

The impact of tax revenue on Azerbaijan's economic growth

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SUMMARY: Tax revenues that the state obtains by force from its citizens based on its sovereign authority make up the majority of public revenues and influence financial policy. Economic development is the first financial policy aim. Tax revenues impact economic growth directly and indirectly through savings, consumption, output, and employment. Many macroeconomic factors improve with economic expansion. Economic growth boosts economic activity and tax income. This research examines Azerbaijan's tax kinds, tax revenues, and economic development from 1991 through 2021. Tax revenues and economic growth were analysed using time series methods. Unit root and Maki structural break cointegration tests were employed. In the research with three structural breakdowns, a long-term cointegration connection was discovered between tax revenues and economic growth in all models.

KEYWORDS: Tax Revenues, Economic Growth, Time Series Analysis, Maki Cointegration Test

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Introduction

After regaining its independence from the Soviet Union in 1991, the development of the oil and gas production industry has been recognised as a catalyst for Azerbaijan's future economic growth. Over the last decade, Azerbaijan's economic growth has been primarily related to natural resources. However, recently, the Azerbaijani government has taken measures to diversify the economy. The reason for this is that the economic dependence on oil and gas has caused problems such as the loss of competitiveness and the decrease in the share of entrepreneurial sectors in total output. Non-oil economic growth is critical, as oil production is expected to decline gradually after 2015, and the non-oil budget deficit has already risen to 20% of GDP. Azerbaijan's current strategy for future economic stability is based on the development of non-oil trading sectors. Therefore, recent employment growth is higher in the non-oil sectors of the economy

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than in the oil sector. Policymakers in Azerbaijan are looking for the best way to deal with this problem. They concluded that expanding the Azerbaijani export basket should be considered the primary goal of the Azerbaijani government. According to the State Statistics Committee of the Republic of Azerbaijan, 93 percent of individual entrepreneurs in Azerbaijan are mainly engaged in retail trade and transportation. Only a small percentage of individual entrepreneurs are engaged in commercial activity in the industrial sector. One proposed explanation for this is the effect of repressive taxes. Higher tax rates may reduce employment and growth, encouraging individuals to substitute leisure for work. Recent developments in the legal framework and financial infrastructure are expected to attract a larger proportion of the population to entrepreneurship; however, this requires raising awareness among potential entrepreneurs about positive changes in the legal and financial systems. It is of great importance that fiscal policy achieve the goal of economic growth, both in developed and developing countries. In order for the fiscal policy to reach its economic growth target, it is necessary to ensure a positive increase in gross domestic product through the implementation of incentive policies that will increase production, investment, savings, and employment. In this context, public expenditure policies and public revenue policies, which are among the fiscal policy instruments, are implemented in order to ensure economic growth. Public revenues consist of tax revenues, non-tax revenues, and borrowing revenues. Tax revenues are well known to be the most important source of income among public revenues. Today, taxes are the most important public revenue policy tool used to achieve fiscal policy goals (Akinci, 2019). The effects of tax revenues on economic growth can sometimes be positive or negative, and the nature and depth of this effect are determined by many variables. Tax types, tax rates, the state of the economy, and the level of economic development of the country are some of these variables. When we look at the results obtained from theoretical and empirical studies in general, some of the studies investigating the relationship between tax structure and growth show that the relationship between taxes and growth is positive, and some are negative. In addition, there are studies that have obtained the finding that there is no relationship between these two variables (Atabey ve Şimşek, 2022: 223).

This research examines public revenues, notably tax revenues, on economic growth. The regression approach was used to investigate the link between Azerbaijan's tax collections and economic development from 1991 to 2021.

1. Effects of Tax Revenues on Economic Growth

Taxes, which are one of the instruments of fiscal policy and have the highest share in public revenues, can directly or indirectly affect many macroeconomic variables such as income distribution, inflation, employment, foreign trade, price stability, savings, and investment. Therefore, tax policies, which are one of the most important variables for economic growth and for this growth to be sustainable, should be chosen in accordance with macroeconomic components (Polat ve Yilmaz, 2022:45).

The size of public revenues, both as an absolute amount and as a ratio to GDP, significantly affects the production capacity of the economy, economic activity, and therefore the welfare level of society. By withdrawing a part of the national income from the economy as public revenues, the state provides financing for public goods and services on the one hand and makes use of public revenues as a fiscal policy tool on the other (Öztürk, 2016: 16). Today, tax revenues are the leading financial instruments used to achieve fiscal policy goals. Tax is the economic value that the state or public institutions that have received taxation authority from the state based on their sovereign power are forced to extract from taxpayers free of charge according to the rules specified in the laws (Ulusoy, 2016: 50). Taxes, which have the highest share in public revenues, are a tool of fiscal policy, and the objectives to be achieved include ensuring economic growth and development, economic stability, and a fair distribution of resources and income (Altay, 2015: 146). In an economy that maintains its existence through economic growth, which is one of the objectives of fiscal policy, it is expressed that the level of employment, natural resources, technological innovation, and other factors will increase and expand in a way that will provide a higher real income per capita compared to the previous year. With tax policy, the increase and expansion of economic growth can be achieved and supported to a certain extent (Türgay, 2011: 326). One of the most important applications of today's economies is a tax policy that regulates resource distribution in order to ensure the effective participation of production factors in the production process at the level of technology and expand production capacity or potential production opportunities, and encourages initiatives in this direction (Akdoğan, 2016: 494). There are various approaches to the effects of tax policies on economic growth. Growth models based on the Keynesian view argue that public expenditures are the dynamics of economic growth rather than tax policies, while the Neo-Classical growth model argues that tax policies have no effect on economic growth in the long run. The endogenous growth model, on the other hand, argued that tax policies could have an impact on economic growth rates in the long run, and the supply-side economics approach, on the other hand, addressed the issue of taxation in terms of supply and stated that tax policies and economic growth could be affected (Tokatlıoğlu ve Selen, 2017: 302). In order to ensure economic growth, tax policy can intervene in the economy in various ways. With tax policies, policy makers can apply various incentives to develop the workforce potential in terms of quality and quantity, to encourage savings and investments to increase capital accumulation, and to provide technological development (Susam, 2016: 232). In general, tax policies can affect economic growth in five ways (Tokatlıoğlu ve Selen, 2017: 306):

- ▶ Taxes on income may affect investment rates.
- ▶ It can affect the labor supply.
- ▶ It can affect productivity with policies related to research and development.
- ▶ It can ensure that resources are directed to sectors with low productivity.
- ▶ It can disrupt the effective functioning of human capital.

2. General Framework of Azerbaijan Tax System

The historical development of taxes in Azerbaijan dates back to ancient times. However, when the modern tax system is mentioned, the tax system of the Republic of Azerbaijan, whose history is not very old, is understood. In the early 1990s, the Azerbaijani tax system, although not independent, was established and implemented by the Ministry of Finance. The modern tax system of the Azerbaijan Republic began to take shape after the declaration of state independence, namely at the end of 1991 and the beginning of 1992. The formation and future development of the market economic system in the Republic of Azerbaijan, as the basic condition for political and economic independence, has led to the need for radical reforms in the tax system as well as in other areas (Salayev, 2019). This formation process is divided into three stages in the fiscal literature: In the first stage, covering the years 1991–1992, an independent tax service institution began to form in the Republic of Azerbaijan with the adoption of laws on taxes on income and expenses. Following the country's economic independence, Azerbaijan's President issued Decree No. 369 on October 14, 1991, establishing the Azerbaijan Republic, the Azerbaijan State Tax Inspectorate, the Nakhchivan Autonomous Republic, and district and city tax inspectorates. Various tax laws have been approved and implemented in the Republic of Azerbaijan for the implementation and collection of various types of taxes since 1991, and these laws remained in force for nine years until January 1, 2001. In December 1991, the "Value Added Tax" and "Non-Exclusive Consumption Tax" laws were adopted in Azerbaijan. The Law of the Republic of Azerbaijan "On the State Tax Service" was adopted on June 21, 1992, to determine the duties, rights, and responsibilities of the state tax system, the organisation of the tax system, and the legal status and social protection of employees of the state tax system. With the adoption of the laws "On Profit and Different Income Taxes of Legal Entities" and "Income Tax of Real Persons" in June 1992, an independent tax service body has been established in Azerbaijan since the middle of 1992. In the second stage, covering the years 1993–1996, laws on a number of new tax types were enacted in accordance with the realities of the market economy, and their legal framework was established. The existence of some gaps in the tax legislation developed in 1992–1993, the inability to fully adapt the legal and regulatory processes to modern conditions, and the frequent changes in laws and decrees created some obstacles in the socio-economic development of the country, as well as the development of entrepreneurship and the implementation of the budget. This showed that there was a great need for a single legislative act in the country. In the third stage, covering the years 1996 and 2000, studies were carried out to improve the laws adopted in the previous stage, depending on the qualitative changes in society and the economy, and at the same time, changes and regulations were included in the legislation. In December 1996, laws on "mining tax" and "taxes to the State Road Fund" were adopted, and instructions and regulations regarding the implementation of tax laws were developed. A "Tax Law" was adopted by the National Assembly on 11 July 2000. The formation of tax policy in the Republic of Azerbaijan and the collection of taxes for the budget with the help

of the tax system have improved, especially after the adoption of the “Tax Code” (Veliyev, 2006; Novruzov & Abrahamov, 2012). One of the most important elements of the Azerbaijani tax system is the creation of a favourable business environment, the focus of business on economic development and compliance with the economic interests of not only the state, but also entrepreneurs and citizens (Salayev, 2019). Table 1 shows the shares of tax revenues within the Azerbaijani tax system. When taxes are examined, it is seen that the highest tax share belongs to “Value Added Tax (VAT)”. In second place, the tax income with the highest share belongs to “Profit of Legal Persons,” that is, “Corporate Tax.” The taxes that have the least share in tax revenues are “land tax” and “property tax.”

Table 1: Tax Revenues within the Azerbaijan Tax System

Year	Total income	Personal income tax	Profit (income) tax of legal entities	Land tax	Property tax	Value-added tax	Excise	Mining tax	Taxes related to foreign economic activity	Other taxes
1995	316,9	22,8	86,3	0,8	0,9	30,6	17,7	0,01	8,9	62,9
1996	402,6	41,3	122	1	0,9	93,9	41,3	8,3	22,5	40,3
1997	513	62,6	87,7	4,5	2,8	117,9	45,3	66,3	67,7	10,6
1998	465,5	82,4	65,7	5	4,7	143,8	19,2	34,9	58,6	7,3
1999	559,5	90,1	73,4	8,5	9,8	158,1	22,9	35,9	63,5	5,5
2000	714,6	94	125,9	6,7	11,8	190,8	22,4	50,4	63,4	9
2001	784,8	94,7	117,6	10,4	12,4	253,3	110,9	47,5	59,9	7,3
2002	910,2	109,7	147,8	8,8	20	334,9	86,7	50	75,2	2,4
2003	1220,9	150,4	178,3	11,3	26,6	409,7	67	56,7	92,7	12,8
2004	1509,5	221,6	223,4	14,1	32,2	452,7	72,4	97,8	101,5	16,5
2005	2055,21	317,43	355,39	15,27	40,44	599,88	140,98	53,54	205,18	28,1
2006	3868,77	407,3	1360,52	18,55	55,79	737,85	187,37	100,17	139,34	40,9
2007	6006,6	588,59	2457,75	27,09	72,3	1179,16	402,88	123,16	293,2	68,59
2008	10762,67	627,19	2862,33	30,63	112,89	1910,87	486,87	147,7	449,71	96,8
2009	10325,94	581,87	1329,19	26,24	66,17	2012,77	485,15	121,9	418,13	86,79
2010	11403	590,2	1429,9	35,3	101,8	2082,5	514,9	130,1	291,8	90,3
2011	15700,7	715,7	2134	35,3	103,9	2222,7	480,2	129,8	433,1	140,6
2012	17281,5	813	2252	30,6	105,1	2366,9	531,5	125,8	592,5	157,6
2013	19496,3	859,7	2374,8	33,1	125,1	2710	593,3	121,5	675,2	161,5
2014	18400,6	980,3	2302,7	35,4	141,3	3119,6	797,3	116,2	684,7	192,7
2015	17498	982,5	2211,1	48,7	148,2	3454,7	647,8	116,1	934,5	247,7

Year	Total income	Personal income tax	Profit (income) tax of legal entities	Land tax	Property tax	Value-added tax	Excise	Mining tax	Taxes related to foreign economic activity	Other taxes
2016	17505,7	1145,7	1983,2	50,3	174,7	3623,5	625,1	110,3	861,2	457
2017	16516,7	1040,3	2285,9	50,4	178,6	3668,6	612,6	111,1	903	505,7
2018	22508,9	995,9	2499,7	50,6	182,2	4287,6	728,6	137,4	1143,7	561,6
2019	24398,5	952,1	2546	50	212,6	5185,1	854,7	133,8	1343,2	477,5
2020	26075,4	1151	2351,7	40,8	186,8	4818,3	898,2	130,2	1160,6	413,8

Source: <https://www.stat.gov.az>

State taxes are taxes that are determined in the Tax Code and must be paid in the territory of the Republic of Azerbaijan. Autonomous Republic taxes are taxes determined by the laws of the Nakhchivan Autonomous Republic in accordance with the Tax Code Law in the Nakhchivan Autonomous Republic and paid in the Nakhchivan Autonomous Republic (Tax Mecellesi/taxes.gov.az, 2022). Local taxes (municipal taxes) are the taxes determined by this law and the relevant law, applied in line with the decisions of the municipalities, and paid on the lands of the municipalities. Other payments required by municipalities are determined by the relevant law. State taxes are included in Article 6 of the tax law. State taxes according to this law:

- ▶ Personal income tax,
- ▶ Profit tax on legal entities (but not on municipal enterprises and organizations);
- ▶ Value-added tax,
- ▶ Tax on negotiating
- ▶ Land taxation of legal persons and individuals in the circumstances specified in Article 206.18 of this Law;
- ▶ Road tax;
- ▶ Mining tax;
- ▶ It is a simplified tax.

Autonomous Republic taxes will include listed state taxes determined by Article 6 of the Nakhchivan Autonomous Republic's tax code. Local taxes (municipal taxes) are determined by Article 8 of the tax law as follows: 1. Land tax of individuals in cases stipulated in Articles 206.1-19 and 206.310 of the relevant law; 2. property tax of individuals in the case stipulated in Article 198.111 of this law; 3. mining tax on building materials of local importance; 4. income tax of enterprises and organisations belonging to the municipality. The rules for the calculation and payment of local taxes, the rights and responsibilities of taxpayers and tax authorities of municipalities, the forms and methods of tax control, the liability for violations of tax legislation, and the rules for objecting to the actions (or inaction) of municipal tax authorities and their authorities are determined by the relevant legislation. The

rates of local taxes (municipal taxes) are determined within the limits determined by the tax legislation. According to tax legislation, municipalities are authorised to fully or partially exempt certain categories of taxpayers from local taxes and to reduce the tax rate in their region. With the 5th article of the tax law, forms of taxation, Tax amounts are withheld in the following ways:

- ▶ Direct source (withholding tax before income or profit);
- ▶ By declaration (withholding tax after income or profit);
- ▶ By notification (for payment of tax by the taxpayer on the basis of the payment notification
- ▶ Submitted by the tax authority or municipality for the amount calculated on the basis of the value and area of the taxation object).

Each state's tax system has its own peculiarities. Of course, Azerbaijan's tax system has its own characteristics. These features are:

- ▶ The Azerbaijan Tax System is not based on individual legal regulations. Based on a legal basis, the Azerbaijan Tax System covers all financial relations related to the redistribution of a part of the gross domestic product.
- ▶ Unified rules are established on the basis of a single mechanism for the calculation and payment of taxes, regardless of the organisational and legal form of economic assets.
- ▶ Tax payments are monitored by tax authorities.
- ▶ It imposes the same requirements on taxpayers, determines the number of taxes and tax rates, regulates the mechanism of tax benefits and their issuance, ensures the same conditions for income generation, and ensures a fair distribution of tax burden among different categories of taxpayers without interfering with the use of funds remaining after taxes. It also takes into account the experiences of foreign countries and ensures their participation in the international integration process (Nebiyev, 2011).

3. Literature review

The effect of taxes on economic growth is one of the most debated topics in economics, with various approaches offered in the literature. Although studies on the effect of tax revenues on economic growth have been conducted for many years, Solow was one of the first to work in its modern form. The neo-classical growth model put forward by Solow (1956) argues that taxation does not affect growth in the long run (Kbritcioğlu, 1998:8). Continuing, Lucas (1988) states that economic growth will slow down in the case of an increase in income tax; Romer (1990), on the importance of tax policies on growth; and Easterly and Rebelo (1993), on the other hand, conducted studies on the negative effects of deviations in local tax revenue on consumption and investment (Çiğdem and Altaylar, 2021:23). Durkaya and Ceylan (2006) examined the relationship between tax revenues and economic growth in Turkey between 1980 and 2004 with the Engel-Granger cointegration test. According to the findings, a long-term relationship was determined between total tax revenues and economic growth. Mucuk and Alptekin

(2008) examined the effect of tax revenues on economic growth in Turkey between 1975 and 2006 with the Johansen cointegration test and Granger causality analysis. According to the test results, a long-term relationship was determined between tax revenues and economic growth, and a causal relationship was established from indirect taxes to economic growth. Göçer et al. (2010) examined the relationship between tax revenues and economic growth in Turkey between 1924 and 2009 using the ARDL cointegration method. According to the findings, a long-term relationship has been established between tax revenues and economic growth, and it has been determined that tax revenues have a positive effect on economic growth. Hope et al. (2011) examined the effects of tax revenues and borrowing on economic growth in Turkey between 1990 and 2009 by using Johansen cointegration and the least squares method. According to Johansen's cointegration analysis, no long-term relationship could be found between tax revenues and economic growth. Erdogan et al. (2013) examined the relationship between tax revenues and economic growth in Turkey in the period 1998:Q1–2011:Q4 with cointegration and causality tests. In the study, which deals with tax revenues under two headings, indirect taxes and direct taxes, a long-term relationship was determined between indirect taxes and economic growth, but a long-term relationship could not be determined between direct taxes and economic growth. Terzi and Yurtkuran (2016) examined the relationship between direct and indirect tax revenues and economic growth in Turkey between 1980 and 2013 using TY/U-VAR causality methods. According to the results of the VAR analysis, bidirectional causality has been determined: from direct tax revenues to economic growth negatively and from economic growth to direct tax revenues positively. A causal relationship between indirect tax revenues and economic growth could not be determined. Using the Granger causality test method, Diküt zpençe (2017) investigated the effect of public expenditures and tax revenues on economic growth in Turkey between 1980 and 2015. According to the results of the research, it has been determined that tax revenues have a negative effect on economic growth, while public expenditures have a positive effect on economic growth. In their study, Demir and Sever (2017) examined the effect of tax revenues on economic growth in 11 OECD countries between 1980 and 2014 using panel data analysis. As a result of the analysis, it has been determined that the increase in tax revenues has a negative effect on economic growth. In their study, Sandalcı and Sandalcı (2017) examined the effect of tax revenues on economic growth in 32 selected OECD countries between 1990 and 2014 using the panel data analysis method. According to the findings, it has been determined that the effect of total tax revenues on economic growth is negative. Eren et al. (2018) examined the relationship between tax revenues and economic development in Turkey between 1975 and 2013 using Hacker and Hatemi causality test and Breitung and Caldalon frequency domain causality test methods. In the study, in which real national income per capita was used as development data, a one-way causal relationship from tax revenues to economic development was determined. Dam and Ertekin (2018) examined the relationship between tax revenues and economic growth in Turkey in the period of 2005:Q1–2016:Q2 using the ARDL method. According to the test results, a long-term relationship was determined between tax revenues and economic growth. Son (2022) examined the relationship between annual tax revenue and economic growth for the

period 1995–2019 for 10 OECD countries. According to the analysis findings, while a 1% increase in tax revenues reduces economic growth by 0.77% according to FMOLS, a 1% increase in tax revenues reduces economic growth by 1.13% according to DOLS. Karas (2022) investigated the cointegration relationship between income, expenditures, and taxes on wealth, tax burden, and growth in G-7 countries for the period 1990–2018 with the LM Bootstrap cointegration test and the causality relationship between these variables with the Konya Panel causality test. As a result of the analysis, it was found that tax burden and economic growth were not cointegrated. Results have been obtained showing that the taxes collected on income in Japan, Canada, and England; collected on expenditures in France, Italy, Japan, and England; and collected on wealth in Canada, Germany, and the USA positively affect the growth figures. Hill et al. (2022) investigated the short-run effect of changes in GDP on tax revenues and the long-run relationship between nominal GDP and tax revenues using panel data analysis as well as time series analysis, using data for the economies of 25 developing countries in Asia and the Pacific over the 1998–2020 period. As a result of the study, in which ARDL and ECM methods were used, it was determined that tax revenue increases decreased by one-tenth after the COVID-19 pandemic caused changes in GDP. In addition, as a result of the study, it is estimated that there is a loss in tax revenues of 0.5% of the GDP in 2019 due to the pandemic.

4. Analysis of The Effect of Tax Revenues on Economic Growth

4.1. Econometric Method

The study is based on the testing the impact of taxes on economic growth. For this purpose, the study incorporated data for 31 years from 1991 to 2021. Frequencies are based on annual observations from Azerbaijan economy. Study incorporated one dependent variable which is annual GDP in US Dollar, one independent variable which is total taxes and following ten controlling / supporting variables based on different categories of taxes. The details related to the variables is below:

Y1 = Gross Domestic Product

X1 = Total Income Tax

X2 = Personal Income Tax

X3 = Income tax of legal entities

X4 = Land Tax

X5 = Property Tax

X6 = Value Added Tax

X7 = Excise Duty

X8 = Mining Tax

X9 = Taxes Related to Foreign Economic Activity

X10 = Other Taxes

X11 = Other Income

In this study our main model is based on gross domestic product and total taxes. And we also included the remaining all controlling variables. In this study, we develop the following model:

$$Y1_t = \alpha_t + \beta_1 X1_t + \varepsilon_t \quad (1)$$

Where; $Y1_t$ is dependent variable, $X1_t$ is independent variable, α_t is intercept, β_1 is regressor coefficient and ε_t is error term. Equation (1) will be regressed with ordinary least square method under system-based regression. Before doing final regression in OLS setting, the study did some pre-requisites tests like unit root test, normality test, correlation analysis and step-wise regression to finalize the variables. After performing all pre-requisites, the study will perform the following system-based analysis (Zaheer, Kashif & Waseem-Ur-Rehman, 2017):

$$[Y1_t] = \begin{bmatrix} \alpha_{t1} \\ \vdots \\ \alpha_{tn} \end{bmatrix} + \begin{bmatrix} \beta_{t1} \\ \vdots \\ \beta_{tn} \end{bmatrix} \begin{bmatrix} X1_t \\ \vdots \\ X11_t \end{bmatrix} + \begin{bmatrix} \varepsilon_{t1} \\ \vdots \\ \varepsilon_{tn} \end{bmatrix} \quad (2)$$

Ordinary least square regression OLS in system-based settings in EViews was used to regress the equation (2). Variables included in the final model will be based on quality of the data. If the data will satisfy the pre-requisites of the ordinary least square than the study will include only these variables for further analysis.

4.2. Empirical Results

The first analysis which the study uses to confirm the quality of the data with the help of Augmented Dicky Fuller Test which will be discussed in this section. Our all dependent and independent variables' unit root test analysis are given below:

Table 2: Unit Root Test

Variable	t-statistic	p-value	Stationary Level
Y1	-3.632317	0.0112	1st Difference
X1	-3.633202	0.0130	2nd Difference
X2	-5.773555	0.0001	1st Difference
X3	-4.977907	0.0004	1st Difference
X4	-4.549823	0.0011	1st Difference
X5	-4.823576	0.0006	1st Difference
X6	NA	NA	Non-Stationary Variable at Levels
X7	-7.028233	0.0000	2nd Difference
X8	-7.081815	0.0000	1st Difference
X9	NA	NA	Non-Stationary Variable at Levels
X10	-3.252037	0.0270	1st Difference
X11	NA	NA	Non-Stationary Variable at Levels

The dependent variable, Gross Domestic Product is stationary at first difference therefore, the study took the first difference of dependent variable. Our independent variable Total taxes X_1 has unit root at level and at first difference but the data was stationary at second difference as p-value is near to zero. As per the results of Augmented Dicky-Fuller test of unit root for X_2 indicate that the variable is stationary at first difference therefore the difference was used for this variable. The data of X_3 was also used by taking first difference because at level this variable has unit root. Similarly, the variables X_4 and X_5 has unit root at level but were no unit root at first difference. The variable from X_2 to X_5 were used after taking first difference but there is no level of stationary for X_6 was found therefore, the variable X_6 has been excluded for further analysis. The variables X_8 and X_{10} are stationary at first difference and variable X_7 is stationary at second difference. Variables X_9 and X_{11} are not stationary at any level of difference. With the help of Augmented Dicky-Fuller test the study excluded X_6 , X_9 and X_{11} from further analysis to avoid biased results. After excluding the variables and transforming the data as per unit root test, the uses further tested the normality of the data series.

Individual Sample Based Descriptive Statistics

To test the normality of the data series, the study performed the descriptive analysis. The normality is another assumption for ordinary least square. To confirm the normal distribution of the data, Jarque-Bera statistics were considered. As per the normality results the variable X_7 data were not normally distributed therefore, the study excluded this variable. Data of X_7 has negative observations, the logarithm of this data was not possible to convert them into the normality. To satisfy the normality assumption, the study excluded X_7 from father analysis.

Table 3: Descriptive statistics

	ΔY_1	$\Delta^2 X_1$	ΔX_2	ΔX_3	ΔX_4	ΔX_5	$\Delta^2 X_7$	ΔX_8	ΔX_{10}
Mean	1,53E+09	34,64690	67,29400	166,7727	2,586333	11,96867	11,56621	7,836333	23,40533
Median	1,07E+09	32,17700	26,98350	54,89265	0,325000	5,064500	12,99200	2,262500	5,999000
Maximum	1,58E+10	13799,05	768,0660	1653,210	48,36000	120,9780	278,9700	90,48000	422,4780
Minimum	-2,22E+10	-9256,200	-684,0080	-1226,509	-15,64000	-43,86000	-292,8150	-46,58716	-142,9700
Std. Dev.	7,72E+09	4562,640	254,1091	482,8421	9,871910	30,39392	123,7388	25,04804	96,40873
Skewness	-0,917703	1,271088	0,391304	0,560994	3,293151	1,705539	0,119459	1,098469	2,592331
Kurtosis	4,969149	6,584867	6,292889	6,425878	16,97576	7,507962	3,549412	5,754555	11,77722
Jarque-Bera	9,057833	23,33767	14,31949	16,24437	298,3767	39,94648	0,433714	15,51763	129,9004
Probability	0,010792	0,000009	0,000777	0,000297	0,000000	0,000000	0,805045	0,000427	0,000000
Normal Dist.	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Observations	30	29	30	30	30	30	29	30	30

Correlation

The study also included the correlation results before performing regression. The total taxes have negative relationship with gross domestic product but as per correlation analysis the relationship is weakly explained in Azerbaijan context. Moreover, the variable X2 personal income taxes were also having negative moderate relationship with gross domestic product. The income from legal entities is positively associated with gross domestic product but the relationship was weak. Land and property taxes are negatively related with gross domestic product and mining and other taxes are also negatively related. Majority of the tax's variables are negatively associated in Azerbaijan context.

Table 4: Correlation analysis

	Δ^2X_1	ΔX_2	ΔX_3	ΔX_4	ΔX_5	ΔX_8	ΔX_{10}
ΔY_1	-0,04153	-0,4669	0,05901	-0,4828	-0,3745	-0,2755	-0,4944

Step-wise Least Square Regression

After explaining the data with the help of correlation, the study uses the step-wise least square regression to confirm the model. The step-wise regression develops the model by adjusting the issue of multicollinearity. The very important remedy to eliminate the multicollinearity from the model is to add or remove the variables. Below results are based on step-wise least square regression.

Table 5: Stepwise Least Squares Regression Output

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
C	2,56E+09	1,14E+09	2,239164	0,0356
D2X1	-207155,9	299457,7	-0,691770	0,4963
DX4	-5,10E+08	1,92E+08	-2,657813	0,0144
DX3	10496145	3048882	3,442621	0,0023
DX2	-6865072	4767766	-1,439893	0,1640
DX8	-53100690	62353863	-0,851602	0,4036
DX10	-11230985	14455632	-0,776928	0,4455
R-squared	0,587696	Mean dependent var		1,87E+09
Adjusted R-squared	0,475250	S.D. dependent var		7,62E+09
S.E. of regression	5,52E+09	Akaike info criterion		47,90884
Sum squared resid	6,71E+20	Schwarz criterion		48,23888
Log likelihood	-687,6782	Hannan-Quinn criter.		48,01220
F-statistic	5,226456	Durbin-Watson stat		1,394001
Prob(F-statistic)	0,001771			

Selection Summary
Added DX4
Added DX3
Added DX2
Added DX8
Added DX10

*Note: p-values and subsequent tests do not account for stepwise selection.

The step-wise method include all controlling variables one by one to build the strong the model. In the final least square model, the study includes Y_1 dependent with X_1 independent following X_2 , X_3 , X_4 , X_5 , X_8 and X_{10} as controlling variables. Now if we talk about the results of the step-wise regression, the dependent variable X_1 was insignificantly related with gross domestic product in Azerbaijan context. Our variables X_3 and X_4 are significant only with gross domestic product. The model can explain 58.76 percent of population results and step-wise least square model was jointly significant as F-statistics was 5.22 with p-value very low. As per the results of step-wise regression and correlation analysis the taxes did not play any vital role in developing the economic growth in Azerbaijan context.

System Based Ordinary Least Square Regression

After performing the step-wise regression, the study did the analysis by using system-based matrices form regression model which was analyzed by ordinary least square method. The results of this system-based model are as below:

Table 6: System-Based Ordinary Least Squares Regression Output

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1,87E+09	1,44E+09	1,298414	0,1957
C(11)	-69403,56	321324,8	-0,215992	0,8292
C(2)	2,46E+09	1,32E+09	1,858342	0,0646
C(12)	-13829299	5112577	-2,704956	0,0074
C(3)	1,33E+09	1,52E+09	0,879341	0,3803
C(13)	1164415	3013783	0,386363	0,6996
C(4)	2,45E+09	1,32E+09	1,857910	0,0647
C(14)	-3,58E+08	1,31E+08	-2,721601	0,0071
C(5)	2,58E+09	1,45E+09	1,775632	0,0774
C(15)	-87566546	45062305	-1,943233	0,0534

C(8)	2,14E+09	1,46E+09	1,468183	0,1437
C(18)	-77935783	56357489	-1,382882	0,1683
C(10)	2,43E+09	1,30E+09	1,873664	0,0625
C(20)	-38472910	13273156	-2,898550	0,0042
Determinant residual covariance		8,0E+131		

Equation: $(DY1-C(1)-C(11)*D2X1)-(o)$

Observations: 29

S.E. of regression	7,76E+09	Sum squared resid	1,62E+21
Durbin-Watson stat	1,266442		

Equation: $(DY1-C(2)-C(12)*DX2)-(o)$

Observations: 30

S.E. of regression	7,00E+09	Sum squared resid	1,37E+21
Durbin-Watson stat.	1,386940		

Equation: $(DY1-C(3)-C(13)*DX3)-(o)$

Observations: 30

S.E. of regression	7,84E+09	Sum squared resid	1,72E+21
Durbin-Watson stat.	1,215922		

Equation: $(DY1-C(4)-C(14)*DX4)-(o)$

Observations: 30

S.E. of regression	6,99E+09	Sum squared resid	1,37E+21
Durbin-Watson stat.	1,598161		

Equation: $(DY1-C(5)-C(15)*DX5)-(o)$

Observations: 30

S.E. of regression	7,38E+09	Sum squared resid	1,52E+21
Durbin-Watson stat.	1,643262		

Equation: $(DY1-C(8)-C(18)*DX8)-(o)$

Observations: 30

S.E. of regression	7,60E+09	Sum squared resid	1,62E+21
Durbin-Watson stat.	1,383751		

Equation: $(DY1-C(10)-C(20)*DX10)-(o)$

Observations: 30

S.E. of regression	6,89E+09	Sum squared resid	R
Durbin-Watson stat.	1,581598		

As per the above results, the main independent variable of the study is insignificant. Similarly like the step-wise regression, the system-based method also provided the similar results. As the variables X₃, X₄ and X₁₀ are significant. These variables have p-value almost equal to zero.

Conclusion

It is known that one of the most important goals of fiscal policy is the goal of economic growth. In order to achieve the economic growth target, various policies are tried to be formed through public revenues and public expenditures, which are among the fiscal policy tools. Taxes, which are included in public revenues, which are a fiscal policy tool, come to the forefront as the most important financing source in the financing of public expenditures. In the study, the relationship between total tax revenues and economic growth in Azerbaijan in the period of 1991-2021 was examined by considering structural breaks. The study based on explaining role of taxes in economic growth of Azerbaijan. For this purpose the study uses gross domestic product as a indicator for economic growth and total taxes were included as independent variable. Moreover, study also incorporated supporting variables based on brief categories of taxes. Time series data was used from 1991 to 2021 which was based on 31 years. The variables were included in regression analysis after taking the difference. The auto-correlation was addressed with the help of correlogram. The study uses three different methods to test the association between economic growth and taxes. First the study included the correlation, second the study analyses the data with step-wise regression and finally the study uses the system-based ordinary least square method. The results of all methods are almost similar. Taxes have negative or insignificant impact on gross domestic product in Azerbaijan. This may be because the taxation system in the country is not as strong as first world countries. These findings can further be enhanced by incorporating the more data. Arranging tax policies in a way that will increase economic growth, not making concessions on fiscal discipline, ensuring economic growth, and making tax revenues more qualified and stable without disturbing other macroeconomic balances are also presented as a policy proposal. ■

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