

## **EFFECTS OF TRADE LIBERALIZATION ON TAX REVENUE IN PAKISTAN: AN EMPIRICAL SCRUTINY USING ARDL BOUND TESTING**

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**Abstract.** This research paper examines the relationship between the trade openness and tax revenue collection alongwith other non-tax determinants affecting the tax revenue of Pakistan, by using time series data from 1980 to 2015. ARDL bound testing approach has been used to estimate co-integration. The results indicate that trade openness is inversely linked with tax revenue performance. If the trade openness is followed by reduction in tariff, then there may be a situation of reduction in tax revenue otherwise the outcome of trade openness might be different. For policy implication, the study suggests that government should give proper emphasis on the overhauling of the entire tax system for internal tax revenue mobilization in the context of uncertainty in foreign aid and acceptance of worldwide policy of free trade. Further, it should improve the property tax revenue collection in urban areas and also revamp the system of capital value tax on the immovable property transactions.

**Keywords:** Trade liberalization, Tax revenue, ARDL

**JEL classification:** F10, H27

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## I. INTRODUCTION

Resource mobilization and development has been strongly focused by the policymakers for the last five decades or so. Underdeveloped countries are more concerned about the issue of resource mobilization for physical and human capital formation. Fiscal deficit arises as a result of a gap between the government receipts and expenditures. To bridge the fiscal gap, the state has to opt for internal or external borrowings which may have serious repercussions in the economy. The problems of fiscal deficit, high inflation, current account deficit in balance of payment are linked with the failure of tax structure in the country. When the government prefers internal borrowing for meeting the fiscal deficit, it leads to “crowding out” of private investment. The negative consequence of ‘crowding out’ effect of private investment means that investment in physical capital has reduced which ultimately retards the level of national output. Similarly, if the government relies on external borrowing for fiscal deficit, then it will lead to create the trade deficit at the end. In order to avoid these fall outs of fiscal disarray, it is necessary for the state to concentrate at the fullest level for mobilization of domestic resources.

The best indicator of the state performance is the level of tax effort by the government of a country as it measures the difference between the actual taxation and potential taxation. Bigger gap of tax effort reflects the failure of the state by challenging its legitimacy and authority because tax collection is a hidden eye to probe the state capacity for internal resource mobilization. Taxation is essential tool in the hand of government to achieve the goal of sustainable development. As Nicholas Kaldor (1963) stressed the role of taxation for development that an undeveloped country to transform itself into a developed country needs to increase its tax collection by 25-30 percent of GDP in place of 10-15 percent prevailing in developing economies. For the sustainable delivery of public goods and services, the government needs funds which may be ideally mobilized through taxation as the external funding is unpredictable and also tied with certain restrictions. In this article, an attempt has been made to investigate the factors which influence the tax revenue performance in Pakistan.

## **PROBLEM STATEMENT**

Today the countries of the world are more concerned about the generation of domestic resources for the fulfillment of their needs. This essay focuses on the issues regarding the factors affecting the tax collection in Pakistan. A number of factors are included in the model to link the nature of relationship between tax collection and most importantly, the trade openness.

## **RESEARCH QUESTION**

Has the trade openness negatively influenced the tax collection in Pakistan?

## **OBJECTIVE**

To examine the long run relationship between the tax collection and trade openness in Pakistan.

## **HYPOTHESIS**

HA: There exists a negative relationship between trade openness and tax revenue collection in Pakistan.

## **II. LITERATURE REVIEW**

The factors affecting the tax revenue has been matter of long debate. A lot of empirical work has been done in this regard to investigate the nexus between a number of factors influencing the tax revenue collection significantly or otherwise. Researchers have studied this issue by including several variables in the regression model as independent variables by keeping the tax revenue GDP ratio as a dependent variable. Results and conclusions are quite different and sometimes contradict each other. The veracity in results may be due to diversified variables used in the data, countries chosen in the panel data, time period covered, and application of different research methodologies.

Chelliah, Baas and Kelly (1975) made a regression analysis for a group of 47 countries for the period 1969-1971. The results indicate a positive and significant relationship of tax GDP ratio with trade openness and share of mining in GDP. As expected, there has been a negative relationship of tax revenue with share of agriculture in GDP. Tait, Gratz

and Eichengreen (1979) uphold the same result for a group of 47 countries by taking the data from 1972 to 1976.

Ghura (1998) in his study revealed the positive link of tax revenue with trade openness, and per capita GDP but a negative one with agriculture GDP ratio and corruption indices.

Piancastelli (2001) investigated for 75 countries on the basis of data from 1985 to 1995. The study confirms that the per capita GDP, trade openness and share of industrial production are positively associated with tax revenue collection. On the contrary, the share of agriculture in GDP is negatively correlated with the tax revenue.

Teera (2003) investigated the linkage between tax revenue and several other variables on the basis of data for Uganda for 1970-2000. The results conclude that tax evasion, agriculture GDP ratio, and population density negatively influence the tax revenue collection. Surprisingly, per capita GDP also bears a negative sign. Whereas, trade openness evidences a negative sign but foreign aid documents a positive relationship with tax GDP ratio.

Eltony (2002) in his study took the data of 16 Arab countries for 1994-2000 to analyze the relationship of tax revenue with several other determinants. Two empirical models have been separately estimated for Arab countries and Non-oil Arab countries by using Hausman Test. For non-Oil Arab countries, the result suggests that the agriculture share in GDP is negatively correlated with tax ratio. While the other variables like share of mining in GDP, share of exports in GDP, share of imports in GDP, GDP per capita income and foreign debt GDP are positively related to tax ratio and are statistically significant. On the other hand, for Arab countries, the share of exports in GDP, mining share in GDP, and agriculture share in GDP are adversely associated with tax performance whereas import share in GDP and per capita GDP are positively linked with tax revenue collection.

Bird, *et al.* (2004) for the period from 1990 to 1999 for a group of 110 countries revealed the interesting relationship of tax revenue with several determinants. The empirical analysis reveals that the per capita GDP, and trade openness, index of civil liberties, political stability, and level of corruption are positively associated with the tax revenue collection. In the contrary, agriculture share in GDP, size of informal

economy, literacy rate and inequality indices are negatively related with revenue performance. The study further added that the institutional quality also matters for achieving a high level of tax revenue collection. Lower level of tax collection has been attributed to poor quality of state institutions in Latin America.

Agbeyegbe, *et al.* (2004) based their study for 22 countries of the period 1980-1996. The results given by the study are that the variables like industrial share in GDP, agriculture share in GDP, per capita GDP, and trade openness are positively associated with the tax performance. But inflation rate is negatively correlated with the tax revenue. The positive sign of share of agriculture output in GDP is due to higher volume of exports of agriculture value added goods.

Ahsan and Wu (2005) identified the tax determinants affecting the tax revenue for a group of developed and developing countries for 1979-2002. Variables like agriculture GDP ratio, per capita GDP and population growth are negatively linked with tax GDP ratio whereas, trade openness has significant but positive relation with tax GDP ratio.

Lutfunnahar, (2007) undertook the regression analysis for Bangladesh with 10 other developing countries for 1990-2005. The study identified that trade openness, broad money GDP ratio, and foreign debt bear a significantly positive relation with tax GDP ratio. The coefficient of GDP per capita is negative which deviates from the normal perception.

Davoodi and Grigorian (2007) documented the link between tax revenue and various tax determinants which are in line with the earlier researches for a group of 141 countries for 1990-2004. The coefficients of institutional quality, per capita GDP, urbanization, trade openness and share of agriculture in GDP are found to be positively linked. Inflation and impact of shadow economy are negatively regressed with tax GDP ratio.

Gupta (2007) made an empirical study for 105 countries covering the period of 25 years and established a positive and statistically significant relationship of tax revenue with per capita GDP, foreign aid, trade openness and size of the economy. The study further finds that political stability, level of corruption, share of agriculture in GDP, and share of indirect taxes in overall tax collection have negative but statistically significant association with tax revenue collection. The study also

investigates an interesting relationship between sources of tax revenue and the overall tax revenue collection and finds that more reliance on taxing goods and services leads to lowering the revenue collection. The study further extends its horizon by including an interesting notion that the relationship of tax revenue collection with other different variables also depends upon the prevailing stages of development of different countries in the panel data.

Mahdevi (2008) also contributed in the same subject matter by constructing a regression model for 43 countries covering the period from 1973 to 2002. The study reveals that the tax revenue performance is positively linked with trade openness, literacy rate, and per capita GDP and has negative association with inflation, foreign aid, and population density. Interestingly, share of agriculture in GDP, female labor employed, civil liberties, and economic volatility are found to statically insignificant.

Aizenman and Jinjark (2009) investigated that the low income countries with poor quality of institutions experience a fall in their tax GDP ratio as a result of trade and financial openness. They further reveal that the association between trade openness and shadow economy is negative.

Profeta, and Scabrosetti (2010) developed the regression model for tax determinants based on 39 countries for 1990-2004. The study includes 11 Asian, 19 Latin American and 9 European countries for analyzing the results on the basis of regional disparities. Debt GDP ratio and per capita GDP are not statistically significant for Asian countries but positively associated in case of Latin American Countries. Trade openness is positively linked with tax revenue in case of countries from Asia and Europe but has negative effect for Latin American countries. Agriculture GDP ratio negatively influences the tax collection in case of Latin American countries but is not statistically significant for Asian countries. Similarly, literacy rate, ratio of female employed in the formal market, size of the informal sector of the economy, and ratio of working population over 65 years of age influence the tax performance significantly and positively in Latin American countries. Whereas, the results are quite different for Asian countries finding a negative

relationship of employed population over 65 years of age with tax revenue and urbanization has no significant impact on tax revenue.

Pessino and Fenochietto (2010) present an empirical study for a group of 96 countries for the period 1991-2006 to determine the correlation between tax revenue and other independent variables. The study upholds the previous results by endorsing a positive and significant relationship of tax revenue with per capita GDP, trade openness, and literacy level. While the variables like inflation, income distribution, and corruption indices have negative association with tax GDP ratio.

Antonio and Garcimartin (2011) investigated the relationship of tax revenue with various determinants for a group of developing and developed countries from 1990 to 2007. On the basis of empirical analysis, they find a positive and significant relationship of tax revenue with per capita GDP, and trade openness. While agriculture share in GDP and inflation show a significant but a positive relationship with tax GDP ratio contradicting the expected results. Income distribution is the most significant variable affecting the tax revenue.

Dioda (2012) made a study for 32 countries in Latin America and Caribbean for a period from 1999 to 2009 by segregating the determinants of taxation into three main categories *i.e.* economic, political and socio-demographic ones. The regression analysis gives an important result that the share of agriculture in GDP is statistically significant but negatively associated with tax revenue. The impact of trade openness is positive on tax revenue. Similarly, the result also affirms a positive correlation of tax revenue with per capita GDP, female labor participation rate, literacy rate, population density, and share of people above the age of 65 years. Level of urbanization and population growth is not statistically significant having a small impact on tax revenue.

Karagoz (2013) constructed an econometric model for the period of 1970-2010 based on Turkey. The study estimated that the share of agriculture in GDP is negatively linked with tax revenue. Trade openness has no significant impact on revenue collection in Turkey. Foreign debt GDP ratio, share of industrial output in GDP, and urbanization are positively associated with tax revenue.

Castro and Ramirez (2014) developed an empirical model for 34 countries from OECD for the period from 2001 to 2011. The result shows

that the per capita GDP, industrial growth and civil liberties have been positively linked with tax revenue collection whereas foreign direct investment and agriculture sector growth have adverse impact on the tax collection.

Velaj and Prendi (2014) investigated the relationship between the tax revenue collection and other variables including per capita GDP, unemployment rate, inflation rate and imports of goods and services based on data from 2001 to 2013 in case of Albania. The result indicates that the inflation rate, imports of goods and services, and per capita GDP have been positively linked with tax revenue collection. The unemployment rate has been negatively related to the tax revenue collection.

Jafri, *et al* (2015) investigated the relationship between trade liberalization and tax revenue collection in Pakistan based on data from 1982 to 2013. The results reveal that trade liberalization has been positively linked with tax revenue collection.

Cage and Gadenne (2016) investigated the relationship between tax revenue collection and trade liberalization with its impact on trade tax revenue for a group of 130 developed and developing countries of the world for the period ranging from 1792 to 2006. The results show that trade liberalization has more severe impacts on developing countries as compare to developed countries of the world and these are more longer lived in the former.

### **III. FISCAL IMPLICATIONS OF TRADE LIBERALIZATION**

The affects of trade liberalization on fiscal balance is a very crucial issue to consider, as most of the Underdeveloped have the budget deficit due to revenue constraint and rising trends in expenditures. The fiscal implications of trade liberalization are very sensitive debate especially in the context of underdeveloped countries and Rodrik (1998) regarded the fiscal severity created as a result of trade liberalization as a time bomb. The share of trade taxes to total taxes is significant one particularly in the case of underdeveloped countries of the world and the affect of trade openness on tax revenue mobilization are quite difficult to understand as it depends upon the mode of openness. Gupta (2007) and Keen and



Simone (2004) analyzed that trade openness adversely affects the tax revenue if it is followed by decreasing the tariffs. They further contributed that the trade liberalization positively affects the tariff revenue if there are reduction in non-tariff barriers like lifting the restriction of import quotas, rebates/concession, simplification of custom procedures, and lowering the tariff rates. Khattry & Rao (2002) made a cross-country evidence to analyze the impact of trade liberalization on tax revenue by taking the data of eighty countries on the basis of income classifications. They construct a regression model between the trade tax revenue and the degree of openness and other structural independent variables. The result indicates that the degree of openness is inversely related to tax revenue GDP ratio. A one percent decrease in the trade tax revenue leads to a 0.33 percent fall in tax revenue GDP ratio in all the groups of low income countries. They also point out that the independent structural variables have strong influence on the tax revenue GDP ratio particularly in the case of low income and lower middle income countries groups. Another study made by Khattry (2001) in which he discusses the relationship between the trade liberalization and the revenue squeeze in the context of impact on public investment. He analyzes that the trade liberalization creates fiscal deficit and this fiscal deficit can be overcome by reducing the expenditures or by financing the deficit through internal or external borrowings and this will ultimately leads to increase in public debt. Increase in public debt leads to an increase in expenditures on interest payments and therefore further increases the budget deficit. In this process, the government is trapped into a vicious circle of fiscal deficit. The relationship between trade openness and tax revenue GDP ratio has also been discussed by Baunsgaard and Keen (2005) by taking the data of 125 countries for the period of 1975- 2000. They conclude that the low income countries are unable to recover the lost revenue from trade liberalization efficiently. Low income countries only recover 30 cents against each dollar from the lost trade tariff revenue. The middle income countries have comparatively better recovery against the lost trade tax revenue. Their recovery is upto 45-60 cents for each dollar lost. In high income countries, the recovery is the highest one for one to one dollar.

In underdeveloped countries of the world, there has been a persistent reliance on indirect taxes as they are easy to collect especially custom

duty and tariff. The government is more keen to levy indirect taxes to fulfill its budgetary target. In this scenario, if the government opts for trade liberalization policies following the path of lowering the tariff barriers will result into the shortfall in tax revenue. The government does not find a comfortable path to offset its revenue loss from other alternative sources. Therefore, the government has to rely on internal as well as external borrowings for reducing its budget deficit. More relying on borrowings may increase the burden of interest payments and the vicious circle of debt trap goes on. Cage and Gadenne (2012) made an empirical study on the same issue. They experienced that many developing countries suffered a tax revenues loss, therefore, trade liberalization may have come at a fiscal cost. Using a panel dataset of tax revenues and government expenditures in developing countries for the period 1945-2006, to consider whether countries are able to recover those lost revenues through other tax resources. The results show that trade taxes fall by 4 GDP percentage on average and less than half of the countries recover the lost tax revenues. Therefore, the fiscal cost of trade liberalization is more severe for countries as compared to developed countries of the world. Underdeveloped countries are more relied upon trade taxes due to easier mode of collection but when they have to forego trade taxes, they have been deprived of their major source of tax revenue. Then the countries have to opt for internal as well as external borrowings to compensate its revenue loss. This sort of remedial action creates more hardship for the government resulting into increased budget deficit. The budget deficit demands the government to reduce its development expenditures. In a nutshell, the fiscal cost of trade liberalization is the budget deficit.

In Pakistan, the trade taxes had been remained dominant among the other taxes during 70s and 80s but it had faced cut after the country followed the path of Structural Adjustment Program. In the pursuit of revamping the tax structure, the Federal Board of Revenue shifted the tilt from trade taxes to direct taxes especially the with-holding taxes. Despite of its all efforts, the government has not been able to make significant improvement in tax GDP ratio. From 2005-06 to 2015-16, the revenue from trade taxes has been decreased from 30% to 17% (as given in table below) reflecting the government failure to off set the loss it incurs from trade taxes.

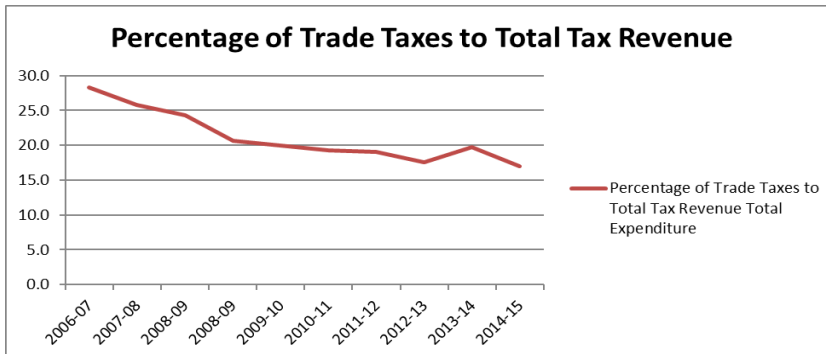
TABLE 1

## Fiscal Indicators as Percentage of GDP

Year	Total Tax Collection Rs. bn	Tax Rev as % of GDP	Percentage of Trade taxes to Total Tax Revenue
2005-06	713.5	9.4	28.3
2006-07	847.2	9.2	25.8
2007-08	1008.1	9.5	24.3
2008-09	1161.1	8.8	20.7
2009-10	1327.4	8.9	20
2010-11	1558.2	8.5	19.3
2011-12	1882.7	9.4	19
2012-13	1946.4	8.7	19.9
2013-14	2254.5	9	17.6
2014-15	2589.9	9.4	19.7
2015-16	3103.7	10.1	17

Figure 1

## Percentage of Trade Taxes to Total Tax Revenue

**IV. DATA COLLECTION AND MODEL CONSTRUCTION**

The objective of present study is to investigate the relationship between economic growth, trade openness, urbanization, foreign aid and tax revenues. World Development Indicators 2015 has been used to collect

data on urbanization, trade openness (exports + imports). The data on real GDP, foreign aid and tax revenues from economic survey of Pakistan (various issues) have been obtained. The time span of our study is 1980 – 2015.

Following the above discussion in existing economic literature, the general form of our empirical model is given below:

$$TRY = f(LYPC, TRD, UPP, LPOP, NODAU) \quad (1)$$

where,

LYPC = Natural log of GDP per capita (constant 2004 US\$).

TRY= Real tax revenues % of GDP.

TRD= Real trade openness (exports + imports) Per Capita.

UPP =Urban population percentage of total population.

LPOP=Natural log of total population.

NODAU=Natural log of net official development assistance and official aid received constant at 2012 US \$.

### **JUSTIFICATION OF VARIABLES**

- Per capita GDP is considered to be an ideal indicator for analyzing the overall economic development of a country and also positively associated with the tax revenue collection. As the per capita GDP increases, the share of tax revenue also enhances in the overall revenue collection. The positive correlation between per capita GDP and tax revenue has been further elaborated on the basis of Wagner's law which states that the demand for public goods and services is income-elastic. Income elastic demand for public goods and services signifies that the people demand for more goods as their income increases and this increased demand is financed through raising tax revenue. Lotz and Morss (1967), Chelliah (1971), Ghura (1998), Hinrichs (1966) and Tanzi (1992) have made the same observation that the development always facilitates the state to raise its tax revenue collection.

- The effect of trade openness on tax revenue mobilization are quite difficult to understand as it depends upon the mode of openness. Gupta (2007) and Keen and Simone (2004) analyzed that trade openness

adversely affects the tax revenue if it is followed by decreasing the tariffs. They further contributed that the trade liberalization positively affects the tariff revenue if there are reduction in non-tariff barriers like lifting the restriction of import quotas, rebates/concession, simplification of custom procedures, and lowering the tariff rates. Rodrik (1998) also extended a positive relationship between trade openness and tax revenue and stressed a broader role of the government in a more liberalized open trade environment. This conclusion has been replicated by Leuthold (1991), Ghura (1998), and Stotsky & WoldeMariam (1997). This finding has been further strengthened by the fact that imports and exports are easy to tax because their entry and exit are on some locations which are being monitored by the government.

- Foreign aid is also another significant determinant of tax revenue affecting the revenue performance. The relationship of foreign debt with tax revenue gives different results in various researches.
- Segment of aged population is another factor which may affect the tax performance of the state. As quantum of aged population increases, it puts more pressure on the state to create a sustainable system of taxation in order to establish a sound pension system for the wellbeing of aged population.
- Urbanization is considered to be positively linked with tax revenue collection. The increase in urbanization place more strains on the government to expand supply of public goods and services which needs to be financed through tax revenue.

## V. EMPIRICAL RESULTS AND DISCUSSION

This section explores the relationship between economic growth, trade openness, urbanization, foreign aid and tax revenues over for the time period of 1980-2015. We find that our variables have unique order of integration and co-integration present among the series. Additionally, economic growth raises tax revenues but trade openness declines it. Urbanization is positively linked with tax revenues but foreign aid impedes tax collection in Pakistan. This study presents new insights to policy makers for designing an inclusive economic policy to sustain economic growth via transparent tax collection.

## UNIT ROOT TESTS

When dealing with time series data it is necessary that its stationarity properties should be exploited. If stationarity properties are overlooked it can have important bearings on the estimation techniques. For instance, presence of non-stationary variables leads to spurious results which cannot be generalized in a useful manner. Therefore, two stationary tests namely: Augmented Dickey Fuller and Phillip Perron tests with constant and trend specifications have been applied to check the stationarity of variables. Both the tests produced mixed order of integration of the underlying variables in the model i.e. I (0) and I (1). To be specific TRY and LYPC are first difference stationary whereas TRD, NODAU, UPP and LPOP are level stationary.

TABLE 2  
Unit Root Tests

Variables	ADF at level		PP at level		ADF at 1 <sup>st</sup> Difference		PP at 1 <sup>st</sup> Difference	
	Constant	Constant & Trend	Constant	Constant & Trend	Constant	Constant & Trend	Constant	Constant & Trend
<b>TRD</b>	-2.9936 <sup>b</sup>	-3.2172 <sup>c</sup>	-3.0794 <sup>b</sup>	-3.3344 <sup>c</sup>	-	-	-	-
<b>NODAU</b>	-4.1019 <sup>a</sup>	-4.3470 <sup>a</sup>	-4.1019 <sup>a</sup>	-4.2858 <sup>a</sup>	-	-	-	-
<b>TRY</b>	-1.1091	-2.7282	-0.0958	-1.5719	-4.6397 <sup>a</sup>	-4.7343 <sup>a</sup>	-3.1668 <sup>b</sup>	-3.4200 <sup>c</sup>
<b>LYPC</b>	-1.3345	-2.3751	-1.9074	-2.3156	-3.9152 <sup>a</sup>	-4.0260 <sup>b</sup>	-3.8667 <sup>a</sup>	-3.9862 <sup>b</sup>
<b>UPP</b>	-3.7351 <sup>a</sup>	-0.9614	-3.9803 <sup>a</sup>	0.1538	-	-	-	-
<b>LPOP</b>	-10.8222 <sup>a</sup>	-1.0332	-10.6647 <sup>a</sup>	-1.0295	-	-	-	-

Source: Author's Estimation

## AUTOREGRESSIVE DISTRIBUTED LAG BOUND TESTING PROCEDURE

There is wide range of co-integrating techniques available in economic literature to investigate long run relationship among variables of macroeconomic nature. In this analysis, ARDL technique of co-integration analysis has been employed due to its underlying advantages over other co-integration techniques. ARDL technique has advantage over other co-integrating techniques as it performs better in the sample of small size. Furthermore, this technique can be applied without any priori assumption regarding order of integration i.e. under this technique

explanatory variables can be I (0), I (1) or mutually co-integrated. To investigate co-integration, ARDL testing procedure conducts a bounds test for the null hypothesis of no co-integration. The decision regarding presence of long run relationship among variables is made by comparing F-statistic with the critical values tabulated by Pesaran et al. (2001). If the value of F-statistics surpasses upper critical value, null hypothesis of no co-integration is rejected irrespective of whether variables are I (0) or I (1). Null hypothesis is accepted if F-statistic fails to exceed lower critical value. Results will be inconclusive if F-statistic falls between lower and upper critical values. If all variables are I (1), decision will be made on the basis of upper bounds. Conversely, if all variables are I (0), decision will be made on the basis of lower bounds.

The findings of ARDL bound testing procedure suggest the rejection of null hypothesis of no co-integration at 2.5% significance level when TRY is treated as the dependent variable. As it can be seen from the Table 4, the calculated F-statistic exceeds upper bound critical values at 2.5% level of significance suggesting the presence of long run relationship among variables when TRY is treated as dependent variable.

TABLE 3  
ARDL Bounds Test

Test Statistic	Value	K
F-statistic	4.1065	5
Critical Value Bounds		
Significance	I <sub>0</sub> Bound	I <sub>1</sub> Bound
10%	2.08	3
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

Source: Author's Estimation

TABLE 4  
ARDL Co-Integrating and Long Run Form

Variable	Coefficient	Standard Error	t-Statistics	p-value
TRD	-0.1005	0.0458	-2.20	0.029
LYPC	0.7313	0.3013	2.43	0.022
UPP	0.9376	0.3976	2.36	0.026
NODAU	-0.0384	0.0466	-0.82	0.417
LPOP	0.5951	0.4842	1.23	0.229
C	0.4168	0.2148	1.94	0.063
<b>Error Correction Term</b>				
$\varphi$	-0.4817	0.1515	-3.18	0.004
<b>Short Run Dynamics</b>				
D(TRD)	0.0999	0.0402	2.49	0.019
D(LYPC)	-0.6635	0.3536	-1.88	0.071
D(UPP)	1.1512	0.6103	1.89	0.070
D(NODAU)	-0.0473	0.0305	-1.55	0.133
D(LPOP)	-0.9053	0.7386	-1.23	0.231

Source: Author's Estimation

Long run results are shown in Table 4. We find that income has positive impact on tax revenues and it is statistically significant at 1 percent level of significance. This indicates that 1 percent increase in per capita GDP is linked with 0.7313 percent increase in tax revenues, all else is same. This finding is consistent with the results of Srinivasan (2001), Mushtaq, Buksh and Hassan (2012). Trade openness is inversely related with tax revenues and statistically significant at 5 percent. Keeping other things constant, a 0.1005 percent decrease in tax revenue is linked with 1 percent increase in trade openness. The said finding has been the same as given by the results of Khattry (2001), Khattry (2002), and Keen & Bansguard (2005). The relationship between urbanization and tax revenues is positive at 1 percent level of significance. It reveals that 1 percent increase in urbanization increases tax collection by 0.9376 percent if other things remain constant as showed by Longoni (2009).



The foreign aid affects tax revenues negatively and it is statistically significant. We find that a 1 percent increase in foreign aid decreases tax collection by 0.0384 percent by keeping other things constant as parallel studies found a negative impact of aid on tax revenues (Gupta, Clements, Pivovarsky & Tiongson, 2003; Khan & Hoshino, 1992), but more recent works are Bräutigam and Knack (2004), aid reduces tax revenue in the recipient country. Similarly, the relationship between population growth and tax revenue collection finds to be positive. This has been validated by the facts as mentioned in Economic Survey of Pakistan 2015-16 that 60.4 percent of population is between the ages of 15 to 64 years in comparison to dependent population of children under the age of 15 years is 35.4 percent whereas 4.2 percent people are above 65 years. Therefore, main segment of the population has been contributing in the economic activity.

**DIAGONISTIC TESTS**

When estimating regression equation, it is better not to overlook its major issues like Serial correlation, Heteroskedasticity, Normality and Specification bias. If these issues are present in estimated model, then there is danger of getting potentially biased results which will not be reliable. Therefore, different tests namely: Ramsay RESET Test for Functional Form, Breusch-Godfrey Serial Correlation LM Test, Breusch-Pagan-Godfrey Heteroskedasticity Test and Normality Jarque-Bera Test have been employed to check for the possible diseases which may render results unreliable. The insignificance of all the tests except Ramsay RESET Test suggest that the model under consideration is free from serial correlation, heteroskedasticity, and residuals are normally distributed as well. Whereas, significance of RESET Test at 5% level of significance indicate the presence of specification bias.

TABLE 5

Diagnostic Tests (Ramsay RESET Test for Functional Form)

	Value	df	Probability
t-statistic	2.2491	27	0.0329
F-statistic	5.0584	(1, 27)	0.0329
<b>Breusch-Godfrey Serial Correlation LM Test</b>			
F-statistics	0.1833	(2, 26)	0.8336

	<b>Value</b>	<b>df</b>	<b>Probability</b>
Chi Square(2)		2	0.7840
<b>Heteroskedasticity Test: Breusch-Pagan-Godfrey</b>			
F-statistics	0.7051	(6, 28)	0.6480
<b>Normality Jarque-Bera Statistic</b>			
Jarque-Bera	1.9407	-	0.3790

**Source:** Author's Estimation

### **PARAMETER STABILITY TESTS**

The presence of long run relationship among variables does not ensure stability of parameters. If the parameters are not stable, there is a danger of getting potentially biased results. Therefore, to check for the long run stability of coefficients, cumulative sum of recursive residuals (CUSUM) and the CUSUM of squared residuals (CUSUMSQ) tests proposed by Pesaran (2001) are employed. The underlying advantage of these tests is that do not require any priori information regarding structural break point. The null hypothesis is that all parameters are stable.

CUSUM test is based on cumulative sum of recursive residuals which utilizes first observations that are updated recursively and plotted against break point. Such a mechanism makes this test suitable for detecting systematic changes in the coefficients. Whereas, CUSUMSQ test is based on squared recursive residuals which makes this test conducive for situations where the departure from constancy of coefficients is haphazard and abrupt. The decision regarding whether parameters are stable or not is based on the plots of CUSUM and CUSUMSQ. If the plot of CUSUM and CUSUMSQ lie within 5% critical bound, parameters are regarded stable which means null hypothesis is not rejected. Conversely, if either of parallel lines of critical bounds are crossed, then parameters are regarded unstable which means null hypothesis is rejected.

As it can be visualized from the figures, both the CUSUM and CUSUMSQ plots stay within the 5% critical bound, thus indicating that the coefficients in the model do not suffer from any structural instability during the period of study.

FIGURE 2

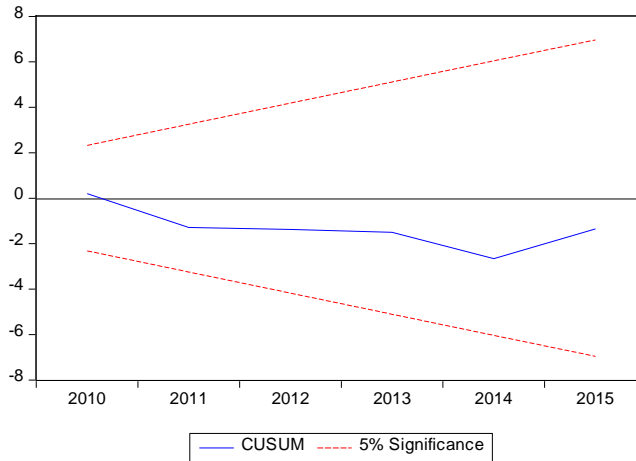
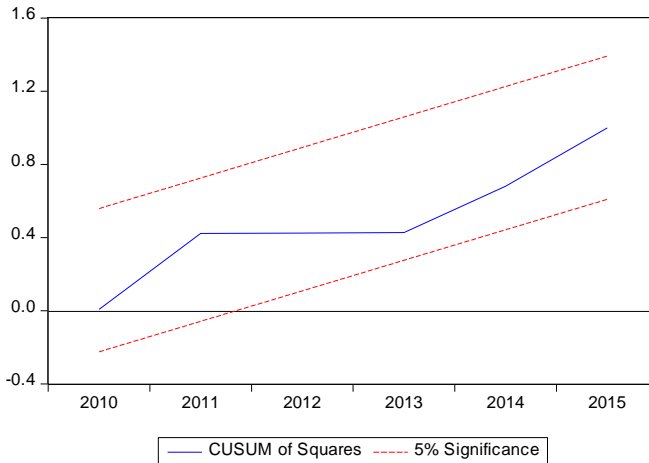


FIGURE 3



## V. CONCLUSION AND POLICY IMPLICATIONS

This section determines the contributing factors i.e. economic growth, trade openness, urbanization, foreign aid population growth and tax revenues in case of Pakistan. The time span of study is 1980-2015. We have applied Ramsay Reset test for functional form, Bresuch-Godfrey Serial correlation LM Test, Bresuch Pagan Godfrey Heteroskedasticity Test and Normality JarqueBera Test to find the integrating properties of

the variables. The presence of co-integration is tested by applying the ARDL bounds testing approach to co-integration in the presence of structural break arising in the variables. Our empirical evidence validates the existence of co-integration over the period of 1972-2015. Economic growth enhances tax collection. Trade openness is inversely linked with tax revenues. Urbanization raises tax collection. Another important result is the negative relationship between foreign aid and trade openness. More the reliance on foreign aid, higher will be the volume of interest payment which further squeeze the government's capability to reduce the budget deficit. The relationship between the population growth and tax revenue collection has been positive marking the potential available human capital as the 60 percent of the population lies in the age bracket of 15 to 64 years of age.

Our results suggest several policy recommendations. Negative impact of trade openness and foreign aid on tax revenue performance recommends that the government in Pakistan has to take several policy measures for overhauling the tax structure which emphasis more on reducing tax expenditure, minimizing tax evasion, expanding narrow tax base and curtailing the size of informal sector of the economy. To tackle the problem of revenue shortfall due to trade openness, the solution is of two tiers. Firstly, the government has to make full efforts for maximizing the revenue from custom tariff. Secondly there is need to eliminate the distortions in domestic tax system which retard the process of revenue generation.

For enhancing the tax base, it is imperative on the part of the government to reduce horizontal inequities arising as a result of large number of tax exemptions and concessions. Large tax exemptions clearly indicate that all the growing sectors of the economy do not contribute into the tax effort in accordance to their share in GDP. For that purpose, it is substantial to increase the share of those sectors in federal taxes which are lightly taxed or fully untaxed by a long list of exemptions like agriculture, services and capital gain. Main focus should be given to those subsectors whose tax contribution is far less than their GDP share *e.g.* textile, transport and communication, food and beverages, whole sale and retailer, telecom and other services. For broadening the tax base, the practice of dependence on few revenue spinners should be brought to an end because 70% of revenue collection from GST comes from only 5

import items. Sales tax and excise duties have been underperformed due to special tax regimes and zero-rating, these preferential treatments should be reviewed. In order to control the misuse of tax credits, exemptions, zero-rating and other preferential treatments, audit of the business affairs of the taxpayer and enforcement of tax laws are imperatives for increasing the tax effort. Moreover, government should give more stress for switching from 'easy to tax' to 'hard to tax' *i.e* from indirect tax to direct tax. Tax expenditures should be reduced because these are the root cause of narrow tax base and creating various distortions in the economy. The benefits of tax exemptions are restricted to a specific interest group whereas its cost bears by the whole economy. Therefore, the process of granting the status of preferential treatment to selected taxpayers demand a cautious scrutiny of the taxpayer and its repercussions.

Pakistan needs a continuing effort for taking measures to off-set the revenue loss due to tariff reduction. The first and foremost measure which the government requires to take is to eliminate the tariff exemptions in order to lessen the heavy bulk of tax expenditures. The government should adopt a uniform tariff policy which would facilitate to remove the differentials in protection rates, minimize the scope of pressure groups pursuing for special preferential treatment, also play down the discretionary powers of the custom administration to misclassify the imports at the time of border entry, and also helps to simplify the custom procedures. One of the studies estimated that by eliminating all exemptions, and adopting a uniform tariff of 10% help to increase the tariff revenue by 79% and total import tax revenue by 36% in Pakistan (Reis & Taglioni 2013).

The positive relationship between urbanization and tax revenue performance give further insight to improve the property tax resource mobilization in urban areas in the light of spiky acceleration in the capital and rental values of the urban immovable properties. The government can get a substantial amount of revenue by revamping the entire system of taxation dealing with urban immovable properties. The government should withdraw its un-necessary exemptions given to different class of persons. The government should avoid the practice of rate differentials and underassessment of urban properties by strict employing strict non-discriminatory enforcement policy.

**REFERENCES**

- Agbeyegbe, T., Stotsky, J., and Woldemariam, A. 2004, "Trade Liberalization, Exchange Rate Changes, and Tax Revenue in Sub-Saharan Africa," Working Paper No. 04/178: International Monetary Fund, Washinton, D.C.
- Ahsan, S.M. and Wu, S., 2005, "Tax Structure and Reform in China, 1979-2002", Mimeo
- Ansari, M., 1982, "Determinants of Tax Ratio: A Cross Country Analysis", *Economical and Political Weekly*, 19 June pp. 1035-1042.
- Baunsgaard, T., and Keen, M., 2005 "Tax Revenue and (or?) Trade liberalization", IMF Working Paper WP/05/112.
- Bird, Richard., Jorge Martinez- Vazquez, and BennoTorgler, 2004, "Societal Institutions and Tax Effort in Developing Countries," International Studies Program Working Paper 04-06.
- Brautigam, AD., & Knack, S., 2004, "Foreign Aid, Institutions, and Governance in Sub-Saharan Africa", *Economic Development and Cultural Change*, Research Library Core pg. 255.
- Cagé, J., and L. Gadenne (2012): "The Fiscal Cost of Trade Liberalization," PSE Working Paper 2012-27.
- Cage, J., and Gadenne, L., 2016 "Tax revenues, development, and the fiscal cost of trade liberalization, 1792-2006, Warwick Economic Research Papers No. 1132.
- Cardenas, M., M. Eslava and S. Ramirez 2010, "External Wars, internal Conflicts and State Capacity:Panel Data Evidence", Latin America Initiatives at Brookings.
- Castro, GA., & Ramirez, DB., "Determinants of Tax Revenue in OECD Countries over the period 2001-2011", *Contaduría y Administración*, Volume 59, Issue 3, Pages 35-59.
- Chelliah, R.J., H.J. Bass andK.R. Kelly 1975, "Tax Ratios and Tax Efforts in Developing Countries", *IMF Staff Papers*, 22(1), 187-205.
- David A. Grigorian& Hamid Reza Davoodi, 2007."Tax Potential vs. Tax Effort," *IMF Working Papers* 07/106, International Monetary Fund.
- Dejong, D.N., Nankervis, J.C., Savin, N.E., 1992, "Integration versus Trend Stationary in Time Series", *Econometrica*, 60, 423-33, Department of Economics, Concordia University, Canada.

- Dickey, D., Fuller, W.A., 1979, "Distribution of the Estimates for Autoregressive Time Series with the Unit Root", *Journal of the American Statistical Association*, 74 (June), 427-31.
- Economic Survey of Pakistan 2012-2013.
- Elliot, G., Rothenberg, T.J., Stock, J.H., 1996, "Efficient Tests for an Autoregressive Unit Root", *Econometrica*, 64, 813-36.
- Eltony, M. Nagy, 2002, "Determinants of Tax Efforts in Arab Countries," Arab Planning Institute Working Paper 207.
- Ghura, Dhaneshwar, 1998, "Tax Revenue in Sub Saharan Africa: Effects of Economic Policies and Corruption," *IMF Working Papers* 98/135.
- Gupta AbhijitSen, 2007, "Determinants of Tax Revenue Efforts in Developing Countries," *IMF Working Paper* 07/184 (Washington: International Monetary Fund).
- Gupta, S., Clements, B., Pivovarsky, A., & Tiongson, ER., 2003 "Foreign Aid and Revenue Response: Does the Composition of Aid Matter" 2003, *IMF Working Paper* WP/03/176.
- Hinrichs, H.H. 1966, "A General Theory of tax structure: Change during Development", Cambridge, MA: Harvard Law School International Program.
- Jafri, A A., Tabassum, F., and Asjed, R., 2015 "An empirical Investigation of the relationship between trade liberalization and tax revenue in Pakistan", *Pakistan Economic and Social Review* Vol 53, No. 2 pp. 317-330.
- Johansen, S., 1991, "Estimation and Hypothesis Testing of Co-integrating Vectors in Gaussian Vector Autoregressive models", *Econometrica* 59, 1551-80.
- Jonathon Di John, 2010, "Taxation, Resource Mobilization and State Performance", *Crisis States Research Centre*.
- Jose Antonio and Carlos Garcimartin, 2011, "Does Aid Hinder Tax Efforts? More Evidence", *Centre for Research in Economic Development and International Trade*, No. 11/04.
- Joshua Aizenman and YothinJinjarak ,2009, "Globalisation and Developing Countries – a Shrinking Tax Base?", *Journal of Development Studies*, Vol.45, No.5, 653-671.

- Karagoz, K., 2013, "Determinants of Tax Revenue: Does Sectorial Composition Matter?," *Journal of Finance, Accounting and Management*, 4(2), 50-63, July 2013.
- Keen, M and A. Simone, 2004, *Tax Policy in Developing Countries: Some Lessons from the 1990s and Some Challenges ahead*", in *Helping Countries Develop: The Role of Fiscal Policy*, edited by Sanjeev Gupta, Benedict Clements and Gabriela Inchauste, 302-352, Washington D.C., International Monetary Fund, 2004.
- Khan, AH., & Hushino, E., 1992, "Impact of Foreign Aid on the Fiscal Behaviour of the LDC governments", *World Development*, Vol 20, Issue 10, pp 1481-1488.
- Khattry, B., 2003, "Trade Liberalization and the Fiscal Squeeze: Implications for Public Investment", *Development and Change* 34(3): 401-424.
- Khattry, B., and M. Rao, 2002, "Fiscal Faux Pas? An Analysis of the Revenue Implications of Trade Liberalization," *World Development*, Vol. 30, pp.1431-44.
- Kwiatkowski, D., P.C.B, Phillips, P. Schmidt, and Y. Shin 1992, Testing the Null Stationarity against the Alternative of a Unit Root: How Sure Are We That Economic Time series have a Unit Root?", *Journal of Econometrics*, 54, 159-78.
- Lotz, and Elliot R. Morss 1967, "Measuring Tax Efforts in Developing Countries, Staff Paper 14.
- Luca Dioda 2012, "Structural Determinants of Tax Revenue in Latin America and the Caribbean 1999-2009", ECLAC United Nations.
- Lutfunnahar, B. 2007, "A Panel Study on Tax Effort and Tax Buoyancy with Special Reference to Bangladesh", Working Paper 715: Policy Analysis Unit (PAU) Research Department Bangladesh Bank.
- Longoni, E., 2009 "Trade Liberalization and Trade Tax Revenues in African Countries", Working Paper Series, No. 158.
- Michael, M. S., P. Hatzipanayotou, and S. M. Miller, 1993, "Integrated Reforms of Tariffs and Consumption.
- Mushtaq, S., K. Bakhsh and S. Hassan (2012), Estimating impact of trade liberalization on tax revenue in Pakistan. *Journal of Agriculture and Social Sciences*, Volume 8(4), pp. 148-150.



- Mahdevi, S. 2008, "The Level and Composition of Tax Revenue in Developing Countries: Evidence from Unbalanced Panel Data", *International Review of Economics and Finance* 17, pp. 607-617.
- Mushtaq, S., Bakksh, K., Hassan, S., 2012 "Estimating Impact of Trade Liberalization on Tax Revenue in Pakistan", *Journal of Agriculture and Social Sciences* ISSN 1813-2235 pp 148-150.
- Nareyan, P.K., 2005, "The Saving and Investment Nexus for China: Evidence from Co-integration Tests", *Applied Economics* 17, 1979-1990.
- Ng, S., Perron, P., 2001, "Lag Length Selection and the construction of Unit Root Test with Good Size and Power", *Econometrica*, 69, 1519-54.
- Pesaran, M.H., Shin, Y., Smith R., 2001, "Bounds Testing Approaches to the Analysis of Level Relationship", *Journal of Applied Econometrics* 16, 289-326.
- Pessino, C., Fenochietto, R., 2010, "Determining Countries' Tax Effort", *Revista De Economica Publica*, 195-(4/2010), 65-87.
- Phillips, P.C.B., Peron, P., 1988, "Testing for a Unit Root in Time Series Regression", *Econometrica*, 75, 335-446.
- Piancastelli, Marcello, 2001, "Measuring the Tax Effort of Developed and Developing Countries. Cross Country Panel Data Analysis," IPEA Working Paper No. 818.
- Profeta, P. and S. Scabrosetti 2010, "The Political Economy of Taxation: Lesson for Developing Countries", Edward Elgar Publishing Company.
- Reis, J.G., & Taglioni, D., 2013, "Pakistan: Reinvigorating the Trade Agenda", *Policy Paper Series on Pakistan*, Pk 15/12.
- Rodrik D., 1998, "Why do more open Economies have bigger Governments?", *Journal of Political Economy* 106, pp. 997-1032.
- Schneider, F., 2005, "Shadow Economies around the World: What do we really know?", *European Journal of Political Economy*, Elsevier, 21(3), pp. 598-642.
- Srinivasan, TN., 2001 "Trade, Development , and Growth", *Essays in International Economics*, Vol. 225, pp 1-32 Princeton University, Princeton, New Jersey, USA.
- Stotsky, J.G and A. WoldeMariam 1987, "Tax Effort in Sub-Saharan Africa", *IMF Working Paper* 97/107, International Monetary Fund.

- Tait, A., Gratz, W. L. M., Eichengreen, B. J. International comparisons of taxation for selected developing countries 1972-76. IMF Staff Papers, n. 26, p. 123-156, 1979.
- Tanzi V., 1992, "Structural factors and Tax Revenue in Developing Countries: A Decade of Evidence", I. Goldin and L.A. Winters Editions Cambridge University Press.
- Tanzi, V., and L., Schuknecht 1997, "Reconsidering the Fiscal role of the Government: The International Perspective", American Economic Review 87(2), pp. 164-168.
- Teera, J. (2003), "Tax Performance: A Comparative Analysis" working Paper, University of Bath, United Kingdom.
- Velaj, E., and Prendi, L., 2014 "Tax Revenue- The determinant factors-The case of Albania", European Scientific Journal Vol 1: 1857-7881.