and to reduce their impacts during sanctions is one of the most important factors in reducing vulnerability along these conditions. In line with the correct policies during the sanctions, the present study attempts to cast light upon the estimation of the structural model of new Keynesian vector auto-correlation in the two following samples compared to sanction conditions and the time period before the sanctions. A) The seasonal data of 1993-2006 and B) The seasonal data of 1993-2012. In this study, the impact of four impulses of demand, supply, currency rate and monetary policy of Iranian Central Bank on the production gap has been dealt with. To implement the model in Iran's economy, oil prices have been considered as the extraneous variable. The results from the estimation model indicate that during the period of sanctions all the above impulses are modified in a longer timeframe. In both samples the impulse of positive growth of monetary base in making fluctuations of production gap has been of first significance. The impact of this impulse in short term has led to greater fluctuations during the period of sanctions and in long term has caused the increase in inflation and decrease in production gap. Thus, using the policy of money expansion is not recommended during the sanctions. The positive impulse of official currency rate in the first sample has increased the production gap, however, during the sanctions period the impact of this impulse

has decreased the production and on the wake of that the production gap has decreased. Therefore, for the future studies, Marshall Lerner condition is suggested in terms of sanctions.

JEL categorization: C32, C51, E58, E52

Keywords: Monetary policy, currency rate, production gap, structural model of auto correlation of new Keynesian, sanctions

INTRODUCTION

The Need to Reconsider Economic Policies During Sanctions

Till now various sanctions have been imposed on Iran, but since 2007 the economic sanctions imposed have been practiced more intensely. In line with preventing the development of nuclear weapons, the resolutions of 1747 (2007), 1803 (2008), 1835 (2009) and 1929 (2010) were enacted in the United Nations to put economic sanctions on Iran. Following those sanctions, individuals, companies and financial institutions have also been identified.

Identification of factors affecting the production gap can be a great help to deal with the recession and inflation, its negative consequences and achieving economic stability in Iran. Thus, examining how it affects the impulses of production gap, currency rate, inflation rate and monetary base growth rate on the production gap has a great significance. Investigating the fluctuations of production gap and the influencing factors, from the point of view of

fighting with the sanctions conditions is significant. Therefore, in the present study two samples have been taken into account A) Observations before the sanctions from 1993-2006, and B) The observations by taking the sanctions years into account. In this respect the seasonal data of 1993-2012 has been utilized. Finally, the results obtain from the estimation model in the two samples were compared with one another.

About the effect of the above mentioned impulses on production gap, different theories and some foreign and local studies have been examined. Taylor (1979) has used the supply of money as the central bank policy instrument. The results of a study by Olivo (2005), showed that the instrument of interest rate for balancing the production gap has been more efficient, but the instrument of money growth rate has had a better performance in controlling inflation. In Iran, the following studies have been done on this subject. Based on the studies by Komeijani et al., (2013), Erfani and Taleb Bidokhti (2013),

Taghinezhad and Bahman (2012), Komeijani and Tavakolian (2011), Motavaseli et al., (2010), and Dargahi and Sharbat Oghli (2010) it is concluded that the effect of increasing the money supply and rising the monetary base growth rate have led to the inflation increase and decline in production in Iran.

Increase in currency rate becomes effective through its impact on the trade balance. Considering Marshall Lerner condition to be true, increase in currency rate leads to rise in gross domestic production. This condition has been empirically true in a number of studies, but has not been true for some other cases. Based on the results of the studies by Moura and Dasilva, (2005), Onafowra (2003), Kishore and Kulkarni (1996) and Bahmani-Oskooee and Malixi (1992) Marshall Lerner condition has been established.

In a study by Bhagwati and Yusuke (1974) devaluation of exports of developing countries with floating exchange rates has increased the exports. However, countries with fixed exchange rates have not shown the same reaction to the devaluation of national currency. Edwards (1985) showed that in most developing countries the policy of devaluation of national currency has failed. The reason has been practicing monetary and financial policies along with the policy of

devaluation of national currency. Among the studies in Iran, the results of researches by Ahmadi Shadmehri and Ahmadian Yazdi (2012), and Pedram, Shirinbakhsh, and rahmani (2011) and also Rahimi Borujerdi (1993) have confirmed existence of Marshall Lerner conditions. But in the studies by Torki et al., (2014) and also Dezhpasand and Goodarzi (2009) do not conform the Marshall Lerner condition. Positive impulses of prices in the studies by Mehanatfar and Mechaili (2013), Sharif Azadeh and Kaghazian (2008), and also Khatayi and Danesh Jafari (2001) have increased the production cost and then have had decreasing effect on production. The main goal of the present research is to provide a practical solution in the field of economic policies to deal with sanction conditions. In the present research the effect of impulses of supply, demand, the nominal exchange rate and monetary base growth rate in a structural model correlated with the new Keynesian brotherhood are examined. The research assumptions are as follows. Positive demand of impulses has a positive impact on the production gap. Positive impulse of inflation has a negative impact on production gap. Positive impulse of the nominal exchange rate has a positive impact on the positive gap production. Positive impulse of the monetary

growth base rate has a positive impact on the production.

The organization of the research method section deals with the structural model of new Keynesian vector auto-correlation. In the findings section, auto-correlational model of the structural new Keynesian using the E-views 6 software was estimated and the results from the mentioned impulses on the production gap in the two examples before and after sanctions were analyzed and compared. In this section using impulse response functions and its analysis their variance share of each of the impulses in making production gap fluctuations was calculated. In the final section the conclusion was also discussed and some applied suggestions for future studies were proposed.

METHODOLOGY

The present research attempts to analyze the economy of Iran using a new Keynesian model which is the result of a dynamic general equilibrium model and has regarded rational and prospective behavior of the factors to analyze the economy of Iran. In the present model of the model of Yun Shawn Chen (2011) and Olivio's study (2005) have been used to make changes to adapt to the situation of Iran. Gross domestic product gap of difference between real gross domestic

product and potential output is obtained. To estimate the potential production of HP, Prescott filter has been used. Equation (1) with regard to the demand side of the economy shows a forward-looking view.

$$x_t = \alpha_0 + E_t x_{t+1} - \alpha_1 (g_{M_t} - E_t \pi_{t+1}) + \alpha_2 (s_t + p_t^* - p_t) + \varepsilon_t^x \quad (1)$$

Where x_t is the production gap and is obtained from the difference between real production and potential production: $(x_t = y_t - \bar{y}_t)$, g_{M_t} : is the growth rate of monetary base, s_t is the official currency rate, p_t is the domestic prices level, p_t^* : is the foreign prices level. π_{t+1} : is the rate of inflation which is calculated this way: $\pi_{t+1} = p_{t+1} - p_t$. Moreover, the real currency rate is obtained from this equation: $q_t = s_t + p_t^* - p_t$. E shows the expectations and ε_t^x is called production gap impulse.

Supply based on the Philips Kahlo (1983) curve equation is defined in this way given the frequency of price.

$$(2)$$

$$\pi_t = \beta_0 + \beta_1 E_t \pi_{t+1} + \beta_2 x_t + \varepsilon_t^\pi$$

Where π shows inflation and ε_t^π : is the impulse of supply side. Present inflation depends on the expected future inflation and the effect of future expected inflation rates is

shown with β_1 of present inflation which is called the subjective discount factor of the manufacturing firm. The central bank's monetary policy via the following equation that is in Klaryda (2001) and Olivio's (2005) forward-looking view is taken into consideration to be expressed in (3).

$$g_{M_t} = \gamma_0 + \pi_t + \gamma_1(E_t \pi_{t+1} - \pi^T) + \gamma_2 x_t + \varepsilon_t^{g_{M_t}} \quad (3)$$

Where π^T shows inflation target and $\varepsilon_t^{g_{M_t}}$ is monetary policy impulse. In order to calculate structural disorders in the looking-forward expectations model, expectations are reduced one order before any variables where the values $e_t^x = (x_t - E_{t-1}x_t)$, $e_t^\pi = (\pi_t - E_{t-1}\pi_t)$, $e_t^{g_{M_t}} = (g_{M_t} - E_{t-1}g_{M_t})$ and $e_t^s = (s_t - E_{t-1}s_t)$ are called the prediction error of the current values. Considering the values of $(E_t x_{t+1} - E_{t-1}x_{t+1}) = r'_x A Q e_t$, $(E_t \pi_{t+1} - E_{t-1}\pi_{t+1}) = r'_\pi A Q e_t$, and $(E_t s_{t+1} - E_{t-1}s_{t+1}) = r'_s A Q e_t$ the relationships between the impulses will be as below. The relationship of the exchange rate has been added in this section.

$$(4) \quad \varepsilon_t^\pi = e_t^\pi - \beta_1 r'_\pi A Q e_t - \beta_2 e_t^x$$

$$(5) \quad \varepsilon_t^x = e_t^x + \alpha_1 e_t^{g_{M_t}} - r'_x A Q e_t - \alpha_2 (e_t^s - e_t^\pi)$$

$$(6) \quad \varepsilon_t^s = e_t^s - r'_s A Q e_t + \eta_1 e_t^x$$

$$(7) \quad \varepsilon_t^{g_{M_t}} = e_t^{g_{M_t}} - e_t^\pi - \gamma_1 r'_\pi A Q e_t - \gamma_2 e_t^x$$

Long-term limitations based on the equations (4) to (7) are practiced. All the variables have been considered logarithmically and the logarithm for oil price is taken into account as a logarithm.

RESULTS

In this section estimating the model in two samples has been experimentally studied and the results obtained from the two samples have been compared together. Based on the results of Dickey-Fuller, test the generalized model of all the variables with a time difference become stationary. Determining the optimal lag in both samples has been done according to Henan Queen, Schwarz Bayesian and Aquake. Thus, interval 4 has been chosen for each sample. Based on the results of test statistics, the maximum Eigenvalue, existence of co-integration vector is not approved at 95% of the second sample but there is a long vector before the sanctions. Based on the results of the two samples test Lagrange auto-correlation coefficient, disruption statements are not auto-correlated. Based on the results of auto correlation tests of Lagrange on the

two samples, disruption statements at lag 4 have not autocorrelation.

Estimation of the Model's Coefficients

Model coefficients given the constraints imposed on long disruption statements, are written in both samples in the following table. In the sample before the sanctions, the impulse coefficient of demand side and currency rate on production gap obtained positive and the impact of inflation impulses the growth rate of monetary base on the production gap obtained negative. In the second sample (with regard to sanctions) impact of all the impulses on the production gap has been negative. Given the fact that the nominal exchange rate before the sanctions has been positive and during the sanctions negative, it seems that Marshall-Lerner condition is not met during the sanctions.

Impulse Response Functions (Reaction, Response)

Impulse response functions in **Diagrams 1 and 2** show that if one impulse or a sudden change as the extent of a standard deviation is made in the production gap, inflation rate, currency rate and monetary base growth rate, its effect in the next 100 periods will be as shown below. Confidence interval for impulse response functions has been considered 95%.

In the conditions during the sanctions in **Diagram 1** the impact of demand side impulses, inflation rate and currency rate up to the 50th period reaches balance and the impact of monetary base growth rate impulse reaches balance in the 70th period. However, considering the years of sanctions in **Diagram 2** the impact of impulses on the demand side in the 100th period are diminishing. The impact of inflation and currency rate impulses in 80th period has diminished and the impact of monetary base growth rate has diminished in 80th period. As a result, there seems that sanctions have caused that the impact of abovementioned impulses to wipe out in longer periods.

The first chart shows that the impact of inflation rate impulse due to monetary illusion will have caused an increase in production until 12th period but due to increased production costs since the 12th period onwards, it has had a decreasing impact on production gap. This impulse in the second sample which is shown by the second chart has had a reducing impact and there has been no monetary illusion in that period.

The positive impulse of currency rate based on the first chart has had a seasonal impact but these changes do not follow a certain trend in the long time. In the second chart

with regard to the sanctions they have had a reducing impact on the production gap. This may indicate lack of Marshall-Lerner conditions during the sanctions. Monetary growth rate impulses in both examined samples have caused severe seasonal fluctuations on the production gap which have diminished in a longer term during the sanctions.

Production Gap Variance Analysis

In **Tables 2 and 3**, analysis of variables model variance based on the estimation auto-correlational model of Keynesian vector during 100 periods are shown.

Table 2 that shows the period before the sanctions, monetary growth base rate impulse impact (58/52) has the highest share in production gap fluctuations. Inflation impulse share with 20/91 is of second importance.

Currency rate and demand side impulse have second and third degree of importance. Also monetary growth base rate impulse share is constantly more than the total of other impulses.

In **Table 3** which involves years of sanctions, monetary growth rate impulse has made 41/29 % of production gap fluctuations and it has maintained its priority in relation to the period before sanctions had smaller share of production gap fluctuations. Production gap impulse has adopted (48/36) percent of the fluctuations which up to the end of the period under study is of second degree of importance. Inflation and nominal currency rate impulses are of third and fourth grade of importance. The total monetary base growth rate impulse in both has had a significant impact on the production gap.

Table 1: Estimates of Regression Coefficients

| | Before the sanctions (first sample) | | Considering the sanctions (second sample) | |
|--|-------------------------------------|--|---|--|
| | Coefficients | Probability of verifying the null hypothesis | Coefficients | Probability of verifying the null hypothesis |
| Coefficient of production gap impulse on itself | 0/048494 | 0 | -0/048874 | 0/0001 |
| Coefficient of inflation impulse on production gap | -0/019065 | 0/00025 | -0/056202 | 0 |
| Coefficient of currency rate on production gap | 0/013840 | 0/0321 | -0/066719 | 0 |
| Coefficient of monetary base growth rate | -0/031710 | 0 | -0/036647 | 0 |

Source: Research Calculations

Table 2: Analysis of Variance before Sanctions

| Monetary growth base rate | Currency rate | Inflation rate | Production gap | Standard deviation | Period |
|---------------------------|---------------|----------------|----------------|--------------------|--------|
| 58/82 | 19/29 | 20/91 | 0/98 | 0/029837 | 1 |
| 54/24 | 27/61 | 13/04 | 5/11 | 0/074282 | 25 |
| 54/87 | 27/68 | 12/07 | 5/38 | 0/086772 | 50 |
| 55/21 | 27/74 | 11/61 | 5/44 | 0/09187 | 75 |
| 55/33 | 27/80 | 11/41 | 5/45 | 0/094067 | 100 |

Source: Research Calculations

Table 3: Variance Analysis After the Sanctions

| Monetary growth base rate | Inflation rate | Production gap | Standard deviation | Period |
|---------------------------|----------------|----------------|--------------------|--------|
| 41/29 | 3/17 | 36/48 | 0/038046 | 1 |
| 42/73 | 4/58 | 30/37 | 0/090525 | 25 |
| 39/89 | 4/29 | 33/59 | 0/112566 | 50 |
| 39/12 | 4/47 | 35/13 | 0/123054 | 75 |
| 38/83 | 4/61 | 35/09 | 0/128317 | 100 |

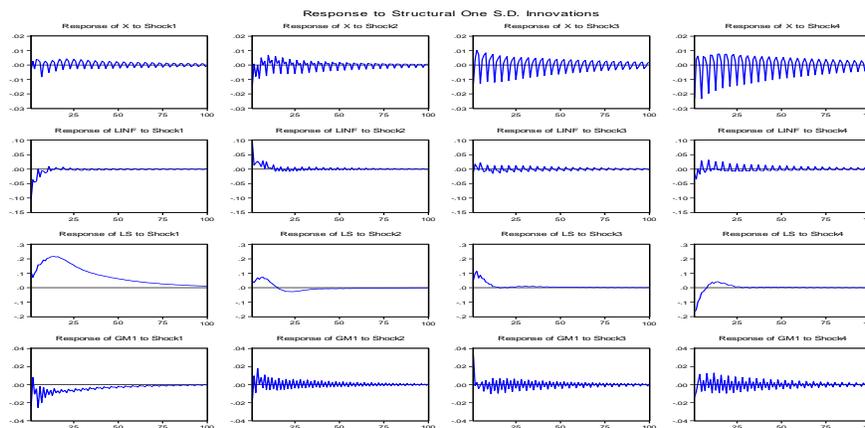


Diagram 1: Impulse Response Functions before Sanctions

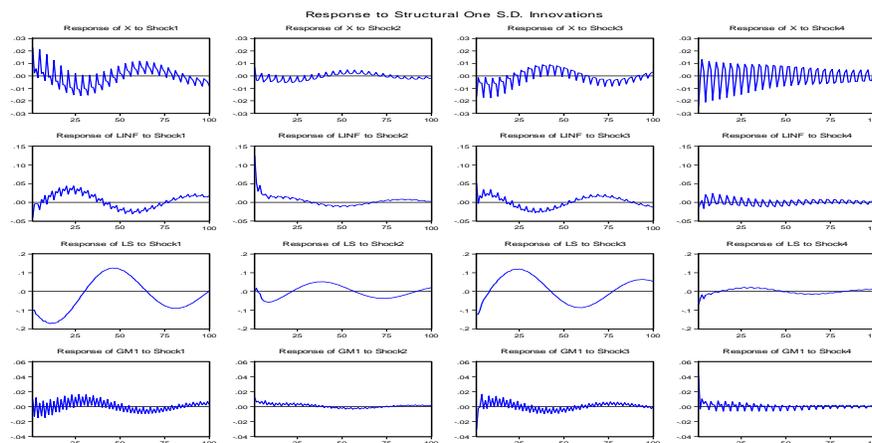


Diagram 2: Impulse Response Functions after Sanctions

RESULTS AND DISCUSSION

In the present research the economic conditions years in Iran before and after the sanctions have been compared using the new Keynesian structural auto-correlational vector model. In this study the impact of demand side impulses, the supply side, the nominal currency rate and monetary growth base rate on production gap has been studied. Oil price variable has also been introduced in the model. To provide practical solutions in resistive economy the following model for the two samples has been estimated: A) The years before sanctions including seasonal data of 1993-2006 and B) The seasonal data from 1993-2012 which includes years of sanctions. The impact of production gap impulse on this variable has been positive during the years of sanctions. But taking the years of sanctions into consideration, it has negative values. Regarding the presence of commercial cycles one can conclude that sanction conditions has caused that commercial cycles enter recession period in shorter periods and have a negative impact on the production gap. This impulse in the years before the sanctions has had the lowest share in the fluctuations but despite the presence of the above mentioned impulse compared to the other impulses, it has secondary significance. In a study by Khatayi

and Danesh Jafari (2001) that has investigated the period of 1971-1998, positive production impulse has caused production increase which is in accordance with the results obtained from the present research about the years before the sanctions.

In the first sample (before sanctions) currency rate increase has caused export improvement and import decrease and so production and production gap have increased. This confirms Marshall-Lerner condition before the sanctions, the results of the researches by Ahmadi Shadmehri and Ahmadianan Yazdi (2012), Pedram, Shirinbakhsh and Mardani (2011) and also Rahimi Borujerdi (1993) are consistent with the results of the sample before the sanctions. Considering the sanctions conditions, the impact of this impulse has decreased the production gap. Thus, it seems that under sanctions conditions Marshall-Lerner condition does not exist. The results of studies by Torki *et al*, (2014) and also Dezhpasand and Goudarzi (2009) correspond with the results obtained from the sanctions conditions period.

Other impulses in both before mentioned states have had a negative impact on production gap. Taking this point into consideration that inflation coefficient has been obtained negative, thus, it can be

concluded that this is due to increase in production costs. The results of Mehnatfar and Mechaili (2013), Sharifzadeh and Kaghazian (2008) also Khatayi and Danesh Jafari (2001) are also consistent with the results obtained from the present research. Increase in currency base rate has a negative impact on the production gap and in both studied cases has had first degree of importance in the fluctuations. The result of the study by Jalali Naini and Nazifi (2001) is consistent with that of Sharifzadeh and Kaghazian (2008).

CONCLUSIONS

1. The impact of all the impulses before sanctions has diminished in a shorter period of time. While taking the sanctions tears into consideration the exercised impulses have caused deeper cycles and their impact diminishes after a longer time period. Therefore, implementing financial and foreign exchange policies should be done more carefully during the sanctions
2. The impact of production gap impulse during the sanctions period has had secondary importance and has been negative,

therefore, it seems that increase in demand does not cause production rise and just adds to the inflation. Thus, it is suggested that in order to necessary measure be taken to cope with demand shocks.

3. With regard to the fact that monetary growth base rate has had the largest share in the production gap fluctuations and the impact of this impulse during the sanctions period has increased, it seems that monetary policies during the sanctions should be implemented with more consideration and thought.
4. Considering the fact that the positive currency rate impulse during sanctions has decreased the production gap thus it seems that this can be due to lack of Marshall Lerner condition. In this regard, it is recommended that for future studies establishing or non-establishing Marshall-Lerner condition during the sanctions be tested.

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