The Impact of Tax Revenue on Economic Growth in Turkey from 2010 to 2020

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Abstract: This study aimed to examine and analyze the impact of tax revenue on economic growth and the relationship between tax revenue and economic growth in Turkey for the period 2010 to 2020. This study purposed that tax revenue has a positive impact on economic growth and has a long-run relationship between variables. According to the ARDL model, results are significant at 5% that accept the null hypothesis and reject the alternative hypothesis which means tax revenue has a positive impact on economic growth. The tax revenue and economic growth have a long-run relationship by the bound test for the study period from 2010 to 2020 in Turkey's economy.

Keywords: Economic Growth; Tax Revenue; Bound Test; ARDL model; and Turkey

1. Introduction

The desire for tax bills has been a phenomenon of world importance because it impacts each financial system regardless of national differences. Taxation is an age lengthy occasion (Ojong et al., 2016). Tax, which is one of the most important financial sources of the state in the context of the fulfilling ability of public services, income received from economic units forcibly and unrequitedly. Tax, which has funded investments by boosting internal savings; revs the economic growth of the country, confirms price resilience, indirectly controls the level of production and consumption, and regulates the distribution of income between individuals (Polat, 2019). Taxation is an important aspect of fostering long-term growth and poverty alleviation (Takumah, 2014). Also, the most critical strategic objective for the state

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in a volatile international economic climate is achieving financial sustainability (Tsindeliani et al., 2019).

Tax is an obligatory rate imposed through a general authority on the income and residences of people and corporations as defined through the authorities Regulation, Acts, or Laws regardless of the precise quantity of provider of the payer in recovery (Omotoso, 2001). In this context, public expenditure policies and public revenue policies are implemented from fiscal policy instruments in order to achieve economic growth. It consists of general revenues, tax earnings, non-tax earnings, and borrowing income. It is known that tax revenues are the multiple essential sources of income in public revenues (Dam et al., 2018).

The concept of a tax system refers to a whole consisting of all taxes available in a country at a certain time; it contains financial obligations such as taxes, paintings, fees, funds, etc., to which the central administration and local administrations and the public institutions to which they are delegated authority are authorized to collect. Each country has its own tax system that reflects the characteristics and level of its social, economic, and political structure (DPT, 2001, p. 12).

Tax revenues are essential for Turkey's economy, tax revenues significant part of the GDP in turkey compare to other countries in the area. In 2020 Tax revenues were around 17.64% share of the GDP in the turkey economy (world bank database, 2022).

Ensuring economic growth is important for countries. Especially economic growth is one of the principal economic objectives that come to the forefront in developing countries. In order to achieve economic growth, investments to improve capital quality, technological innovations, and increasing the number of production factors can be used in different ways. The main subject under consideration here is the association between economic growth and tax earnings (Çetin, 2018, p. 2).

This research needs to reply to the following query whether what is the essence of the association between tax revenues and economic growth? And, what influence does tax revenue have on the economic growth in turkey from 2010 to 2020? Maybe the explanation for this query is the central purpose of this study. Consequently, this investigation will try to test the hypothesis of the positive impact of tax revenue on economic growth in turkey and imply that tax revenue does have a long-run relationship between tax revenue and economic growth. For our results and each solution in this research. For this objective, statistical and normal examinations will be employed to assess the relationships between the variables to be presented in the

econometrics method. The article rolls as follows. Section one shortly shows an introduction of tax revenue and economic growth. Section two briefly shows a literature review of tax revenue and economic growth. Section three explains the data and contracts with the methodological points employed in the observed comment, also in Section four the empirical proof is shown. Finally, in Division, the conclusions of the comment are summarized.

2. Literature Review

Several studies are observing the association between tax revenues and economic growth and the influence of tax revenues on economic growth. In these studies; each country can have different results according to its tax policies and conjunctural status.

The link between tax policies and economic growth variables was first determined by Solow (1956) was used the Neoclassical Growth Model within the scope of economic growth theories. In his study, Solow stated that in a stable state, economic growth is not impacted by tax policies. Romer (1990), took out investigations implying that tax policies perhaps contain long-run or enduring impacts on growth.

Engen and Skinner (1996) explained that even a comprehensive tax policy change would only have a low impact on growth rates. Kneller et al. (1999) conducted a similar study for 22 OECD countries, stating that taxes on income and wealth negatively affect economic growth, while excise taxes do not have such an effect. Widmalm (2001) analyzed the period 1965–1990 based on 23 OECD countries and extrapolated that there is a negative association between tax revenues and economic growth. Stoilova et al. (2013) The link is analyzed by the means of regression research the study discovered that direct taxes included a better efficient effect on economic growth from 1995 to 2010 in 27 European Union partner governments in the allocation of the whole tax commitment. Takumah (2014) used the Co-integration and Granger Causality examinations and discovers that taxation income exercised a positive and statistically important consequence on the economic growth of Ghana's economy in the long and short-run. Babatunde et al. (2017) used the Johansen cointegration test in this study to find that tax revenue has a positive relationship with GDP in Africa from 2004 to 2013. Egbunike et al. (2018) utilized OLS estimation and Granger Causality this study sees a positive influence of tax income on a gross domestic product (GDP) in Nigeria and Ghana from 2000 to 2016.

Durkaya et al. (2006) utilized the engra Granger Cointegration and concluded that a long-term balance was reached between the changes in their studies covering the period 1980-2005 in turkey. Mucuk et al. (2008) experimented the relationship between indirect and direct taxation and economic growth in the Turkish economy between 1975 and 2006, consecrating that there existed a long-term relationship between basic taxation types and economic growth. The conclusion they found with the Granger test is that for the short duration there is an association between direct taxes only to economic growth. Gul et al. (2009) examined the relationship between tax revenues and economic growth in Turkey and European union member states from 1980 to 2008 and concluded that there was a long-term association between tax incomes and economic growth in all countries examined. Göçer et al. (2010) In their studies discussed the relationship between tax revenues and economic growth in Turkey between 1924 and 2009 with the ARDL co-ordination method, according to the findings, the long-term relationship between tax incomes and economic growth was determined and tax revenues positively affected economic growth. Dam et al. (2018) In their studies examined the relationship between tax revenues and economic growth in Turkey from the duration of 2005 to 2016 by the ARDL method, according to the test results, the long-term relationship between tax incomes and economic growth keeps existed determined. Akinci (2019) utilized the cointegration test this research shows have the long-term relationship between tax revenue and economic growth from 2006 to 2018 in turkey.

However, the existing data is complemented by a number of studies, some of which reveal both positive and negative effects of tax revenue on economic growth, while others give weak or no evidence. This section examines existing studies to imagine the effect of tax revenue on economic growth (GDP).

3. Research Methodology

3.1. Data

The aim of this research is an attempt to examine the impact of tax revenue on economic growth (GDP) and examine the relationship between dependent and explanatory variables in turkey. According to annual data for 2010 to 2020. The proposed model contains two main variables: tax revenue and economic growth (GDP). The data employed by the World Bank database.

This study is using the Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF) Unit Root Tests to stationarity the tax revenue and economic growth data. Besides that, the examination between tax revenue and economic growth is estimated by employing the ARDL Method. Also, to investigate a relationship between tax revenue and economic growth is using the Bound test. Another step of investigation has been brought out to analyze the structural stability and the results obtained from the model must undergo some descriptive tests to be reliable like tests Heteroskedasticity Test: Breusch-Pagan-Godfrey and Heteroskedasticity Test: ARCH.

3.2. Model Description

The inclusion of tax revenue in the model is informed by Babatunde, Ibukun, and Oyeyemi (2017). The recursive relationship and impacts exist between economic growth and tax revenue accruable to the country. The functional relationship is described as:

GDP=f (TAXRE)   (1)

Where: GDP is the Gross Domestic Product; TAXRE is the Tax Revenue. Especially, to gain the goal of this investigation and founded on the effects of the linearity of variables, the functioning association is modeled in a straight equation to produce Equation 2:

$$GDP = \beta_0 + \beta_1 TAXRE + U_t \qquad\qquad (2)$$

4. Empirical Results

In econometric analyses, it is essential to first determine the degree of stasis of the series and then to decide the analysis methods to be used according to this information in order to obtain reliable results. In the first step, we will use the unite root tests for stability because perhaps some data is not stable. If the whole data is stable Beside then will check ARDL Method because tax revenue is stable at the first difference and GDP growth is stable at the level.

4.1. Unit root tests

Unit root analysis is utilized to test whether the series is stable. The fact that the variables are unit-rooted in the time series indicates that the variables are not static. The fact that the variables are unit-rooted indicates that the effects of policy changes or any shock on the variable are permanent. There are numerous tests to determine the presence of the volume root. In this study, unit root tests Augmented Dickey-Fuller and Phillips-Perron unit root tests that allow structural fracture were utilized to examine the presence of unit root.

Table 4.1. Unite Root Test Results Using ADF and PP Test

Order of integration	Variables	ADF	PP
		Prob	Prob
		Trend and intercept	Trend and intercept
Level	GDP	0.0067*	0.0001*
Level	TAXR	1.0000	1.0000
1st Difference	TAXR	0.0459*	0.0462*

Sources: Created by the author by results.

The results of the analysis of the time series of variables studied to test their stability over time were illustrated by conducting the unit root tests and determining their stability using the augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) unit root tests, and Table (4.1) shows the results of unit root tests for variables. Results of the Unite root test show GDP dependent variables stability at the level and tax revenue independent variables stability at the first difference.

4.3. The Preliminary Estimation of the ARDL Method

Because all of the variables in this analysis are not integrated in the same order, Hassan's (2020) ARDL method for testing cointegration was used. This model was used to impact explanatory variables on dependent variables from 2010 to 2020. The results of this model are shown in table (4.2). (Prob F-statistic= 0.037069) significant or lower than 5% and the value of the adjusted R2 coefficient (R-2= 66.7%) which gives the explanatory power for the model.

Table 4.2. ARDL Method Results

Variable	Coefficient	Std. Error　　t-Statistic	Prob.*
R-squared	0.792021	Mean dependent var	4.531889
Adjusted R-squared	0.667233	S.D. dependent var	2.542806
S.E. of regression	1.466842	Akaike info criterion	3.905203
Sum squared resid	10.75813	Schwarz criterion	3.992859
Log likelihood	-13.57341	Hannan-Quinn criter.	3.716043
F-statistic	6.346948	Durbin-Watson stat	1.654682
Prob(F-statistic)	0.037069*		

Sources: Created by the author by results.

4.4. Bound Test

If we have time-series variables, perhaps all variables are not stable at the same level of difference we have to utilize the ARDL model. The ARDL cointegration approach for estimating needs two main steps. First, we start by testing the existence of the positive impact of the explanatory variables on the dependent variable by using the F-statistic. Based on we use the bounds test to show the relationship between our variables shown in table (4.3).

Table 4.3. Bound Test Results

		F. Statistic	
Critical values		14.82591	
	I(0)		I(1)
10%	3.02		3.51
5%	3.62		4.16
2.5%	4.18		4.79
1%	4.94		5.58

Sources: Created by the author by results.

Table (4.3) shows the F. Statistic value is (14.82591), which is greater than the maximum critical values equal (5.58) at the level of (1%), which denotes that there is a long-run relationship between the tax revenue and economic growth for turkey from 2010 to 2020.

4.5. Structural Stability Tests

"CUSUM" and "CUSUM of Squares" tests developed by Brown et al. (1975) were used to measure whether the coefficients in the model provided stability. The test graphs "CUSUM" and "CUSUM of Squares" for the model are shown in Figures (4.1) and figure (4.2).
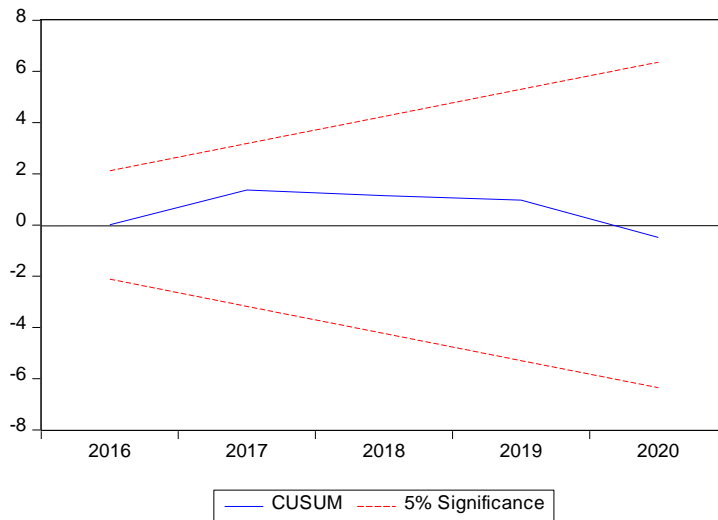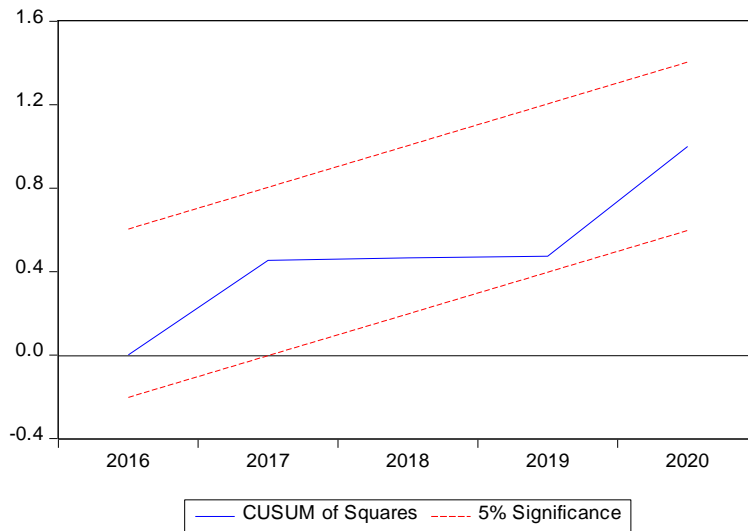
Figure 4.1. CUSUM

Figure 4.2. CUSUM of Squares

When Figure (4.1) and Figure (4.2) are examined, it is seen that the residues in the model remain within the bands at the level of 5% importance. At the same time, it states that the predicted coefficients in the model provide the stability condition and that there is no structural breakage in the model.

4.6. Diagnostics Tests

The results obtained from the model must undergo some descriptive tests to be reliable. Such as, in this section, we'll utilize two tests Heteroskedasticity Test: Breusch-Pagan-Godfrey and Heteroskedasticity Test: ARCH.

Table 4.4. Heteroskedasticity Test: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.139658	Prob. F(3,5)	0.9320
Obs*R-squared	0.695846	Prob. Chi-Square(3)	0.8742
Scaled explained SS	0.163757	Prob. Chi-Square(3)	0.9832

Sources: Created by the author by results.

This test is the Heteroskedasticity Test: Breusch-Pagan-Godfrey the results shown in the table (4.4) which results show the LM $<\chi 2$ and probability values are not significant or greater than 5%, which suggests there is no subjective correlation for the remainder of the estimated model.

Also, in the Heteroskedasticity test: ARCH results are shown in table (4.5) whose results show that the model does not suffer from heterogeneity problem, while the value of LM $< \chi 2$ and probability values are not moral or greater than 5%, this indicates homoscedasticity of estimated residues.

Table 4.5. Heteroskedasticity Test: ARCH

Heteroskedasticity Test: ARCH			
F-statistic	0.508744	Prob. F(1,6)	0.5025
Obs*R-squared	0.625305	Prob. Chi-Square(1)	0.4291

Sources: Created by the author by results.

5. Conclusion

This study attempted to examine and analyze the impact of tax revenue on economic growth in turkey the time series we utilized was the time duration from 2010 to 2020

we profit from the world bank database for whol data. And this study purpose tax revenue has a positive impact on economic growth and has a long-run relationship between tax revenue and economic growth for the study period.

We used ADF and PP unit root tests for stability data, in this research finding tax revenue time series stationarity at the first difference, and GDP growth time sires stable at the level.

We utilized the ARDL model to examine the impact of tax revenue on economic growth for our study period, in this model results were significant at 5% that accept the null hypothesis and reject the alternative hypothesis which means tax revenue has a positive impact on economic growth from 2010 to 2020 in the Turkey economy.

And this study benefits from the bound test for a long-run relationship between the dependent variable and explanatory variable, this test results were significant at 5% that accept the null hypothesis and reject the alternative hypothesis which means have long-run relationship between tax revenue and economic growth from 2010 to 2020 in turkey's economy.

The results obtained from the model we undergo some descriptive tests to be reliable. we utilized both tests Heteroskedasticity Test: Breusch-Pagan-Godfrey and the Heteroskedasticity Test: ARCH, both tests found probability values are not significant or greater than 5%, which suggests there is no subjective correlation for the rest of the estimated model.

Taxes are the defining elements of economic social life. Taxes, which are one of the most essential sources of financing for the public, contain various effects on economic and social life, especially economic growth. In addition, increased taxes in the economic literature affect economic growth through economic components such as consumption, savings, and investment.

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