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Nexus between Foreign Aid and Economic Growth in Pakistan (1972-2021)

Bilal Bashir[1], Shuja Ur Rehman[2] & Zulfiqar Hussain Awan[3]

[1] Lecturer (Economics), Govt. Graduate College of Commerce, Sargodha, Pakistan
[2] Head of Economics Department, Pak Shamaa School, Qatar
[3] Lecturer, Department of Economics, University of Sargodha, Pakistan

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ABSTRACT

Aid from other countries is essential to the financial well-being of emerging countries and makes a significant contribution to economic expansion. Since Pakistan is one of the countries that receives a substantial amount of foreign aid, the purpose of this research is to determine the impact that this assistance has had on the country's economic progress. In order to fulfill their responsibilities, developing countries like Pakistan become more reliant on financial assistance from other nations. The purpose of this study is to investigate the relationship that exists between international assistance and economic expansion in Pakistan during the course of the years 1972 through 2021. For the purpose of determining the empirical analysis, the auto-regressive distributed lag (ARDL) co-integration method is used. In order to determine this nexus, data on all of the contributing components is collected over a period of fifty years, beginning in 1972 and continuing through 2021. According to the data, there is an association between foreign aid and economic growth over the long term in Pakistan. However, the results showed that foreign assistance also had a positive impact on real GDP in the short term.

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Introduction

Finance has been the key source of progress for any country since the inception of its existence. Most nations spend money on health, education, infrastructure, defense, welfare, and energy, but developing nations do not invest enough in these areas due to a lack of resources. External assistance is considered the primary means of covering costs. It is being considered the major source of finance in Pakistan and it is important for economic growth as well. Overseas assistance is frequently associated with official development assistance (ODA), a subset of government expenditures for development that is typically given to less developed nations. (World Bank, 2021). Over the past 50 years, foreign aid has grown to be a crucial strategy for alleviating poverty in poor countries over the past 50 years. Major international institutions like the World Bank (WB) and the International Monetary Fund (IMF) became more influential on these issues related to global economic challenges during this time period (Hjertholm and White, 2000). To overcome the shortage of economic resources for sustainable economic growth, most developing countries heavily depend on other states and governments (Adepoju et al., 2007).

Underdeveloped countries have to borrow from other countries because of fewer exports and more imports in order to strike a nice balance between their resources to encourage job opportunities, increase national income, improve private investment and mitigate the budget deficit. Furthermore, natural disasters like famine, drought, earthquake and floods are also notable reasons for borrowing to invite foreign investment (Nelasco, 2012). Developing countries like Pakistan increase their dependence on foreign aid in order to meet these obligations. The government allocates the inflow of foreign aid for the betterment of health, education, defense, infrastructure, energy, etc., but these allocations are not stable. Instead, they are characterized by some degree of variability. Pakistan has been facing a lot of crises since its birth. Some crises are occurring only because of inadequate government expenditures and the misuse of foreign aid. Pakistan uses tied aid on other projects that are unproductive because of bad economic policies.

Foreign aid does have an impact on how much money the government spends. The Keynesian theory contends that government spending spurs economic expansion and that it acts as an external force that modifies overall output. External assistance also leads to tax relief, as in Pakistan, when foreign aid increases, tax revenue reduces and increases spending on social sectors. On the other hand, higher government spending with bad economic policies may reduce overall economic performance. Foreign aid encourages economic growth in war-torn nations by enhancing fundamental social services like health, education, and human capital production, as well as by introducing new technologies and ideas, constructing infrastructure, and providing crisis relief (De Long and Eichengreen, 1991).

Pakistan is a developing country and has been crying for assistance since its birth because of low domestic resource mobilization. Pakistan is receiving more aid than other countries because of its low domestic savings and poor geographical condition. Foreign aid has had a decreasing trend in Pakistan since 2006–2007 and 2011–2012 because of low domestic savings, budget deficit and an unequal balance of payments. Pakistan, like other less developed countries, depends on external assistance mainly for purposes of development because of very low internal resource

mobilization.

Foreign aid can contribute positively or negatively to the growth of a less developed country, i.e., Pakistan. It is also on the takeoff stage among South Asian countries and came onto the world map in 1947. The important point is that it has been depending on other countries since its independence. A lot of studies concerned with growth and foreign assistance suggest that aid is not effective because of the dire macroeconomic policies of the government and if macroeconomic policies are sound, overseas assistance may have a favorable effect on economic development (Khan and Ahmed, 1997). Pakistan depends on external aid mainly for its progress in different sectors due to very low internal resource mobilization. The flow of savings in developing nations has usually been in the form of external assistance and loans from other nations. Assistance relief may bring rapid economic development. Additionally, there are negative effects of ODA in recipient nations that divert a substantial portion of their revenues for the repayment of debt, security and defense spending, and non-development public administration. Burnside contends that effective policies that have important policy recommendations for donor countries, aid organizations, and policymakers in beneficiary nations help foreign assistance work well.

Furthermore, swift changes in policies, inefficiency of organizations, political instability and biased government sector priorities shrink the impact of economic growth and external assistance. thereby having less effect on the alleviation of poverty as well (Ahmed and Wahab, 2011). Overseas assistance appeared as a main approach to plummeting poverty in developing countries. On the other hand, official development assistance with bad economic policies may reduce overall economic performance. Foreign aid is gaining interest because of its potential to encourage economic growth in the recipient country. Many underdeveloped nations made progress by means of foreign aid in their critical periods. Pakistan's situation is similar to that of other emerging nations. Pakistan is experiencing numerous problems, including low domestic savings, low taxes, shoddy law and order, and energy crises, among others. Under these circumstances, Pakistan is crying for the assistance and the better policies of the government lead to better use of aid.

2.0 Literature Review

There are a lot of studies that examine the connection between foreign aid and economic growth across the world. Economists are still confused about the advantages and disadvantages of foreign aid on the basis of theoretical and empirical evidence.

The theoretical literature

Several theoretical works, including the Harrod-Domar model, two-gap analysis, neoclassical growth theory, endogenous growth theories, and the Solow growth model, have proven how foreign assistance affects a country's economic growth. There are two main categories in the literature on this connection. The first section of theoretical research, such as the Solow growth model and the Harrod-Domar model, shows a positive influence of foreign assistance on economic growth, whereas the remaining section of literature supports a negative effect of foreign aid on economic growth.

The Harrod Domar model is in view of the fact that less developed countries have low

income for sufficient savings to generate new investment; therefore, for a sufficient level of investment in the country, it is anticipated that an addition of internal savings through overseas assistance will remedy this and expand development expenditures. It will also boost capital accumulation, which will result in high economic development. Capital accumulation entails high economic development. The Solow model states that the inflow of capital and the propensity to borrow increase the growth of a country. Likewise, Elmendrof and Mankiw state that the higher the public borrowing, the higher the interest rate, and thus private investment decreases. Additionally, dual-gap analysis investigates how less investment and less of a tendency toward saving are characteristics of developing nations. Therefore, the purpose of foreign aid is to encourage people to save and invest more money.

The Empirical Literature

There is a lot of literature that supports determining the type of nexus between foreign aid and economic growth. This study of literature is divided into three categories, which are as follows: Gezimu Gebre et al. (2021) observed the impact of foreign aid and economic growth by using the auto-regressive distribution lag model to co-integrate with time series analysis and the results revealed that external assistance has an adverse impact on a country's growth in both the long run and shortrun. In this regard, evidence has also indicated that external assistance is not always necessary for the promotion of a country's growth. Albiman (2018) discovered how significant inflows of international aid affected Tanzania's economic expansion. GDP was utilized as the dependent variable in the study, whereas foreign assistance was used as the independent variable. The data was collected between 1976 and 2016, and the Dynamic Ordinary Least Square Method was employed to determine the outcomes. The study demonstrated that Tanzania's economic growth is negatively impacted by foreign aid.

Ahmad and Wahab (2016) examined the affiliation between external assistance and the economic growth of Pakistan. They observed that national savings have a positive effect and foreign assistance has an adverse effect on the growth of the country. The major requirement is to improve internal resource mobilization because of the positive effect of countrywide savings on economic development and also to diminish dependence on external loans. Castrillo (2011) investigated the impact of official development assistance and the role of accountable institutions on economic growth. The study suggested that there is not a huge impact of ODA and accountability structures on growth in the Caribbean and Latin America. But economic factors like decreased government consumption rates, lower inflation rates, and increased trade openness perform well. Muhammad and Qayyum (2011) observed that the substantial inflow of outside funding does not help the country's development. With sound macroeconomic policies, external aid significantly and favorably impacts Pakistan's economic growth. Foreign aid, real GDP, and policy interaction have a strong positive link, in contrast to real GDP and aid, which also have a negative relationship.

Tadesse (2010) revealed that external assistance contributes soundly to the growth of a nation in the long run and is significant in shortrun. The effect of external aid on economic growth is negative when foreign assistance is associated with policy. The negative relationship is because

of the damaging effects of poor policies in long run. As a whole, the current study observed that in the existence of bad policies, the growth effect of assistance is negative. Ekanayake and Chatrna (2010) used the least squares estimation method to calculate the impact of international assistance on developing nations' growth. The various aspects of external assistance have favorable effects in various circumstances, which indicates that external assistance has a healthy impact on the growth of the country when the model was anticipated for various income levels in developing countries. Minoiu and Reddy (2009) analyzed cross-sectional data from developing nations by using two SLS and OLS analyses to determine whether foreign development aid had an encouraging and huge effect on the growth of the nation. They also recommended that when overseas assistance is used as development aid from a large number of donor countries, the effect is faintly small.

Mohey-ud-din (2007) confirmed a positive effect of foreign assistance on gross domestic product growth from 1975 to 2004 in Pakistan. The regression analysis suggested a significant effect of the external capital inflow (FCI) on the GDP (gross domestic product), such that gross domestic product increases as the FCI increases. Thus, on the whole, the effect of external assistance on growth is also positive. Vu Minh Duc (2006) explained that there are problems in the current aid-giving system, while assistance hampers the economic growth of less developed countries. There is an adverse correlation between overseas help and growth because of the basic causes, such as aid dependency, corruption, poor cooperation and poor coordination between the foreign aid agencies. Whitaker (2006) examined the significant impact of external assistance on the growth of less developed countries. As the current paper suggests, the effect of foreign assistance on development is significant. Moreover, 120 developing countries also identified that aid that spurred the economic growth of the developing world to enviable levels would be a massive expenditure.

Kyriakos and Dimitrios (2005) investigated the possible connection between the use of external assistance and economic growth. They documented that productive aid has a huge and favorable effect on the growth of a country and on the other side, volatility has an adverse effect on growth. On the other hand, ineffective aid has a detrimental impact on the nation's economic growth, while volatility has a positive impact. Mohey-ud-din (2005) evaluated both the negative and positive impacts of external assistance on growth by using a quadratic regression model. On the positive side, foreign assistance supports boosting gross domestic product growth. On the negative side, aid is a substitute for savings and also increases the debt burden. This study also estimated that the debt burden of Pakistan has also increased because of aid over various time periods. Njeru (2003) focused on the nexus between foreign aid and government spending and observed that official development assistance does influence government expenditure. An increase in foreign assistance encourages development expenditure more than an increase in internal resources. The nexus between external flow and development expenditure may specify that foreign aid is not spent for development purposes at the margin.

The aforesaid literature indicated that the majority of studies have anticipated short- and long-term relationships with the co-integration method and the studies highlighted the negative as

well as positive effects of foreign assistance on the economic growth of a country. The present paper gives suggestions and policy recommendations for better use of official development assistance (ODA) to encourage economic growth in the country. The present work is an effort to contribute to the existing economic literature.

3.0 Methodology

The chapter explains the data and methodology. The current paper moves around the characteristics of time series data to evade spurious regression. The study will lead to an explanation of the procedure of the auto-regressive distributed lag (ARDL) co-integration approach.

Data and Variable Descriptions

The current paper uses time series data from 1972 to 2021 from the World Development Indicator (WDI). Official Development Assistance (ODA) is treated as an independent variable, and the real gross domestic product (GDP) is used as a dependent variable. Several control variables are: gross national expenditure (GNE), trade openness (TO), and inflation (INF). Trade openness (TO) is computed as the addition of imports and exports as a percentage of GDP, whereas inflation (INF) is calculated as the change in the Consumer Price Index per year in percent.

Model Specification

To identify the nexus between foreign aid and economic growth in Pakistan, the following model is defined, which is based on the literature similar to Muhammad and Qayyum (2011) and Kargbo (2012).

$$LnGDP_t = f(ODA_t, LnGNE_t, INF_t, TO_t, \varepsilon_t) \quad (1)$$

In this equation, Official Development Assistance (ODA) is treated as an independent variable, and log-real Gross Domestic Product (GDP) is used as a dependent variable. The log of gross national expenditure, trade openness and inflation are explanatory variables and denote the error term.

Hypothesis

The hypothesis of the present paper is as follows:

- Foreign aid has a positive effect on the economic growth of Pakistan.

Econometric Model

In order to apply accurate methodology, it is of great importance to observe the stationarity of the variables in time series estimation. The mean and variance of variables must be constant, or else they may be non-stationary, which leads to inaccurate results, low Durban Watson, and higher values of R-squared and t-statistics. A series may be stationary by taking difference 1(1) or at level 1(0).

Unit Root Test

In order to avoid the difficulties of autocorrelation, the Augmented Dickey Fuller (ADF) and Philips Perron (PP) unit root tests are generally used. AIC and SBC are considered the bases for choosing optimal lag selection. Following are the cases of the above-mentioned tests.

So far as the size limit is concerned, the PP test has an advantage over the ADF on the basis of the size limit.

Co-Integration

Granger proposed the first idea of co-integration in 1981. Later on, Engle and Granger improved upon this idea in 1987, but there were limitations in Enger and Granger's (1987) residual based on the co-integration approach and this idea is unable to differentiate between dependent and explanatory variables and provides a single long-run equilibrium link. Therefore, this technique is improper and applies only to two variables.

Johansen and Juselius (1990) and Johansen (1995) developed the well-known co-integration approach to address this issue. This method distinguishes between explanatory and dependent variables. When a model has more than one variable and many co-integrating vectors, the multiple equation approach is used. Only when all other variables have integration in the same order can this method be used. The auto-regressive distributed lag (ARDL) co-integration method is used to resolve this difficulty. This technique is liked by the researchers as it can be used when variables have different integration orders.

Autoregressive Distribution Lag Model

This study applies The ARDL method is based on the bounds-testing co-integration approach by Pesaran and Shin (1999) and Pesaran et al. (2001) to probe the nexus between foreign aid and economic growth in Pakistan from 1972 to 2021. The ARDL model incorporates 1(0) and 1(1) variables in the same estimation so if variables are stationary on 1(0), then Ordinary Least Square (OLS) is suitable and if all are stationary at 1(1), then it is suitable to do VECM (Johansen Approach). This technique has some advantages over controversial technique.

This approach investigates the long-run nexus between the variables. The simple ordinary least squares technique is utilized to investigate the short- and long-run estimations of auto-regressive distributed lag equations. The technique has a lot of advantages. Initially, this technique checks co-integration among variables and short- and long-run estimations can be calculated in a single equation as well. Secondly, it analyzes the co-integration associations when variables are 1(0), 1(1) or a mixture of the two, and also tells the structural break in the annual data. “In addition, this technique behaves more effectively when the data set is small, while other methods like the Johansen approach are used for large sample data sets(Narayan and Narayan, 2005).

The debatable method requires a large number of estimation equations, whereas the auto-regressive distributed lag model may be performed quickly and produces results that are simple to understand. The Error Correlation Model (ECM), a linear modification of the ARDL model, offers details on both the long-term equilibrium and the short-term connections between the variables. A strong foundation for utilizing both the knowledge from the data and the knowledge from economic theory is provided by the error correction formulation (Hylleberg and Mizon, 1989).

There are two steps to the auto-regressive distributed lag method. The unrestricted error correlation method's lagged term of the series' significance level is determined using the OLS approach in the first stage after the bound test is used to look into the long-term associations between the variables. In terms of the second stage, the lag lengths for various variables are chosen using the auto-regressive distributed lag approach after the short-run and long-run parameters are assessed.

Brown et al. (1975) devised CUSUM and CUSUMSQ to capture the stability of the boundaries of parameters of long-run coefficients under the ARDL framework. In this study, the integration orders of all the variables are diverse. These variables are integrated in order 1(1) or order 1(0).

Model

Model

$$\Delta LnGDP_t = \alpha_0 + \sum_{i=1}^{p_1} \lambda_1 \Delta LnGDP_{t-i} + \sum_{i=0}^{p_2} \lambda_2 \Delta ODA_{t-i} + \sum_{i=0}^{p_3} \lambda_3 \Delta LnGNE_{t-i} + \sum_{i=0}^{p_4} \lambda_4 \Delta TO_{t-i} + \sum_{i=0}^{p_5} \lambda_5 \Delta INF_{t-i} + \beta_1 LnGDP_{t-1} + \beta_2 LnGNE_{t-1} + \beta_3 ODA_{t-1} + \beta_4 TO_{t-1} + \beta_5 INF_{t-1} + \varepsilon_t \quad (2)$$

The variables are explained hereinbefore. Here the first difference operator is Δ and the constant term is α_0 while λ_i and β_i shows the short run coefficients with one year lagged term of long run.Optimal lag selection is shown by P_i.

The long-run nexus of one-year lagged terms of model variables is determined using an F-test. The variables do not show long run link according to the null hypothesis, whereas, alternative hypothesis represents long run association.

Null Hypothesis

$$H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$$

Alternative Hypothesis

$$H_1 : \beta_1 \neq 0, \beta_2 \neq 0, \beta_3 \neq 0, \beta_4 \neq 0, \beta_5 \neq 0$$

In order to confirm the long-term relationship between the variables, Pesaran et al. (2001) created a table of crucial values with upper and lower limitations. The crucial values and number of parameters with the addition of trend or intercept in the model are confirmed using the very same table. To check the long-term association between the variables, the estimated value of F is contrasted with the F value from the table. If estimated values are in between the tabulated boundaries, then the result is considered inconclusive. is rejected if the calculated value is above the uppermost bound and this shows there is a long-run relationship between variables. If the estimates are below the lower boundaries of the table, the null hypothesis cannot be rejected.

The Long-Run Coefficients of the ARDL Model

The long-run coefficients are calculated and lead to the next step of the ARDL approach if co-integration is found between the variables. AIC and SBC are exercised to select the optimal lags. The long-run model is shown below.

$$\Delta LnGDP_t = \alpha_0 + \sum_{i=1}^{p_1} \lambda_1 \Delta LnGDP_{t-i} + \sum_{i=0}^{p_2} \lambda_2 \Delta ODA_{t-i} + \sum_{i=0}^{p_3} \lambda_3 \Delta LnGNE_{t-i} + \sum_{i=0}^{p_4} \lambda_4 \Delta TO_{t-i} + \sum_{i=0}^{p_5} \lambda_5 \Delta INF_{t-i} + \varepsilon_t$$

The Short-Run Coefficients of the ARDL Model

The lagged dependent variable is included in the model to illustrate how short-run and long-run parameters differ from one another. The following task is to measure the short-run parameters. The short-run parameters found using the error correlation method are written below.

The value of the error correlation method should be significant and negative too. In order to learn about the adjustment speed toward long-run equilibrium from the disequilibrium of the previous year, the ECM coefficient is employed.

$$\Delta LnGDP_t = \alpha_0 + \delta_0 (ECM_{t-1}) + \sum_{i=1}^{a} \lambda_1 \Delta LnGDP_{t-i} + \sum_{i=0}^{b} \lambda_2 \Delta ODA_{t-i} + \sum_{i=0}^{c} \lambda_3 \Delta LnGNE_{t-i} + \sum_{i=0}^{d} \lambda_4 \Delta TO_{t-i} + \sum_{i=0}^{e} \lambda_5 \Delta INF_{t-i} + \varepsilon_t$$

Stability Test

To prove the reliability of regression estimates, co-integration is exercised. If the parameters are unstable, then the co-integration estimates are not reliable. The CUSUMSQ and CUSUM tests were used by Brown et al. (1975) to avoid the difficulty of unstable coefficients.

Diagnostic Test

The diagnostic test is applied to verify the model's goodness of fit. The residual serial correlation is checked by the Lagrange multiplier test, the ARCH LM test of heteroscedasticity, and Ramsey's RESET test of error specification. These are examples of tests that are similar in this regard. Similarly, the Skewness-Kurtosis test is checked for normality.

4.0 Results

The empirical findings of the current literature are used for the period 1972–2021 with the help of the ARDL technique in Pakistan. In order to examine whether the series aren't stationary at the second difference (1, 2) and to evade spurious regression results that give bogus results before applying the auto-regressive distributed lag method, the PP and ADF tests are exercised. The results of PP and augmented Dickey Fuller are depicted in Table 4.1 with constants and trends:

Table 4.1 : Unit Root Test

Panel (a): Augmented Dickey Fuller (ADF) Test

	Level			First Difference		
Variables	**None**	**Intercept**	**Intercept & Trend**	**None**	**Intercept**	**Intercept & Trend**
LNRGDP	-1.23	-1.40	-2.13	-9.42***	-9.27***	-9.54***
ODA	-1.32	-2.15	-3.93**	-7.42***	-7.37***	-7.27***

LNGNE	4.02	-0.74	-2.09	-5.12***	-8.11***	-8.39***
INF	-1.36	-3.32**	-3.42***	-7.86***	-7.78***	-7.70***
TO	-0.04	-3.35**	-3.25*	-7.49***	-7.41***	-7.39***
	Panel (b): Phillip Perron Test					
	None	**Intercept**	**Intercept & Trend**	**None**	**Intercept**	**Intercept & Trend**
LNRGDP	-1.23	-1.40	-2.13	-9.42***	-9.27***	-9.54***
ODA	-1.32	-2.15	-3.93**	-7.42***	-7.37***	-7.27***
LNGNE	4.02	-0.74	-2.09	-5.12***	-8.11***	-8.39***
INF	-1.36	-3.32**	-3.42***	-7.86***	-7.78***	-7.70***
TO	-0.04	-3.35**	-3.25*	-7.49***	-7.41***	-7.39***

Notes: *, **, and *** denote significance at 10%, 5%, and 1%, respectively.

The findings of the ADF and PP tests show that some variables are stationary at level and some variables are integrated at first difference. The real GDP and national government spending are stationary at the first discrepancy. Trade openness, inflation, and official development assistance all remain stable at their current levels. An ARDL-bound testing strategy can be used in this investigation as variables are integrated in a different order.

Results of the ARDL Bound Testing Approach

In the current study, the suitable lag length is chosen by SBC and the maximum range of lag is 3 because, for the annual, three lags can be exercised in the auto-regressive distributed lag Technique. The results are as below:

Table: Results of Bound Testing Method

Note: For optimal lag selection, SBC and AIC are used. ** indicates that F-statistics lie above the uppermost boundaries at the 10% significance level.

Model	**F-tabulated (at 90 percent)**		**F-Calculated**	**Conclusion**
	I(0)	**I(1)**		
F(LnGDP/LnGNE,ODA,TO,INF)	3.063	4.084	4.55**[.004]	Co-integration Exist

The bound testing approach indicated that in this model co-integration is found at the 10 percent point of significance level as in model, the estimated F calculated value is above the upper bound, which reveals co-integration that lies among the variables. The next step is to measure the short run and long-run parameters for the model.

The Long Run Coefficients

The long run coefficients provide nexus between foreign aid and economic growth. The findings are explained in Table 4.3 in the model, Ln GDP is dependent variable and Gross National Expenditure (GNE), Official Development Assistance (ODA), Trade Openness (TO) and Inflation (INF) are independent variables.

Table: Longrun Results Using the ARDL Technique

ARDL (1, 1, 2, 2, 2) from on SBC

RGDP (in log) is used as Dependent variable

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
ODA	0.07	0.025	2.87*[.008]
LnGNE	0.64	0.062	10.29*[.000]
TO	0.04	0.0057	0.98*[.000]
INF	-0.02	0.005	-4.96*[.000]
K	5.42	1.46	3.69*[.001]
T	-0.06	0.004	-13.98*[.000]

*indicate one percent level. **specify five percent level. ***confirm ten percent level

Table 1 illustrates that official development assistance also has a positive and significant relationship with real GDP. Foreign aid has facilitated enhancing gross domestic product growth with the help of modern technology, structural transformation, technical assistance, and the good fundamentals of the agricultural and industrial sectors (Mohey-ud-din, 2005). The coefficient of ODA illustrates that if official development assistance is increased by one percent, it will expand the real gross domestic product by 0.07 percent. Consequently, LnGNE has a positive and significant effect on LnGDP, which means that public spending fosters overall economic development because an increase in public spending will increase economic growth (Keynes, 1936), which favors the study of Coricelli and Chadha (1997), which examined whether the spending pattern of the government can restructure the country. According to the coefficient of Log of Gross National Expenditure (LnGNE), a 1% increase in LnGNE will result in a 0.64 % increase in real gross domestic product.

The effect of trade openness (TO) on real gross domestic product is positive due to the provision of raw materials and the entrance to the global market with the use of superior technology. The coefficient reveals that a one percent increase in trade openness gives impetus to the economy by 0.04 percent. Inflation causes an adverse effect on real GDP as it increases the cost of production in order to increase the prices of raw materials and negatively influences the decision-making power of the stakeholders (Ramazan & Ahmad, 2021). Its coefficient decreases the real gross domestic product by 0.02%. Table 4.3 shows the empirical results of the model and real GDP is the dependent variable, while ODA, GNE, TO and INF are the dependent and explanatory variables**.**

The ECM Results

The Error Correlation Model (ECM) is used to calculate the model's short-term findings. The error correlation model's coefficient must be negative, indicating that the speed of adjustment from disequilibrium towards long-run equilibrium The impact of the short-run model presented below

Table: Error Correlation Model Representation for the Model

ARDL (1, 1, 2, 2, 2) based on SBC

RGDP (in log) is Dependent variable

Regressor	Coefficient	Standard Error	T-Ratio [Prob.]
dODA	0.016	0.007	2.01***[.053]
dODA1	-0.014	0.006	-2.08**[.045]
dLnGNE	0.66	0.081	8.25*[.000]
dTO	0.011	0.003	3.43*[.002]
dTO1	-0.007	0.003	-2.13**[.041]
dINF	-0.002	0.002	-1.38[.177]
dINF1	0.005	0.002	3.09*[.004]
dK	2.95	1.274	2.32**[.027]
dT	-0.032	0.008	-3.89*[.000]

ecm(-1)	-0.544	0.136	-3.98*[.000]
R Squared	0.87	R Bar Squared	0.81
F-stat. F (9 , 31)	20.63*[.000]	DW-statistic	1.99

*Specify one percent level. **indicate five percent level. ***show ten percent level

Table 4.4 indicates the results of official development Assistance. The finding brought out that official development assistance also has a positive impact on real GDP in shortrun. Whereas, the lagged term has an adverse and significant relationship with real gross domestic product, which shows that dependency on foreign assistance, corruption, poor coordination and dire economic supervision may slim down economic growth (Vu Minh Duc, 2001). Foreign assistance may have usually had an effect on stimulating growth, but it did not significantly contribute to economic development (Kargbo, 2012). The ECM coefficient is negative and statistically significant, which indicates a 0.54 percent disequilibrium in adjustment in the recent year toward long-run equilibrium due to the setback of the preceding year.

4.2 The Diagnostic Test

The diagnostic test, which is displayed in Table 4.4, demonstrates that the model encounters issues with heteroscedasticity, serial correlation, model misspecification of functional form, and non-normality of data.

Table: Diagnostic Tests of the Model

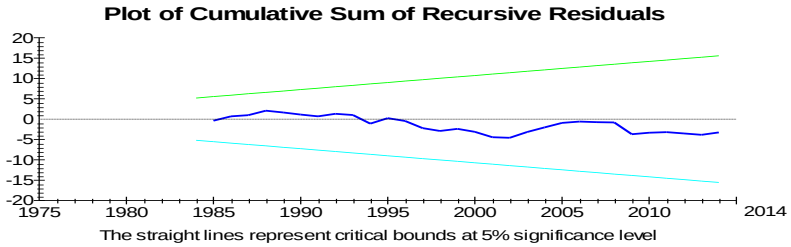
Test Statistics	F Version	LM Version
A: Serial Correlation	F(1, 26) = 0.26[.617]	CHSQ(1) = 0.40[.527]
B: Heteroscedasticity	F (1, 39) = 9.72[.003]	CHSQ(1) = 8.18[.004]
C: Normality	Not applicable	CHSQ(2) = 0.066[.968]
D: Functional Form	F (1, 26) = 0.70[.410]	CHSQ(1) = 1.07[.299]

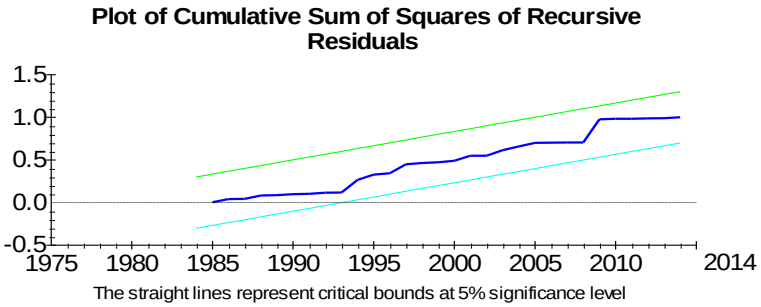
Note: Author calculates this test by using Microfit

The Table 4.5 presented the results of a diagnostic test for the model of real GDP, gross national expenditure and official development assistance. The empirical statistics show that the model is devoid of the heteroscedasticity, serial correlation and functional form misspecification issues.

The Stability Test

The CUSUM and CUSUMSQ graphics are used to illustrate the stability of the model. The CUSUM and CUSUSQ indicate that the model is stable. While this test explained that the model is unstable, the stable parameter does not decrease if graphics are positioned inside the critical values of the 5% level of significance. CUSUM and CUSUMSQ graphics are below.





Conclusion

The aim of this paper is to evaluate the nexus between foreign aid and economic growth in Pakistan by utilizing the autoregressive co-integration technique from 1972 to 2021. The findings illustrated that official development assistance has a long-term relationship with the economic growth of Pakistan. The current literature also indicates that, in the long run, official development assistance has a positive and significant relationship with real GDP. However, in the short run, the finding brought out that official development assistance also has a positive effect on real gross domestic product in short run. While the lagged term of ODA has a significant negative relationship with real GDP, this supports the controversial analysis, which states that dependency on foreign aid, dire economic supervision, poor coordination and corruption may slim down economic growth.

According to Abdu's (2015) research, external assistance had a good impact on internal savings in India, which in turn helped the country's economy flourish. Foreign assistance has

positively impacted the development of Pakistan, which eventually has affected public expenses and internal funds (Mehmood et al., (2015). While foreign aid may have normally had an effect on encouraging growth, it did not contribute significantly to economic development (Kargbo, 2012). Furthermore, gross national expenditure has a positive and significant effect on real GDP. Trade openness has also had a positive impact on real GDP; on the contrary, inflation has a negative relationship with real GDP.

Policy Recommendations

Based on the outcomes of the study, it is suggested that official development assistance also positively affects the real GDP, so policy should be devised to improve the problems of the aid-providing system and more attention should be given to the positive use of foreign aid. Good policies may lead to better use of aid. The current aid-provider structure may have some problems were aid hampers growth. Less developed countries should make superlative use of foreign assistance at the macro level, regardless of the quality of policy. Inflation plays a very critical role in monetary and fiscal policy. It is required to minimize the effects of inflation to attain constructive use of aid.

Bilal Bashir: Problem Identification and Model Devolpement
Shuja Ur Rehman: Data Collection, Results and Analysis
Zulfiqar Hussain Awan: Literature review and Drafting

Conflict of Interests/Disclosures

The authors declared no potential conflicts of interest in this article's research,authorship, and/or publication.

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