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The uncertainty effect of oil revenues on indirect taxes using fuzzy logic

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EXTENDED ABSTRACT

INTRODUCTION

The impact of oil revenues on tax revenues has been investigated and analyzed in various studies, and there are two different and opposing views in this regard. According to the first view, governments try to use oil revenues for public expenses and reduce tax revenues to maximize the welfare of society and the satisfaction of public opinion. With this, the increase in oil revenues is replaced by a decrease in tax revenues. From the second point of view, governments in oil-rich countries, by investing oil revenues in other economic sectors, cause the growth of these sectors and, in this way, help to increase tax revenues. This discussion of which view can be correct in a country is of great importance in planning and budgeting. On the other hand, there has always been uncertainty in the oil market, and in most cases, it has been able to affect the economies of the countries that export it. As a result, in making economic decisions, it is necessary to consider the uncertain effect of oil revenues on tax revenues in policy making. Accordingly, the current research has investigated the impact of tax revenues and, in particular, indirect taxes on the uncertainty of oil revenues themselves.

METHODOLOGY

This research has been done using fuzzy regression from 1991 to 2021 for Iran's economy. The research model was taken from Abdelwahed (2020), which was adjusted according to Iran's economy. Oil revenues, the uncertainty of oil revenues, the gross domestic product without oil, imports, the literacy rate, the added value of service sectors, agriculture and industry,

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the inflation rate, the exchange rate, the growth of the government's construction budget, and the size of the underground economy are the independent variables of the model, and the ratio of indirect taxes to GDP is the dependent variable of the model.

FINDINGS

The estimation of the model was estimated by using fuzzy regression and considering the symmetrical triangular number, the results of which are shown in **Table 1**.

Table 1. Model estimation results based on fuzzy regression
Source: Research results

Variable	Fuzzy Coefficients	
	a	**s**
Intercept	29.043	2.009
GDP Without Oil	1.9709	0.0001
Oil Revenues	-0.0237	0.0297
Uncertainty of Oil Revenues	-0.0971	0.0039
Import	0.0354	0.0007
Exchange Rate	-0.0742	0.0012
Literacy Rate	0.5660	0.0031
Inflation Rate	-0.0953	0.0009
Added Value of the Industry	0.8431	0.0010
Added Value of Agriculture	-0.0973	0.0017
Added Value of Services	0.9716	0.0030
Underground Economy	-0.0768	0.0087
Construction Budget Growth	1.0114	0.0076

In **Table 1**, oil revenues with a fuzzy coefficient (0.0297, -0.0237) have a small effect on indirect taxes. Although the average effect of this variable is negative (-0.0237) because the fuzzy interval includes zero and positive numbers, it cannot be an important and influential factor in the absorption of indirect taxes. Analyzing the ambiguity of this coefficient, it can be said that with the increase in oil revenues, the motivation of the government to attract indirect taxes will decrease to a great extent because the government provides its budget from the sale of oil. On the other hand, the range of positive numbers in this coefficient confirms that the import tax is more affected by the revenues from oil. According to the obtained fuzzy number, none of the above two effects are dominant in the absorption of indirect taxes, and the ambiguity of the fuzzy coefficient is the reason for this. In **Table 1**, the uncertainty coefficient of oil revenues is equal to (0.0039, -0.0971), which shows that uncertainty has a negative and significant effect on indirect tax revenues. The maximum effect of this variable on attracting indirect taxes is 0.0932, and its minimum effect is 0.1010. The average effect of this variable on indirect tax revenues is -0.0971.

CONCLUSION

The results showed that the uncertainty of oil revenues has a negative effect on indirect taxes in Iran's economy. Therefore, a one percent increase in the uncertainty of oil revenues reduces indirect taxes by 0.097 percent. In other words, the uncertain increase in oil revenues, which can be caused by various factors such as oil price fluctuations, sanctions, and restrictions on oil sales, can increase the budget deficit by affecting indirect taxes.

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