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FISCAL POLICY AND SECTORAL GROWTH IN PAKISTAN

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ABSTRACT
Main objective to write this paper was to find out impact of fiscal policy on sectoral growth in Pakistan. Annual data for period 1980-2021 was used from world development indicators of World Bank (2021). ADF and PP unit root test were employed to check the stationarity of all variables. ADRL bound testing was considered as estimation technique because some variables were stationary at level and some were at first difference while no variable was stationary at second difference. Three models were estimated where dependent variables were agriculture, industry and services while independent variables were GDP per capita, total debt services, external balance on goods and services, and gross national expenditures. These most repeated variables are selected from existing empirical literature on impact of fiscal policy over economic growth. All variables related to fiscal policy affected agricultural sector positively and insignificantly except total debt services that has positive and significant impact on agricultural sector. GDP per capita, inflation and total debt services have positive and significant effect on industrial sector while this sector was affected negatively and significantly by external balance of goods and services and gross national expenditures. All explanatory variables showed negative and significant association with services sector except total debt services that has positive and significant relationship with services sector. The error correction terms for agricultural, industrial and services sectors respectively are negative (-3.185, -1.674 and -2.110 respectively) indicated that the system was stable and converged to the equilibrium track following a disturbance. All diagnostic and stability tests satisfied the basic requirements of model suitability.
Keywords: Fiscal Policy, GDP, Agriculture, Industry, Services, Inflation.

INTRODUCTION

John Maynard Keynes (1883-1946) gave the idea of fiscal policy where he argued that any government can control the business cycle condition through their spending and earning policies. He also argued that economic recession is due to lack of business investment and consumer spending components of aggregate demand. He believed economic output can be regulated and business cycle stabilizes too by adjusting tax policies and spending. Taxes and spending are two main tools of fiscal policy. There are three types of fiscal policy, expansionary, contractionary and neutral fiscal policy. Expansionary fiscal policy is used when economy is in recession. By decreasing tax rates, government may employ fiscal policy to fuel economic growth and increase aggregate demand. It is used to kick-start an economy during a recession through this aggregate demand that boosts lead to increase in output and employment of economy. Expansionary fiscal policy during recessions can increase government spending more than its tax collection to increase level of economic activity. In expansionary fiscal policy there is raise in interest rates accelerating inflation and growing trade deficit. These are side effects of expansionary fiscal policy to partly offset its growing effect. In case of depression (inflation) government may employ contractionary fiscal policy to increase tax rates that decreases aggregate demand. Contractionary fiscal policy is used to pay down debt of government. There is rise in tax rates or cuts in government spending or both. This is best in economic booms to check on inflation and slows down the strong economic

growth pace. When economy is in the equilibrium, state neutral fiscal policy is undertaken. In this instance, tax revenue and government spending are equal which cause neutral effect on level of economic activity. Fiscal policy has three basic functions stability, allocation and distribution. To achieve main macroeconomic objectives, stabilization function is used such as price stability, sustainable external balance and economic growth. Allocation function is process of sharing total resources among public and private goods and distribution function ensures appropriate distribution of wealth and income (Simsek, 2010).

Pakistan being a developing country depends on agriculture, manufacturing industry and services sectors. The growth rates of the Pakistan's economy was relatively higher in decades of 1960's and 1980's but became worst in 1990's not only due to poor economic performance but also political instability, poor governance, debt burden and imposed sanction relevant to nuclear propagation on Pakistan (Madni & Choudhry 2017). The first ever deficit recorded in 1965-66 due to a pre-Bangladesh war because of more defence spending. Again, next deficit happened in 1971-72 war year. In 1975-76 to 1990-91 deficit was 9% for five yearly publications published in 2010. The sixth largest deficit scored by PTI government that is 8.9%.

The purpose of tax system is to achieve objectives of fiscal policy in the most efficient way for government expenditure not just to raise in necessary funds, but also contribute to economic stabilization, resource allocation, income redistribution and economic growth (Stoilova & Patonov, 2020). The predictions from conventional economic theory, taxation causes impacts and distortions negatively on economic growth, but some studies argue that the personal and corporative income taxes are most detrimental to the growth while environment, property and consumption taxes are less harmful (OCED, 2008).

Objective of the study was to check the impact of fiscal policy on sectoral growth in Pakistan. There was no study found on impact of fiscal policy on sectoral growth in Pakistan to the existing literature.

REVIEW OF LITERATURE

Agu et. al., (2015) emphasized on various public expenditure components on economic growth and fiscal policy in case of Nigeria, using OLS and augmented dickey fuller unit root test. They revealed recurrent expenditure is much higher than total government expenditure evidencing poor growth in country economy. Hence there is some positive correlation evidence between the government expenditure on economic growth and economic services.

Al-Abri et. al., (2018) investigated government spending impact in remitting country on GDP using VAR estimation technique for 1980-2015. They showed that outflows of remittance have weak effect on government spending if at all which showed insignificant impact on the GDP.

Basit et. al., (2022) applied autoregressive distributed lag (ADRL), augmented dickey fuller (ADF) and unit root test for 1971-2018 to investigate economic growth and factors output in Pakistan. They obtained formation of gross fixed capital, direct and indirect taxes and government expenditure have significant positive impact in Pakistan on economic growth. In Pakistan it is suggested that expansionary fiscal policy is very effective to the surge economic growth.

Burgert et. al., (2021) applied DSGE model for period 1999-2018 to check in a monetary union of fiscal policy with downward rigidity of nominal wage. They identified reduction in contribution of social security strengthen international competitiveness and domestic demand and provides growth effect more persistent and enhances the fiscal position.

Cheema (2015) investigated fiscal adjustment impact on growth in transition economies by applying endogenous growth model and fixed effect model for period 1992-2001. They obtained non-Keynesian effects of the fiscal policy during the adjustment is creative destruction in the transition economies inherit underutilized capacity and inefficiencies.

Comlan (2017) studied economic growth and fiscal policy in case of West African countries. By panel data of 1980-2014 through endogenous growth model concluded that in WAEMU zone there is no contribution of more open trade to boost economic growth.

Garry and Valdivia (2017) used SVAR model, co-integration test and dynamic stochastic equilibrium model to Analyzed contribution of the public expenditure to fiscal multipliers and economic growth in case of Central America, Mexico and Dominican Republic for period for period 1990-2015. They found significant contribution in most countries of public spending to the GDP in 2005-2014 but

investment contribution has moderated to GDP growth. Correlation coefficient showed strong and positive relationship between current expenditure and economic growth but showed weak in economic growth and capital spending. Co-integration test showed long term relationship for public expenditure and economic growth.

Gyasi and Genevieve (2020) applied bounds test approach to check fiscal deficit impact on economic growth in Morocco economy for period 1990-2017 on annual series data. They obtained Morocco economy effect of fiscal deficit on economic growth is in long run and equilibrium correlation is to be found significantly quickly. Hanusch, Chakarborty and Khurana (2017) focused on economic growth, fiscal policy and innovation for G20 countries using fixed effects model and unit root test for 2000-2010. Results showed that innovation impact related spending is much higher than other of macro variables on economic growth. Hasanov, Mammadov and Musehel (2018) revealed non-oil economic growth effects of fiscal policy through unit root test, co-integration test, ARDL bound test estimation technique for panel data period 1998-2011. They computed fiscal policy have significant positive impact on non-oil sector in both short and long run.

Hlongwane et. al., (2018) analyzed fiscal policy impact on economic growth through co-integration vector auto regression approach, Johansen co-integration vector error correction models in South Africa for period 1960-2014. They showed result of long run estimates revealed government tax revenue have significant and positive long run influenced on the economic growth while budget deficit and government gross fixed capital formation have negative impact on the real GDP. Iqbal, Din and Ghani (2017) estimated the economic growth and fiscal deficit in Pakistan. By applying smooth transition autoregressive model (STAR) for time series data period 1972-2014 showed fiscal deficits threshold level is 5.57% of the GDP above this there is negative impact of deficit on growth. Karagoz and Keskin (2016) investigated fiscal policy impact on macroeconomic aggregates in case of Turkey for quarterly data period 2003-2015 using BVAR model. They obtained that the impact of revenue and government expenditure on macroeconomic variables have limited which included inflation, GDP, external debt, stock market index and interest rate.

Kim et. al., (2021) applied Dickey Fuller test and Philips-Perron test for 1985-2015 to check some evidence of economic growth and fiscal policy from China. They found output growth larger impact of local expenditure growth than the central expenditure growth. The output growth response to anticipated changes is impeded by the liquidity constraints in taxation. Evidence indicates that on china's fiscal system long term debt has a significant influence, especially on the government revenues. Lgwe, Emmanuel and Ukpere (2015) applied unit root test, co-integration test, vector error correction model and Granger causality test for period 1970-2012 using time series data worked on fiscal policy variable impact in case of Nigeria on economic growth. There is long run relationship found in all dependent variables and economic growth by Johansen co-integration test. The VECM analyzed recurrent expenditure and capital expenditure is positively related and statistically significant in long run economic growth determination.

M.A.K and H (2019) studied fiscal policy impact on economic growth in comparison between Sri-Lanka and Singapore, through ADRL-ECM technique for period 1972-2017 using time series data. They obtained that government expenditure, investment expenditure and government revenue has positively and significant effect in Sri-Lanka as well as Singapore economic growth in long runs. Further bidirectional economic relationship showed between economic growth and investment expenditure in Sri-Lanka. Madni and Choudhary (2017) using ADRL technique for time series data period 1984-2015 worked on economic growth in institutions and fiscal policy context. They obtained affect is identified on country economic growth by government spending and institutional quality while private investment and educational attainment are significantly contributing to Pakistan's economic growth. Makhoba et. al., (2019) investigated assessment of fiscal policy impact on economic growth in South Africa using VECM approach for 1960-2017. They obtained formation of gross fixed capital and government revenues has long significant positive impact on the economic growth while public debt and government expenditure share long run negative relationship with the economic growth. Government expenditure has been at higher growth pace than the revenue.

Masca et. al., (2015) illustrated the fiscal policy in EU countries as growth engine by applying panel techniques generalized least squares, feasible generalized least squares t-test for 1995-2011. They found economic growth influenced positively on public sector of small dimensioned opposed to the non-productive investment. Olubunmi et. al., (2019) worked on economic growth and fiscal policy in

case of Nigeria applied ARDL bound test and ECM approach for period 1990-2017. Government revenue and economic growth showed significant positive relationship in the short run but in the long run it become negative. Recurrent expenditure relationship with the economic growth had significant negative in the short run but become insignificant in long run. However, in both short and long run relationship is significant positive for inflation rate.

Sarwar and Chaudhry (2017) analyzed fiscal policy impact in case of Pakistan on economic growth for period 1980-2014 by applying unit root test co-integration test, maximum likelihood method and VECM model using time series data. There are two co-integration equations in the short run and vector error correction model declared that there is positive relationship between DT, GDP and NDT in the short run. By defense expenditure causality test revealed that GDP does not caused and DFEXP is granger caused by interest rate. Stockhammer et. al., (2016) studied fiscal policy demand effects by applying two stage least squares, structural vector auto-regression techniques for 2001-2014. They concluded in depression fiscal policy placed major role that is experiencing by southern European countries. Stoilova and Patonov (2020) applied OLS techniques for the time series data period 1995-2018 and investigated annual growth rate of Bulgaria's for the annual value of GDP of previous year, total tax revenue, government expenditure and index of corruption. They found that government expenditure doesn't sustainably contribute in Bulgaria to increase the growth rate of annual GDP. Besides public spending taxation is more reliable instrument of the fiscal policy.

Symoom (2018) illustrated fiscal policy impact on economic growth in case of south Asian countries using ECM and ADRL model for period 1980-2016. He found empirically tax revenue and government expenditure have no significant impact in those south Asian countries on the real GDP growth. Tan et. al., (2020) investigated monetary and fiscal policy impact on economic growth in Singapore, Thailand and Malaysia for 1980-2017 using ADRL approach, fully modified least square method, canonical co-integration regression and dynamic ordinary least square method. They found that interest rate has negative impact in these three countries on economic growth. Government spending has negative impact in Malaysia and Singapore on economic growth, but Thailand has positive impact. In Malaysia and Singapore monetary policy is more effective while in Thailand fiscal policy is more effective. Toriola et. al., (2022) applied ADRL and granger causality test to check inclusive growth and fiscal stability in Nigeria for 1985-2015. They showed in Nigeria, inflation and debt ratio have significant negative effect in short run on inclusive growth and debt ratio have significant negative effect in long run on inclusive growth. The granger causality test showed unidirectional relationship between fiscal stability and inclusive growth measures from debt ratio and inclusive growth from fiscal deficit.

Tung (2018) in case of Vietnam analysed fiscal policy effect on economic growth by error correction model and OLS technique used quarterly time series data for period 2003-2016. There is empirically found the co-integration relationship between economic growth and fiscal deficit which had negative effect in both short and long run on economic growth. Ugwuanyi and Ugwunta (2017) studied economic growth and fiscal policy in case of sub-Saharan African countries for 1970-1995 using endogenous growth model. They revealed government unproductive and productive expenditure, non-distortionary and distortionary taxes had significant effects on economic growth. Finding also showed budget balance has significant but positive effect on the economic growth in countries of sub-Saharan Africa.

ECONOMETRIC METHODOLOGY

ARDL Model:

Autoregressive Distributed Lagged (ARDL) bound testing approach for cointegration given by Pesaran et al. (2001) is used in this research work. Advantage of the ARDL model is clear that it can be used:

1- When variables are stationary at level and first difference.
2- When data is available in small samples.
3- When no variable is stationary at second difference (Pesaran et al., 2001).

Following three ARDL based equations were considered to be estimated to know about possible impact of fiscal policy on agricultural, industrial and services sector respectively.

$$\Delta AGRICL_t = \alpha_0 + \alpha_1 AGRICL_{t-1} + \alpha_2 GDPPC_{t-1} + \alpha_3 LCPI_{t-1} + \alpha_4 LDSER_{t-1} + \alpha_5 LED_{t-1}$$
$$+ \alpha_6 LGNEXP_{t-1} + \sum_{k=1}^{n} \phi_k \Delta AGRICL_{t-k} + \sum_{k=0}^{n} \sigma_k \Delta GDPPC_{t-k} + \sum_{k=0}^{n} \eta_k \Delta LCPI_{t-k} + \quad (1)$$
$$\sum_{k=1}^{n} \pi_k \Delta LDSER_{t-k} + \sum_{k=1}^{n} \nu_k \Delta LED_{t-k} + \sum_{k=1}^{n} \theta_k \Delta LGNEXP_{t-k} + \varepsilon_t$$

$$\Delta INDRY_t = \beta_0 + \beta_1 INDRY_{t-1} + \beta_2 GDPPC_{t-1} + \beta_3 LCPI_{t-1} + \beta_4 LDSER_{t-1} + \beta_5 LED_{t-1}$$
$$+ \beta_6 LGNEXP_{t-1} + \sum_{k=1}^{n} \phi_k \Delta INDRY_{t-k} + \sum_{k=0}^{n} \sigma_k \Delta GDPPC_{t-k} + \sum_{k=0}^{n} \eta_k \Delta LCPI_{t-k} + \quad (2)$$
$$\sum_{k=1}^{n} \pi_k \Delta LDSER_{t-k} + \sum_{k=1}^{n} \nu_k \Delta LED_{t-k} + \sum_{k=1}^{n} \theta_k \Delta LGNEXP_{t-k} + \varepsilon_t$$

$$\Delta LSERVC_t = \gamma_0 + \gamma_1 LSRVC_{t-1} + \gamma_2 GDPPC_{t-1} + \gamma_3 LCPI_{t-1} + \gamma_4 LDSER_{t-1} + \gamma_5 LED_{t-1}$$
$$+ \gamma_6 LGNEXP_{t-1} + \sum_{k=1}^{n} \phi_k \Delta LSERVC_{t-k} + \sum_{k=0}^{n} \sigma_k \Delta GDPPC_{t-k} + \sum_{k=0}^{n} \eta_k \Delta LCPI_{t-k} + \quad (3)$$
$$\sum_{k=1}^{n} \pi_k \Delta LDSER_{t-k} + \sum_{k=1}^{n} \nu_k \Delta LED_{t-k} + \sum_{k=1}^{n} \theta_k \Delta LGNEXP_{t-k} + \varepsilon_t$$

Where $AGRICL$ stands for agricultural sector, $INDRY$ stands for industry, $LSERVC$ is used for services sector, $GDPPC$ stands for GDP per capita, $LCPI$ is showing inflation, $LDSER$ stands for total debt services, LED stands for external balance on goods and services , and $LGNEXP$ is used for gross national expenditures. Δ is the first difference operator and ε_t is a term used for white-noise disturbance error. The equations mentioned above can offer both short- run and long-run estimations within a single-equation framework. The long-run effects can be estimated using equation (1), (2) and (3) by standardising the coefficients of α_2 to α_6 on α_1, β_2 to β_6 on β_1 and γ_2 to γ_6 on γ_1 respectively whereas the short-run effects may be estimated using the coefficient of the respective initial differenced.

If the estimated F-statistic falls between the lower and upper bound critical values, the result is inconclusive. While indicating the presence of a cointegrating relationship, the null hypothesis can be rejected if the calculated F-statistic is greater than the upper bound value of critical values. If the calculated F-statistic is less than the lower bound value, the null hypothesis of no long run relationship cannot be rejected. Narayan (2005)'s lower bound and upper bound critical values are employed instead if the data sample size for the study is less than 80.

Data

World Bank's world development indicators (WDI 2021) was the source of annual data for period 1980-2021 related to agricultural sector, industrial sector, services sector, GDP per capita, inflation, total debt services, external balance on goods and services and gross national expenditures.

RESULTS

Unit Root Tests:

The results of the unit root test are shown in tables 1 and 2. Before we use the bound testing approach, the order of integration of the variables must be determined, with the variables being either I(0), I(1), or fractionally integrated. The variables, on the other hand, cannot be I(2). Thus, two-unit root tests, namely ADF and PP, are used to determine the stationarity of the variables. These results indicate that the variables are either I(0) or I(1) integrated. This study can be proceeded with the estimation of the ARDL model because it meets the conditions for the ARDL bound test.

Table No. 1: ADF unit root test for ARDL

S.#	*Variables*	*Level*		*First Difference*		Order of integration
		Intercept	*Trend and intercept*	*Intercept*	*Trend and intercept*	
1	*GDPPC*	-4.980	-9.032	-10.326	-10.493	I(0)
2	*AGRICL*	-8.932	-1.899	-5.114	-5.291	I(0)
3	*LCPI*	-3.268	-3.383	-7.088	-7.013	I(0)
4	*LDSER*	-2.748	-3.197	-9.298	-9.228	I(0)
5	*LED*	-2.306	-2.285	-6.688	-6.615	I(1)
6	*LGNEXP*	-2.302	-2.280	-6.659	-6.587	I(1)
7	*INDRY*	-5.189	-6.222	-8.822	-8.801	I(0)
8	*LSERVC*	-1.484	-2.462	-6.141	-6.119	I(1)
Critical values of 1%		-3.571	-4.157	-3.574	-4.161	
Critical values of 10%		-2.599	-3.182	-2.600	-3.183	

Gdppc, agricl, lcpi, ldser, led, lgnexp, lindry and lservc stands for GDP per capita, agriculture value added, inflation, total debt services, external balance on goods and services, gross national expenditures, industry value added and services value added respectively. All variables were taken into log form except agriculture value added, industry and GDP per capita because these three logged variables were found to show autocorrelation in estimation process. So these three variables were converted again in non-log form.

Table No. 2: PP UNIT ROOT TEST

S.NO	*Variables*	*Level*		*First Difference*		
		Intercept	*Trend and intercept*	*Intercept*	*Trend and intercept*	
1	*GDPPC*	-4.917	-5.028	-11.077	-11.311	I(0)
2	*AGRICL*	-9.108	-9.301	-41.808	-41.522	I(0)
3	*LCPI*	-3.374	-3.382	-7.202	-7.110	I(0)
4	*LDSER*	-2.677	-3.126	-9.440	-9.568	I(0)
5	*LED*	-2.380	-2.359	-6.698	-6.615	I(1)
6	*LGNEXP*	-2.380	-2.358	-6.668	-6.586	I(1)
7	*INDRY*	-5.314	-6.222	-14.239	-14.347	I(0)
8	*LSERVC*	-1.486	-2.462	-6.128	-6.139	I(1)
Critical values of 1%		-3.571	-4.157	-3.574	-4.161	
Critical values of 10%		-2.600	-3.181	-2.600	-3.183	

Gdppc, agricl, lcpi, ldser, led, lgnexp, lindry and lservc stands for GDP per capita, agriculture value added, inflation, total debt services, external balance on goods and services, gross national expenditures, industry value added and services value added respectively. All variables were taken into log form except agriculture value added, industry and GDP per capita because these three logged variables were found to show autocorrelation in estimation process. So these three variables were converted again in non-log form.

ARDL Results:

For small sample sizes, Schwarz Information Criterion (SIC) is appeared to be more suitable criteria that is usually used to get the optimal number of lags in ARDL analysis. The findings are estimated by restricting the number of maximum lags on the model to four in case of agricultural sector, lag three for industrial sector and services sector respectively. This desire stems from the notion that smaller lags for a small data range would be more rational. Where possible, the maximum lag chosen for the dependent and independent variables will be four, if there is no issue of degree of freedom. However, if the chosen model has serial correlation difficulties, as proposed by Pesaran et al., the maximum number of lags will be decreased (2001). The null hypothesis of no cointegration is rejected at the 5% significance level based on the estimated overall F-statistic, according to the Narayan (2005) critical value. According to McNown et al. (2018), the estimated F-statistic for lagged independent variables is greater than the upper bound critical value.

Lag Selection:

Table 3 shows that ARDL model having lag length (4,0,3,4,2,3) automatically. Our research does not accept the null hypothesis of no cointegration at the 5% level of significance based on the Narayan (2005) critical values for computed F. Statistics.

There is long run cointegration between agricultural sector and variables related to fiscal policy as the calculated F. statistics (6.577) is greater than the upper bound critical value (3.38).

Table No. 3: Bound Test Agricultural Sector

5% critical values bound test				
Dependent Variable: agricl	*F. Statistics*	*1(0)*	*1(1)*	*Cointegration Exists*
Model: (4,0,3,4,2,3)) (gdppc, lcpi, ldser, leb, lgnexp)	*6.577*	*2.39*	*3.38*	*yes*

Table 4 shows that ARDL model having lag length (2,2,0, 3,2,0) automatically. Our research does not accept the null hypothesis of no cointegration at the 5% level of significance based on the Narayan (2005) critical values for computed F. Statistics. Calculated F. statistics (8.601) is larger than the upper bound critical value (3.38) that demonstrates that there is cointegration between industrial sector and variables related to fiscal policy.

Table No. 4: Bound Test Industrial Sector

5% critical values bound test				
Dependent Variable: indry	*F.Statistics*	*1(0)*	*1(1)*	*Cointegration Exists*
Model: (2,2,0,3,2,0) (gdppc, lcpi, ldser, leb, lgnexp)	*8.601*	*2.39*	*3.38*	*Yes*

Table 5 shows that ARDL model having lag length (2,0,1,0,0,3) automatically. Our research does not accept the null hypothesis of no cointegration at the 5% level of significance based on the Narayan (2005) critical values for computed F. Statistics.

Calculated F. statistics (6.289) is greater than the upper bound critical value (3.38) that demonstrates that there is cointegration between services sector and variables related to fiscal policy.

Table No. 5: Bound Test Services Sector

5% critical values bound test				
Dependent Variable: dlservc	*F. Statistics*	*1(0)*	*1(1)*	*Cointegration Exists*
Model: (2,0,1,0,0,3) (gdppc, lcpi, ldser, leb, lgnexp)	*6.289*	*2.39*	*3.38*	*Yes*

Long Run Relationship:

Table 6 shows that the linear model is estimated to investigate the impacts of changes in GDP per capita, inflation, total debt services, external balance on goods and services and gross national expenditures on agricultural sector. All variables related to fiscal policy affected agricultural sector positively and insignificantly except total debt services(*ldser*) that has positive and significant impact on agricultural sector.

Table No. 6: Long run Cointegration Agricultural Sector

Variables	*Coefficients*	*t-statistics*	*P. Values*
Dependent Variable: agricl		*Restricted Constant with no trend*	
gdppc	*0.110*	*1.355*	*0.189*
lcpi	*1.044*	*1.282*	*0.213*
ldser	*6.262*	*7.211*	*0.0000*
leb	*3.821*	*1.212*	*0.238*
lgnexp	*965 .701*	*1.262*	*0.220*
c	*-1933.673*	*-1.263*	*0.219*

Table 6 shows that the linear model is estimated to investigate the impacts of changes in GDP per capita, inflation, total debt services, external balance on goods and services and gross national expenditures on industrial sector. GDP per capita, inflation and total debt services have positive and significant effect on industrial sector while this sector was affected negatively and significantly by external balance of goods and services and gross national expenditures.

Table No. 7: Long run Cointegration Industrial Sector

Variables	*Coefficients*	*t-statistics*	*P. Values*
Dependent Variable: indry		*Restricted Constant with no trend*	
gdppc	*1.498*	*6.858*	*0.000*
lcpi	*2.734*	*2.308*	*0.028*
ldser	*4.670*	*2.819*	*0.008*
leb	*-12.671*	*-2.820*	*0.008*
lgnexp	*-3051.911*	*-2.803*	*0.009*
c	*6101.831*	*2.802*	*0.009*

Table 6 shows that the linear model is estimated to investigate the impacts of changes in GDP per capita, inflation, total debt services, external balance on goods and services and gross national expenditures on services sector. All variables showed negative and significant association with services sector except total debt services that has positive and significant relationship with services sector.

Table No. 8: Long run Cointegration Services Sector

Variables	*Coefficients*	*t-statistics*	*P. Values*
Dependent Variable: dlservc		*Restricted Constant with no trend*	
gdppc	*-0.002*	*-2.483*	*0.020*
lcpi	*-0.011*	*-3.267*	*0.003*
ldser	*0.010*	*2.141*	*0.043*
leb	*-0.042*	*-2.84*	*0.009*
lgnexp	*-10.209*	*-2.854*	*0.009*
c	*20.431*	*2.856*	*0.009*

Error Correction Models:

VECMs is built based on the cointegration results to assess the model's short-term dynamic behaviour. Tables 9-11 exhibit the findings of the vector error correction models(VCEM), where error correction term (cointegration term) since the departure from long-run equilibrium is gradually corrected through a series of partial short-run adjustments (Johansen, 1995; Juselius, 2006).

Table No. 9: Error Correction Model, Agricultural Sector

Variable	*Coefficient*	*t-statistic*	*P. Value*
ect(-1)	*-3.185*	*-7.619*	*0.000*
Residual Diagnostic Tests (F.Statistics			
B.G LM Test	*0.122*		*0.886*
ARCH Test	*0.101*		*0.752*
White Test	*1.454*		*0.191*
J-B Test	*1.184*		*0.553*
R2	*0.896*		

At least one of the coefficients of the error correction terms must be statistically significant in order for cointegration to exist. The short-term influence is indicated by the coefficients of variables. A significant coefficient indicates that previous equilibrium errors have influenced present results. The negative indicator implies that the adjustment is in the right direction for the long-term partnership to be restored. The speed of adjustment is indicated by the amount of the error correction model coefficients.

Table No. 10: Error Correction Model, Industrial Sector

Variable	*Coefficient*	*t-statistic*	*P. Value*
ect(-1)	*-1.674*	*-8.477*	*0.000*
Residual Diagnostic Tests (F.Statistics			
B.G LM Test	*2.241*		*0.124*
ARCH Test	*0.016*		*0.899*
White Test	*1.689*		*0.110*
J-B Test	*0.883*		*0.643*
R2	*0.806*		

Tables 9-11 show that the error correction terms for agricultural, industrial and services sectors respectively are negative (-3.185, -1.674 and -2.110 respectively) indicating that the system is stable and converges to the equilibrium track following a disturbance. Diagnostic tests show that there is no autocorrelation, multi collinearity and heterogeneity in the chosen model, and there are no misspecification difficulties. JB test evidenced that all three models have normal distributions.

Table No. 11: Error Correction Model, Services Sector

Variable	*Coefficient*	*t-statistic*	*P. Value*
ect(-1)	*-2.110*	*-7.450*	*0.000*
Residual Diagnostic Tests (F.Statistics			
B.G LM Test	*1.940*		*0.169*
ARCH Test	*0.055*		*0.815*
White Test	*1.594*		*0.139*
J-B Test	*2.66*		*0.265*
R2	*0.833*		

The cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) results for the linear ARDL model are shown in figures 1-2 for agricultural sector, figure 3-4 for industrial sector and figure 5-6 for services sector, respectively.

Stability Tests:

The implementation of the CUSUM or CUSUMSQ parameters stability test devised by Brown et al. (1975) following the short-term and long-term coefficients estimate is advised by Pesaran and Pesaran (1997) to verify the robustness of any statistical analysis. In contrast to breakpoints, CUSUM and CUSUMSQ statistics are updated recursively. If the CUSUM or CUSUMQ line stays inside the top and lower bounds of the CUSUM and CUSUMQ graph, the estimated parameters are known to be stable. Figures 1-6 showed that the parameters were stable in case of agricultural, industrial and services sectors respectively.

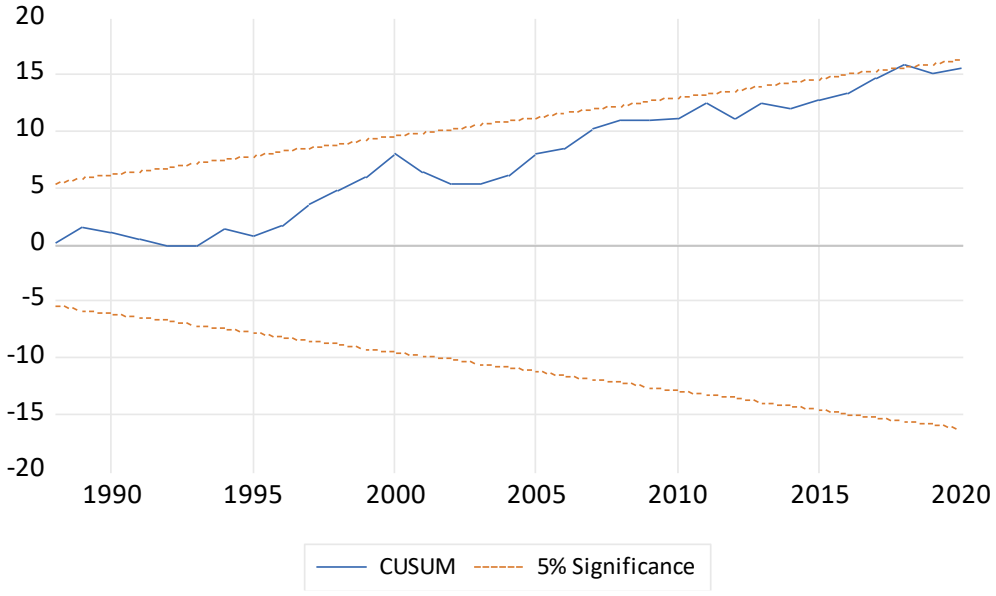

Figure 1: Agricultural Sector

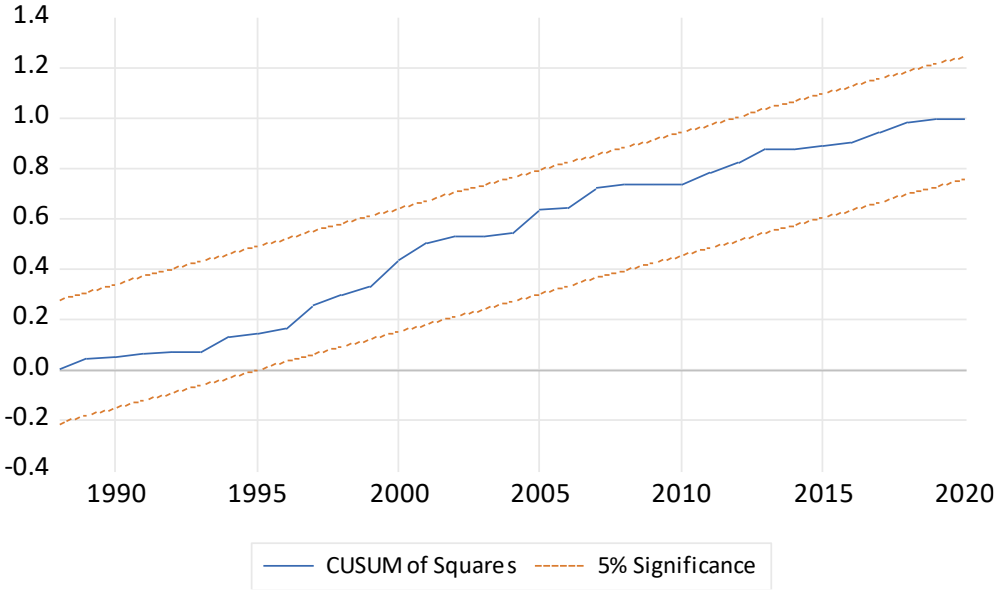

Figure 2: Agricultural Sector

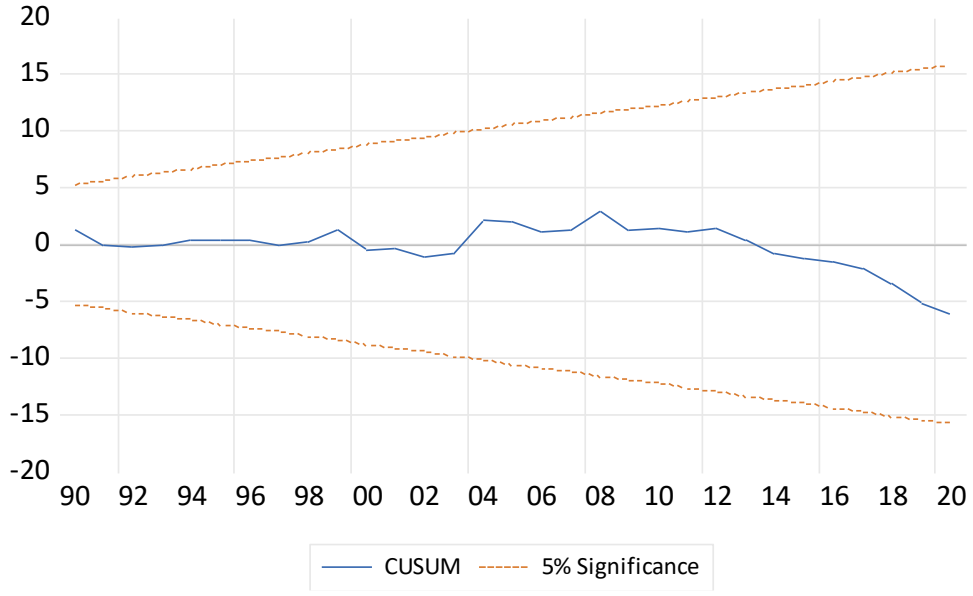

Figure 3: Industrial Sector

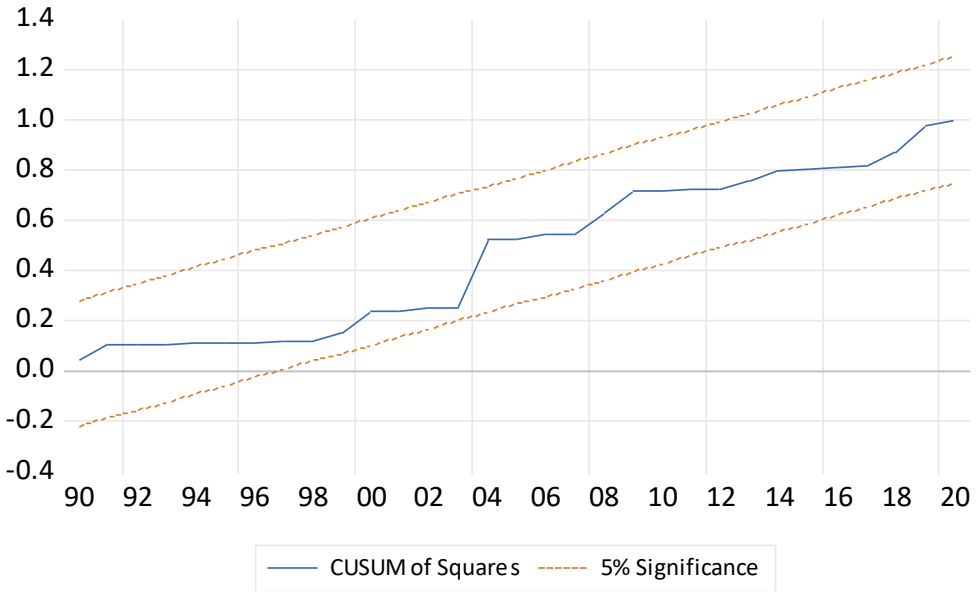

Figure 4: Industrial Sector

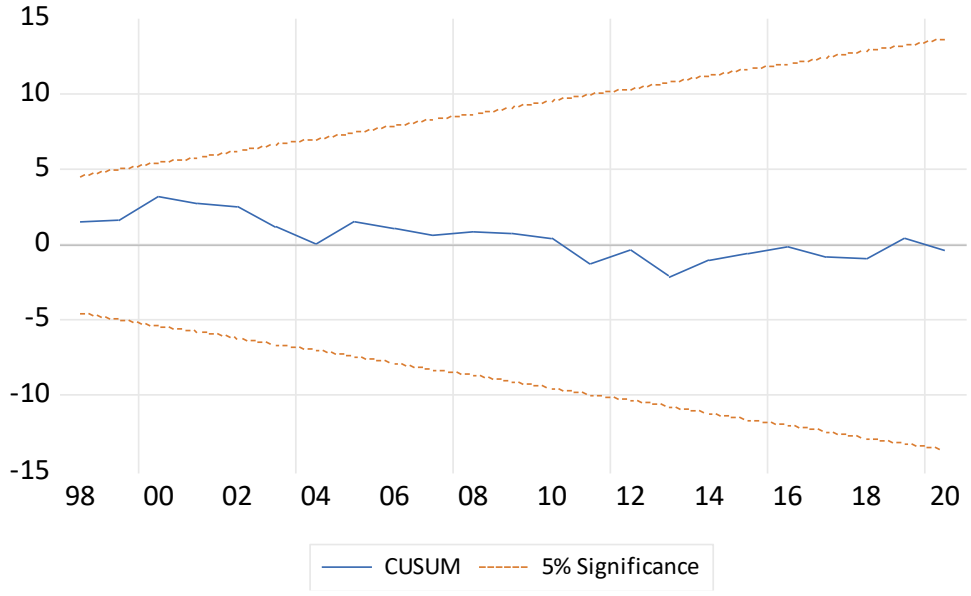

Figure 5: Services Sector

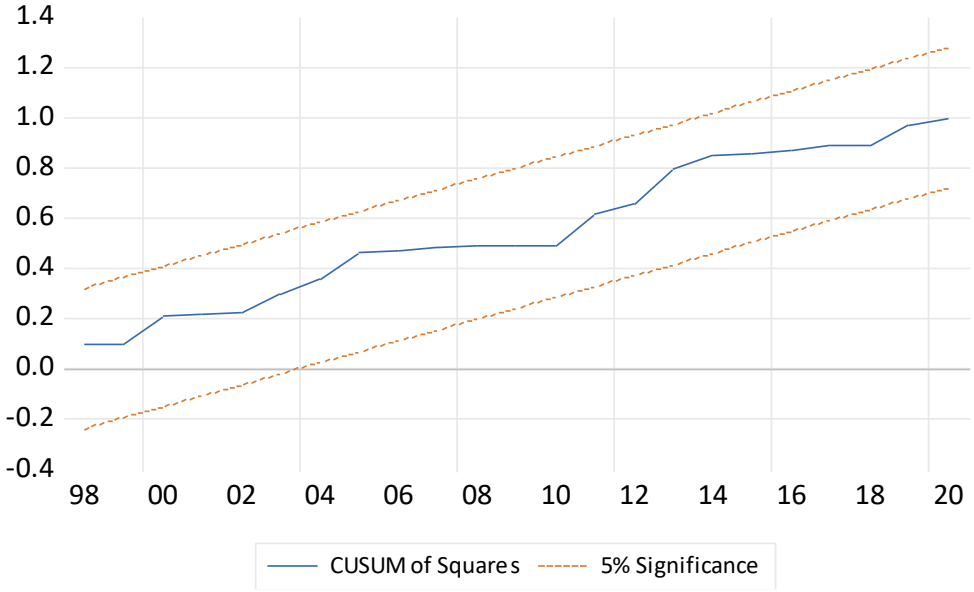

Figure 6: Services Sector

CONCLUSION

Main objective to write this paper was to find out impact of fiscal policy on sectoral growth in Pakistan. Annual data for period 1980-2021 was used from world development indicators of World Bank (2021). ADF and PP unit root test were employed to check the stationarity of all variables. ADRL bound testing was considered as estimation technique because some variables were stationary at level and some were at first difference while no variable was stationary at second difference. Three models were estimated where dependent variables were agriculture, industry and services while independent variables were GDP per capita, total debt services, external balance on goods and services, and gross national expenditures. These most repeated variables are selected from existing empirical literature on impact of fiscal policy over economic growth. All variables related to fiscal policy affected agricultural sector positively and insignificantly except total debt services(*ldser*) that has positive and significant impact on agricultural sector. GDP per capita, inflation and total debt services have positive and significant effect on industrial sector while this sector was affected negatively and significantly by external balance of goods and services and gross national expenditures. All explanatory variables showed negative and

significant association with services sector except total debt services that has positive and significant relationship with services sector.

The error correction terms for agricultural, industrial and services sectors respectively are negative (-3.185, -1.674 and -2.110 respectively) indicated that the system was stable and converged to the equilibrium track following a disturbance. All diagnostic and stability tests satisfied the basic requirements of model suitability.

Government should focus on the variables augmenting the agriculture, industry and services sectors respectively so that these sectors could contribute in GDP growth equally and positively.

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