



THE RELATIONSHIP BETWEEN TAX BURDEN AND ECONOMIC GROWTH: TURKEY CASE

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ABSTRACT

Purpose – In the theoretical framework, the relationship between tax revenues and economic growth, which is the multiplier mechanism, shows that an increase in tax revenues has a negative impact on economic growth. In this study, the relationship between tax burden and economic growth is examined by VAR analysis and Granger causality test.

Methodology – In this study, VAR analysis and Granger Causality test analysis methods are used. In the study, the analysis is done for Turkey. Annual data are used in the study. The analysis covers the years from 1970 to 2018. In the study, firstly VAR analysis is done and then Granger Causality test is performed.

Findings – The findings obtained in the analysis are as follows. In the VAR analysis the tax burden has a negative effect on the 3rd period growth. As a result of the Granger Causality test, it is concluded that tax burden and economic growth are mutual causes of each other.

Conclusion – According to the results obtained, the tax burden affects economic growth negatively. Accordingly, increasing tax rates will not have positive feedback in terms of economic growth, and vice versa, its will have negative effects on economic growth. It would be more positive result, if policy makers reduce their tax rates in practice rather than increasing.

Keywords: Tax Burden, Economic Growth, VAR Analysis, Causality, Tax Policy

JEL Codes: H20, O10, C50

1. INTRODUCTION

States must have a revenue in order to fulfill their public needs. The most important source of revenue of the states is tax revenues and this is the most important feature of taxes. However, in addition to the task of providing public finance, taxes have gradually started to be used for balancing the social and economic order. Economies in the world generally attach great importance to economic growth. But it also gives the same importance to earning an income for growth. Taxes as financing are always important for both developed and developing countries. In the definition of the tax, it is emphasized that it is public revenue and it is also unrequited. How much tax will be collected, how much will be collected from whom and how it will be collected is implemented with different policies for each country.

Taxes as public revenue appear to be a shared financial obligation among all those living under the legal domination of the state (Özpençe and Özpençe, 2007, 3, Özgün et al., 2016, 29 – 30). Economic growth is a sine qua non for the states. In the historical doctrines that started with Mercantilism, they are engaged in the development of growth in the light of various policies. Physiocrats, who say that growth can be by agriculture, oppose the Mercantilist view that growth can be by keeping precious metals in the country. This trend in France explains that taxes should only be charged through agriculture (Higgs, 2001, 19 – 20).

Later, the classical school emerged as the basis of modern economics, defended by important figures such as Smith, Ricardo, Malthus and opposed to the intervention of the state by shaping in the framework of liberal policies in general. According to the classics, the basic condition of growth is to have a productive population. It is accepted by many economists that the free market economy is a better system for growth and therefore argues that the state should not interfere with the market (Özpençe, 2017, 33). Smith who referring to the division of labor, argues that labor will specialize in the division of labor, and this specialization will lead to growth (Smith, 1998, 17 – 19)

In the Keynesian school, growth is handled in the short term and argues that it will happen with the increase in demand. The Harrod - Domar growth model, which is referred to as the long - term version of Keynes, states that the increase in investments, such as Keynes, will create a double effect and result in capacity increase and demand effect. Demand effect will also lead to an increase in investment and consumption expenditures (Doğan, 2014, 369). Solow model, which makes various criticisms of Harrod - Domar growth model, states that growth can be achieved with technical developments (Solow, 1956, 65 – 66, Solow, 1957, 312 – 313). Later, the Intrinsic Growth Model emerged, pioneered by Lucas and Romer, evolving with names like Barro and Grossman - Helpman.

The progress of countries towards continuous development also creates new theories in economic theory (Fine, 2000, 245). In this model, it is stated that Romer and Lucas, technological development, R & D, education investments and human capital investments will provide growth. In addition, Barro states that the investments and expenditures of the public sector in the productive areas will be the factor that provides economic growth (Erdoğan and Canbay, 2016, 36 – 39, Saraç, 2015, 23 – 24, Şiriner and Doğru, 2005, 166 – 167).

It is known that the basis of growth is mainly production, but also growth will be ensured with the increase in production. However, especially after the 1970s, with the globalization, the circulation of production factors becomes free and makes the production process difficult. Especially in developing countries, with the liberalized capital mobility in 1980 and after, growth begins to depend on capital inflows. Since this capital mobility is particularly short-term, growth becomes dependent on high break.

This study explains the concept of the tax burden in Turkey after the first view the relationship between economic growth and the tax burden is then given to literature. Then an econometric study is carried out for Turkey and finally the study is concluded with the results and evaluation part.

2. TAX BURDEN

Taxes are income collected and compulsory according to everyone's financial strength in order to cover public expenditures. Everyone pays the tax directly or indirectly. However, taxes are seen as an income for the state and an expense for the payer. As a matter of fact, it is known that the direct and indirect separation of the taxes and the high indirect tax rates in our country do not give tax according to the financial power of people, in this case it forces low income people.

The fact that taxes are unrequited appears to be a burden or discontent for taxpayers (Neumark, 1937, 257, Pehlivan, 2014, 160). This is because it causes a decrease in the economic power of taxpayers, i.e. their income. Naturally, it is normal for people to see conditions that negatively affect their economic power as a burden. It is possible to classify the tax burden into subjective tax burden and objective tax burden. The subjective tax burden is the pressure felt by taxpayers, and this reflects a psychological effect. The objective tax burden is expressed as the ratio between the tax paid by the taxpayers and their income (İnaltong, 2012, 17).

The tax burden can be expressed as the ratio of taxes paid to the total taxable base, although no specific definition is made (Öztürk and Ozansoy, 2011, 198). Tax burden imposes a burden on taxpayers and is important in terms of achieving large-scale targets such as economic growth and income distribution. Tax rates are one of the most important factors affecting tax burden. The high tax rates and the introduction of new taxes increase the pressure on individuals and lead them to look for ways to tax evasion or evade taxes. In this way, the high tax burden reduces the profits of investors and also adversely affects capital investments (Işık and Kılıç, 2009, 150, İdiküt Özpençe and İşler, 2017, 129).

Previously, A. Laffer drew the relationship between tax rates and tax revenues on napkin paper at a restaurant in Washington in 1974, and after a while he wrote its theory. Since A. Laffer wrote this in 1974, the inverse relationship between tax rates and government revenues has been discussed. It is stated that if the tax rates are high, the incomes of the state will decrease and people will evade the tax and it will have negative effects on the growth. Tax rates should be neither 100% nor 0%. Because in

both cases there are negative aspects for both the state and taxpayers (Ballard et al., 1985, 188, Laffer, 2004, 2, Wanniski, 1978, 3 – 4 (https://www.nationalaffairs.com/public_interest/detail/taxes-revenues-and-the-laffer-curve)) (13.12.2017).

The tax burden is grouped under various names. These groupings are briefly defined as follows. Total tax burden is expressed as the ratio of all taxes collected in a country in a given period to GDP in that period. The total tax burden represents the tax capacity that a country pays over a period. The personal tax burden is defined as the ratio of all taxes paid by a person to all income received during that period. In this way, the tax burden in sectors and regions is expressed in the same logic. As of 2001, Marmara region has the highest regional tax burden and Eastern Anatolia region has the lowest tax burden (Günay, 2007, 5, İnaltong, 2012, 17, Tekbaş and Dökmen, 2007, 203).

The tax burden is directly proportional to the tax paid and inversely proportional to the solvency. In this case, if the amount of tax payable increases, the tax burden increases, and as the solvency increases, a decrease in tax burden occurs. In other words, an increase in the amount of tax paid causes an increase in the tax burden, while an increase in the wealth or income of tax payers reduces the tax burden (Öztürk and Ozansoy, 2011, 199, Çiftçi et al., 2012, 83). It is known that the tax burden should be distributed fairly among sectors, regions, individuals and institutions. The fair and balanced distribution of the tax is important in this regard. In this respect, in most countries, the fair distribution of the tax burden is applied within the framework of laws. In our country, this issue is included in article 73 of the constitution (Rakıcı and Vural, 2011, 62 – 65). The fair distribution of the tax burden is also important for voluntary compliance. There are several reasons for voluntary compliance. The first is justice, as previously stated, the second is the belief that taxes are used in the public interest, and the third is the fairness of the tax burden (Çiftçi et al., 2012, 84).

Considering the tax burden for Turkey is seen to be particularly much difference between direct taxes and indirect taxes. The status of Turkey's tax revenues are examined in Table 1. It is also stated its share in tax revenues.

Table 1: Share of Income Tax, Corporate Tax and VAT in Budget Revenues

Years	Tax Income	Income Tax Rev.	Ratio in Tax Rev. (%)	Corporate Tax Rev.	Ratio in Tax Rev. (%)	Total VAT Rev. (Domestic + Import)	Ratio in Tax Rev. (%)	Income Tax + Corporate Tax + VAT Rev.	Ratio in Tax Rev. (%)
2000	26.503.698	6.212.977	23,4	2.356.787	8,9	8.379.554	31,6	16.949.318	64,0
2001	39.735.928	11.579.424	29,1	3.675.665	9,3	12.438.860	31,3	27.693.949	69,7
2002	59.631.868	13.717.660	23,0	5.575.495	9,3	20.400.201	34,2	39.693.356	66,6
2003	84.316.169	17.063.761	20,2	8.645.345	10,3	27.031.099	32,1	52.740.205	62,6
2004	101.038.904	19.689.593	19,5	9.619.359	9,5	34.325.208	34,0	63.634.160	63,0
2005	119.250.807	22.817.530	19,1	11.401.986	9,6	38.280.429	32,1	72.499.945	60,8
2006	151.271.701	31.727.644	21,0	12.447.354	8,2	50.723.560	33,5	94.898.558	62,7
2007	171.098.466	38.061.543	22,2	15.718.474	9,2	55.461.123	32,4	109.241.140	63,8
2008	189.980.827	44.430.339	23,4	18.658.195	9,8	60.066.230	31,6	123.154.764	64,8
2009	196.313.308	46.018.360	23,4	20.701.805	10,5	60.169.248	30,6	126.889.413	64,6
2010	235.714.637	49.385.289	21,0	22.854.846	9,7	75.649.986	32,1	147.890.121	62,7
2011	284.490.017	59.885.000	21,0	29.233.725	10,3	95.550.463	33,6	184.669.188	64,9
2012	317.218.619	69.671.645	22,0	32.111.820	10,1	103.155.875	32,5	204.939.340	64,6
2013	367.517.727	78.726.008	21,4	31.434.581	8,6	123.878.363	33,7	234.038.952	63,7
2014	401.683.956	91.063.306	22,7	35.163.517	8,8	130.538.554	32,5	256.765.377	63,9
2015	465.229.389	105.395.330	22,7	37.009.625	8,0	153.844.174	33,1	296.249.129	63,7
2016	529.607.901	123.686.147	23,4	46.898.425	8,9	168.808.352	31,9	339.392.924	64,1
2017	626.082.415	143.962.939	23,0	57.868.208	9,2	206.679.678	33,0	408.510.825	65,2
2018	738.180.401	175.420.074	23,8	84.132.155	11,4	250.661.593	34,0	510.213.822	69,1

Source: GİB (Gelir İdaresi Başkanlığı), (http://www.gib.gov.tr/sites/default/files/fileadmin/user_upload/VI/CV13.htm) (16.10.2019).

The share of income tax in total tax revenues is calculated as 22.4% on average. The share of corporate tax in total tax revenues is 9.5% on average. The share of total VAT in tax revenues is calculated as 32.6% on average. When we look at the share of the three big taxes in the total tax revenues, it is seen that the average amount is 64.4%. When Table 1 is evaluated in terms of indirect and direct taxes, it is seen that VAT, income tax and corporate tax are higher than the total share of tax revenues.

The tax burden ratio in Turkey is seen in Table 2 below. In addition, OECD's tax burden average is taken in order to make comparisons.

Table 2: GDP, General Budget Tax Revenues, Tax Burden in Turkey and OECD Tax Burden Average

Years	GDP (Thousand TL)	Tax Revenue (Thousand TL)	Tax Burden (%) (2/1)	OECD Average(%)
2002	359.358.871	59.644.416	16,6	33,02
2003	468.015.146	81.783.798	17,5	33,93
2004	577.023.497	100.373.326	17,4	33,89
2005	673.702.943	119.627.198	17,8	33,37
2006	789.227.555	137.480.292	17,4	33,50
2007	880.460.879	152.835.111	17,4	33,57
2008	994.782.858	168.108.960	16,9	33,94
2009	999.191.848	172.440.423	17,3	32,20
2010	1.160.013.978	210.560.388	18,2	32,29
2011	1.394.477.166	253.809.179	18,2	32,59
2012	1.569.672.115	278.780.848	17,8	33,06
2013	1.809.713.087	326.169.164	18,0	33,35
2014	2.044.465.876	352.514.457	17,2	33,59
2015	2.338.647.494	407.818.455	17,4	33,71
2016	2.608.525.749	459.001.741	17,6	34,42
2017	3.110.650.155	536.617.206	17,3	34,24
2018	3.724.387.936	621.536.356	16,7	34,26

Source: a) GİB, (http://www.gib.gov.tr/sites/default/files/fileadmin/user_upload/VI/GBG/Tablo_3.xls.htm) (16.12.2019)

b) OECD, (<https://data.oecd.org/tax/tax-revenue.htm>) (16.12.2019)

Table 2, there is GDP, tax revenues are the general budget and tax burden in Turkey, while the OECD average tax burden. In terms of years, the lowest tax burden was realized in 2002, while the highest tax burden was realized in 2010 and 2011. Within the framework of these years, there is not much increase and decrease in tax burden. The average tax burden in Turkey between the years 2002-2018 is calculated as 17.45%. This average is lower than the average of all OECD countries (33.46%) in this period. But despite the low of Turkey's tax burden in OECD countries, there is no a fair distribution. The gap between indirect and direct taxes in Turkey explains that the tax burden is not distributed fairly and in a balanced way.

The issue of fair and balanced distribution of the tax burden is expressed even during the II Development Plan. Accordingly, considering the impact of Turkey's current taxation system on the economy, the fair and balanced distribution of the tax burden, increasing the savings amounts in terms of the development of the economy at the desired speed and direction, and distribution is an important factor (Avcı, 1988, 32). One of the reasons why the tax burden in Turkey is lower than the average tax burden of OECD countries is due to the narrow tax base in our country. The fact that taxes are generally take from goods, services and income and also affects the narrowness of the tax base due to the high tax evasion in our country (İlhan, 2007, 7).

3. LITERATURE REVIEW

When the literature is examined, various results of the studies that examine the relationship between economic growth and tax are shown in the Table 3. One of the main reasons why the results are different here are the level of development of the countries and the different economic policies they implement.

In the studies we have analyzed, it is seen that generally time series analysis and panel data analysis methods are used. In the literature, only the relationship between tax burden and economic growth is not examined in the general framework. It is also

involved in studies that address a single specific tax, such as the impact of the indirect tax burden on economic growth. Table 3 in our study is useful to see different analyzes. The reason why different analyzes are included in the analysis of tax burden and economic growth is that the issue is multifaceted. When we look at the literature table, Kneller et al. (1999), Lee and Gordon (2005), Arnold (2008), Veronika and Lenka (2012), Demir and Sever (2016) and Stoilava (2017) use panel data analysis. At the same time, Anastassiou and Dritsaki (2005) and Ünlükaplan and Arisoy (2011) use causality tests and Erdoğan et al. (2013) we see that they use cointegration analysis and causality tests. The studies carrying out VAR analysis are Mucuk and Alptekin (2008) and Bacarezza et al. (2013) it can be seen in table 3.

Studies conducted with panel data analysis mostly conclude that the tax burden has a negative effect on economic growth. Unlike these studies, Stoilova (2017), who could not find the same result, concludes that there is a fundamentally positive effect. When we look at the causality test results, it is seen that there is a causality relationship between tax burden and economic growth. In the studies analyzed by VAR analysis, there are studies that have obtained both negative and positive results between tax burden and economic growth. The most effective reason for this is that the economic structures of the countries discussed are different and the periods discussed are different. As a result, developed countries and developing countries are not expected to have the same result. At the same time, cointegration analyzes also determine the existence of a long-term relationship between tax burden and economic growth. Çelikay (2017) can be given as an example. In our study, both the VAR model and causality test analyzes are performed. In our study, as a result, it was partly Bacarezza et al. (2013), Ünlükaplan and Arisoy (2011) and Anastassiou and Dritsaki (2005) have yielded similar results.

Table 3: Empirical Studies on Tax and Economic Growth

Author/ Year of the Study/ Country(s)/ Econometric Method and Years	Findings
Kneller et al. (1999)/ 22 OECD Countries/ Pane Data Analysis 1970 – 1995	According to the analysis, it is concluded that distorting taxation affects growth negatively.
Widmalm (2001)/ 23 OECD Countries/ Cross Section Analysis 1965 – 1990	The increase in personal income tax adversely affects economic growth.
Anastassiou and Dritsaki (2005)/ Yunanistan/Granger Causality 1965-2002	As a result of the research, it was determined that there is a causality between economic growth and tax revenue.
Koch et al. (2005)/ South Africa/ Data Envelopment Analysis 1960 – 2002	As a result of the analysis, it is suggested that the decrease in tax burden is related to economic growth and the decrease in indirect taxes is effective in economic growth.
Lee and Gordon (2005)/ 70 Countries/ Panel Data, Cross Section Analysis and Regression Analysis 1970 – 1997	The 10% decrease in corporate tax will increase economic growth by 1% and 2%.
Arnold (2008)/ 21 OECD Countries/ Panel Data Analysis 1971 – 2004	In the analysis, it is concluded that income tax has a negative effect on more economic growth than consumption tax and wealth tax.
Mucuk and Alptekin (2008)/ Turkey/ VAR Analysis 1975 – 2006	As a result of cointegration test, the variables move together and as a result of causality test, it is concluded that there is a one-way relationship from direct taxes to economic growth.
Ünlükaplan and Arisoy (2011)/ Turkey/ Granger Causality, Cointegration Analysis and Impact - Response Analysis 1968 – 2006	According to the results of cointegration, a relationship was found between the tax burden and real GNP. According to the causality test, economic growth and tax burden are the cause of each other in the long run. According to the impact response analysis, an external shock on the tax burden creates a static effect.
Veronika and Lenka (2012)/ 27 EU Countries/ Panel Data 1998 – 2010	In the analysis, it has been concluded that the increase in corporate tax adversely affects economic growth in the long run.
Bacarezza et al. (2013)/ 17 Latin American Countries and 81 Latin American Country / VAR Analysis and Panel Data Analysis 1990 – 2009	In Latin American countries, there is generally no significant negative relationship between income tax and economic growth, and in 81 countries there is a negative relationship between income tax and economic growth. It has been suggested that reducing corporate tax may affect the economy positively.

Erdoğan et al. (2013)/ Turkey/ Cointegration and Causality Analysis 1998 – 2011	A long-term relationship was found between indirect taxes and economic growth. In addition, a one-way causality has been identified from indirect tax revenues to economic growth in the short and long term.
Saraç (2015)/ Turkey/ Markov Regime Change Technique 1969 – 2013	In the periods of contraction and expansion of the economy, the increase in direct taxes negatively and indirect taxes increase positive affects economic growth.
Demir and Sever (2016)/ 11 OECD Countries/ Panel Data 1980 – 2014	In the long term, a one-unit increase in direct taxes leads to a decrease in the income level of 0.13 units. In the short term, a one-unit increase in total taxes leads to a decrease in the income level of 0.17 units.
Çelikay (2017)/ Turkey/ ARDL Boundary Test Approach 1924 – 2014	The 1% increase in GDP per capita has a positive effect of approximately 0.07% on the tax burden in the long term.
Stoilova (2017)/ EU Countries (28)/ Panel Data Regression 1996 – 2013	The tax structure based on excise taxes, personal income and property tax positively affects economic growth.

4. MODEL AND METHODOLOGY

This study examines the relationship between tax burden and economic growth. The data used in the study were taken from GIB and OECD database. Data on tax burden (Total Taxes / GDP) and economic growth cover the period from 1970 to 2018. The data obtained are annual data. VAR analysis and Granger causality test are used in the study. VAR analysis is a method that shows the effects of the variables used on each other. Brief representation of the data used in the study is as follows.

Economic growth: GDP

Tax burden: TB

Var (Vector Autoregressive Model) analysis method was developed by Sims in 1980. It addresses the variables at hand in a whole without any constraints on the model. It examines the relationships between macroeconomic variables. It is a model used to analyze the dynamic effects of a random shock in variables on other variables. This method is one of the most widely used methods because it gives dynamic relationships without any constraints to the structural model (Mucuk and Alptekin, 2008, 162 – 163, Özgen and Güloğlu, 2004, 95 – 97).

Accordingly, it is possible to formulate the VAR model in our study as standard as follows:

$$GDP_t = \alpha_0 + \sum_{p=1}^k \beta_{1p} \Delta TB_{t-p} + \sum_{p=1}^k \mu_{1p} GDP_{t-p} + \varepsilon_{1t}$$

$$\Delta TB_t = \alpha_0 + \sum_{p=1}^k \mu_{2p} GDP_{t-p} + \sum_{p=1}^k \beta_{2p} \Delta TB_{t-p} + \varepsilon_{2t}$$

k: Lag Length,

Δ : Gap Parameter

t: Time,

μ : GDP Stability Coefficient

p: Lag Coefficient,

ε : Error Term

β : Tax Burden Stability Coefficient,

4.1. Ampirical Findings

In an economic analysis, first of all, it is checked whether the data to be used is stationary. The most commonly used methods to test whether the time series are stationary are known as Augmented Dickey - Fuller (ADF) developed by Dickey and Fuller (1979), and Phillips - Perron (PP) unit root tests developed by Phillips Perron (1988). In order for the time series to be used to give more meaningful results, the parameters should not contain a unit root. In other words. H_0 is rejected in the hypothesis test.

ADF and PP tests give almost the same results. The PP test is a recommended error correction model for the ADF during the testing process. Hypotheses are presented as follows (Güvenek et al., 2010: 7):

$H_0: p = 0$ the series is not static, there is a unit root in the series.

$H_1: p < 0$ the series is stationary, there is no unit root in the series.

The time series should be stationary in the generated models. If time series is not stationary, it can lead to spurious regression. The fact that time series are stationary causes the analysis to be more meaningful and more consistent. As Granger and Newbold

(1974) stated in their study, the problem of spurious regression occurs when analyzed with non-static time series. In this case, the results obtained are not real results and do not reflect the correct result (Gujarati, 2001, 726).

In the analysis, descriptive statistics related to the study are evaluated first. Then, ADF and PP tests are used to examine the stagnation of economic growth and tax burden series.

Table 4: Descriptive Statistics of Economic Growth and Tax Burden

Statistics / Variables	GDP	Tax Burden
Mean	4.5617	17.6467
Median	5.1666	16.2940
Maximum	11.1135	25.8990
Minimum	-5.9623	9.0610
Standart Deviation	4.1196	5.7934
Skewness	-0.8522	0.1364
Kurtosis	3.1774	1.3594
Jarque Bera	5.7516	5.4166

When Table 4 is examined, it is seen that descriptive statistics of variables are included. When we look at the Skewness coefficient, it is skewed to the right in the growth data and left to skewed in the tax burden data. When we look at the kurtosis coefficient, it is seen that the variables have a basic and normal distribution respectively.

Table 5 contains the results of the stationarity analysis of the tax burden and economic growth variables in the model of the study according to the Augmented Dickey - Fuller (ADF) and Philips - Peron (PP) unit root tests.

Table 5: Unit Root Tests and Results

Variables		Augmented Dickey – Fuller (ADF) Test			
		Constant		Constant + Trend	
		t- Stat.	Prob.	t- Stat.	Prob.
Level	GDP	-6.5307	0.0000*	-6.4636	0.0000*
	TB	-0.7449	0.8248	-1.8180	0.6797
First Differens	TB	-6.5782	0.0000*	-6.4966	0.0000*
Variables		Philips – Peron (PP) Testi			
		Constant		Constant + Trend	
		t- Stat.	Prob.	t- Stat.	Prob.
Level	GDP	-6.5263	0.0000*	-6.4567	0.0000*
	TB	-0.7459	0.8246	-1.9766	0.5983
First Differens	TB	-6.5786	0.0000*	-6.4952	0.0000*

*1% meaning level does not contain unit roots.

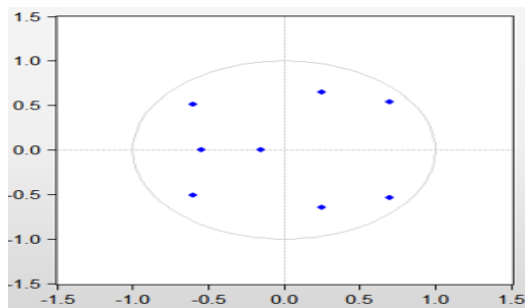
Table 5 shows the ADF and PP test results. According to these results, while the GDP level is stable, the tax burden is stable at the meaning level of 1% when the first difference is received. Both variables were not stable at the same level. In this case, cointegration analysis is not possible and the analysis is continued with VAR model. In the VAR model, stationary states of the series are used. Therefore, the GDP level value is included in the analysis and the tax burden is included in the analysis by taking the first difference.

Information criteria for determining the lag length of the model are given in Table 6. In the model, the minimum number of lag without autocorrelation and changing variance problems is 4.

Table 6: Determination of Lag Length

Lag	LR	FPE	AIC	SC	HQ
0	NA	19.97148	8.67004	8.75278*	8.70037*
1	0.66553	23.76434	8.84345	9.09169	8.93444
2	8.49449	22.89373	8.80434	9.21807	8.95599
3	4.94578	24.14410	8.85351	9.43274	9.06582
4	16.0381*	18.09664*	8.55798*	9.30270	8.83095

In the following figure 1, it is seen that in the case of the stagnation and the appropriate delay of the variables (4), all inverse roots are located in the unit circle. As here, the fact that whole inverse units roots are in the circle indicates that the model is stable.

Figure 1: Inverse Roots Unit Circle**Table 7: LM Autocorrelation Test**

Lag	LM Stat.	Prob.
1	3.749386	0.4410
2	3.191514	0.5263
3	2.439615	0.6555

Table 8: Heteroscedasticity Test

White Heteroskedasticity (No Cross Terms)		
Chi – Square	df	Prob.
52.01012	48	0.3206

Table 7 and Table 8 show that there are no autocorrelation and heteroscedasticity problems at the lag level determined in the model.

When we look at the graphs in Figure 2, the other two graphs, except the graphs at the top right and bottom left, explain the relationship with each other. In this context there is no need to interpret these figures. In the top right graph interpretation of impact-response analysis, the tax burden is 3rd period negatively affects growth. The bottom left graph of the impact-response analysis cannot be statistically interpreted.

Figure 2: Impact - Response Analysis

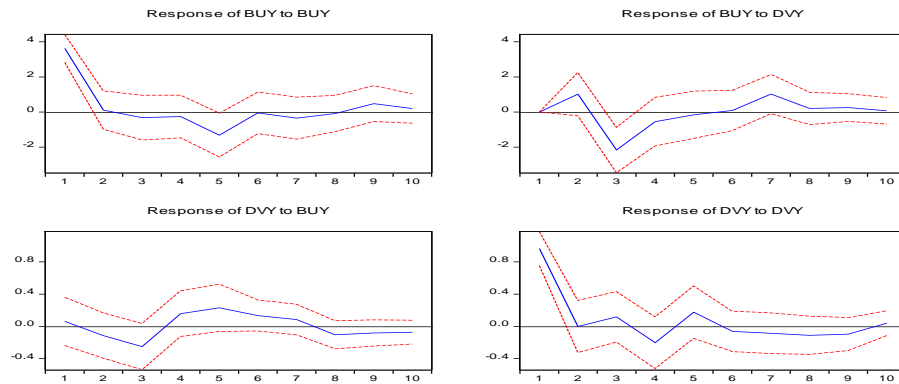


Table 9: Variance Decomposition

GDP			TB		
Period	GDP	TB	Period	GDP	TB
1	100.0000	0.000000	1	0.404135	99.59587
2	92.67264	7.327363	2	1.801845	98.19816
3	69.84528	30.15472	3	7.834719	92.16528
4	68.86636	31.13364	4	9.630685	90.36932
5	71.34127	28.65873	5	13.42937	86.57063
6	71.31679	28.68321	6	14.68163	85.31837
7	68.10333	31.89667	7	15.08737	84.91263
8	67.98622	32.01378	8	15.69576	84.30424
9	68.11935	31.88065	9	16.03787	83.96213
10	68.15956	31.84044	10	16.36768	83.63232

When Table 9 is generally evaluated, the impact of economic growth on itself is decreasing and economic growth is increasing to be affected by the tax burden. By the 10th period, 31.84% of economic growth appears to be due to the tax burden. When the tax burden assessment is examined, it is seen that the impact of tax burden on itself is quite high. In the 10th period, 16.36% of the tax burden is due to economic growth.

Table 10: VAR Granger Causality Test

Explanation	GDP		TB	
GDP	----		Chi - Square	Prob.
			17.51533	0.0015
TB	Chi - Square	Prob.	----	
	9.184847	0.0566		

Table 10 shows the results of the Granger causality test between tax burden and economic growth. When the table is examined, the tax burden and economic growth emerges as a result of each other at the meaning level of 10%. As a result, it is concluded that tax burden negatively affects economic growth in impact-response analysis, economic growth is increasingly affected by tax burden in variance decomposition, and causality test is mutually related. These results support each other.

5. CONCLUSION

In this study, the period between 1970 and 2018 is examined in Turkey. In addition, the study is tested with VAR analysis and Granger causality test. As a result of VAR analysis, it is seen that tax burden negatively affects economic growth in the 3rd period. According to the results of Granger causality test, it is concluded that tax burden and economic growth are the mutual cause of each other. When the variance decomposition results are examined, it is observed that the tax burden effect gradually increases despite the fact (68.15) that growth is mostly affected by itself in the 10th period (31.84). Tax burden, again, is mostly affected by itself in the 10th period (83.63). The rate of self-impact of the tax burden is gradually decreasing and the share of economic growth is gradually increasing (16.36).

In this respect, the negative impact of the tax burden on economic growth is a good result for the review of tax policies. Accordingly, increasing tax rates will not have positive feedbacks in terms of economic growth, and vice versa. Policymakers would be more positive in practice to decrease tax rates rather than increase tax rates. In this context, various policy proposals can be presented.

One of these recommendations may be to alleviate the excessive tax burden on the minimum wage. There is an excessive tax burden with indirect taxes paid due to direct taxes and expenditures. According to the Constitution, the principle of fair distribution of taxes can be revised here. Another suggestion should be taken into account in regional factors when calculating the minimum wage. Moreover, increasing the rate of a significant tax, such as corporate tax, may negatively affect economic growth. Although the countries in the world intend to reduce corporate tax in order to attract investment, the desire to increase in our country may not have a positive effect on the economy.

It is known that income tax creates a higher tax burden for the middle-income citizens in Turkey. This situation leads to a tax system which is not functioning properly. This can be solved by spreading the tax to a wide base. High tax rates are the most important reason for the high tax burden. Therefore, high tax rates bring about tax evasion. Moreover, the fact that the indirect tax rates are high is an extra tax burden on low-income citizens. The more fair distribution of taxes is one of the most important duties of the state. Finally, tax policies should be implemented in a simpler and more voluntary tax compliance with low tax rates.

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