A STUDY OF PAKISTAN'S FISCAL LANDSCAPE: EXAMINING THE INFLUENCE OF INSTITUTIONAL QUALITY AND TAX POLICY TRANSFORMATION

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ABSTRACT

Tax collection is the fundamental pillar of financing public services such as education, healthcare, social welfare programs, and infrastructure, and ensuring economic stability. A high share in tax to GDP shows greater capacity of a government to provide a high living standard. Maintaining a high tax-to-GDP ratio is important to reveal the ability of the government to generate revenue mobilization. The main drive of the paper is to scrutinize the tax reform influence on the tax-to-GDP ratio for the data period covering from 1996 to 2022 in Pakistan. The study employs the ARDL estimation method, which is suggested by the unit root test. Notably, the long-run results show that regulatory quality and government effectiveness depicted a positive influence on the tax to GDP share, suggesting that improvements in these areas can significantly increase revenue collection. Similarly, political stability and the rule of law also play a positive and significant impact on tax to GDP shares, highlighting their vital roles in increasing revenue mobilization and tax voluntary tax compliance. In contrast, inflation appears negative association with tax to GDP ratio, indicating a substantial decline in the revenue mobilization in the total revenue collection. Findings recommend that the government have to focus on enhancing controlling quality, political stability, government efficiency, and the law and order to boost voluntary tax compliance. Additionally, strengthening institutions is vitally important for enforcing tax laws, and guaranteeing a fair and transparent tax mechanism further boosts revenue collection efforts.

INTRODUCTION

Collection of Tax is an important source of revenue for a country. An equitable amount of revenue from tax share in GDP is obligatory for the smooth running of the government system and for raising the living standard (Olufemi et al., 2018). Tax reforms involve cautious changes to a country's tax system, amendments in rates of tax, administration, and improving efficiency and effectiveness. These reforms are carried out to produce an adequate amount of revenue for public expenditures, encourage economic growth, certify justifiable distribution of the tax load, make the collection techniques simple, increase limpidity, and develop overall competence (Brys et al., 2016). They frequently aim for important parts such as tax rates, administration of tax processes, and the overall tax structure for economic development while. Good tax reforms are measured by their effect on revenue generation, economic growth, and income distribution (Sang, 2019).

However, the financial situation of Pakistan has undergone main transformations in recent years, moved by a sequence of tax reforms intended to reshape the nation's revenue organization plans. Since the inception of Pakistan (1947), every government has attempted to improve revenue collection, aiming at enhancing responsiveness, transparency, efficiency, and affordability. More specifically, over the past 32 years, the government has made nine attempts to boost revenue mobilization (Bukhari and Haq, 2020). To achieve this goal, various committees and commissions have

been formed throughout the years, including the Tax Reforms Committee in 1990, the Resources Mobilization and Tax Reforms Commission in 1994, and the Commission of Tax Reforms in 1997. Furthermore, recent reforms initiated in 2001 with the help of the World Bank, as a part of the Poverty Reduction Program (PRP), linked financial assistance from International Financial Institutions (IFIs) to a broad range of structural, financial, and governance reforms (Iqbal, 2014).

Indeed, these reforms covered civil service management, tax administration and compliance, financial management, and procurement, with the objective of poverty reduction (World Bank, 2002; Khan et al., 2023). Specifically, the World Bank-funded Tax Administration Reform Project in 2005 and the Tax Administration Reform Phase II in 2009 have made substantial impacts on revenue structure, equitable distribution of burden, increased transparency, and enhanced efficiency. Succeeding initiatives included the Tax Reform Commission in 2014 and the Revenue and Resource Mobilization Commission in 2022 to cope with the remaining flaws.

Undeniably, Pakistan's average tax-to-GDP ratio during this period was reported at a lower 10 percent to the GDP share. This low contribution creates concerns about the capacity to finance crucial social welfare programs, potentially leading to increased debt-to-GDP share and heightened budgetary borrowing (KC, 2017). The higher tax-to-GDP ratios in developed countries not only signify a more

effective revenue collection system but also provide them with greater fiscal space for social spending. Therefore, as the government is grappling with the dual objectives of boosting tax revenue and achieving fiscal sustainability, the tax-to-GDP ratio emerges as a pivotal element in evaluating the country's fiscal health. This ratio reflects the government's capacity to generate revenue proportionate to the overall economic output, and a higher tax-to-GDP ratio and robust revenue collection system to pace for sustained economic growth and development (Niaz, 2021). This key indicator of revenue collection has consistently remained below desirable levels, underscoring challenges in mobilizing sufficient revenue relative to the economy's size. Initiatives like the Tax Administration Reform Project and various commissions have been implemented, yet enduring issues such as tax evasion, a narrow tax base, and implementation challenges have held up significant enhancements of revenue collection (Iqbal, 2014). The persistent structural issue raises critical concern about the efficiency and impact of undertaken reforms, underlining the necessity for a broad and sustained strategy to find out the core reasons for Pakistan's tax revenue challenges.

Addressing the said issue this study utilizes an extensive dataset, including multiple years, and incorporates various macroeconomic and institutional factors, such as good governance, Controlling Quality, Political Strength and absence of violence, government effectiveness, inflation, Rule of law and Tax to GDP ratio through advanced econometric techniques and statistical models. Despite, multiple reform attempts this study aims to aims to assess the overall changes in the tax-to-GDP ratio and provide valuable perceptions for policymakers and researchers alike.

Figure 1 illustrates the total revenue, expenditure, and development fund allocations within the given financial period. Similarly, Figure 2 presents a breakdown of the 'total tax collection' categorized by various sources and Figure 3 depicts a comparative analysis of revenue and expenditure for the years 2022 and 2023.
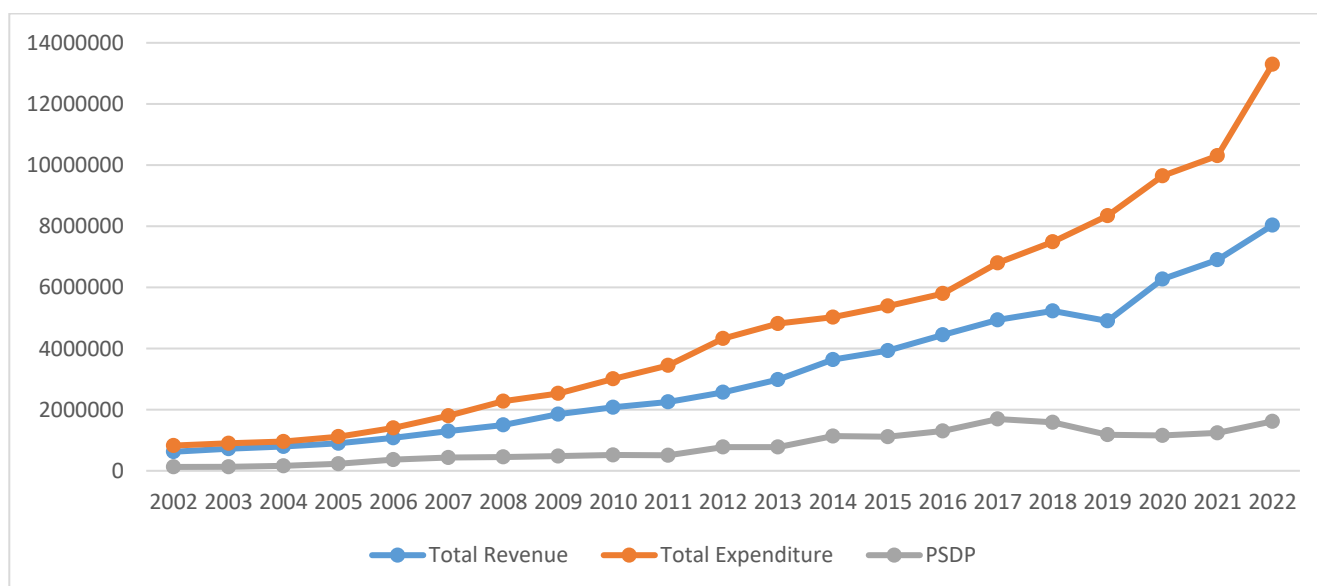

Figure 1. Total revenue, expenditure, and development fund; Source: Economic Survey of Pakistan.

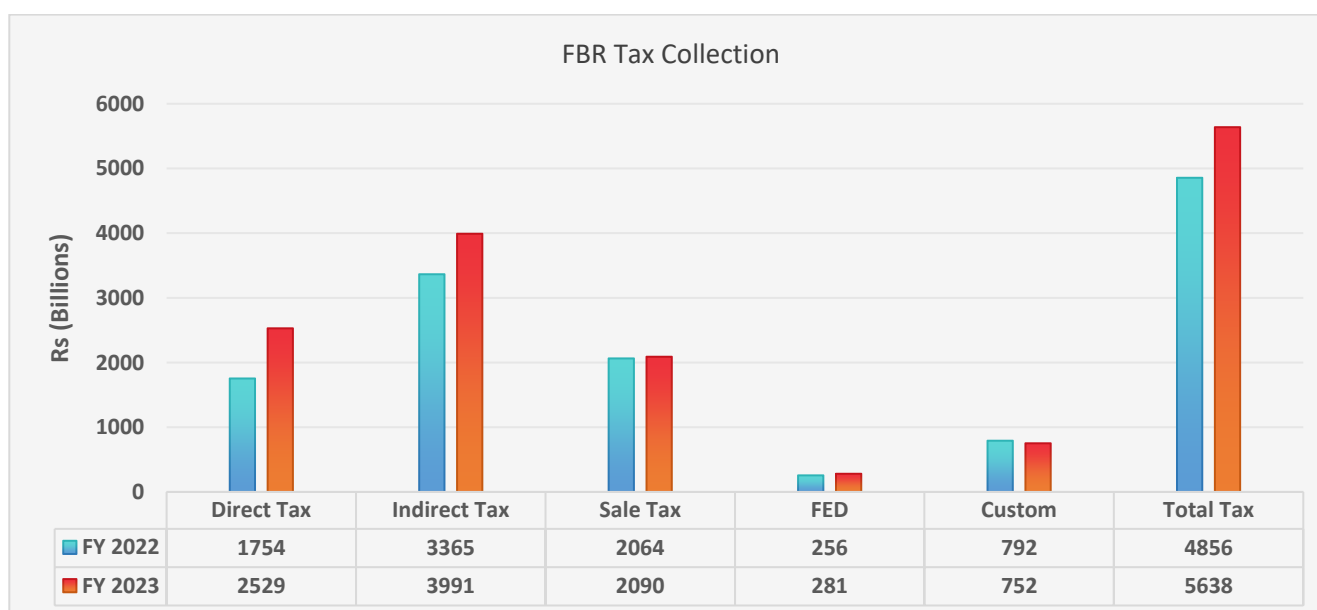|	Direct Tax	Indirect Tax	Sale Tax	FED	Custom	Total Tax
FY 2022	1754	3365	2064	256	792	4856
FY 2023	2529	3991	2090	281	752	5638

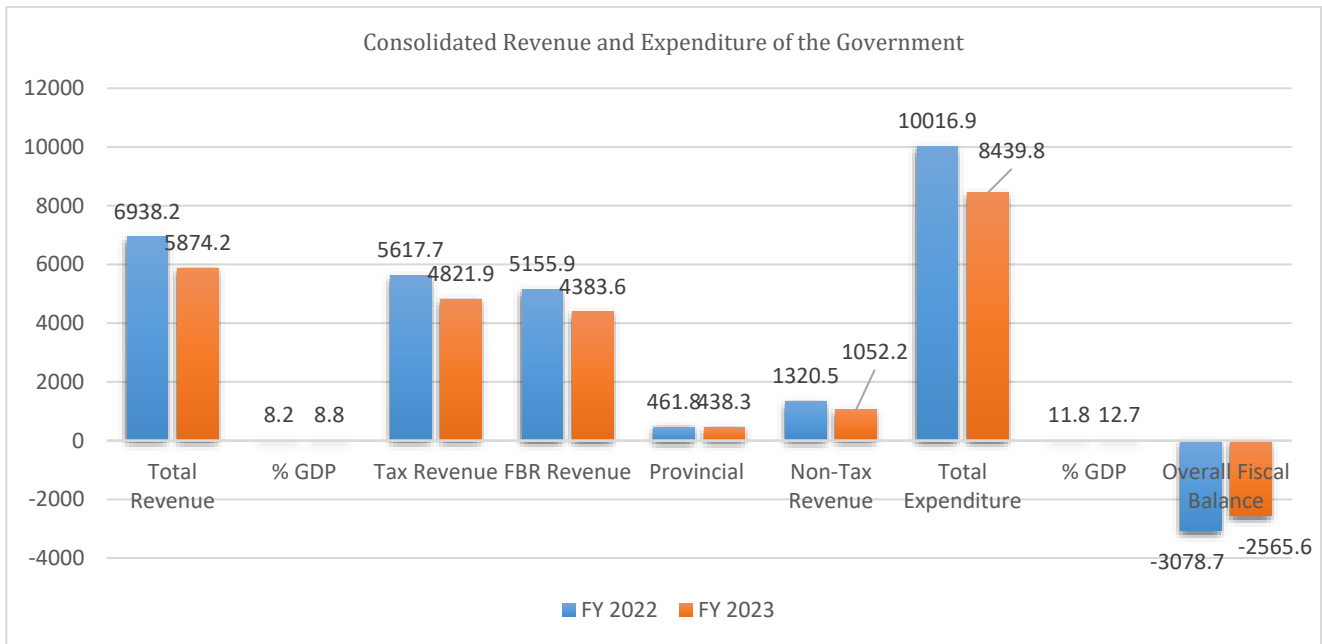Figure 2. Total Tax Collection; Provisional Source: FBR.

Figure 3. Comparison of Revenue and Expenditure; Source: Economic Survey of Pakistan (2023).

This section of the study has observed the existing literature and finds divergent perspectives on the connection between factors of institutional quality and revenue mobilization. The study conducted by Chaudhry and Munir (2010) on Pakistan's tax revenue determinants from 1973 to 2009, utilized an autoregressive model to capture dynamic changes. Results indicate that the agriculture sector negatively impacts the tax and GDP ratio, while factors like openness, overseas support, external liability, broad money and stability positively influence tax income. Similarly, Addison and Levin (2012) analyzed 39 countries from 1980 to 2005 to inspect the causes of total tax revenue and tax organization using using two-step GMM regression estimation technique. The study found that the agriculture sector adversely affects the total tax income-GDP segment. While GDP PC and urbanization are positively connected to the tax revenue-to-GDP share for indirect tax income collection. However, the scale of foreign support adversely impacts the direct tax collection to the GDP share. Recently, Shakeel et al. (2023) studied the effect of Tax Reform on development in the context of Pakistan, utilizing the data spanning from 1978 to 2011. The study used the ADF test to assess the stationarity of the variables under consideration. The analysis utilizes the ARDL approach to check both short-run and long-run relationships in the variables. A significant adverse impact of tax reform on economic growth is indicated in both. Conversely, FDI exhibits a positive as well as a significant influence on economic growth. Import, while displaying a positive and insignificant effect in the short period, demonstrates a negative but significant impact on economic growth in the long run. Furthermore, the literacy rate is found to be an insignificant determinant of economic growth.

In contrast, Ahmed and Talpur (2016) noted that tax policy is a crucial determinant of inclusive growth, income distribution, and wealth redistribution. In the Pakistani context, the limited impact of taxes on income distribution, particularly for the poorest quintile, stems from a narrow tax base. This paper delves into a significant case where despite the private sector experiencing anticipated profits, the resulting income increase has failed to bring about progressive changes in tax contributions. The study also sheds light on the inadequate capabilities of the tax administrative machinery to combat evasion. Furthermore, it explores how a distortion tax policy acts as a barrier to the entry of new firms and investments, impeding competition and hindering the enhancement of consumer surplus. Examining the economic landscape since 2007, the research uncovers challenges such as low investment levels, sluggish private sector credit growth, and declining exports, despite preferential market access. The study suggests that the corporate tax structure may contribute to cartel, a view supported by insights from the tax directory and discussions with key stakeholders. Drawing on these findings, the paper puts forth recommendations for corporate taxation reform in Pakistan.

Similarly, Castanheira et al. (2012) provide a comprehensive exploration of the political economics writings about individual income tax reforms. The study examines the part of political restrictions and inducements as the primary source of tax reforms. The study identified labor tax reforms in the European Union between 2000 and 2007; the findings focus on the main effect of political variables over economic attention in driving tax reforms. This literature provides important practical evidence for the understanding of the complicated interaction between political dynamics, economic factors, and tax reform consequences. In contrast, Audi et al. (2021) find that a tax system is important for economic well-being and development. The evaluation emphasizes on tax importance of South Asian countries, taking the data from 1990 to 2019. The findings include significant buoyancy for income tax, sales tax, and total tax revenue, indicating a positive association with economic progress. Excise duty and customs duty display positive but insignificant coefficients, proposing the need for policy adjustments. The study suggests improving the overall tax system and emphasizes the encouragement of customs duties and excise duties by international institutions. In summary, the paper highlights the significance of a balanced tax structure for economic development in the SAARC region. On the other hand, Milwood (2011) assessed Jamaica's tax system for the data period March 1998 to December 2010 by estimating the impact of discretionary changes on elasticity and buoyancy. The findings indicate a total tax progression rate of 3.39.

Iqbal (2014) investigated the major flaws in Pakistan's public sector (PS) despite a series of reforms initiated under various

projects. The research aims to understand why these reforms have had limited impact, addressing questions about their effects on PS organizations and exploring intended and unintended consequences. The study used a qualitative case study approach. The research employs a social constructionist perspective and ethnographic methods for this analysis. The findings of the study reveal that prevalent corrupt practices, such as nepotism and favoritism, hindered the desired outcomes of efficiency and transparency in the field of revenue collection. In contrast, Hassan et al. (2021) studied the connection between governance and revenue from tax in Pakistan taking the period from 1976 to 2019. The governance, described by stability, law and order, and conflict resolution, is explored as a vital determinant of tax revenue collection. This article used the Autoregressive Distributive Lag technique. The findings revealed the significant as well as a positive influence of governance factors on tax revenue suggesting that better-quality governance adds to improved revenue collection in Pakistan. activities as strategic measures for fostering improved tax revenue collection in Pakistan. The study suggests valuable intuitions for policymakers to reinforce the fiscal landscape and improve economic activities and revenue mobilization

Another study done by Mughal (2012) on tax evasion poses important challenges to the government. This paper focuses on separating the complexities of tax avoidance and evasion in the context of Pakistan. The results confirm the strength of all study variables related to the reasons for tax evasion in Pakistan. Moreover, the study reveals an extremely significant as well as positive relationship among individual variables, underscoring the interconnected nature of these issues. The findings on tax behavior, provide a nuanced understanding that can inform policy interventions and strategies to mitigate tax avoidance and evasion in Pakistan. Other scholars who have worked on the subject are Arshed et al. (2022), Huang et al. (2023), Shabeer et al. (2024), Shabeer (2022), Shabeer et al. (2021a, 2021b), Shabeer and Rasul (2024a, 2024b), Wang et al. (2023), Abedeen et al. (2024), and Zubair et al. (2023).

METHODOLOGY
Data
Every government relies on revenues to fund various essential expenditures such as defense, healthiness, learning, structure, transfer payments, and grants. A well-organized taxation system is crucial for revenue generation and to finance these expenditures. In this study, an efficient taxation system is assessed through institutional factors like tax regulatory quality, political stability, government effectiveness, tax GDP ratio, rule of law, and inflation for the data period 1996 to 2022. The data for this study is sourced from reputable outlets such as the Economic Survey of Pakistan and World Development Indicators.

Justification of Variables
The data for tax to GDP is a dependent variable in the model that can explain an increase in the tax/GDP ratio pointing out that the government is collecting a higher proportion of its revenue relative to the overall economic output or Gross Domestic Product (GDP). On the other hand, independent variables can be explained as Tax Reforms are all the struggles and efforts taken for the improvement of tax income collection of a state is tax reforms. Controlling quality examines the efficiency of rules. Political stability is another independent variable, that measures the level of political discontent and political issues on tax collection. Government efficiency is an important sign that measures the competence of community management, reflecting

the government's capacity to implement and enforce tax policies. The rule of law, as an independent variable, evaluates the strength of legal frameworks, playing a significant role in shaping the business environment and influencing tax compliance. Lastly, Inflation (GDP deflator annual %) takes the average change in the prices of all goods and services produced within a country, reflecting the inflationary or deflationary trends in the economy relative to its Gross Domestic Product (GDP). This set of independent variables collectively offers a distinction and multifaceted examination of governance, economic stability, and fiscal policies, contributing to a comprehensive understanding of their potential interconnectedness with the tax/GDP ratio.

Model
Functional and econometric model
The function of the variables takes the following form:

$$TGR = f(GG, RQ, PS, GE, RL, INFL) \qquad (1)$$

Where, GTR represents the dependent variable, and f () denotes the functional form, representing the connection between GDP and the independent variables.

The goal is to estimate the coefficients of the said variables on tax to GDP share; we need an econometrics model, which can be written as follows:

$$TGR_{it} = \beta_o + \beta_1 RQ_{it} + \beta_2 PS_{it} + \beta_3 GE_{it} + \beta_4 RL_{it} + \beta_5 Inf_{it} + \varepsilon_{it} \qquad (2)$$

Where, Tax-GDP-ration shows the dependent variable and the other independent variables, including RQ are regulatory quality, PS is political stability, GE is government effectiveness, RL is rule of law and finally, Inf is inflation. While β_0 to β_6 are the coefficients to be estimated in this study and the ε_t represents the error term capturing unobserved factors' influence. Additionally, in time series data analysis the first step is to pursue stationary of the data, to choose an appropriate estimation technique for a data set. For this purpose, a unit root test is used.

The Autoregressive Distributed Lag (ARDL) model
The ARDL co-integration technique is used to study the short-term and long-run connection amid the concerned variables by including lagged values of the dependent variable to assess the impact of past values of the dependent variable, thereby capturing any long-run relationship that may exist (Gul et al., 2023). The ARDL model is written as follows:

$$\Delta \ln T_{it} = \beta_0 + \sum_{i=1}^{n1} \beta_1 \Delta \ln GTR_{t-i} + \sum_{i=1}^{n2} \beta_2 \Delta \ln R Q_{t-i} \sum_{i=1}^{n3} \beta_3 \Delta \ln P S_{t-i} + \sum_{i=1}^{n4} \beta_4 \Delta \ln G E_{t-i} + \sum_{i=1}^{n5} \beta_5 \Delta \ln R L_{t-1} + \sum_{i=1}^{n6} \beta_6 \Delta \ln I NF_{t-1} + \alpha_1 TGR_{t-1} + \alpha_2 \ln R Q_{t-1} + \alpha_3 \ln P S_{t-1} + \alpha_4 \ln G E_{t-1} + \alpha_5 \ln R L_{t-1} + \alpha_6 \ln I NF_{t-1} + \varepsilon_t \qquad (3)$$

Where:
$\Delta \ln$ Tax-GDP-t represents the first difference of the log of GDP at time t, showing the short-run changes in GDP. While $\Delta \ln$ RQ t-i, $\Delta \ln$ PS t-i, $\Delta \ln$ GE t-i, $\Delta \ln$ RL t-i, and $\Delta \ln$ INF t-i, revealed the first differences of the log. Whereas β0 is the intercept, and β_i (for i = 1 to n) are the coefficients representing the short-run impacts of the changes in the independent variables on Tax-GDP. Moreover, the study pursues the Error Correction Term to know the long-run adjustment.

Error Correction Model (ECM)
It is an econometric technique used to estimate the link between two or more variables that share a long-term equilibrium association. The term "error correction" pertains to the extent to which the current point corrects the past disequilibrium, aiming to restore balance (Khan et al., 2023). The ECT value must exhibit both statistical significance and a negative sign. The ECM model includes the first differences of the variables to assess the short-run change toward the long-run equilibrium adjustment. The ECM model is as follows:

$$\ln Tax - GDP_{t-1} = \beta_0 + \sum_{i=1}^n \beta_i \Delta \ln RQ_{t-1} + \\ \sum_{t=1}^n \beta_i \Delta \ln PS_{t-1} + \sum_{i=1}^n \beta_i B \ln GE_{t-1} + \\ \sum_{i=1}^n \beta_i \Delta \ln RL_{t-1} + \sum_{i=1}^n \beta_i \Delta \ln INF_{t-1} + \\ \gamma ECM_{t-1} + \varepsilon_t \qquad (4)$$

Where:
ECM_{t-1} is the lag value of ECT, which captures the deviation from the long-term equilibrium and γ is the coefficient of the ECT, indicating how quickly the variables adjust. The ECM provides insights into both short-term dynamics and long-term associations between Tax-GDP and independent variables in the model. Moreover, to validate the model's results, it is essential to conduct some diagnostic tests.

Unit Root Test
A unit root implies a trend in the time series, where the variance and mean are not constant over time. It assesses whether the series exhibits stationary (unit root) or not. There are many tests such as ADF, KPSS, and ERS, to be used for this purpose but the most widely used is the unit root test. Based on the Unit root test, it is justified that our variables are in mixed order hence ARDL estimation method is appropriate in this data analysis (Khan et al., 2023).

Diagnostic Tests
Diagnostic tests are an important part of econometric analysis. They help to know the validity of the model assumptions and evaluate the reliability of the estimated model. Here are some commonly used diagnostic tests for analysis, as given below:

Normality Test: For the normality of residuals often use the Jarque-Bera test. This test observes whether the residuals follow a normal distribution or not. Departures from normality may indicate model misspecification of the assumptions.

Heteroscedasticity test: Heteroscedasticity refers to the presence of non-constant variance in the residuals. This can be assessed using the Breusch-Pagan test.

Autocorrelation: Autocorrelation occurs when the residuals are correlated with each other over time. This issue is being detected by using the Breusch-Godfrey test in this study.

Stability Test: To test for stability, the study employs the CUSUM test to examine whether there are structural breaks in the model parameters. These are a few diagnostic tests commonly used in econometrics. The specific tests to be applied may depend on the features of the data and the assumptions of the specific model.

RESULTS AND DISCUSSION
Results obtained from the previously mentioned methods are presented and discussed in this section. Table 1 of descriptive statistics gives a brief overview of the said variables. The mean values provide a central tendency measure, showing distinctive levels observed across the dataset. Specifically, the average value is 2.25, suggesting the average proportion of tax revenue relative to GDP. The median is the middle point of the dataset and provides insights into the central tendencies. For instance, the median PS is 0.244295 indicates the middle value of the stability measurement. The range values between the minimum and maximum values tell about the spreadness in the dataset. Similarly, standard deviation measures the dispersion of values around the mean, with higher values representing greater variability in the dataset. Skewness assesses the symmetry of the distribution, with positive values indicating right-skewed distributions while Kurtosis measures the degree of peakedness or flatness with higher values showing heavier tails or more extreme values. These descriptive statistics jointly provide valuable insights into the distributional properties and central tendencies.

Table 1. Descriptive statistics.

Statistics	TGR	PS	RQ	RL	GE	INFL
Mean	2.254	0.265	0.211	0.166	0.206	0.144
Median	2.219	0.244	0.186	0.156	0.201	0.211
Maximum	2.565	0.374	0.333	0.221	0.246	1.835
Minimum	2.128	0.196	0.156	0.133	0.174	8.382
St. Dev.	0.110	0.054	0.057	0.026	0.020	0.051
Skew	1.307	0.681	1.206	0.814	0.477	-0.093
Kurtosis	4.021	2.108	2.847	2.414	2.466	1.772
Jarque-Bera	8.864	2.986	6.573	3.371	1.347	1.735
Probability	0.012	0.225	0.037	0.185	0.510	0.420
Sum	60.872	7.151	5.690	4.488	5.570	13.898

Table 2. Correlation.

Correlation	TGR	PS	RQ	RL	GE	INFL
TGR	1					
PS	0.7616	1				
RQ	0.8304	0.8680	1			
RL	0.7914	0.8784	0.8965	1		
GE	-0.0388	-0.0284	0.2660	0.0814	1	
INFL	-0.6863	-0.9016	-0.71578	-0.7627	0.3415	1

Table 2 depicts the summary of the correlation matrix. Notably, the tax-to-GDP ratio shows a strong positive relation with PS having a value of 0.7616, RQ 0.8304, and RL (0.7914), showing that higher tax-to-GDP share reveals the stability of fiscal development. Conversely, inflation shows negative correlations with PS having a value (-0.9016), RQ (-0.7158), and RL (-0.7627), signifying that higher inflation rates show lower levels of stability and regulatory effectiveness. While GE represents only reasonable correlations with other variables, RQ (0.2660), shows a more tone relationship. These correlations, provide valuable insights into the dynamics between concerned variables.
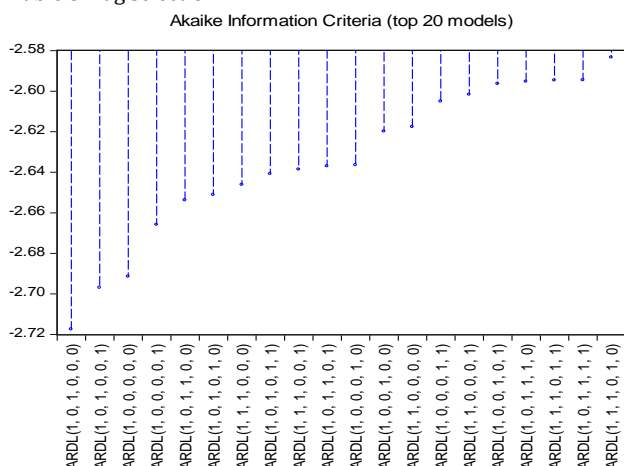
In Table 3, AIC provides for Autoregressive Distributed Lag (ARDL) assessment serves as a crucial measure for model selection and balancing the goodness of fit. A lower AIC value indicates a better-fitting model. The estimation findings reveal the AIC aids researchers in recognizing the most appropriate ARDL model among competing alternatives and highlighting models that offer optimal explanatory influence while minimizing complexity.

Table 4 summarizes long-run and short-run results produced by ARDL. Notably, Regulatory quality and government effectiveness show positive coefficient values of 1.747 and 1.731 respectively, which suggests that improvements in these factors lead to substantial enlargement in the dependent variable (Tax to GDP). In the same way, political stability and the rule of law represent positive relations having values of 3.009 and 2.528 respectively, underscoring their important roles in increasing economic stability and development. In contrast, inflation depicts a negative coefficient having a value of -3.511, suggesting its detrimental effect on the dependent variable (Tax to GDP). Additionally, the negative value of ECT (-0.958649), represents a persisting impact of past economic conditions and speed of adjustment toward equilibrium.

As shown in Table 5, The F-test evaluates the overall fit of a regression model. The Value of the F-statistic value is 10.57263 which is greater than the lower and upper bound values at all levels of significance at 10%, 5%, 2.5%, and 1% respectively. It suggested that the overall model is fit and eligible for further estimation. If the F-statistic Therefore, the study rejects the null hypothesis.

Table 3. Lag selection.

Akaike Information Criteria (top 20 models)

Table 4. Short run and long run results.

Short period coefficient				
Variable	Coefficient	S. E	t-statistic	Prob.
PS	0.081047	0.022143	3.660136	0.0017
RQ	2.936218	0.819851	3.581404	0.0020
RL	-0.439555	1.217993	-0.360885	0.7222
GE	-3.511128	0.981380	-3.577746	0.0020
INFL	0.078871	0.007730	10.202923	0.0000
Coint. Eq(-1)	-0.958649	0.267556	-3.582982	0.0021
Long Run coefficient				
Variable	Coefficient	S. E	t-statistic	Prob.
RQ	1.747258	0.691261	2.527638	0.0224
GE	1.731359	0.742997	2.330236	0.0304
PS	3.008769	1.232975	2.440251	0.0246
RL	2.528210	0.898008	2.815355	0.0115
INFL	-3.511128	0.981380	-3.577746	0.0020
C	2.080011	0.251968	8.255063	0.0000

Table 5. Bound test.

F- Test Test Statistics		Null Hypothesis		
		Significance	I (0)	I (1)
F-statistic	10.57263	10%	1.81	2.93
		5%	2.14	3.34
		2.5	2.44	3.71
		1%	2.82	4.21

The Breusch-Pagan-Godfrey test (Table 6) is conducted to check heteroskedasticity in the regression model. Hence the results show that there is no significant evidence revealed of finding heteroskedasticity in the model. The F-statistic value 1.261658 with a probability value (Prob. Chi-Square) of 0.2860 both exceeds typical significance levels. These findings show that the variability of errors across observations is not statistically significant. More specifically, it means that there is no evidence of heteroskedasticity. In Table 7, the results of the Breusch-Godfrey test are presented, which show the presence of serial correlation within the regression model. The F-statistic and chi-square value (Prob. χ2) is greater than 0.05 hence it provides evidence that there is no autocorrelation in the regression model.

In Figure 4, normality test using the Jarque-Bera statistic, which examines whether the data pursue normal distribution. In this case, the calculated value is 1.482489 and the corresponding p-value of 0.476521 indicates a measure of normal distribution. For instance, with a p-value of 0.476521, which is greater than the typical significance level of 0.05, there is insufficient evidence to reject the null hypothesis that the data is normally distributed. The CUSUM and CUSUM square (Figure 5) are statistical techniques used to assess stability in the regression model. The CUSUM test examines cumulative changes, while the CUSUM Square test reveals sensitivity by integrating squared deviations. When the blue line consistently falls within the red lines and can't touch the critical line, it shows an absence of significant structural alterations. This stability shows that in the observed values, no substantial deviation or shift is detected throughout the analyzed timeframe. Additionally, the QUSUM Square test provides further insights into the variance changes over time, emphasizing the overall understanding of process stability.

Table 6. Breeusch Pagan Godfrey test.

F-stat	1.261658	Prob. F (7,18)	0.3227
Obs*R-squared	3.557882	Prob. Chi-Square (7)	0.2860

Table 7. LM test.

F-statistics	0.894645	P F-(2,22)	0.4231
Obs*R2	2.406851	P. χ2 (2)	0.3002

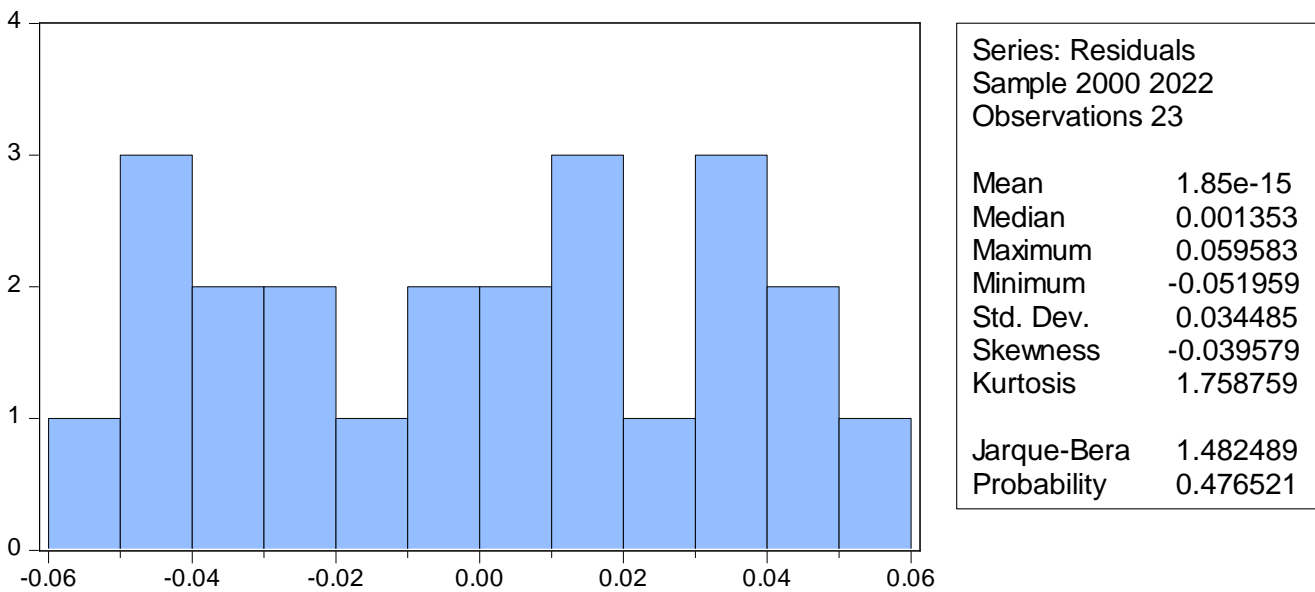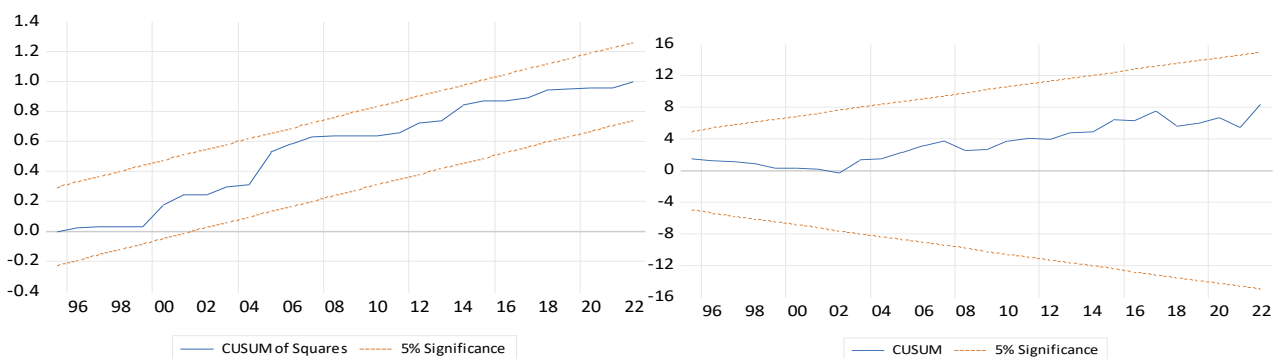| Series: Residuals	
Sample 2000 2022	
Observations 23	
Mean	1.85e-15
Median	0.001353
Maximum	0.059583
Minimum	-0.051959
Std. Dev.	0.034485
Skewness	-0.039579
Kurtosis	1.758759
Jarque-Bera	1.482489
Probability	0.476521

Figure. 4 Result of normality test.

Figure 5. CUSUM and CUSUM of square.

CONCLUSIONS AND RECOMMENDATIONS

The central aim of this analysis is to assess the effect of tax improvements on tax to GDP ratio in the context of Pakistan. The result of the unit root test suggests that the ARDL estimation technique is appropriate for this data analysis. Additionally, the bound test revealed that all the independent variables collectively impact tax to GDP share in Pakistan. Similarly, the long-run results depicted that, regulatory quality and government effectiveness show a positive effect on tax to GDP share, which suggests that improvements in this area lead to a substantial increase in the dependent variable (Tax to GDP). Similarly, political stability and the rule of law represent positive and significant on tax to GDP share, underscoring their important roles in increasing revenue collection. In contrast, inflation depicts a negative effect on tax to GDP share that highlights the decrease in revenue mobilization in total revenue collection.

Based on the empirical findings, a few recommendations can be suggested: The positive influence of regulatory quality and government effectiveness on the tax to GDP share shows that improving this area can lead to an enhancement in revenue collection. Measures such as streamlining rules, improving governance, and lessening bureaucratic problems can contribute to producing a more attractive environment for tax compliance and revenue mobilization.

Political stability and the rule of law have revealed a positive effect on tax to GDP share in the case of Pakistan. Researchers and policymakers must prioritize efforts to retain political stability and improve the rule of law to foster tax compliance. Additionally, strengthening institutions' responsibilities for enforcing tax laws and guaranteeing a fair and transparent tax structure can further boost revenue mobilization efforts.

REFERENCES

Abedeen, Z.S., Ghulam Shabeer, M., Azra, Mazhar Rauf, M., 2024. Unravelling fin-tech influence on financial penetration: The global assessment. J. Asian Dev. Stud. 13, 208–218. https://doi.org/10.62345/jads.2024.13.1.18.

Addison, T., Levin, J., 2012. The determinants of tax revenue in sub-Saharan Africa. Diva-portal. Retrieved online from: https://www.diva-portal.org/smash/get/diva2:570456/FULLTEXT01.pdf.

Ahmed, V., Talpur, M., 2016. Corporate tax reforms in Pakistan. Retrieved online from web: https://sdpi.org/sdpiweb/publications/files/Corporate-Tax-Reforms-in-Pakistan-W-155.pdf.

Arshed, N., Awan, M.Z., Mirza, A., Riaz, F., Shabeer, M.G., 2021. China Pakistan economic corridor (CPEC), its role in Pakistan economy and its social and environmental status. J. Appl. Res. Multidiscip. Stud. 2, 1–15. https://doi.org/10.32350/jarms.22.01.

Audi, M., Ali, A. and Roussel, Y., 2021. Measuring the tax buoyancy: Empirics from South Asian Association for Regional Cooperation (SAARC) (No. 109567). University Library of Munich, Germany.

Brys, B., Perret, S., Thomas, A., O'Reilly, P., 2016. Tax design for inclusive economic growth (No. 26). OECD Publishing. https://www.oecd-ilibrary.org/taxation/tax-design-for-inclusive-economic-growth_5jlv74ggk0g7-en.

Bukhari, H., Haq, I., 2020. Tax reforms in Pakistan. Retrieved online from: https://ebooksnspp.punjab.gov.pk/jspui/bitstream/nspp/579/1/Tax%20Reforms%20in%20Pakistan-Historic%20and%20Critical%20View.pdf.

Castanheira, M., Nicodème, G., Profeta, P., 2012. On the political economics of tax reforms: Survey and empirical assessment. Int. Tax Public Financ. 19, 598–624. https://doi.org/10.1007/s10797-012-9226-z.

Chaudhry, I.S., Munir, F., 2010. Determinants of Low Tax Revenue in Pakistan. Pakistan J. Soc. Sci. 30, 439–452.

Gul, C., Khan, A.U., Khan, M.H., Khan, A.W., 2023. Impact of transport infrastructure on economic growth of Pakistan. Int. J. Hum. Soc. 3, 468–488.

Hassan, M.S., Mahmood, H., Tahir, M.N., Yousef Alkhateeb, T.T., Wajid, A., 2021. Governance: A source to increase tax revenue in Pakistan. Complexity 2021, 1–11. https://doi.org/10.1155/2021/6663536. https://mpra.ub.uni-muenchen.de/id/eprint/109567.

Huang, X., Khan, Y.A., Arshed, N., Salem, S., Shabeer, M.G., Hanif, U., 2023. Increasing social resilience against climate change risks: a case of extreme climate affected countries. Int. J. Clim. Chang. Strateg. Manag. 15, 412–431. https://doi.org/10.1108/IJCCSM-04-2022-0051

Iqbal, F., 2014. An analysis of administrative reforms in Pakistan's public sector. https://uobrep.openrepository.com/handle/10547/550403.

KC, J.B., 2017. Tax-to-GDP ratio in Nepal: A critical analysis. Nepal. Manag. Rev. 18, 78–92.

Khan, A.W., Khan, A.U., Gul, C., 2023. Does inflation affect poverty in South Asia? Panel ARDL and NARDL analysis from 2001-2021. Gmjacs 13, 111–134. https://doi.org/10.59263/gmjacs.13.02.2023.356.

Milwood, T.A.T., 2011. Elasticity and buoyancy of the Jamaican tax system. Bank Jamaica. https://boj.org.jm/uploads/pdf/papers_pamphlets/papers_pamphlets_Elasticity_and_Buoyancy_of_the_Jamaican_Tax_System.pdf.

Mughal, M.M., 2012. Reasons of tax avoidance and tax evasion: Reflections from Pakistan. J. Econ. Behav. Stud. 4, 217–222. https://doi.org/10.22610/jebs.v4i4.320.

Niaz, I., 2021. Pakistan's search for a successful model of national political economy. Round Table 110, 232–249. https://doi.org/10.1080/00358533.2021.1904590.

Olufemi, A.T., Jayeola, O., Oladele, A.S., Naimot, A.O., 2018. Tax revenue and economic growth in Nigeria. Sch. Int. J. Manag. Dev. 5, 72–85.

Sang, K., 2019. Effect of tax policy reforms on the performance of Kenya Revenue Authority in Mombasa North tax district. https://ikesra.kra.go.ke/bitstream/handle/123456789/214/Kenneth%20Sang.pdf?sequence=1.

Shabeer, M.G., 2022. financial integration, knowledge sharing and economic growth: Does the experience of developing countries differ from developed countries? J. Contemp. Issues Bus. Gov. 28, 768–783.

Shabeer, M.G., Rasul, F., 2024. Energy, Forests and Environmental Sustainability: A Comparative Analysis of Developed and Developing Economies. J. Econ. Impact 6, 14–20. https://doi.org/10.52223/econimpact.2024.6102.

Shabeer, M.G., Rasul, F., 2024a. Aligning innovation and information with development: a comparative analysis of developed and developing nations. Environ. Dev. Sustain. 1–15. https://doi.org/10.1007/s10668-024-04478-9.

Shabeer, M.G., Riaz, S., Riaz, F., 2021a. Critical factors of patient satisfaction in private healthcare sector of Lahore. J. Econ. Manag. Sci. 2, 1–14. https://doi.org/10.52587//jems020101.

Shabeer, M.G., Riaz, S., Riaz, F., 2021b. Energy consumption and economic growth nexus: A comparative analysis of US, China and Japan. J. Econ. Manag. Sci. 2, 58–74. https://doi.org/10.52587/jems020205.

Shabeer, M.G., Zafar, Q., Anwar, S., Majeed Nadeem, A., 2024. Evaluating innovation and institutions for tech-trade: A global assessment in the quest for sustainable economic prosperity. J. Asian Dev. Stud. 13, 163–175. https://doi.org/10.62345/jads.2024.13.1.14.

Shakeel, M., Saeed, M.I., Raza, S., 2023. The impact of tax reform on economic growth: Evidence from Pakistan: An ARDL Approach. J. Bus. Manag. Res. 2, 1022–1041.

Wang, Y., Arshed, N., Shabeer, M.G., Munir, M., Rehman, H. ur, Khan, Y.A., 2023. Does globalization and ecological footprint in OECD lead to national happiness. PLoS One 18, e0288630. https://doi.org/10.1371/journal.pone.0288630.

World Bank, 2002. Poverty reduction and the World Bank: Progress in operationalizing the WDR 2000/2001. The World Bank. https://eric.ed.gov/?id=ED465681.

Zubair, R., Iqbal, Z., Zafar, Q., Shabeer, M.G., 2023. Examining the electronic customer satisfaction in enhancing e-customer loyalty: A case of Pakistani banking sector. J. Asian Dev. Stud. 12, 1194–1206. https://doi.org/10.62345/jads.2023.12.4.97.