



Defense Expenditure, Foreign Aid and Economic Growth of Pakistan

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This study is aimed to examine the impacts of defense expenditure and foreign aids on economic development of Pakistan by using time series type of data from 1972-2019. Data is collected from World Development Indicator, economic survey of Pakistan and World Bank, and some indexes are calculated by author. The multiple econometric techniques are applied as descriptive statistics, correlation and unit root test. Based on those results the regression technique of ARDL (Auto-Regressive-Distributed-Lag) is selected. The present study evaluates the foreign aid and defense expenditure relation with economic growth by the help of other control variables as the labor employment rate, gross fixed capital formation, health index, education index and political index. The conducted study concluded that defense expenditure and foreign aid has negative and significant impact on economic development of Pakistan in the long run while for the short run the defense expenditure influence positive but insignificantly and foreign aid has negative impact and insignificant outcome. From the policy perspective, the spare defense projects and corruption in the case of aid should be replaced by development projects, it may help to increase the economic growth of Pakistan.

1. Introduction

Defense expenditure and foreign aid strongly affect the economic growth of nations and act in society at all levels. Economic growth plays a vital role as it is the necessary ingredient for making improvements in the quality of life and economic welfare by creating jobs, wealth and diversifying the economy, etc. A nation's Defense is taken for the defending action and protecting from the dangerous and attack. Foreign aid refers to the serving hand for the many developing countries by the global transfer of capital and goods & services developed nations to the developing countries. It can be a grant or a loan having various types like military-aid bilateral-aid (from one management to the other), multilateral-aid (from different organization to the other global organizations. Foreign assistance supports the humanitarian, military and development aids for helping in the natural disasters, in promoting economic development and for encouraging armed strength respectively. Sharif and Afshan (2017) examined the study for the India and the Pakistan for military expenses influence on income inequality by different surveys during 1980-2014. Results exhibited positive and significant effects for military spending in both countries India and Pakistan.

Since 1947 the Pakistan is facing various crises, in which Afghan Soviet, war of Indo-Pak in 1965, parting of the East Pakistan (Bangladesh) in 1971 etc. are including. All of this has resulted in increased defense expenditures and an increased need for foreign aid. Hence defense is necessary for

the security of a nation, but its expenditure considered a burden. Foreign aid has a vital role in society but major part of the aid is absorbed by corrupt people due to which it has never fulfilled its aims. These sentences asserting that study of the defense expenditure and the foreign aid is important for the economic growth in Pakistan and changed via time. The grants decreased overtime while the loans and defense expenditure increased. During second and third five year's plans the dependency on the foreign assistance was increased. The defense spending increased to 3 percent before 1965. Pakistan's defense expenditure during 1971-72 again reached to high level due to separation of East Pakistan. Pakistan attained a vast amount of foreign aid for the USA war against Afghanistan while it decreased in 1990's. In 2020 China had major defense armies in the world at 2.18 million, other first five major defense armies include United State, Russia, Korea and India in the world. For economic and political consequences in the community of Pakistan the foreign aid and military expenditure has more importance for discussion.

The solitary objective of this paper is to connect influences of the defense spending and the foreign aid and its impacts on the macroeconomic indicator of economic growth in Pakistan during 1972-2019 by using time series data.

2. Review of Literature

By reviewing the previous studies, the judgment of ideas of different scholars about existing problem can be achieved, that have been helpful always for new investigators.

Chawla (2001) analyzed the military expenditure of Pakistan, and concluded reason for the high spending was the wastage of excessive %age of the resources. The study exhibited the impact on the welfare and growth rate in the long run due to defense burden of the developing nations by applying penal data from 1962 to 2006, outcomes concluded that increase in defense expenditure had ambiguous influence on economic growth rate (Shieh et al. 2002). The co-integration effect of the foreign aid on growth rate of six depressed African states was focused, foreign aid influenced negatively and significant without Togo, which had positive and significant influence for RGDP (Malik 2008).

The economic growth was explored for military expenditure via penal type of data taken from 1992 to 2006 for ninety countries. The findings revealed the negative impact of economic growth on military expenditures. The effect of foreign aid on the Governance of Pakistan observed by investigating secondary type of data over the period of 1984-2012. The clarified study found the significant and negative impact of foreign aid on state of Pakistan. (Chang et al. 2011, Sarwar et al. 2015). Hussain et al. (2015) explored an experimental analysis for the duration of 1972-2012. The results of finding confirmed that defense spending were not gain able and influenced on GDP negatively significant.

Sheikh and Chaudhary (2016) elaborated the relation between the defense spending and economic growth of Pakistan and India during 1972-2010. Finding of the study showed that in RDEP linked significant and positive with economic growth while non-defense expenditure influenced insignificant in saving equation of Pakistan.

Pohwaniet al. (2019) Planned to found the influence of Foreign aid to Pakistan's economic growth using time series data from 1991 to 2015. The paper showed insignificant consequences.

Hence opinions of various studies approved different results, in which numerous studies exhibited opposite results while other was in same fevers.

3. Data and Methodology

The current study uses the secondary type of data. The employment rate of labor is designed by dividing the unemployment proportion by the whole labor force. The existing study estimates the polity index by author's calculations taking the unit in fraction form. It involves two variables, one is the political stability and the other is social economic conditions. The health index for this paper is composite by six indicators in which life expectancy (the predictable average living time of a person's life), population/bed, health spending in million-rupees, mortality rate/thousand adults, quantity of hospitals and population/doctor of Pakistan are included. The education index is also taken as proxy for non-defense input, involving of five measured indicators, which comprises figure of teachers existing in degree-collages, degree collage's enrollments, education expenditure, total of teachers of high schools and high school's enrollments of all over Pakistan.

The study deals the economic growth rate of Pakistan linking other essential indicators consuming the Solow-Growth Model. The Cobb-Dougllass function shows the Solow-Swan growth model which is established in 1956 as the production function of neoclassical in economic growth.

The taken equation for this function is

$$Y = A(t)F(K,N)$$

In which,

Y → real output of national income

A (t) → technology

K → sum of capital stock

N → sum of labor

Where,

$$A(t) = f(\text{Defense Expenditure, Foreign Aid})$$

3.1 Variable's Description

The variable GDP is taken for a proxy for growth rate of Pakistan's economy, and is taken as the log of GDP. The defense expenditure and foreign aid are core variables of the paper and taken as the percentage of GDP. The GFCF and labor employment rate are also engaged with a share of the GDP of Pakistan.

3.2 Statistical Description

Statistical Description only describe the data variables, it does not conduct consequences about the data.

Table 1
Variables' Descriptions

Variable	Description	Source of Data	Expected Sign
GDP	Gross Domestic products in Million rupees. (dependent variable)	World Development Indicators and National Account's data files	+

LAB	Labor employment ratio is the percentage of the total labour force.	World Development Indicators	+
CAP	Gross Fixed Capital Formation as a percentage of GDP	World Development Indicators and National Accounts data files	+
DEX	Defense spending/ Expenditure as percentage of GDP	World Development Indicators	±
FAD	Foreign Aid as a share of GDP	Economic Survey of Pakistan Various Issues	±
PLI	Political Index unit for political stability.	GDPR (General Data Protection Regulation)	+
EDI	Education-Index fraction form as a Proxy of nondefense expenditure.	World Development Indicators	+
HLI	Health-Index in the fractional form for non-defense spending	World Development Indicators	+

The econometric functional form of the model for existing study specified on following based on the neo-classical production function.

$$\ln GDP_t = \beta_0 + \beta_1 LAB_t + \beta_2 CAP_t + \beta_3 DEX_t + \beta_4 FAD_t + \beta_5 PLI_t + \beta_6 HLI_t + \beta_7 EDI_t + \mu_t$$

Where, LNGDP is natural log of GDP is the dependent variables in the model. However other variables used in the are independent variables, and μ_t is the error term.

4.1 Results of Study

The different test techniques are adopted to evaluate the selected variable's nature and consulting these results the next procedures are analyzed.

Table 2
Descriptive Statistics

LNGDP	DEX	PLI	HLI	CAP	LAB	FAD	EDI
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Mean	6.678	5.151	3.233	4.648	15.773	94.910	1.886	5.989
Median	6.721	5.513	3.344	5.326	16.279	94.495	1.557	5.541
Maximum	7.123	6.992	5.467	8.153	19.129	99.879	6.501	10.776
Minimum	6.155	3.265	0.602	0.380	11.330	86.926	0.232	3.680
Std. Dev.	0.291	1.319	1.188	2.168	1.833	2.284	1.501	2.269
Skewness	-0.286	-0.112	-0.171	-0.445	-0.553	-0.479	1.331	0.881
Kurtosis	1.934	1.390	2.553	2.216	2.482	4.782	4.343	2.562
Jarque-Bera	2.928	5.287	0.634	2.815	2.986	8.188	17.781	6.597
Probability	0.231	0.071	0.728	0.245	0.225	0.017	0.000	0.037
Sum	320.561	247.228	155.207	223.093	757.106	4555.702	90.508	287.477
Sum Sq. Dev.	3.982	81.810	66.374	221.000	157.937	245.125	105.934	241.877
Observations	44	44	44	44	44	44	44	44

Source: Authors own calculation

Table 2 represents the descriptive statistics. In the above table the mean value of the LNGDP stands 6.678 and showing negatively skewness of GDP at -0.286. For LAB, the mean value is 94.910. DEX has a mean value of 5.151 with -0.112 value of skewness, which shows it's negatively skewness to leftward. The median and mean values for FAD are 1.557 and 1.886 respectively and 1.331 is the value of skewness. The value of kurtosis $4.343 > 3$ showed distribution non-normally.

4.2 Correlation Matrices

We estimated the zero couple correlations to examine the degree of association among the explanatory variables. The value close to +1 is the indication of high collinearity while the value close -1 indicates low collinearity. The results shown in table 3 demonstrating that the LAB rate reduced economic growth by 51 percent, here the reason may be the disguised labor employment rate that looked like working but in fact these employees are not generating production.

Table 3
Pairwise Correlation

	LNGDP	LAB	CAP	DEX	FAD	PLI	HLI	EDI
LNGDP	1							
LAB	-0.51	1						
CAP	-0.15	0.32	1					
DEX	-0.788	0.44	0.38	1				
FAD	0.82	-0.33	-0.31	0.73	1			
PLI	0.50	-0.32	0.08	0.35	0.26	1		
HLI	0.98	-0.51	-0.09	0.72	0.81	0.53	1	

EDI	0.90	-0.40	-0.36	-0.82	0.91	0.34	0.87	1
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Source: Authors own calculation

The multicollinearity between FAD and EDI is at highest level at 90 percent, while the multicollinearity between DEF and EDI stands -83 percent which is the lowest level.

4.3 Unit-Root Test

This assessment is measured to examine stationarity on secondary type of data exhibited in table 4.

Table 4
ADF Test

Variable	Level		1st Difference		Conclusion
	Intercept	Trend & Intercept	Intercept	Trend & Intercept	
LnGDP	-1.229	-1.618	-8.882	-8.947	I (1)
Cap	-2.448	-2.809	-5.398	-5.586	I (1)
Lab	-4.651	-5.533	-15.277	-15.346	I (0)
FAD	-1.873	-3.76	-3.7600	-5.552	I (0)
HLI	-1.257	-2.793	-9.5760	-9.616	I (1)
DEX	-0.816	-1.804	-5.1707	-5.0844	I (1)
PLI	-2.939	-2.976	-5.3726	-5.3627	I (0)
EDI	2.913	-0.915	-2.5059	-4.4910	I (1)

Source: Authors own calculation

The variable is called integrated at zero if it's stationarity stands at level and displays as I(0) on the other hand it will called integrated at first difference if stationarity stands at difference and displays as I (1).

4.4 Long-Run Estimation

The coefficients of the labor and the capital formation are positive and extremely significant. The simplest reason is that hugely employed labor and high capital formation are the indications of the finest living standards and it will cause to decrease in poverty and make improvement in economic growth rate of Pakistan.

Table 5
Long Run ARDL Estimation

Variable	Coefficient	Std. Error	t-Statistic
C	3.567673*	0.609204	5.856288
LAB	0.02303*	0.006961	3.308575

CAP	0.023035*	0.005793	3.976113
PLI	0.009568*	0.004564	2.096184
DEX	-0.047989*	0.010872	-4.41408
FAD	-0.049022**	0.020135	-2.434669
HLI	0.148503*	0.01395	10.645504
EDI	0.031799***	0.02555	1.244573

Source: Authors own calculation using E-views a statistical soft ware

*significance at 1% level, ** significance at 5% level and *** significance at 10% level

In our estimation the one percent rise in defense spending will reason to decrease in GDP 0.05 percent. Defense expenditure has highly significant and negative impacts on the GDP. Solitary reason can be that the defense like a non-development mission in which the investment returned nothing in nominal form as well as it provides safety like wellbeing to humanity that cannot be measured in nominal GDP. The findings seem similar to the the study (Saba and Ngepah, 2019).

Parameter of foreign aid has negative and significant results signifying the foreign aid unfavorable for the economic growth of Pakistan. It facts out the decrease in GDP to 0.05 percent due to one percent increase in foreign assistance. A number of scholars verified the negative relationship of foreign aid with GDP. The verdicts are linked with subsequent studies. Khan and Ahmad (2007) directed a pragmatic investigation round the FAD supporting the growth rate of Pakistan, it was determined that foreign aid never can support the economic growth in Pakistan. Foreign aid influenced the economic growth unfavorably while the GDP impacts positively (Fatima 2014, Raza et al. 2011).

Defense spending influence the GDP negatively solitary reason may be that the defense expenses are not accomplished via market procedure, so there can be the distortion of absolute prices. Alternative reason can be the use of defense expenditure in damaging wars and in defense in defense industry instead of required security, on the other side if these expenditure used in infrastructure it will give returns. Military expenditure are the expenses from a government for elevating and maintaining the armed services by financial assets. These may be the expenses on weapons, equipment, or other capital payments for preserving the security and welfare of a state. When the administration creates expenses for a specific period, consistently other private expenditure will decrease for investment. According neo-classical and classical "the growth in government spending will cause to a replacement of private goods with government goods". Hence the dominance defense expenditure leads to distraction of resources from development missions to non-development schemes. The study concluded negative and significant results by applying penal causality and GMM tests (Saba and Ngepah, 2019).

According to results, foreign aid discourage the GDP of Pakistan. Because of receiving a huge portion of USAID the Pakistan has not stands itself able to support development. This aid may cause to benefits for the short-run instead it cannot useful for the long-run. In this way the dependency of Pakistan is rising on other nation-states due to which the ability of independent economic growth or policies are going to lost. Foreign aid had continuously switched in private reserves and had increased the debt burden (Awan & Mueen-ud-din, 2015, Malik 2008).

One more imperative cause is corruption and injustice. Various private organizations and government administrations are present in the state who absorbs the huge portion of aid to their own

portfolios. The remaining amount of foreign aid almost exploits in projects which are non-development and the slight share is utilized for other social services like infrastructure. These ailments lead to rise in inflation that will cause to decrease the GDP and increase the unemployment. The main causes of the negative link of foreign aid on economic growth were the corruption, non-development expenditure, minimum public investment, shortage of the social services, less government payments for infrastructure, growing inflation, and the chief reason was dependency on foreign aid (Raza et al.2011).

The estimation shows the increase of one-unit in the polity index causes to 0.009568 units growth in the GDP of Pakistan. The study displays identical results (Radu 2015). The next two variables taken as a proxy type variables for the non-defense contribution. Truthfully if we observe the spending on health and education, they will cause to increase in economic growth by contributing for structure up the human factors.

High-quality of health and education be responsible for the well-organized labor force in a country. According our investigation the coefficient of health stands highly significant and influenced positively. The 1 percent growth of the health index will improve the GDP to a 0.15 percent. The same results are suggested by the variety of studies as (Hussain et al. 2015, Afzal et al. 2011).

4.5 Short-Run Estimation

Table 6
Short-Run ARDL Estimation

Variable	Coefficient	Std. Error	t-Statistic
D(LNGDP(-1))	-0.470**	0.156	-3.008
D(LNGDP(-2))	0.212	0.199	1.062
D(LNGDP(-3))	0.634*	0.179	3.551
D(LAB)	0.014**	0.005	2.782
D(LAB(-1))	0.006	0.006	1.063
D(LAB(-2))	-0.007*	0.002	-3.437
D(CAP)	0.022*	0.005	4.400
D(CAP(-1))	0.001	0.004	0.274
D(CAP(-2))	-0.009**	0.004	-2.283
D(CAP(-3))	-0.005	0.003	-1.609
D(DEX)	0.003	0.012	0.274
D(DEX(-1))	0.052**	0.021	2.520
D(DEX(-2))	-0.039**	0.016	-2.403
D(DEX(-3))	0.021	0.013	1.574
D(FAD)	-0.002	0.005	-0.411
D(FAD(-1))	-0.016**	0.007	-2.426

D(FAD(-2))	0.027*	0.008	3.439
D(FAD(-3))	0.030**	0.010	3.023
D(PLI)	0.009***	0.004	2.115
D(HLI)	0.101*	0.021	4.869
D(HLI(-1))	0.016	0.015	1.058
D(EDI)	0.045	0.025	1.775
D(EDI(-1))	0.077	0.043	1.775
D(EDI(-2))	-0.037	0.034	-1.090
D(EDI(-3))	-0.097*	0.029	-3.379
CointEq(-1)	-0.972*	0.199	-4.882

Cointeq = LNGDP - (0.0230*LAB + 0.0230*CAP -0.0480*DEX -0.0490*FAD + 0.0096*PLI + 0.1485*HLI + 0.0318*EDI + 3.5677)

Source: Authors own calculation using E-views a statistical soft ware

*significance at 1% level, ** significance at 5% level and *** significance at 10% level

The finding of the outcome showing appropriate value is of co-integration which is $-0.971764 < -1$ with 0.0005 value of probability. The impacts of coefficients of CAP and LAB are significant at positive level. The result showing that there is 0.01 unit of growth in GDP by increasing 1 unit of LAB and 0.02 units growing in GDP due to a one unit increase in CAP. While for the second lag the defense spending has adverse impacts on the economic growth of Pakistan, at which the defense expenditure is significant and negative, at which the one percent rise in defense expenditure will reduced the GDP 0.04 percent. The estimate displaying relationship of foreign aid negative as in long-run evaluation, instead in the short run its parameter stands insignificant. The parameters of the non-defense contribution representing the similar impacts.

5 Concluding Remarks

Finally, we present the conclusion of whole the study and suggested the policy based on the finding of the present research.

The principal purpose for conducting this study is to explore the involvement of foreign aid and defense spending in the economic development of Pakistan by the support of other selected control variables, illustrated as gross fixed capital formation, health index, labor employment rate, education index, and polity index. The existing research paper used the annual type of data from 1972 to 2019 by using Solow Growth model. The study used the GFCF as a proxy for capital (CAP) as an independent variable and used the health (HLI) and education (EDI) indices as the proxy for non-defense contribution as an independent variable with defense expenditure and foreign aid to measure influences on the economic development of Pakistan. The defense expenditure shows opposite estimation for the short run analysis which declares it insignificant. Foreign aid influenced negatively such as in the long-run investigation at insignificant level in short run.

Based on this research paper the policy implications are based on the following:

- I. The government focus should be on the total labor working in Pakistan, for the purpose of replacement of the disguised employed labor by effective labor, this step will cause to promote the economic growth and can present new technologies in Pakistan.
- II. Obviously the defense segment is not neglect able but needless arms schemes should be swapped by development missions for making enhancement of the trade of goods & services as an alternative of weapons. Automatically this growth in GDP will increase in defense expenditure to some limit.
- III. Defense instructions should be stimulated by removing regional and political conflicts and keeping political stability.

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