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The Effect of Trade Liberalization on Tax Structure of Pakistan

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ABSTRACT

This study empirically investigates the effect of trade liberalization on tax structure in Pakistan. Autoregressive Distributed Lag approach has been used for examining the cointegration among the variables of the model and Vector Error-Correction method is used for short-run dynamics of the variables. The empirical result shows that trade liberalization and trade tax revenue have a negative impact on tax structure in both short and long run. While other control variables, such as budget deficit and external debt servicing is negatively associated with tax structure. The size of the underground economy is used as a proxy for administration capacity, the level of corruption and tax evasion. The empirical results show that the underground economy has also significantly negative impact on tax structure. While, real per capita growth, urban share of population and political stability has a positive impact on tax structure.

Keywords: Trade Liberalization, Trade Revenue, Domestic Tax Structure, ARDL

Introduction

Trade liberalization is a comprehensive term and it not only encompasses the flow of goods and services but also scientific and cultural ideas and values across countries of the world. It also facilitates the flow of physical, financial, and even human capital across the borders. Trade liberalization may improve economic efficiency and can be helpful in accelerating economic growth through technological spillover effects. Earlier theories of free trade like Absolute Advantage by Smith (1776) and Comparative Advantage by Ricardo (1817) were based on the notion that free trade would result in efficient allocation of resources among trading countries. Samuelson (1949) got insight from the work of Smith (1776) and

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concluded that free trade may improve resource allocation, the mobility of labor and factor pricing.

Despite its benefits, it has been criticized on the grounds that it may have a negative effect on the lives of the people of developing nations. For example, Bhagwati (1958) suggested that if growth is relatively export biased which may cause to deteriorate the terms of trade as well as reduce the welfare of the exporting country. Bhagwati (2004) documented that economic globalization may have severe negative consequences for developing economies and it may cause social ills, such as poverty, inequality, and environmental deterioration. Besides, trade liberalization may also result in revenue loss which limits the spending ability of the government in developing countries.

Trade liberalization may create fiscal instability for developing countries because of the high share of trade tax revenue in total tax collection. Domestic tax revenue as a share of GDP is usually low in developing economies because of unsophisticated tax administration, large informal sector, negligible agricultural income tax, high exemptions or tax holidays and widespread tax evasion. To search alternative resources of tax revenue against trade revenue loss are not easy because they have no capability to bring further change in domestic tax structure.

Pakistan has experienced low tax revenue as a share of GDP. Tax to GDP ratio has been fluctuating due to loss of trade revenue, extensive tax evasion and high administration cost during last twenty years. The size of the informal economy is also the main cause of less tax collection. The contribution of direct taxes is low as compared to indirect taxes. The major share of indirect taxes still depends on sales tax, central excise duty, and customs revenue. Indirect taxes are easy to collect but it has serious implications for social welfare. Instead of increasing direct taxes, fiscal authorities in Pakistan try to recover trade tax losses through indirect taxes (i.e. sales tax). During the 1990s, a major share of total revenue was generated through indirect taxes in Pakistan. Import duties or trade tax produced forty percent of total government revenue. After the structural reforms, tax revenue as a percent of GDP started declining and contributing fifteen percent of total government revenue in Pakistan.

Trade liberalization has new fiscal challenges, especially for developing countries because they have a low level of tax revenue to GDP ratio. Due to trade liberalization, developed countries are able to shift trade tax revenue loss on other form of domestic tax because they have a high level of institutional quality and efficient administration. But in the case of developing countries, they face both problems like low institutional administration quality to tax collection and also a low tax to GDP ratio. So, these economies are not able to shift tax burdens towards domestic direct tax collection (Aizenman & Youthin, 2009).

There are two main categories of taxes i-e direct and indirect which are utilized to overcome the trade revenue loss. Direct taxes put burden proportionately according to the ability to pay of the taxpayers. While indirect tax put a disproportionate burden on all segments of the society. In the case of developing countries, the share of indirect taxes is usually more than the direct tax because they have less tax collection cost and less chance of tax evasion. Further, these countries have no ability to change the direct tax base due to unsophisticated administration. This study tries to measure the impact of trade liberalization on the ratio of direct and indirect taxes termed as tax structure in case of Pakistan. The ratio of tax structure over time gives clear representation about the supply side fiscal implication of trade liberalization as well as welfare aspect for society. Previous work empirically explored the composition and different aspects of taxes. This study investigates the effect of trade liberalization on tax structure for Pakistan. The rest of the paper will discourse the following sections such as literature, theoretical and empirical results of trade liberalization and its effect on tax structure.

Literature Review

Trade liberalization has so many implications for its trading countries. The implication of trade revenue is one of them for developing countries with the emergence of free trade. Economic theory observed a positive relationship between trade liberalization and trade revenue. As the degree of trade liberalization increases which leads to higher trade volumes results in an increase in trade tax. This relationship between trade liberalization and other taxes also points out that trade liberalization has, to some extent, an influence on the collection of domestic taxes. While, some studies concluded that trade liberalization may cause to revenue loss and aggravate the government to collect revenue from other domestic sources (Michael et al., 1993; Hatzipanayotou et al., 1994; Abe, 1995; Keen and Ligthart, 2001, 2002, 2005).Adam et al. (2001) concluded that the openness of trade increases trade taxes and reduces goods and service taxes. This proposes that trade liberalization and revenue are responsive to measurement issues. The association between trade openness and tax revenue with domestic revenue is also unclear. There are so many factors like tax structure of the economy, the share of trade tax revenue and administration capabilities which have significant consequence for tax revenue (Ebrill et al. 1999; Keen & Ligthart, 2002).

The relationship between trade liberalization and domestic taxes was presented by Ebrill et al. (2001). After that, Khattry and Rao (2002) analyzed the impact of liberalization on tax level and structure of government expenditures for large countries data set, with the main emphasis on low-income countries. They concluded that rapid trade liberalization process caused a fiscal squeeze in developing countries. As a result of fiscal squeeze, it created a series of problems for low-income countries to meet the rising fiscal needs and they severely depended on internal and external debt. Combes and Tahsin (2006) analyzed the effects of trade openness on budget deficit for 66 developing countries. Econometric results showed that trade openness increased the external shocks for trading countries in the form of the instability of terms of trade at first stage and negative impact on budget deficit at a later stage. Domestic sources of budget deficit also existed like corruption, income inequalities in developing countries, but further tariff reduction led to the budget deficit. They also concluded that the natural openness and trade outcomes had different results on budget balances.

Gupta (2007) investigated the determinants of tax revenue for developing economies using structural factors such as per capita, the composition of GDP, trade openness, foreign debt, the share of direct and indirect taxes and aid. This study also used institutional factors like corruption, political stability, law and order and tax efforts index. The results indicated that aid, per capita and indirect taxes significantly improved total revenue, but not in the case of debt and trade revenue as a share of total tax revenue. Among the institutional factors, results showed that corruption, political and economic instability had a significant inverse impact on revenue collection in developing nations.

Keen (2008) discussed the issue relating to the trade revenue working as neutral against internal sources. He empirically investigated the data for large number countries and determined that the low-income nations are not able to recuperate the revenue loss from trade liberalization through domestic taxes. Low-income countries only recuperated 30 cents against one dollar loss from trade revenue. While in the case of middle-income countries they have recovered 65 cents against one dollar. But in the case of high-income countries, they were able to recover equal revenue loss against one dollar. Aizenman and Yothin (2009) investigated the hypothesis how fiscal challenges are neutral against trade liberalization especially in developing countries? They concluded that, due to trade liberalization, developed countries are able to shift tax burden through easy collection of taxes (trade revenue have less collection cost). High-income countries easily improved tax revenue/GDP ratio because they have high institutional quality and efficient administration which would

make trade revenue neutral against free trade. But the developing countries faced both problems like low institutional quality and low tax revenue/GDP ratio. So, these economies are not able to shift the tax burden to easy tax collection.

Baunsgaard and Michael (2010) addressed the question, "do economies have the ability to recover the tariff revenue loss against trade liberalization? The answer is yes only in the case of high-income countries. They have other sources to recover the revenue loss from trade liberalization but not in the case of low-income countries. Low-income economies are more dependent on trade revenue to fill their fiscal needs. The empirical results indicated that the degree of openness is inversely linked with the ratio of domestic tax revenue to GDP. A one-percent decrease in the trade tax revenue led to a 0.33 percent fall in the ratio of domestic tax revenue to GDP. They also pointed out that some structural variables (institution quality, administration, and political conditions) had a strong influence on the ratio of domestic tax revenue to GDP particularly in the case of low income and middle-income groups.

Liberati and Antonio (2011) analyzed the impact of economic integration on the vertical public structure at the country level. Under certain conditions, when the volume of trade openness increased the aggregate total tax revenue over GDP reduced. It may put different effects on the country's vertical structure of public sectors performance. First, trade liberalization may cause to reduce the total government tax over GDP. Second, it also may cause to reduce the total public expenditure. Third, economic integration may cause to increase the local tax revenue especially in those countries which are negatively related to central tax revenue. At fourth place, it increases the degree of decentralization in the country. Cage and Lucie (2012) investigated the fiscal impact of trade liberalization for 103 developing countries. They used panel data set of tax revenue and government expenditures for the time period 1945- 2006. Trade revenue decreased during the process of trade liberalization in most of the developing countries. Less than half of the countries were able to recover the revenue loss through other tax resources. They also concluded that tax friendly economic environment, inclusive political institutions quality and efficient tax administrations led to a more chance of revenue recovery in the long run.

According to Karras (2012), fiscal policy is less effective in open economies as compared to closed economies because of the small value of the fiscal multiplier. The empirical findings showed that the degree of openness is 10% of GDP in long run fiscal multiplier value was more than one (the range 1.3 to 1.5). As the degree of trade openness reached about 50 percent of GDP then the long run fiscal multiplier value was near to one or less. In last few decades, the majority of economies moved towards trade openness. In the results, one implication is that the less effectiveness of fiscal policy may reduce economic performance in future.

Jaffri et al. (2015) empirically investigate the association between trade and tax revenue for Pakistan. Recently, Yang (2016) empirically investigated the effects of trade and financial openness on fiscal multiplier using the data of 51 countries for the period of 1971-2011. The cross country analysis showed that an increase in trade openness by 10 percent reduced the fiscal multiplier by 8 percent in the long run. However, the effect of financial openness on fiscal multiplier was small and statistically insignificant. When we review the literature on trade liberalization and fiscal performance, we find hardly any study in-depth for tax structure of Pakistan. Some studies reflect macroeconomic determinants of tax and public expenditure and other reflect economic consequences independently.

Theoretical Framework

According to free trade theories, trade liberalization policy improves society's welfare through its various channels under the perfectly competitive market conditions but on the other hand, one channel may cause to affect the welfare due to revenue loss. The trade

revenue loss automatically creates fiscal changes for tax collection at domestic level. So, free trade on one fold considered improving economic efficiency while on another fold it may create inefficiency in the fiscal performance of developing the world. There are so many models to employ and investigate its market, social, political and fiscal implications for different countries, regions, and sectors. For developing country like Pakistan, this study only investigates the fiscal implication of trade liberalization.

Haque and Mukherjee (2005) suggested that tariff revenue loss may be offset through profit tax instead of commodity taxes. In monopoly condition, government depends on profit tax to make trade revenue loss neutral against trade liberalization documented by (Mujumdar, 2004). On the other hand, Emran (2005) developed another strategy to gain revenue from an export tax on selective items. Due to this, the production of these items is helpful to cover the revenue loss from trade liberalization under the assumption of constant producer prices. Under these conditions, trade liberalization may be appropriate for domestic tax collection. Primarily this strategy is more appropriate only for developed nations because they have more imports volume. Naito (2006) studied the dynamics of tariff and tax reforms under revenue neutrality constraint. He developed a strategy that tariff revenue is not neutral in those economies which have more share of capital goods rather than consumer goods in their total imports items.

Aizenman and Yothin (2009) established the relationship between the different types of openness and tax base. They concluded that financial and trade openness are positively correlated with hard to collect tax (Direct taxes high collection cost) and negatively associated with easy to collect tax (Indirect taxes low collection cost). Keeping in view the work of Khattry and Rao (2002), Gupta (2007), Baunsgaard and Michael (2010) and Gaalya (2015) found strong evidence that trade revenue has endogenous effects on fiscal composition and structure. Most of the studies conclude that trade revenue has an adverse effect on tax revenue in those countries which have less ability to change the domestic tax structure. In previous studies, to measure the tax structure, tax to GDP ratio, the growth rate of tax revenue and a different component of indirect and direct tax have been used for empirical analysis.

Econometric Methodology and Data Sources

This study tries to measure tax structure with the help of direct and indirect ratio. The ratio of tax structure over time gives clear representation about the demand side fiscal implication of trade liberalization as well as welfare aspect for society. So, in the light of previous studies, the observed function of tax structure is as below

$$TS = h(ATR, TR, Y, BD, DS, UGE)$$

Where, TS= ratio direct tax and indirect tax revenue measure as tax structure, ATR = Tariff rate weighted mean of all products (%) as a measure of trade liberalization, TR=Trade tax revenue as a share of total tax revenue, Y= GDP per capita growth (annual %), BD = Fiscal balance as a share of GDP, DS = Interest payments on external debt (% of GNI), UGE= Underground economy as share of GDP.

Co-integration is a more appropriate method to investigate the existence of long and short run relationship among different time series. Initially, the idea of co-integration was developed by Engle and Granger (1987). After that, it was augmented by Stock and Watson (1988), Johansen and Juselius (1990), Johansen (1991, 1992, and 1995), Pesaran et al. (2001) and Paresh (2005). This study uses bound testing approach to cointegration developed by Pesaran et al. (2001) and Paresh (2005). Autoregressive distributed lag approach has

following advantages over previous approaches. First, it produces more reliable results for small datasets. Second, it is appropriate for a different order of integration of variables. Third, it is an easy approach to transforming long run coefficients to short run through re-parameterization. This approach follows two steps for empirical estimation. First, it computes F-statistics of bound testing which is based on Pesaran et al. (2001) and Paresh (2005). Second, by using error correction mechanism the short run results are obtained.

Data sources and variable Description

In previous studies, to measure the tax structure with the help of tax to GDP ratio, the growth rate of tax revenue and a different component of indirect and direct tax have been used for empirical analysis. This study tries to measure tax structure with the help of direct and indirect ratio. The ratio of tax structure over time gives clear representation about the supply side fiscal implication of trade liberalization as well as welfare aspect for society over the time 1974 to 2014. Data sources and description of concerned variable as follows:

Trade Revenue: Trade tax revenue is defined as import and export duties or customs duties on free trade are used a proxy for trade revenue because almost 95 percent trade tax revenue are collective from customs duties in Pakistan. Other trade revenues were also collect like inform of non-tariff barrier one of them, we are not able to include in trade revenue for analysis one it has less share and second-time serious study need regular values of data over time in case of non-tariff revenue it has a missing value. We know this type of trade duties are imposed on trade for different objective at different time period. Keen (2008) and Adam et al. (2001) used to investigate the impact of trade revenue on domestic taxes. They concluded that trade revenue decreased during the process of trade liberalization in most of the developing countries.

Size of Underground Economy: The size of the underground economy is used as a proxy for administration capacity of tax collection as well as corruption level of the economy. The size of the underground economy increases we may expect negative link with the fiscal structure for Pakistan. Bird et al. (2004) and later on Gupta (2007) investigated the determinants of domestic tax revenue for developing economies using structural variables like administration, political stability, and level of corruption. He also mentioned that such type of factors has direct and significant role on the fiscal position of developing economies. For the size of the underground economy, data estimated by (Gulzar et al. 2010). We use a moving average for remaining four years observation.

GDP Per Capita Growth: In literature, Tanzi (1992) investigates the relationship between tax revenue and level of development. GDP per capita annual growth is used in most of the studies as a determinant of fiscal performance. Per capita growth has a different result for different countries but the most common result shows positive relation for fiscal structure. The level of economic development may improve the domestic tax collection. This may provide the nature of elasticity and buoyancy of domestic tax collections. The demand for public services is usually income elastic; an increase in public goods and services causes economic development which may be possible through an increase in tax revenue (Tanzi, 1987).

Trade Liberalization: There may be ambiguity in the relationship between trade liberalization and revenue mobilization. If the trade liberalization causes the reduction in tariff, the losses may be expected in the trade tax revenue. However, as suggested by Keen and Simone (2004), the eliminations of exemptions, improvement in custom administration

and tariffication of quotas may cause to increase in revenue. Trade liberalization is measured with a weighted mean of all product percentage average tariff rates. Trade liberalization or tariff reduction policy produced unclear results for fiscal policy for different countries (Keen and Ligthart 2001), Ebrill et al. (1999) and Benarroch and Pandey (2012) investigate the relationship between tariff level and fiscal structure. Trade liberalization has a different result on the performance of fiscal policy for developed as well as developing countries. The data on average tariff rate is taken from Pakistan Customs Tariff (2016) the online data base managed by Federal Board of Revenue, Government of Pakistan.

Fiscal deficit: Fiscal deficit is another important variable which influences the public policy. The Large fiscal deficit has no clear effect on total tax collection but it may create adverse effects on tax ratios. According to Abe (1992) and Bird et al. (2004) high budget deficit economies show more dependency on foreign debt and aid to meet their fiscal needs. This process may create serious implications for domestic tax collection at the repayments of debt servicing.

Foreign Debt Servicing: Foreign debt servicing has also been considered as a factor that may affect revenue collection. For example, Gupta et al. (2005) investigate the relationship between loans and fiscal variables. If foreign aid primarily consists of loans, the policy makers may be induced to mobilize higher revenue due to the burden of repayments of future loans. Thus the burden of debt servicing without increasing the tax base reduces the tax revenue collection. Interest payments on the external debt as a percentage of gross national income (GNI) are used to investigate the impact on fiscal performance. Gupta (2007) used foreign debt to investigate the impact on domestic taxes. The major data sources are Handbook of Statistic on Pakistan Economy publish by State Bank of Pakistan (2015) and World Development Indicator (WDI) by World Bank (2014).

Empirical Results

The study employed both descriptive and correlation matrix approaches among concerned variables. The descriptive and correlation results have been presented in table 1 and 2. The results suggest that there is a negative correlation between per capita growth, debt servicing, average tariff rate, budget deficit, and trade tax revenue with tax structure. Political stability and urbanization have a positive correlation with tax structure.

Table 1: Suggestive Statistics and Correlation Matrix of Model.

	TS	PCG	DS	ATR	BD	TR
Mean	0.38150	2.18986	3.84066	23.4767	6.0120	23.4647
Median	0.39251	1.97178	4.08571	25.4895	6.1000	20.6000
Maximum	0.65673	6.60247	6.62840	35.5284	8.7000	39.2000
Minimum	0.16728	-1.64241	1.77330	7.66547	2.3000	11.3000
Std. Dev.	0.16608	1.95527	1.27763	9.30917	1.6772	9.81581
Skewness	0.18211	0.30668	0.12128	-0.23954	-0.3321	0.29701
Kurtosis	1.56617	2.59263	2.53246	1.52705	2.2980	1.47568
Jarque-Bera	3.10041	0.76806	0.39303	3.39875	1.2834	3.79158
Probability	0.21220	0.68111	0.82158	0.18274	0.5261	0.15019
Sum	12.9711	74.4553	130.582	798.209	198.40	797.800
Sum Sq. Dev.	0.91029	126.161	53.8676	2859.85	90.091	3179.55

Observations	39	39	39	39	39	39
	TS	**PCG**	**DS**	**ATR**	**BD**	**TR**
TS	1					
PCG	-0.27636	1				
DS	-0.45402	-0.20957	1			
ATR	-0.62028	0.12953	0.53188	1		
BD	-0.32972	0.278695	0.51269	0.74738	1	
TR	-0.92019	0.263592	0.27729	0.89041	0.772266	1

Table 2: Suggestive Statistics and Correlation Matrix of Model.

	TS	**ATR**	**TR**	**UGE**	**PS**	**UP**
Mean	0.38150	23.4767	23.4647	29.0429	4.79411	3.51445
Median	0.39251	25.4895	20.6000	29.3450	4.50000	3.35701
Maximum	0.65673	35.5284	39.2000	39.4100	6.00000	4.64956
Minimum	0.16728	7.66547	11.3000	19.7300	3.00000	2.74934
Std. Dev.	0.16608	9.30917	9.81581	6.19174	0.8714	0.58737
Skewness	0.18211	-0.23954	0.29701	0.06359	-0.35911	0.42795
Kurtosis	1.56617	1.52705	1.47568	1.56098	2.46789	1.81964
Jarque-Bera	3.10041	3.39875	3.79158	2.95649	1.13202	3.01155
Probability	0.21220	0.18274	0.15019	0.22803	0.56779	0.22184
Sum	12.9711	798.209	797.800	987.460	163.000	119.496
Sum Sq. Dev.	0.91029	2859.85	3179.55	1265.14	25.0582	11.3800
Observations	37	37	37	37	37	37
	TS	**ATR**	**TR**	**UGE**	**PS**	**UP**
TS	1					
ATR	-0.62028	1				
TR	-0.32972	0.89041	1			
UGE	-0.59344	0.5123	0.59270	1		
PS	0.243110	-0.43089	-0.08430	0.092221	1	
UP	0.826445	0.38734	0.52951	0.52061	-0.06199	1

The empirical estimation of economic theory is meaningless without testing unit root problem of the variables. This study uses Ng and Perron (2001) unit root tests for examining stationarity of the variables of above model. The results are presented in table 3. Tax structure, per capita income growth and political stability, are stationary at level. All other variables are stationary at first difference. There is the mixed order of integration observed in unit root test which is more appropriate for applying short run and long run ARDL bound testing cointegration.

Table 3: Unit Root Estimation

Ng-Perron Unit Root Estimation At Level				
Variable	**Ng-Perron Test Statistics**			
	MZa	**MZt**	**MSB**	**MPT**
Direct/indirect tax ratio	-11.1011**	-2.28977	0.2.620	8.5332
Urban pop as share of total population	-0.4067	-0.2448	0.6020	22.551
Average tariff rate	-0.4659	-0.2855	0.6128	22.837
Trade revenue as a share of tax revenue	-1.1289	-0.5168	0.4577	13.847
Real per capita growth	-18.5407***	-3.01141	0.1624	1.4414
Budget deficit as a share of GDP	-2.6201	-3.8551	0.1268	5.7623
external debt servicing as a share of GDP	-7.1515	-1.8578	0.2597	3.5429
Political stability	-18.37***	-3.0182	0.1642	1.3805
Underground economy as share of GDP	-1.2953	-0.1375	0.9657	16.550
At 1st Difference				
Variable	**Ng-Perron Test Statistics**			
	MZa	**MZt**	**MSB**	**MPT**
Direct/indirect tax ratio	-15.9091**	-2.8096	0.1766	1.5800
Urban pop as share of total population	-14.4925**	-2.6916	0.18573	1.6913
Average tariff rate	-16.7675**	-2.8112	0.1679	1.7671
Trade revenue as a share of tax revenue	-17.7196***	-2.9751	0.1679	1.3876
Real per capita growth	-16.2992**	-2.8546	0.1751	1.5034
Budget deficit as a share of GDP	-14.9210**	-2.9061	0.1867	1.5935
External debt servicing as a share of GDP	-18.883***	-3.2268	0.1545	4.3904
Political stability	-14.033**	-2.6460	0.1885	1.7565
Underground economy as share of GDP	-20.384***	-3.6947	0.1942	4.4363

*, **, *** shows the level of significance

After confirmation of the stationary level of the variables, now we move towards lag selection procedure. Table 4 presented empirical results for a selection of the lag order of ARDL model. The empirical results of different criterion suggest one optimum lag length for above models. While the lag order results of model 2 also suggest one.

Table 4: Lag Order Selection Criteria Based on VAR

Lag	FPE	AIC	SC	HQ
0	10208.06	29.09594	29.41338	29.20275
1	1.297840*	20.05691*	22.59643*	20.91138*

*indicates optimal lag selections

The estimate ARDL bound F-Statistic is presented in table 5. For testing the null hypothesis of no cointegration, F-statistic and W-statistic are used. The calculated F-statistic of models are (5.4145) and (7.2412) respectively which is greater than the upper bound value proposed by Pesaran et al, (2001) at 95 percent level of significance. So the null hypothesis of no cointegration is rejected of all two models and the alternative hypothesis of cointegration is accepted. This confirms that there is a long run relationship among our concerned variables.

Table 5: ARDL Bounds Testing Cointegration Test

	F-Statistic (Calculated)	At 95%		At 90%	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound
Tax structure Model (1)	5.4145** (1,0,0,0,0,0)	3.2178	4.6443	2.6867	3.8991
Tax structure Model (2)	7.2412** (1,0,0,0,0,0)	2.6452	4.2310	2.1345	2.9452

, * 5% and 10% significant level reject the null hypotheses of no cointegration.

The long run results are reported in table 6. The results show that trade liberalization has a negative and significant relationship with tax structure. The results show that high tariff rate improves the share of indirect tax as compared to a direct tax. The coefficient estimates suggest that a 10 percentage point increase in trade liberalization will cut 6 to 7 percentage point in tax structure at 5 percent level of significance. The coefficient of trade tax revenue shows that there is a negative and significant relationship between trade tax revenue and tax structure in Pakistan. The empirical result shows that a 10 percentage point increase in trade tax revenue will reduce tax structure by .01269 percentage point. It means that Pakistan has more emphasize on indirect taxes as compared to direct taxes. Our results support the proposition developed by Aizenman and Yothin (2009) because the indirect tax is easy to collect and have relatively low collection cost.

Per capita growth has a positive and significant relationship with tax structure in Pakistan. The estimated coefficient shows that 10 percentage point increase in per capita growth brings on average, 1 percent increase in tax structure in Pakistan. The empirical results coincide with Gaalya (2015) the economic theory, as the level of economic development increases it promote the government ability to tax collect as well as the ability of taxpayers also increases. The overall tax system of Pakistan is elastic and buoyant. The elasticity and buoyancy of tax structure help to determine how responsiveness of tax yields to change national income. The magnitude of the tax structure elasticity is favorable over time with the responsiveness of income.

The estimated results show that budget deficit has a negative and insignificant relationship with tax structure in case of Pakistan. It means that budget deficit causes to increase the indirect tax share in total tax collection. The estimated coefficient shows that the 10 percentage point increase in fiscal deficit will decrease 30 percent of tax structure but the result is statically insignificant. The level of external indebtedness is considered as an important factor to reshape the domestic tax structure especially in the case of developing nations. The repayments of external debt servicing put adverse impact on domestic resources mobilization. The coefficient of interest payments has also a negative relationship with tax structure and the results are statistically significant at 5 percent. The results on the relationship between debt servicing and tax structure are consistent with Gupta (2007). For low-income nations, the government should focus on easy to tax collection (Indirect taxes with high tax collection cost) as compared to hard to tax collection (Direct taxes with low tax collection cost).

The size of the underground economies and population density is another important internal factor which is used to investigate the marginal impact on tax structure. The collection of direct taxes remained restricted largely to the industrial and financial sectors, to public limited companies and multinationals, to corporate profits and salary income and to the metropolitan cities of Pakistan. The level of corruption and administration capacity is

another factors include by Bird et al. (2004) and Gupta (2007) to analyze the domestic tax efforts by using broad data set. The tax structure is progressive; there is an improvement in tax administration and the level of tax evasion. But in the case of Pakistan, our empirical results support that tax structure improves disproportionately because of unsophisticated tax administration, large informal sector and widespread tax evasion in the economy.

Table 6: Long Run Coefficient of ARDL Regression

Variables	**Model 1 Dependent variable Tax structure**		**Model 2 Dependent variable Tax structure**	
Constant	.05475*	3.1407[.004]	.0690**	2.1407[.002]
Average tariff rate	-.0621**	-2.015[.031]	-.0750**	-1.991[.042]
Trade revenue as a share of total tax revenue	-.01269*	-2.315[.027]	-.0160*	-9.665[.000]
Real per capita growth	.01565**	-2.415[.035]	------	------
Budget deficit as a share of GDP	-.37574	-1.185[.247]	------	------
External debt servicing as a share of GDP	-.01997***	-1.901[.059]	------	------
Urban pop as share of total population	------	------	.08081*	3.148[.000]
Political stability	------	------	.02919**	2.186[.039]
Underground economy as a share of GDP	------	------	-0.075***	-1.691[.065]

Note: *, **, *** Means at 1% 5% 10% significant level

After finding the long run relationship, now we move to find the short run relationship between the variables of the above two regression. The short run results have also been presented for both models of fiscal structure in table 7. When tax structure is used as dependent variable while trade liberalization, trade tax revenue, per capita income, budget deficit, interest payment, the share of the urban population, hidden economy and political stability are used as independent variables in model 1 and 2. The results of tax structure show that all the independent variables have a negative relationship with tax structure in Pakistan and all the variables have a significant relationship except political stability and urban share of total population. The negative sign of the coefficient of lag error correction term is -.7012 and -.6532 in model one and two respectively, it is statistically significant. The coefficient of lag error term shows that the convergence of long-run equilibrium position.

Table 7: Short Run Coefficient of ARDL Regression

Variables	**Model 1** Direct/indirect tax ratio (1,0,0,0,0,0)		**Model 2** Direct/indirect tax ratio (1,0,0,0,0,0)	
Constant	0.0549**	4.7947[.020]	.0183*	6.324[.000]
ΔAverage tariff rate	-.0394***	-1.654[.108]	-.052**	-2.214[.024]
ΔTrade revenue as a share of tax revenue	-.0123	-0.514[.391]	-.08***	-.1.659[.076]
ΔReal per capita growth	-.01293**	-2.09[.031]	-----	-----

Variables	**Model 1** Direct/indirect tax ratio (1,0,0,0,0,0)		**Model 2** Direct/indirect tax ratio (1,0,0,0,0,0)	
ΔBudget deficit as a share of GDP	-.0170**	-1.99[.042]	-----	-----
ΔExternal debt servicing as a share of GDP	-.0547		-----	-----
ΔUrban population as a share of total population	-----	-----	.0486	1.532[.125]
ΔPolitical stability	-----	-----	.0544**	2.590[.014]
ΔUnderground economy as share of GDP	-----	-----	-.0504**	-2.223[.020]
Lag error correction term	-.5477*	-3.712[.000]	-.6014*	-2.5636 [0.025]
R^2 and D.W	.7012/ 1.618		.6532/1.879	

Note: *, **, ***Means at 1% 5% 10% significant level

After cointegration analysis, we move to investigate the cause and effect among concerned variables with the help of Pairwise Granger Causality Tests. The estimated results presented in table-8. The causality results are also confirming the long run association of concerned variables.

Table 8: Pairwise Granger Causality Tests

Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
TR does not Cause TS	37	7.5973	0.0007
TS does not Cause TR		2.2063	0.1002
DS does not Cause TS	37	1.2613	0.3317
TS does not Cause DS		1.3224	0.3068
UGE does not Cause TS	37	2.4646	0.0733
TS does not Cause UGE		2.2081	0.1000
PCG does not Cause TS	37	2.2256	0.0979
TS does not Cause PCG		2.5581	0.0656
PS does not Cause TS	37	2.6348	0.0610
TS does not Cause PS		0.5603	0.7552
UP does not Cause TS	37	3.7626	0.0174
TS does not Cause UP		0.8209	0.5708
ATR does not Cause TS	37	2.5140	0.0887
TS does not Cause ATR		3.2862	0.0213

The diagnostic tests are reported in table 9. The results show that there is no serial correlation and heteroscedasticity problem in data. Moreover, the variables of the model have correct functional form and data is normally distributed.

Table 9: Diagnostic Tests

Test Statistics	Model 1		Model 2	
Serial Correlation	0.7595	(0.383)	0.5644	(0.459)
Functional Form	0.0763	(0.782)	0.5566	(0.815)
Normality	0.6369	(0.641)	0.5317	(0.421)
Heteroscedasticity	0.2535	(0.615)	0.2400	(0.621)

Note: LM Version of the test statistic is used for testing hypothesis. The probability value of test statistic is reported in ( ).

Brown et al, (1975) proposed the hypothesis testing of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMsq) for the stability of coefficients of the entire regress model. This study has also contracted these plots of above four models to confirmation of stability of long-run coefficients. The empirical results of (CUSUM) and (CUSUMsq) are presented in figures 1 to 4 respectively as below. The empirical results also confirm the stability of coefficient of all two models at 5 percent of significant.

Figure 1: Plot of Stability Diagnostics (Recursive) for the Estimate Regression

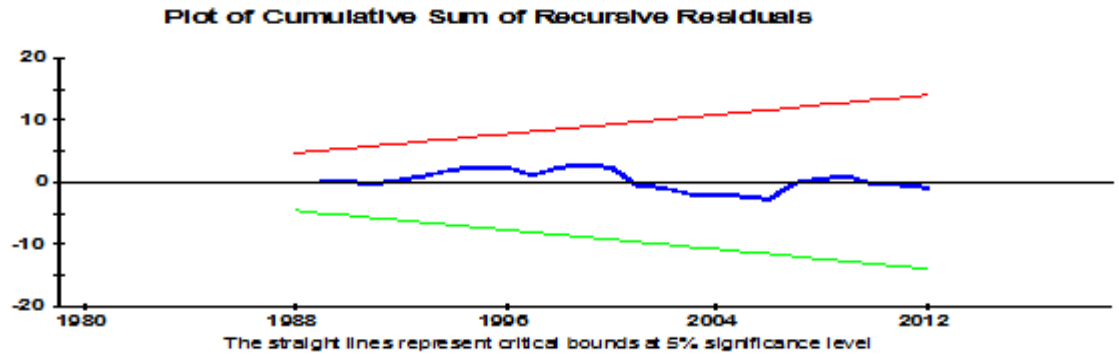


Figure 2: Plot of Stability Diagnostics (Squares Recursive) for the Regression Estimates

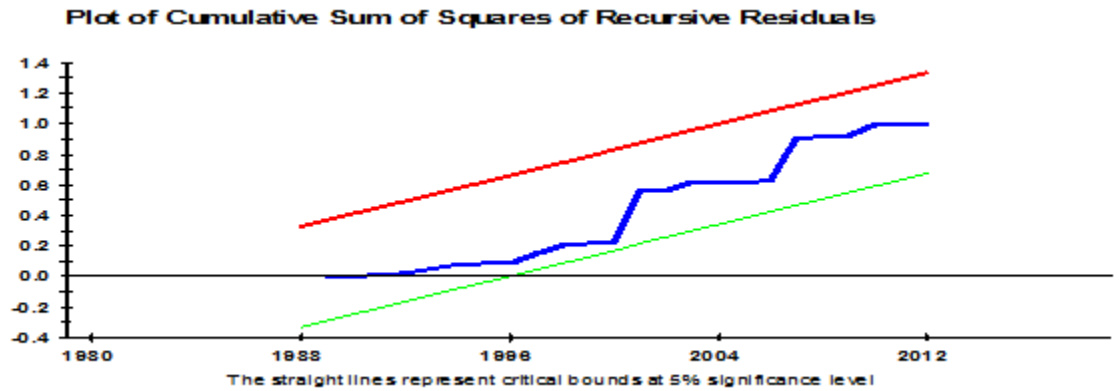


Figure 3: Plot of Stability Diagnostics (Recursive) for the Estimate Regression

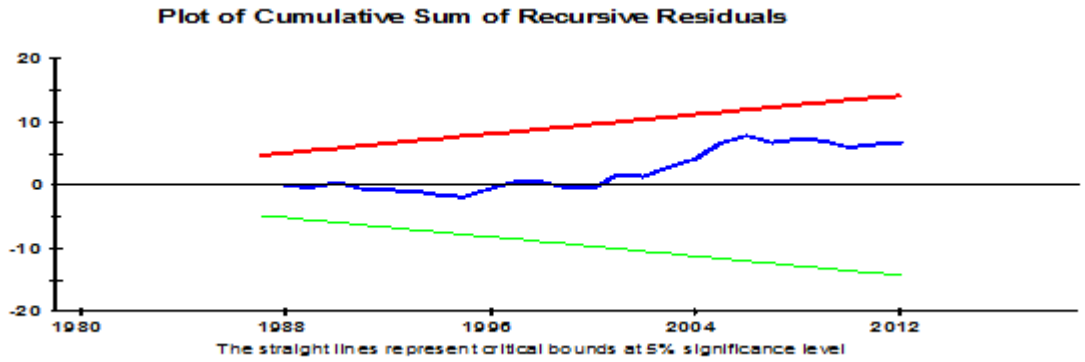
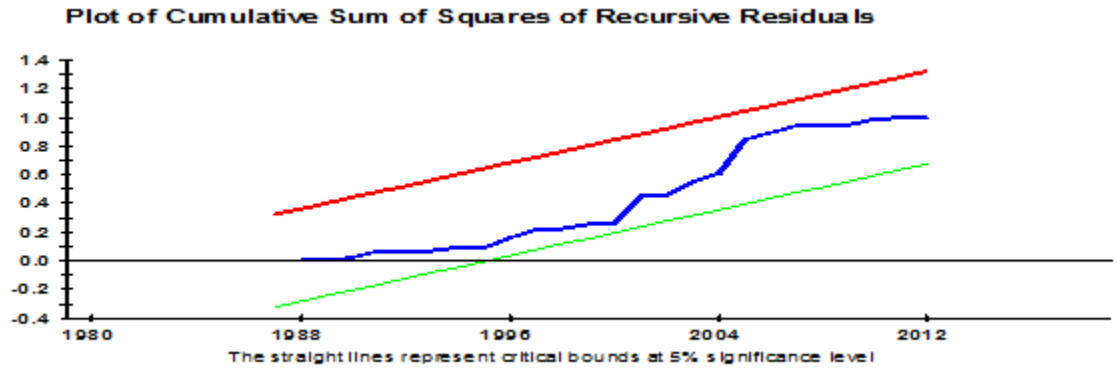


Figure 4: Plot of Stability Diagnostics (Squares Recursive) for the Regression Estimates



Conclusions and Policy Commendations

Trade liberalization has so many implications for economic, social and political changes for developing world. The fiscal implication of trade liberalization is one of them which gained more importance for developing economies because most of the developing nations considerably depend on trade tax revenue. This study empirically investigates the effect of trade liberalization with other structural and institutional factors on tax structure of Pakistan. The empirical results show that trade liberalization and trade tax revenue have a negative impact on tax structure in both short and long run of Pakistan. Size of the underground economy, external debt services are used to capture the administration capacity of tax collection. The empirical results show that the level of corruption and administration performance has a negative impact on tax structure. While, real per capita growth, urban share of population and political stability has a positive impact on tax structure.

On the basis of empirical results of the fiscal implication of trade liberalization, we are able to conclude that the fiscal structure has produced an adverse effect on welfare. Due to trade liberalization, the income effect of trade tax revenue loss has considerably adverse influence on the fiscal structure in case of Pakistan. The share of indirect tax quickly increases as compared to a direct tax. The indirect tax is a regressive form of taxation which has a dis-protonate influence on the welfare level of taxpayer through various channels. Pakistan has no ability to shift trade tax burden towards direct tax because it has faced both problems like low institutional administration quality to tax collection and also a low tax to GDP ratio.

For the policy implication, the government should improve the tariff rate, on one hand, While, on the other hand, government should improve domestic fiscal structure. Pakistan should reduce tax evasion opportunities and inefficiency in domestic tax collection administration capacity with the help of proper documentation of the economy. Then, we may be able to overcome the trade revenue loss with the improvement of direct tax collection. This policy may neutral welfare loss of tax payers in the process of future trade liberalization.

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