

The Impact of Reducing of Budget Deficit on the foreign Exchange Rate

Mohammad Ali Asgari

PhD student of Economics, Science Academy, Baku, Azerbaijan

ABSTRACT

This article aims to investigate the impact of reducing of budget deficit on the foreign exchange rate. Budget deficit as the government cost to income surplus is a result of financial policies. These financial policies influence considerably on the society economic. Concern to increase of the government debates and budget deficit questions raise that: Does budget deficit impact considerably on the economic variables? What is the respond of the long term and short term analyses? This article tries to investigate the impact of reduction of budget deficit on exchange rate. For doing so, ARDL was used in order to find contingency effects of reduction of budget deficit on the exchange rate during 1978-2006 in Iran. The results of evaluation of the economic model in Iran show that there is a long term balanced relationship between budget deficit and foreign exchange.

KEY WORDS: Foreign exchange, ARDL, Error Correction Model

INTRODUCTION

Exchange rate is a function of international financial affairs relative price. The duty of the economists is to identify the effective factors on unpredictable behavior of the real and nominal rate in long and short term. The government budget deficit like foreign exchange has been discussed by the policy makers and scholars.

This article tries to investigate the impact of reducing of budget deficit on foreign exchange rate between US dollar and Iran Rial.

The highest budget deficit relative to gross domestic production was seen during 1981-1988. This significant increase in budget deficit influences on the macroeconomic indicators in Iran. Accordingly, investigation of the budget deficit effects in order to identification of the government polices seems necessary. Elimination of the budget deficit causes to reduction of the interest rate, but its effect on exchange is not obvious. Some authors believe that reduction of the budget rate enhances foreign exchange, while some believe that this reduction leads to decrease of foreign exchange. Unfortunately, there are documents for both inferences in the literature. In US and Germany, increase of budget deficit increased domestic foreign exchange value while in Italy, Finland and Sweden, it led to reduction of domestic exchange value. The aim of this article is to study the impact of reduction of budget deficit on exchange rate in Iran during 1978-2006. For doing so, ADF test was used for examination of the stability and non stability of the variables. The estimated model adjustment speed was calculated by ECM.

1. Theoretical principles

Theoretical and experimental studies on the relationship between budget deficit and foreign exchange rate indicate different and even paradoxical results. Elimination of budget deficit has different effects on foreign exchange rate that some of these effects lead to increase of exchange rate and some effects cause to weakening of exchange. Reduction of budget deficit influences directly and indirectly on foreign exchange and interest level. Reduction of budget deficit reduces foreign exchange rate directly while, it increases exchange rate indirectly and it can reduce the foreign exchange.

Reduction of budget deficit influences directly on interest rate and foreign exchange since it reduces note budget demand. Government encounters with significant deficit when planning budget; generally, before income payment of the costs requires providing capital from financial market. When the government reduces budget deficit it will have less debate that leads to demand for note budget and reduction of the interest rate. The exchange rate is reduced by reduction of the domestic interest rate. The investors tent to selling the domestic exchange securities with less return and buying foreign securities with more return by reduction of domestic capital return. When an investor sells domestic securities with domestic currencies he uses foreign currencies for foreign securities transactions. Reducing domestic interest rate decreases demand for national money and increases forging exchange rate.

Reduction of budget deficit indirectly increase demand for note budget by the private investors. Increase of demand for note budget is resulted from followings:

- 1-low expected inflation rate
- 2-less risk of foreign exchange conversion
- 3-domestic capital returns more than expected rate

At first, reduction of budget could lead to reduction of the expected inflation. When the government reduces budget deficit the demand for money printing for meeting needs will be reduced and it will lead to elimination of the expected inflation rate. Since nominal interest rate is a function of expected inflation by the definition, when expected inflation is reduced in long term the nominal interest rate is reduced consequently. Declining inflation expectations leads to reduction in nominal interest rate in long term while interest rate is increased. When interest rate is increased the investors are attracted by domestic securities and this leads to increase in demand of national money. In other hands, when expected inflation is decreased exchange rate is increased.

Secondly, budget deficit may increase reduction of domestic securities risk compared to foreign securities. When budget deficit is eliminated the government debate is reduced and governmental securities falls and finally foreign exchange risk right is increased. When the government reduces budget deficit the risk of payment of debates is reduced and foreign exchange risk right is eliminated.

Thirdly, reduction of budget deficit impacts on the domestic securities expected return rate. The government could reduce budget deficit by reducing of costs and increasing of tax. These methods could have independent effect on the domestic capitals expected return rate .When the government reduces cost resources are transferred to private sector. Utilization of the resources by the private sector promotes private investment and economic growth.

As a result domestic capital expected return rate is increased, so domestic capital and currency demand and foreign exchange rate are increased.

Budget reduction could lead to low tax rate. By reduction of final tax rate the domestic securities after return tax rate is increased and demand of domestic published securities and as a consequences domestic currency are increased.

Several studies have been conducted on this subject matter.

“Gaf” investigated the relationship between budget deficit and long term interest rate during 1953-1987. He studied first grade differential equations in order to avoid false regression. The results show that predicted deficit does not affect signifacnatly on long term interest rate in the confidential level of %5 that confirms Ricardo suggestion [4].

Bero investigated the correlation between government budget deficit and current account deficit during 1959-1986. The correlation coefficient for US is 0.55 in this period that confirms hypothesis of correlation between budget deficit and payment balanced account deficit. Even for US; the correlation between these variables was obtained only because of economic condition after 1983 and for years 1959-1982. The correlation coefficient between these variables is practically zero. For other nine countries, the unadjusted correlation coefficient is dispersed and it is in range between -0.35 for Japan and 0.29 for Sweden. It can be concluded that this two deficit ratio is independent and there is no sign of budget deficit leading to more deficiency in the payment balance account [2].

“Bergin ” analyzed US current account in recent years and concluded that according to solving budget deficit problem ,the account deficit phenomenon is not accompanied by deficit .Paul in investigation on “Patrisha Polard” findings concluded that it is probable that changes in budget deficit and account deficit are in the same or different direction. The results show that reduction of current account deficit leads to increase of savings or reduction of investment [5]. Ziter and Pamberten investigated the US commercial deficit by the structural concurrent equations. They conclude that at first, budget deficit impacts significantly on current account by the influence on domestic attraction and income not by higher interest and foreign exchange rate. Secondly, commercial deficiency could not be considered as the result of the government budget deficit [8].

“Beckman” by using VAR variable investigated the relationship between current account deficit and budget surplus. The result of the causative test showed that only budget surplus has caused to changes in current account deficit [1].

Esterli ,Ridrigez and Schmit studied the relationship among public sector ,commercial deficiency and foreign exchange rate in ten developing countries during 1964-1989 and they found that there is a close relationship in financial, foreign commerce sector deficit and foreign exchange rate in decade 1980 [3].

2. METHODOLOGY

Application of traditional economic measuring methods in the experimental studies is based on hypothesis of stability of the variables. The results show that this hypothesis is rejected in most cases of macroeconomic series and most of the variables arenot stable. According to co integration theory, it is necessary to assure stability and instability of the variables [6].

In this study ADF statistics was used for investigation of stability and instability of the variables .Akaeik criterion was employed for determination of number of delays .After ARDEL and ECM, the long term relationship and short term dynamicity were studied.

Co integration is the advantage of ARDL. This method is applicable without considering models variables as I(0) or I(1).In other words, it is unnecessary to divide variables into correlated variables of grade one or zero in this method.

ARDL has been shaped based on dynamic approach and it is as follows in bi- variables state:

$$y_t = \alpha_0 + \sum_{j=1}^p \alpha_j y_{t-j} + \sum_{i=0}^q \beta_i x_{t-i} + v_t$$

In this relation, dependent variable is a function of level values and it can be rewritten with ARDL and its delay values are as follows:

$$A(L)y_t=B(L)x_t+u_t$$

In this relation (L) is delay operator as $-\alpha_3L^3-\dots-\alpha_pL^p$ $1-\alpha_1L-\alpha_2L^2$ and delay operator B(L) as $\beta_0+\beta_1L+\beta_2L^2+\dots+\beta_qL^q$.

ARDL examines co integration of the model variables in addition to estimation without consideration of the parameters. In order to have dynamic model with long term balance, it is necessary that sum of $i=1,2,\dots,p$ is less than one. For test, t is obtained by following relation and it is compared to Beranchi , Dolado and Master critical quantities.

$$t = \frac{\hat{\alpha}_i - 1}{S_{\hat{\alpha}_i}}$$

If calculated t is bigger than Beranchi , Dolado and Master critical quantity, estimated regression has long term balanced relationship and in other case the variables are not integrated. In case of co integration of the variable, it can be investigated the short term dynamicity and movement toward balance [7]. Shin and et al (1996) showed that the long term relationship between model variables is estimated by ECM coefficient. So that if $ecm(-1)$ is between 0 and 1 and it is significant from statistical view point then there is a long term relationship between the variables.

For estimation of this model, it is necessary to estimate the relationship by OLS for all possible combinations based on variables different delays. Maximum delays are estimated by the author based on number of observations. In next step, among measured regressions, one regression is selected based on four Akaeik, Schwrtz-Byzen, Hannan rules and determination coefficient. In final step, coefficients related to long term model are proposed based on ARDL. In this model, in addition to long term relationship the ECM is proposed.

3. Experimental Studies

In this study, time series data of period (1978-2005) provided by central bank of the Islamic republic of Iran were used. The variables are government budget deficit and foreign exchange rate.

Before estimation of the model, it is necessary to investigate variables stability. For doing so, ADF test was used. Table (1) depicts the results of the test in two parts.

1-The model has width from source and it is without trend

2- The model has width from source and it has trend

In order to specify the stability and instability of the variables, four criteria of Schwrtz-Byezin,Akaeik,Hannan Queen and uprightness logarithm can be used. Schwrtz-Byezin criterion is used in this article. The results show that H0 is rejected based on having unit root in budget deficit, it means that static budget deficit variable is zero. But for ER, H0 can be rejected and it should be used root of unit test in the variable first differential. According to table (2), the results show that the H0 can be rejected in first grade differential, so this variable is one grade.

Table(1): results of ADF test on variables level

model	Width from source and trend			Width from source and without trend		
	Statistic	Critical value	Delay	Statistic	Critical value	Delay
ER	7/4895	-2/9798	0	2/2309	-3/5943	2
BD	-0/13984	-2/9798	1	-1/1153	-3/5943	1

Resource: research resources

Table(2): results of ADF test on variables differential level

model	Width from source and trend			Width from source and without trend		
	Statistic	Critical value	Delay	Statistic	Critical value	Delay
ER	-7/8463	-2/985	0	-8/4926	-3/6027	0

Resource: research resources

According to Schwiatz –Biyerzen criterion, optimal delay for BD variable is zero and it is one for ER.

The result of calculation of short term equation is as follows:

$$Er=119.0812+0.11376 \text{ bd}$$

This relation shows that there is a direct relationship between foreign exchange and budget deficit. Foreign exchange is increased by increase of budget deficit. The results show that one percent increase in the government budget deficit leads to increase ER by %11.

After calculation of dynamic equation, long term relationship is tested. For doing so, sum of delay coefficients with dependent variable is subtracted from one and it is divided into standard deviation and the result is -2.27. Since this figure is less than critical value of Benrah, Dolado and Master table (-3.27) from absolute value view point, thus H0 is accepted as having long term relationship. The following results are obtained:

$$\frac{0.1602 - 1}{0.24042} = -2.27$$

The result of long term equation is as follow:

$$ER=0.71014BD$$

Error correction coefficient shows percentage of adjustment of dependent variable imbalance toward long term relationship in each period. In this article, ECM(-1) is -0.16 that shows that 0.16 is adjusted from short term imbalance to long term balance every year.

4. Conclusion

Undoubtedly, governmental budget deficit has been considered in economic issues since last decade. Although economists have different viewpoints in this case, but most of them believe that budget deficit is harmful and probably it is dreadful. The effect of budget deficit on ER was studied. Budget deficit could influence on variables like long term participation, national savings and governmental debates. In deed the government budget deficit was considered as an independent variable and ER was considered as a dependent variable in the structural model. Studied annual time series is in range 1978-2004 in Iran economic. The long term relationship between budget deficit and ER shows that when budget deficit is increased one percent ER is increased 70 percent. As a result balanced budget play a detriment role in stability of foreign exchange rate. Since there is a long term economic relationship between ER and budget deficit, for this reason the government should emphasize on the budget stability and employ financial resources in appropriate way. It is probable that foreign exchange rate by close relationship between government budget polices influence on Iran export.

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