Impact of Taxation on Economic Growth: Empirical Evidence from Pakistan

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ABSTRACT

Purpose: Governments rely on taxes, but a high tax rate can slow economic growth. Fiscal policy objectives can be achieved most effectively by lowering tax collection costs and boosting economic growth through efficient taxation. This study aims to find the impact of tax revenue on Pakistan's economic growth.

Design/Methodology/Approach: The time series dataset spanning 1985–2021 is used for the current analysis. GDP is used as the dependent variable, while tax revenue and other fiscal policy variables like government spending, inflation, gross fixed capital formation and current account balance are used as the explanatory variables. The stationarity of the data is checked using the ADF test. The results of the ARDL bound test, which is used to determine whether there is a long-term link between the variables and a short-term relationship, indicate a long-term relationship.

Findings: Current analysis reveals that tax revenue and inflation have a negative and significant impact while government expenditures and gross fixed capital formation have a positive and significant impact on the economic growth of Pakistan.

Implications/Originality/Value: According to the study's results, Pakistan's government should ensure that tax rates are set at the right level to bring in enough money to pay for government spending that helps the economy grow.

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Introduction
Modern tax policies aim to accomplish a wide range of policy goals. Income redistribution,
stabilization of the economy, and the elimination of externalities are all goals of taxation. At the same time, taxation should be helpful to economic progress. Fiscal policy objectives (allocation, redistribution, and stabilization) can be achieved most effectively by lowering tax collection costs and boosting economic growth through efficient taxation. Economic growth and fiscal consolidation can only be achieved if taxation is efficient and the tax structure is well-designed (Stoilova & Patonov, 2013).

A tax is a financial burden imposed on people or property owners in order to fund the government. According to the legislative authorities, taxation—also called toll, duty, or custom; excise; subsidies; aid; and supply—is imposed government contribution rather than a voluntary payment or donation. A country's tax system often reflects the values of the country's people or the values of those in power. An effective tax system necessitates decisions about how taxes are collected and distributed and how the money is spent. If elected officials set tax policy in a democracy, their choices show what kind of society the people want to live in.

There are distortions created by taxation (apart from lump-sum taxes), and these distortions have a detrimental impact on economic growth. There are three ways that taxation affects growth: Physical capital comes first, followed by human capital and total factor productivity. Corporate and individual income taxes are reportedly the most detrimental to growth, while consumption, environment, and property taxes are less negative (OECD, 2016). Taxes can raise the cost of capital and make it less appealing to investors. High taxes discourage investments, hurting economic progress (Ferede & Dahlby, 2012). Taxes have a significant impact when it comes to saving, labour, and human capital. Rather than engaging in higher-taxed activities, people choose to do so instead in lower-taxed ones. The fundamental reason is that high tax rates encourage people to cut back on their work hours, engage in less productive economic activity, or even leave the workforce altogether, all of which decrease economic growth (Poulson & Kaplan, 2008).

Optimal fiscal policy plays a vital role in Pakistan, like other developing countries and is thus used as an important tool for economic development and growth. Analyzing the role of fiscal policy in the long-run strength of the economy is still not properly defined, and therefore, it needs lots of investigation. In the conventional model, when government decreases taxes without corresponding changes in its expenditures, it increases personal disposable income, due to which consumption and interest earnings will increase. In contrast, it has been thoroughly explained in the Ricardian Equivalence Theorem (RET) that a reduction in taxes without a corresponding reduction in government expenditures does not affect the economy in the same way as mentioned.
above. We can say that macroeconomic outcomes have nothing to do with the reduction in taxes (Saxton, 1999).

This prompted numerous studies to examine whether a long-term relationship exists between taxation and economic growth. The majority of studies found a negative correlation between the two variables. Consumers' purchasing power will be reduced as taxes rise, resulting in a downward trend in demand. In addition, manufacturers will provide less, causing a shift backwards in supply. Total output will be reduced (Mdanat et al., 2018). On the other hand, taxation was found in numerous studies to have a favorable impact on output (Babatunde, Ibukun, & Oyeyemi, 2017; Ocran, 2011; Tosun & Abizadeh, 2005).

Many macroeconomic variables are responsible for changes in economic growth and affect the economic indicators of a country. Therefore one cannot easily confine the effect of these variables in a single study. Therefore, this study investigates the variations brought by tax revenue, government expenditure, inflation, gross fixed capital formation and current account balance in economic growth. This study consists of four sections: section 2 provides the literature, section 3 provides the methods, and section 4 contains the study's findings and comments, while section 5 includes the conclusion and policy recommendations.

**Literature Review**

A significant number of researchers have investigated the relationship between tax burdens and economic growth in different countries (Babatunde & Ibukun, 2016; Baiardi, Profeta, Puglisi, & Scabrosetti, 2019; Neog & Gaur, 2020; Padda & Akram, 2009). The inverse relationship between the taxes and economic growth rate is due to a) high tax rate discourages work efforts and reduces the tax revenue, b) mobilizes the citizens from high tax rate countries to lower-tax countries c) marginal tax rates also distort price signals. As a result, foreign investors cannot relocate to a country with a high tax rate because they will not be able to maximize their profits (Al-tarawneh, Khataybeh, & Alkhawaldeh, 2020; Mdanat et al., 2018). In order to take advantage of the low tax rates and strong investment opportunities, local investors will begin to invest abroad. As a result, the burden of taxation and structure is crucial for economic development (Stoilova, 2017).

Every country collects revenue differently. Some countries raise taxes, while others don't change their taxation laws. Increasing government revenue through any means hampers economic progress (Engen & Skinner, 1996). The foundational ideas of the endogenous growth theory were presented by Solow (1956) and Swan (1956). In the exogenous growth model, tax policies only have a short-term impact on economic growth; however, this influence is permanent in the endogenous growth model. Ahmad, Sial, and Ahmad (2018) explored the real tax revenue and economic growth correlation in Pakistan. They used time-series data set from 1974 to 2010 and applied the ARDL bounds approach for co-integration analysis. They found that total tax revenue adversely affects economic growth. If the total taxes increases by 1%, it will decrease economic growth by 1.25%.

In addition, Alkasasbeha, Haron, and Abueid (2018) investigated the impact of taxes and spending by the government on the growth of the economy in Jordan. They used an ARDL model for the analysis and confirmed a positive association between taxation and expenditure with growth. Babatunde et al. (2017) investigated the impact of taxes on the growth of the African economy. According to the findings, the total amount of tax revenue has a positive effect on GDP and helps to encourage economic growth in Africa. Using a pooled panel of data, Stoilova (2017) studied the relationship between tax policy and economic expansion in 28 European nations. The relationship between taxation and economic growth was the main topic of this study. According to the findings of the study, certain tax rates have a beneficial effect on economic development.
Ahmad, Ahmad, and Yasmeen (2013) empirically analyzed how much the tax impacts the economic growth of Pakistan by using time series data from 1976 to 2011. ARDL method is used for estimation. GDP is considered a dependent variable, while other factors like life expectancy, trade liberalization, and exchange rate are considered explanatory variables. The result shows that economic growth is positively impacted by life expectancy, trade liberalization, and exchange rate. Larissa-Margareta, Ramona-Anca, and Loan (2012) claim a negative correlation between taxes and government spending due to increased taxable income. According to the author's research, there is a negative correlation between corporate profits and economic development in 25 OECD nations from 1975 to 2011. Higher tax rates are bad for the economy. On the other hand, lower tax rates are essential to the country's economic growth since they create funds that may be used to increase productivity.

Ferede and Dahlby (2012) studied ten Canadian provinces using data from 1977-2006. They found that there is a link between a country's tax rate and its economic growth. They argue that higher taxes on corporate profits limit economic growth. Economic growth can be boosted by a reduction in taxes, and the opposite is also true. Taxes influence economic growth in two ways, increases in overall factor productivity and the accumulation of factors. Investors are put off by higher tax rates, which has a negative impact on the country's economy. Taxes reduce the efficiency of resource allocation, which in turn affects the efficiency of production components. Whether or not taxes affect economic development and income distribution is a hotly debated topic. The equal distribution of income is favored by progressive taxation (Clark & Lawson, 2008).

Mashkoor, Yahya, and Ali (2010) use a time-series dataset to investigate the relationship between Pakistan's economic development and tax income from 1973 to 2008. Tax policy is an essential part of any country's economic strategy. Investment suffers when taxes are raised. Bad policies hurt the economy's productivity by limiting investment in new ideas and technologies. People and organizations will devote more time and resources to R&D if the tax rate is reduced. Paying more in taxes reduces economic growth because it reduces incentives to work. Koester and Kormendi (1989) and Padovano and Galli (2001) examined that there is no significant association between taxes and economic growth. Additionally, Dowrick (1993) and Leibfritz, Thornton, and Bibbee (1997) found that taxation has a detrimental impact on economic growth.

Even though most of the theoretical literature says that taxes hurt economic growth, the results of empirical studies are mixed. So, no one can agree that taxes and economic growth are related because the relationship between these two things is not clear. So, this study uses the ARDL method to examine how the two variables are linked in Pakistan.

**Data and Methodology**

The current study examines the effect of tax income on economic growth in Pakistan was calculated using annual data from 1985 to 2021. All variables' data has been gathered from the World Development Indicators (WDI) except the tax revenue, and its data are taken from the Economic Survey of Pakistan. The present study considers GDP as a dependent variable, tax revenue as an independent variable, and others are control variables. Table 1 describes the measurements of the variables. The following model examines the correlation between tax revenue and economic growth.

\[
GDP = f(TAX, GEXP, INF, GFCF, CAB)
\]  

(1)

In econometric form, equation 1 can be written as:

\[
GDP_t = \beta_0 + \beta_1 TAX_t + \beta_2 GEXP_t + \beta_3 INF_t + \beta_4 GFCF_t + \beta_5 CAB_t + \varepsilon_t
\]  

(2)
Table 1: Description of the Variables

| Abbreviation | Variable Name               | Measurement                              |
|--------------|-----------------------------|------------------------------------------|
| GDP          | Economic Growth             | GDP per capita growth (annual %)         |
| TAX          | Tax Revenue                 | % of GDP                                 |
| GEXP         | Government Expenditures     | % of GDP                                 |
| INF          | Inflation                   | Consumer prices (annual %)               |
| GFCF         | Gross fixed capital formation | % of GDP                               |
| CAB          | Current account balance     | % of GDP                                 |

This study used the Autoregressive Distributed-Lag Model (ARDL) for the analysis introduced by Pesaran and Shin (1998). If the variables are stationary at level and first difference, this strategy should be used. The two most important assumption for ARDL approach is that the depended variables must be at the level and independent will be at I(1), and none of the variables is at I(2). This criterion is verified by applying the ADF test where the results are provided in table 3. ARDL is a unique technique that gives many advantages. The ARDL approach can be appropriately applied to a small sample size. Secondly, it is not necessary for ARDL that all variables are in the same order. ARDL simultaneously analyses the long and short-run relationship. If the variable is 2nd difference order the model is crashed. It also takes lag values of the variables during estimation so with these advantages the serial correlation of error problem is eliminated by lags. In the last ARDL the endogeneity problem does not exist so all the estimation is unbiased and reliable.

Two steps are involved in the implementation of this method. The first step in determining the long-term relationship between two variables is to determine whether they are stationary or non-stationary. The Augmented Dickey-Fuller (ADF) test examines non-stationarity on the level and in the first difference. Secondly, use the bound test to see if co-integration is present between the dependent and independent variables. The null hypothesis of the test is the absence of a correlation between the variables. A calculated F test provides two bounds based on two different assumptions about the co-integration of the model variables. The null hypothesis is rejected if the estimated F exceeds the upper critical limit, which means that the variables are co-integrated. Assuming the long-term link exists, we can next estimate the long- and short-term coefficients.

Empirical Analysis and Results
This section includes descriptive statistics, stationarity tests, and a bound test for long-term relationships among the variables. The results from these exercises demonstrate co-integration between GDP, tax revenue and other explanatory variables.
Descriptive Statistics
Descriptive statistics summary is used to examine the most fundamental aspects of a subject. This statistical summary comprises all the information from the sample. Descriptive statistics are crucial because it is quite difficult to understand the trend and characteristics of raw data. Descriptive statistics provides a clear picture of the data. Table 2 shows the descriptive statistics of all the selected variables in the model. Particularly this table provides the mean, minimum, maximum, standard deviation, skewness, and kurtosis of all the variables.

| Variable | Mean | Minimum | Maximum | Std. Dev. | Skewness | Kurtosis | Observations |
|----------|------|---------|---------|-----------|----------|----------|--------------|
| GDP      | 1.804919 | -3.262355 | 5.095223 | 1.909991 | -0.459437 | 2.923244 | 37           |
| TAX      | 10.85000 | 8.400000 | 14.40000 | 2.144955 | 0.380510 | 0.380510 | 37           |
| GEXP     | 11.15082 | 7.346709 | 16.78491 | 2.181992 | 0.426044 | 0.426044 | 37           |
| INF      | 8.162562 | 2.529328 | 20.28612 | 3.827830 | 0.676154 | 0.676154 | 37           |
| GFCF     | 15.68192 | 12.52063 | 19.11229 | 1.778324 | -0.070338 | -0.070338 | 37           |
| CAB      | -2.569881 | -9.204316 | 4.823228 | 4.725825 | 2.725825 | 2.725825 | 37           |

Source: Author’s calculation

Unit Root Test
Using Eviews software, the Augmented Dickey-Fuller (ADF) test is used to determine whether variables are stationary. It is essential to test the stationarity because if we use the non-stationary data the output of the estimation is invalid. Usually, by taking the first difference the variables become stationary. After making the variables stationary, the Bound test, and ARDL can be run without yielding spurious conclusions. The findings of the Augmented Dickey-Fuller (ADF) test are presented in Table 3, where only GDP, inflation, and gross fixed capital formation are integrated at a level, while tax revenue, government expenditure, and current account balance are integrated at 1st difference. Therefore whenever the variables are the mixture of I(0) and I(1) then ARDL method is preferred.

| Variable | Level | 1st Difference | Decision |
|----------|-------|----------------|----------|
| GDP      | -4.467600* | -6.382830* | I(0)     |
| TAX      | -2.506624 | -7.082760* | I(1)     |
| GEXP     | -1.522571 | -5.017956* | I(1)     |
| INF      | -4.481899* | -4.147238* | I(0)     |
| GFCF     | -4.016557* | -5.289520* | I(0)     |
| CAB      | -2.658950 | -5.549028* | I(1)     |

Note: * indicates 5% level of significance. Source: Authors’ calculation

Bound Test
The bound test shows how the explanatory variable and the dependent variable are related in the long run. There is a long-term or short-term association if the F-statistics value is greater than or equal to the upper or lower bounds, respectively. Similarly, if the F-statistic value falls within the upper and lower bounds, then the F-statistic is pointless. The bound test results are shown in table 4. The F-statistic is found to be statistically significant and higher than the upper bound critical value. As a result, it can be inferred that the two variables have a long-term association.

| Test statistic | Value | Level of Significance | Lower Bound | Upper Bound |
|----------------|-------|-----------------------|--------------|-------------|
| F-statistic    | 6.283785 | 10%                   | 2.26         | 3.35        |
| K              | 5     | 5%                    | 2.62         | 3.79        |
|                |       | 2.5%                  | 2.96         | 4.18        |
|                |       | 1%                    | 3.41         | 4.68        |
Optimal lag selection
For minimizing the residual correlation the optimal lag selection criteria are utilized. In particular, the degree of lag duration is achieved from vector autoregressive (VAR) through Akaike Information Criteria (AIC), Hannah-Quinn Information Criteria (HQ), and Schwartz Information Criteria (SC). The rule of thumb is to select the criteria that have the lowest value. Because the lower the value, the better the model. The results are shown in table 5. The AIC has the lowest value that is 21.03916. Thus the optimal lag length for the model is 2 and the best criterion adopted for the model is AIC.

| Lag | AIC      | SC      | HQ       |
|-----|----------|---------|----------|
| 0   | 25.24749 | 25.51412| 25.33953 |
| 1   | 21.08357 | 22.94999*| 21.72786*|
| 2   | 21.03916*| 24.50537| 22.23570|

Source: Author’s calculation

Results of ARDL Model
This study utilized the ARDL model recommended by Pesaran, Shin, and Smith (2001) to analyze the impact of tax revenue and other control variables on economic growth in Pakistan. The upper part of table 6 shows the short run results. The findings indicate a short-term, significant negative correlation between tax revenue and economic growth (Al-tarawneh et al., 2020). Short-term results show that both government spending and gross fixed capital formation have a significant and positive effect on economic growth. While inflation and current account balance have significant and negative impact on economic growth in short run. The value of ECM is -0.696390 and significant. This demonstrates that the variables have a long-term relationship. This study also demonstrates that each year, a 69.6% adjustment is made to the short run deviations from long run equilibrium.

| Variable  | Coefficient | Std. Error | t-Statistic | Prob.  |
|-----------|-------------|------------|-------------|-------|
| D(GDP(-1))| 0.374931    | 0.201071   | 1.864672    | 0.0740|
| D(TAX)    | -0.548184   | 0.257785   | -2.126511   | 0.0435|
| D(GEXP)   | 0.415504    | 0.191478   | 2.169979    | 0.0397|
| D(INF)    | -0.230001   | 0.087527   | -2.627771   | 0.0145|
| D(GFCF)   | 0.584069    | 0.263732   | 2.14633    | 0.0361|
| D(CAB)    | -0.403822   | 0.131575   | -3.069144   | 0.0051|
| D(CAB(-1))| -0.448626   | 0.141763   | -3.164612   | 0.0041|
| Coint Eq(-1)| -0.696390 | 0.282771   | -5.999169   | 0.0000|

Source: Author’s calculation

The lower part of table 6 shows the ARDL long run results. The results shows that tax revenue has a negative and significant impact on economic growth in long run (Al-tarawneh et al., 2020). Which means one percent increase in tax revenue decrease economic growth by 0.32 percent. Since investors avoid doing business in an atmosphere where taxes are high, this has a negative impact. Economic growth is sluggish as a result of this. The result is consistent with the findings of (Ahmad et al., 2018; Ferede & Dahlby, 2012; Larissa-Margareta et al., 2012; Mdanat et al.,
2018) as they found a negative impact of tax revenue on economic growth but inconsistent with the findings of (Alkasasbeha et al., 2018; Babatunde et al., 2017) as they found a positive impact of tax revenue on economic growth. Government spending has been demonstrated to have a favorable and significant association with economic growth in particular. The GDP will grow by 0.24 percent if the government spends 1% more (Chandio, Jiang, Rehman, & Jingdong, 2016; Udoh, 2011). Growth in the economy suffers as a result of a current account deficit. The results indicate that current account balance has a positive and insignificant impact on economic growth. According to the findings, inflation has a detrimental and considerable impact on Pakistan's economic growth. Demand declines and production costs rise as a result of inflation, which negatively impacts economic growth (Ayyoub, Chaudhry, & Farooq, 2011; Faria & Carneiro, 2001). The results also show that the amount of gross fixed capital formation in Pakistan has a significant and positive effect on economic growth. Therefore, a 1% increase in gross fixed capital formation results in a 0.34% rise in economic growth. The results are consistent with (Ali, 2015; Khadaroo & Seetanah, 2008).

Diagnostic tests

Table 7 represents the diagnostic tests of the model to check for the problem of normality, serial correlation, and heteroskedasticity.

| Test               | Name                                      | F-statistic | Probability |
|--------------------|-------------------------------------------|-------------|-------------|
| Normality          | Jarque-Bera                               | 0.175344    | 0.9160      |
| Serial correlation | Breusch-Pagan-Godfrey LM test             | 0.844399    | 0.3655      |
| Heteroskedasticity | Breusch-Pagan-Godfrey                     | 1.011423    | 0.4478      |

Source: Author’s calculation

The probability value of Jarque-Bera is 0.9160 which is higher than 0.05, it implies that the observations are normally distributed. To test the problem of serial correlation the study uses the Breusch-Pagan-Godfrey LM test the p-value is insignificant at a 1% significant threshold, which means that the residuals are free from the problem of serial correlation. For the presence of heteroskedasticity, the Breusch-Pagan-Godfrey test is used. Since the probability value is greater than 0.10, which means that there is no heteroskedasticity. The estimated model satisfies all dispensable diagnostic tests.

Stability Tests

The stability of long run parameters is examined using CUSUM and CSRQ (CUSUMSQ). Figures 3 and 4 illustrate cumulative residuals. If the test plot is within critical limitations, the null hypothesis cannot be rejected at the 5% level. As long as the test is between the upper and lower critical limits, both short-term and long-term estimates are accurate and useful. This
demonstrates that the model is stable.

**Conclusion**
This study investigates the impact of tax revenue and other macro-economic variables on Pakistan's economic growth. Annual time series data are used in the current study, and the analysis spans the years 1985 to 2021. Information is taken from both the World Development Indicators and the Economic Survey of Pakistan so that the variable data can be put together. Augmented Dickey-Fuller test checks variable stationarity. Results from the unit root test show that GDP, inflation, and gross fixed capital formation are integrated to order zero $I(0)$, while the tax revenue, government expenditures, and current account balance are stationary at the first difference $I(1)$. As the variables have a mixed order of integration. So, the ARDL method is applied for both short-run and long-run results. According to the results of the study, except for the current account balance, each of the variables has a significant impact on the economic growth of Pakistan. Economic growth in Pakistan is negatively and significantly influenced by tax revenue and inflation while being positively and significantly influenced by government expenditures and gross fixed capital formation in the short and long run. Based on the results, it is necessary for the government to keep a close eye on its tax rates. People are less motivated to work when taxes are raised, which leads to a decrease in overall production. A decrease in the tax rate results in an increase in the value of the goods and services produced inside the economy. It is suggested that in order to boost Pakistan's economic growth, it would be crucial to reduce tax rates. The government should ensure tax rates are suitable in order to generate the necessary funds to finance government expenditures that support economic growth.

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