



Interaction effect between government tax revenues and metropolitan municipality of Ahvaz revenue study

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Abstract: Municipalities in many countries around the world, has a key role in the economic development of cities and making decisions about many aspects of the city's economy has been transferred to municipalities. Municipalities that are mainly responsible for serving the people and producing of goods and public service needed in the city, are dependent on sources of income for covering their costs. Thus, a study of the affecting factors of Municipal revenue sources, especially tax resources are essential. Economically taxes are considered as one of the most relevant national and local government revenue sources. While Taxes are financing resources, they are being considered as an efficient tool to implement economic policies. For this reason, an efficient tax system is essential for the continuation of national and local governments. The lack of a proper tax system not only will lead to an absence of the above advantages, but also a reduction in social welfare and purchasing power of citizens and thereby reducing the revenues of municipalities. So it cannot be said that increasing government tax revenues are not necessarily leading to an increase in municipal revenue. This article will investigate the interactions between tax revenues with municipal revenues of Ahvaz by a VAR model. The results of this study show that the increase in tax revenues, leads to decreased revenues of Ahwaz Municipality.

Keywords: income Municipality, tax income, exchange rate, Ahvaz Municipality

Introduction

Municipalities as the operational level management in public sector organizations need special financial resources. Municipalities are responsible for a wide range of tasks and to perform these tasks, they designed different programs and projects into practice. Implementation of these programs and projects will require financial resources. A lack of continuous and sustainable financial resources will disrupt municipality, financial planning and budget and by following this process, current funding sources will not be accountable for growing municipal costs regarding services in the coming years. Therefore, study of the effective factors on municipal income is very important. One of the major macroeconomic variables is a tax which has major effects on Ahwaz municipal income. Tax revenues through municipal contributions from this source of income and also disposable income of citizens after taxation and purchasing power and their demand for municipal services are effective.

This article is trying to review the interactions of government tax revenues on Ahvaz Metropolitan Municipality revenues.

The necessity of research

The cost of buying or selling a unit of foreign money to the country currency is called the exchange rate. Internal and external equations have a special role in determining the exchange rate and also the power of national currency and the value of its equity are crucial issues in today's world economic relations. In recent years, the study of currency fluctuations effects on relative prices of the economy has a great importance in economic literature. The results show that Money supply and interest rates on foreign

currency and the general price level are among the factors that affect the value of the exchange rate and the expected rate of future variables. Increasing in Domestic money supply and the growing foreign interest rate will raise the domestic price level and the nominal exchange rate. And it leads to rising costs and the less willingness of manufacturers to produce. And by reducing production and increasing domestic prices and reduced purchasing power of people, will effect on municipal revenues (Department of Economic Affairs). Taxes are the most common and the most important financial resource for the provision of public funds and one of the most effective tools of government fiscal policy. The government can serve many social services and welfare to its people and give necessary direction to many economic and social activities. The taxes have several effects and each tax base also has a maximum capacity that can be exceeded due to the acceleration in the reduction of economic activity, so it will reduce tax revenues.

Taxes are as follows

1. the indirect taxes, which will take place by withdrawing from the income and assets of people indirectly and by increasing the prices of commodities and services.
2. The direct taxes, which its main sources are income and assets of natural and legal persons and will be received directly from them.

A considerable share of indirect taxes in the composition of government tax revenues and considering the possibility of further tax transferring on this type of taxes and their unclear impact has caused the improper role of indirect taxes in the control of inflation and the tool for optimizing investments by the Government. (Zandi, 1990)

Most developing countries were associated with deep inequalities in wealth distribution, consumption and income and their economic structures have suffered from high inflation and lack of capital. One of the best ways to compensate for the inequality and optimal allocation of resources is appropriate tax policies. (Yazdi, 2000)

On the other hand, the tax resources which meant taxable activities will stretch towards tax rate; this means that the reducing and increasing tax rates affect activities and income. This causes an increasing on earnings and thus national and local government tax revenues by changing tax rates.

The value-added tax is the most common tax that the government and municipalities will receive for their funding. VAT is a consumption tax, which will be received in import chain, production and distribution according to the percentage of the value of goods and included services. This tax was first designed by von Siemens in 1951, to overcome the financial problems of Germany. VAT is an indirect tax, which the consumer will pay it with the purchase value of goods and services and the recipient is required to deposit the amount of tax to the state treasury. Since the seller has paid such a tax on his initial purchase, but he is not a consumer, he has the right to deduct his total pay value added tax from his total received value added tax and pay the rest of it to the government.

According to what was said about the government revenues and the impact of tax rates on activities level and tax revenues and with regard to the municipalities' share of value added tax revenues, including Ahvaz municipality and also the effect of changing exchange rate on the producer level of activities, investigating the interactions between government tax revenues and exchange rates and revenues of Ahvaz Municipality seems necessary.

Determining non-optimal tax rates lead to reduced purchasing power of citizens which this will follow by decreasing the municipality's revenues through non-payment of municipal services, on the other hand non-optimal tax rates lead to reducing the level of generating activities and the reduction of municipality's revenues. Increasing in government tax revenues due to the adoption of non-optimal rates may be reduce the level of activity and economic growth in the long term, but in the short term may be lead to a temporary increase in municipality's revenues through the municipalities' share of value added tax. Thus, a study of the amount and impact of these factors on municipality's revenues is essential.

Experimental studies background

In a research, Hassan Zadeh and Khosro Shahi (2011) study the model of efficient funding provided to municipalities in large cities, according to social justice they stated that the neglect of this issue will cause the citizens' deprivation who cannot pay taxes for using produced goods and services. In order to resolve this problem, they offered a local taxes progressive tool and government grants financial assistance to municipalities.

In a research, Akbari and Muezzin Jamshidi (2011) study the value added tax as a source of a stable income for the management of cities. In this research, by a fluctuation descriptive study of municipalities' revenue sources, they found the income value added tax position and level

on municipalities' revenue sources. The results showed that the value added tax could constitute a significant share of municipalities' revenue source.

Mehregan and colleagues (2011) examined the interaction between government tax revenues and municipality of Tehran income in the form of VAR and payment integration model. This research result showed that the increase in government revenues leads to decrease in the revenues of Tehran municipality.

Research Methodology

The Vector model (VAR)

The Vector model (VAR), is presented by Sims (1980). Sometimes, it is possible that the economic theory has not the necessary power to determine the relationship between variables. In such a situation, using VAR models can be remedied. Anders (2004) states that the VAR model provides a direct method to forecast regardless of how the variables in the model will affect other variables. VAR model mathematical representation is as follows:

$$Y_t = A_1 Y_{t-1} + \dots + A_p Y_{t-p} + B X_t + e_t \quad (1)$$

Where Y_t is a vector with k components of endogenous variables, x_t is a vector with d components of exogenous variables, A_1, \dots, A_p and b are matrices of coefficients which should be estimated. Finally, e_t is a vector of transformation that may be simultaneously correlated, but they have no correlation with their own lagged values and variables on the right side. Since only lagged values of the endogenous variables appear on the right side of equations, the problem of synchronization will not appear and the ordinary least squares OLS method provides compatibility estimates. In the standard VAR model, in general the disorders are shown by correlations at the same time. This makes the system response to changes in a variable; answered all those variables that are correlated with that variable. However, correlation at the same time will resolve by an orthogonal process of Cholsky. (Farzanegan and Marquardt, 2009)

The main tool used to estimate VAR models are the impulse response functions (IRFS). IRFS will allow us to obtain the dynamic shock effects on a specific variable on other macroeconomic variables. Through IRFS we can show the size and statistical significance of the available variables in the model to increasing the size of a variable standard deviation shock. (Sadeghi and Shawwal pour, 2010)

Integration test

Since in the estimated autoregressive models, stationary variables of the model are necessary and also due to the fact that there is useful information in the variable level, which will be lost by differencing, so the co-integration should be examined variables. The concept of integration in the 1980s was presented to solve stationary problems and the possibilities to study the long-term relationships between non-stationary variables were provided. In this study, we used Johansen and Juselius testing and two statistic largest eigenvalues and effect test, for finding a long-term relationship between the variables under investigation. In the test of special value, respectively the null hypothesis of not existing the co-integration, relation and against the existence of a stacked relationship and existing the co-integration relation in front of two stacked relationship and etc. will be tested. In effect test also hypothesis of not existing the co-integration relation in front of existing the co-integration and existing of one or less than one stacked relation in front of two stacked relation and etc. will be tested (Nofresty, 1999).

Model estimation

In this study, regarding statistical analysis and doing econometric methods, the EViews 7.1 software has been used and for examining the relationship between government tax revenues and exchange rate with Ahvaz municipality's income, the VAR techniques (VAR) is being used.

The variables which are used in the model are as follows:

LR: natural logarithm of municipality's revenues in Ahvaz

LT: the natural logarithm of government tax revenues

LA: natural logarithm of exchange rate

The model of this study has been estimated for the period of 1M2007-12M2014.

Study of static variables

For studying the static variables in this article augmented Dickey-Fuller test which is considered one of the most authentic static tests, is used and by comparing Dickey-Fuller statistics and critical values of MacKinnon, we study the status of variables.

Table1.The test results of model static variables from augmented Dickey- Fuller’s unit root test

First differences		level		Variable name
4.69-	augmented Dicky Fuller	0.60	augmented Dicky Fuller	LR
2.89-	MacKinnon critical value at the level of 0.05	2.89-	MacKinnon critical value at the level of 0.05	
8.52-	augmented Dicky Fuller	1.45	augmented Dicky Fuller	LT
2.89-	MacKinnon critical value at the level of 0.05	2.89-	MacKinnon critical value at the level of 0.05	
9.88-	augmented Dicky Fuller	0.02	augmented Dicky Fuller	LA
2.89-	MacKinnon critical value at the level of 0.05	2.89-	MacKinnon critical value at the level of 0.05	

Source: research calculation

The stationary of variable results show that all variables under investigation are placed in the non-stationary level and became stationary after one differencing.

Cointegration test

In this study Johansen and Juselius testing and two largest statistic eigenvalues and effect test, is used for finding long-term relations between the variables under investigation. If this statistic in significant levels of interest is greater than the critical value, the null hypothesis that there is no long-run relation between variables can be rejected, and subsequently, the hypothesis that implies the existence of up to one long-term relation and up to two long-term relations and... will be investigated. According to this test result in the table (2) and (3), both statistics effect and maximum special value of existing a long-term relationship is being approved at the confidence level of 95% between variables of the model.

Table2. The results of the effect test to determine the number of co-integrated vectors

hypothesis H_0	hypothesis H_1	The value of probability level at 95%	Statistics effect)trace(Critical value (0.05 level)
$r=0$	$r>0$	0.045	24.58	24.27
$r=1$	$r>1$	0.575	4.94	12.32
$r=2$	$r>2$	0.175	2.08	4.12

Source: research calculation

Table3. The results of the maximum special value test to determine the number of co-integrated vectors

hypothesis H_0	hypothesis H_1	The value of probability level at 95%	The maximum amount of eigen statistics	Critical value (0.05 level)
$r=0$	$r>0$	0.026	19.63	17.79
$r=1$	$r>1$	0.808	2.86	11.22
$r=2$	$r>2$	0.175	2.08	4.12

Source: research calculation

In the following, according to equation (2), long-term relation is selected between the estimated model variables and the normalized vector toward first endogenous variable. As it can be seen in the selected optimal vector, all variables are statistically significant coefficients.

$$LR = -0.5956LT - 0.7917LA \quad (2)$$

$t = 3.62$ ($t = 8.92$)

The results of determining the appropriate lag length in the model

To determine the number of long-term relation with Johnson method (VAR) is necessary to first estimate VAR model variables according to vector variables so that by the resulting coefficient matrix characteristic root test, the long term relationship between variables will be determined. The first step in estimating the optimal lag model is in the VAR model. For this purpose, it is first necessary to determine a maximum interval for the test. Because of the relatively small sample size and more than three lags, will reduce the degree of freedom, the maximum two lags is being set to test. This work has been done by using

Akaike (AIC) Schwartz Bayesian (SBC) - Henan Quinn (HQC) criteria. Results of Ivano vakilianstudy (2005) showed that for a sample size of less than 120, the most suitable criterion is SBC.

Philipp and Ploberger (1994), based on simulation studies also showed that the criterion of Schwartz is generally better than Akaike criterion in the selection of lag. One of the improper effects of lags in the pattern, creating autocorrelation in the remaining sentences. In addition, the normal condition of the remaining sentence pattern is influenced by this choice.

Table

Thus, according to the test results, determining the optimal lag of VAR model and based on Schwartz criteria, one lag has been chosen as a proper lag for this model.

Table4. Determining the optimal lag in the VAR model

Number of lags	SBC	AIC	HQC
0	2.266076	2.183310	2.216697
1	*0.825595-	1.156697-	*1.023118-
2	0.658792-	1.238221-	1.004458-
3	0.438920-	1.266676-	0.932728-
4	0.300340-	*1.376423-	0.942291-
5	0.42454-	1.366863-	0.832546-

Source: research calculation

Impulse response functions and variance analysis

These functions are considered as one of the tools in the study of varied dynamic movements. In These functions a shock standard deviation will be evaluated in each selected variables of the system. Using this criterion, we can determine the shock duration effect and maximum shock impact after shock happens. (Khanjari and Homayounifar, 2011)

Chart 1 shows the logarithmic response of Ahwaz municipality’s revenues over the shock from logarithm variable tax revenues and logarithmic response of tax revenues over the shock from Ahwaz municipality’s revenues logarithmic in the size of a standard deviation for ten courses.

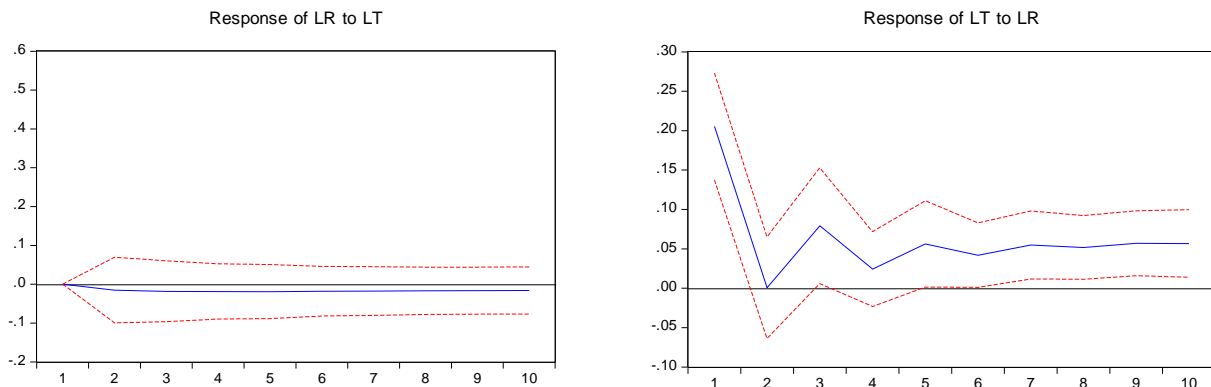


Figure 1. Impulse Response Function

As Figure 1 can be seen, the shock by the LR variable during the second and third period, will increase 0.079 percent in LT variable, from the third to the fourth period resulted in a 0.024 percent reduction of LT, but from the fourth course later, it will increase with a gentle slope and then reaches an stabilization till the end of the period.

The shock of the LT variable from the middle of the first period until the end of the second period, leads to 0.02% LR reduction and it will reach stability from the second period.

One of the VAR model applications is analyzing the variance that arises after coming momentum. In this method, the forecasted error variance will be decomposed into elements which include momentum of each variable. In other words, this shows the percentage of change is explained by another variable.

Ahvaz municipality's revenue variance analysis in Table 5 shows that in the first period, 100 percent of the changes are related to the variable itself. In the second period, 97.72 % of the changes are related to the variable itself and the rest are related to another equation variable. In the first period, Ahvaz municipality's income variable is not affected by tax revenues and the exchange rate. In the tenth period, the effect of tax revenues has the greatest impact on the revenue of the municipality in all periods.

Table 5 . Analysis of variance for Ahvaz municipality's revenues (LR)

LA share shock	LT share shock	LR share shock	Period
0	0	100	1
1.11	1.15	97.72	2
1.58	1.30	97.11	3
2.30	1.96	95.73	4
2.69	2.58	94.71	5
3.84	2.68	93.46	6
3.83	3.77	92.38	7
4.87	3.84	91.27	8
5.82	3.90	90.27	9
5.74	4.95	89.29	10

Source: research calculation

Conclusion

Government's tax policies are Among the most important tool to finance and economic goal achievement. One of the main factors of not achieving a stable urban development is neglecting the tax issue. If taxing happens with optimal tax rates, will lead to economic growth and prosperity in the city and municipality's revenues will be increased. But if tax rates were not favorable, it will lead to lower levels of activity and purchasing power of citizens and consequently the revenues of the municipality will be reduced despite its share From the VAT.

The results of this study show that increasing government tax revenues leads to decreasing Ahvaz municipality's revenues so that a shock from the government tax revenues in the middle of the first period till the end of the second period, leads to 0.02 percent reduction in Ahvaz municipality's revenues. Johansen 's co-integration model results show that one percent, increasing in government tax revenues leads to 0.5956 percent decreasing in the municipality of Ahvaz revenues. High government tax revenues were in such a way that even Ahvaz municipal share From the VAT revenue, failed to offset its revenue decline and this municipal revenue decline can be attributed to reduced activity levels and reduced incentives for manufacturers due to the top and unfavorable tax rates and also reduction of the people purchasing power. However, the results show that increasing Ahvaz municipality revenues from the second to fourth period was faced with increasing and decreasing government tax revenue fluctuation but from the fourth period later it is rising with a gentle slope.

The results show that a percent change in the exchange rate leads to 0.7917 percent, decreasing in Ahvaz municipality's revenue, so this shows that reduced levels of manufacturing activity and a recession in the market and reduce the purchasing power of citizens due to the high exchange rate, resulting in reduced levels of income derived from the Ahvaz Municipality.

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