

The Relationship Between Tax Revenue And Economic Growth In Turkey: The Period Of 1975-2011

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Abstract

In the study, the relationship between tax revenues and economic growth for the Turkish economy has been examined in the period of 1975-2011. Johansen Juselius cointegration test

and Granger causality test have been used in order to find long term and short term relationship, respectively. Impulse-response function and variance decomposition analysis have been applied via VAR model. The findings have shown that there is interaction between tax revenue types and the economic growth in the long term and is not such an interaction in the short term. The effect of the shock given to indirect tax revenue to economic growth rate has decline; the response of growth rate to shock given to direct tax revenue has been tendency to rise up towards the end of the period. In the variance decomposition method; direct tax revenue is more effective than indirect one. But, the growth rate that is expressed by GDP (gross domestic product) or other factors affecting growth rather than tax revenue has been appeared affected itself.

Keywords: Direct tax, indirect tax, economic growth, granger causality test, co-integration test, VAR

1.INTRODUCTION

Turkey has adopted foreign trade policy and strengthening of free market economy as an economic growth model with the beginning of 1980's, and applied them so far as basic principles. In this model, increase of demand, encouragement of private sector and making the price policy more functional are acceptable principles of the free market. The government that has fiscal and monetary policy instruments is assumed as a catalyst instead of interference to economy. The major fiscal policy tools to have sustainable growth process by government are (Paksoy, S. and S. Bakan, 2010, p.154) ;

- ❖ Expenditure
- ❖ Income
- ❖ Debt policies.

Aside from expenditure and debt policies, tax revenue is the most important tool within the income policy. Tax is an economic value to finance public services taken by individual & corporation compulsorily according to their ability to pay (Pehlivan, O., 2009: p.19). It is important that while government actualizes fiscal and non-fiscal services, tax burden should be delivered equitable, and the distribution of tax should balance the condition of stability. Moreover, tax should be taken in accordance with legal principles, and should increase the level of welfare. But these considerations are not enough alone. It's also important that tax revenue must be used for society services and contribute the country's economic growth and development, otherwise, the citizens of the country damage from that wrong policy.

Economic growth is one of the macro variables related to tax revenues. Neo-classic growth models claimed that economic policies don't have any impact for long term growth percentage and they also adverted that government's interference by means of fiscal policy is unnecessary, moreover, damages optimal distribution of resources. In spite of these theories, endogenous growth models revealed that fiscal policy tools, such as public expenditures, taxation and subsidies etc. have strong impact on long term growth percentage. Many models have been constituted to prove this case (Yanpar, A., 2007, p.1).

When the impact of taxes on economic growth has been analyzed, the distinction of direct and indirect taxes has been made in recent years. Due to the importance of that discrimination to shape tax system vigorously, the relationships between aforementioned tax types and economic growth have been evaluated by means of Vector Autoregressive Model (VAR) in our study. Although our study is similar to the other studies related to Turkish economy in

terms of analysis technique, it is different in terms of the analysis period. The focus of this study is that the effect of tax revenues to economic growth will be positive in developing countries in the case of legal regulations are made about tax policy.

2.DIRECT AND INDIRECT TAXES

Direct taxes are taken from individuals and institutions according to their levels of revenue whose tax payer is also the same with payer on this subject, tax payer cannot transfer own tax burden to others. Income and corporation tax are both example of direct taxes. Indirect taxes arise from the use of services and goods. Everyone derived benefit from services or goods liable to tax has to pay it at the same rate regardless of income level. Tax payer and payer are different on this subject. Value added tax (VAT) and excise tax are both example of indirect taxes (Temiz, D. , 2008, p.3).

Direct taxes which consist of income tax, property tax and corporation tax, indirect taxes which consist of taxes taken from both domestic and foreign trade have different function and impact on the economies. Direct taxes have the results for high income groups which have inclination to high savings and investment and also low marginal propensity to consume. On the other hand, indirect taxes have results for low income groups. The basic aim of the taxation is to create resources to cover expenses of public for both developed and developing countries. So, both tax types can also be used as a policy tool. However, the characteristics of the distribution of tax revenues are expected to impact upon economic growth and development line in the developing countries where indirect tax revenue is an important part of total tax revenues (Açıkgöz, Ş., 2008, p.93).

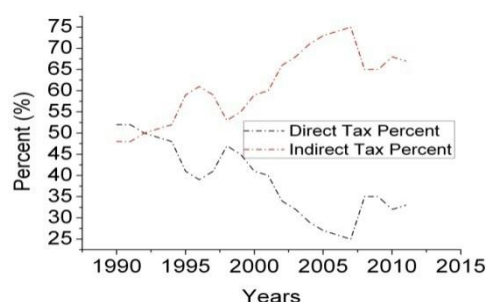


Chart 1. The Percentage of Direct and Indirect Taxes (www.tcmb.gov.tr)

The high ratio of indirect taxes is closely associated with economic growth & development. Since tax systems & policies are not fully settled in the developing countries, they focus on indirect taxes (Göçer, İ., M., Mercan et all, 2010, p.99). While the ratio of direct tax to the total tax revenue in the developed countries is high, it reverses for the developing countries. This reversal is a result of easier collection of indirect taxes, and that easiness comes from the unawareness of tax payers about statutory obligation. So, they do not respond to tax executives. When the progress of direct and indirect taxes have been examined, the composition of total tax revenue reversed from direct tax to indirect tax revenue after 1990s. The indirect tax percentage rose up to 67% from 48% between 1990 and 2011. Turkey distinguishes from developed countries with this tax structure. This deterioration is a result of increased value added tax rate like excise tax rate. Table 1 shows the distribution of indirect and direct tax revenue percentages between 1990-2011 years.

3.LITERATURE REVIEW

Engen and Skinner (1996) shown that tax affects economic growth in moderate levels in the long-term. But this moderate effect may have large cumulative effect on living standards. Lee and Gordon (2005) shown that corporation tax rate has negative relationship with economic growth, and there is no relationship between tax rate associated with manpower income and economic growth by analyzing 27 years long data set of 70 countries between 1970- 1997. The relationship between economic growth and tax revenue in the period of 1965-2002 was tested in the study of Anastassiou and Dritsaki (2005) for Greek economy. According to their findings; there are relationships between total tax revenues, marginal direct tax rates, savings-income rate and economic growth in the long term. They have reported that there is one-way causal relationship from total tax revenue and marginal direct tax rate to the economic growth in the short term.

The relationship between tax revenue and economic growth was investigated for Turkey by Durkaya and Ceylan (2006), and they used Engle-Granger co-integration test in order to search long term relations between direct and indirect tax revenues and economic growth. Vector error correction model (VECM) and Granger causality test were used to investigate short-term relations between direct and indirect tax revenues and growth for the years of 1980-2004. The findings show that there is causal relationship between direct tax and growth. Temiz (2008) analyzed to find relationship between public tax revenues and economic growth for 1960-2006 years. Temiz used Johansen co-integration test to search long term relations and VECM to search short term relations. The findings show that there are two way causal relationships between total tax revenue and economic growth. Açıkgöz (2008) used causality analysis and impulse-response functions to determine causal relationships between tax types and economic growth.

The findings are that the direction of casual relations is from economic growth rate towards the proportion of direct tax revenue in total tax revenue and the proportion of indirect tax revenue in total tax revenue. Additionally, one-way causal relationship from direct tax burden (proportion of direct tax revenues to GDP) toward growth rate has also been reported. Mucuk & Alptekin (2008) applied VAR analysis in order to investigate the casual relationship between tax types and economic growth for the period of 1975-2006 for Turkey. They determined the relationships among them by means of co-integration test for the long term duration, and the granger causality test shows that there is one way relation from direct tax revenue toward economic growth in the short term

4. DATA SET, METHOD AND FINDINGS

In this study, the proportion of direct taxes to GDP (direct tax burden), proportion of indirect taxes to GDP and annual GDP have been used for the period of 1975-2011 by using annual data for Turkey. Annual data have been provided from Central Bank of Turkey and Revenue Administration of Turkey. "L" and "D" used in front of variables refer to the logarithm of that variable and first difference of that variable, respectively. ADF test has been applied to series for stationary of them in order to investigate the relationships between the variables, and Table1 indicates the ADF test results. Critical values have been evaluated by Eview-5 econometrical program and based on MacKinnon values.

ADF test results have indicated that the levels of variables are not stationary, but first levels of variables are stationary. Johansen-Juselius test has been used in order to examine long-term relationships between variables, by then. In Johansen-Juselius test, two different tests called Trace and Max Eigen value statistics have been applied to determine the number of co-

integration vector and whether they are statistically significant or not. Before these tests have been applied, the length of optimal lag should have been determined under different criteria. Taking into account annual data usage and shortness of period, the maximum lag length has been determined as 3. As can be seen in Table 2, the lag length has been found as “0” according to the all criteria (Mucuk, M. V., Alptekin, 2008, p.165).

Table 1: The Results of ADF Test of Values

Unit Root Test Results Belong to Level of Variables				
		Constant	Constant –Trend	
Variables	m	ADF –t	M	ADF-t
Ldtax	0	-2.028 (-2.611)	0	-2.051(-3.202)
Lgdp	1	-1.623 (-2.622)	4	-2.822(-3.243)
Lindtax	0	-0.128 (-2.611)	0	-2.951(-3.202)
Unit Root Test Results Belong to First Level of Variables				
		Constant	Constant-Trend	
Variables	m	ADF –t	M	ADF-t
DLdtax	0	-9.312 (-2.614)		-9.228 (-3.207)
DLgdp	0	-4.131 (-2.627)		-4.327 (-3.229)
DLindtax	1	-6.850 (-2.615)		-6.731 (-3.209)

Note: “m” given in the table shows dependent variable lag determined by Akaike Information Criteria the values within parenthesis show critical values of MacKinnon Table at the level of %10 statistical significance

Table 2: The Criteria of Lag Length Determination (* shows lag length by criteria)

Lag Length	LogL	LR	FPE	AIC	SC	HQ
0	-21.36558	NA*	0.001529*	2.030465*	2.177722*	2.06953*
1	-14.42982	11.55959	0.001833	2.202486	2.791513	2.35875
2	-12.45725	2.794483	0.003437	2.788104	3.818901	3.06157
3	-4.74705	8.995233	0.004270	2.895588	4.368155	3.28626

Johansen-Juselius co-integration test findings have been in Table 3 & Table 4 according to Trace & Max-Eigen statistics in the framework of determined optimal lag length. Trace statistics indicates “1” co-integration equation(s) at the (0.05) level. Max-Eigen statistics also indicates “1” co-integration equation(s) at the (0.05) level. This results show that the variables of both tax types and economic growth have been acted together in the long term.

Table 3. Cointegration Test According to Trace Statistics

Hypothesis	Eigenvalue	Trace Statistic	%5 Critical Value
None	0.642802	3.804.758	2.979.707
At most 1	0.326940	1.334.041	1.549.471
At most 2	0.147796	383.831	384.146

Table 4. Cointegration Test According to Max Eigen Statistics

Hypothesis	Eigenvalue	Trace Statistic	%5 Critical Value
None	0.642802	2.470.716	2.113.162
At most 1	0.326940	950.209	1.426.460
At most 2	0.147796	383.831	384.146

Short term relations of variables have been evaluated with Granger causality test as shown in Table 5. There is no any relationship between economic growth and indirect or direct tax revenues in the short term. It should be pointed out that there should be other factors which may affect to the economic growth

Table 5: Granger Causality Test Results

Null Hypothesis	Chi-sq	Prob.
Growth is not the granger cause of indirect tax	0.674505	0.7137
Growth is not the granger cause of direct tax	0.273824	0.8720
Indirect tax is not granger cause of growth	2.740258	0.2541
Direct tax is not granger cause of growth	2.503435	0.2860

5. VAR ANALYSIS TEST RESULTS

Size of the effects of direct and indirect tax revenues to economic growth with the help of VECM has been presented in this part. Evaluation has been completed through impulse-response functions and variance decomposition analysis. VECM model has been used instead of VAR models because of long term and consistent relationships among variables. Impulse-response function (IRF) reflects the effects of one standard deviation shock in one of the random error terms to the present and future values of internal variables. Chart 2 shows the impact of the shocks that occur in the variables of direct and indirect tax revenues on variable of GDP for VECM. While the impacts of one standard error shock occurred in indirect tax revenue on the economic growth has increased till second term, it has decreased till fourth term and decreasingly lost its significance. While the impacts of one standard error shock occurred in direct tax revenue on GDP has decreased till third month and gradually increased.

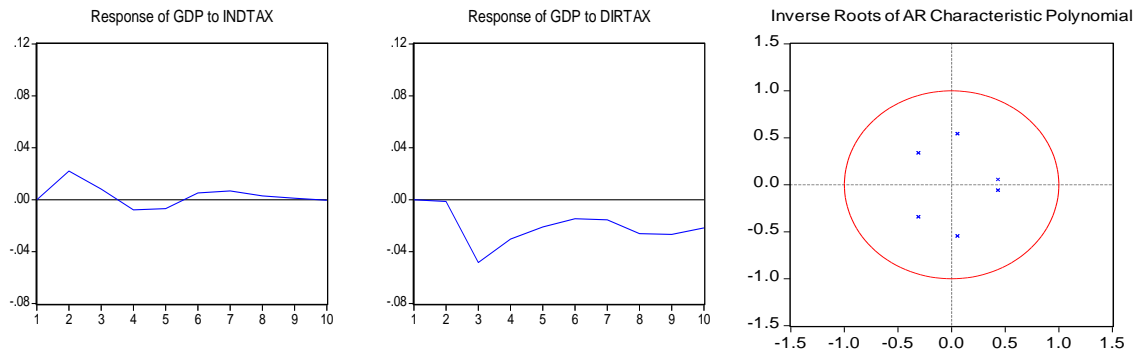


Chart 2 : Impulse-response Functions Poly.

Chart 3 : IR of AR Characteristic

It's necessary to evaluate the variance decomposition results to determine the importance of potential random shock in any variable. Variance decomposition distinguishes one of the internal variable deviations affecting all internal variables as separate shocks so that it gives information about the dynamic situation of the system. Variance decomposition presents alternative approach to reveal dynamics of VAR system. The source of variance deviation of variables in the model can be decomposed, thus the percentage of changes resulted from itself and other variables can be understood easily (Özsoy, C., 2007, S.11).

A change in GDP occurs in the 1st period is resulted from only itself (excluding tax revenues, other factors affecting growth). In this sense, tax revenues don't affect GDP in the first period. The effect of it appears after 2nd period and shows an increase during periods. Direct tax has the most impact on GDP. Approximately 26% of the variance for GDP is explained by direct tax in 10th period and approximately 71% of it is affected by itself (or other factors affected). The effect of indirect tax to change is remained at 3%.

It is necessary to test the model whether it has stationary or not. The stationary of model depends on eigenvalue of coefficient matrix. If eigenvalues of coefficient matrix are within the unit circle, the system is stationary or stable. If at least one eigenvalue is out of the unit circle or on the unit circle, the system is not stationary and it indicates expanding characteristics (Mucuk and Alptekin, 2008, p.168). The position of inverse roots of AR characteristics polynomial shown below proves that presented model is stationary as shown in Chart 3.

Table 6 : Variance Decomposition

PERIOD	SE	GDP	INDTAX	DIRTAX
1	0.110236	100.0000	0.000000	0.000000
2	0.115645	96.31835	3.667978	0.013668
3	0.125720	81.65548	3.526506	14.81801
4	0.129691	76.96164	3.674209	19.36416

5	0.132262	75.07070	3.797569	21.13173
6	0.138779	76.11258	3.588492	20.29893
7	0.142982	76.10009	3.608613	20.29130
8	0.146186	73.90997	3.494080	22.59595
9	0.149230	71.74413	3.359454	24.89641
10	0.151868	70.68551	3.244468	26.07003

6. CONCLUSION

In this study, an interaction between tax revenue types and the economic growth in the long term has been proved by co-integration test, and Granger causality test does not indicate any interaction in the short term. In other words, the effects of tax policies applied do not appear in the short term, but can appear in the long term. In according to IRF; the effect of the shock given to indirect tax revenue to economic growth rate has declined; the response of growth rate to shock given to direct tax revenue has been tendency to rise up towards the end of the period. In the variance decomposition method; direct tax revenue is more effective than indirect one. But, the growth rate, which is expressed by GDP (gross domestic product) or other factors affecting growth rather than tax revenue, has been appeared affected itself.

If tax revenue has been channeled to incentives for investment, it can lead to the economic growth. Since Turkey experienced the national and global crises in between 1975-2011, governments in preparing their budgets were not investment-oriented, but they were oriented to overcome the crises. The budget was performed to meet the deficit and scale up tax ratio. Moreover, a stable tax policy was not applied in Turkey, the policy prevailed by a government was removed or lessened effectiveness of it by subsequent governments. Although the ratio of indirect tax has been increased over the years, its impact on economic growth remains weak. Despite being a relationship between direct tax and economic growth in the long period, this relationship is weak. The other factors affecting GDP growth rather than tax revenue have gained weight.

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