

Assess the relative success of the policy on value added tax in gain total tax revenues in Yazd

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Abstract: Tax is the best tool for providing general tax revenues, once the distribution of wealth and income, create fiscal discipline and economic management. Value added tax is a new tax than other introduced taxes, expand system is one of the best the tax developments to arises eliminate or reduce the problems and traditional taxes deficiencies and increase government revenue. In this study, using data autoregressive off setar monthly of Yazd province in the years 2005 to 2013 to examine the impact of the value added tax revenues have been studied. The results show that the relative success value added tax policy in increasing the total in Yazd tax revenues have been seen.

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Introduction

Studies indicate that the tax system of the country, despite all efforts to meet the targets suffer the shortcomings of the country's total tax receipts is not enough to half the current expenses of the government, so the budget is on the source of such as oil.

As we know, government revenues will be divided into two groups of tax and nontax revenues.. Role of tax revenues compared to nontax revenues and other income sources, in many developed countries and the developing world is more important. In other words, when we have this important source compared with other sources of income, we found that the share of taxes to finance government spending is more, the economy will be less than the adverse effects.

One of the most important problem of government revenue is, not a stable source of income. It is hoped that the implementation of the Law on VAT, route of administration for smooth steady income and promising horizons for public institutions to develop sustainable income.

Studies and experience of the implementation of the tax in different countries show that run it now could be helpful to dispel some of the current problems in the tax system, including tax income, payers identify and address the lack of information about them, slowing flashback tax, reduce tax evasion, etc. Now VAT runs in more than 135 countries worldwide and due to the fast growth and coordination of characteristics of tax with development targets of countries refer to it as a modern tax (Keen, 2005).

Statement of the problem

The main source of government revenue to cover these costs in today's world is a value added tax unlike the method of financing through the sale of oil, leading to increased demand and inflation is healthier way affect on the composition of demand. Changes in the economy and the resulting changes in the production and distribution of wealth and income is required to review and revise the value added tax. Value added tax (Vat) is a multi-stage tax at different stages of the production chain distribution will be getting based on a percentage of the value added of goods produced or services provided. tax paid at each stage of Import, production and distribution chain moving to the next phase element to be paid ultimately by the final consumer. This is an indirect tax on consumption that might otherwise accumulate boast in all stages of production and distribution of private goods and services.

Given the significant effect of taxes on economic variables, adopted an appropriate tax policy that provide objectives, has the least impact of disruption to the economy and the country's economic development. In fact, effective tax policy, has been an important factor in achieving the tax goals and is a symbol of national sovereignty and of the economic policies of each country and this new tax system would be effective and appropriate role to play in the management of the economy and increase the satisfaction of people. Therefore, this study attempts to be studied and explored the problems and obstacles of enforcement that law perspective taxpayers Yazd and in the end, based on the results of the research

provided recommendations to deputy managers in VAT tax in Yazd province.

Literature

Altoni(2001) In research using time series and cross sectional data of 16 Arab countries (the countries in three groups of the Persian Gulf, and the non-grouped) during the years 1994-2000 as that many Arab governments to generate sufficient revenues of public spending face suffer and may a deficit. Abstract considered the purpose of this study was to compare the tax effort between the Arab countries in research theories determining important factors of the share of tax revenues and in the production of national gross income per capita is expressed share of agriculture sector and the mining sector's contribution to GDP.

Col Boshal (2005) In a study conducted in India in the added value has reached the following conclusions:

Implementing Difficulties of VAT in India are:

- Lack of knowledge of the accounting system of value added tax
- Lack of extensive information about the procedure
- Failure to apply VAT on services
- All the states in the value-added tax are not included.

VAT due to the following reasons will grow faster and larger:

- India will become a common market. Goods without paying additional local taxes moved to reduce prices, demand, and production will increase.
- financial will result in lower Indian prices at markets will lead to export growth and industrial development and higher income.
- the collection of taxes by tax increases in the state of Haryana in the year 2003 value is applied to a 5.27 percent increase over the 2 years of income.

Ballard, Scholes and dignity in 1987, using a general equilibrium model to the conclusion that Establishment of a uniform rate of VAT in the United States improves economic efficiency and the value added tax, is the lowest marginal social cost among sales tax.

Miltovich and Collis 1997 in study titled estimated of income tax with VAT in the Republic of Croatia have shown that the value added tax in the country between 1994 -1997 between 50 to 58 percent of the country's GDP fluctuated. They are also using a multivariate regression model of cross-sectional based on data on income from VAT, expand the tax base, tax rates and changes in rates of 49 countries have concluded that tax rates and broaden the tax base could be increased Income of the VAT the regression

results indicate that the negative effects associated with variations in the rate of VAT on income from the tax would be.

Isazadeh Roshan (1988) estimated system of studied equations by using time series information of Iran economic three decades and three phased minimum squared. This study that was done on economic and administrative collage of Esfahan University, first investigated different economic parts of city by calculating value added, and then investigated financial capacity of this city. At general, if we want to make a logical relationship between these two ratios, it can be done by reducing government's capacity, it means reducing current expenditures and increasing tax incomes by refining tax system of country.

Fallahati et.al (2010) measured country's tax capacity by neural networks. His paper used neural network modeling method whose independent variables entered into learning system of neural network as an input layer. Input variables of model such as inflation, Gini coefficient, ratio of city population to total population, openness of economy, and share of value added of agriculture & industry parts from GDP, are independent variables of model, and tax capacity as the dependent variable or function is the output layer of neural network. Neural network is chosen by cause & effect test for hidden layers and nodes of each layer properly. In this learning model, intra-network and Presspetron multilayered methods were used.

Arab Mazar and Ayat (2008) in the article of "estimating potential economical capacity of tax in Iran" investigated potential capacity of taxes in Iran. They tried to give a certain definition of potential economical capacity of tax and studied the factors effecting on it from different dimensions. After reviewing literatures in an international level, potential economical capacity of tax was measured in the frame of a Panel model and according to 20 countries' information in 1998-2000. Model results show that in above said period, average of potential economical capacity of tax in country (without calculating payments of social insurance) is about 12.3% that compared with average performance of country's tax system in this period (7.1%) is very high. Also results show that index of tax attempt in our country is about 58% in this period.

Tite (1988), in a study about tax rates of value added and obtained tax incomes in 44 countries reached to important results.

15 countries had a single rate (despite 0 rates that all countries have for export). Highest single rate was in Denmark (22%) and lowest ones were in Japan (3%). Some countries changed their method from single rated tax of value added to double or more rated

taxes. In multi rated systems of value added tax, the highest rate was in Senegal (50%) and lowest rate was in Belgium (1%).

Research hypotheses

(1) the lack of proper infrastructure in the proper implementation of the law on income tax, value added tax is negative and significant impact.

(2)- Obstacles to the full implementation of the Law of VAT is negative and significant on income tax.

Data and Variables

Data of this statistically study are seasonal in 2005-2013. Variables of study are tax revenues of Yazd province and value added tax (vtax) of this city. Note that all information is collected from annals of country tax organization and Yazd tax organization.

Table 1-3: variables of research (annals of country tax organization)

No	Variables	Sign	Variable type
1	Yazd tax revenues		independent

Research Patterns

Introducing threshold regression model

Threshold regression method provided by Hansen (1999) wanted to answer whether regression functions can pass all observations uniformly or it can break into separate groups?

Traditional analysis of nonlinear relations is base on the method of dividing pattern to two groups endogenously that is base on individual preference

and judgment. If this method is chosen, selection of regimes' number and their location is arbitrary and according to guidelines of past economical ideas. So the correctness of results and estimated parameters are questionable, since it is strictly dependent of point selection of threshold that occurs there.

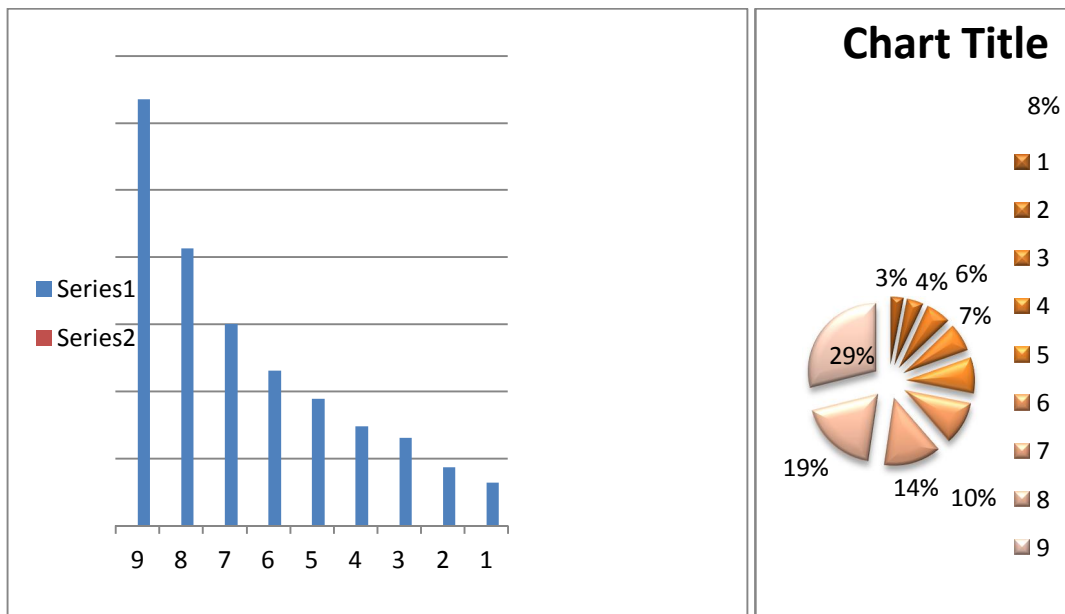
Another method used in threshold analysis is sequential regression or regression tree that specifies number & location of thresholds indigenously and by ordering existing data (Lee & Vang 2005). Hansen expanded this method by providing a new technique in economy evaluating. Another advantage of this study is that imaginaries didn't interfere in forming of nonlinear relations and no nonlinear subform is needed for evaluating nonlinear relations.

If balanced synthetic data is $[y_{it}, q_{it}, x_{it}: 1 \leq i < n, 1 \leq t < T]$, that i is the sections and t the time, so independent variable of y_{it} and q_{it} are scalar while x_{it} regression is a vector. Structural form of this model is as follow:

$$Y_{it} = \mu_i + \beta_1' x_{it} I(q_{it} \leq \gamma) + \beta_2' x_{it} I(q_{it} > \gamma) + e_{it}$$

That $I(\cdot)$ is index function.

Observations are divided to two regimes according to this issue that threshold variable q_{it} is lower or higher than threshold γ . These regimes are clarified by difference of β_1 and β_2 regression slopes. To recognizing β_1 and β_2 , x_{it} factors should not change over time. Also it's believed that q_{it} threshold variable will not change over time too. Also e_{it} seems to be independent and distributed equally & its average is 0 and its limited variance is σ^2 .



Thresholds are everywhere. It doesn't affect little changes but big changes will affect it surely. When deviations are big enough, convergence will appear. This section will investigate modeling processes that are used to specifying, estimating & testing multi variable models. Thresholds, by themselves & a transform variable, will describe regimes with different dynamic behaviors for indigenous variables of system. These estimated setar thresholds are used for prediction and analysis of asymmetric responses to shocks.

Models of changing regime in methods that regime develop over time, are different. In sum there are two deferent groups. First group models assume that regime can be clarify by observable variable. Past or current regimes are certain, though they may be created by statistical techniques. Models of second group assume that regime can't be seen in reality but it is clarified by an unobservable possible process, so it shows that we can't be sure that a special regime has occurred in a special point of time but some possibilities can be attributed to occurrences of different regimes.

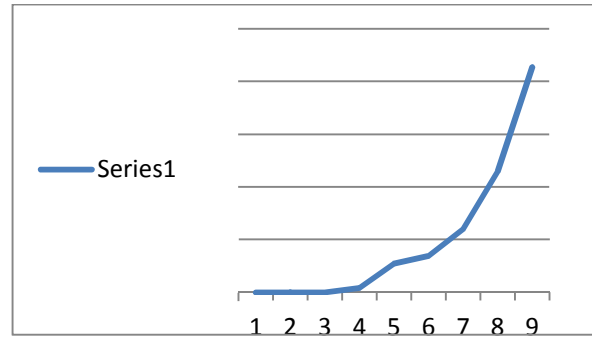
To simplify this definitions, we first will focus on models with two regimes. Some statements to expand these models to allow multiple regimes are below.

Studying process of value added tax and tax revenues

We will look for process of model main variables changes. Variable process of Yazd tax revenues are shown in diagram. As it can be seen from the diagram, tax revenues of this province in 2005 to 2013 years are increasing.

The diagram shows the process of Yazd value added tax in 2005 to 2013. Lowest value taxes are before doing value added in 2005 to 2007 and after

2008 it increased due to executing policy of value added tax that this process increased received revenues.



Review of research data

Data used in this research, i.e. total tax revenues that are collection of direct and indirect taxes in periods of 2005-2013, are used in estimating research model. Process of time series growth rate of Yazd tax revenues data are shown in diagram 3-4.

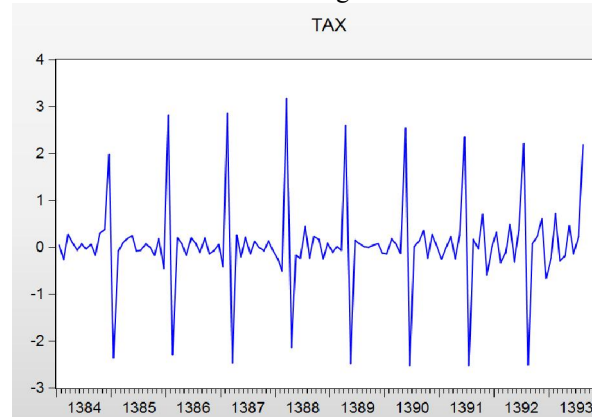


Table 1. Results of single root test

variable	Dicker – Foulter test static	Critical amount of McKinnon		
		Assurance level 1%	Assurance level 5%	Assurance level 10%
vtax _t	-24.758	-3.501	-2.892	-2.583

Single Root Test

Before analyzing tax revenues and the effect of policy of value added tax, and in order to avoid false regression & unacceptable results, we will first study the stability of data. This study has used data of logarithm changes of Yazd tax revenues as follow.

$$vtax_t = \log(tax_t) - \log(tax_{t-1})$$

Dicker – Foulter test is made of most common tests that are used for recognizing stability. Results of using this test for data of logarithms changes of value added tax are shown in table 1.

Results of table 1 show the coefficients of single rot test of tax revenues' data. Since amounts of Dicker

– Foulter test static (ADF) is more than amounts of critical amounts in 1%, 5% & 10% levels, so variable under investigation lacks single root and therefore lacks static or I(o).

Selection of model optimized pause

After stability of data are proved, to analyze the effects of value added tax policy on total tax revenues, data time series behavior are studied by using threshold models approach and to do this threshold auto regressions investigated two situation in different pauses and results are shown in table 2.

Table 2 shows that by adding a pause to model, acetic scale will improve significantly. More pauses

will increase acetic scale. So setar ($m > 2$) is chosen as the optimal and final model.

Optimal model estimate setar (k)

Table 3 shows the results of threshold model process to change growth rate of Yazd tax revenues in

2005 to 2013. Threshold was estimated at 6.85. So growth process of tax revenues are divided to two regimes: most of revenues that are more than threshold and amounts of growth rate that are lower than threshold.

Table 2. Optimized pause of model

Model	Regimes number	Pause number	Acetic scale
K	2	1	-292.50
	2	1	-316.26
	2	3	-315.12

Table 3. Estimation of STAR model

variable	coefficient	Standard deviation	Statistics t	Pr(> t)
Regimes 1				
C	0543/0	./244	2.22	** .02841
1Q	-.571620	./125922	-4.5395	***-.05e1/561
2Q	-.389947	0.0927113	-4.2059	***-.5e5.635
Regimes 2				
C	0.049054	0.142220	0.3442	0.738770
1Q	-.773963	0.283956	-.27956	***.00756661
2Q	-.901691	0.248564	-.36276	*** 0.0004506
Low regim proportion				84.7%
high regim proportion				15.24%
0.04566RESIDUED VCRIAC(E)		316- =ATC	226.2%=MAPE	.249%=t

According to results of table 3, $\mu_0 = /85$, all coefficients are meaningful in level 5%. The average in low regime is, $\mu_0 = /85$ and the average in high regime is $\mu_1 = 1/64$. So situation 1 is low situation and situation2 is high situation. Auto regression

coefficients are -0.571 and -3.389 for low threshold that are meaningful and -0.773 and -0.901 for high threshold that is meaningful too. Also observations done in low regime are 84% & in high regime are 16% more than threshold.

Regime switching plot

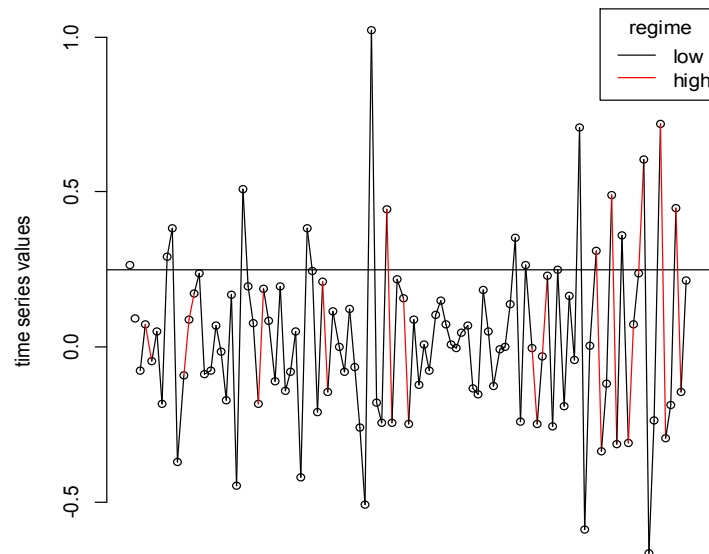


Diagram 4. Obtained auto regression coefficients for low and high threshold level

Table 4 shows the amounts of growth rate of tax revenues in two estimated regimes. According to estimated threshold, table 4 shows that we are in which tax regime in every month. According to table 4 and diagram 4, country tax system was in low regime before executing policy of value added tax. But after doing this policy and seeing what its effects on tax revenues are, though indices of growth rate of tax revenues were in low regime, over time more of them go to high regime. Therefore results show relative successfulness of value added tax policy in increasing of total tax revenues.

Studying autocorrelation functions (ACF) and slight autocorrelation functions (PACF) obtained from model estimation

One way of showing time correlation in a time series structure, is to define autocorrelation function. Relation between function (ACF) & delay K are shown as relation1:

$$\rho_k = \frac{\sum_{i=1}^{n-k} (z_i - \bar{z})(z_{i+k} - \bar{z})}{\sum_{i=1}^n (z_i - \bar{z})^2} \quad -1 \leq \rho_k \leq 1$$

P_k is the amount of time series ACF with delay K
 Z_i & Z_{i+k} are amounts of time series variables or data in time i and delay time k

\bar{z} is the average of variables

Another method to show time correlation in a time series structure is to define slight autocorrelation function. If ϕ_k is time series PACF with delay k, its relation will be as relation 2:

$$\phi_k(k) = \frac{\rho_k - \sum_{i=1}^{k-1} \phi_i(k-1)\rho_{k-i}}{1 - \sum_{i=1}^{k-1} \phi_i(k-1)\rho_i}$$

ϕ_k is the amount of time series PACF with delay k.

In below diagrams, pacf and acf diagrams of investigated threshold model & total tax revenues are shown.

According to above diagrams we can say that investigated threshold model of tax revenues' growth rate in Yazd province have desire properties in stability.

Results

First hypothesis test

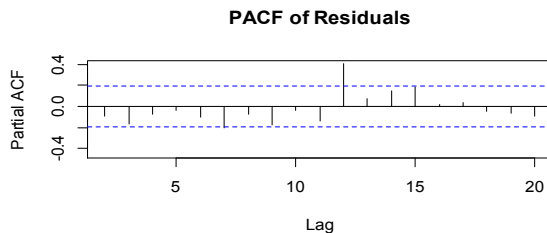
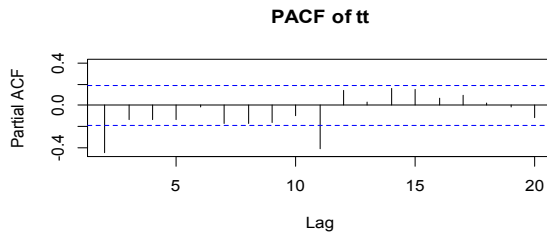
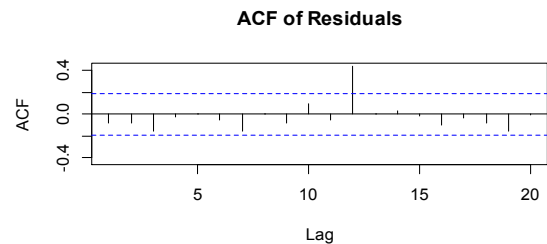
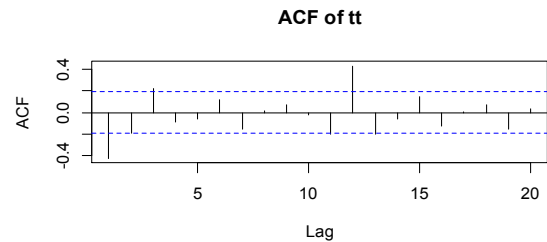
Second hypothesis say that Yazd tax revenues' growth rate goes beyond the threshold of tax revenues after executing value added tax law. To investigate this hypothesis we refer to threshold regression pattern in section 4 to confirm or reject this hypothesis. According to obtained results from estimating STAR model in table 3 and base on the obtained auto regression coefficients for low & high threshold levels,

we can say that Yazd tax revenues' growth rate had positive effects after executing value added tax law.

Conclusions

According to results of section 4, we can define findings as below:

Threshold 6.85 for periods of 2005-2013 of Yazd tax affairs administration base on the results of threshold & vector regression pattern shows that the average number in low regime is $\mu_0 = 0.85$ and this number in high regime is $\mu_1 = 1.64$. Obtained regression coefficient for low threshold level is -0.571 & -0.389 and for high threshold level is -.773 & -.901 and meaningful. According to table 4, 84% of observations are in low regime and 16% are in high regime. Although growth rate indices of tax revenues are in low regime, after executing law of value added tax most of observations were in high regimes. Therefore results show a relative successfulness of value added tax law to increase tax revenues.



Recommendations

1- Value added tax evasions should be informed clearly so that all groups know it.

2- National media had informed according to movements of tax organization. Of course it had informed not described. Tax organization should use national media's capacity properly.

3- Pathology of unsuccessful phase should be done and educational programs should be provided.

4- Unfortunately, this law isn't informed properly. Complains and resistances are in a way that public thoughts are uninformed about this law in the field of money system and people profits. The importance of value added tax law and its execution process and also its profit in organizing financial systems should be informed continuously and comprehensive by national media and broadcasting, newspaper or in public and universities.

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