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Non-linear Response of Inflation: A Real Effective Exchange Rate in Iran

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EXTENDED ABSTRACT

INTRODUCTION

Exchange rate is a variable transferring international economic shocks to domestic economy. In countries like Iran which are experiencing a high inflation and whose GDP as well as consumption expenditures are mostly dependent on imports and foreign capital flows, exchange rate changes and its effects need to be carefully monitored by policy makers and economic researchers. Considering the importance of inflation in the theoretical discussions and the high inflation rate in some developing countries, the effect of exchange rate on inflation has attracted economists interested in monetary issues and international economics.

Nonlinear behavior in the exchange rate effect on inflation can provide false estimates of exchange rate coefficient when the econometric model is estimated linearly. In such a circumstance, we can accommodate cases when the inflation condition and its rate affect economic factors in response to an exchange rate shock. Indeed, domestic prices may not be sensitive to an exchange rate shock due to a low and stable inflation. However, they may respond wildly to a similar shock when inflation is above some significant thresholds.

Although studies have mostly focused on measuring the extent of exchange rate effect on price levels, we believet that investigating the possible existence of one or more thresholds in exchange rate effect is important, because the reaction of monetary policymakers may somehow depend on the extent of exchange rate effect with respect to one (or more) threshold value(s). For instance, policymakers might not take care of the exchange rate fluctuations below a certain level, but as soon as it crosses such a level, they believe it damages the economy and the country welfare, thus triggering some intervention in the currency market.

METHODOLOGY

A reason for the non-linear response of inflation is the non-linear nature of exchange rate trend. In fact, geometrically, among all the time paths of exchange rate, the probability of a linear path between the two time points is very weak. The effect consequence of all determinants of the exchange rate is displayed in its changes. Here are two important points to note. First, the cross-effects of exchange rate determinants can influence the impact of each determinant. Second, the importance of currency, especially in developing countries, and its key role between the foreign exchange and financial markets, has made the exchange rate an intelligent variable, which corrects mistakes at the next rate through the learning process. Hence, the course of exchange rate over time is expected to be nonlinear.

The purpose of the present paper is to the test a nonlinear model estimating the response of inflation to real effective exchange rate in Iran. In order to examine threshold effects of exchange rate on inflation in Iran, following Posedel & Tica (2009), pattern was used:

$$\pi_t = I_{t-d}\left[\alpha_1 + \sum_{i=0}^{k} \beta_{1i} e_{t-i}\right] + (1 - I_{t-d})\left[\alpha_2 + \sum_{i=0}^{k} \beta_{2i} e_{t-i}\right] + \varepsilon_t$$

$$I_{t-d} = 1 \quad if \quad e_{t-i} \geq \tau$$

$$I_{t-d} = 0 \quad if \quad e_{t-i} < \tau$$

where inflation π is a function of the Real Effective Exchange Rate (REER). The variable I_t is a dummy variable: $I_t = 1$ if the REER (e_t) is equal or bigger than the threshold (τ) and $I_t = 0$ if the REER (e_t) is smaller than threshold (τ).

FINDINGS

Finding based on time series data for the period 1971-2017 and Threshold Regression (TR) model indicates that real effective exchange rate of 6160.27 Rials has been applied as a threshold value. In other words, based on the above threshold value, the estimated model shows the exchange rate coefficient has increased somewhat from the first to the second regime.

CONCLUSION

Considering the fact that preserving the value of the national currency is one of the most important tasks of central banks and to control inflation, it seems necessary to give the due attention to exchange rate and its threshold impacts when planning, designing and implementing monetary and exchange policies. The results of this study suggests a policy guideline, namely, that, in order to limit the damaging effects of inflation on the economy and household welfare, monetary policymakers in Iran must restrain the foreign exchange shocks.

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