

Evaluation of the structural shocks effect on production instability in the Iranian economy

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Abstract

Economic volatility has decreased over the past three decades in the world especially in GDP growth, which is known as the "Great Moderation". There is no agreement on the causes of this phenomenon. But there are three categories of causes: the good luck, good policy and structural changes hypotheses. The purpose of this article is to evaluate the three hypotheses in the form of the relationship between the real GDP volatility, monetary policy index, the structural change indicator, exchange rate and oil revenues during the period of 1352-1396 in Iran. This research uses a structural vector autoregressive model (SVAR) by applying the Blanchard-Quah (B-Q) restrictions. According to the results, the impact of the monetary policy index on the volatility of production is 0.971, the impact of the financial liberalization is 0.1, and the revolution and war is 0.978. The effect of monetary policy shocks on production volatility is 0.971 which is higher than that of good chance (oil revenue fluctuation 0.831 and exchange rate of 0.587) and structural change effect (capital inflow) of 0.002. Therefore, all three categories of factors affect production volatility in Iran.

Keywords: Iran, good luck, good policy hypothesis, Great Moderation.

JEL Classification: C15, C22, E24, E32, E47, E58.

1. Introduction

The economy of developed countries has experienced declines in national growth volatility since the mid-1980s, during which booms were longer and more robust, and recessions were smaller and less frequent. Taylor (1998) called this period a "long Boom". Kim and Nelson (1999) and Blanchard and Simon (2001) called the improvements in long-term growth and decline in recessions and fluctuations as "Great Moderation." There is no general agreement on the causes of "Great Moderation". In the related literature, three categories of causes are cited as the cause of the great moderation phenomenon: The first argument is that great moderation is due to lesser and smaller shocks that have occurred in the economies of the country during this time. This is referred to as "good luck" for policymakers during those years (e.g., Ahmed et al., 2002: 2). Some other economists consider the cause of the "great moderation" to be

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structural and technological changes, which are not directly controlled by macroeconomic policies. The evolution of inventory management (McConnell and Perez Quiroz, 2000), openness of trade, and financial market developments (Cavallo, 2007) are among the reasons for structural changes. 3) The third reason is advanced monetary policy. Based on this view, developed monetary policies reduce the levels of inflation and the volatility of the economies of the countries. (Taylor, 1997, 2007, 2009 and 2010).

Considering the reduction of production volatility in the Iranian economy during this period, the purpose of this study is to investigate the factors affecting the production instability in the Iranian economy and to examine the relative role of economic policies (monetary policy) in relation to out-of-control events (bad luck) and structural changes. For the volatility of production in the Iranian economy, we can consider three main hypotheses: 1) The smaller economic shocks in the Iranian economy are mainly due to the oil revenues. Reducing oil revenue fluctuations reduces economic instability (good luck hypothesis). 2) A better monetary policy means more control over the growth of liquidity (in contrast to a worse monetary policy), which leads to less volatility in GDP growth (good policy). 3) Financial market changes (inflow of capital to GDP), which has caused technological and structural changes in Iran's economy and reduced production volatility.

2. Literature Review

Seminal contributions have been made by Taylor (1998), Kim and Nelson (1999), Perez Quiroz (2000) and Blanchard and Simon (2001). Several studies were carried out following these studies. According to Hakura (2009), domestic policies are the most important factor in reducing the production volatility in underdeveloped countries and emerging economies. Ahmed et al. (2002) and He and Chen (2013) consider the reason for great moderation to be lower random shocks or good luck hypotheses. Cecchetti et al. (2011) and Bhoola and Uma (2011) consider monetary policy to be more important than other factors. Giannone et al. (2008) argued that, in conjunction with inflation, a credible monetary policy reduces instability of inflation, and in relation to production, the hypothesis of "good luck" is more prevalent. Wolf and Leicester (2010) attributed the great moderation to structural changes in services and deregulation within the banking industry. Walter and Lester (2009) consider factors influencing great moderation as a combination of good luck, good policy and favorable economic conditions. Abrishami (2002) believes that supply shocks, such as import changes, productivity, and oil revenues, play a major role in Iran's economic fluctuations. Bakhshi et al. (2012) examined the effects of oil shocks on some oil-exporting countries. They argued that currency systems, monetary policies, macroeconomic structures and policies adopted explain the instability of production.

3. Model Identification and Estimation

The econometric method used is the Vector Autoregressive Model (SVAR) and the Blanchard-Coa technique. Based on the hypotheses and after applying the restrictions, the SVAR model of production volatility for the Iranian economy is as follows:

$$\begin{bmatrix} \epsilon^{VGDPP} \\ \epsilon^{MGDPP} \\ \epsilon^{NFGDPP} \\ \epsilon^{EXP} \\ \epsilon^{OILP} \\ \epsilon^{d1} \\ \epsilon^{d2} \end{bmatrix} = \begin{bmatrix} c_{11} & c_{12} & c_{13} & c_{14} & c_{15} & c_{16} & c_{17} \\ c_{21} & c_{22} & 0 & c_{24} & c_{25} & c_{26} & c_{27} \\ c_{31} & 0 & c_{33} & c_{34} & 0 & c_{36} & c_{37} \\ 0 & c_{42} & 0 & c_{44} & c_{45} & c_{46} & c_{47} \\ 0 & 0 & c_{53} & 0 & c_{55} & c_{56} & c_{57} \\ 0 & 0 & 0 & 0 & 0 & c_{66} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & c_{77} \end{bmatrix} \begin{bmatrix} e^{VGDPP} \\ e^{MGDPP} \\ e^{NFGDPP} \\ e^{EXP} \\ e^{OILP} \\ e^{d1} \\ e^{d2} \end{bmatrix} \quad (1)$$

Where VGDPP is real production instability, M2GDPP represents monetary policy index, NFGDPP denotes financial liberalization index, i.e. capital-to-GDP ratio, OILP shows oil revenue, EXP represents the exchange rate and d1 and d2 are the virtual variables of revolution and sanctions. The results of the SVAR model estimation are summarized in Table 1.

Table 1: Estimates of SVAR

Probability	Z-statistic	Coefficient	Parameter
0.00	17.7395	0.9712	c₁₂
0.00	4.7179	0.1009	c₁₃
0.00	54.7935	0.5874	c₁₄
0.00	198.6835	0.8312	c₁₅
0.00	11.6877	0.3508	c₂₁
0.00	5.8464	0.0685	c₂₄
0.00	3.5884	0.0025	c₂₅
0.00	5.0636	0.4504	c₃₁
0.00	63.7939	0.8756	c₃₄
0.00	0.8040	0.5519	c₄₂
0.00	16.7484	0.1486	c₄₅
0.00	4.9120	0.6631	c₅₃
0.00	6.6237	0.9785	c₁₆
0.0114	0.5306	0.4579	c₂₆
0.0687	1.8202	0.9168	c₃₆
0.00	5.4348	0.5615	c₄₆
0.001	3.8495	0.1887	c₅₆
0.0556	1.9138	0.3932	c₁₇
0.003	3.6424	0.8802	c₂₇
0.0071	2.6935	0.0808	c₃₇
0.003	3.6283	0.7906	c₄₇
0.00	4.9562	0.8460	c₅₇

4. Discussion and Conclusion

The purpose of this study was to evaluate the relationship between GDP volatility, monetary policy index, financial liberalization index, real exchange rate and oil earnings using the SVAR model for the Iranian economy during the period 1338-1396. Based on the results, regardless of the dummy variable effect of revolution and war, monetary policy shock with a coefficient of 0.9712 had the greatest impact on GDP volatility and the financial liberalization shock with the coefficient of 1.009 had the lowest effect. Also, the results of VECM model with Johansen-Juselius cointegration method showed that there are at least three long-run relationships between the model variables. The most important consequence of the cumulative impulse response functions is that the shocks on GDP instability are only significant over a period of time. Historical decomposition of structural shocks also shows the significance of the shocks of model independent variables on GDP volatility. The results showed that all three categories of variables explain the causes of production volatility in Iran, but the effect of monetary policy is larger than the other two factors, i.e., good chance and structural change. Taking dummy variables into account, the greatest impact on production volatility was found to be related to the variables of revolution and war, monetary policy index, oil revenues, exchange rate, sanctions and financial liberalization index, respectively.

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