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The Effect of Exchange Rate on Iranian Trade Balance under Uncertainty

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Abstract

The main objective of this study is to investigate the non-linear impacts of macroeconomic instability on the relationship between exchange rate and trade balance of Iran. For this purpose, annual time series over the period 1973 to 2017 is used and computing the combined index of economic instability by means of variables such as consumer price index, foreign reserves, exchange rate, budget deficit and long run deposits rates is accomplished. Then, relationship between exchange rate and trade balance has been estimated employing Markov-Switching technique. The results indicate that Iranian macroeconomic instability is dividable into two regimes including high macroeconomic instability (regime 1) and low macroeconomic instability (regime 2). Increased exchange rate has induced the improvement of trade balance in both regimes. The effect of macroeconomic instability on exchange rate-trade balance relation, is negative and significant in two regimes. The both regimes implied that the macroeconomic instability deteriorates the effect of exchange rate on trade balance.

Keywords: exchange rate, trade balance, macroeconomic instability, Markov-Switching model.

JEL Classification: F31, F14, C22.

1. Introduction

International trade is one of the important sectors of any society so that some researchers have pointed it as the engine of growth. A review of the Iranian economic statistics shows that the country has been faced with non-oil trade deficit throughout the last four decades. Some economists, based on theoretical debates, believe that exchange rate must be increased. The main economic indicators of the country during the last four decades show an instable economic situation. Macroeconomic instability, affecting the exchange rate behavior and the elements of trade deficits, can reduce the effect of exchange rate on trade balance.

Exchange rate increases in recent years (2011-2017) have not induced a significant increase in exports or decrease in imports. Therefore, no improvement in the country's trade balance has occurred.

The theoretical knowledge on the linkages that exchange rates affecting trade balance is important for policy making. However, without refer to the special

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characteristics of the country it cannot be helpful. In studies concerning this subject, the effects of economic instability on exchange rate and trade balance especially in the Iranian economic condition have not been under consideration (Lotfali'pour and Bazargan, 2016; Rajabian and Salimifar, 2015; Dejpapsand and Goodarzi, 2009). Therefore the purpose of present study is to examine this issue in the literature and provide an answer to the question of how macroeconomic instability has influenced the effects of exchange rate on trade balance in the period 1973- 2017. In section 2 the literature review has introduced. Section 3 deals with the methodology of the research and the trade balance model. Section 4 is devoted to the estimation of the model and analyzing the results. Section 5 presents the concluding remarks.

2. Literature Review

Usually, economies use the policy of domestic currency depreciation to adjust and correct their trade deficit. The results of many empirical studies for different countries show that this policy improves trade balance (Bahmany Oskooee and Halicioglu, 2018; Vural, 2018; Ching et. al, 2013). However, depreciation policy has different effects on trade balance of developing and oil exporting countries. Since oil exporting economies are severely dependent on their exchange revenues, earned from oil sale, they are frequently faced with budget deficit, high inflation rates, negative real interest rates and fluctuations in their exchange rates as the most important factors causing their instability. Therefore, instability in their macroeconomic environment, along with increasing imports and decreasing exports, can reduce the effects of depreciation policy on their trade balance.

3. Method

To investigate the impact of exchange rate on trade balance, in most of the empirical studies, model (1) has been used (Bahmani-Oskooee and Kantipong, 2001; Narayan, 2004; Reis Gomes and SennePaz, 2005; Kalyoncu et. al, 2009; Hsing, 2010; Wang et. al, 2012; Bahmani Oskooee and Halicioglu, 2017). The model we used for trade balance was the reduced form of the model introduced by Rose and Yellen (1989) and Rose (1990;1991). The general form of this model is as follows:

$$LnTB_t = \alpha_0 + \alpha_1 LnRE_t + \alpha_2 Lny_t + \alpha_3 Lny_t^* + \varepsilon_{1t} \quad (1)$$

where $LnTB_t$ is the logarithm of non-oil trade balance index, $LnRE$ is the logarithm of real exchange rate, and Lny and Lny* are the logarithms of Iran's and world's real incomes, respectively. As it was mentioned, in the developing and oil exporting countries such as Iran, macroeconomic instability affects the relationship between exchange rate and trade balance. Hence, for testing how macroeconomic instability affects the relationship between exchange rate and

trade balance, we added instability to the model of trade balance in an intersect form. This adjusted our model to the following form:

$$LnTB_t = \alpha_0 + \alpha_1 LnRE_t + \alpha_2 Lny_t + \alpha_3 Lny_t^* + \alpha_4 LnMII_t * LnRE_t + \varepsilon_t \quad (2)$$

Where LnMII is the logarithm of Iranian macroeconomic instability. In this study, using the method introduced by Jaramillo and Sancak (2007), we defined a compound index of instability. In this index, macroeconomic instability index is defined as weighted sum of percentage change in general price level (CPI), percentage change in unofficial exchange rate (EX), percentage in budget deficit (BD), percentage change in the long-run deposits interest rates (R), and percentage in international reserves (SIR). The weight of each variable is the inverse of the standard error. The higher the magnitude of this index, the higher the instability:

$$MII_t = \frac{(\frac{CPI_t - CPI_{t-1}}{CPI_{t-1}})}{\delta_{CPI}} + \frac{(\frac{EX_t - EX_{t-1}}{EX_{t-1}})}{\delta_{EX}} + \frac{(\frac{R_t - R_{t-1}}{R_{t-1}})}{\delta_R} + \frac{(\frac{BD_t - BD_{t-1}}{BD_{t-1}})}{\delta_{BD}} + \frac{(\frac{SIR_t - SIR_{t-1}}{SIR_{t-1}})}{\delta_{SIR}} \quad (3)$$

In the present study, we first extracted the compound macroeconomic index of Iran and then estimated equation 2 using the Markov Switching approach.

4. Empirical Results

Estimated results using Markov Switching approach is reported in Table 1.

Table 1: Estimation of Parameters in Equation 2

Variable	Regime 2 (low instability)		Regime1 (high instability)	
C	**Prob.**	**Coefficients**	**Prob.**	**Coefficients**
LnY	0.000	-17.82	0.000	-12.23
Lny^*	0.005	-.35	0.000	-.42
$LnRE$	0.005	0.82	0.000	0.55
C	0.026	0.25	0.037	0.12
$Ln(MII * LnRE)$	0.035	-0.03	0.004	-0.13

Source: Research Estimations

As shown in Table 1, trade balance elasticity with respect to domestic income (Lny) is positive and significant in both regimes. Elasticity of trade balance with respect to foreign income (Lny*) is also positive and significant in both regimes. These results indicate that during the period of study, increase in domestic income has had a consumption direction, causing imports to increase and deteriorating the Iranian trade balance. However, increasing income in other countries of the world improved the Iranian trade balance. The effect of real exchange rate on trade balance was positive and significant in both regimes. This means that with increasing exchange rate (depreciation of domestic currency), trade balance improves in both regimes. The coefficients for intersection effect of macroeconomic instability and real exchange rate are negative and significant in both regimes. The negativity of these coefficients in both regimes means that macroeconomic instability causes the reduction of exchange rate effect on Iran's

trade balance. Therefore, trade balance elasticity with respect to exchange rate in both regimes is a function of the amount of macroeconomic instability. That is, the higher the macroeconomic instability leads to the lower the positive effect of exchange rate increase will be (domestic currency depreciation) on trade balance.

5. Conclusions and policy suggestions

The results of this study indicate that the behavior of Iranian macroeconomic instability in the course of our investigation follows a model of two regimes. The effect of macroeconomic instability on the relationship between exchange rate and trade balance was negative and significant in both regimes, causing a reduction in the effect of exchange rate on trade balance. Therefore, it is necessary that the policy makers bring management of the variables related to macroeconomic instability index to the center of their attention. To fulfill this aim, there is a need to develop certain policies to control money supply and inflation rate. Besides, due to the effect of budget deficit on the increase in monetary base, inflation and macroeconomic instability, we suggest that the government observe financial discipline and avoid budget deficits.

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