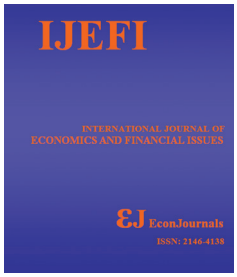

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Decentralized Tax Revenue, Institutional Complementarity and Economic Growth: A Time Series Analysis of Pakistan

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ABSTRACT

Fiscal decentralization is one of the major policy variables to attain economic efficiency. The present study examines the impact of decentralized taxes on the economic growth of Pakistan from 1976 to 2018. For examining the stationarity of variables, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) and Ng-Perron unit root Tests are used. Autoregressive Distributed Lag Approach (ARDL) is used for co-integration among the variables of the model. The results suggest that decentralized tax revenue i.e., income tax decentralization and sales tax revenue with political institutions have growth promoting impact on the economy of Pakistan. With strong institutions, provincial governments can give better results while transferring responsibility of collecting income tax from federal to provincial level.

Keywords: Stationarity, Income Tax and Sales Tax, Decentralization, Political Institutions, Economic Growth
JEL Classifications: H2, H77, O1

1. INTRODUCTION

Over the last three decades, most countries have restructured their institutional settings transferring fiscal sovereignty and political power towards sub-national governments. It is generally accepted that decentralization would enhance productivity, and eventually economic growth through detrimental channels (Filippetti and Sacchi, 2016). However, the association between decentralization and performance of the economy is quite multifaceted. Most of the socio-economic researchers have tried to separate it both empirically and theoretically. On the theoretical side, the links between fiscal federalism and performance of the economy is built on a number of direct and indirect channels. It may spurs saving, productive and allocative efficiency (Martínez-Vázquez and McNab, 2003). The empirical side, a large number of literature have examined this phenomena with mixed results (e.g., Davoodi and Zou, 1998; Thieben, 2003; Iimi, 2005; Bodman, 2011).

Most of the empirical work can be illuminated by the element that these contributions ignored the significance of political institutions (Enikolopov and Zhuravskaya, 2007). In fact, most studies determine the association between fiscal decentralization (FD) and performance of the economy by neglecting role of political institutions. While, some researchers consider political institutions for investigate the impact of decentralization and economic growth (Libman, 2010; Blanchard and Shleifer, 2000). The seminal work on fiscal federalism (Riker, 1964), later on recent workings (Lago-Penas et al., 2011; Filippetti and Sacchi, 2016).

Some studies conceptualize the interaction between fiscal decentralization and the dimensions of regional authority. The interaction term depends on the notion of institutional complementarity which is stated as the two institutions can be complementary if existence of one enhances the outcome of other (Rodden, 2004). The crux of the research is that the similar institutions existing in different countries may have different results relying on the presence of interdependent

institutions. Overall decentralization process involves several institutional dimensions are at work: such as taxing system (fiscal federalism), administrative power and competences, political legitimacy and political accountability may generate different outcomes. Some studies have tried to investigate the role of institutional complementarities concerning different dimensions of decentralization (Lockwood, 2006).

There takes place two levels of government in Pakistan: federal government and provincial government (Iqbal et al., 2013). Taxation system of Pakistan is centralized in nature. The fiscal decentralization mechanism has been made strengthened by the government of Pakistan time to time. After the Pakistan came into being, the revenue sharing mechanism established between federal and provincial governments. In this regard, well known awards by Neimeyer and Raisman in 1947 and 1952 respectively following the one unit Formula 1961. The National Finance Commission (NFC) was established under constitution of Pakistan 1973 to sharing revenue for divisible pool of resources. Seven NFC awards have been announced so far with irregular intervals. The development of 18th amendment in constitution and 7th NFC award with revised revenue sharing formula have shifted more resources to provinces with more fiscal autonomy. The federal government has provided ad hoc allocations and grants to provincial governments to cover their fiscal deficit.

The objective of this study is to fill the gap by examining the link between disaggregated tax decentralization and economic growth through diverse institutional arrangements in Pakistan for the period of 1976-2018. It explores to what extent the effect of income tax decentralization and sales tax decentralization on economic growth depends on the institutional structures (complementarity or substitution). There are limited empirical evidences to explore the effect of disaggregated tax decentralization and political institutions on the economic performance of Pakistan. The rest of the paper explore the literature review in section II, theoretical framework, methodology and sources of data discuss in section III, section IV discuss the empirical findings and conclusions in section V.

2. LITERATURE REVIEW

Fiscal federalism designates the configuration of transferal errands to different government levels to spawn the impact of fiscal decentralization (FD) on the development of economy. An extensive literature is available to promote the apparently positive impact of FD through financial autonomy of sub-national government. The greater financial and regional authority enhances distributive efficiency and production straight to economic growth.

Oates (1993) discussed that fiscal decentralization performed a vital role potentially in economic growth. A number of critical pre-requisites are required for local welfare regarding the conversion of prospective input to economic development. In turn, the local institutions had responsibility to contribute welfare depending on appropriate configuration of fiscal institutions.

Stegarescu (2005) developed the measure of political decentralization for twenty three OECD countries over the period 1965-2001. Different measures of revenue decentralization and autonomy of taxation were offered considering a current systematic framework for the OECD. The time series data on fiscal decentralization were applied by taking into justification of variations in the transfer of decision-making efficiencies. Common measures were generally working inclined to overemphasize the level of fiscal decentralization significantly. During the last thirty years, evidence provided growing fiscal decentralization among OECD countries.

Faridi (2011) determined that improved public sector efficiency was generated through FD which headed towards economic development. Time series data had been employed from 1972 through 2009 to examine the association of FD and economic development. The outcomes formed the conclusion that expenditure as well as revenue decentralization had positive and significant effect on economic growth of Pakistan.

Feld and Schenellenbach (2011) described wide-ranging studies on federalism and economic development. Along with the survey literature, they offered comprehensive report of their own findings in the field of fiscal federalism. The authors had distinguished the types of study concerning single country and cross countries with the application of wider institutional structure to entrench fiscal decentralization. The federalism might have influence on economic growth through the fundamental variation and transfers among different tiers of government as a comprehensive mechanism.

Ezcurra and Rodríguez-Pose (2012) pointed out that current literature had addressed the effect of decentralization on regional inequality and economic performance ignoring political decentralization. The authors filled this gap by examining the link among constructed index of political decentralization with two indicators of economic development: Variation of regional disparities and in GDP per capita. It was found to be insignificant association between political decentralization and development of the economy, irrespective of measures of political decentralization. While there found to be significant association between political decentralization and regional disparities.

Iqbal et al. (2013) investigated the link between FD and growth of Pakistan's economy by taking time series through 1972-2012. The outcomes came up with mixed results. The revenue decentralization had positive association with economic growth whereas expenditure decentralization had negatively influenced economic growth. The composite decentralization positively contributed to development. The complementarity of democratic institutions had been confirmed empirically.

Liberati and Sacchi (2013) examined the association between fiscal federalism and the local government size by taking unbalanced panel of OECD countries. Though many pragmatic studies stressed that local taxes limit the growth of local government expenditures and grants boost it. The study explored the problem that how tax decentralization would detain local government spending. The important outcome was that property taxes, typically constructed on a tax-separation pattern, appeared to favor lower tier of governments. As tax separation arrangements could be required

among government levels, therefore, tax decentralization was an essential condition for regulating the growth of local governments.

Gemmell et al. (2013) examined the achievement of efficiency through decentralization for the panel dataset of twenty three OECD countries through 1972 to 2005. The outcome of method of pooled mean group showed that decentralization had created more growth in the countries with higher degree of decentralization. The authors found that expenditure decentralization had growth retarding impact while revenue decentralization had growth promoting effect. Generally, the OECD countries were having more expenditure decentralization as compare to revenue decentralization. This phenomenon endorsed Oates' (1972) proposition of adjacent revenue and expenditure decentralization. The results recommended reduction of spending decentralization along with increasing own financing at local level to promote growth.

Ivanyna and Shah (2014) provided an exclusive data set on local governance for 182 countries. "It apprehended institutional measurements of fiscal, administrative and political autonomy of local governments. These measurements were then accumulated to construct a decentralization index and then used to adjust heterogeneity to formulate a government closeness index." This dataset measured government decision making at the local level as compared to previous studies mainly concentrated on sub-national level decision making.

Filippetti and Sacchi (2016) studied the association between fiscal decentralization and growth of the economy with diverse structures of institutions in twenty one countries of OECD through 1970-2010. The authors found that the pro-growth impact of FD was contingent analytically on the power of lower level governments. The tax decentralization led to increasing growth rate of economy when combined with higher level of political and administrative decentralization. The results indicated that tax decentralization was found to be favorable for growth if subnational taxes contributed generally from self-governing revenues like property taxes.

Ganaie et al. (2018) attempted to evaluate relationship between fiscal decentralization and regional growth for the period of 1981-2014 employing panel data set in India. Differentiated Ordinary Least Squares had been used to assess long-run coefficients. The study confirmed significant and positive association between expenditures decentralization and regional development and negative relationship between revenue decentralization and state domestic product. Furthermore, at state level, the average of expenditure and revenue decentralization index had been used. The combined decentralization measure had significant and positive impact on state domestic product. It illustrated that national level government said to be more efficient in revenue collection and state level government for expenditures. In a broader sense, this relationship could be developed with complex mechanism depending on subnational government autonomy of raising revenue and spending pattern. In general, though, heavy public spending by the states had established infrastructural base but low level of institutional quality remained obstacle in the way of raising more revenue.

The literature exhibited that a lot of work on decentralization was under taken to determine the association of fiscal decentralization and economic growth of developed countries. Most importantly, the studies with reference to Pakistan were addressing the direct impact of fiscal decentralization, the only dimension, on performance of the economy (Raza and Hina, 2016, Iqbal et al., 2013, Khattak et al. 2010 and Malik et al., 2007). Consequently, the present study will be an additional view of disaggregated tax decentralization in the presence of institutional settings and would be an effort to find the link between decentralization and economic performance of developing country such as Pakistan.

3. THEORETICAL FRAMEWORK

FD deliberates the transfer responsibilities of revenue generation and government expenditures from federal to lower tiers of government. Davoodi and Zou (1998) used growth model of endogenous theory to examine the link between decentralization and development of the economy. Generally, ordinary least square (OLS) estimation has been employed to examine decentralization impact on economic development in different studies (Thieben, 2003; Lin and Liu, 2000). The major problem in the existing empirical studies is endogeneity due to small sample size. This problem is addressed by Iimi (2005) by considering instrumental variable technique.

Federal and provincial governments are two levels for the execution of public spending in Pakistan. The general government expenditures are the aggregate of federal and provincial spending. Iimi (2005) had used the institutions with decentralization for economic development.

Rodríguez-Pose and Kroijir (2009) formed regression model by following Woller and Phillips (1998) which was originally developed by Levine and Renelt (1992). Simple form of the model in this study is as under:

$$Yt=f\,(TDt, PFt, Xit) \quad (1)$$

Where
Y_t is the measure of GDP,
TD is the Tax decentralization measures,
PF denotes political freedom,
X represents set of control$_{variables}$, and

t=1,2,…N. The control variables are extensively used in the literature of growth like Mankiw et al. (1992), Barro and Lee (1996).

In the equation (1), the proxy of institutions is merged as political freedom (PF). The rationale behind incorporating PF is to find whether it is complement or substitute?

The model of aggregated and disaggregated tax revenue decentralization for Pakistan develops as:

$$Y_t=\beta_0+\beta_1\,ITD_t+\beta_2\,PF_t+\beta_3\,ITD_t\times PF_t+\beta_4\,LF_t+\beta_5\,GFCF_t+\beta_6\,AID_t+\beta_7\,PD_t+\gamma_t \quad (2)$$

$$Y_t=\beta_0+\beta_1 STD_t+\beta_2 PF_t+\beta_3 STD_t\times PF_t+\beta_4 LF_t +\beta_5 GFCF_t+\beta_6 AID_t+\beta_7 PD_t+\beta_8 PGR_t+\gamma_t \quad (3)$$

Where as
ITD=Income tax decentralization,
ITD×PF=Interaction term of income tax decentralization and political freedom,
STD=Sales tax decentralization,
STD×PF=Interaction term of sales tax decentralization and political freedom,
LF=Measure of total labor force,
GFCF=Gross fixed capital formation,
AID=Foreign aid.
PD=Political decentralization,
PGR=Population Growth rate.

3.1. The ARDL Model to Cointegration

The long run relationship between FD and GDP per capita (Log) will be addressed by auto-regressive distributive lag (ARDL) approach after defining problem of unit root. This approach is apposite for lesser set of data with mixed order of integration (Pesaran et al., 2001). For projected F-statistic value will be ranged out the upper critical bound, the long run association between predictors and outcome. The estimation of long run association and long run coefficients will be made with the help of equation defined below:

$$\Delta Y_t = \delta_0 + \delta_1 Y_{t-1} + \delta_2 Dec_{it-1} + \delta_3 PF_{t-1} + \delta_4 X_{it-1} +\sum_{p=1}^{k} \delta_p \Delta Y_{it-p} + \sum_{q=0}^{k} \varphi_q \Delta PF_{t-q} + \sum_{j=0}^{k} \varphi_j \Delta X_{it-j} + \varepsilon_{it} \quad (4)$$

Where the symbol Δ displays change in variables.

Vector auto regression (VAR) estimates are not steady when it is pragmatic on the set of data converted into first difference (Engle and Granger, 1987). Consequently; for efficient but significant estimates, the error term of first lagged period should be incorporated in the ARDL equation. Hence the modified Vector Error Correction Model (VECM) is presented below:

$$\Delta Y_t = a_0 + \sum_{k=1}^{p} \beta_k \Delta Y_{it-k} + \sum_{j=0}^{p} \gamma_j \Delta PF_{t-j} + \sum_{q=0}^{p} \delta_q \Delta X_{it-q} + \theta ECT_{t-1} + \varepsilon_{it} \quad (5)$$

3.2. Construction and Description of Variables

3.2.1. Income tax decentralization

It is measured by portion of provincial government's income tax pool on tax revenues of general government.

$$ITD=PITR/(PITR+FITR)$$

Where ITD, PITR and FITR are "income tax decentralization," "provincial income tax revenue" and "federal income tax revenue," respectively. The data is collected from various issues of Pakistan Statistical Year Book.

3.2.2. Sales tax decentralization

It is measured by portion of provincial governments own sales tax pool on general government tax revenues.

$$STD=PSTR/ (PSTR+FSTR).$$

Where STD, PSTR and FSTR are "sales tax decentralization," "provincial sales tax revenue" and "federal sales tax revenue," respectively. The data is collected from various issues of Pakistan Statistical Year Book. The graph below shows comparison of income tax decentralization (ITD) and sales tax decentralization (STD). There has been more decentralization in income tax revenue as compare to sales tax revenue from 1972 to 1999. For the last 15 years, sales tax decentralization is greater than income tax decentralization. There is gradual increase in STD while ITD has frequent ups and downs.

3.2.3. Political freedom

The index of political freedom has been developed by averaging political rights and civil liberty. This index is used as proxy for institutions. The value of index ranges from 0 to 7, where 0 means full freedom and 7 no freedom. A number of studies investigated political rights, civil liberty and economic growth (Aixalá and Fabro, 2009). Freedom house is the source of data.

3.2.4. Human capital

Total labor force is used as proxy of human capital. The source of data is economic survey of Pakistan (various issues). Due to non-availability of labor force data from 2016 to onward, data is taken from 1976 to 2015.

3.2.5. Physical capital

The physical capital is considered to be an important factor of economic growth. The production function employs both labor and capital. A positive association is established between physical capital and economic growth (Jan et al., 2012). The log of gross fixed capital formation is used as proxy of physical capital. The data source is world development indicators.

3.2.6. Foreign aid

Foreign aid is considered to be stimulus for economic growth conditioned with good fiscal, monetary and trade policies for less developed nations (Burnside and Dollar, 2000). Net official development assistance and official aid received is taken as proxy of foreign aid and data is collected from WDI.

3.2.7. Political decentralization

It is measured on the basis of national and local elections (Schneider, 2003). The index is constructed by assigning values of 0 to 6. It takes the value 1 if national assembly members take oath in a year, 0.25 for each provincial assembly members. It takes value 1 if local body members take oath in each province. The maximum value is 6 in case of national and local body members take oath in a year. Minimum value of 0 in case of no national/provincial assembly neither local body representatives.

3.2.8. Population growth rate

Population growth rate is taken as control variable and data is taken from world development indicators. Population growth may hardly be ignored to study economic growth (Sala-i-Martin, 1997).

4. EMPIRICAL RESULTS AND DISCUSSION

In this study, the dependent variable is Log of GDP per capita. The descriptive statistics shows that average value of log GDP per capita is 2.6878. All the variables are in log form excluding decentralization ratios (Table 1).

4.1. Kwiatkowski-Phillips-Schmidt-Shin (KPSS) Unit Root Test

The test was originally established by Kwiatkowski et al. (1992) in accordance with asymptotic results (Table 2). The null hypothesis states that there exists stationarity in the process unlike other tests. If the value of LM-Stat is greater than critical value, the null hypothesis will be rejected. Normally this test gives more robust results for small number of observations and considers best unit root test for time series data.

4.2. Ng-Perron Unit Root Test

The test was designed by Ng and Perron (2001) on the basis of Monte Carlo simulations. The simulations provide information that neglecting the residual dynamics can have impact on tests performance. Akaike's information criterion (AIC) and Schwarz's criterion (SC) are mostly used as Augmented Dicky-Fuller (ADF) test but these criteria apt to include lags in AR equations. The null hypothesis states that there exists non-stationarity in the process. The null hypothesis will be rejected if MZa value is greater than critical value. This test also gives more robust results as compare to ADF test.

In order to select the best performing ARDL-model, the significance of the resulting ARDL-VECM parameters, the Schwarz information and Akaike information Criterion is used in the study. The Schwarz information and Akaike information Criterion lag specifications for model (1) and (2) are shown in Table 3. For these two models, the optimal numbers of lags for each of the variables are ARDL (1, 1, 2, 1, 0, 1, 2, 0) and ARDL (1, 1, 0, 0, 0, 2, 2, 0, 2) respectively. The empirical result shows that linear combinations exist in the concerned variables over the longer period of time.

The results of disaggregated tax decentralization i.e., Income tax decentralization are reported in Table 4. The evidence can be seen that adjusted coefficient of income tax decentralization is positive and significant at 1% level. The positive sign shows it stimulates to economic growth of Pakistan. The results show that adjusted coefficient of political freedom has positive and significant impact on economic growth. The positive sign of interaction term shows that income tax decentralization and political freedom are complement to each other. It means more income tax decentralization is required with political institution to promote economic growth. The results of institutional complementarity are in line with the previous literature that FD and economic growth are complement to each other (Iqbal et al., 2013).

Table 1: Descriptive statistics

Variables	Obs.	Max	Min	Mean	Median	Std. dev.
Tax decentralization	43	0.381111	0.177263	0.270688	0.284403	0.059667
Income tax decentralization	43	0.140413	0.042440	0.097084	0.098771	0.022781
Sales tax decentralization	43	0.144865	0.040183	0.077546	0.077767	0.028322
GDP per capita	43	3.120756	2.278345	2.687837	2.651236	0.226444
Political freedom	43	6.000000	3.000000	4.794872	4.500000	0.824924
Labor force	43	1.780605	1.333246	1.560375	1.533772	0.134740
Gross fixed capital formation	43	10.51286	9.361728	9.986509	9.971117	0.322629
Foreign aid	43	9.557736	8.789426	9.097433	9.030199	0.214161
Political decentralization	43	1.0000	0.0000	0.472868	0.33333	0.318998
Population growth rate	43	3.416965	1.685114	2.602846	2.645425	0.602094

Table 2: Unit root test results

Variables	KPSS		Ng-Perron	
	LM-stat. at level	LM-Stat. at 1st difference	MZa at level	MZa at 1st difference
GDPPC	0.792121	0.076395*	1.64746	−7.72015***
ITD	0.149170*	0.092773	−8.52132**	−20.1555*
STD	0.799717	0.500000**	−3.15532	−19.3236*
PF	0.082986*	0.083891	−7.01124***	−20.4153*
TDPF	0.583556	0.270225*	−7.43586***	−19.8038*
ITDPF	0.110888*	0.068159	−8.31431**	−20.4488*
STDPF	0.862571	0.500000**	−4.05488	−20.1366*
LF	0.823920	0.101896*	−0.16290	−20.4145*
GFCF	0.801892	0.132047*	1.22268	−7.94004***
AID	0.753483	0.245095*	0.73543	−39.5224*
PD	0.088557*	0.114087*	−10.6803**	−20.5000*
PGR	0.670549**	0.233724*	−463.131*	−6.42481***

*, **, *** show stationarity at 1%, 5% and 10% respectively

The control variable Labor force has positive and significant impact on economic growth at 1% level. The physical capital is significant at 1% with the coefficient of 0.294707 and positive sign shows that it is growth promoting. Political decentralization is significant at 5% and negative sign shows it is growth retarding. The results are in line with the previous studies (Rodríguez-Pose and Ezcurra, 2010).

In the short run, income tax decentralization and political institutions have insignificant impact on economic growth. First lag of interaction term of ITD and PF shows that both are substitutes in short run. The controlled variables labor force, capital formation, foreign aid and political decentralization have significant effect on economic growth. The long run and stable equilibrium can be attained through speed of adjustment by introducing first period lagged term of ECM and Bannerjee et al. (1998) suggested the convergence towards long run equilibrium with negative and significant coefficient of ECM (−1). The reported results in Table 4 exhibits that the coefficient of ECM (−1) is negative and significant and confirms convergence hypothesis. The speed of adjustment to achieve long run equilibrium is almost 72%.

Table 3: Long-run results, ARDL (1, 1, 2, 1, 0, 1, 2, 0)

Dependent variable=GDPPC			
Variable	**Coefficient**	**t-statistic**	**P-value**
ITD	−2.983447 (1.31573*)	−2.296033	0.0303
PF	−0.064148 (0.02673*)	−2.528686	0.0181
ITDPF	1.011571	3.759160	0.0009
LF	0.629880	5.480922	0.0000
GFCF	0.294707	5.674296	0.0000
AID	0.299865	5.140541	0.0000
PD	−0.004188	−2.448732	0.0217

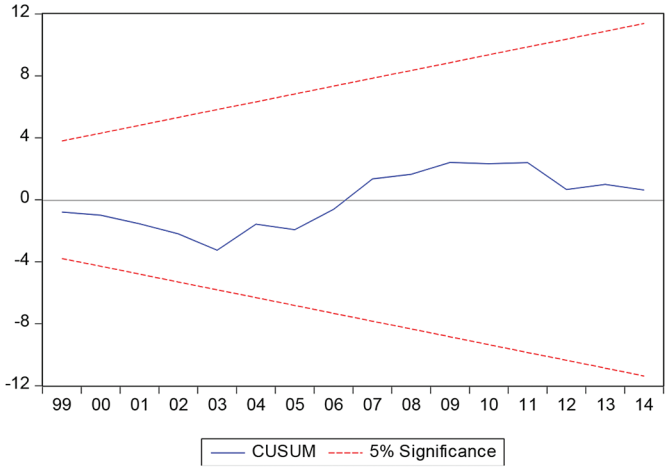
Table 4: Short-run results

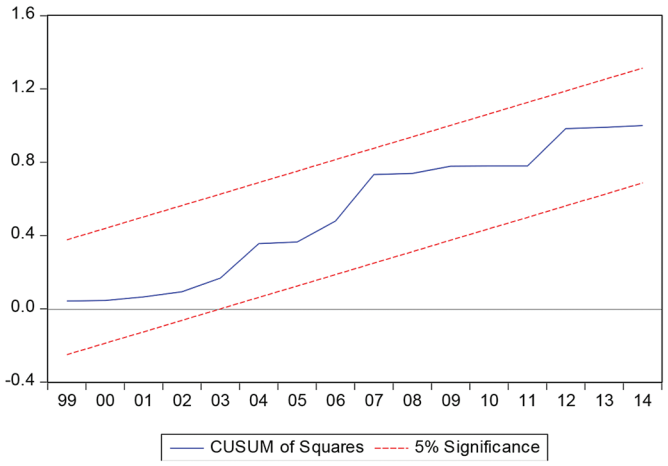
Dependent variable=dGDPPC			
Variable	**Coefficient**	**t-statistic**	**P-value**
dITD	−0.768129	−0.883102	0.3856
dITDPF	0.211423	1.146502	0.2624
dITDPF(−1)	−0.167823	−4.728544	0.0001
dPF	−0.015682	−0.911779	0.3706
dLF	0.455042	4.645416	0.0001
dGFCF	0.796927	10.133597	0.0000
dAID	0.115993	4.825447	0.0001
dAID(−1)	−0.043626	−2.119905	0.0441
dPD	−0.003025	−2.336281	0.0278
Ecm (−1)	−0.722426	−6.554632	0.0000

Table 5: Long run results, ARDL (1, 1, 0, 0, 0, 2, 2, 0, 2)

Dependent variable=GDPPC			
Variable	**Coefficient**	**t-statistic**	**P-value**
STD	−6.280725 (−1.0392*)	−2.161027	0.0418
PF	−0.050187 (0.070928*)	−1.445302	0.1625
STDPF	1.164783	1.960968	0.0627
LF	0.645332	2.463727	0.0220
GFCF	0.410448	5.280128	0.0000
AID	0.509161	4.862368	0.0001
PD	−0.009073	−2.636587	0.0151
PGR	0.107386	3.640676	0.0014

The equations structural stability is detected through cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) while the systematic changes in the regression coefficients are identified through diagnostics. The CUSUM and CUSUMQ detect the quick changes in the underlying regression coefficients. The figures show that the graphs lie between 5 present confidence interval bands. This confirms the stability of model to be estimated over time.





The results of second model of disaggregated tax decentralization i.e., Sales tax decentralization are reported in Table 5. The evidence can be seen that adjusted coefficient of sales tax decentralization (STD) is significant at 10% level and the negative

Table 6: Short run results

Dependent variable=GDPPC			
Variable	**Coefficient**	**t-statistic**	**P-value**
dSTD	−2.726206	−2.316248	0.0302
dPF	−0.025638	−1.633486	0.1166
dSTDPF	0.595025	2.291064	0.0319
dLF	0.329666	1.921146	0.0678
dGFCF	0.568436	9.320301	0.0000
dGFCF(−1)	−0.191220	−2.942121	0.0075
dAID	0.085820	4.190100	0.0004
dAID(−1)	−0.104269	−4.663971	0.0001
dPD	−0.004635	−3.007723	0.0065
dPGR	0.140370	3.410026	0.0025
dPGR(−1)	0.057147	1.702463	0.1028
Ecm(−1)	−0.510847	−4.719675	0.0001

Table 7: Diagnostic checking for ARDL

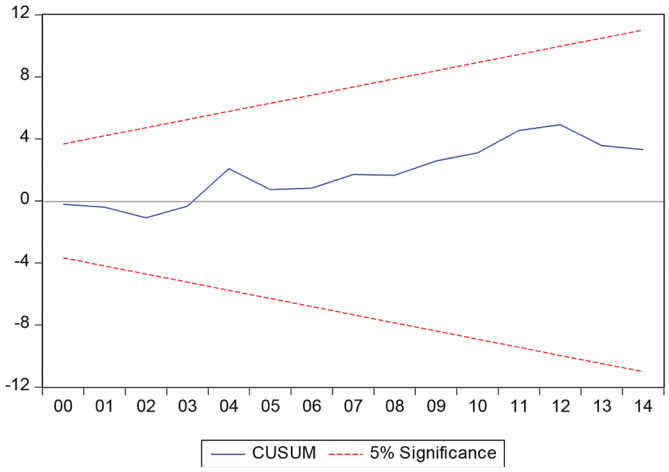
Diagnostic test	Model 1	Model 2
	ARDL (1, 1, 2, 1, 0, 1, 2, 0)	ARDL (1, 1, 0, 0, 0, 2, 2, 0, 2)
Jarque-Bera	1.31077 (0.51924)	0.248149 (0.883314)
LM test	0.646475 (0.5331)	2.439330 (0.1127)
Bounds test	F= 5.309303	F=5.826913
	L=2.32, U=3.5	L=2.32, U=3.5
Breusch-pagan-godfrey heteroskedasticity	1.000984 (0.4837)	1.043297 (0.4543)
Ramsey reset test	1.339743 (0.1929)	0.061839 (0.9513)

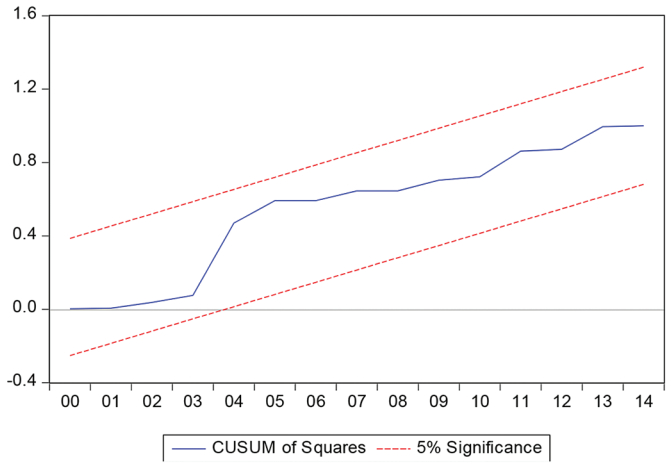
sign shows that it has growth retarding impact. The results show that adjusted coefficient of political freedom has positive but insignificant impact on economic growth. The positive sign of interaction term shows that sales tax decentralization and political freedom are complement to each other. It means more sales tax decentralization is required with political institutions to promote economic growth.

The control variable Labor force has positive and significant impact on economic growth at 5% level. The physical capital is significant at 1% with the coefficient of 0.410448 and positive sign shows that it is growth promoting. Political decentralization is significant at 5% and negative sign shows it is growth retarding. The results are in line with the previous studies (Rodríguez-Pose and Ezcurra, 2010). Due to model misspecification, we have to include another related variable of population growth rate in third model. Population growth rate is positively and significantly contributing to economic growth. The results are in line with previous studies that population growth rate has positive impact on economic development of Pakistan (Ali et al. 2013).

In the short run, sales tax decentralization has significant but political institutions have insignificant impact on economic growth. Sales tax decentralization and political institutions are complement to each other in short run. The controlled variables labor force, capital formation, foreign aid, political decentralization and population growth rate have significant effect on economic growth. The long run and stable equilibrium can be attained through speed of adjustment by introducing first period lagged term of ECM and Bannerjee et al. (1998) suggested the convergence towards long run equilibrium with negative and significant coefficient of ECM (−1). The reported results in Table 6 exhibits that the coefficient of ECM (−1) is negative and significant and confirms convergence hypothesis. The speed of adjustment to achieve long run equilibrium is almost 51%.

The equations structural stability is detected through cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) while the systematic changes in the regression coefficients are identified through diagnostics. The CUSUM and CUSUMQ detect the quick changes in the underlying regression coefficients. The figures show that the graphs lie between 5 present confidence interval bands. This confirms the stability of model to be estimated over time.





The results of different diagnostic tests are reported in Table 7. Jarque-Bera test confirms the normality of the data for models 1 and 2. Long run cointegration is specified through Bound tests for all models. Similarly there is no problem of multicollinearity and hetroskedasticity through LM test and Breusch-Pagan-Godfrey tests respectively and the models are correctly specified.

5. CONCLUSION

This study empirically investigates the disaggregated tax decentralization and political institutions implications for economic growth with others orderly variables. We employ time series data period 1976 to 2018 for Pakistan using ARDL co-integration technique for long run. ECM model is used for short run dynamics.

The empirical results illustrate that income tax decentralization is growth promoting in Pakistan. The tax revenue generation responsibilities through decentralization process create positive externalities that raise the output of the economy. The tax decentralization empowers the provinces subject to own resources to achieve long run economic growth. The political institutions have positive association with economic growth. The positive sign of interaction term of tax decentralization and political institutions shows these are complement to each other. The controlled variables labor force; capital formation and foreign aid have positive association with long run economic growth. The political decentralization also contributes positively to the per capita income growth rate of Pakistan. On the other hand sales tax decentralization has negative and significant impact on economic growth of Pakistan. The political institutions have positive but insignificant effect on economic growth. The interaction term illustrates that sales tax decentralization and political institutions are complement to each other.

The impact of income tax decentralization on economic growth is positive that has an important implication for the design of efficient fiscal decentralization mechanism in Pakistan. The restructuring government process is in initial phase beginning with the channel of 18th constitution amendment and 7th NFC award. The benefits of tax decentralization can be materialized when provinces have ample accountability, fiscal autonomy and adequate capability to respond to local requirements. The government have taken initiatives to provide more autonomy to provinces with bulk resource allocation ultimately to get long run economic growth for Pakistan.

REFERENCES

Aixalá, J., Fabro, G. (2009), Economic freedom, civil liberties, political rights and growth: A causality analysis. Spanish Economic Review, 11(3), 165-178.

Ali, S., Ali, A., Amin, A. (2013), The impact of population growth on economic development in Pakistan. Middle-East Journal of Scientific Research, 18(4), 483-491.

Bannerjee, A., Dolado, J., Mestre, R. (1998), Error-correction mechanism test for cointegration in single equation framework. Journal of Time Series Analysis, 19(3), 267-283.

Barro, R.J., Lee, J.W. (1996), International measures of schooling years and schooling quality. American Economic Review, 86(2), 218-223.

Blanchard, O., Shleifer, A. (2000), Federalism with and without Political Centralization: China versus Russia. Vol. 48. IMF Staff Papers, Palgrave Macmillan, p171-179.

Bodman, P. (2011), Fiscal decentralization and economic growth in the OECD. Applied Economics, 43(23), 3021-3035.

Burnside, C., Dollar, D. (2000), Aid, policies, and growth. American Economic Review, 90(4), 847-868.

Davoodi, H., Zou, H. (1998), Fiscal decentralisation and economic growth: A cross-country study. Journal of Urban Economics, 43(2), 224-257.

Engle, R.F., Granger, C.W.J. (1987), Co-integration and error representation: Estimation and testing. Econometrica, 55(2), 251-276.

Enikolopov, R., Zhuravskaya, E. (2007), Decentralization and political institutions. Journal of Public Economics, 91(11), 2261-2290.

Ezcurra, R., Rodríguez-Pose, A. (2012), Political decentralization, economic growth and regional disparities in the OECD. Regional Studies, 47(3), 388-401.

Faridi, M.Z. (2011), Contribution of fiscal decentralisation to economic growth: Evidence from Pakistan. Pakistan Journal of Social Science, 31(1), 1-13.

Feld, P., Schenellenbach, J. (2011), Fiscal federalism and long-run macroeconomic performance: A survey of recent research. Environment and Planning C: Government and Policy, 29(3), 224-243.

Filippetti, A., Sacchi, A. (2016), Decentralization and economic growth reconsidered: The role of regional authority. Environment and Planning C: Government and Policy, 34(8), 1793-1824.

Ganaie, A.A., Bhat, S.A., Kamaiah, B., Khan, N.A. (2018), Fiscal decentralization and economic growth: Evidence from Indian States. South Asian Journal of Macroeconomics and Public Finance, 7(1), 83-108.

Gemmell, N., Kneller, R., Sanz, I. (2013), Fiscal decentralization and economic growth: Spending versus revenue decentralization. Economic Inquiry, 51(4), 1915-1931.

Iimi, A. (2005), Decentralisation and economic growth revisited: An empirical note. Journal of Urban Economics, 57(3), 449-461.

Iqbal, N., Din, M., Ghani, E. (2013), FD and Economic Growth: Role of Democratic Institutions. PIDE Working Paper, No. 89.

Ivanyna, M., Shah, A. (2014), How close is your government to its people? World wide indicators on localization and decentralization. Economics the Open Access, Open-Assessment E-Journal, 8(1), 1-61.

Jan, S.A., Chani, M.I., Pervaiz, Z., Chaudhary, A.R. (2012), Physical infrastructure and economic development in Pakistan. Middle-East Journal of Scientific Research, 11(2), 216-220.

Khattak, N.R., Ahmad, I., Khan, J. (2010), Fiscal decentralization in Pakistan. The Pakistan Development Review, 49(4), 419-436.

Kwiatkowski, D., Phillips, P.C., Schmidt, P., Shin, Y. (1992), Testing the null hypothesis of stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root? Journal of Econometrics, 54(1-3), 159-178.

Lago-Penas, I, Lago-Penas, S., Martinez-Vazquez, J. (2011), Guest editorial: The political and economic consequences of decentralization. Environment and Planning C: Government and Policy, 29(2), 197-203.

Levine, R., Renelt, D. (1992), A sensitivity analysis of cross-country growth regressions. American Economic Review, 82(4), 942-963.

Liberati, P., Sacchi, A. (2013), Tax decentralization and local government size. Public Choice, 157(1-2), 183-205.

Libman, A. (2010), Constitutions, regulations, and taxes: Contradictions of different aspects of decentralization. Journal of Comparative Economics, 38(4), 395-418.

Lin, J.Y., Liu, Z. (2000), Fiscal decentralisation and economic growth in China. Economic Development and Cultural Change, 49(1), 1-21.

Lockwood, B. (2006), The Political Economy of Decentralization. Cheltenham, United Kingdom: Edward Elgar Publishing.

Malik, S., Hassan, M., Hussain, S. (2007). Fiscal decentralisation and economic growth in Pakistan. The Pakistan Development Review, 45(4), 845-854.

Mankiw, N.G., Romer, D., Weil, D.N. (1992), A contribution to the empirics of economic growth. Quarterly Journal of Economics, 107(2), 407-437.

Martínez-Vázquez, J., McNab, R.M. (2003), Fiscal decentralisation and economic growth. World Development, 31(9), 1597-1616.

Ng, S., Perron, P. (2001), Lag length selection and the construction of unit root tests with good size and power. Econometrica, 69(6), 1519-1554.

Oates, W.E. (1972), Fiscal Federalism. New York: Harcourt Brace Jovanovich.

Oates, W.E. (1993), Fiscal decentralisation and economic development.

National Tax Journal, 46(2), 237-243.
Pesaran, M.H., Shin, Y., Smith, R.J. (2001), Bound testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289-326.
Raza, Q., Hina, H. (2016), Fiscal decentralisation, provincial economic growth and spillover effects: A spatial panel data analysis. The Pakistan Development Review, Pakistan Institute of Development Economics, 55(4), 743-760.
Riker, W. (1964), Federalism: Origins, Operation, Significance. Boston, MA: Little, Brown and Co.
Rodden, J. (2004), Comparative federalism and decentralization: On meaning and measurement. Comparative Politics, 36(4), 481-500.
Rodríguez-Pose, A., Ezcurra, R. (2010), Is fiscal decentralization harmful for economic growth? Evidence from the OECD countries? Journal of Economic Geography, 11(4), 619-643.
Rodríguez-Pose, A., Krøijer, A. (2009), FD and economic growth in Central and Eastern Europe. Growth and Change, 40(3), 387-417.
Sala-i-Martin, X. (1997), I just ran two million regressions. American Economic Review, 87(2), 178-183.
Schneider, A. (2003), Decentralization: Conceptualization and measurement, Studies in Comparative International Development, 38(3), 32-56.
Stegarescu, D. (2005), Public sector decentralization: Measurement concepts and recent international trends. Fiscal Studies, 26(3), 301-333.
Thieben, U. (2003), Fiscal decentralisation and economic growth in high-income OECD countries. Fiscal Studies, 24(3), 237-274.
Woller, G.M., Phillips, K. (1998), Fiscal decentralisation and IDC economic growth: An empirical investigation. The Journal of Development Studies, 34(4), 139-148.