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Threshold Effects of Exchange Rate Fluctuations on Value Added of Iran Economy sectors

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Abstract

The purpose of this study is to examine the Threshold Effects of Exchange Rate Fluctuations on Value Added in Iran's Economic sectors (1393-1353). For this purpose, Generalized pattern Autoregressive conditional Heteroskedasticity (GARCH) and Self Threshold Regression (TAR) were used for this purpose. Also the predicted and unpredictable shocks were obtained by the Hodrick-Prescott method. According to the research findings, in the industrial sector, exchange rate changes had a neutral effect on the previous values of the threshold level, and the values above the threshold level had a negative effect on the production in this sector. Predicted and unanticipated exchange rate impacts were found to have a negative and significant effect on the industrial sector and led to a decrease in the production of this sector. In the service sector, while the fluctuations of the exchange rate in the previous levels of the threshold level had a negative effect on the production of this sector, their effect was positive in values above the threshold level. Predicted shocks had a positive effect and unpredictable shocks had a negative effect on the production in this sector. Based on the results obtained in the agricultural sector, the effect of exchange rate fluctuations on production in the agricultural sector was neutral. In addition to the predicted shocks, fluctuations were found to have caused unforeseen exchange rate shocks in agricultural production. Since the effect of predicted shock was higher than an unpredictable shock, in agriculture and services sector, it is recommended that the government apply more transparency in the policies adopted in this respect.

Keywords: Exchange rate, threshold regression method (TAR), shocks of predicted and unanticipated.

JEL Classification: F31, D51, C24.

1. Introduction

Exchange rate is one of the most important economic variables whose changes can affect other macroeconomic variables. In fact, the exchange rate is the value of a currency relative to other currencies and its supply and demand affects trade

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and international payments. In other words, the value of the national currency of countries reflects the real performance of its economic indicators and the real power of each economy (Shahbazi and Najarghable, 2017: 124). Therefore, it is one of the challenging topics in macroeconomics.

Real exchange rate fluctuations create many changes in the underlying macroeconomic variables, especially in investment and trade, thus contributing to economic growth. In fact, economic sectors are affected by the exchange rate due to the structural relationship with macroeconomic variables (Koochakzadeh and Jalaee, 2014).

Empirical evidence is indicative of different effects for exchange rates on economic growth. In some studies, it has been found to have a negative effect (Ghafari et al, 2014: 104). In some others, it has been found to be ineffective(Akpan and Atan, 2011, 1). And in some studies positive effects have been reported reported (Javed, and Faroog ,2009: 44). On the one hand, currency depreciation lowers export prices. On the other hand, it raises the import prices. If trade is in balance and the terms of trade do not change, these price changes offset each other. But if imports exceed exports, the net result is a reduction in real income inside the country (Kandil, et al, 2007: 467).

Since the exchange rate is fluctuating, according to the economic literature, finding the optimal amount of fluctuations and how it affects production in economic sectors seams essnetial. The present study is organized in four sections. The second part is devoted to the method used in the study. In the next section, the research findings are presented and, finally, the conclusion is presented.

2. Methodology

This study is concenred with the Iranian economy and its data is related to the years from 1973 to 2013. GARCH and TAR were used in the present study. Also the predicted and unpredictable shock are obtained using the Hodrick-Prescott method. In order to test the existence of threshold effects in relation to production and exchange rate, the following model is estimated:

$$LY_{xt} = \text{f (LFEX ,LLA ,LCAA ,HPLEX ,SHOKELX} \quad (1)$$

In the above equations, LY_{xt} is the Logarithm of real production in economic sectors, LLX is the Employment logarithm, LCAX denotes Logarithm of capital stock, LEEX represents the logarithm of exchange rate fluctuations, HPLEX is the predicted shocks, and, finally, SHOCKELX.shows the unpredicted shocks .

3. Results

The results of KPSS Unit Root Test indicated that all the variables used were stationary at the level.

To calculate uncertainty, there is a need to introduce a proper behavioral equation for the exchange rate variable. For this purpose, the ARIMA(1,1,1) model was used. Finally, the GARCH model (1.1) was estimated as the optimal model.

After taking the above steps, exchange rate fluctuations were modeled and introduced as an influential variable in economic growth.

Based on the results, the effect of exchange rate fluctuations on the production of the industrial sector has been nonlinear. Also, predicted and unanticipated shocks will have a negative effect on the production of the industrial sector.

The effect of an increase in exchange rate fluctuations in the values below the threshold level, on the production of service sector, has been negative and significant, and positive and significant at rates above the threshold level. Also, while predicted shocks of the exchange rate have a neutral effect on the service sector production, unanticipated shocks will have a negative impact on this sector's production. in addition predicted shocks of exchange rate fluctuate more effective than unpredicted shocks in fluctuations of exchange rate between two threshold levels.

In the agricultural sector, the increase in exchange rate fluctuations did not significantly affect the production in this sector. Also, the predicted shocks influence production in this section. In addition the effect of predicted shock was higher than an unpredictable shock

4. Conclusion

According to the results, in the industrial sector, exchange rate fluctuations have a neutral effect on the values below the threshold level, and the values above the threshold level have a negative effect on the production in this sector. In fact, because of the great interaction of the industry with the global economy and its dependence on foreign exchange earnings and pricing policies, it is more damaged to exchange rates than other sectors. In the service sector, although exchange rate fluctuations below the threshold level had a negative effect on the production in this sector, at the higher threshold levels, this effect was positive. But in fact, the concealer is a weakness that has been created in the production of other sectors as a result of exchange rate fluctuations. Based on the results obtained in the agricultural sector, the effect of exchange rate fluctuations on agricultural sector was not statistically significant. In fact, the agricultural sector is less dependent on importing intermediary institutions than any other sector and is less affected by exchange rate fluctuations.

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