The Institutional Determinants of Tax Buoyancy: A Case Study of Pakistan

Fahid Subhani[a], Imran Sharif Chaudhry[b], M Hanif Akhtar[c], M Ramzan Sheikh[d]

Abstract

Revenue generation of any country largely depends upon its tax collection capability. Taxation is the main fiscal instrument for the collection of the revenue for both developing and developed economies. Through taxation, income diverts from unproductive expenditures to socio-economic expenditures and investments by acceleration. However, like other developing countries, Pakistan has always been confronting fiscal imbalance and unsatisfactory tax situation. The objective of the study is to explore the institutional determinants of tax buoyancy in Pakistan for the period of 1996 to 2016. The study employs the autoregressive distributed lag (ARDL) technique for aggregated and disaggregated analysis of different types of taxes. The study finds out that buoyancies of different taxes have blended results with different institutional variables.

Introduction

Developing countries are going to be integrated with the global economy as they face various comprehensive challenges. One of the challenges is to increase the revenues. Revenue generation of any country largely depends upon its tax collection capability. Taxation is the main fiscal instrument for the collection of the revenue for both developing and developed economies. In developing countries, the effective tax system is very important and essential because these economies spent a large portion of their income on the unproductive projects. Through taxation, income diverts from unproductive expenditures to socio-economic expenditures and investments by acceleration (Gordon and Li, 2005). Taxation is one of the ways which can mobilize the resources from private sector to the public sector.

Governments finance their expenditures by the deficit financing, foreign aid, and through debt but tax is a measure which has less cost and limited inefficiency than others (Poole, 1956). If government initiates various development projects i.e. infrastructure, health, public parks and education etc. then people who have less income may get the benefit from them. These development expenditures may be done by the government if it has an efficient tax system. Tax is the flexible tool for the government to achieve the political and socio-economic goals. So, government utilizes taxes and monitors these resources to increase economic productivity and efficiency of the state (Hijazi, 2001).

An appropriate tax system may be helpful for the fiscal performance of the state. Tax performs a fundamental role in the economic planning of any country and it is the major source of government income. But Pakistan always faces fiscal imbalance in the form of the large budget deficit, non-development expenditures, and fewer revenues. In each era, Pakistan did not face any satisfactory fiscal condition although approximately seventy new various types of taxes have been imposed and these taxes are being managed by thirty-seven government institutions. These new taxes are imposed in the form of wealth tax, income tax, excise duty, sales tax and customs duty etc. on individual and business firms (Horrigan, 2010). The reasons for low tax compilation comprise tax evasion, complicated procedure, and narrow tax base.

[a] M.Phil Scholar, National College of Business Administration and Economics, Lahore, fahidsubhani@gmail.com
[b] Professor of Economics, School of Economics, Bahauddin Zakariya University, Multan, Email: imran@bzu.edu.pk
[c] Professor of Finance, Department of Commerce, Bahauddin Zakariya University, Multan, Email: haneefakhtar@bzu.edu.pk
[d] Associate Research Fellow, London School of Economics and Political Science, UK, Email: ramzansheikh@bzu.edu.pk

Institutional infrastructure is also very important for an economy because it can make accountable everyone for their actions. Thus, this study explains how much taxes are affected by the institutional variables. The study is an effort to fill up the gap in existing literature. Rest of the discussion is structured as follows: Section 2 describes the concept and measurement of tax buoyancy whereas section 3 clarifies the review of various studies related to the subject. Section 4 explains the data and model specification while section 5 portrays the empirical results. Finally, in section 6 the conclusion and policy implications are presented.

Tax Buoyancy: Concept and Measurement

[a]The concept of tax buoyancy is used to calculate the sensitivity, responsiveness, proportionate or percentage change in tax revenue or tax receipts to percentage change in economic growth. Tax buoyancy is a crude measure. It does not differentiate between the discretionary and automatic growth of revenue.

A tax would be buoyant in which revenues increased by more than one percent for a one percent increase in GDP or output or national income. To calculate the tax buoyancy discretionary changes did not control in the tax system. Tax buoyancy results explain the growth in tax revenues by adopting the discretionary and automatic changes. Tax buoyancy shows both dictionary changes and automatic growth of tax revenues.

Tax Buoyancy shows the percentage change in tax revenue to the percentage change in GDP. The formula[b] of Tax Buoyancy is given below:

$$\text{Tax Buoyancy} = \frac{\text{Percentage Change in Tax Revnue}}{\text{Percentage Change in GDP}} \times 100$$

How the Tax Buoyancy works, it can be illustrated by the following example. For example, a country's GDP growth rate is 9 percent and its tax revenue growth rate is 45 percent in a year. Then tax buoyancy of that country will be 5. In next year if country's growth rate decline from 9 percent to 6 percent and tax revenue growth rate is 18 percent then for that year tax buoyancy will be 3 for that year. So, the tax buoyancy shows the relationship between the economic performance of a country in terms of GDP growth rate and the government happiness in the form of tax revenues.

Review of Literature

Many studies have been explored to understand the tax buoyancy of different countries. For the determinants of tax buoyancies, different studies have discriminated results. This section explains all the consequences of various studies which are related to our study.

Ashfaq and Sarwar (2016) investigated the institutional determinants of tax buoyancy for fifty developing countries. The study applied the Pooled Ordinary Least Squares method for the period of 1996 to 2013. The analysis demonstrates that democracy is positively and autocracy having the negative impact in each case i.e. direct, indirect or total tax revenues.

Musa et al (2016) examined the Tax Buoyancy and Elasticity for Nigeria. The instigators have used Multiple Regression Model for the period of 1980 to 2011. The authors summarized the economic situation of Nigeria that revenue mobilization through taxation did not match with its expenditure in consequence deficit take place. The results illustrate that National Income (GDP),

[a] Leuthold (1986)

[b] Wellington Bonga (2015)

government expenditure positively while external grant, inflation rate and the dummy variable for tax reforms negatively affected the total tax revenue.

Sharma and Kulsrestha (2015) explored the non-tax revenue buoyancy for India. The authors have applied Ordinary Least Square (OLS) method for the period of 2001 to 2011. The study reveals that in Fiscal Services, General Services, Economic Services and Grants-in Aids are significant while Dividends and Profits, Social Services are insignificant. The author observed that non-tax revenue buoyancy value is less than one which shows that for the revenue capacity generating for non-tax revenue (NTR) source is insignificant.

Bonga et al. (2015) analyzed the Tax Elasticity, Buoyancy and Stability in Zimbabwe. The authors used the time series data and applied OLS and Dummy variable technique to measure the tax elasticity and tax buoyancy for the period of 2000 to 2013. The results show that dollarization era is more buoyant than the Zimbabwean dollar era. Tax buoyancy in all over the given time period is greater than one as well. Dummy variable approach also implies the same result of tax buoyancy which is greater than one. In this analysis, six tax heads have used as individual tax, company tax, carbon tax, value added tax, customs duty and excise duty. Only excise duty and individual tax head are significant while customs duty, carbon tax and value added tax are insignificant.

Omondi et al. (2014) inspected the impact of tax reforms on elasticity and buoyancy on Kenya's tax system. The authors used the time series data for the period of 1963 to 2010 and applying the Granger Causality because there is a linear sequence between the variables. The buoyancy coefficient under the Tax Modernization Program (TMP) shows that tax revenue has increased at the given time period while buoyancy coefficient under the Revenue Administration Reform and Modernization Program (RARMP) shows more impact than TMP reforms. The elasticity coefficient of TMP and RARMP having the positive impact on GDP but TMP is more than the RARMP. The investigators proposed that tax base should be widening and tax rate should be lower.

Mawia and Nzomoi (2013) empirically investigate the tax buoyancy for Kenya. The authors used time series quarterly data for the period of 1999 to 2011. The investigators applied the Engel Granger Cointegration technique to explore the results. The author investigated that overall tax sounds well but the individual taxes are not behaving positively as changes in their respective bases. Tax buoyancy has computed for income tax, value added tax, import duty, excise duty and total tax. Only the excise duty is buoyant in furtherance of their base which means that as private consumption changes excise duty reacting positively. Moreover, the government has to analyze the quantity and structure of tax evasion.

Cotton (2012) has estimated the tax buoyancy and tax elasticity of non-oil tax revenue for Trinidad and Tobago. The author used the OLS technique for the period of 1990 to 2009. In this study, the author observed that elasticity of Non-Oil direct taxes, individual income tax, company tax and VAT is greater than one and elasticity of non-oil taxes, international trade tax, excise duty and property tax is less than one. Buoyancy coefficients of direct and indirect tax, income tax, company tax, property tax, excise tax and trade tax are less than one while value-added tax buoyancy coefficient is greater than one.

Twerefou et al. (2010) examined the tax buoyancy and elasticity for Ghana. The authors have applied the Dummy Variable Technique for the period of 1970 to 2007. In this study taxes which are used in the analysis are Total Tax Revenue (TTR) its proxy base is Gross Domestic Product (GDP), Personal Income Tax (PYTAX) with proxy base is Current Personal Income (CUPY), Company Tax (COTAX) its proxy base is Corporate Current Income (COCY), Value Added Tax (VAT) and Excise tax having the same proxy base which is Total Private final Consumption

(TPCON) and Import Duty (IMPDU) its proxy base is Total Imports (TIMP). Results of this study explore that Total Tax Revenue, Company Tax, Value Added Tax, Excise Tax and Import Duty buoyancy coefficients are less than one in short run while Personal Income Tax is buoyant. The authors recommended that tax on agriculture sector should be shifted in the form of land tax instead of export tax that will be more effective without harming the production side of agriculture. Tax administration should be effective that may increase the revenue collection and prevention of tax evasion must be taking place.

Upender (2008) explores the degree of tax buoyancy in India. The author applied Ordinary Least Square (OLS) method for the period of 1951 to 2005 using time series data. The study found that results of regression exemplify that constant gross tax buoyancy's estimate is significantly positive and greater than one during the period of pre-tax reform reveling that gross tax is comparatively elastic. During the pre-tax reform period tax buoyancy estimate is just greater than unity and post-tax reform period tax buoyancy estimate is less than unity this demonstrate that gross tax is comparatively inelastic.

Timsina (2006) investigated the Tax Elasticity and Buoyancy for Nepal. The investigator used the time series data for the period of 1975 to 2005 and applied the regression technique to explore the results. In this study author observed that Import Tax (inelastic), Income Tax (elastic), VAT (inelastic) and Excise Tax (inelastic) positively affected the Tax Revenue. The author recommended that for the improvement of import duty there is a need for effectiveness in this tax by increasing the efficiency of tax administration and reforms in customs.

Botlhole and Agiobenebo (2006) analyzed the buoyancy and elasticity of the tax system of Botswana. The authors used the quarterly data for the period of 1982 to 2001 and applied the vector error correction mode to explore the results. The result of the study shows that Total tax revenue, Mineral revenue, non-mineral income tax buoyancy coefficient are greater than one while customs and excise duty buoyancy coefficient is less than one. The authors suggested that elasticities and buoyancies coefficients are not extensively huge. So, the government must take some actions to diversify the economy for the enhancement of the revenue performance, take some corrective steps for the tax evasion and tax avoidance.

The research gap which has been found is that some studies had investigated the institutional determinants for different countries. But no study has explored the institutional determinates of tax buoyancy for Pakistan. Thus, in this study, we will explore institutional determinants of tax buoyancy for Pakistan.

Data and Model Specification

Data on various taxes for the period of 1996 to 2008 have been collected from the Federal Board of Revenue of Pakistan (FBR)[a] and rest of the data of different taxes for 2009 to 2016 have been taken through Ministry of Finance, Government of Pakistan. The data of Institutional variables have been obtained from the World Governance Indicators (WGI) for the period of 1996 to 2016. The models have been constructed to see the impact of institutional variables further on the buoyancies of various taxes, following econometric models of aggregate taxes and disaggregate taxes have been estimated.

a) Aggregate Models

Model 1: Total Tax Buoyancy Model

$$TBT_t = \beta + \alpha_1 GE_t + \alpha_2 RQ_t + \alpha_3 RL_t + \alpha_4 VA_t + \alpha_5 CC_t + \alpha_6 PS_t + \varepsilon_t \qquad (1)$$

[a] See http://www.fbr.gov.pk/ShowDocument.aspx?Actionid=2009 for data.

Model 2: Direct Tax Buoyancy Model

$$TBD_t = \beta + \alpha_1 GE_t + \alpha_2 RQ_t + \alpha_3 RL_t + \alpha_4 VA_t + \alpha_5 CC_t + \alpha_6 PS_t + \varepsilon_t \quad (2)$$

Model 3: Indirect Tax Buoyancy Model

$$TBINDT_t = \beta + \alpha_1 GE_t + \alpha_2 RQ_t + \alpha_3 RL_t + \alpha_4 VA_t + \alpha_5 CC_t + \alpha_6 PS_t + \varepsilon_t \quad (3)$$

b) Disaggregate Models

Model 4: Income Tax Buoyancy Model

$$TBIT_t = \beta + \alpha_1 GE_t + \alpha_2 RQ_t + \alpha_3 RL_t + \alpha_4 VA_t + \alpha_5 CC_t + \alpha_6 PS_t + \varepsilon_t \quad (4)$$

Model 5: Workers Welfare Tax Buoyancy Model

$$TBWWT_t = \beta + \alpha_1 GE_t + \alpha_2 RQ_t + \alpha_3 RL_t + \alpha_4 VA_t + \alpha_5 CC_t + \alpha_6 PS_t + \varepsilon_t \quad (5)$$

Model 6: Customs Duty Buoyancy Model

$$TBCD_t = \beta + \alpha_1 GE_t + \alpha_2 RQ_t + \alpha_3 RL_t + \alpha_4 VA_t + \alpha_5 CC_t + \alpha_6 PS_t + \varepsilon_t \quad (6)$$

Model 7: Federal Excise Duty Buoyancy Model

$$TBFED_t = \beta + \alpha_1 GE_t + \alpha_2 RQ_t + \alpha_3 RL_t + \alpha_4 VA_t + \alpha_5 CC_t + \alpha_6 PS_t + \varepsilon_t \quad (7)$$

Model 8: Sales Tax Buoyancy Model

$$TBST_t = \beta + \alpha_1 GE_t + \alpha_2 RQ_t + \alpha_3 RL_t + \alpha_4 VA_t + \alpha_5 CC_t + \alpha_6 PS_t + \varepsilon_t \quad (8)$$

Table 1 shows the description of the variables in detail.

Table 1: Description of variables

Variable(s)	Description
TBT	Total Tax Buoyancy (Total Tax as percentage of GDP)
TBD	Direct Tax Buoyancy (Direct Tax as percentage of GDP)
TBINDT	Indirect Tax Buoyancy (Indirect Tax as percentage of GDP)
TBIT	Income Tax Buoyancy (Income Tax as percentage of GDP)
TBWWT	Workers Welfare Tax Buoyancy (Workers Welfare Tax as % of GDP)
TBCD	Customs Duty Tax Buoyancy (Customs Duty as percentage of GDP)
TBFED	Federal Excise Duty Tax Buoyancy (Federal Excise Duty as% of GDP)
TBST	Sales Tax Buoyancy (Sales Tax as percentage of GDP)
GE	Government Effectiveness
RQ	Regulatory Quality
RL	Rule of Law
VA	Voice and Accountability
CC	Control of Corruption
PS	Political Stability

Empirical Results

a) Unit Root Analysis

Unit root test is amplified to check the stationarity or non-stationarity of the data. For this purpose, we have applied Augmented Dickey-Fuller (ADF) test. The condition of stationarity will be fulfilled when mean and covariance is constant and variance will be stable. Serial correlation problem will be removed when lagged differences will be added up to the dependent variable. If the problem remains exists, then the first-order difference is used to get stationary values. Table 2 explains the results of unit root test for institutional variables on level and first difference. Variables will be stationary at level and first difference is symbolized by I(0) and I(1) respectively. We have mixed trend in the table, as several variables are stationary at level and others are on first difference. As TBT, TBINDT, TBIT, TBWWT, TBCD, RQ, RL and CC are stationary at level while remaining variables are stationary at first difference. Here we have mix integrated trend then ARDL technique will be suitable to estimates the models.

Table 2: Results of ADF Test

Unit Root Test on Level							
Variables	**Intercept**	**Lags**	**Intercept and Trend**	**Lags**	**None**	**Lags**	**Conclusion**
TBT	-3.4464 (0.0220)	0	-3.2993 (0.0980)	1	0.1552 (0.7184)	2	I(0)
TBD	-2.5475 (0.1216)	1	-3.4326 (0.0783)	1	-0.3354 (0.5508)	0	I(1)
TBINDT	-4.2041 (0.0046)	0	-3.9706 (0.0303)	1	-0.4110 (0.5200)	2	I(0)
TBIT	-2.5865 (0.1028)	0	-3.4355 (0.0779)	1	-0.4157 (0.5198)	0	I(0)
TBWWT	-3.4129 (0.0236)	0	-4.9231 (0.0065)	3	-3.3309 (0.0026)	4	I(0)
TBCD	-3.6072 (0.0159)	0	-3.6329 (0.0538)	0	-3.1637 (0.0033)	0	I(0)
TBFED	-1.7360 (0.3984)	0	-4.6441 (0.0115)	4	-1.3886 (0.1480)	0	I(1)
TBST	-1.7448 (0.3927)	2	-3.0081 (0.1583)	2	-0.9171 (0.3049)	2	I(1)
GE	-1.4256	0	-3.8228	4	-0.9130	0	I(1)

	(0.5480)		(0.0452)		(0.3080)		
RQ	-3.7780 (0.0140)	4	-3.5854 (0.0663)	4	-1.2458 (0.1879)	0	I(0)
RL	-4.4233 (0.0032)	1	-4.2370 (0.0186)	1	-1.2804 (0.1768)	2	I(0)
VA	-2.0029 (0.2831)	0	-0.6341 (0.0614)	4	-1.0279 (0.2618)	1	I(1)
CC	-3.2995 (0.0296)	0	-3.2818 (0.0993)	0	-0.8379 (0.3396)	0	I(0)
PS	-0.7923 (0.7984)	0	-1.4466 (0.8118)	0	-1.8000 (0.0690)	0	I(1)

Source: Authors' calculations

b) Bounds Analysis

To detect the long-run relationship in variables, the study employs the Bound test for cointegration. WALD test is usually used for the Bounds test. Pesaran et al. (2001) suggested the F-distribution for the WALD test. It is said to be Bounds as it consists of F-distribution's two critical values. One critical value is called lower bound and other is upper bound. Bounds test hypothesis is as follows:

Ho: Coefficients of long-run are equal to zero (β's = 0)

H1: Coefficients of long-run are not equal to zero (β's $\neq$ 0)

The null hypothesis will be rejected if the F-statistic value of the WALD test is greater than the critical value of the upper bound and we will accept the alternative hypothesis. In contrary if the F-Statistics value of WALD test is less than the critical value of lower bound we accept the null hypothesis as there is no cointegration. If the value of F-statistics is more than the critical value of the lower bound but smaller than the critical value of the upper bound then about cointegration no decision can be made.

Table 3: The F-test for Co-integration

		At 5% Significance Level		At 10% Significance Level	
Models	**F - Statistics**	**Lower Bound**	**Upper Bound**	**Lower Bound**	**Upper Bound**
Model 1	17.6057	2.45	3.61	2.12	3.23
Model 2	6.7731	2.87	4.00	2.53	3.59
Model 3	31.3573	2.45	3.61	2.12	3.23
Model 4	4.5404	2.87	4.00	2.53	3.59
Model 5	23.0607	2.87	4.00	2.53	3.59
Model 6	5.2528	2.45	3.61	2.12	3.23
Model 7	6.0351	2.87	4.00	2.53	3.59
Model 8	4.4134	2.87	4.00	2.53	3.59

Source: Authors' calculations

Table 3 illustrates that calculated value of F-Statistics is greater than the upper bound value at 5 percent and 10 percent level of significance in all tax buoyancy models. Thus, in each tax buoyancy model long run relationship exists.

c) Long Run Results

In Table 4 and 5 we have estimated the long-run results of aggregate and disaggregate models respectively. First, the study will explain the long run results of aggregate models in Table 4. Here we have total, direct and indirect tax buoyancy models. In model 1, 2 and 3 total tax buoyancy, direct tax buoyancy and indirect tax buoyancy are the dependent variables. Each model has the same explanatory variables which are Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL), Voice and Accountability (VA), Control of Corruption (CC), Political Stability (PS).

The first explanatory variable is government effectiveness (GE) which expresses that it has the positive association with overall tax buoyancy and indirect tax buoyancy while negative relationship with direct tax buoyancy. GE is significant for total tax buoyancy, direct tax buoyancy and indirect tax buoyancy. Government effectiveness indicates public and civil servants have to do work independently without take the political pressure in the formulation and the implementation of the policies. But in Pakistan political system is not credible. The negative sign of GE with direct tax buoyancy reveals such situation. That's the reason; citizens of Pakistan are hesitant to pay the direct tax to government. In total taxes revenues, indirect taxes have prominent share.[a]As in Pakistan 2015-16 share of indirect taxes is 60% in total tax revenues. Through the government effectiveness, overall and indirect tax revenues would be increased which may increase their buoyancy coefficients as well. Thus, the economy will be more vitalized. Moreover

[a] Pakistan Economic Survey 2015-16

sign of our variables are justified by the studies of Ashraf and Sarwar (2016), Ajaz and Ahmad (2010), and Torgler and Schneider (2007).

Table 4: Long Run Estimates of Tax Buoyancy Models (Aggregate)

Variables	Model 1	Model 2	Model 3
	Overall Tax Buoyancy Model Dependent Variable: TBT ARDL (3, 1, 1, 1, 1, 1, 1)	**Direct Tax Buoyancy Model** Dependent Variable: TBD ARDL (1, 1, 1, 0, 1, 1, 1)	**Indirect Tax Buoyancy Model** Dependent Variable: TBINDT ARDL (3, 1, 1, 1, 1, 1, 1)
GE	0.3685 (0.0872)	-1.3203 (0.0750)	0.2993 (0.0789)
RQ	0.1392 (0.0254)	2.3254 (0.0309)	0.3972 (0.0675)
RL	0.6983 (0.0441)	0.9164 (0.0129)	0.5506 (0.0361)
VA	-0.3555 (0.0192)	-1.7041 (0.0468)	-0.8529 (0.0337)
CC	0.4867 (0.0803)	0.1664 (0.0608)	0.1789 (0.1019)
PS	-0.6762 (0.0498)	-3.6190 (0.0221)	-0.4038 (0.0545)
C	0.7356 (0.0421)	-3.2155 (0.0240)	1.17564 (0.0159)
T	------	0.2280 (0.0132)	------

Source: Authors' calculations

The second variable is regulatory quality (RQ) which has positive and significant impact on total tax, direct tax and indirect tax buoyancies. Positive relationship of RQ shows that one percent increase in regulatory quality then increase in total tax buoyancy will boost up by 0.13 percent, direct tax buoyancy would be increased by 2.32 percent and indirect tax buoyancy have been increased by 0.39 percent. The positive relationship of RQ with total, direct and indirect tax buoyancies reflects that government of Pakistan has a capability to plan and execute the strong policies, rules and regulations which may enhance the tax revenues. Therefore, the tax revenues can be enhanced by more advancing the regulatory quality which may spark the economy.

Furthermore sign of RQ is quite same as in the studies of Alonso and Garcimartín (2013) and Torgler and Schneider (2007) while contrast with the study of Ashraf and Sarwar (2016).

The next variable is rule of law (RL). It has positive and significant impact on total, direct and indirect tax buoyancies. Positive association of RL demonstrates that one percent increase in RL then 0.04 percent, 0.01 percent and 0.036 percent will increase in total, direct and indirect tax buoyancies respectively. In any economy, there will be abiding of courts decisions in contract enforcement and property rights, low probability of crime and violence, and government also protect the fundamental rights of the people. All these satisfactory law and order conditions will encourage the confidence of the people on the institutions and attract them to pay the taxes. Thus, buoyancy coefficients will improve by increase in the overall, direct and indirect tax revenues and economy will be more triggered. Moreover the results are aligned with the studies of Ashraf and Sarwar (2016), Franzoni (2008) and Gupta (2007).

Now we turn the results of voice and accountability (VA) which expresses that it has the negative and significant relationship with overall, direct and indirect tax buoyancies. Freedom of expression and accountability are essential because it creates trust, confidence and expectations of the tax payers. Accountability of the institutions is also imperative because it improves their performance. Unluckily in Pakistan institutions are not more accountable. When the institutions have more transparency then level of tax evasion will decrease and taxpayer would be more convinced. If voice and accountability will not improve it may be the hurdle for enhancement of tax revenues. Our results are supported with the studies Ashraf and Sarwar (2016), Bird *et al*. (2008) and Paul (1992).

The results of control on corruption (CC) demonstrate that it has a positive relation with overall, direct and indirect tax buoyancies. CC is significant for total and direct tax buoyancies while partially significant for indirect tax buoyancy. Control of corruption indicates the presence of accountability, public offices will not be used for the personal interest and element of corruption is not performed openly. In Pakistan, government is exercising its power on both lower and upper level to control the corruption. As in each year every tax payer submitted its return to the Federal Board of Revenue of Pakistan. People who pay taxes, their taxes have been filed annually by a system that restricts the element of corruption. Tax revenue may be boost up through restrain the element of corruption. Our results are in line with the studies of Ashraf and Sarwar (2016), Ajaz and Ahmad (2010), and Ghura (1998).

Finally, we have political stability (PS) which exhibits the negative impact on total, direct and indirect tax buoyancies for Pakistan. The time period which has been considered in this study is 1996 to 2016. Unfortunately in Pakistan, during 1999 to 2008 nine years of this period was dictatorship. In the starting period of dictatorship the institutes work efficiently, after that they follow the caution of the ruler who has its own interests. Moreover the democratic governments which have been established in the remaining period have the allegations of raging and influence of the international powers. The absence of true representation at the parliament does not fully motivate citizens towards payment of taxes in full sprit. The above situation is not the favorable for the economy. If real political stability prevails in the country for a long period it will promote the confidence of taxpayers. The results are matched with the studies of Ashraf and Sarwar (2016) and Gupta (2007).

Table 5: Long Run Estimates of Tax Buoyancy Models (Disaggregate)

Variables	Model 4	Model 5	Model 6	Model 7	Model 8
	Income Tax Buoyancy Model Dependent Variable: TBIT ARDL (1, 1, 1, 0, 1, 1, 1)	**Workers Welfare Tax Buoyancy Model** Dependent Variable: TBWWT ARDL(2, 1, 0, 1, 1, 1, 1)	**Customs Duty Buoyancy Model** Dependent Variable: TBCD ARDL(2, 0, 1, 0, 1, 1, 1)	**Federal Excise Duty Buoyancy Model** Dependent Variable: TBFED ARDL(1, 1, 0, 1, 1, 1, 1)	**Sales Tax Buoyancy Model** Dependent Variable: TBST ARDL(4, 0, 0, 0, 0, 0, 0)
GE	-1.5720 (0.0425)	-1.6827 (0.0296)	4.8504 (0.0001)	0.5214 (0.0651)	0.7964 (0.0364)
RQ	2.4522 (0.0278)	0.3243 (0.0545)	8.2666 (0.0001)	3.8324 (0.0175)	3.2071 (0.1015)
RL	0.8422 (0.0152)	1.1093 (0.1063)	1.0771 (0.0126)	2.2570 (0.0375)	1.0693 (0.1318)
VA	-1.8437 (0.0383)	-3.9784 (0.0018)	-4.0443 (0.0010)	-1.8647 (0.0840)	-10.2812 (0.0662)
CC	0.2952 (0.0373)	1.2731 (0.0130)	0.0450 (0.0862)	2.2586 (0.0187)	1.3670 (0.0488)
PS	-3.7406 (0.0212)	-0.8774 (0.2338)	-4.5615 (0.0001)	-2.3241 (0.1402)	-1.4210 (0.0408)
C	-3.1908 (0.0254)	3.1328 (0.0150)	2.0561 (0.0002)	-6.5401 (0.0094)	0.2969 (0.0828)
T	0.2287 (0.0138)	-0.3241 (0.0036)	------	0.2840 (0.0205)	0.3365 (0.1487)

In Table 5 we have five disaggregate models of tax buoyancies in which first model is income tax buoyancy model here Income Tax Buoyancy (TBIT), is dependent variable, second model is workers welfare tax buoyancy model here Workers Welfare Tax Buoyancy (TBWWT) is dependent variable, third model is customs duty buoyancy model here Customs Duty Buoyancy (TBCD) is dependent variable, forth model is federal excise duty buoyancy model here Federal Excise Duty Buoyancy (TBFED) is dependent variable and fifth model is sales tax buoyancy model here Sales Tax Buoyancy (TBST) is dependent variable. These models have the similar institutional variables which have been explained in Table 4.

Interestingly, it has detected that we have the same signs of explanatory variables with income tax buoyancy and workers welfare tax buoyancy as these variables have with direct tax buoyancy. Moreover we found the similar signs of institutional variables with federal excise duty buoyancy, customs duty buoyancy and sales tax buoyancy as these have with indirect tax buoyancy.

d) Error Correction Model

The long-run relationship of the variables has been exhibited in the detail. Now the short run variations of the variables would be inspected. Error correction model (ECM) is used to compute the short runs changes of the variables. The value of the coefficient of the Error Correction Model exhibits that how slowly or quickly, variable move towards the equilibrium path. The coefficient of ECM demonstrates the speed of adjustment towards the equilibrium in the dynamic model. If the value of ECM is with the negative sign, it describes the convergence in the short run dynamic model whereas the positive value of ECM shows the divergence in the short run dynamic model. In ECM the absolute value of the coefficient reveals the movement speed of the variables towards equilibrium. Tables 6 and 7 show the Error Correction results of Tax Buoyancy models.

Table 6 exhibited the values of the error correction terms of model 1, model 2 and model 3. The coefficient values ECM of model 1, model 2 and model 3 are 2.198, -1.053 and -3.298 respectively. The negative signs of error correction coefficients show that there is convergence trend towards the equilibrium. The results illustrate that, in model 1 the short run shock will be corrected in two years and approximately two months, in model 2 it will be corrected within one year and approximately half month and in model-3 short run shock will also be corrected in three years and approximately three months.

Table 6: Error Correction Results of Tax Buoyancy Models (Aggregate)

	Model 1	**Model 2**	**Model 3**
Variables	**Overall Tax Buoyancy Model** Dependent Variable: TBT ARDL (3, 1, 1, 1, 1, 1, 1)	**Direct Tax Buoyancy Model** Dependent Variable: TBD ARDL (1, 1, 1, 0, 1, 1, 1)	**Indirect Tax Buoyancy Model** Dependent Variable: TBINDT ARDL (3, 1, 1, 1, 1, 1, 1)
D (TBT(-1))	0.7227 (0.0763)	-----	-----
D (TBT(-2))	-0.1038 (0.2989)	-----	-----
D (TBINDT(-1))	-----	-----	1.5087 (0.0289)
D (TBINDT(-2))	-----	-----	0.3254 (0.0736)
D(GE)	1.3845 (0.0833)	-1.5143 (0.0438)	1.3882 (0.0824)

D(RQ)	1.4773 (0.0652)	1.5087 (0.0252)	2.5780 (0.0390)
D(RL)	0.3604 (0.1224)	0.9651 (0.0199)	0.2124 (0.2184)
D(VA)	-0.9705 (0.0936)	-0.0734 (0.8632)	-2.0960 (0.0478)
D(CC)	1.0933 (0.0527)	0.5850 (0.0781)	2.8942 (0.0200)
D(PS)	-0.8519 (0.1429)	-0.5973 (0.4983)	-0.4443 (0.3135)
D (@TREND)	-----	0.2401 (0.0061)	-----
Coint Eq(-1)	-2.1980 (0.0369)	-1.0531 (0.0042)	-3.2983 (0.0206)

Table 7 exhibits the values of the error correction terms of model 4, model 5, model 6, model 7 and model 8. The coefficient values ECM of model 4, model 5, model 6, model 7 and model 8 are -1.0677, -2.0632, -1.2978, -1.1068 and -1.1198 respectively. The negative signs of error correction coefficients show that there is convergence trend towards the equilibrium. The results show that in model 4 the short run shock will be corrected in one year and half month, in model 5 it will be corrected within two years and half month and in model 6 short run shocks will also be corrected in one year and approximately three months, in model 7 the error will be corrected in one year and one month and in model 8 the short run shock will also be corrected in one year and more than one month.

Table 7: Error Correction Results of Tax Buoyancy Models (Disaggregate)

Variables	Model 4	Model 5	Model 6	Model 7	Model 8
	Income Tax Buoyancy Model Dependent Variable: TBIT ARDL (1, 1, 1, 0, 1, 1, 1)	**Workers Welfare Tax Buoyancy Model** Dependent Variable: TBWWT ARDL(2, 1, 0, 1, 1, 1, 1)	**Customs Duty Buoyancy Model** Dependent Variable: TBCD ARDL(2, 0, 1, 0, 1, 1, 1)	**Federal Excise Duty Buoyancy Model** Dependent Variable: TBFED ARDL(1, 1, 0, 1, 1, 1, 1)	**Sales Tax Buoyancy Model** Dependent Variable: TBST ARDL(4, 0, 0, 0, 0, 0, 0)
D(TBWWF(-1))	-----	0.1699 (0.1840)	-----	-----	-----
D (TBCD(-1))	-----	-----	0.4295 (0.0002)	-----	-----
D (TBST(-1))	-----	-----	-----	-----	0.1004 (0.7014)
D (TBST(-2))	-----	-----	-----	-----	0.0549 (0.7126)
D (TBST(-3))	-----	-----	-----	-----	0.4339 (0.0161)
D(GE)	-1.7209 (0.0269)	-5.2481 (0.0253)	6.2950 (0.0004)	0.9865 0.5222)	0.8918 (0.4445)
D(RQ)	1.4376 (0.0276)	-0.6692 (0.5059)	5.9252 (0.0001)	4.2418 0.0536)	3.5914 0.0368)
D(RL)	0.8991 (0.0231)	0.6880 (0.4225)	1.3978 (0.0102)	0.3381 0.6098)	1.1975 (0.0729)
D(VA)	-0.1176 (0.7802)	-2.3183 (0.1090)	-0.0409 (0.9382)	-0.6235 0.5528)	-11.5132 0.0086)
D(CC)	0.7912 (0.0292)	1.7127 (0.0438)	2.7077 (0.0009)	0.2888 0.7260)	1.5308 (0.0204)

D(PS)	-0.4267 (0.6345)	-3.3833 (0.0934)	-14.3088 (0.0000)	-1.8238 0.3844)	-1.5913 (0.3002)
D (TREND)	0.2442 (0.0049)	-0.6688 (0.0032)	-----	0.3143 0.0246)	0.3768 (0.0435)
CointEq(-1)	-1.0677 (0.0033)	-2.0632 (0.0006)	-1.2978 (0.0000)	-1.1068 0.0081)	-1.1198 (0.0444)

Conclusion and Policy Implications

The current study attempts to inspect the institutional determinants of tax buoyancy in Pakistan. The study has been conducted for the period of 1996 to 2016. We have estimated the eight models to explore the association between various taxes and institutions variables. To find out the impact of institutions variables on tax buoyancies, aggregated and disaggregated analysis of different types of taxes have been conducted. Three models are associated with aggregate levels while others five models are related to disaggregate levels. Most of the institutional determinants have the positive relationship with tax buoyancies while the others are negatively related to tax buoyancies. On the basis of results, some important policy implications are suggested for policymakers and upcoming research.

- When public and civil servants formulate and implemented the policies without any political pressure, it signifies the effectiveness of that government. Unfortunately, political system is not reliable in our country. Government constructs the independent policies. But when these policies are tried to be amplified, political influence dominant and restrict these policies. So, there is also need to put and implemented independent polices related with taxation without taking any political pressure.
- Regulatory Quality positive sign assists that government should formulate strong tax policies and strictly implemented these policies in the countries. These policies will be helpful in revenue enhancing in the country. That's why we can increase the value of tax buoyancy coefficients.
- Rule of law has the positive relationship with tax buoyancies. It shows that there should be reliable and transparent changes in the law which should be beneficial for the whole nation. When there will be strict implementation of the law then taxpayer will encourage paying the taxes. By this overall tax revenue will increase.
- Control of corruption has the positive impact on tax buoyancy it reveals that when the government will exercise its authority to control the corruption in the form of bribery, cronyism, extortion, parochialism, graft, influence peddling and patronage then the taxpayer will be more assured about paying tax. Government tax revenue will be increased then tax buoyancy of Pakistan will also increase.
- The real political stability is essential for a country in the perspective of revenue enhancing. When there will be political stability then government machinery will work in proper way. Institutions of the country will follow the stable policy and then efficiently will implement these policies. Same as when tax administration will work under a stable government then their

efforts will be helpful for the increase in revenue. So, that's the way political stability may play a supportive role in the progression of the revenues for a country.

To sum up, the study stands as pioneer in terms of providing a detailed analysis on institutional determinants of tax buoyancy in Pakistan over a period of 1996 to 2016. Had the data been available for earlier years e.g. 1977 and onwards, the generalizability could have been further convincing, however this can be an agenda for future research.

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