

The Effect of Replacing Oil Revenue with Tax Revenue on the Institutional Governance Index in Iran

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Abstract

This article analyses the effect of replacing oil revenue with tax revenue on Iran's institutional quality. For this purpose, good governance index, which is derived from the mean of six good governance indices including Voice and Accountability, Political stability, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption, was considered as the indicator of institutional governance quality. The threshold model effect of oil revenue on the governance quality in Iran was estimated over the period 1996:1-2017:1 by Smooth Transition Regression Model (STR). The inverse U-shaped relationship between the share of oil revenue in GDP and the good governance index and a direct relationship between the share of tax revenue from GDP and this index were found. The Estimated threshold level of oil revenue impact for good governance index was 2.378%. The scenario of a 10% decrease in oil revenue and a 10% increase in tax revenue showed that this replacement resulted in a 11% improvement in the quality of governance in Iran. It is, therefore, recommended that the reform of the tax structure in Iran be put on the agenda of the government and parliament in order to meet the government's financial needs as well as the country's independence from oil. The government, through its competitiveness and accountability mechanisms, supports the establishment of civil society institutions and enhances the power of citizens to help raise tax revenue.

Keywords: Oil Revenue, Tax Revenue, Institutions, Good Governance.

JEL Classification: Q33, F38, O43, H11, I31.

1. Introduction

One of the conditions for achieving economic growth is having capital such as oil and gas resources (Mehra and Kakha, 2008). However, there is disagreement about the impact of abundant natural resources, especially oil, on the economic growth of developing countries (Ebrahimi et al., 2016). According

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to Louis (1955) and Rostow (1960), having rich oil and gas reserves is effective in providing capital and has a positive effect on economic growth. In contrast, Sachs and Warner (2001), Gilfason (2001), and Stigens (2005), believe that the abundance of natural resources reduces economic growth due to rapid fluctuations in the price of natural resources (Mehrara and Kaykha, 2008).

Institutional theory does not limit growth to economic factors and has identified institutional factors such as political system, public policies, culture, religion and so on as important factors in the economic performance of countries (Acemoglu et al., 2005). Thus, one of the factors affecting economic growth is the increasing empowerment of the government. Improving government capacities is possible through strengthening of government institutions, which the World Bank named as good governance institutions (Wood, 1999). The question now is when oil revenues can appear as a blessing and when it will act as a disaster and lead to a slowdown in economic growth. Natural resources are transnational and should be exploited with respect to transnational rights. On the other hand, due to the influence of governments' other political decisions on oil prices, oil-rich countries are seeking alternative incomes (Tohidinia, 2015). One of the most justified sources of government revenue that can be replaced by the natural resources income is tax revenue (Mojtahed and Ahmadian, 2007). For the purpose of this article, it is necessary to see what kind of relationship exists between oil and tax revenue and institutional quality in the country. Then, the effect of this replacement is examined in a hypothetical scenario.

2. Model

The following model is implemented for investigating the relationship of oil and tax revenue with good governance quality, as in Couttenier's (2009) study:

$$\lambda_t = \beta_0 + \beta_1 \left(\frac{Oil}{Gdp} \right)_t + \beta_2 \left(\frac{Tax}{Gdp} \right)_t + \beta_3 Open_t + \beta_4 GR_t + \varepsilon_t \quad (1)$$

where λ_t is the mean of the six good governance indices including Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption¹. $(Oil/Gdp)_t$ and $(Tax/Gdp)_t$ are the share of oil and tax revenue from GDP. $Open_t$ and GR_t represent the trade openness and economic growth rate².

Smooth Transition Regression Model (STR) was used to determine the threshold of the impact of $(Oil/Gdp)_t$ on the λ_t . The appropriate model should be selected from the Logistic function (LSTR) and the Exponential function (ESTR) method (Mahmoudzadeh and Ahmadi, 2018). Thus, Equation (1) was converted to the following equation based on STR method:

1. Data of institutional indicators were extracted from the World Bank Good Governance (WGI)

2. Other variables were extracted from the Central Bank of Iran (CBI.IR), in billion Rials at a constant price in 2004.

$$\lambda_t = \varphi'X_t + (\eta'X_t).G(\gamma, c, s_t) + v_t \tag{2}$$

where X_t is the vector of GR_t , $Open_t$, $(\frac{Tax}{Gdp})_t$ and $(\frac{Oil}{Gdp})_t$. $\varphi' = (\varphi_0, \varphi_1, \dots, \varphi_z)'$ and $\eta' = (\eta_0, \eta_1, \dots, \eta_z)'$ denote the vector coefficients of the linear and nonlinear part and γ, c, s_t, G are the transfer rate, threshold level, transfer variable and transfer function, respectively.

The transition functions for LSTR and ESTR model are as follows:

$$G_{LSTR}(\gamma, c, s_t) = \frac{1}{1+e^{-\gamma(s_t-c)}} \tag{3}$$

$$G_{ESTR}(\gamma, c, s_t) = 1 - e^{-\gamma(s_t-c)^2} \tag{4}$$

3. Estimation Procedures

Due to the use of seasonal data, Heilberg, Engel, Granger, Yu(HEGY) stationary test was used.

Table(1)¹: Results of HEGY stationary Test

	Critical values level 1%= -3.600 5%= -2.940 10%= -2.630				
Variable	GR	Open	$(Oil/Gdp)_t$	$(Tax/Gdp)_t$	λ_t
t-statistic	-3.307**	-4.020***	-3.668***	-2.863*	-3.311**

Table(1) shows that all variables are static. According to the F- statistics presented in Table (2), the model is nonlinear and the suggested model is ESTR with one threshold point.

Table(2): The results of nonlinearity test and determining the type of model

Transfer Variable	Probability				
	F-Statistics	F_2 -Statistics	F_3 -Statistics	F_4 -Statistics	Suggested Model
$(Oil/Gdp)_t$	4.403 (0.015)**	8.922 (0.000)***	6.126 (0.000)***	7.779 (0.000)***	ESTR
	0.991 (0.323)	0.774 (0.465)	0.545 (0.653)	0.512 (0.727)	Linear

According to Table (3), model has serial correlation and variance heteroskedasticity. Also, the stationary test of residuals of both linear and nonlinear part of the model shows that the nonlinear relationship in the residuals did not remain.

1. With ***, ** and* denoting significance at the 1%,5% and10%levels, respectively.

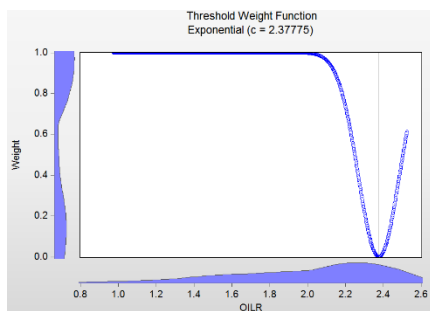
Table (3): The results of classic hypothesis tests

Test	T-Statistic	Probability
Breusch-Godfrey Serial Correlation LM	86.477	0.000***
White Heteroskedasticity	60.124	0.000***
Jarque-Bera Normality	1.062	0.588
Residual's stationary of the linear part	-3.897	0.000***
Residual's stationary of the non-linear part	-3.292	0.002***

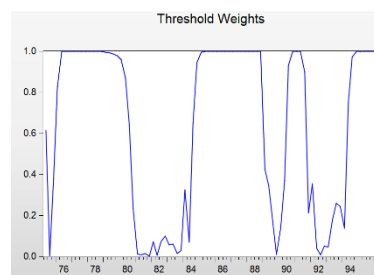
The results of estimating the ESTR method in Table (4), after resolving the serial correlation and variance heteroskedasticity, show that the threshold of the impact of $(oil/Gdp)_t$ on λ_t during the period 1996:1-2017:1 in Iran was 2.378%. The positive effect of the $(oil/Gdp)_t$ before reaching the threshold and the negative value of this coefficient after exceeding the threshold, show an inverse U-shaped relationship between $(oil/Gdp)_t$ and λ_t . Also, the effect of $(Tax/Gdp)_t$ on λ_t was positive.

Table(4): The result of estimating the ESTR model

Variable	Coefficient	Probability
c	-0.230	0.000***
$(Tax/Gdp)_t$	0.053	0.000***
$Open_t$	-0.010	0.000***
GR_t	0.012	0.016***
Trend before reaching the threshold	-0.004	0.000***
Trend after reaching the threshold	0.0014	0.000***
$(oil/Gdp)_t$ before reaching the threshold	0.033	0.000***
$(oil/Gdp)_t$ after reaching the threshold	-0.036	0.000***
$R^2 = 0.88$		$\bar{R}^2 = 0.86$
$\gamma = 42.876$		$c = 2.378$
$s_t = \left(\frac{Oil}{Gdp}\right)_t$		



(a)-Transition function



(b)-Threshold weight

Fig 1. Model transfer function

4. Scenario of replacing oil with tax revenue

According to the purpose of the study, it is assumed that the exploitation of petroleum resources will be reduced by 10% and tax revenue will increase by 10%. This scenario should be implemented in a way that will improve the quality of institutions in the country. Thus, the replacement of these two incomes begins when oil revenue exceeds its threshold and enters the phase of negative impact on institutional indicators. The equation (1), before and after of implementing the scenario, is as follows:

$$\lambda_t = -0.230 + 0.053 \times \left(\frac{Tax}{GDP}\right)_t - 0.010 \times Open + 0.012 \times$$

$$grate + [((0.033 \times \left(\frac{Oil}{GDP}\right)_t) - (0.004 \times Trend)) + ((-0.036 \times$$

$$\left(\frac{Oil}{GDP}\right)_t) + (0.0014 \times Trend))] \times (1 - e^{-42.876 \left(\left(\frac{Oil}{GDP}\right)_t - 2.378\right)^2}) \quad (5)$$

$$\lambda_t = -0.230 + 0.0583 \times \left(\frac{Tax}{GDP}\right)_t - 0.010 \times Open + 0.012 \times$$

$$grate + [((0.033 \times \left(\frac{Oil}{GDP}\right)_t) - (0.004 \times Trend)) + ((-0.0324 \times$$

$$\left(\frac{Oil}{GDP}\right)_t) + (0.0014 \times Trend))] \times (1 - e^{-42.876 \left(\left(\frac{Oil}{GDP}\right)_t - 2.378\right)^2}) \quad (6)$$

Comparison of the institutional quality index before and after the implementation of this scenario shows 11% improvement in the quality of good governance.

5. Conclusion

The inverse U-shaped relationship between $(Oil/Gdp)_t$ and good governance index shows that oil revenue, at the initial level (up to 2.37% from GDP), has a positive effect on institutional quality, but as oil revenue increased and Iran's economy became more dependent on this source, its negative impact on institutional quality emerged. The direct relationship between $(Tax/Gdp)_t$ and good governance indicates that citizens who pay less tax, are less likely to be hold the government accountable, which reduces the pressure to improve institutional quality. In contrast, the government has to satisfy the public by creating more efficient institutions and improving the quality of governance in order to generate more tax revenue. On the other hand, the result of replacing scenario shows 11% improvement in governance quality. It is, therefore, recommended that the reform of the tax structure in Iran be put on the agenda of the government and parliament in order to meet the government's financial needs and for country's independence from oil.

References

- Acemoglu, D., Johnson, S., Robinson, J. A. (2005). "Institutions as a Fundamental Cause of Long Run Growth, in Aghion, Handbook of Economic Growth", Amsterdam:North-Holland, 386-414.
- Couttenier, M. (2008). "Relationship between Natural Resources and Institutions". Paris School of Economics Working paper.
- Ebrahimi, B., IsmailiRazi, H., ShirAli, Sh. (2016). "The effects of abundant oil revenues on the decision-making system and the share of the private sector in Iran's economy", *Journal of Economic Policy*, 8(16): 218-189.
- Mahmoudzadeh, M., Ahmadi, M. (2018). "Government Debt and Economic Growth in Iran:A Smooth Transition Regression Approach", *Macroeconomics Research Journal*, 25: 153-133.
- Mehrara, M., Kaykha, A. (2008). "Institutions, Oil and Economic Growth in Oil-Based Countries during the 2005-2005 Period: Panel Methods of Accumulation", *Quarterly Journal of Economic Studies*, 5(4), 79-55.
- Mojtahed, A., Ahmadian, A., (2007). "The Effect of State Tax Revenue on Iranian Social Welfare", *Quarterly Economic Review*, 7(1), 45-71.
- Tohidienia, A. (2015). "Approaches to realizing interstate justice in utilizing hydrocarbon resources with long-term economic welfare in Iran", *Journal of Economic Research and Policies*, 23(67), 54-33.
- Wood, A. (1999). "Demystifying Good Governance: An overview of World Bank Governance Reforms and Conditions". *Trocaire*: 1-42.