Government Expenditure Composition and Economic Growth: Empirical Evidence from Pakistan

Zia Ur Rehman[*], Muhammad Azam Khan[†] and Muhammad Tariq[‡]

Abstract

Like other developing countries, in Pakistan, government expenditure composition always remained a challenging issue because of its direct and indirect consequences for macroeconomic performance of the country. This study aims to observe the effect of various elements of the government expenditures on economic growth of Pakistan for the period1973 to 2018. Based on the ADF test results, Autoregressive Distributive Lag has been employed to analyze the data. This study found that effect of public expenditure components namely expenditure on research and developmental, subsidies and other transfers, education, compensation to employees on per capita GDP remained positive and significant. While the expenditure on interest payment on loans and military have noteworthy and unhelpful effect on per capita output of Pakistan. This study suggested that the government should boost expenditure on research and development, education and employment to accelerate the economic growth in the country.

Key words: spending composition, growth, ARDL

Introduction

Macroeconomic stability is mandatory for the long run and sustainable economic growth of a country. In the past years, Pakistan's economy has experienced successive and frequent fluctuations in the macroeconomic indicators. Some of the reasons for the macroeconomic instability were the unproductive and unplanned government expenditures and low level of revenue generation, resulted in widening the fiscal deficit gap. The average growth rate in the country during the last five years remained 4.7%. While the government set target of 5.4%. The per capita income was increased by 1.3% during 2017-18 and decreased by 9.4%during2018-19 (Government of Pakistan, 2019). The growth potential of the country can be boosted through fiscal measures and structural reforms which can stimulate the growth through different channels short and long term (International Monetary Fund, 2015).

[*]PhD Scholar, Faculty of Business & Economics, Department of Economics Abdul Wali Khan University, Mardan, KP-Pakistan Email ID: ziamarwat1980@gmail.com

[†]Faculty of Business & Economics, Department of Economics Abdul Wali Khan University, Mardan, KP-Pakistan.

[‡]Faculty of Business & Economics, Department of Economics, Abdul Wali Khan University, Mardan, KP-Pakistan

In the literature large number of theoretical and empirical studies can be conducted to investigate the association between fiscal policy (i.e. mostly used government expenditure as a fiscal policy measure) and the economic growth and found significant association between them(Bose, Haque, & Osborn, 2007). However, the question of whether government expenditure put expansionary or contractionary effects on economic growth is still remained controversial. Understanding of the government expenditure composition is important for the appropriate allocation of the public expenditure to influence the economic development and growth(Akram, Padda, Khan, & Husnain, 2011).

According to Wagner's Law that economic growth is an exogenous factor of government expenditure(Wagner, 1883)while Keynesian hypothesis depicted that the public expenditure is an exogenous factor of growth(Loizides & Vamvoukas, 2005). Solow (1956) argues that government spending has no consequence on the output growth in the long run. Keynesian school of economics claimed that the fiscal policy was a significant tool of government to accelerate economic growth. Further, suggested that any types of government expenses, even of a repeated nature, have a positive contribution to the economic growth. Fiscal policy effect on the aggregate demand (AD)also be subject to on that whether government expenditure crowds out nonpublic expenditure or not (Kandil, 2006). This study based on Keynesian theory that government expenditure will accelerate the economic growth in Pakistan.

Similarly, the empirical outcomes of, some of the study's results depicted that the government expenditure have significant and positive effect on the economic growth(Ram, 1986; Romer, 1990). While, others depicted that government spending has inverse and noteworthy effect on the economic growth (Afonso & Furceri, 2010; Barro, 1990; Landau, 1985). Conversely, some studies depicted that government expenses impact on the economic growth is insignificant(Kormendi & Meguire, 1985; Levine & Renelt, 1992).

This study is dissimilar from previous studies in several features. First, majority of researcher's are conducted for Pakistan focused on the role of the public expenditure on the economic growth. Unlike, those studies, analyzed the disaggregated effect of the government spending components on the Pakistan's economic growth. Secondly, the time frame of the study is dissimilar from the previous studies. Finally, more sophisticated techniques were used for the calculation of results.

This study present survey of literature in section two, research methodology in section three, data analysis, discussion in section four and

finding, conclusion and recommendation in section five and notes and references at the end.

Literature Review

Devarajan, Swaroop, and Zou (1996) taking the data of 140 OECD states and found that public expenditure on defense and education didn't have positive but heath has positive impression on the economic growth. The large pool of studies confirmed that the government expenditure have significant but adverse effect on economic growth(Adebiyi, 2003; Akpan, 2005).Afonso and Furceri (2010) taking the sample of European Union (EU) and OECD countries to detect the effect of the government expenditure and revenue on the economic growth in term of size and volatility and found that both variables were the determinants of growth. Further, the Public consumption, indirect taxes, subsidies, social contribution and investment have a large, significant and negative effect over economic growth.

Baum and Lin (1993) conducted a study and found that defense expenditure and education expenditure have positive impression over economic growth. However, the welfare spending has negative and statistically insignificant effect over economic growth for 58 countries sample. According to Gemmell, Kneller, and Sanz (2016) that the reallocating the government expenditure towards the education and infrastructure have positive effect while social welfare spending has inverse effect over economic growth in the long run. Aliyev and Mikayilov (2016) described that the role of composition of budget expenditure recommend the validity of the relationship the among the variables in the long term. The capital expenditure has negative but insignificant and other expenditures have noteworthy and inverse consequences on economic growth. But, expenditure on social progress has constructive and noteworthy effect of non-oil economic growth. Therefore, the composition of public expenditure was matters for non-oil output growth in the long run.

There was stable co-integration association among the expenditure on military and the economic growth in Pakistan. A rise in the military expenditure reduce the step of the economic growth which approving the strength of Keynesian hypothesis(Shahbaz, Afza, & Shabbir, 2013). The no distortionary taxation and nonproductive expenditure have neutral result on the economic growth in short term and in long term as well. The productive outflow has positive and noteworthy effect on the economic growth. Secondary level school enrollment influences the per capita income and labor force has negative but its effect

was insignificant over per capita income(Ahmad & Wajid, 2013).The education expenditure has a constructive and important consequence on the economic growth in the long term (Riasat, Atif, & Zaman, 2011). The inflation and government expenditure negatively associated to the long run economic growth rate in Pakistan because more expenditure is non-developmental(Khan & Saleem, 2018).

After the review of literature, the views about the about the association between government spending and economic growth rate are different. Some concluded that government spending have positive, some argues insignificant and some argues negative effect over economic growth. Therefore, the public spending has both positive as well negative effect over economic growth(Biswas & Saha, 2014). So, this study was conducted to minimize this gap and contribute in the existing literature.

Methodology

For examining the effect of public expenditures composition on economic growth rate of Pakistan and used time series annual data over the period1973 to 2018. The data were calm from WDI, World Bank (2019). The study used PP and ADF test to check the stationarity and ARDL techniques to estimate the association between the independent variables and dependent variable and diagnostic tests were used.

Model Specification

Several prior studies including Aliyev and Mikayilov (2016), Mudaki and Masaviru (2012) have used Solow Growth model where they also included government expenditure as an autonomous variable in the empirical model of the study Following these studies, this research work is also using similar growth model.

The modified empirical in functional form has been written as follows.

$$Y = f(L, K, G, Z) \quad (1)$$

In equation-1, Y_t indicated is the output, K_t indicated physical capital, L_t is indicated labor force and G_t indicated government expenditure components and Z is a vector for other related explanatory variables.

$$PPI_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} PPl_{t-i} + \sum_{i=0}^{n} \alpha_{2i} LF_{t-i} + \sum_{i=0}^{n} \alpha_{3i} K_{t-i} + \sum_{i=0}^{n} \alpha_{4i} FDI_{t-i} + \sum_{i=0}^{n} \alpha_{5i} TOT_{t-i} + \sum_{i=0}^{n} \alpha_{6i} FD_{t-i} + \sum_{i=0}^{n} \alpha_{7i} HK_{t-i} + \sum_{i=0}^{n} \beta_{1i} R\&DE_{t-i} + \sum_{i=0}^{n} \beta_{2i} ST_{t-i} + \sum_{i=0}^{n} \beta_{3i} ME_{t-i} + \sum_{i=0}^{n} \beta_{4i} IP_{t-i} + \sum_{i=0}^{n} \beta_{5i} HE_{t-i} + \sum_{i=0}^{n} \beta_{6i} EE_{t-i} + \sum_{i=0}^{n} \beta_{7i} GFCE_{t-i} + \sum_{i=0}^{n} \beta_{8i} FCE_{t-i} + \sum_{i=0}^{n} \beta_{9i} G\&SE_{t-i} + \sum_{i=0}^{n} \beta_{10i} EC_{t-i} + \varepsilon_t \quad (2)$$

The ARDL is good for the time series data along with the advantage of the consistent estimates of the long term coefficients that are

normal asymptotically irrespective whether the variables are integrated in order $I(0)$ *or* $I(1)$(Pesaran & Shin, 1998). Based on ADF test results this study employed ARDL approach to observe the long-term association by selecting the optimum lag length

Table1 Variables Explanation

Variables	Symbols	Quantity
Per capita GDP	PPI	Annual %age change
Labor Force	LF	as %age of population
Capital Formation (Gross)	K	Percentage share of GDP
Secondary School Enrollment	HK	%age share of gross
Foreign Direct Investment	FDI	Percentage share of GDP
Term of Trade Index	TOT	Index
Fiscal Deficit	FD	Percentage share of GDP
Government Expenditure on Research and development	R&DE	Percentage share of GDP
Subsidies and Other Transfer	ST	Percentage share of expanse
Military Expenditure	ME	Percentage share of GDP
Interest Payments	IP	Percentage share of Revenue
Health	HE	Percentage share of GDP
education	EE	Percentage share of GDP
General Final Consumption	GFCE	Percentage share of GDP
Final Consumption	FCE	Percentage share of GDP
Goods and Services	G&SE	Percentage share of Expense
Compensation of Employees	EC	Percentage share of Expense

Data Analysis and Discussion

Unite Root Tests

Table-2, present the unite root tests results, in which, PPI, K, FDI, R&DE, HE, EE and C&SE are stationary at level while LF, HK, TOT, FD, ST, ME, IP, GFCE, FCE and EC are stationary at 1st difference. Therefore, there was mix order of integration and unite tests results recomanded to ARDL Model to assessment the parameters.

Table 2 Unite Root Tests Results

Variables	With Intercept			
	ADF (probability)		PP (probability)	
	At level	At 1st diff	At level	At 1st diff
PPI_t	-5.77* (0.00)	---	-5.83* (0.00)	---
LF_t	0.72 (0.99)	-2.97** (0.05)	-2.89** (0.05)	---
K_t	-5.18* (0.00)	---	-5.28* (0.00)	---
HK_t	-1.85 (0.35)	-11.89* (0.00)	-1.43 (0.56)	-12.17* (0.00)
FDI_t	-4.46* (0.00)	---	-4.46* (0.00)	---
TOT_t	-0.86 (0.79)	-7.21* (0.00)	-0.82 (0.80)	-7.22* (0.00)

FD_t	-0.84 (0.80)	-8.60* (0.00)	-3.07** (0.04)	---
$R\&DE_t$	-3.19** (0.03)	---	-2.26 (0.19)	-3.35** (0.02)
ST_t	-1.39 (0.58)	-9.99* (0.00)	-1.02 (0.74)	-10.40* (0.00)
ME_t	-0.64 (0.85)	-4.42* (0.00)	-0.93 (0.77)	-4.50* (0.00)
IP_t	-1.30 (0.62)	-6.95* (0.00)	-1.22 (0.66)	-7.00* (0.00)
HE_t	-6.42* (0.00)	---	-6.45* (0.00)	---
EE_t	-3.49* (0.01)	---	-3.40** (0.02)	---
$GFCE_t$	-1.68 (0.43)	-6.31* (0.00)	-1.85 (0.35)	-6.31* (0.00)
FCE_t	-1.71 (0.42)	-7.51* (0.00)	-1.57 (0.49)	-7.59* (0.00)
$G\&SE_t$	-4.16* (0.00)	---	-4.16* (0.00)	---
EC_t	-2.41 (0.15)	-8.68* (0.00)	-2.41 (0.15)	-11.68* (0.00)

$*= at\ 1\%, **= at\ 5\%\ and\ ***= at\ 10\%\ level\ of\ significance$

Estimation and Discussion

In table-3, the ARDL results depicted that labor force have helpful and noteworthy consequence on PPI. Capital have encouraging and important consequence on PPI. HK_t and FDI_t have positive but isnignificant effect on PPI. The TOT_t have positive and significant effect on econmic growth and FD_t was also found insignificant.

Table3 ARDL Model Results

Variable	Coefficient	t-Statistics	P-value
PPI_{t-1}	-0.482867	-2.783749	0.0106
LF_t	0.249601	2.902756	0.0080
K_t	0.936188	4.813638	0.0001
HK_t	0.102010	1.687368	0.1050
FDI_t	0.031863	0.160100	0.8742
TOT_t	0.132627	6.699912	0.0000
FD_t	0.004653	1.562697	0.1318
$R\&DE_t$	7.958146	5.482659	0.0000
ST_t	0.143142	2.487469	0.0206
ME_t	2.500917	3.315395	0.0030
IP_t	-0.070255	-3.530232	0.0018
HE_t	0.188149	0.506938	0.6170
EE_t	1.533878	2.739841	0.0117
$GFCE_t$	-0.148378	-0.900267	0.3773
FCE_t	0.094052	1.561269	0.1321
$G\&SE_t$	0.059544	1.921238	0.0672
EC_t	1.764655	2.460287	0.0218
C	-53.41932	-6.198231	0.0000
R^2=0.9317		Adj. R^2=0.8693	
F-stat value(p-value)=14.9414 (0.00)			

The effect of research and development expanditure have found positive and higly significant on economic growthandmany others give same arguments like (Guellec & De La Potterie, 2002),while other found negative (Poole & Bernard, 1992). The effect of expanditure subsidies and other transfar was found positive and significant. The socail transfar mechanisms play a important role in the economic growth(Keane & Prasad, 2002). The effect ofmilitry expanditure are fouond positive and significant. The recent stuies give the stronger arguments that militry expanditure have nagitive effect on econmic growth(Dunne & Tian, 2013)and the small size of militry expanditure have positive and noteworthy effect on growth (Deger & Sen, 1995). The effect of expanditure on interest payment on loan have adverse and significant effect on econmic growth. The debt sevecies (Interest) have negative and significant consequence on economic growth(Malik, Khizar, & Hayat, 2010), while others claimedthat debt services have no effect (Olgun, 1998). The consequence of expanditure on health have positive but inconsequential on econmic growth and the same results byMudaki and Masaviru (2012) in the case of Kenya. The effect of expanditure on education have positive and significant econmic growth and also confirmed other(Mudaki & Masaviru, 2012)while other argues that education expanditure are found nagitive in short term and positive and significant inlong run (Saad & Kalakech, 2009). The consequence of general final Consumption Expenditure andfinal Consumption Expenditure were found insignificant. The effect of expanditur on goods and services and employ compansation is found positive and sigificant.

Table 4 Diagnostic Tests

Null Hypothesis (H_0)	Test	Test Value (P-value)	Decision
The residuals series is normally distributed.	Jarque-Bera	0.8052 (0.67)	Can't Reject H_0
There is no serial correlation.	BG Serial Correlation	2.2668 (0.1284)	Can't Reject H_0
The variance is homoscedastic.	Breusch-Pagan-Godfrey	0.9202 (0.5737)	Can't Reject H_0
The variance is homoscedastic.	Harvey	0.648717 (0.8386)	Can't Reject H_0
There is no specification error in the model.	Ramsey RESET	0.012154 (0.9132)	Can't Reject H_0

Findings, Conclusions and Recomandations

This study found that labor force, gross capital formation, research and developmental expenditure , military expenditure and interest payment on external debt are significant at 1%, expenditure on education, and compensation to employees are significant at 5% and goods and services expenditure is significant at 10% level of significant while secondary level school enrollment as proxy for human capital, foreign direct investment, fiscal deficit, expenditure on health, general final consumption and final consumption are found insignificant and terms of trade and expenditure on subsides and transfer are also found insignificant but found significant at first lag. The effect labor force, gross capital formation, expenditure on research and developmental, military, education, compensation to employees and goods and services and term of trade have positive while interest payment on external debt have negative on per capita GDP growth. The study also found that there are long term associations among outcome and covariate variables.

The effect of government expenditure components like expenditure on Research and developmental, subsidies and other transfers, education, compensation to employees have positive and noteworthy effect on GDP per capita, means that upsurge in these variables will also increase GDP per capita income. The expenditure on interest payment on external debt and military have adverse and significant consequence on per capita GDP growth, mean that increase in these variables will also decrees in GDP per capita. This study verifies the Keynesian hypothesis that public expenditure has an important effect over the economic growth because most of the components of public expenditure are found significant. The same result was found by Abdullah, Yien, and Khan (2019) that the government expenditure as instrument of fiscal policy is significant effect over economic growth.

The empirical results is a contribution to the exiting literature and sufficient information to developing countries governments and policy makers to achieve higher and sustainable economic growth and better understanding of expenditure policy. This paper recommended that all governments of developing countries must be concentrate to make a stable expenditure policy to influence the economic growth and will increase the outlay on Research and developmental, subsidies and other transfers, education, compensation to employees and minimize on military and other components like general final Consumption and final Consumption etc. to expand the economic growth in Pakistan and also recommended that government improve and manage the expenditure composition with the aim of expand economic growth in Pakistan.

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