**Research Paper**

# Behavioural Responses to Taxation and Laffer Curve: Empirical Evidence from Pakistan

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## EXECUTIVE SUMMARY

### Overview

Pakistan faces one of the largest tax gaps in South Asia. Despite repeated tax reforms, the tax-to-GDP ratio has remained stagnant, undermining fiscal stability and limiting the country's capacity to achieve its development goals.

This study investigates how Pakistan can address its revenue-generation challenges and raise the tax-to-GDP ratio. It combines empirical analysis with Laffer-curve-based behavioural insights on both salaried and non-salaried individuals.

Using an ARDL model, the study examines the relationship between total tax revenue and top marginal tax rates, and assesses how taxpayers respond to changes in tax rates. The findings confirm the existence of an inverted-U shaped Laffer curve, suggesting that Pakistan is currently on the downward-sloping side of the Laffer Curve, where further increases in tax rates may actually reduce overall government revenue.

The paper also recommends measures to improve compliance, broaden the tax base, and incorporate behavioural perspectives into the tax system.

## Policy Recommendations

- The government may rely less on raising tax rates to generate revenue and instead improve compliance by simplifying procedures, reducing overlapping income-tax return forms, merging duplicate annexures, eliminating redundant sales-tax reporting, and streamlining refund and adjustment processes into fewer, clearer steps.
- Incorporate behavioural nudges to encourage compliance, such as using social norm messages, publicly disclosing persistent non-filers, and recognising model taxpayers through acknowledgments, awards, and incentives. Highlighting high-performing individuals and tax offices with public commendation can create positive competition and motivate broader improvement.
- Focus on performance benchmarking across regional and municipal tax offices by publicly ranking them on indicators such as revenue collection, compliance growth, and taxpayer satisfaction. This can ensure healthy competition, raise standards, and enhance institutional credibility.

# Behavioural Responses to Taxation and Laffer Curve:
# Empirical Evidence from Pakistan

## Introduction

Over the years, revenue generation has attracted significant global attention, with governments adopting a variety of measures to strengthen their fiscal capacity. In Pakistan, likewise, efforts have been made toward increasing revenues through successive adjustments in tax slabs and frequent increases in tax rates. However, despite these adjustments, the overall contribution of tax revenues to GDP has remained modest. Meanwhile, the compliance levels have largely stagnated, reflecting the persistent revenue conundrum the country faces.[1]

The stagnant tax-to-GDP ratio poses significant risks of fiscal crisis. Persistent revenue shortfalls weaken the government's capacity to finance essential public services such as education and health. These fiscal imbalances also increase dependence on external financing, including loans from the International Monetary Fund (IMF), pushing the country deeper into unsustainable debt.

## The Laffer Curve

At two distinct tax rates, the government may obtain the same level of revenue. When the tax rate is set at 100 percent, all productive activity ceases in the formal economy, which may reduce government revenue to zero. In contrast, when the tax rate is set at zero, individuals retain their entire output, and government revenue may again reduce to zero. Between these two extremes, there exists an optimal tax rate at which government revenue reaches its maximum.

The dynamic relationship between different tax rates and revenues was first explored by Arthur B. Laffer (2004).[2] Laffer (2004) states that changes in tax rates have two effects on tax revenues: the arithmetic effect and the economic effect. The former states that if tax rates are lowered, tax revenues will be lowered by the quantity of the decrease in the tax rate. The economic effect shows the positive impact that lower tax rates have on GDP,

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[1] Ullah, F., (2022). Exploring Themes of a Voluntary and Enforced Tax Compliance Behaviour: A Stakeholder's Perspective Using Thematic Approach in Khyber Pakhtunkhwa – Pakistan. City University Research Journal.

and thereby the tax base. It provides incentives to increase economic activities. Therefore, when the economic and the arithmetic effects of tax-rate changes are combined, the consequences of the change in tax rates on total tax revenues are no longer quite so obvious. In simple, at a tax rate of 0 %, there are zero tax revenues. However, at a tax rate of 100%, the government would also collect very few tax revenues since individuals would not be willing to work for an after-tax wage of zero. That is, there would be no tax base.

The present study empirically examines the relationship between tax rates and revenue collection in Pakistan, employing a behavioural perspective to analyse taxpayer responsiveness. Specifically, it analyses whether Pakistan is approaching the tipping point of the Laffer Curve, where increasing tax rates may lead to diminishing returns due to behavioural responses.

Furthermore, it compares the compliance of parliament members and individuals, discussing what forces higher compliance in a certain group and how similar measures can be taken to match this compliance in other groups. The findings aim to inform evidence-based tax policy design that enhances compliance without overburdening the taxpayer.

## Literature Review

Traditionally, the Laffer Curve was treated as a purely economic mechanism of incentives and labour-supply elasticity. However, more recent work adds a behavioural and psychological nuance to the idea of taxation, asking whether the curve is truly universal or shaped by how people think and perceive.

This chapter provides an overview of the literature and divides it into three subsections. Segment 1 discusses the Traditional Laffer Curve. Segment 2 presents Empirical Evidence from Pakistan. Segment 3 explores recent tax related behavioural extensions such as perceptions and psychological responses that shape the curve.

### Traditional Laffer Curve

Early debates on Laffer curve focuses on how labour-supply elasticity shapes the revenue peak. Fullerton (1982) developed one of the first formal general-equilibrium simulations

of the U.S. tax system and demonstrated a revenue-maximising federal rate of roughly 70% once labour, capital, and savings responses were accounted for.

Later, Myles (1995) provided a rigorous welfare-economics foundation, stating that the peak of the curve depends on elasticities of labour, capital and consumption. The government's ability to tax "economic rents" determines whether high rates reduce revenues.

Trabandt and Uhlig (2011) revisited the theory using a dynamic stochastic general-equilibrium model for the U.S. and EU economies and found revenue-maximising average tax rates near 60% for labour income and 40-50% for capital income.

Recently, Lin & Jia (2019) show that if the job demand elasticity of residents is low, the Laffer curve will move to the upper right, which is also in line with the law of economics.[2] Samson 2020) states that tax is the only target of the government, the tax rate is supposed to be high when the supply elasticity of the labour force is low.

**Empirical Evidence from Pakistan**

In Pakistan, a growing body of research evaluates the empirical relevance of the Laffer hypothesis and attempts to identify the country's position on the curve. Using annual data from 1990-2016, Latif et al (2017) argues that Pakistan's tax regime shows the existence of a non-linear Laffer Curve relationship in Pakistan, particularly for indirect taxes on goods and services. It places it in the 'prohibited zone' of the Laffer Curve, where increasing tax rates have begun to discourage compliance and shrink the tax base.[3]

Mehmood et al. (2022) applies a threshold regression model and find that Pakistan's revenue-maximising tax rates are around 25.5-26.7%, whereas the current corporate tax rate is 29%.[4] This suggests that Pakistan is operating beyond the optimal tax rate, reinforcing the Laffer Curve's argument that further tax hikes could reduce revenue by harming compliance and productive activity.

In terms of external revenue, Ahmad and Ali (2018) explore the Trade Laffer Curve, showing an inverted-U relationship between trade openness and trade tax revenue.

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[2] Lin, B., & Jia, Z. (2019). Tax rate, government revenue, and Economic Performance: A perspective of the Laffer curve. *China Economic Review*.
[3] Latif (2019). Estimation of Laffer Curve: Evidence from Pakistan." *Sarhad Journal of Management.*
[4] Khalid (2022). Does the Laffer Curve Exist in the Tax Structure of Pakistan? A Threshold Regression Analysis." *Journal of Economic Impact*.

Pakistan, which heavily depends on customs and trade-related taxes, initially gains from liberalisation.[5] However, excessive openness, without strengthening VAT or addressing evasion, reduces revenue, threatening fiscal stability. This again supports the Laffer Curve logic, both direct and indirect taxation systems have tipping points beyond which tax rates or liberalisation policies backfire.

Sheikh et al. (2019) apply the Debt Laffer Curve to 21 heavily indebted countries (HIPCs) and find that increasing debt beyond a certain point lowers repayment capacity. [6]While Pakistan is not among the original HIPCs studied, it deeply resembles those cases. The study argues for debt relief or restructuring when countries are beyond their debt sustainability thresholds, since further borrowing decreases long-term growth and discourages private investment.

After analysing the tax returns data of the Tax Directory (2014 -2018) of companies, AOPs, and individuals, Khalil (2025) discovered that despite a significant growth in the number of filings, there has been little change in the tax paid, serving as evidence for the switch of tax slabs to avoid high tax rates.[7]

**Behavioural Extensions**

Recently many researchers argue that the Laffer curve is not a simple income-leisure trade-off. It also reflects the disutility of work and perceived fairness. They have studied the Laffer Curve through a behavioural lens. Umer (2018) suggests a fairness-adjusted Laffer curve, quantifying and visualising the behavioural aspects.[8]

The study further explores whether out of reason or emotion, taxpayers may be willing to intentionally punish tax setters by working less under the same exogenous settings. It found that an experiment in which a player A (the "tax receiver") is matched with a player B (the "worker") to elicit the conditions under which tax revenues will increase under a

[5] Ahmad, Khalil (2018). Trade Liberalization-Trade Revenue Nexus: An Empirical Enquiry of Trade Laffer Curve of Pakistan." *Sukkur IBA Journal of Management and Business*.
[6] Muhammad Ramzan Sheikh, M., (2020). Debt Laffer Curve Analysis: A Case Study of Heavily Indebted Poor Countries." *International Journal of Management Research and Emerging Sciences*.
[7] Khalil, Syed Abdul (2025). Pakistan Income Tax Regime: The Economic Gains of Simplicity. PIDE.
[8] Umer, H. (2018). Fairness-adjusted Laffer curve: Strategy versus direct method. *Games*.

certain threshold and decrease thereafter, only to discover that the social norm of fairness enhances productive efficiency in the long run.[9]

Levy-Garboua et al., (2009) challenged the traditional understanding of the Laffer Curve and introduced the concept of the Behavioural Laffer Curve, where emotions and perceived fairness drive individuals to reduce efforts as a response to unfair taxation, even when it is not economically rational.[10] A 'Behavioural Laffer Curve' emerges as a reaction to the perceived unfairness of taxation (Kazman, 2014). It peaks at a lower rate than the conventional Laffer curve (Levy-Garboua et al.,2009).

The present paper reassesses Pakistan's tax policy in the post-COVID landscape, acknowledging that the immediate impacts of the pandemic have subsided. However, the economy continues to grapple with longer-term structural consequences. It also takes into account Pakistan's renewed engagement with the IMF under the Extended Fund Facility (EFF), which brings fresh momentum for tax reform and revenue mobilisation. This study combinines ARDL-based empirical results with Behavioural insight, providing an innovative perspective on the Laffer Curve in Pakistan. Crucially, this analysis approaches taxation through a Behavioural economics lens, drawing on fairness-based theories from literature to explore how perceptions, norms, and psychological responses shape compliance and policy effectiveness in the current context

## **Methodology**

This section outlines the methodology used for designing, collecting, and analysing data to understand the relationship between tax revenue and the top marginal rates in Pakistan. It examines this relationship for both salaried and non-salaried individuals.

## **Data and Analysis**

This study uses annual data from 1979-2022, with separate series for salaried and non-salaried taxpayers. Salaried individuals are defined as persons who derive their salary income or obtain more than 50% of their total income from salary. Non-salaried individuals include all taxpayers whose primary income is not salary, such as business owners,

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[9] Lévy-Garboua, Louis, David Masclet, and Claude Montmarquette. "A Behavioral Laffer Curve: Emergence of a Social Norm of Fairness in a Real Effort Experiment." *Journal of Economic Psychology*.

freelancers, professional service providers, landlords, agricultural producers, or investors earning capital gains (FBR, 2025) [11].

## Variables of the study

The main explanatory variables include the top marginal tax rate for salaried individuals and the top marginal tax rate for non-salaried individuals. Control variables include Inflation, captured through the consumer price index (CPI), with 2010 as the base year in line with established literature and data availability.[12] Additional controls comprise trade openness, defined as the ratio of exports plus imports to GDP, and the industrial share of GDP, which represents the contribution of industry to the overall economy and is drawn from World Development Indicators (WDI). The dependent variable in this study is total tax revenue in PKR. Further details about the variables used in the study and their definitions are provided in Table 1.

**Table 1: The Variables Used in the Models and Their Definition.**

| Variables | Definition |
|---|---|
| TotalTaxRevenue | Total Tax Revenue in Pakistan Rupees |
| TMRS | Top Marginal Rate (Salaried) |
| TMRNS | Top Marginal Rate (Non-Salaried) |
| CPI2010 | Proxy for Inflation. It is the average change in prices of services and goods paid by consumers.[13]. |
| GDPpercapita | Income per capita |
| TradeOpenness | Imports + Exports as a share of GDP |
| IndustrialShareofGDP | Proportion of a country's total GDP that is contributed by the industrial sector |
| AMRS | Average Marginal Rate (Salaried) |
| AMRS2 | Average Marginal Rate (Non-Salaried) |

*Source*: *Own depiction based on the literature*

To complement the quantitative analysis and to better understand behavioural responses within the income-tax system, the study also reviews Federal Board of Revenue/FBR tax documents, policy papers, and other qualitative materials.

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[11] https://download1.fbr.gov.pk/Docs/2018101714105054459Circular05of2018.pdf
[12] G Hall (2018). Applied Econometrics. Bloomsberg
[13] United States Department of Labor. (n.d.). Consumer Price Index. *U.S BUREAU OF LABOR STATISTICS*. *https://www.bls.gov/cpi/*

To explore the taxation behaviour of a society, in the literature time series data is used. The first step in time series analysis is to understand and explore the data. This typically involves testing for stationarity, which helps decide whether transformations like differencing or detrending are needed. Such checks guide the selection of suitable time series models for analysis and forecasting.[14] Stationarity refers to time series whose statistical properties do not change over time, giving reliable results. Non-stationarity, if not handles correctly, show insignificant and unreliable relationships or results.

**Unit Root Test**

In this study, unit root tests were applied to examine the stationarity properties of the variables included in the model. The results of the Unit root test indicate that the dependent variable, lnTotalTaxRevenue, along with lnTMRNS and lnTMRNS2, are I(1). Means that they are integrated of order one. In contrast, CPI2010, Trade Openness, and Industrial Share of GDP are stationary at level, I(0). This gives an overall integration order of (1,1,0,0,0,0) and (1,1,1,0,0,0). Further details and the rationale behind the model of the study are provided hereunder:

**Model of the study**

The variables exhibited a mix of integration orders, with some stationary at the level and others at the first difference [that is I(1) and I(0)]. In simple terms, the variables show non-stationarity at different levels. Using simple regression may face spurious results issues. The issue of unreliable or spurious results can be addressed through the application of non-linear time series models such as VAR, VECM, or ARDL. The choice of model depends upon the underlying data-generating process of the series, or in other words, the statistical properties of the data.

The VAR framework is more appropriate when the variables are stationary at level and the objective is to capture dynamic interdependencies among them. In contrast, the VECM is employed when the series are non-stationary but cointegrated, allowing the researcher to simultaneously model both the short-run dynamics and the long-run equilibrium relationship.

The ARDL approach, however, is particularly advantageous in cases where the variables are integrated of different orders, I(0) or I(1), and not necessarily cointegrated. It provides

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[14] Box, G.E.P., Jenkins, G.M., & Reinsel, G.C. (2008). *Time Series Analysis: Forecasting and Control.*

robust and consistent estimates while accommodating small sample sizes and mixed integration properties, making it a widely used model in econometric analysis.

In this study, as sated, none of the variables is integrated of order two, I(2), the ARDL bounds testing procedure remains valid in such analysis. The presence of a mix of I(0) and I(1) variables thus provides the necessary justification for employing the ARDL framework in this study.[15]

**Autoregressive Distributed Lag Model (ARDL)**

The ARDL model is an econometric technique used to analyse the short-run and long-run relationship between the dependent variable and one or more independent variables. It is particularly useful in time series analysis when trying to estimate dynamic relationships. The main specification used in the ARDL model is "q, p₁,…, pₙ". Where p represents the number of lags of the independent variables and q represents the number of lags in the dependent variable. A value of 0 indicates that the variable is without lags. In this study, total tax revenue, the dependent variable, includes 1 lag.

Within the above specification, multiple ARDL models or candidates can emerge with different specifications. Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) are statistical measures that determine the best model in a set of such candidates. The model with the lowest AIC and BIC shows a better model.

Since this study aims to estimate the Laffer theory, the basic Laffer Curve equation, based on theory, is depicted as:

$$TR = \alpha\, r_0 + \alpha\, r^2 + u \qquad \textbf{(1)}$$

The set of different models, that examines the Laffer curve relationship between total tax revenue and different types of tax rates are built upon the basic Laffer equation. Based on Khalil (2025) [16], multiple equations for different ARDL combinations are as follows:

$$lnTR = \beta_0\, TMRS + \beta_1\, TMRS2 + \beta_2\, lnCPI + \beta_3\, lnGDPpc + u_i \qquad \textbf{(2)}$$

$$lnTR = \beta_4\, TMRS + \beta_5\, TMRS2 + \beta_6\, lnCPI + \beta_7\, lnGDPpc + \beta_8 lnInd\, u_i \qquad \textbf{(3)}$$

$$lnTR = \beta_9\, TMRS + \beta_{10}\, TMRS2 + \beta_{11}\, lnCPI + \beta_{12}\, lnGDPpc + \beta_{13} lnInd + u_i \textbf{(4)}$$

$$lnTR = \beta_{14}\, TMRS + \beta_{15}\, TMRS2 + \beta_{16}\, lnCPI + \beta_{17}\, lnGDPpc + \beta_{18} lnInd + u_i \qquad \textbf{(5)}$$

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[15] Ibid
[16] Khalil, Syed Abdul. Pakistan Income Tax Regime: Economic Gains of Simplicity. PIDE, 2025.

Table 1 explains the definitions of all the variables used in the model. Khalil (2025) suggests that the log-log specification gives improved results. Based on trial and error, the log-log specification was more statistically significant and better fitting than the level-level model. It establishes how tax revenue responds to any change in tax rates. This made the model easier to interpret and more aligned with standard economic theory and the Laffer Curve theory.

Based on Equations 2, 3, 4, and 5, Models 1, 2, 3, and 4 specify the relationship between total revenue and tax rates. Among these, Models 2 and 4 explore the relationship for non-salaried individuals. Models 1 and 3 represent the relationship for salaried individuals. Models 1 and 2 examine this relationship using top marginal tax rate data, whereas Models 3 and 4 use average tax rate data. Since the results of Models 3 and 4 were statistically insignificant, this study continues to focus on the top marginal rate models in the analysis.

## **RESULTS, INTERPRETATIONS, AND FINDINGS**

Table 2 shows the descriptive statistics summarising the characteristics of the data, over the period of 1980-2022, used in our models. The mean for top marginal rates is higher than that for average marginal rates, for both salaried and non-salaried individuals, and the total tax revenue variable shows the highest spread over time. Among the tax rate variables, the top marginal rate and average marginal rate, the mean for non-salaried individuals is higher than the mean for salaried individuals. CPI2010 and GDP per capita also show high variance, suggesting significant economic changes throughout the years. Skewness measures the asymmetry when the data deviates from the mean, and kurtosis gives us the degree of outliers present in our data.[17]

The values of skewness show that most are skewed towards the right of the mean, particularly total revenue and the industrial share of GDP. Kurtosis values above 3 indicate a higher degree of outliers.

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[17] Menon, Kartik. (2025, April 14).The Complete Guide to Skewness and Kurtosis.*Simpli Learn.* *https://www.simplilearn.com/tutorials/statistics-tutorial/skewness-and-kurtosis#:~:text=a%20normal%20distribution.-,What%20Is%20Skewness?,Figure%203:%20Negatively%20Skewed*

**Table 2: Descriptive Statistics**

| Variables | Mean | Standard Deviation | Variance | Skewness | Kurtosis |
|---|---|---|---|---|---|
| TotalTaxRevenue | 1141071.00 | 1512836.00 | 2.29E+12 | 1.60 | 4.72 |
| TMRS | 0.33 | 0.01 | 0.01 | 0.12 | 1.96 |
| TMRNS | 0.35 | 0.09 | 0.01 | 0.07 | 2.46 |
| AMRS | 0.18 | 0.07 | 0.00 | 0.49 | 2.17 |
| AMRNS | 0.20 | 0.07 | 0.00 | -0.07 | 1.93 |
| CPI2010 | 70.47 | 66.36 | 4403.32 | 1.14 | 3.33 |
| Inflation | 8.46 | 4.04 | 16.31 | 0.86 | 4.03 |
| GDPpercapita | 62100.48 | 71657.24 | 5130000000.00 | 1.28 | 3.66 |
| TradeOpenness | 130723.50 | 128139.60 | 1.09 | 1.09 | 3.47 |
| IndustrialShareofGDP | 2.57E+12 | 3.32E+12 | 1.1E+25 | 1.50 | 4.61 |

*Source*: *Own depiction based on the literature*

Based on the above equations, Table 3 and 4 present the regression results for multiple ARDL models, showing the relationship between tax revenue, top marginal rates, and average marginal rates for salaried and non-salaried individuals in Pakistan. The details from the ARDL models showing an association between tax revenue and tax rates for salaried people are listed in Table 2. However, an ARDL framework, multiple integrations and multiple orders of integration can be used. Based on the trial-and-error criteria the most robust model was selected for this study. Details of such models are provided here: Table 3 compares the ARDL regression details for each of the four models. It shows that models 1 and 2 have a higher R-squared, suggesting they are a better fit for our data. Whereas Models 3 and 4, which were based on AMRS, reported with very low R-square values. They moreover show insignificant results; hence they are not considered further in the study. The adjusted R-squares values were also very low, 5% and 16%, respectively, making them the least appropriate models.[18]

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[18] The reason is that, when average marginal tax rate is taken, two very different compliance behaviours are compressed into a single number. For salaried people, the marginal rate hardly changes their compliance because taxes are withheld at the source. By averaging, the model assumes a "representative taxpayer," but in reality, there is no such uniform behaviour.

## Table 3: ARDL Model Details

| Indicators | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| **Dependent Variables** | lnTotalTaxRevenue | lnTotalTaxRevenue | lnTotalTaxRevenue | lnTotalTaxRevenue |
| **Independent Variables** | lnTMRS, lnTMRS2 | lnTMRNS, lnTMRNS2 | lnAMRS, lnAMRS2 | lnAMRNS, lnAMRNS2 |
| **Controls** | lnCPI2010, lnGDPpercapita, TradenessOpe-nness, IndustrialShare-ofGDP | CPI2010, TradenessOpe-nness, IndustrialShare-ofGDP, lnGDPpercapita | CPI2010, GDPpercapita | CPI2010, TradeOpenness, IndustrialSha-reofGDP |
| **ARDL** | (1,1,0,0,0,0) | (1,1,1,0,0,0) | (1,0,0,0,0) | (1,0,0,0,0,0) |
| **Cointegration** | Yes | Yes | No | No |
| **Serial Correlation** | No | No | No | No |
| **Heteroskedasticity** | No | No | No | No |

## Table 4: Model Comparison

| Statistical Measures | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| ARDL | (1,1,0,0,0,0) | (1,1,1,0,0,0) | (1,0,0,0,0) | (1,0,0,0,0,0) |
| R-Squared | 0.50 | 0.61 | 0.16 | 0.21 |
| Adjusted R-Squared | 0.41 | 0.48 | 0.05 | 0.16 |
| Root MSE | 0.05 | 0.05 | 0.06 | 0.07 |
| Log Likelihood | 69.10 | 71.49 | 60.21 | 63.55 |
| AIC | -119.20 | -126.99 | -108.42 | -115.11 |
| BIC | -108.11 | -112.90 | -97.85 | -104.54 |

Model 1 and Model 2 shows the most significant results, has higher significance, fits the data better, and has the lowest AIC and BIC. Its $R^2$ values were higher then Model 3 and Model 4, suggesting that the variation in tax revenue is more explained by the model. Ther negative and statistically significant error correction term implies a long-term relationship between the dependent and independent variables, moderating the speed of adjustment toward long-term equilibrium.

**ARDL Long-Term and Shor-Term results**

Table 5 shows, in the short run, for the salaried individuals, both the linear and squared top marginal rate terms are significant at 5% significance level.

**Table 5: ARDL Results**

| Coefficients | Short-Run | | Long-Run | |
|---|---|---|---|---|
| | Salaried | Non-Salaried | Salaried | Non-Salaried |
| TMRS | -0.09 ** | 1.173** | 0.95*** | -6.88*** |
| lnTMRS2 | | 0.047** | -3.99*** | -2.11** |
| CPI | | | 1.34*** | 0.03* |
| TradeOpen | | | 7.17e-07 | -0.00 |
| cons | 2.70*** | 1.25 | | |

Significance: ***p<0.01, **p<0.05, *p<0.1
Source: Own estimation based on FBR (2025)

For salaried taxpayers, the short-run coefficient of TMRS is negative (-0.09, p<0.05). In the long run it is positive (0.95, p<0.01) with a negative squared term (-3.99, p<0.01), confirming the Laffer curve. For non-salaried taxpayers, TMRS is positive in the short run but negative in the long run with a negative squared term, suggesting rates beyond the revenue-maximising level. CPI is positive and significant in both models. Meanwhile, trade openness remains insignificant. Constants (cons) are significant and positive in both models.

**Discussion**

Based on both the ARDL model's findings and insights from contemporary literature, this section discusses the results of the study and the behavioural and structural dynamics that shape tax compliance in Pakistan. The analysis highlights how behavioural factors such as perceptions of fairness, inertia, and psychological costs influence taxpayer

responses to changing tax rates. It further explains why compliance levels differ across multiple groups, the role of visibility and incentives, and the broader implications for Pakistan's fiscal policy in the context of its persistent tax-to-GDP challenges.

**Behavioural Insights**

Contemporary literature suggests that behavioural factors, such as the disutility of work, perceptions of fairness, and the psychological costs of compliance also significantly shape both labour efforts and revenue outcomes.[19]

The ARDL model results also show significant evidence of such behavioural dynamics. In the short run, the findings suggest that salaried and non-salaried individuals do not show a significant negative response to a rise in tax rates. Or in other words a minor increase in the tax rate is somewhat acceptable by the individuals. This is connected to the behavioural concept of inertia, where existing habits and the status quo delay behavioural adjustments. After a minor change a society show convergence to the existing equilibrium.

The long-run estimates, however, show a negative response to rising tax rates. Individuals, particularly the salaried class, tend to be less compliant when tax rates exceed a specific point or when tax rates are increasing constantly. In the ARDL model, both the linear and squared terms are significant-that is, a further rise in the top marginal rate will decrease the tax revenue. The behavioural responses to tax increases are moderate or muted at low to moderate rates but intensify significantly once rates cross a threshold of fairness, ability or feasibility as Laffer (2004) suggested.

For non-salaried individuals, such effects are not much stronger, since they operate at greater income flexibility, higher levels of informality, and lower traceability of earnings. As a result, they are more capable of adjusting their reported income or deductions to remain in lower tax brackets.

**Transparency, Compliance, Informality, and Fairness in Taxation**

Perceived fairness plays a decisive role in tax revenues. When tax rises beyond a certain point, people may see it as unjust and unfair, which negatively impacts tax compliance. Compliance rates and incentives amongst different groups inform about the tax behaviour

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[19] Umer, H. (2018). Fairness-adjusted Laffer curve: Strategy versus direct method. *Games*, *9*(3), 56. https://doi.org/10.3390/g9030056

of a society. In Pakistan's context, informality provides the opportunity, and perceptions of unfairness provide the motivation, for long-term non-compliance. The long-term results of this study follow this pattern.

**Table 6: Tax Compliance Rates (2013 – 2020)**

| Tax Paid Dummy | Individuals | Businesses | Parliamentarians |
|---|---|---|---|
| 0 (tax paid) | 33.85% | 42.18% | 12.83% |
| 1 (not paid) | 66.15% | 57.82% | 87.17% |

| Source: FBR (2024) |
|---|

Table 6 highlights the tax compliance rates amongst different groups. The parliamentarians have a high percentage of people paying their taxes. This is because this group is incentivised. FBR releases a report of all the parliamentarians, listing people by name and stating how much tax they paid. This public announcement, paired with high compliance rates, shows that visibility can act as a compliance nudge. Another motivation is, they (parliamentarians) are also exempt from running in any elections if they fail to comply.

Individuals, on the other hand, have the lowest percentage of compliance. Since they are not publicly exposed for their tax payments. Exposing the public to similar visibility and reputational pressures, through transparent public registers, community recognition, or public benchmarking, the tipping point of the Laffer Curve in Pakistan may shift to the right, allowing for higher sustainable tax rates without eroding compliance.

The results from the ARDL model provide an insight into the policy applications for Pakistan's tax systems. Especially considering the ongoing fiscal discussions under the IMF's Extended Fund Facility (EFF) and the constant struggle to improve Pakistan's tax-to-GDP ratio and meet the targeted 13%.[20]

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[20] Desk, N. (2025, July 24). *Pakistan's tax-to-GDP ratio reaches 10.6% in FY2025, FBR tells pm*. Profit by Pakistan Today. https://profit.pakistantoday.com.pk/2025/07/24/pakistans-tax-to-gdp-ratio-reaches-10-6-in-fy2025-fbr-tells-pm/

The IMF requires Pakistan to improve its fiscal position by increasing the tax revenue through higher tax rates.[21] According to the findings of this Paper, Pakistan is currently operating on the wrong side of the Laffer Curve, where any further increase in the tax rate could lead to reduced revenue, displaying low tax compliance.

Ahmed et al. (2010) and Nizamani (2020) concluded similar results and stated that increasing tax rate in the country result in reduced investment levels, decreased consumption and an increase in poverty and confirmed a negative impact of increasing tax on growth.[22]

For the salaried individuals, the top marginal rate shows a weaker Laffer curve effect. This group's income is typically more transparent and subject to withholding at the source, limiting opportunities for evasion. However, among salaried taxpayers, compliance is not purely an economic calculation. Emotional and moral reactions to perceived injustice in tax policy can reduce work effort and willingness to comply.[23] This aligns with the long-run decline in revenue observed in the results.

For non-salaried class, the study confirms a downward-sloping nonlinear relationship with the total tax revenue and top marginal tax rate. Hence, this suggests that Pakistan is currently on the right side of the Laffer curve for this group, where any further increase in the tax rates could reduce revenue due to evasion, underreporting, or even non-compliance.

Sano (2024) found that disclosure of tax-related information to the public can affect tax compliance positively. Full disclosure of tax returns and audit results, along with the

[21] International Monetary Fund (IMF). (2024, September 27). IMF Executive Board Concludes 2024 Article IV Consultation for Pakistan and Approves 37-month Extended Arrangement. *International Monetary Fund*. https://www.imf.org/en/News/Articles/2024/09/27/pr-24343-pakistan-imf-concludes-2024-aiv-consultation-pakistan-approves-37-mo-extended-arr#:~:text=Advancing%20reforms%20to%20raise%20productivity,discussion%20by%20the%20Executive%20Board

[22] Nizamani, Sarah. (2020). Higher Taxes Reduce Economic Growth: Overwhelming International Evidence. *PIDE Knowledge Brief*. No. 2020:14, pg 1-8. https://file.pide.org.pk/pdfpideresearch/kb-014-higher-taxes-reduce-economic-growth.pdf

[23] Lévy-Garboua, Louis, David Masclet, and Claude Montmarquette. "A Behavioral Laffer Curve: Emergence of a Social Norm of Fairness in a Real Effort Experiment." *Journal of Economic Psychology* 30, no. 2 (April 2009): 147–61. https://doi.org/10.1016/j.joep.2008.09.002.

identities of the taxpayers, showed a positive impact on tax compliance; however, it relied on the moral consciousness of the people.[24]

From a theoretical standpoint, the findings align with the extended Laffer Curve framework. The traditional Laffer Curve, based on the income-leisure trade-off, predicts a non-linear relationship between revenue and tax rates, with revenues declining beyond a certain point where higher tax rates result in lower revenue. However, as discussed earlier, the behavioural perspective states non-salaried taxpayers in Pakistan face lower detection probabilities, greater income flexibility, and more opportunities to operate informally, making it easier for them to avoid high tax rates if perceived as unfair.

This is particularly relevant to the recent FBR efforts focused on increasing tax rates for non-filers and high-income individuals, especially within the non-salaried category. In 2022, FBR reported the gross tax gap of Rs 1,179 billion.[25] The findings suggest that increasing the tax rates without considering the behavioural implications can be problematic or counterproductive.

Similar behaviour towards tax rates can also be seen in salaried persons, as shown by the Model, which suggests a strong Laffer curve shape in Pakistan. Behavioural reasoning explains that if tax increases for a certain income, then people have an incentive to change to a lower taxed income slab.[26]

Use of behavioural theories in the tax system is not a standalone operation. It is only effective if the administrative bottlenecks are also acknowledged and reconditioned. The complex tax filing system is one of the many administrative flaws in Pakistan's tax system, its complicated structure deters taxpayers from filing their taxes on time, or at all. Therefore, simplification of the tax system is necessary to make it more accessible.[27]

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[24] Sano, Hiroyuki. (2024). Impacts of public disclosure on tax compliance using agent-based modeling.*Journal of Economic Interaction and Coordination*, 20:273–305 https://doi.org/10.1007/s11403-024-00420-4

[25] Tax Gap (2022). https://download1.fbr.gov.pk/Docs /2023118141362748Tax-Gap-Report-2022-Final.pdf

[26] Kazman, Samuel B., "Exploring the Laffer Curve: Behavioral Responses to Taxation" (2014). UVM Honors College Senior Theses. 8. https://scholarworks.uvm.edu/hcoltheses/8

[27] Ibn e Hassan, Ahmed Naeem, Sidra Gulzar. (2021). Voluntary tax compliance behavior of individual taxpayers in Pakistan. Financial Innovation (2021) 7:21 https://doi.org/10.1186/s40854-021-00234-4

In Pakistan, low trust in the tax authority and perceptions of unfairness hinder compliance stemmed by the administrative corruption in Pakistan's administrative systems.[28] Hence, to build trust between the individuals and the state, there should be visible public service delivery. Similarly, tax officials and policymakers should also shift their focus to simplifying the tax filing process (Hassan et al., 2021).

## Conclusion and Policy Recommendations

This paper explored the relationship between tax revenues and tax rates. The findings suggest that the average marginal rate is insignificant for Pakistan's tax revenue. Whereas the top marginal rate has proven to be more significant and established a Laffer Curve-like relationship.

According to the empirical analysis, Pakistan is currently functioning on the right side of the curve. Similar empirical results also reported by Latif et al. (2019), who found that the Laffer Curve exists in Pakistan and is in the prohibitive area. Meaning that revenue is negatively sensitive to any change in tax rate, particularly to the top marginal rate. Taking note of these findings, it can be asserted that in Pakistan, traditional methods of asserting higher tax rates to improve the tax revenue may be of little help to Pakistan in fulfilling its objective of improving the tax-to-GDP ratio as well as to address the country's fiscal challenges.

The study moreover highlighted that behavioural nudges could be strategically used to address the perception-reality gap in tax fairness. Many Pakistanis may overestimate the degree of unfairness or misallocation in tax use, leading to high rates of non-compliance. Interventions such as simplified tax communication, real-time feedback on how much is spent, and targeted reminders framing tax payment as a civic duty have shown significant results in improving compliance.

Based on this study, strong enforcement of such nudges on high-risk groups, particularly non-salaried individuals in informal sectors, could smooth the short-run, long-run divergence observed in the data and maximise revenue within the Laffer framework.

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[28] Stroeker, Natasha Els. (2016). AN OVERVIEW OF BEHAVIORAL ECONOMICS IN DUTCH POLICY MAKING. THE NEXT STEP: HOW TO NUDGE POLICY MAKERS. APSTRACT Center-Print Publishing House. Vol. 10. Number 2-3. Pages 27-32. 10.19041/APSTRACT/2016/2-3/3

However, for Pakistan, another issue is meeting revenue goals with the given circumstances as well as meeting the IMF's conditions. The following are some policy recommendations to help with such issues.

**Recommendations**

The government may:

- Rely less on raising tax rates to generate revenue and instead improve compliance by simplifying procedures, reducing overlapping income-tax return forms, merging duplicate annexures, eliminating redundant sales-tax reporting, and streamlining refund and adjustment processes into fewer, clearer steps.

- Incorporate behavioural nudges to encourage compliance, such as using social norm messages, publicly disclosing persistent non-filers, and recognising model taxpayers through acknowledgments, awards, and incentives. Highlighting high-performing individuals and tax offices with public commendation can create positive competition and motivate broader improvement.

- Focus on performance benchmarking across regional and municipal tax offices can improve both compliance and administrative efficiency. Publicly ranking tax offices on indicators such as revenue collection, compliance growth, and taxpayer satisfaction can foster healthy competition, raise standards, and enhance institutional credibility.

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