



Macroeconomic Factors Determining the Growth of Pakistan



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Abstract

This study attempts to explore the relation of External Debt, Terms of Trade, Education, Military expenditures, Consumer Price Index, and Gross Domestic Production of Pakistan throughout 1997-2019. To estimate the targeted objectives of this research Auto Regressive Distributive Lags (ARDL) technique was used. The results revealed some facts that Military expenditures and education were essential to achieve the goal of the high growth rate of the economy in the form of Gross Domestic Production. So policymakers should adopt strong strategies. Education should be as skilled and technical as possible and produce military equipment to save foreign exchange. CPI, TOT, and Exd should be properly regulated because of their negative impact on GDP. CPI affects the people, so fiscal policy should be adopted. Without external debt, governments feel helpless, so breaking this trap is essential for dignity and development. The model has a dampening convergence towards equilibrium.

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Introduction

It has been a common problem for all highly indebted countries, first low per capita income, and second is low economic growth because these countries have imports of capital intensive goods and export mostly primary commodities (Nwannebuiket al., 2016). These circumstances emphasize getting assistance through external debt. As it is clear in the report of the World Bank 2000_2001, Pakistan is facing a serious debt problem and is one of the lists of highly indebted countries. Pakistan has a very grim situation for the future as well

as the present (Ali and Mustafa, 2012). Therefore it is the call of time to minimize this accumulation, so essential actions should be taken for a better economy's future (Addullahiet al., 2015). The objectives of a developing country like Pakistan are (1) to sustain the growth of the economy, (2) to get infrastructural development and reduction of extreme poverty. If the government fails to do so, then it becomes necessary to get financial assistance in the form of external debt. The same case is with Pakistan (Dey and Tareque, 2019). At the start of the 21st

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century, heavy indebtedness became a major economic policy problem for Pakistan. Only one possible way to get effectiveness from debt is to utilize the debt in the form of developing the infrastructure. Otherwise, its negative effect cannot be controlled (Din *et al.*, 2020). In this case, the main hindrance to the development and growth of developing countries is external debt and repayments. As the study of past thrice decades shows that a decrease in investment and growth has been due to the external debt. It is like a tax that is unfavorable on next-generation without their will (Malik *et al.*, 2010).

According to the statistics, the inclination of economic growth is decreasing while the expenditures of government are increasing. These increased expenditures force the government to go to the financial institutions, either SBP (State Bank of Pakistan) or international like Asian Developing Bank, International Monetary Fund (IMF), and World Bank. The government also increases taxes on public goods. All these steps decrease the economic growth because such borrowing money supply increases, which is a cause of increased inflation or in prices of goods. So increase in taxes becomes a reason for distortion of economic growth and output of the economy (Attari and Javed, 2013).

According to the new growth theories, human capital has much importance for economic growth—investment in human capital in the form of education increase the productivity and skills of workers. Education provides not only market benefits but also nonmarket benefits. Higher investment in education helps people to achieve higher capabilities economically. Because it improves productivity, skills, awareness, and quality of life (Khattak and Khan, 2012). West and East Pakistan had unfortunately only one higher education

institution, the University of Punjab and the University of Dhaka, in 1947. Until now the spending on education, science, and technology is less than the global average. According to UNESCO and World Bank data spending in countries of OIC, including Pakistan is very low, like 0.34% of GDP, while the global average is 2.36 % (Kiani and Kauser, 2010).

So investment in human capital in the form of educational expenditure is essential to source for development and economic growth. Well-educated workers keep ready to adopt new skills and emerging technologies with new equipment. So the performance of skilled and educated persons results in better output for the economy gradually, so the goal of economic growth will be achieved (Ali and Jabeen, 2015).

The main conclusion from various studies showed that education is very helpful to achieve sustained growth of the economy. Two-way causality exists among the variables economic growth and expenditure on education like in one side, more education guides toward better economic growth on the other side, in the long run, it reduces poverty and increases the standard of living of the people (Kiani and Adiga, 2013).

The goal of macroeconomists is to gain sustainable economic growth with minimum consumer prices of goods because inflation declines the growth and increases income distribution. Both demand-pull inflation and supply pull inflation has a positive correlation. Suppose the growth increases with the pace of demand, then high growth will be attained without inflation. At this stage, there will be spare capacity for more demand pressures. If there is no output potential and full employment level, then an increase in demand will be a cause for high prices. This situation has severe problems for the economy (Ayyoubet

[al.,2011](#)). The high consumer price index affects the economy and decision-making process for all economic players like consumers, producers, investors, and savers. It proved a cause of the erosion of local currency's value in terms of currencies of foreign ([Arby and Ali, 2017](#)).

TOT is the export prices relative to import prices. It indicates a relationship between the quantity of two products buying and selling between countries. TOT improves when the prices of export increases than that of the commodities of imports. It means foreign exchange inflow is more than outflow. This is favorable for a balance of payment and economic growth. Growth is adversely affected if the prices of output increase ([Ijaz et al.,2014](#)).

If domestic demand for cross-border goods increases and domestic goods demand decreases, then this situation adversely affects the trade balance at the start and, in the end, economic growth. Deterioration in terms of trade leads to elevate a country's national welfare when there are differences in wage rate ([Jebran et al., 2018](#)). Four propositions are famous in the context of economic growth and TOT; export lead growth, feedback relation, third growth has driven export, and fourth is no relation between TOT and economic growth([Hussain 2014](#)). Security from domestic and foreign threats has its importance for persons and property for any economy. So increase in security and certainty will cause an increase in output. According to Adam Smith state has to perform two primary duties; protection of society from violence and protection from invasion of foreign states. Most developing countries have a fear of insecurity and war. So their economic growth is affected by this uncertainty([Dunne et al.,2005](#)).

Literature Review

[Dey and Tareque \(2019\)](#) aimed to study the shock of external debt on Bangladesh's

GDP growth. They formed a variable Macroeconomic Policy(MEP) by using data from 1980 to 2017, applied the ARDL testing approach. Results showed that external debt had negatively related to growth while MEP had a positive effect and significant.

Din *et al.* (2020) studied the problem of Pakistan's economy of external debt by using the data of time series 1976_2018 in the light of the Solow Growth Model with ARDL, ECM, and appropriate diagnostic tests. Results showed that debt servicing and external debt prevent the economic growth of Pakistan. They emphasized that government should increase exports, foreign direct investment, foreign exchange reserves, savings, and exports to decrease dependence on external debt and increase economic growth.

[Malik et al. \(2010\)](#) aimed to look at the relation of external debt and Pakistan's economic growth by using data of 1972_2005. And explored that external debt and economic growth had negative relation while debt servicing has an inclination of regular increase. It burdened the economy. So external debt and debt servicing both lead the economic growth towards decline.

Khurusi and Ada (2018) explored the relation involving economic growth and government outer borrowing. The data was gathered from the central bank of Oman and World Bank of variables Gross Domestic Product Growth rate, external debt to GDP, population, fixed capital formation, and trade, price rises, and school enrollment. The results of ECM showed short-run negative relation of economic growth in Oman and foreign debt because of the problem of crowding out due to debt overhang. The capital formation had a significant encouraging impact on growth.

Cordella *et al.* (2005) explained that most highly indebted countries (HIPC's)

have been suffering from the problem of debt overhang. So their growth rate cannot improve in the presence of external debt. The results from HIPC's showed that when debt increases above 15 to 30 % of GDP it affects the growth irrelevant more than 70_80 % of GDP. So this decline in GDP is also because of the rise in external debt burden and its non-serious utilization.

[Nwannebuiket al., 2016](#)) used export factor research design to ascertain the external debt's impact on Nigeria's economic growth by using data of GDP, exchange rate, external debt stock, and foreign debt servicing for the time period of 1980-2013. Data were analyzed by ordinary least square, augmented dick fuller, unit root test, and error correction model. It revealed that external debt is positively related to economic growth in a small time frame. However, in extended time it is negative as debt servicing is also negatively related to economic growth. But exchange rate had a positive relation with economic growth.

[Ali and Mustafa \(2012\)](#) investigated that external debt is a great phenomenon for developing countries with low domestic financial resources like Pakistan. Whose debt condition keeps griming. They used capital formation, external debt, labor force, and human capital as independent variables. GNP as dependent variable, applying ADF test co-integration and ECM for 1970_2010. Evidence has revealed the harmful impact of external debt on the economy because of overhang. Human capital is positively related to growth while the labor force has helpful relation with economic expansion because of low productivity and unskilled labor while in the short run has a positive impact on growth. This study recommended if savings and export would be rise than reliance on the external debt will be reduced. And there is hardly a need

for good utilization of external debt for the prosperity of Pakistan's economy.

[Senadzaet al.\(2017\)](#) looked at the impact of foreign debt on the economy of 39 sub-Saharan African countries, using data of 1999_2013 by applying the Generalized System Method of Moments(GMM) technique for estimation. Thirty-nine countries have been categorized into middle-income and low-income countries on the basis of per capita income. But the results were not different; in both cases, the negative force of debt on growth was examined. So there is a challenge for economists to reduce the dependency on foreign debt because this is impossible for developing countries to enhance their economic growth in the presence of external debt. This study focused to generate domestic revenue by increasing the tax net and checking the holes of revenue leakages to raise domestic revenue for economic growth.

[Shaukat al. \(2019\)](#) evaluated the macroeconomic uncertainty, private investment, and consumption expenditure with control variables like volatilities of foreign direct investment rate of interest, inflation, Government consumption expenditure, and political instability. By using secondary data from the World Bank of 1975 to 2014. Autoregressive model and GARCH technique have been used in the study and showed that foreign direct investment played a key role in the development of the economy because of resource inflow, infrastructural development, and advancement of technology. Government consumption expenditure has a significant effect and negative impact on private investment. So it confirmed by this study that volatility of macroeconomic variables has a significant relation to Government consumption in Pakistan, like developing countries.

[Attari and Javed. \(2013\)](#) investigated the relation of economic growth with

inflation and Government expenditure. Government expenditure disaggregate into two types of expenditure first current expenditure second development expenditure, by using data from 1980_2010 time series. Analyzed by ADF, ARDL, Granger Causality test, and Johansen Cointegration. Derived results showed that relation existed long term, positive externalities are yielded by government expenditure. But in short-run only government expenditure and economic growth and inflation is not. Unidirectional causality existed between inflation, government expenditure, and economic growth. Effective policy analysis is applicable due to the stability of ECM. No autocorrelation was found in this study.

[Khattak and Khan \(2012\)](#) concentrated on economic growth and contribution of education by using data time series from 1971_2008, applying analytical technique Ordinary least square and test of Johansen Cointegration. The results of OLS showed that education positively contributes to GDP in Pakistan. The results of Johansen Cointegration also proved the results of OLS right and found the constructive relation between education and economy. So to increase Primary school enrollment and decreasing the dropout rate will be helpful to achieve stable economic growth.

[Ali and Jabeen. \(2015\)](#) deliberated that the role of education in the economy by education quality dissemination. The work was around the macroeconomic variables improvement and education's role in this reference first preliminary and second, middle, and higher school enrollment were used as variables some basic health units were also used as macroeconomic variables. So it is clear that education is a driven force for the development of the economy and individuals' income. So for achieving

economic growth, it is essential to bring major changes in the basic education system.

[Kiani and Adiga. \(2013\)](#) aimed to prove that enhanced schooling is a key factor for development strategy. For this purpose, some key macroeconomic variables are used like economic growth, exports, literacy rate school enrollment at a primary, middle and high level. Some basic health units (BHUs) and labor force. It is concluded that to gain stable economic growth, it is essential to motivate the children and Youngers to enroll in educational institutions. It implied that literacy is a pre-requisite to accelerating growth. So foundation stone is education for economic development. Health and exports have a positive relation with economic growth as well as education.

[Ajmairet al.\(2018\)](#) used the approach of general to specific to examine the effect of gross national expenditures, credit extended, consumer price index, remittances, gross fixed capital formation on economic growth in case of Pakistan. Results showed a positive association between economic growth and gross fixed capital formation and remittances while CPI. So it is recommended to control inflation, alleviate government involvement in the market, especially financial, cut government expenditures, increase capital formation and try to gain foreign remittances to speed up the wheel of economic expansion.

[Ayyoubet al. \(2011\)](#) first inspected the impact of price increases on economic development in Pakistan. Second to re-examined the relation of growth in the presence of inflation. Time series annual data from 1972-73 to 2009-2010 is used by applying simple regression analysis. The results concluded that there is a tradeoff between the growth of GDP and inflation. The significant results showed that the

increase persistently in price level reduce in economic growth. But there is a threshold of 7 percent for inflation. Below 7 % inflation ion caused positive effect on economic growth and above is it's opposite. Trade openness has a significantly positive relationship with economic growth.

[Ijaz et al. \(2014\)](#) studied the relationship of terms of trade, inflation, and growth of the economy by using data from 1972 to 2012 of Pakistan. GMM techniques were employed to examine it. There is a depressing relation among the growth of the economy, terms of trade and inflation while foreign export prices are positively related to inflation. It has observed the significant and positive influence of money supply on inflation. So inflation increase by foreign export prices implied that if dependency on foreign imports reduced, then inflation will also be decreased, which is a good sign for economic growth.

[Arby and Ali, 2017](#) searched the answer to the question of what is the inflation threshold level beyond which growth will be positive? They found the relation of economic growth and inflation, and when they proved its relation is negative, low, and stable? By using annual data from 1976 to 2017, employed two models for analysis 1. Quadratic 2. Regression kinked. [Arby and Ali, 2017](#) examined that inflation and growth has nonlinear relation. So when inflation was low and stable, growth was positive, and when it was negative economic growth was high. But in reference to Pakistan, it was observed when co-existence was found in inflation, and economic growth means high inflation with high economic growth. So threshold level was searched by them, which was 5.67. So below 5.67 level inflation is favorable for economy while above 6.05 can hamper the growth of Pakistan. So it was suggested to remain inflation to keep below 5.67%.

[Jebran et al. \(2018\)](#) examined the effect of terms of trade on the economic growth of Pakistan by using data from 1980 to 2013. Econometrics techniques were opted. Results showed a significant positive relation of TOT and the economic development of Pakistan. While positive relation between labor and economic growth exists. Capital stock optimistically influenced the growth in the long run, not in the short run. So deteriorate TOT is required to increase economic growth.

[Farhane and Heshmati, \(2020\)](#) tested the saying that the growth engine is traded, using data Southern African Development Community(SADC). Results indicated that during the time period of 2005_2017, expansion of export had stimulated the growth, but trade openness reduced it. So results indicate three conclusions like at first if trade keeps exporting to increase, than the objective to achieve capital formation will be fulfilled and at second trade openness jeopardize the economic growth, and finally, SADC could not gain its expected targets. So trade should be increased by export, not imports, for growth of the economy.

[Hussain \(2014\)](#) explored that there was a turbulent phase for Pakistan's economy from the last two decades as led toward default because of its debt. He examined through Granger Causality test, causality in export and import for economic growth in Pakistan from 1976_2011. ADF, Granger Causality, and co-integration econometrics techniques were employed. Bidirectional causality existed between GDP and exports and no Causality between imports growth and export. It has been concluded that an increase in exports would help to increase exports because more products fulfil domestic demand.

[Jawaid and Raza \(2012\)](#) investigated the impact of TOT and TOT's volatility on the growth of the Indian economy by using

data time series from 1980 to 2010, employing co-integration technique. Which resulted that there was positive in the long-run relation of TOT and growth. But volatility of TOT was negatively and significantly related to economic growth. Results proved robust by sensitivity analysis. So it should be less volatile for betterment of economy's growth in the case of India and diversifying export to make volatility less effective.

[Mirza et al. \(2015\)](#) found in their paper the contingent relation between state's economic growth and military spending. There were three types of schools of thought in this perspective; 1. economic growth is promoted by military spending, 2. it chocks off economic growth 3. no causal relation. Being indispensable military spending need of time for Pakistan due to the threat perception. So, that study has an argument military spending has its role in economic development, maybe it would be indirect. Provision of security advancement in technology and social projects were positively related to health of the economy. A variety of states has been earning trillions of dollars with arm trades. Defense industrial efficiency has the capacity to contribute a lot by increasing its output by supplying equipment. So the policy is essential to make a self-sufficient and powerful industry of defense for a long run. Then, it would support the military and a way to earn foreign exchange by increasing export of arm equipment.

[Chairilet al. \(2013\)](#) examined that post cold's military expenditures has been increase the trend for the ASEAN region, including Indonesia. This trend supported the argument of the positive multiplier of military expenditure's effect on growth of the economy. Empirically test of casual relation of economic growth and military expenditure has tested by using Augmented Solow Growth model. Results

demonstrated the positive outcomes of Indonesia's military spending on growth because of development for human capital as entire effect of military expenditure.

[Shahbaz and Shabir. \(2015\)](#) re-investigated the consequences of military expenses on the economy by ARDL bound testing and rolling window approach (RWA) to check long-run relation of variables. Causality of military expenses and growth was checked with VECM Granger causality. Empirical results indicated relation between variables existed in long run and confirmed by the approach of rolling window. There was unidirectional and negative causality from defense expenditures.

[Dunne et al. \(2005\)](#) estimated growth model while growth literature did not prove that military spending had a significant determinant of economic growth. This paper attempted to justify that there was a product of special specification, like Feder-Ram model. This model did not a part of mainstream literature of economics. They evaluated two theoretical approaches; the Barro model and the model of augmented Solow. It is concluded Feder-Ram model did not fit for defense economics literature. Such literature like mainstream growth of economy is good for this type of analysis.

[Qureshi and Khan \(2017\)](#) aimed to investigate different phases of regimes of the military of Pakistan by using model of Markov Switching. Two type of relation has been found; 1. there was positive causality between two variables, 2. positive connection between military expenditures and GDP growth at low variance. Keynesian Income Multiplier supports this idea. So in the state of a stable economy, military expenditures resulted in positive outcomes on economic growth, otherwise negative. So military expenditures need to plan according to the economic condition of the country.

Methodology

The data used in this analysis of 32 years from 1997 to 2019. The variables are External debt, Gross domestic production, Terms of Trade, Military expenditures, education, and Consumer price index. The records are obtained from World Bank.

Method

Unit root test was done with Augmented Dickey-Fuller (ADF). ARDL was used for data analysis.

Model Specification

The model consisted on External Debt, Gross Domestic Production, Terms of Trade, Military expenditures, Education, and Consumer Price Index. The dependent variable is GDP, and further variables are independent variables.

Model mathematically formulated as

$$GDP=f(\text{Exd, TOT, Edu, Mlt, CPI})$$

For estimable has written as equation

$$GDP=b_0+b_1\text{Exd}+ b_2\text{TOT}+b_3\text{Edu}+b_4\text{Mlt}+b_5\text{CPI}+e_t$$

b_0 =a constant term, b_1 , b_2 , b_3 , b_4 , b_5 are coefficients of independent variables

GDP= Gross Domestic Production

Exd= External Debt

TOT= Terms of Trade

Edu= Education

Mlt= Military expenditures

CPI= Consumer Price Index

e_t =Error term

Unit Root Test

Non stationarity is takes typically as a problem. So stationarity test is essential to determinate the state of stationarity at different levels (Abdullahiet al., 2015). On the basis of the results of stationarity test ARDL approach has been used. It is

enough for correction of endogenous residuals, variable's problem and serial correlation. Testing of unit root test is not essential for ARDL approach, but it is good to be risk free from invalid estimation. So before doing from econometric analysis, the test of stationarity properties has done (Dey and Tareque, 2019). Unit root testing was done with Augmented Dicky Fuller (ADF)

ARDL Bound Test

After level determination, to investigate of co-integration of Gross Domestic Production and its determinants. It has advantages over other methods like using only one model of reduced form and is applicable when there is mixture of stationarity of level and ^{first} difference, not ^{second} difference. Secondly it can estimate long and short-run results (Abdullahiet al., 2015). F-Statistics in ARDL error correction model (ECM) will be calculated. Long-run relation determined by F-Statistics. Represented yardstick of I(0) and I(1) shows lower and upper estimate limits for F-Statistics. In the case of calculated value of estimated F-statistics is larger than the estimated value of both limits at that time long-run relation exists in the form of co-integration. There will be inclusive relation when F-statistics are between two values, and there will be no co-integration when F-statistics value will be lesser (Naryan 2005). In short-run ECT is estimated which stands for error correction term that defines correction mechanism to stabilize disequilibrium. So negative ECT term is necessary for effectiveness co-integration and adjustment in model's problem of disequilibrium (Abdullahiet al., 2015). Pasaran Shin and their research fellow Smith, 2001 had discovered a method for testing co-integration named ARDL technique has used with following steps

1. Test of the unit root of each variable

2. Select optimal lag for equation
3. With the help of Wald test, measure the long-run relationship
4. Coefficients have measured for both short and long run
5. Diagnostic and stability measures were done in end ([Attari and Javed, 2013](#)).

Analysis

For checking the stationarity of the economic variables, a test has been used called Augmented Dicky Fuller (ADF). The results shows that GDP at a level while other variables are stationary at first difference.

Table 1. Results of Unit Root Test

Variable	Constant without Trend				Constant with trend			
	Level t-stat	P-value	1st Diff t-stat	P-value	Level t-stat	P-value	1st Diff t-stat	P-value
GDP	-3.7288	0.0080**			3.8250	0.0273**		
Exd	-1.0964	0.7059	-5.0922	0.0002**	-2.2893	0.4281	-4.9618	
TOT	-0.7534	0.8194	-7.8583	0.0000***	-2.7809	0.2135	-7.7713	0.0000***
Edu	-2.8172	0.0667	-4.1674	0.0026**	-2.7350	0.2301	-4.1631	0.0127*
Melt	-1.5203	0.5114	-4.4299	0.0013**	-0.1163	0.9924	-4.7879	0.0027**
CPI	-2.6658	0.0904	-6.6230	0.0000***	-2.6261	0.2719	-6.5261	0.0000***

Source: Accumulated by authors

Note: ***, **, * represents level of significance at 1%, 5% and 10% respectively.

The table has calculation of first of intercept and second of trend and intercepts at level and first difference CPI, ED, EDU, MLT, and TOT are stationary at first difference while GDP is stationary at level. So ARDL technique is used for further analysis.

ARDL Bound Test Results

Table 2 consists of results of ARDL Bound

co-integration's result. The model proves significant for the long run relationship statistically. Here Gross Domestic Production is as a dependent variable. The F-Statistics is 7.99, which is larger than the lower and upper bound values. So GDP, CPI, MLT, ExD and TOT have a long-run relation and are co-integrated because the condition for using ARDL bound test is fulfilled.

Table 2. Results of ARDL bound test

Model for Estimation	F-Statistics	
	7.99	
Significance Level	Lower Bound	Upper Bound
10%	2.26	3.35
5%	2.62	3.79
1%	3.41	4.68

Source: Accumulated by authors calculation of ARDL Bound Test

Estimation of Long-Run Coefficients

Results show that CPI, ExD, Edu, and TOT are negatively related with GDP while MLT is positively co-related with GDP. CPI and MLT are statistically

significant. So all variables have a long term relation with GDP.

Estimation of Long Run coefficients ARDL(1,2,1,2,2,1)dependent variable is GDP

Table 3. Long Run Coefficients

Variables	Coefficients	T-Statistics
CPI	-0.1998***	-3.1816
Exd	-0.0646	-1.0546
Edu	-0.3100	-0.3982
Melt	1.3709***	3.6405
TOT	-0.0282	-1.1002
C	5.0359**	2.5180

Source: Accumulated by authors

CPI is negatively related to the GDP. The coefficient value is -0.1198 which means 1% increase in CPI will lead to a 0.2% decrease in GDP (Attari and Javed, 2013) (Ajmairet al., 2018) (Minhaj-ud-Din et al., 2020). The value of external debt 's coefficient and education is also negative and insignificant which means that a 1 % increase in Exd and Edu will cause a 0.06% decrease in GDP (Muhanji and Ojah, 2011) (Minhaj-ud-Din et al., 2020). 1 % increase in Edu will cause a 0.31% decrease in GDP respectively (Eggohet al., 2015). Military expenditure is significant at all level like 1%, 5%, 10% and positively related to GDP (Mirza et al., 2015) (Chairilet al., 2013). terms of

trade is also negatively related to GDP and insignificant. Value of coefficient show that 1% increase in TOT will be a reason of 0.03% decrease in GDP (Muhanji and Ojah, 2011)

Error Correction Representation of Results

The term ECT₁ shows the long run relation among variables of the model. It should have a negative sign with proper level of significance (as shown in below table). This value of coefficient -1.30 tells about the adjustment rate of the estimated coefficient (short-run).

Table 4. Results of Error Correction Term

Variables	Coefficients	T-Statistics
D(CPI)	-0.1907**	-2.1852
D(CPI(-1))	0.2048**	2.5101
D(Exd)	-0.3040***	-3.3538
D(Edu)	1.43	0.898
D(Edu(-1))	2.3664	1.8390
D(MLT)	2.9482**	2.5460
D(Mlt(-1))	-2.1348	-1.7083
D(TOT)	-0.106*	-1.9071
ECM	-1.3016***	-6.4755

Source: Accumulated by authors calculation of ECM Term.

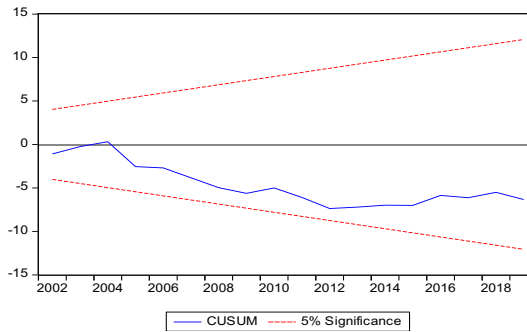
The ECM has a negative sign and at the 1% level is statistically significant. If the co-efficient value of lagged ECM term lies between -1 and -2 then it makes dampened fluctuation (Narayan and Smyth 2005). In this model ECM value is -1.3 which implies that there is fluctuation around the long run equilibrium dampening manners instead monotonically convergence.

Test of Stability

The cumulative sum of recursive residuals(CUSUM) and the other one cumulative sum of squares of recursive

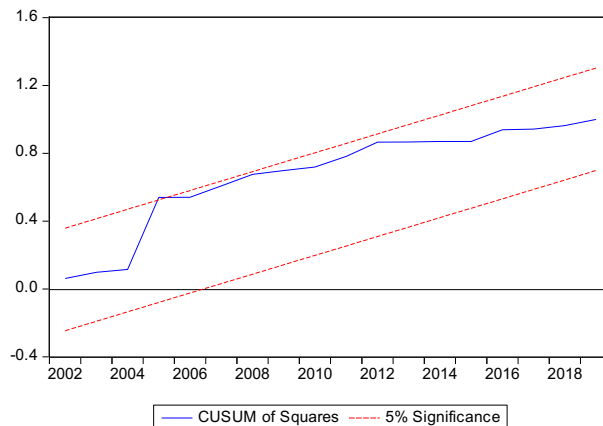
residuals(CUSUMSQ) are employed in ARDL estimation, in the end, to test out the constancy of all coefficients in model of ECM for short and long run(Attari and Javed, 2013). The CUSUM and CUSUMSQ 's plots are given below and show that the estimated coefficients are stable in the ECM model over the selected time period at the level of significance of 5 % because there is no deviation of the blue line beyond the red lines, which are considered as critical lines. Hence the result showed the stability in short and long run. So it can be gathered that there is no structural break for the selected sample of the time period.

Custom Test



Graph 1

Cusum of Square Test



Graph 2

Conclusion

This paper examined the impact of consumer price index, external debt, terms of trade, and military expenditure on GDP in Pakistan for the period of 32 years by applying ARDL approach for short-run and long run. ECM term was calculated to measure the speed of adjustment.

The empirical outcome of the model evaluated that there is elongated relation between all selected variables. CPI, Exd, and TOT has a depressing impact on GDP. Edu and Melt have encouraging relation in the short-run with GDP. But in the long run only Melt expenditures are positively related with GDP.

The co-integration equation proves a parameter is significant and has adjustments in the long run. This value shows a dampening mannered convergence towards equilibrium.

From the perspective of policymaking, it is clear that continuous increase in consumer price index will generate inflation which will decrease the GDP. So it is necessary to control inflation. Similarly, external debt is also negatively affect GDP because of restriction of institution, increase in unnecessary government expenditures and misutilization of it. Terms of Trade are also not favorable in Pakistan's perspective due to low price of and amount of exports. In this study it is shown that education expenditures in the short-run increase GDP but in long run, our system of education does not support the economic framework of economy. Military expenditures in the short-run and long run boost up the GDP. So it proves right

the saying that Defence is a pre-requisite for economic development.

Policy Implications

- Policymakers should make policies to control inflation which is due to many reasons. One tax because tax net is equally deals with poor and rich people and down the purchasing power of poor.
- Government expenditures also effect the economy in form of education if the people will be well skilled and educated in those fields which are the need of time than it will be active earners but our education system provide just degree holders who want job not do research and innovation which is the demand of this time
- Military exp also a burden but it is essential for survival so policymakers should develop such policies which produce military equipment so in this way export of military equipment can earn foreign exchange and save our foreign exchange from imports of military equipment.
- Investment in export goods industries and discourage the imports will give a relief for GDP, so it is a big frame for policymakers to draw their role
- Government should control necessary expenditures which are the main cause to take debt .debt makes the nation a slave who cant take right decision for their welfare no doubt its difficult to do, but favourable policies can overcome this dilemma after hard time.

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