Assessing the Determinants of Tax Revenue: Empirical Evidence from Pakistan

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Abstract

Raising tax revenue is a critical question for non-resource-based revenue-generating economies. There are few studies intending to contemplate the relationship of economic and financial variables with tax revenue. In Pakistan, this question has not been addressed by the researchers previously. This study chooses economic and financial factors as exogenous variables and tax revenue as an endogenous variable in the case of Pakistan for the period ranging from 1980 to 2019. The study uses ARDL Bound Testing as it contains the data of the variables that are stationary at the level and first difference. The study finds that financial variables influence tax revenue positively whereas per capita income has an inverse relationship with tax revenue. According to the results of the study, the financial variables, which include bank capital to total asset ratio, bank non-performing loans, and the bank risk premium on lending, relate positively and the economic variables, which include broad money and foreign development assistance, relate positively except per capita income, which gives results otherwise. The results of the study dictate that increasing reliance on indirect taxation results in a negative relationship between tax revenue and national income because its incidence is on the poor. It suggests that established financial institutions, inclusive growth, consolidation of the money market, and a progressive tax system could help the economy generate more rewarding revenue generation activity. Indirect taxation creates disparity and regressive taxation, which hampers economic growth; therefore, it is suggested efficient taxation with more portion of direct taxation by the study.

Keywords: Fiscal Deficit, Tax Revenue, Economic Variables, Financial Variables, Developing Economies, GDP, Economic Growth, M2, Broad Money, Bank Non-Performing Loans

Introduction

The triumph of government lies in working for the welfare of society. A country can develop only if it carries enough resources to fund its value-creation projects (Puspitawati & Hartono, 2019). Tax is the chief source

of revenue for the administration and it is collected from individuals and firms on their income and other profit-generating activities and transactions (Hakim & Bujang, 2012).

Tax is the fee for public services. Tax is neither a charity nor is based upon the will of the tax giver. It is rather regulated by the government forcefully which is why tax avoidance is a crime punishable by law. There are two systems of taxation i.e., uniform tax rate and progressive tax rate. In a flat tax rate, the same tax is applied to different levels of income, and in a progressive tax rate, an incremental tax rate is applied to different levels of income. There are two main approaches to taxation i.e., direct tax and indirect tax. In direct taxation, the burden of tax is born by the person who pays it; however, indirect tax is not born by the payer of it, but it is shifted by the payer to the ultimate user. There is a rich diversity of taxation which includes income tax, property tax, tariffs, payroll tax, etc. Fiscal capacity is the term used to name the ability of any government to gather taxes and when budgeted expenditures are higher than the amount of tax collected which is termed as fiscal deficit, the government has to go for debts that in turn raise expenditures of following years by debt servicing. In the modern world, tax is supposed to help the poor, destitute, and old people and collected from those who are earning handsome and spending handsome amounts thereby it promotes equitable growth. Hypothecation is a tax intended to finance activities related to deal the negative externalities of products that undergo such taxation.

Governments provide redistribution, transfer payments, and public goods which are non-rival and non-excludable. Collection of tax is a bloodline for a country since a contraction in tax may give rise to a fiscal deficit and put the country into a quagmire of debt. Hefty public borrowing makes financing harder for the private sector in case of domestic debt which is known as crowding out the private sector (Arora & Dua, 1993; Karras, 1994; Burney and Akhtar, 1992; Darrat, 2000).

To cure fiscal deficit, developing countries strive to curtail down public outlays, enhance revenues, and attract private investment. The budget consists of a revenue budget and a capital budget. A few studies claim the progressive impact of fiscal deficit on economic growth whereas other studies demonstrate counter the positive impact of fiscal deficit on economic growth (Prunera, 2000; Fatima et al., 2011; Huynh, 2007). The fundamental focus of developing countries is to attain a high growth rate but the main hurdle in the attainment of that goal are weak economic structure, poor infrastructure, and low level of per capita income. Therefore, they look forward to international organizations getting the debt to vamp up their infrastructure. A few researchers claim that foreign debt impacts the economy negatively (Rauf et al., 2021). The government's expenditure on infrastructure enhances industrial production (Aschauer, 1989; Romp & Haan, 2007). The rise in growth rate depends upon the economy's expenditure to develop infrastructure (Canning & Pedroni 2004). To provide non-tax revenue, the government needs to rely upon the public-owned entity. The historical perspective of Pakistan shows its poor experience of public organizations as these entities proved loss-making entities owing to inefficiency and corruption. Therefore, tax income is the key source of proceeds for the government.

Financial variables have a keen role to play in determining the tax revenue of an economy as they provide a platform for resource generation. A nonperforming loan is a key financial variable that shakes the tax revenue of a country. A non-Performing loan is a very important parameter to gauge credit administration and it is an important parameter of financial development (Ozili, 2019).

We find that during the period from 2008 to 2020, the proportion of tax revenue increased as compared to non-tax revenue. Although overall government revenue increased, there is an upsurge in the proportion of tax revenue in that period. The twentieth century was marked by a fall in tax revenue (as a percentage of GDP). In 1999, tax revenue was 13.3% whereas it reduced to 10.7% in 2000. Overall that decade until 2010, Pakistan could hardly reach 10 per cent of GDP. Recently it reached up to 12.6% in 2016 and 12.9% in 2018. However, it falls again to 11.8% in 2019. This paper is intended to help the government know possible measures regarding economic and financial factors to enhance tax revenue.

There is a significant relationship between the GDP of the

economy and its tax revenue (Adegboye et al., 2022). There is a relationship between broad money and tax revenue (Ali & Audi, 2018). There is a number of other studies that prove the relationship between economic variables and tax revenue. This study has opted for this question to test the relationship as given below.

What is the relationship between Economic Variables and Tax Revenue?

Basel Committee on Banking Supervision defines non-performing loans as a loan that has elapsed 90 days after their due date. The lending of the banks increases with non-performing loans the banks (Vithessonthi, 2016). As banks are a major part of the financial world, their contribution to overall financial indicators is very important Ozili (2019). Bank non-performing loan proportion is an important measure of the quality of the assets of the banks and their credit risk (Molyneux, 2017). NPL is an important financial indicator to measure the link between financial factors and tax revenue (Basheer et al., 2019).

The risk factor in the financial world and the performance of the banking industry depend upon the capital adequacy ratio (Bank Capital to Total Asset Ratio); therefore, it becomes an important indicator of the performance of the overall financial sector (Batten & Vo, 2019). The capital adequacy ratio helps banks avoid default risk as there is a significant association between financial performance and Capital Adequacy Ratio (Amahalu et al., 2017). There should not be a disparity in the tax for equity and debt as it results in more debt financing which ultimately results in more risky intermediaries in the financial world (Schepens, 2016). Only a strong financial intermediary could ensure capital mobilization and investment. BCAR (Bank Capital to Total Asset Ratio) is the predictor and a parameter to measure the impact of financial variables on tax revenue (Basheer et al., 2019). The paper is going to address the second important question that is given below.

What is the relationship between Financial Variables and Tax Revenue?

Tax Revenue is the bloodline of the economy. Without tax revenue, the state can't be functional. Economic growth and economic salvation of a country depend upon its ability to earn revenue and spend it for welfare and economic development (Egbunike et al., 2018). Therefore, there is a dire need for tax revenue for the economies to remain sovereign and grow (Ajiteru et al., 2018). This paper demonstrates the economic and financial factors that help to enhance tax revenue. Nowadays, economies are increasingly concerned about their indigenous resource mobilization to meet their budgetary demand. This paper focuses on economic and financial variables that play a major role in determining Tax Revenue Collection. The tax structure of Pakistan is quite cumbersome as there is considerable overlapping in different categories of tax. Underdeveloped countries have issues with data management, cash base transactions, and mismanagement of tax collection and expenditure. There are many categories of tax that are a matter of debate for a tax consultant, accountant, Provincial and Federal Government, and industrialists as some of them argue that these categories are not taxed and some consider them as tax. Workers welfare fund and workers Participation Fund are an example of these moot points.

There are many studies that focused on the relationship between economy and growth most of them considered the direction of the relationship from Tax Revenue to Economic Growth (Ormaechea and Yoo, 2012; Arnold, 2008; Arnold et al., 2011; Gale et al., 2014). On the other hand, a few studies are related to the impact of economic and financial variables on Tax Revenue (Ali & Audi, 2018; Agbeyegbe, 2004; Asghar & Mehmood, 2017; Basheer et al., 2019; Cage & Gadenne, 2018; Castro & Camarillo, 2014; Gnangnon, 2016; Gnangnon, 2017; Harahap et al., 2018; Mahmood et al., 2013; Nwosa et al., 2012; Pessino and Fenochietto, 2010; Terefe and Teera, 2018; Velaj and Prendi, 2014; Zeng et al., 2013). Out of these studies, only Asghar & Mehmood (2017) and Mahmood et al. (2013) studied the impact of financial and economic factors on Tax Revenue in Pakistan; however, Asghar & Mehmood (2017) took GDP, Trade Openness, Urbanization, and Population as the independent variable and Mahmood et al., (2013) took FDI and GDP as the independent variable. Our study is unique as it is going to study the impact of 6 economic and financial variables on Tax revenue.

Literature Review

Basheer et al. (2019) conduct a study in the Middle East. The paper also finds that economic variables such as GDP, FDI, and cash surplus/deficit poses more influence on tax revenue as compared to financial variables included in the model. Ali & Audi (2018) conduct a study on tax revenue as evidence from Pakistan. It shows Tax Revenue also moves in the same direction as broad money moves. Short term relationship of the dependent variable with independent variables of the research study as obtained through the Error Correction Model shows that unemployed labour rate, foreign direct investment, inflation rate and broad money has a direct association with tax revenue significantly.

H1: M2 influences Tax Revenue Positively.

Harahap (2018) studies tax revenue and effective tax rate as dependent variables and macroeconomic variables as independent variables as evidenced by Indonesia. Adegboye et al. (2022) conduct a study to determine factors affecting Tax Revenue belonging to Albania. The paper finds that GDP correlates with tax revenue positively and the result is also significant. Mahmood (2013) conducts a study to find the impact of FDI and GDP on tax revenue in Pakistan. The paper concludes that both GDP and FDI are good for the economy in terms of improving domestic revenue collection and increasing tax revenue for the economy. The paper finds that child mortality and education don't relate significantly whereas life expectancy relates negatively and gives significant results. Egbunike et al. (2018) study the impact of tax revenue on GDP as evidenced by Ghana and Nigeria. Gale & Samwick (2014) study the effects of tax changes and their aggregation on the GDP growth rate and this paper finds that different sort of variation in tax revenue has a different impact. Zafar (2017) studied the taxation system of Pakistan and its impact on the economy. Ahmad et al. (2018) study the interaction between indirect tax and economic growth for the period starting from 1974 to 2010. Amin et al. (2018) study the impact of personal income tax on economic growth by comparing the taxation system of Pakistan and China. Javed & Basheer (2017) study the predicting variables for the profitability of banks as market concentration, interest rate, real GDP GR, expenditure of bank and its fixed assets. This paper finds a significant effect of a few of the changes in Tax structure on GDP Growth rate (Hakim & Bujang, 2012). According to Koch et al. (2005), income is directly proportional to growth. Barro (1990) explains the relationship as the growth rate increases with higher income tax; however, it starts falling after a certain limit of income tax as it starts falling with the rise in income tax after this limit. Hartman (1985) studied the effect of Tax decisions on Foreign Direct Investment and found a significant change in FDI due to changes in tax strategy. There are many studies on the topic of the relationship between taxation and the economic positive rate of change (Johansson et al., 2008). Arnold et al. (2011) proposed a tax structure that could play the role of rehabilitation from crisis and accelerate consistent Growth of the economy. For years oil-rich countries have been providing civic facilities and employment from oil revenue but it is evident that for every nation real source of revenue for the Government of that country is tax despite natural resources as they may prove non-permanent, disparity and exploitation (Chemingui & Roe, 2008). Higher tax affects financial institutions' financing capability (Bernanke and Gertler, 1995; Basheer et al., 2018). Taxes affect business liberalization negatively as selling lower tax rates multinational companies invest in a country where there is a lower tax rate comparatively (Devereux & Maffini, 2007).

H2: GDP per Capita impacts Tax Revenue negatively.

Zeng et al. (2013) study the impact of economic factors and tax structure on tax revenue concerning China's modal and overall periodic changes. Nwosa et al. (2012) study the impact of trade liberalization on trade tax revenue as evidence from Nigeria. Pessino & Fenochietto (2010) study factors determining the tax efforts of economies. Yalaman (2019) studies the impact of financial inclusion on tax revenue. Isabwa & Mabonga (2020) find a negative association between profitability and Non-Performing Loans. Tosun & Abizadeh (2005) claimed that taxes have a huge rate to manipulate monitory policy and hence power to influence the rate of inflation and deflation. Taxes reduce growth by allowing labour to be leisure. It states that a low tax rate attracts more capital from outside. Nkusu (2011)

studied that higher economic growth and higher unemployment lead to high Non-Performing loans whereas Klein (2013) derived results counter to this. Non-Performing loans are those loans whose payment both in terms of capital and debt servicing is not according to contract and defers (Isabwa & Mabonga, 2020). Streimikiene et al. (2018) study the tax revenue of Pakistan and envisaged the tax revenue based on its determinants. Non-Performing loans have a great way to determine the tax collection and tax income of a country (Noeth & Sengupta, 2012).

H3: Bank Non-Performing Loan to Total Gross Loans raises Tax Revenue.

Developed countries mostly rely on indirect tax except for China, which heavily depends upon VST. However, there is a pattern emerging with the new wave of globalization that countries like Japan and France also raised their proportion of indirect tax to cover dynamic capital flow and its consumption (Wen et al., 2020). Jansky & Palansky (2019) study the impact of profit shifting by resorting to tax havens on tax revenue. Cebula (2018) found a positive relationship between tax avoidance and real interest rate yield and found a positive relationship between two variables which means higher the avoidance of tax causes a higher cost of financing meaning loan becomes costly. Al-Shubiri & Jamil (2017) studied variables that determine and influence interest rate spread as evidenced by Oman. The results say that independent variables which impact IRS significantly are liquidity risk, return to asset ratio, risk aversion, unemployment rate, principal repayment and debt service ratio. Johannesen (2014) studies the impact of withholding tax on the business of banking in terms of bank deposits. Ozili (2019) studies the relationship between financial development and non-performing loans. There is a dearth of research done on banking profitability variables such as interest rate, deposit rate and lending rate as a determinant of Tax collection and their mutual relationship (Javed & Basheer, 2017; Johannesen, 2014).

H4: Risk Premium on Lending impacts Tax Revenue negatively.

Mahmood & Zahra (2017) studied factors determining the tax revenue of Pakistan. Colliard & Hoffmann (2017) studied the impact of the financial transaction tax introduced in France on the liquidity of the market and its efficiency. The results of the paper show that investors part of the market do not change their share of ownership as compared to the control group. Faccio and Xu (2015) studied the interaction of taxes both corporate and personal taxes on capital structure. This study finds that taxes manipulate and influence the capital structure of corporations as this paper studied their relationship. Flores & Moussu (2019) conducted a study to see the impact of tax incentives and allowance given on equity on bank capital. The paper finds the value of the coefficient equal to 0.085 between equity ratio and ACE tax reduction. Cornett et al., (2011) and Dermine, (2013) suggested that an interest tax shield gives an incentive to companies to go to higher leverage. Al-Faris, (2002) studied the relationship between capital expenditure and the Growth of the economy and found them co-integrating positively.

H5: Bank Capital to Asset Ratio curtails down Tax Revenue.

Rana & Wahid (2016) studied budget deficit and economic growth from the perspective of Bangladesh. Munir & Sultan (2016) studied the impact of taxes on the economic growth of Pakistan. The results of the paper prove significant long-term and the short relationship between dependent and explanatory variables and the nature of this relationship is also positive. Artavanis et al., (2016) studies tax evasion. Terefe et al. (2018) conduct a panel study in countries of East Africa considering tax revenue as the dependent variable. Cage & Gadenne (2018) study the impact of trade openness on tax revenue. The paper finds that economies faced greater costs after 1970 than before it due to trade liberalization. Asghar & Mehmood (2017) study the impact of trade openness on tax revenue in Pakistan. This research paper contains other factors as independent variables in addition to trade liberalization.

Gnangnon (2017) studies the impact of FDI on corporate tax revenue and non-resource tax revenue in 172 countries for the period ranging from 1980 to 2013. The paper finds that trade openness and inflation relate negatively to non-resource tax revenue and non-resource corporate tax revenue. The paper also finds positive and significant

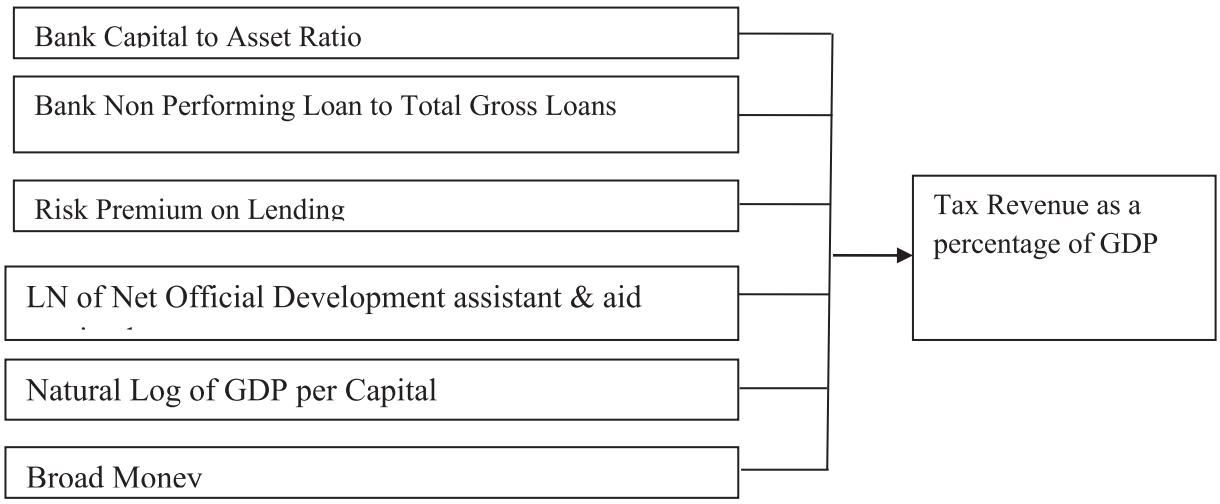
interaction between the contribution of value addition to agriculture and non-resource tax revenue. Gnangnon (2016) studies the effect of trade facilitation reforms (including removing hurdles and creating access, recovering business and regulatory situations, and developing information and communication expertise) on tax revenue. Castro & Camarillo (2014) study the impact of social, economic, productive specialization and institutional factors on tax revenue in 34 countries of the Organization for Economic Cooperation and Development (OECD) for a time duration ranging from 2001 to 2011. The paper finds that 11 countries reduced tax revenue in the given period. Suryanto et al. (2018) study tax revenue as the reason as well as solution of income in Islamic countries. The paper finds that developed countries tax more than spend and developing countries on the other hand spend more than taxing. In developing as well as developed countries, the relationship between taxation policy and GDP including other economic and financial indicators is one of the hottest topics (Easterly & Rebelo, 1993). Credit risk plays a key role in deciding the interest rate on any financing. Chirwa, (2001) and Fetai, (2015) studied and proposed that increase in interest rate affects the entire economic sector which results in a loss of economic growth. Aamir et al. (2011) study the system of taxation in practice in India and Pakistan. Arnold (2008) studied the interaction of tax structure and economic development.

H6: Net official development assistance and official aid received decreases Tax Revenue.

Conceptual Framework

In this research study, I am going to study the effect of Economic and Financial factors on Tax Revenue. To study these broad abstracts and their mutual interaction, I will use 10 proxy variables as these variables have been used in research by Basheer et al., (2018).

THEORETICAL FRAMEWORK



The following theories provide the base of the relationship of Tax Revenue with Economic and Financial Factors. Benefits Received Theory which states that there is a relationship of mutual consideration between the state and taxpayer as the state provides goods and services in return for the tax proceeds. Socio-Political Theory claims that social and political milestones are important in making decisions about taxes as the theory stresses that tax should be levied to serve the interest of society rather than providing for individual benefits. Ricardian Equivalence Theory claims that consumers save tax cuts as they envisage future higher taxation to meet debt obtained to finance the tax cut. Adam Smith, in his celebrated book "The Wealth of Nations," gives four canons of taxation as Equity, Certainty, Convenience and Economy. The Benefit Theory of Taxation states that the tax load must be divided

among the people concerning benefits received by these individuals from the state. Ability to Pay Theory states that people should be subjected to the tax rate as per their ability to pay. Keynes' General Theory of Employment claimed that when there is less output, Government should increase expenditure. Expediency or Financial Theory states that Government should collect the maximum possible tax revenue from its public with the least possible damage to the public politically and economically. Modigliani and Miller Proposition I and II (With Taxes) say that the value of a levered firm enhances owing to taxes as compared to all equity financing firms

ECONOMETRIC MODEL

$$TR = -7.067 + 0.86383 * BCAR + 0.330598 * BNPL + 0.478303M2 + 1.130437 * RPL - 3.434313 * NLYPC + 0.281711 * NODAU + \in_t$$

OPERATIONAL DEFINITIONS & MEASUREMENT OF VARIABLES

The economic impact is measured with the help of the Natural Log of GDP per Capita (NLYPC), Natural Log of Net Official development assistant and official aid received (NODAU) and Broad Money (M2). The financial impact is measured with the help of Bank Capital to Total Asset Ratio (BCAR), Bank Non-Performing Loan to Total Gross Loans (BNPL) and Risk Premium on Lending (RPL).

DATA SOURCES AND SAMPLING

Secondary data is obtained from World Bank development indicators and the Economic Survey of Pakistan. The range of the data is January 1, 1980, to December 31, 2019. Since the study is conducted on the entire population of Pakistan.

Methodology

This is a time-series study. The study uses ARDL bound testing to see the long-term and short-term relationship between independent and dependent variables.

RESULTS AND DISCUSSION

Table 1- Descriptive Analysis

	TR	BCAR	BNPL	M2	NLYPC	NODAU	RPL
Mean	11.98750	9.706661	20.42500	46.59837	10.10908	21.61044	2.378918
Median	12.20000	9.608416	20.85000	45.33788	10.13211	21.43541	2.205017
Maximum	14.30000	17.30000	38.00000	59.03668	12.07448	23.85309	6.992545
Minimum	9.300000	1.766931	7.200000	34.79942	8.006436	20.03140	-1.057723
Std. Dev.	1.474951	4.920380	8.819115	6.702194	1.278642	1.062109	1.697960
Skewness	-0.206491	-0.141462	0.292307	0.374296	-0.007114	0.501469	0.530275
Kurtosis	1.670395	1.832005	2.129356	2.069776	1.693466	2.194322	3.112259
Jarque-Bera	3.230674	2.407095	1.832990	2.376177	2.845390	2.758340	1.895612
Probability	0.198824	0.300128	0.399918	0.304803	0.241063	0.251788	0.387590
Sum	479.5000	388.2664	817.0000	1863.935	404.3633	864.4178	95.15671
Sum Sq. Dev.	84.84375	944.1956	3033.295	1751.857	63.76213	43.99496	112.4397
Observations	40	40	40	40	40	40	40

Jarque-Bera shows that variables are normally distributed.

Table 2 Correlation Analysis

Sample: 1980 2019
Included observations: 40

Correlation Probability	TR	BCAR	BNPL	M2	NLYPC	NODAU	RPL
TR	1.000000 -----						
BCAR	-0.482984 0.0016	1.000000 -----					
BNPL	0.536509 0.0004	-0.874519 0.0000	1.000000 -----				
M2	-0.418033 0.0073	0.747968 0.0000	-0.714053 0.0000	1.000000 -----			
NLYPC	-0.609319 0.0000	0.951002 0.0000	-0.879733 0.0000	0.768504 0.0000	1.000000 -----		
NODAU	-0.097530 0.5494	-0.460956 0.0028	0.422368 0.0066	-0.146061 0.3685	-0.381553 0.0151	1.000000 -----	
RPL	0.111557 0.4931	0.061039 0.7083	-0.196653 0.2239	-0.334975 0.0346	0.004196 0.9795	-0.444655 0.0040	1.000000 -----

Table 3 ARDL Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
TR(-1)	0.771898	0.061784	12.49342	0.0000
BCAR	0.197041	0.058053	3.394164	0.0020
BNPL	-0.008896	0.033574	-0.264970	0.7928
BNPL(-1)	0.084306	0.038681	2.179505	0.0373
M2	0.109102	0.029863	3.653354	0.0010
NLYPC	-0.783372	0.196092	-3.994925	0.0004
NODAU	-0.315780	0.147371	-2.142753	0.0404
NODAU(-1)	0.380039	0.142692	2.663357	0.0123
RPL	0.257854	0.062749	4.109293	0.0003

R-squared	0.906297	Mean dependent var	11.93846
Adjusted R-squared	0.881309	S.D. dependent var	1.460824
S.E. of regression	0.503276	Akaike info criterion	1.663818
Sum squared resid	7.598599	Schwarz criterion	2.047717
Log likelihood	-23.44445	Hannan-Quinn criter.	1.801557
Durbin-Watson stat	2.130071		

ARDL model shows the dependence of tax revenue on financial and economic factors measured with variables included in the model. R square is 0.906297, which tells that 90 per cent of the variation of the dependent variable is explained by the model as the explained sum of squares makes the major part of the average sum of squares. The value of R square also known as the coefficient of determination shows that the model is good as it tells the goodness of fit of the model. Furthermore, the adjusted R square does not fall much from the coefficient of determination. This value is very important as it tells the inclusion of unrelated independent variables in the model. Adjusted R square is 88 per cent and R square is 90.6 per cent. This shows that all the variables included in the model are quite important in explaining the overall variation in the dependent variable and tells that the model is a good one. The value of Durbin-Watson is 2.13, which is quite closer to 2. According to the criteria of autocorrelation based on the Durbin-Watson test is that from 0 to 2 value of DW, there is a positive correlation and from 2 to 4 value of DW, there is negative autocorrelation and there is no autocorrelation exactly at 2. As this value of DW is extremely closer to 2, it shows no issue of autocorrelation; however, it has been further checked below with the help of serial correlation whether there is a serious issue of serial correlation or not. Short-term results show that tax revenue depends upon its first lag as a significant value is less than 5 per cent, so the null hypothesis is rejected and the null hypothesis is that tax revenue is not significantly influenced by its lag. This tells that tax revenue depends upon its value in the previous year shortly. BCAR as an independent variable for tax revenue being a dependent variable also has a significant value which is 0.002<0.05. Based on the value of significance, the null hypothesis is rejected and the alternative hypothesis professing a relationship between BCAR and tax revenue is accepted in the short run. BNPL at its level has no significant relationship with tax revenue in the short run as a significant value is greater than 0.05 so the null hypothesis is accepted which tells that there is no significant relationship between BNPL at its level and tax revenue. However, the lag value of BNPL impacts tax revenue as the significant value of BNPL is less than 5 per cent; therefore, the null hypothesis is rejected and the alternative hypothesis has got hold claiming that the previous year's BNPL value impacts significantly tax revenue in the short run. Tax revenue also has a short-term relationship with the level values of NODAU and its lags, which means it is influenced by both the current and the previous year's values of NODAU as ARDL gives significance below 5 per cent. RPL also have a significant short-run relationship with tax revenue. Asgar and Mehmood (2017) found that there is a significant negative correlation between NODAU and Tax Revenu, this study also proves a significant negative relationship between NODAU and Tax Revenue.

Table 4 Long Run Results

Levels Equation
Case 1: No Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BCAR	0.863830	0.358047	2.412618	0.0222
BNPL	0.330598	0.105748	3.126290	0.0039
M2	0.478303	0.164411	2.909188	0.0068
NLYPC	-3.434313	1.364516	-2.516872	0.0174
NODAU	0.281711	0.401619	0.701438	0.4884
RPL	1.130437	0.356453	3.171348	0.0035

EC = TR - (0.8638*BCAR + 0.3306*BNPL + 0.4783*M2 -3.4343*NLYPC + 0.2817*NODAU + 1.1304*RPL)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	6.337748	10%	1.75	2.87
k	6	5%	2.04	3.24
		2.5%	2.32	3.59
		1%	2.66	4.05

ARDL Bond testing results are given in table number 14 and results prove that calculated F statistics which is 6.337748 is greater than the higher bound of the test which is 3.24 at a 5 per cent level of significance and therefore, it proves the long-term relationship between dependent and independent variables. Amjad and Audi (2018) found a positive significant long-term relationship between M2 and tax revenue. Similarly, M2 has a significant positive long-run relationship with tax revenue. Basheer et al., (2019) found a positive relationship between tax revenue with BNPL and BCAR so the relationship based on our ARDL long-run coefficient gives also a significant positive relationship between the variables. Basheer et al., (2019) also found a positive relationship between economic growth and tax revenue. NLYPC turns out to be negatively relating to tax revenue which is quite unexpected; however, the same negative relationship has been found by Chaudhry and Munir (2010). This is negative relationship is explained by the fact that Pakistan has a major portion of taxation as indirect taxation and there are various categories of tax that influence people's income negatively. Therefore, conversely to the developed world, there is a negative relationship between per capita income and tax revenue. The results show that a 1 per cent increase in BCAR causes 0.863 in Tax revenue, 1 per cent increase in BNPL results in a 0.3306 per cent increase in Tax Revenue, 1 per cent increase in M2 causes 0.4783 per cent increase in Tax Revenue, 1 per cent increase in NLYPC transform Tax Revenue negatively with a decrease of 3.43, 1 per cent increase in NODAU causes 0.2817 increase in Tax Revenue, and 1 per cent increase in RPL results in 1.13 per cent increase in Tax Revenue.

Table 5 Error Correction Form

ECM Regression Case 1: No Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BNPL)	-0.008896	0.025320	-0.351340	0.7278
D(NODAU)	-0.315780	0.118062	-2.674709	0.0120
CointEq(-1)*	-0.228102	0.031262	-7.296375	0.0000
R-squared	0.673837	Mean dependent var		-0.053846
Adjusted R-squared	0.655717	S.D. dependent var		0.782992
S.E. of regression	0.459426	Akaike info criterion		1.356125
Sum squared resid	7.598599	Schwarz criterion		1.484092
Log likelihood	-23.44445	Hannan-Quinn criter.		1.402039
Durbin-Watson stat	2.130071			

As the value of ECM is negative and it is -0.228 given table number 15, which shows the variables will converge towards equilibrium and the speed of convergence is 22.8 per cent annually as our data is annual; furthermore, the results are significant.

Table 6- Variance Inflation Factor

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
TR(-1)	0.007900	183.9447	2.739900
BCAR	0.003343	64.38954	9.0244259...
BNPL	0.001185	88.57559	8.1652577...
BNPL(-1)	0.001446	116.1974	9.0918730...
M2	0.000903	320.9973	6.376294
NLYPC	0.058533	978.3963	9.1772452...
NODAU	0.026037	1936.636	4.420846
NODAU(-1)	0.020477	1529.303	3.683109
RPL	0.005950	8.214783	2.694349
C	24.14403	3850.724	NA

For the sake of the selection of variables in the model, the threshold for variance inflation factor has been chosen as 10. As none of the independent variables trespasses that limit of 10, the variables included in the model have no problem with multicollinearity.

Table 7-Serial Correlation

F-statistic	0.185027	Prob. F(1,29)	0.6703
Obs*R-squared	0.247251	Prob. Chi-Square(1)	0.6190

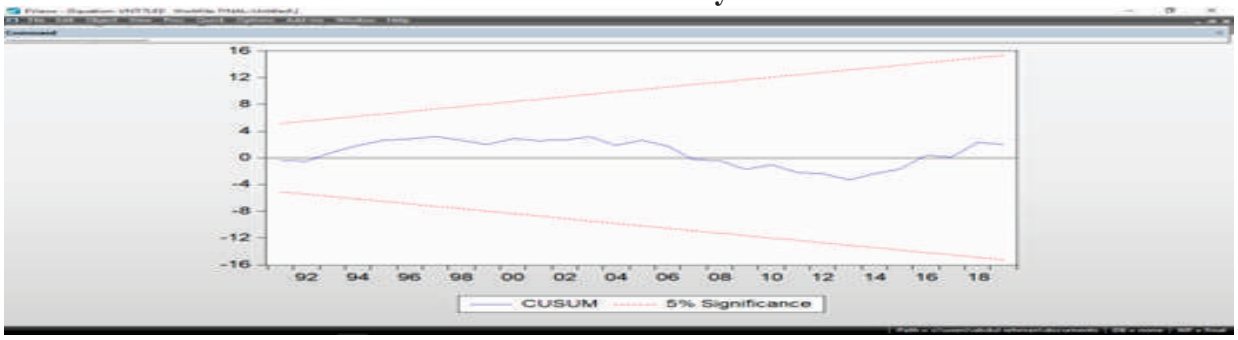
As the null hypothesis of Breusch-Godfrey Serial Correlation LM Test t is that the variables have no problem with serial correlation and the p. value is not also significant thereby accepting the null hypothesis, the variables have no problem with serial correlation.

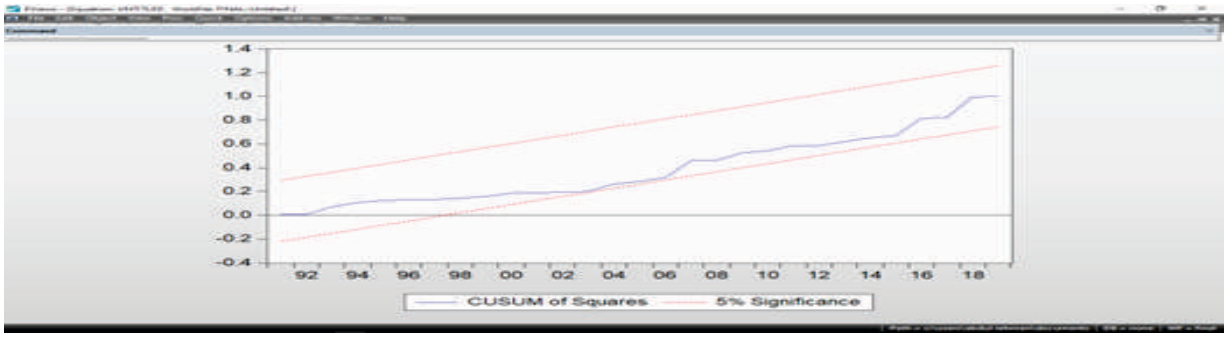
Table 8 Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.759561	Prob. F(9,29)	0.6533
Obs*R-squared	7.439599	Prob. Chi-Square(9)	0.5915
Scaled explained SS	3.609841	Prob. Chi-Square(9)	0.9352

As the significant value lies within limits, the null hypothesis could not be rejected. Therefore, the null hypothesis which is that the variables are not heteroskedastic is accepted thereby proving no issue of heteroscedasticity.

Table 9 Stability





Cusum and Cusum of Squares test proved that the model is stable as it lies within the defined threshold at 5 percent level of significance.

Conclusion(s)

This research study has analysed the impact of economic and financial factors on tax revenue on the time series data for the time duration of 40 years (1980 to 2019). The study uses the ARDL bounds testing approach to test the hypothesis about economic and financial variables. The results of the level of stationarity as measured through the unit root test show a mixed level of stationarity. The study shows the significant positive impact of BCAR, BNPL and RPL. These three factors are used to analyse the financial impact. Based on these results, it is expressed that financial factors have a positive impact on tax revenue in the long run. There is one factor that is one of the negative characteristics of financial institutions. It is a Bank Non-Performing loan as a proportion of the overall loan. This shows that prolonged loans may result in the availability of funds at the hands of the public which results in more tax revenue. This result is in line with the result of M2.

Short term result of ARDL also shows that financial variables have a positive impact on tax revenue in the short run except for BNPL, which also has a positive impact on lag value. Overall, financial factors have a positive impact on tax revenue. M2 and NODAU have a positive impact on tax revenue whereas quite surprisingly NLYPC has a negative relationship with tax revenue as given in the long run results. Broad Money has a positive relationship as more money in the market would result in more tax revenue nominally. Foreign Assistance also enhances tax revenue. However, the negative relationship with per capita income is explained by the fact that Pakistan like other developing countries has a major portion of indirect taxation as a part of total taxation and this indirect taxation might have such sorts and incidents where it affects the economy negatively, which ultimately gives negative relationship with per capita income. Therefore, the government should point out instances where it is becoming counterproductive. Short-term results of economic factors also predict a similar trend in the short run as coefficients of NODAU and M2 is positive whereas it is negative in the case of NLYPC. In literature, many studies are highlighting this fact (Chaudhry & Munir, 2010; Gashi et al., 2018). Koch et al. (2005) study adopting the influence of high indirect tax as compared to direct tax as a research problem focusing on developing countries of South Asia and find as tax revenue changes its major contribution from direct taxation to indirect taxation, it starts portraying counter impact on the economy of the countries. Therefore, this conclusion holds interesting recommendations and points toward the grave problem in policymaking, which assumes that higher revenue always portrays a positive impact on the economy.

Recommendation (s)

Pakistan, like other countries, is heavily dependent on indirect taxation. This indirect taxation creates imparity if not planned well. Specifically, its incident on poor people causes further inequality. This creates a negative relationship between tax revenue and economic growth. Even internal revenue generation activity makes people of that country suffer in terms of their national income. Pakistan should make its taxation system efficient and progressive so that the success of public revenue generation activity may be translated into the success of the people of that country.

A positive relationship between Bank Capital to Total Asset Ratio with Tax Revenue shows that a stable financial system with less default risk results in higher public revenue for our country and other developing countries of the region. Furthermore, the revenue of financial institutions is also relating tax revenue positively as it is explained by the positive relationship between tax revenue and the risk premium on loans. A positive relationship between Tax Revenue and Broad Money shows that having enough liquidity for individuals and institutions in the market raises tax revenue. This positive relationship with M2 dictates that government should strengthen its money market so that may help individuals secure liquidity along with the benefits of lucrative financial assets. These results suggest that a strong and stable financial system, progressive taxation system driven by efficient direct taxation, and liquidity of financial institutions and the public with the availability of current assets could enhance the tax revenue of Pakistan.

Limitations

The study has few limitations as this study has been conducted on the time series data of Pakistan which could limit its generalization to the developed countries of the world; however, developing countries having more proportion of indirect taxation are facing similar problems and may seek guidance about the interaction of economic factors, financial factors and tax revenue of their countries by comparing their financial system with Pakistan. In terms of Pakistan's economic and financial system, there is no availability of data on tax revenue and independent factors before the eighties from a credible source. If the data is available beyond that there could be a more versatile model with the inclusion of more financial and economic factors that could be used to predict the broader picture, which is not possible with time-series data of 40 years as there is left a little degree of freedom after inclusion of such variables which may severely damage the resultant model. However, the study has included more critical factors which are imperative to predict the relationship between financial and economic factors based on sound theoretical background.

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