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EMPIRICAL ANALYSIS OF THE IMPACT OF MACROECONOMICS VARIABLES ON TAX REVENUE IN PAKISTAN DURING (1995 TO 2024)

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Abstract

This study is to investigate how a several of factors, including unemployment, interest rates, inflation, and national saving, affect Pakistan's tax revenue. The World Bank website and Pakistans federal bureau of statistics and Pakistans economic survey and Pakistans state bank all helped with this study. This study looks at Pakistans economy. How different things affect the tax revenue of Pakistan. The study is about Pakistan and what things make a difference, in the tax revenue of Pakistan Secondary data covering the years 1995 to 2024 serve as the basis for this study. Additionally, this paper has the consistent year for all variables. The result show in normality test Most variables have $p > 0.05$ (e.g., 0.278, 0.370), suggesting normal distribution. Two variables have $p < 0.05$ (0.000, 0.016), indicating non-normal distribution. And in the stationary test most variables are I(1), meaning they require first differencing to achieve stationary (ADF/PP $p < 0.05$ after differencing).One variable is I(2), needing second differencing. I have taken into unemployment and the Human Development Index and national income, per capita and inflation and interest rates, total savings, and tax revenue in a more complex multiple regression model. The regression analysis shows, demonstrates how the model's various variables affect tax revenue. The predictor variables total savings, HDI, and interest rates the analysis that variables have significant positive effect on tax revenue and the difference, national income, unemployment, inflation exhibit significant negative impacts on tax revenue. These effects are supported by p-values below the 5% significance level.

1. Introduction

The social science of economics looks at how governments, businesses, and individuals allocate limited resources. It focuses on how goods and services are made, used, and distributed and it is divided into two main branches: macroeconomics, which examines the economy as a whole and places an emphasis on decision-making to maximize production and consumption, and microeconomics, which focuses on individual and firm-level decisions. Benefit during times of fear, surplus, and accomplishment in developing economy, taxation is prime economic tool and revenue collection method for the government. In rising economies, an efficient tax system is essential to economic expansion. As a result, taxes have a variety of effects on an economy, although their effects may not always be positive. Taxes also have some negative effects. According to Paulson et al. (2008), Taxes has significant negative effect on economic expansion, and taxation has both positive and negative effects on GDP.

HDI: Human Development Index (HDI) measures a nation's development over time in three fundamental areas of human development index towards knowledge, Standard of living, and healthy life. Gross national income **(GNI)** for short, is the sum of all the gross balances of primary incomes for all sectors. **Total saving;** Measurement of Savings By definition, Savings are a portion of income that is not used. These are measured indirectly by the rate of inflation in national income; **inflation** is the rate at which prices rise over a certain amount of time. The cost of living in a country and overall price increases are two examples of measures of inflation. Interest rate is the part of a loan that is charged as interest. It is often expressed as a yearly percentage of the amount still owed on the loan. **Tax revenue** is the obligation to pay taxes to the general government or a supranational right without receiving any compensation. Taxes are unjust because the government usually gives taxpayers benefits that don't match what they pay in taxes. People who are employable and actively seeking employment but are unable to do so are referred to as "**unemployed.**" Those in the workforce who are employed but do not have an appropriate job.

2. Literature

In this section, I have examine previous researches and studies which show relationship among variables human development index, total savings, national income per capita, unemployment, inflation, interest rates, and tax revenue. According to AMJAD ALI (2016), the authors discovered that people with lower incomes have a lower opportunity to save, and that saving is positively associated with income. With a given nominal interest rate, saving money loses value when inflation is high. According to Pakistan's date, personal real interest rate and national saving rate have been trending in the same direction. The Human Development Index was found to have a negative correlation with total savings, as stated by Professor SHATAKSHEE DHONGDE (2014). This is in line with the idea that a high unemployment rate makes it less likely that people will save a lot. Domestic investment and economic expansion have a positive effect on tax revenues, Jamel Eddine, Bakari, Sayef and Othmani, Mkadmi, Ameni (2021)Domestic investment is not affected by economic expansion or tax revenue in the long run. According to Omar mohammad abad Alkasasbeh; Nazatul faizah haron; Ali Ibrahim Saleem abueid (2012), government spending and taxes has positive significant effects on aggregate economic growth. According to Muhammad Asim, Farooq-E-Azam Cheema, and Sidrat Jilani's research, GDP is significantly influenced by interest rates, inflation, and exchange rates. In terms of the co-efficient indicators, GDP was negatively correlated with inflation and interest rates were positively correlated with interest rates. ROBERT MATUSIAk (2022) Throughout the period, the gross domestic product and government expenditures both contribute to revenue growth, as do initial investments and exports, which initially have a negative impact Moses G. The significant positive correlation between GDP increase and tax revenue, as stated by Chamisaa and Tafirenyika Sunde (2024), suggests that economic expansion results in an increase in tax revenue. To support the domestic resources mobilization agenda and boost economic growth, policymakers ought to develop and implement prudent policies.

3. Research Gap

This research study will analyze separately the impact of Macroeconomic variables on total tax revenue, federal by developing model. This is another gap addressed by this research according to the literature review none of the studies carried out in Pakistan has done such research. This research will also cover macroeconomic variables not addressed by other past research studies and evaluate the relationship between This research will analyse, the impact of real GDP growth rate, saving rates, Human development index, inflation and unemployment and analyse their impact on Tax Revenue.

4. Problem statement

Tax revenue is a primary source of income for the government and plays a crucial role in development in an economy is hugely dependent upon it. The entire fiscal policy is made on the basis of tax collections, therefore tax revenue and the factors affecting it carry a significant importance in any economy. Pakistan is experiencing rising tax revenue and has indicated substantial growth, in the recent years. Despite of rising tax revenues Pakistan is struggling with low tax to GDP ratio, narrow tax base and too much reliance on few sectors and exemptions. (www.finance.org.pk). Problems that limit fiscal space for public investment and debt reduction. According to the official figures as collected by (www.fbr.or.pk) for the financial years, FY-2023-204, there was a sharp increase in tax collection and targets were revised upward in FY-2024-25 but the tax revenue remained susceptible to the macroeconomic shocks and policy changes experienced by economy. Tax base in our economy (Through Incomes, Profits, and consumptions), as well as revenue administration outcomes both are being heavily influenced and affect by macroeconomic factors including, unemployment, exchange rates, interest rate, inflation and GDP.

5. Research Objectives

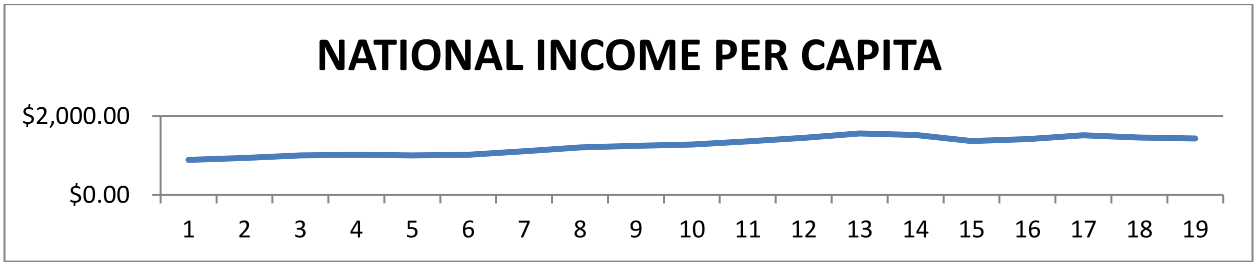
- To examine the effect of Gross National Income (GNI) per capita on tax revenue in Pakistan.
- To assess the impact of total savings on tax revenue in Pakistan.
- To determine the effect of inflation on tax revenue in Pakistan.
- To evaluate the influence of the Human Development Index (HDI) on tax revenue in Pakistan.

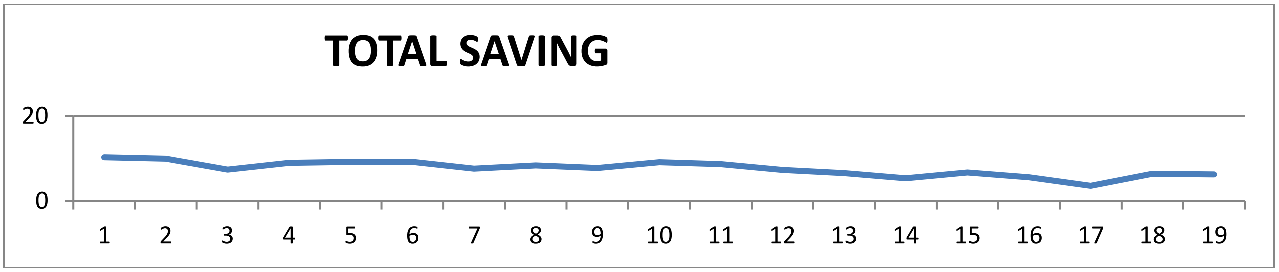
6. To analyze the relationship between the unemployment rate and tax revenue in Pakistan.Research Methodology;

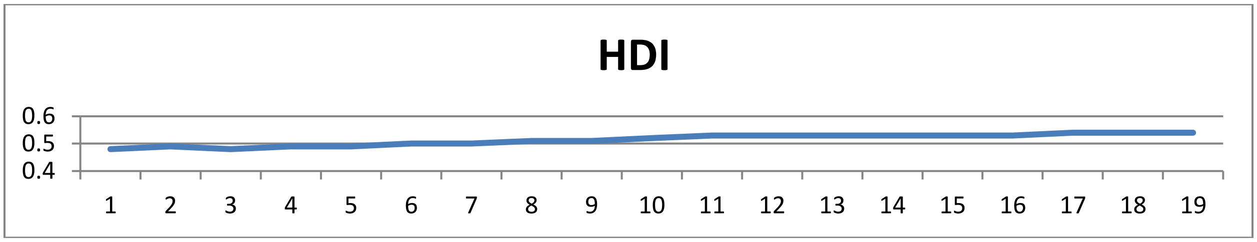
The nature and source of secondary data used in this study and where it came from. The analysis makes use of annual time series data. The relevant variables from 1995 to 2024. This analysis of annual data variables of total savings, human development index, Unemployment rates, national income, inflation, and tax revenue are collected using secondary data from the journal and article of Statistics Pakistan Economy and Federal Bauru. The Economic Survey of Pakistan's data were examined with the help of the correlation, regression, and normality.

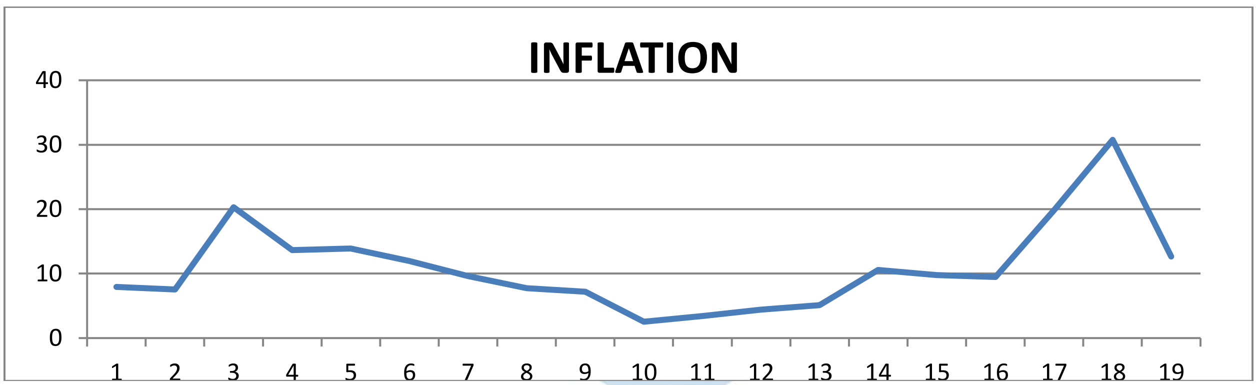
7. Research Analysis;

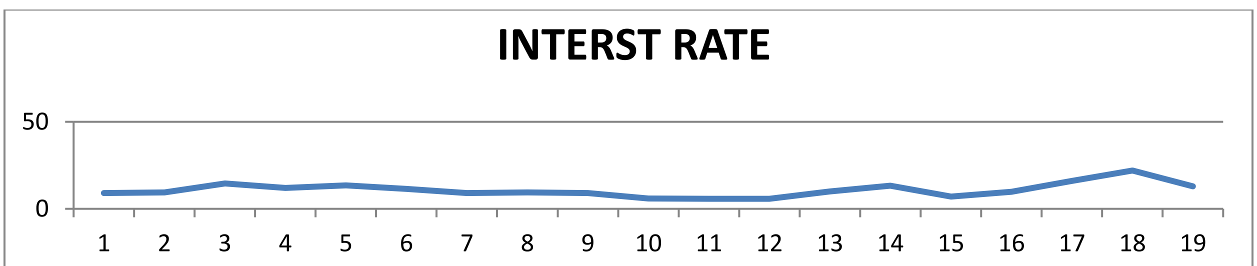
Descriptive and statistical techniques are utilized in this study's analysis and evaluation of the outcome. Descriptive statistics can now be used to comprehend the data's structural properties. Inferential analysis includes correlation analysis, regression analysis, unit root analysis, and co integration analysis. In correlation analysis, the relationship among variables is determined using of Pearson correlation. In regression analysis the determine the strength and significance of the relationship.

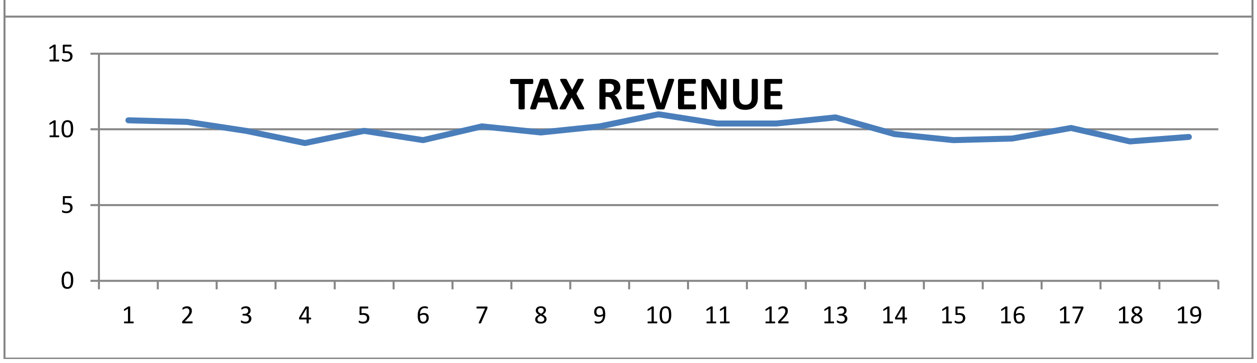



TOTAL SAVING
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19


HDI
0.6
0.5
0.4
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19


INFLATION
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19


INTERST RATE
50
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19


TAX REVENUE
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

Normality test Result				
Variables	Skewness	Kurtosis	Jarque bera	Prob
National incomepercapita	-0.1544	1.6033	2.5577	0.278
Total saving	0.2594	1.8510	1.9864	0.370
HDI	-0.377	1.752	2.656	0.264
unemployment	0.889	2.607	4.152	0.125
Interest rates	0.690	2.763	2.450	0.293
inflation	1.643	6.376	27.74	0.000
Tax revenue	1.250	3.519	9.158	0.016

Jarque-Bera = 2.5577, p = 0.278; normal; income per capita: skewness = −0.1544 (slightly left-skewed); kurtosis = 1.6033 (platykurtic); Skewness was 0.2594, kurtosis was 1.8510, Jarque-Bera was 1.9864, and p was 0.370—normal. HDI: normal, Skewness = - 0.377, Kurtosis=1.752, Jarque-Bera = 2.656, p = 0.264 skewness= 0.889, kurtosis = 2.607, Jarque-Bera = 4.152, and p = 0.125 are all normal for unemployment. Rates of interest have a skewness of 0.690, a kurtosis of 2.763, a Jarque-Bera value of 2.450, and a normal p value of 0.293. Skewness was 1.643, kurtosis was 6.377, Jarque-Bera was 27.74, and p was 0.000 nonnormal. Revenue from taxes: skewness = 1.250, kurtosis = 3.519, Jarque-Bera = 9.158, and p = 0.016 are non-normal.

Stationary Test Results							
Variables	ADF atat	prob	Kpss atat	prob	PP atat	Prob	Decision
National incomepercapita	8.083	0.001	0.307	0.001	7.608	0.001	2^{nd} difference level
Total saving	7.167	0.001	0.2282	0.001	8.237	0.001	1^{st} difference level
HDI	6.424	0.001	0.2074	0.001	6.423	0.001	1^{st} difference level
Unemployment	4.587	0.001	0.114	0.001	4.635	0.001	1^{st} difference level
Interest rates	4.442	0.002	0.357	0.002	4.809	0.006	Level
Inflation	2.643	0.090	0.2088	0.001	2.677	0.090	Level
Tax revenue	6.765	0.001	0.198	0.002	6.776	0.001	1^{st} difference level

1) "ADF "Tests the null hypothesis that the series is non-stationary." If prob ≤ 0.05, reject the null series is stationary. All values except the sixth row (prob = 0.090) indicate stationarity after differencing.

2) Kpss atat (KPSS statistic): "Tests the null hypothesis that the series is stationary." If prob ≤ 0.05 reject the null series is no stationary. All KPSS probabilities are 0.001, suggesting the original levels are no stationary, confirming the need for differencing.

3) PP atat (Phillips-Perron statistic) test: similar to ADF, tests for a unit root. Results match ADF, supporting the same stationary decisions. rob (PP p-value) - The probability for the PP test; ≤ 0.05 implies the series is stationary. Decision. Indicates the series is made stationary at level, 1st difference, or 2nd difference. Most variables become stationary at the 1st difference (I(1)).One variable needs a 2nd difference (I(2)).

Dependent Variable: TAXREVENUE
Method: Least Squares
Date: 11/15/25 Time: 18:24
Sample: 1995 2024
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NATIONALINCOME	-0.000294	0.001983	-0.148114	0.8835
TOTALSAVING	0.351410	0.148523	2.366026	0.0264
HDI	16.05260	7.761070	2.068349	0.0495
UNEMPLOYMENT	-0.286374	0.199463	-1.435726	0.1640
INTERSTRATES	0.261939	0.065775	3.982333	0.0006
INFLATION	-0.151415	0.050470	-3.000123	0.0062

R-squared	0.740822	Mean dependent var	10.73000
Adjusted R-squared	0.686827	S.D. dependent var	1.446315
S.E. of regression	0.809385	Akaike info criterion	2.591772
Sum squared resid	15.72249	Schwarz criterion	2.872011
Log likelihood	-32.87658	Hannan-Quinn criter.	2.681423
Durbin-Watson stat	1.879231		

In the regression analysis, it is shown that different variables within the model influence tax revenue. The predictor variables, total savings, HDI, and Interest rates. The results show that some factors have a significant positive effect on tax revenue, as evidenced by p-values below 5% and high T-statistics. Conversely, national income, unemployment, and inflation exhibit a significant negative effect on tax revenue. The coefficients of each variable reflect the direction of their influence on the dependent variable.

8. Limitation

This study to assess and examine macroeconomic variables influence Pakistan's tax revenue over the period from 1995 to 2024. Furthermore, only data from fiscal years 1995 to 2024 will be utilized to evaluate the effective tax revenue rate parity.

9. Conclusion.

These study macroeconomic variables that have an effect on tax revenue in Pakistan's economic development. The present study employs annual time series data and analyzes data from 1995 to 2024. In order to combine the variables data, information is gathered from Pakistan's economic survey and world development indicators. All variables have mix order of assimilation.

10. REFERENCE

Ali, A., & Audi, M. (2018). Macroeconomic environment and taxes revenues in Pakistan: An application of ARDL approach. Bulletin of Business and Economics, 7(1), 30–39.

Ahmad, A., & Yasmeen, K. (2013). The impact of tax on economic growth of Pakistan: An ARDL approach. Journal of Basic and Applied Scientific Research, 3(11), 392–398.

Ali, G. (2015). Gross fixed capital formation and economic growth of Pakistan. Journal of Research in Humanities, Arts and Literature Applied, 1(2), 21–30.

Atolagbe, S., & Abiodun, A. A. (2021). Impact of some macroeconomic variables on tax revenue in Nigeria. Nigerian Journal of Basic and Applied Sciences, 29(2), 17–29.

Barro, R. J., & Redlick, C. J. (2011). Macroeconomic effects from government purchases and taxes. The Quarterly Journal of Economics, 126(1), 51–102.

Conrad, R. F., & Alexeev, M. V. (2024). Evolutionary tax reform in emerging economies: An income-based approach. Oxford University Press

Creswell, J. W., & Garrett, A. L. (2008). The "movement" of mixed methods research and the role of educators. South African Journal of Education, 28(3), 321–333.

Macek, R. (2014). The impact of taxation on economic growth: Case study of OECD countries. Review of Economic Perspectives, 14(4), 309–328.

Matusiak, R. (2018). Impact of macroeconomic variables on tax revenues: Empirical study using the VEC model. Annales Universitatis Mariae Curie-Skłodowska, Sectio H Oeconomia, 52(5), 39–46.

Moeen, G., Naqvi, H. A., & Khan, M. A. (2021). Impact of sales tax reduction on Pakistan's economy. Studies of Applied Economics, 39(4).

Shafiq, M. N., Bhatti, M. A., Bashir, F., & Nawaz, M. A. (2022). Impact of taxation on economic growth: Empirical evidence from Pakistan. Journal of Business and Social Review in Emerging Economies.

Shaikh, S., Rashdi, U. S., & Urooj, M. B. (2024). The metaverse in the workplace: Thematic analysis of possibilities and implications for human resource development in Pakistan. International Journal of Social Sciences Bulletin, 2(4), 134–143.