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Investigating the threshold effect of inflation rate on budget deficit with Smooth Transition Regression (STR) approach

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EXTENDED ABSTRACT

INTRODUCTION

For more than half a century, extensive theoretical and empirical controversies have been formed around the relationship between the government budget deficit and inflation - as two conventional indicators of macroeconomic performance. 1- What is the effect of the inflation rate on the budget deficit in different regimes? 2- What effect does the GDP growth rate have on the budget deficit in different regimes? 3- What effect do oil revenues have on the budget deficit in different regimes? And 4- What effect does the market exchange rate have on the budget deficit in different regimes? There are questions that have not yet been answered theoretically or empirically. Empirical studies have also been conducted regarding the issue of existence or non-existence or the direction of the causal relationship between the government budget deficit and inflation, and these studies have reported contradictory results depending on the sample under investigation, assumptions and time requirements of the research. . Therefore, it seems that the best way to respond to these theoretical and empirical contradictions is to experimentally investigate the effect of inflation on the government budget deficit separately in each country. Based on this, the main goal of the current research is to investigate the threshold effect of the inflation rate on the budget deficit. - as the two major challenges of Iran's economy in the years after the victory of the revolution - in Iran's economy.

METHODOLOGY:

Nowadays, due to the fact that many countries are facing successive changes in the field of politics and economy, it is expected that the modeling of macroeconomic variables with linear models and fixed parameters is not suitable, therefore, non-linear models and time parameters have a relative advantage. In this study, in order to investigate the threshold effect of the inflation rate on Iran's budget deficit during the period of 1979-2019, the Smooth Transition Regression (STR) approach has been used. The econometric model used in this research is derived from the model used by Chiu & SUN (2016) in the form of equation (1):

$$BD_t = \phi'\omega_t + (\theta'\omega_t)G(s_t.\gamma.c.) + u_t \qquad (1)$$

Where is the government budget deficit as a dependent variable (in billions of Rials), and ω_t is the vector of the control variables as follows:

- INF is the inflation rate obtained from the total price index of consumer goods and services.
- GDP is the growth rate of the gross domestic product based on the purchasing power parity of money (at the constant price of the base year 2005).
- $OILR$ is oil revenues (in billion Rials).
- EX is the exchange rate index (in terms of annual percentage).

$\phi' = (\phi_0.\phi_1.\dots.\phi_p)`$ is the vector of linear part coefficients and$\theta' = (\theta_0.\theta_1.\dots.\theta_p)`$nonlinear part coefficients. s_t ndicates the transition variable, γ is the parameter of the transition speed from one regime to another, and c indicates the threshold limit or the place where the regime change occurs. u_t is the perturbation component of this equation, which is assumed to satisfy the condition $u_t \approx iid(0.\sigma^2)$ It should be noted that the data used in this research were extracted from the time series data bank and reports of the central bank. Also, JMULTI and Eviews10 software were used for model estimation and statistical analysis.

FINDINGS:

The sum of the inflation rate coefficients in the first and second regimes has had positive effects on the budget deficit. On the other hand, the sum of the exchange rate coefficients in the first and second regimes has increased the budget deficit, which shows that the exchange rate in both regimes has aligning effects on the budget deficit. Other results indicate that the total coefficients of the economic growth rate in both the first and second regimes have reduced the budget deficit. Finally, the sum of coefficients of oil

revenues had a negative effect on the budget deficit in the first regime and a positive effect in the second regime.

CONCLUSION:

The questions of the present research were investigated using the smooth transition regression approach and are as follows:

The first question of the research indicates that "how is the effect of inflation rate on the budget deficit in different regimes?" The results of the research indicate that the inflation rate has a positive effect on the budget deficit in both regimes.

The second question of the research also states that "What effect does the GDP growth rate have on the budget deficit in different regimes?" Based on the results of the research, the economic growth rate in both regimes has a negative effect on the budget deficit.

The third question of the research indicates that "what effect do oil revenues have on the budget deficit in different regimes?" Based on the results of the research, oil revenues have a negative effect on the budget deficit in the first regime and a positive effect in the second regime.

The fourth question of the research shows that "What effect does the market exchange rate have on the budget deficit in different regimes?" Based on the results of the research, the exchange rate has a positive effect on the budget deficit in both regimes.

The budget deficit is one of the characteristics of most developing countries, on the other hand, inflation has a prominent effect on the government's revenues and expenses, so the policy proposals for these two variables should be carefully considered. needs. But what can be expressed in the form of a suggested using this research is as follows:

1- According to the research results in both regimes, the increase in inflation has aggravated the government budget deficit, considering that the government budget deficit itself can be one of the main causes and factors affecting inflation, so there is a two-way relationship between inflation and deficit. There is a budget, so it can be concluded that in order to reduce inflation, the government's budget should be reviewed in terms of revenue and expenditure sources in such a way that:

A). The share of tax revenues, tolls, etc. should increase and the share of inflationary tax in securing the government budget should decrease.

B). The government's reliance on the Central Bank (Haq al-Zarb) to provide income should be reduced.

C). The government should manage its expenses and limit the source of the budget deficit by reducing expenses in unnecessary cases.

D). The government should reduce the budget deficit by downsizing and financial discipline and limiting the sphere of influence of the budget. Because with the shrinking of the government and the reduction of its activities, firstly, the costs will decrease, and secondly, the private sector will gain power and the source of taxes will increase.

Therefore, based on the proposed proposals, first, the budget deficit will decrease, and according to the two-way relationship between the budget deficit and inflation, inflation will also decrease, and secondly, when inflation decreases, the government's budget deficit will return to the stage The second decreases more. Therefore, this factor causes the budget deficit and inflation to go down.

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