



Impact of trade liberalization on economic growth of Pakistan

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ARTICLE DETAILS	ABSTRACT
History Revised format: Feb, 2019 Available Online: Mar, 2019 Keywords trade liberalization; Economic Growth; ARDL; Nigeria;	This study analyses the effect of trade liberalization on Pakistan's economic development, for this purpose the study utilizes the time series data of period 1980-2016. the study uses the GDP as dependent variable while trade openness, foreign direct investment, exchange rate, inflation and gross fixed capital formation as independent variables. ADF (Augmented DickeyFuller) test has been employed to check the stationarity of variables. The dependent variable is stationer at level while all the independent variables are stationer at 1st difference so study employed the ARDL (Auto regressive distributed lag model) econometrics techniques for estimation. The findings of the study show the significant positive impact of trade openness and gross fixed capital formation on GDP both in short run and in long run. Inflation and exchange rate are negatively related to GDP. Foreign direct investment has significant positive impact on GDP but only in short run. In long run both FDI and exchange rate are negatively associated with GDP. It is concluded and recommended by the result of our study of liberalize the trade and reduce all the restrictions to enhance economic growth of Pakistan.

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1 Introduction

Since 1970's the trade liberalization has become an important element of development policies due to the greatest and necessary changes in global economic policy. Trade is simply the exchange of goods and services with in different parts of the country and between different countries, while trade liberalization is exchange of goods and services without all the restriction like tariff and quotas.

The founders of the advantages of the international trade are mercantilists they believed that the wealth in the world is static and it can be judged by the amount of precious metals in the country. They give importance exports than the imports because they think that exports will give rise to precious in the country. In the 1776 Adam Smith

presented the theory absolute advantages due to the greatest importance and benefits of international trade. After this David Ricardo published his book “principals of political economy and taxation” in 1817 in which he presented the law of comparative advantage base on free trade. In 1919 an article “the effect of foreign trade of the distribution of income” was published by the Eli Heckscher who investigated the impact of international trade on the earnings of factor of production in the countries in which trade took place.

GDP is the collective value over a given time span of all the goods and services produced in an economy. The size of Pakistan's GDP constitutes 0.44% of the international economy. The average GDP was 703.68 billion dollars from 1960-2016. In terms of purchasing power parity (PPP), Pakistan 's economy is the 25th biggest nation in the world and the 42nd biggest in nominal GDP terms. At the time of independence in 1947, Pakistan was an agricultural country. Pakistan has to face the economic decline during 1951-1952.

The empirical work displays the great and strong positive connection exist between the trade openness and economic growth on long run. Trade liberalization is preferred because it increases the growth of the country by enhancing the utilization of the resources, competitive advantages, increases the rang of efficient investment projects (foreign and domestic), increases market size of the country, encourages the exports of the country and increases the employments opportunities which increases the productivity of workers. The cost which is attached with trade liberalization is loss of revenues collected by tariff because free trade reduced the tariff rates. To compensate this loss large tax imposed on consumers but this has the adverse effect on the growth of country.

Literature has suggested a strong link between trade and economic growth. There are many studies that observed the impact of trade liberalization on economic, Ghani et al. (2003). There are several studies that have used various channels to examine the relationship between trade openness and economic development, such as human resources, FDI, GFCF, inflation, real exchange rates, imports and exports.

There are great arguments that trade liberalization increases the economic growth by paving the way for innovations, technological progress enhancing specialization Trade liberalization give rise to competition which improves the domestic technology and enable the resident of the country to get different varieties and qualities of a product, trade liberalization also enable the country to make a stable position in foreign market.

Now a day it is a keen desire of every developing country to achieve liberalize trade by adopting the efficient trade policy which accelerate the economic growth of their country. There are two categories of trade strategy import substitution and export promotion. Import substitution strategy protects the infant domestic industries from foreign competition while export promotion strategies connect the domestic market with foreign market. The type of strategy to be adopted depends on the endowment factors of the country. As in the case of Pakistan the time of independence 1947 Pakistan's industrial base was very weak Pakistan has only 34 units including textile mills, sugar mills and some cement factories, so in the early years of the independence Pakistan adopted the import substitution strategy in order to protect the local industries by foreign competition at the same time Pakistan also take efforts to promote the exports. In the last 50 years Pakistan's imports and exports fluctuated greatly as the early years of independence of Pakistan focused on import substitution rather than on export promotion so exports in the 1950's were very low there was 5.7% per annum decline in the exports. But in 1960's Pakistan enhance their exports and average rate of exports was 10.7% per annum. In 1970's export growth rate was 22.3% while in 1980's it grew at 8.5%per annum and in the first 8 years of 1990's it grew at the 7.6%per annum.

In 1959's Pakistan adopted the imports substitution strategy. As Pakistan is the agricultural based country the revenues of the government, depends on the exports taxes on agricultural products and manufactured goods get the agricultural raw material at the low prices than the world price and set their product domestically above the world price. These most extreme protections and restrictions lasted from 1952-1959.

In 1960's government of Pakistan took many measures to promote exports and reduce anti-exports bias. In 1959 government introduced the export bonus scheme which help the exporters the manufacturers' goods to compensate for overvaluation of rupee it was basically a multiple exchange rate system.

In 1960's govt. gave the focus to liberalize imports in trade policy, also includes the automatic renewal of import license. The previous exports performance was checked of firms forgiving the automatic renewal license. In 1960's "free list of imported items" policy also adopted. Along with these measures the trade liberalization was not much high.

In 1970's govt. of Pakistan took more efficient measures to liberalize the trade and reduce anti-export bias. 1950's and 1960's policy overvalued the Pakistan's rupee but 1970's policy devalued Pakistan's rupee and dismissed the export bonus scheme. In 1972, 57% devaluation of rupee was taking place. The important step of govt. was to end the restrictive licensing system in 1972. In 1970's two import lists were introduced rather than 6 lists in which one was free list of item and other was tied list of items.

In 1980's govt. also take step to eliminate anti-export bias. In early years of 1980 Pakistan's trade policy was highly restricted but in 1986 govt. of Pakistan eliminated the import quotas on non- capital imports and liberalized the trade of greater extent. Almost 100 commodity categories were introduced to the free list in 1980-1983. But still Pakistan's import was not much free of restrictions due to provide the protection to the local industries from foreign competition and reduce the imports of expensive consumer goods. All this give rise to monopolies and smuggling in the country. According to 1987's tariff reform, the tariff rate was reduced from 225% to 125% and in 1989-1990 it was reduced to 64%. Furthermore, in 1980's govt. of Pakistan also take interest in export promotion and took many positive measures to encourage the exporters under the flexible exchange rate system. In 1988 Pakistan's govt. run the structural adjustment program to bring the changes in the trade regime. In 1997-1998 the tariff was reduced to 45%.

In 2000, govt. of Pakistan also took many measures to liberalize the trade, promote exports and to increase their international market size. In this regard Pakistan make many bilateral and regional agreements with other nations which are:

- Agreement on South Asian trade area (6, January 2004)
- Preferential trade agreement with Iran (4 March 2004)
- Free trade agreement with Sri Lanka (12 June 2015)
- Early harvesting program with Malaysia (10 Oct, 2005)
- Early harvest program with China (5 April, 2005)
- Free trade with Malaysia (8 Nov, 2007)
- Free trade agreement with China (24 Nov, 2006)
- Preferential trade agreement with Mauritius (30 July, 2007)
- Framework agreement on trade (21 July, 2006)

The purpose of 2008-2009 trade policy was expanding their exports by providing incentives to exports producing products, by lowering the cost of business.

Besides the trade liberalization, inflation also effects the growth of a country. Inflation has the great importance for policy makers. Inflation is generally the increase in price level. There are two causes of inflation when $AD > AS$ (demand- pull inflation) and cost pull inflation which occur when cost of production inputs increases. The relationship between the inflation and GDP may be positive and negative but in the case of Pakistan's inflation and growth are positively related.

Foreign direct investment FDI also has a great impact on the growth of the country. FDI is a source of capital inflow in a country which increase the investment and production in the country. It enables the workers to get experience from high developed technology of developed countries which increases the efficiency of the workers. Pakistan attracted the greatest FDI in 1996 to almost 119 million dollars but Pakistan failed to further attract the FDI due to corruption, political instability, budget deficit etc, so the foreign investors hesitate to invest in Pakistan but after 2003 China make the greatest investment in Pakistan.

Exchange rate is also the determinant of growth. It is the rate by which domestic currency is exchanged with the foreign currency. Generally, it has the positive impact on GDP but in the case of Pakistan where imports are of high cost while exports based on primary goods the exchange rate is negatively related to the growth of Pakistan.

This study investigates the role of trade liberalization, FDI, GFCF (gross fixed capital formation), inflation and exchange rate in determining the economic growth and providing the implications for bringing the high growth rate.

2 Literature Review

Shaheen et al. (2013) investigated the linkage among trade liberalization and economic growth of Pakistan. The study has used to trade openness gross fixed capital formation (GFCF) foreign direct investment (FDI) and inflation as independent variables while GDP was used as dependent variable. The study has tested the association between the variables by utilizing the time series data of period 1975-2010. An empirical analysis was estimated by using Johenson co integration economic techniques. ADF test was used to check the stationarity of the variables. The study based on the results that trade liberalization GFCF were the factors which have the great impact on the GDP of Pakistan, while the other independent variables inflation and FDI also effect GDP of Pakistan but their relation was inverse in Pakistan.

Chaudhary et al. (2010) examined the relationship between trade liberalization, human resources and Pakistan's economy. This study is based on data for the 1972-2007 period. This study used the granger causality and co integration techniques for empirical analysis. The study utilizes the trade liberalization as dependent variable while human capital and economic growth as independent variable. The data source of growth and trade liberalization was world development indicator (WDI) and ESDS international web side and data from human capital index was collected from Pakistan economic survey. The study checked the stationarity of the variables by using ADF unit root test the resulting of ADF indicates that all the variables were stationered at 1st difference. The study suggested that to accelerate the economic growth the development of the policies should focused on human capital formation and trade openness.

Hussain, H.& Malik.S (2011) explored with regard to Pakistan, the link between inflation and economic development. Time series data from the period 1960-2009 was used. Inflation has been positively linked to economic growth in Pakistan and vice versa, according to this report. Error correction model has been used to understand the stationarity of these two variables. In short time period the error correlation model (ECM) was used to see the results. Uni direct has been found to be concerned with causality between these two variables. The approximate threshold model indicated the systemic inflation breakpoint, which is beginning to lower Pakistan's economy. Pakistan needs inflation, but for growth in a single digit, since the inflation rate can be increased by a growth rate too quickly.

Adhikary (2011) traversed the relationship between Foreign Direct Investment, trade openness, capital formation and Bangladesh's economic growth. This study has utilized the time series data of time period (1986-2008). To check the stationarity of the variables the study has been used the ADF and PP tests which showed that all the variables were stationed at 1st difference. Johanson juselius techniques was for empirical analysis. The study has used FDI, Trade openness, capital formation as independent variables while GDP as dependent variable. The results of the study were that FDI and capital formation has increased the economic growth but trade openness has reduced the economic growth due to large imports and negative BOP but the effect of trade openness on growth was diminishing.

Zohongo (2017) threw light on nation effect on trade liberalization on economic growth of developing countries particularly pondered on Sub-Saharan region utilized dynamic growth model containing time series 1980-2012. According to this study the effect of trade openness on economic growth was no directly proportional, in fact trade was a hike initially then it got restricted to a threshold above which the effect declined. The evidence showed U-curved (laffer curve of trade) this variable effect suggested that restrictions surcharges required for trade openness of intensity the income of a country.

Mani and Afzal (2012) analyzed the evaluation of trade liberalisation in the Bangladesh economy from 1980 to 2010. In terms of very important variables such as inflation, development, exports and imports following trade liberalisation, this research investigates the achievements of the economy. For analytical performance, researchers used ordinary least square (OLS) techniques as a methodology. It has clearly shown that the rate of GDP growth has increased following liberalisation. Trade liberalisation would not require inflation to have an impact on the economy. Greater transparency has also been shown in quantitative research to be favourable for economic growth. With greater transparency, both genuine imports and exports have increased. After the liberalisation policy of 1990, the country's exports increased, due to greater economic growth. The results of this study may provide an accurate summary of trade liberalisation in developing economies.

Mubarik (2005) enquired level of the threshold of inflation in Pakistan by applying annual data from 1973-2000. The consequences of the projected model, which indicated an epical 9 percent threshold level of inflation for economic development, were illustrated by this theory. The Granger causality test determines not vice versa, but uni-directed causality path from inflation to economic development.

Parikh and Stirbu (2004) inspected The effect on economic growth, expenditure, share of GDP, transparency, balance of trade and current accounts of trade liberalisation. Domestic economic growth is positively linked to many countries' liberalisation. Higher economic growth has had a detrimental impact on the balance of trade due to liberalisation. As shown by this research, researchers saw how pre-liberalization period production growth is smaller than the fixed effect post liberalisation period and random effect models have been developed. The correlation between the findings indicates that liberalisation encourages growth, but for a vast majority of

countries, growth has a negative effect on trade balance. This analysis included the framework used for political and security variables that overlap or catch up in a cross-section regression sample. It is also estimated that if one unit shift in the liberalisation index leads to an average improvement in growth rates of 1.02 percentage points on average.

Schott et al. (2006) attempted multi-product corporations have a general equilibrium model and have studied their conduct towards trade liberalisation. Firm competitiveness in a given product was modelled as a relationship between "capacity" at the business level and "expertise" at the business product level, which is stochastic and uncertain as preliminary to the company's payment of sunk entry costs. Higher business level capacity increases the competitiveness of a company across all goods, which convinces a positive connexion between the intensive margins of the company. After liberalisation, the exporter manufactures a smaller variety of goods and thus sells them internationally in order to increase both the sector share and the export per sector.

Hamad et al. (2014) attempted to evaluate the impact on economic growth in Tanzania of trade liberalisation. The effect of trade liberalisation on economic growth in this period has drawn a great deal of attention from many researchers. This study conducted a simple model where GDP was a dependent variable while trade openness was the independent variable. Time series data was used from the period 1970-2010. This period was divided into a closed economy period (1970-2010) and open economy period (1986-2010), for the estimation of regression OLS technique was used twice, regarding two sub-periods., trade openness had a positive and significant effect on economic growth in Tanzania. Compared with the open economy era, this impact was comparatively greater during the closed economy. This result recommends that a strong effort to value exports in order to compensate for imports must be placed in place by the government.

Damania et al. (2003) inspected the linkage between trade policy, corruption and environmental policy. Researchers presented a theoretical model that produced many testable predictions. Trade liberalization increased the stringency of environmental policy. Corruption decreased environmental policy stringency, the effect of trade liberalization on environmental policy was conditional on the level of trade openness. Panel data was used from 1982-1992. Improvements in environmental production appear particularly pronounced in countries where regulation was most distorted in the most corrupt countries. Therefore, researchers believed that positive impact on environmental policies for fighting corruption was target amongst heavily protected countries.

Topalova et al (2011) analysed the impact of India's trade reforms in the early 1990s on firm productivity in the manufacturing sector using a panel of business-level data, focusing on the relationship between this policy shock and the characteristics of the market, business and atmosphere. As part of an IMF-supported adjustment programme with India in 1991, the rapid and extensive tariff reductions allow us to create a causal connexion among inter-industry and intertemporal differences in output tariffs, input tariffs, and efficient security rates and reliably measured firm productivity. Particularly, declines in trade protectionism have contributed to higher levels of firm competitiveness, with the greatest impact on sectors which have been competitive in imports and which have not been subject to excessive domestic regulation. The lower tariffs on intermediate inputs also provided a big productivity boost. Incidentally, the impact of trade liberalisation on firm efficiency does not appear to be affected by state-level features, such as labour legislation, the investment climate and financial growth. After this,

there is clear evidence suggesting that trade liberalisation and trade policy that foster domestic competitiveness are complementary.

Javaid (2014) attempted to check the more comprehensive econometric methods to analyse the comparative impact of three distinct trade openness steps on economic growth in Pakistan. Autoregressive distributed lag (ARDL) method, JJ co integration and ordinary least square (OLS) findings show that the long-term relationship between exports and economic growth is substantially positive. By comparison, overall exchange and import levels have a major negative influence on economic development. The inclusion of completely updated ordinary least square (FMOLS) variables and findings demonstrate that the findings are robust. The Granger study of causality and variance decomposition shows the unidirectional causality among openness to trade and economic development. Causality runs from export to development in the export model. So although, in the framework of overall trade and import volumes, causality varies from growth to total trade volumes and from imports in Pakistan. It is inferred from the results that policy makers should concentrate on a trade development strategy to improve economic growth of a country. In addition, in order to ensure high domestic output in the country, the efficient utilisation of capital goods should be improved and reliance on non-capital goods should be reduced.

Hozouri (2017) examined the linkage between international trade, economic development and tariff rates of 12 countries which were MENA countries. The study utilized the time series data of time period (2002-2013). The study used the trade and tariff as independent variables and economic growth as dependent variable. The study checked the stationarity of the variables by applying the method of 'levin, Lin and chu'. For estimation the study used the 'Generalized least square and generalized method of moment' technique. The summarized results of the study were that trade liberalization increased the growth while tariff rate was the cause of lowering the growth of Pakistan.

Paudel (2009) examined the effect of foreign debt, trade openness and labour power in Sri Lanka's economic growth through the use of the Johansen co-integration maximum likelihood method. It analyzed the data for the period, 1950-2006. The study reveals that the correlation between economic growth and foreign debt, trade openness and the labour force is co-integrated. Moreover, the findings indicate that labour, trade openness and foreign debt have a positive effect on Sri Lanka's economic growth in the long run.

Olaifa et al. (2013) traversed the relation between trade liberalization and growth of Nigeria by using the time series data of period 1970-2012. The study used the DGP as dependent variable and trade openness, FDI, exports and imports as independent variables. The data of the variables were collected from central bank of Nigeria. The study used the OLS econometric technique to investigate the long run relationship among trade liberalization and growth in Nigeria. All the variables of the study were stationered at 1st difference. The findings of the study showed that there is long run positive relationship among the trade liberalization and growth of Nigeria and exports has opposite relation with growth of Nigeria. It is suggested that by using openness, FDI, exports and imports, we can improve the GDP level of Nigeria.

Ghani et al. (2003) observed that the casual relationship between the trade openness and economic growth in Pakistan. The study used time series data of time period 1960-2011. This study was applied the Granger causality under the framework of Vector auto regression (VAR) to observe the casual relationship between openness and growth. But the variables were stationer of order 1. The data of the variables were collected from the world

development indicator. The results of the study showed that in the short run there was no causal relationship between the variables while in the long run the relationship was positive and bidirectional between the trade openness and economic growth of Pakistan.

3 Theoretical relationships between trade liberalization and GDP

The relationship between trade liberalization and GDP can be described by a number of theories. Mercantilists were the founder of benefits of international trade. They developed the mercantilism economic system in Europe in 16th to 18th century. They believed that a nation is wealthy which has greater amount of precious metals like silver, gold etc. according to them if a nation does not have the precious metals then it can get these precious metals through trade. They prefer the exports over imports. They believe that an economy can grow if it adopts the export promotion policy rather than imports substitution policy. They suggest to reduce the wants of an economy towards the luxurious imported goods because it reduces the stock of precious metals in economy. They believe that only one nation gains on the expense of others nation involved in international trade. They believed that large population can lead an economy towards the self-sufficiency. By the large population an economy can increase its domestic labor force. The mercantilists were against the laissez-faire economy they support the interference of government and state to achieve all the goals.

After the mercantilists Adam Smith (father of economics) presented the trade theory which based on the absolute advantages in 1776. He states that two nations do trade only when each nation can gain from trade. The two nations can gain if they become specialized in the production of goods of their absolute advantage and produce the good more than their domestic need and exchange surplus of it with the goods of their absolute advantage with the other nation who has absolute advantage in the production of that product. Adam Smith elaborates the laissez-faire policy and free trade. According to him in this way the nation's resources can be utilized in an efficient way and production level of an economy can be increased.

After Adam Smith. David Ricardo in his book "principles of political economy and taxation" in 1817 presented the theory of comparative advantage of trade. According to this theory a nation can gain from trade by exporting the commodity of its comparative advantage or in which it has less absolute disadvantage and importing the commodity of comparative disadvantages or which it has greater absolute disadvantage. In this way both nations gain from the trade and increase their output.

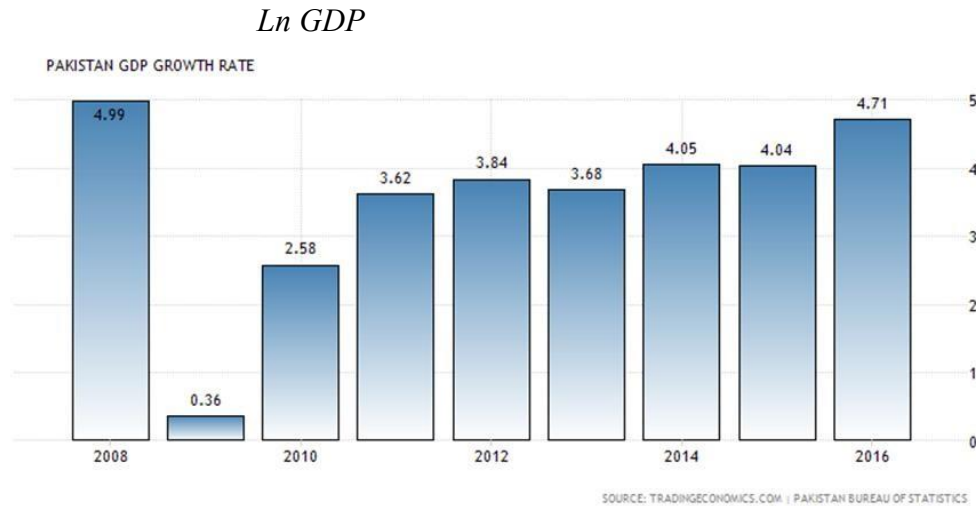
To show the effect of international trade on the earnings of factor of production in trading nations a Swedish economist in 1919 Eli Heckscher published an article "modern theory of foreign trade on the distribution of income" after that it becomes the "modern theory of international trade". The Heckscher-Ohlin theory has two parts. Heckscher-Ohlin theorem postulates that a nation will get specialization in the production of that commodity which requires the abundant and cheap factors of production of that nation and will import the commodity whose production requires the use of scarce and expensive factors.

H-O theorem further postulates that the basic cause of international trade is the difference between the nations with respect to factor abundance.

The second part of the H-O theory is the factor prices equalization in international trade. It is presented by Paul A. Samuelson in 1948. It states that when a country exports the goods which are made by relatively abundant and cheap factors with the passage of time it will increase the prices of abundant factors. While the factors which are

relatively scare will become less scare with the import of commodity made by scare resources. All this process will equal the factor prices in the trading countries. Thus international trade is very important because it equalize the wage of workers and rent of capital between trading countries and give benefit to all trading countries. Besides this there are many studies in literature which shows the positive relationship between trade liberalization and GDP by using different channels.

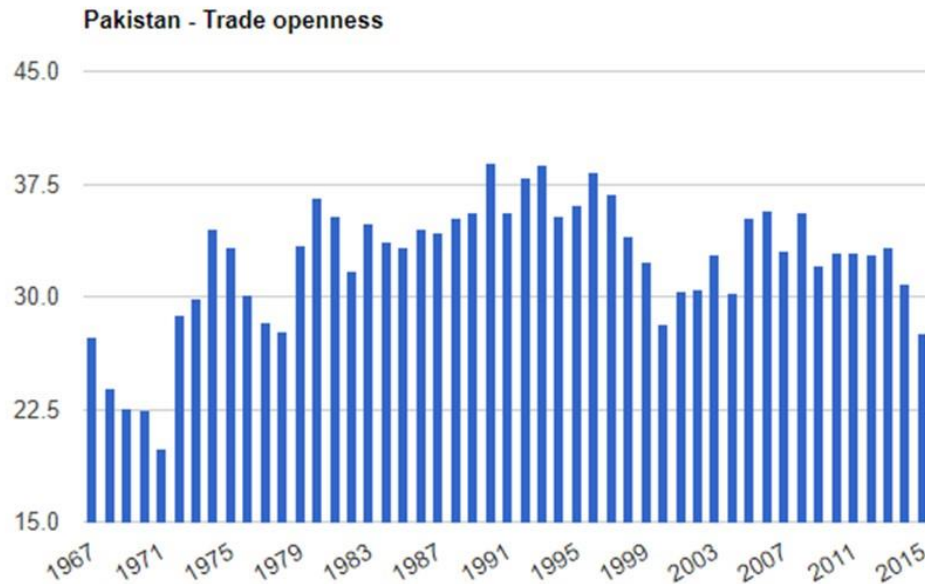
GDP trend in Pakistan



Fluctuations in GDP are due to the business cycles. The above figure shows the GDP trend in Pakistan of ten years from 2008-2016. The figure shows the GDP is increasing in 2008 and declining in 2009. After that GDP starts to rise and remain rising up to 2016.

Trade liberalization trend in Pakistan

lnTO



The above figure is showing the trend of trade openness in Pakistan during 1967-2015. In the early years govt. of Pakistan took many measures to promote the exports and to enhance their international market size. For this purpose, Pakistan make many bilateral original agreements with other nations, as the result of this there was greater liberalize trade in the early years of 2000. After that there was a sharp decline in open trade or there are more restrictions on free trade.

4 Data and Methodology

Data collection from a trustworthy source is very crucial for our research work. The present study uses the secondary data which consists on annual observation of time period 1980-2017. We have collected the data of GFCF, TOP, FDI, LITR and FDI from WDI (world development indicator) while data of EXC and GDP is collected from world economic surveys.

To analysis the behavior of economy it is very necessary to include all the relevant variables which are obtained from authentic sources. This study utilizes the GDP as dependent variable and TOP, FDI, GFCF, Literacy rate and exchange rate as independent variables. While top is the main independent variable and other explanatory variables are utilized as helping variables.

Augmented Dickey-fuller test

ADF is represented by Duckey and Fuller in 1979. It is the extension of DF test. This test is used to check the stationarity of variables. To solve the problem of autocorrelation this method uses the lagged term of dependent variables. If all the variables are integrated at level 1(0) than OLS method is used. Is all the variables integrated of order one 1(1) then johanson co-integration technique is used? If some variables are of 1(0) and 1(1) then ARDL technique is applied. The model on which ADF based is as follows,

$$\Delta y = a + \beta t + (\rho - 1) y_{t-1} + \sigma \Delta y_{t-1} + \mu t$$

Co-integration analysis by auto regressive distributed model

ARDL technique is developed by Persian et al. the benefit of using this model is that it is used When the sample size is short or small and this model present the short and long run effects of variables. But the drawback of this technique is that we cannot use it when the variables are stationned at upper degree of 1(1).

There are two phases of ARDL model

At first check whether the lagged terms of variables have the impact or not we use F statistic for long run relationship among the variables. Second we examined the short run and long-run co-efficient.

Model specification

The estimated equation that show the impact of TOP, FDI, GFCF, EXC and literacy rate on GDP is as follows

$$GDP_t (TOP_t) = \beta_0 + \beta_1 (TOP_t) + \beta_2 (GFCF_t) + \beta_3 (LITR_t) + \beta_4 (FDI_t) + \beta_5 (EXC_t) + \mu_t$$

Where

μ = error term (impact of the variables unknown by the researcher) $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$

= coefficient of slope

In this equation the dependent variable is GDP while TOP, GFCF, EXC, LITR independent variables.

Test for stability

The stability of the coefficient is very necessary for the correct interpretation of results and to and to provide the better guidance to policy makers. In the regard we use the cumulative sum of recursive residual (CUSUM) test. For the stability of model, the plotted blue line should be between the critical boundaries or red lines.

5 Empirical Results Descriptive Analysis

To present the quantitative description of the data set descriptive analysis is used. This study used the data of TOP, FDI, GFCF, EXC and literacy rate of time period 1980-2017. Table 5.1 present the mean values, standard deviation, skewness and kurtosis of all the variables.

Table 5.1: Descriptive statistic of variables.

	<i>GDP</i>	<i>TOP</i>	<i>GFCF</i>	<i>FDI</i>	<i>EXC</i>	<i>LITR</i>
<i>Mean</i>	4.906201	9.108071	16.03089	0.920638	50.89711	43.33158
<i>Median</i>	4.846451	6.925388	16.49136	0.659288	48.83500	42.90000
<i>Std.dev</i>	2.101275	6.473869	1.801152	0.816945	31.99733	12.18209
<i>Skewness</i>	0.191783	2.477389	-0.559678	2.096741	0.395636	-0.050861
<i>kurtosis</i>	0.191783	9.806007	2.353685	6.877650	1.850337	1.466837

Literacy rate and GFCF are negatively skewed while TOP, GDP, EXC are positively skewed. GDP and FDI are leptokurtosis while TOP, GFCF, EXC and literacy rate are platykurtic.

ADF test for stationarity

In time series data we first check the stationarity of the variables. In this study we used the Augmented DickeyFuller unit root test to check the order of integration of the variables.

The results are given in table.

Table 5.2: Results of ADF test

<i>Variables</i>	<i>Order of integration</i>	<i>Probability</i>
<i>GDP</i>	<i>1(1)</i>	<i>0.0000</i>
<i>TOP</i>	<i>1(0)</i>	<i>0.0004</i>
<i>FDI</i>	<i>1(1)</i>	<i>0.0811</i>
<i>GFCF</i>	<i>1(1)</i>	<i>0.0009</i>
<i>EXC</i>	<i>1(1)</i>	<i>0.0000</i>
<i>LITR</i>	<i>1(1)</i>	<i>0.0002</i>

The above table shows that GDP is integrated of order 1 while all the independent variables except TOP are integrated on level. Which is showing different levels of integration of variables that confirms the use of ARDL technique in our research work.

Bound test for co-integration

To check the long run long run co-integration we use the bound test analysis in which we encourage the r^2 statistic value with upper bound and lower bound. If the F-statistics is greater than upper and lower bound than we reject the null hypothesis and accept that there is long run relationship among the variables. The result of bound test is given in the table.

Table 5.3: Results of bound testing for co-integration

Test Statistic	Value	K
F-statistic	8.833616	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Table 5.4: Long run estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOP	-0.139977	0.024362	-5.745661	0.0012
GFCF	-0.465238	0.087494	-5.317392	0.0018
LITR	0.039029	0.040818	0.956169	0.3759
FDI	0.704869	0.165993	4.246391	0.0054
EXC	-0.062103	0.017362	-3.576896	0.0117
C	15.805188	1.274930	12.396907	0.0000

The basis of calculation of Author Employing E views 9.

The study used in GDP as dependent variable while TOP, GFCF, FDI, EXC and literacy rate as independent variables. Model has been estimated by using ARDL technique.

The regression coefficient of trade openness is positively related to GDP which is showing that when there is one unit increase in TOP than GDP increases. In our analysis TOP has significant impact on economic growth of Pakistan because when trade is liberalizing than it improves the utilization of resources, increases comparative advantages, encourages the exports of the country as the result of which production process increases which create more employment and lead the country towards economic growth. Chaudhary et al (2010), Shaheen et al (2013). In short run TOP also have significant impact on GDP of Pakistan. So the result shows TOP accelerates economic growth of Pakistan both in short run and long run.

The regression coefficient GFCF increases the economic growth. If GFCF increases by one unit, it will increase the GDP. GFCF is statistically significant in long run because GFCF increases the investment in the country, improves the infrastructure, exploit natural resources, improves the technology all this increase the economic growth of Pakistan. GFCF increases the GDP of Pakistan in both long run and short run.

Regression coefficient of literacy rate showing the negatively effect on economic growth of the country. If there is one unit change in literacy rate than it lowers the GDP. Literacy rate has statistically significant negative effect on economic growth Pakistan because increase in illiterate people decreases the per capita income of the country.

The exchange rate and FDI have insignificant impact on economic growth of Pakistan in long run.

Table: Short run estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
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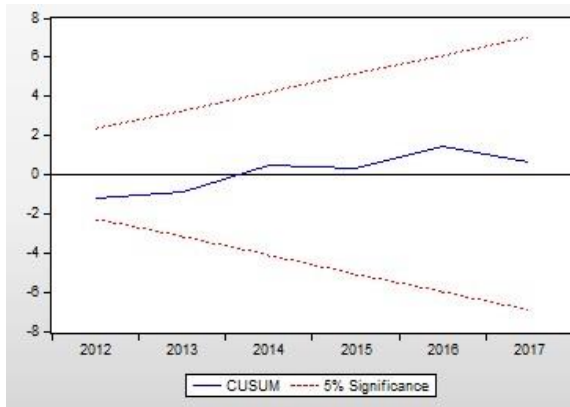
D(GDP(-1))	3.377260	0.733190	4.606255	0.0037
D(GDP(-2))	1.757426	0.487604	3.604206	0.0113
D(GDP(-3))	0.546364	0.209032	2.613781	0.0399
D(TOP)	-0.090805	0.056825	-1.597956	0.1612
D(TOP(-1))	0.528760	0.124505	4.246906	0.0054
D(TOP(-2))	0.255294	0.086642	2.946552	0.0257
D(TOP(-3))	0.127435	0.046971	2.713032	0.0350
D(GFCF)	-0.867448	0.303227	-2.860721	0.0288
D(GFCF(-1))	1.862286	0.553388	3.365242	0.0151
D(GFCF(-2))	1.481192	0.516052	2.870236	0.0284
D(GFCF(-3))	1.430319	0.478390	2.989857	0.0243
D(LITR)	-1.856194	0.415852	-4.463593	0.0043
D(LITR(-1))	-2.809946	0.724664	-3.877583	0.0082
D(LITR(-2))	-1.555823	0.596368	-2.608833	0.0402
D(EXC)	-0.178271	0.076842	-2.319949	0.0595
D(EXC(-1))	0.138918	0.118946	1.167910	0.2871
D(EXC(-2))	-0.301367	0.098144	-3.070662	0.0219
D(EXC(-3))	-0.340973	0.097822	-3.485644	0.0131
D(FDI)	2.442344	0.747339	3.268051	0.0171
D(FDI(-1))	-2.718195	0.752097	-3.614154	0.0112
D(FDI(-2))	-1.719332	0.707475	-2.430236	0.0511
C	85.95801	16.33780	5.261295	0.0019
TOP(-1)	-0.761278	0.172682	-4.408549	0.0045
GFCF(-1)	-2.530239	0.664832	-3.805831	0.0089
LITR(-1)	0.212264	0.229264	0.925849	0.3902
EXC(-1)	-0.337755	0.119304	-2.831043	0.0299
FDI(-1)	3.833498	1.133077	3.383264	0.0148
GDP(-1)	-5.438595	0.922185	-5.897508	0.0011

ARDL technique is used for estimation in this research work. The study used the lagged values of dependent variable of two previous years and the lag terms for independent variables of previous 4 years. The short run results show that all the variables have the significant impact on the economic growth in the short run. TOP, GFCF, FDI has the positive impact on GDP while exchange rate and literacy rate have the negative relation with GDP. We use the error correction term in the short term to establish the long run relationship. The value of coin eq (-1) should be negative and significant, in our result it is significant and negative which is confirming the long run relationship. The value of r^2 showing that explanatory variables have succeed to explain the 96% variation in dependent variable.

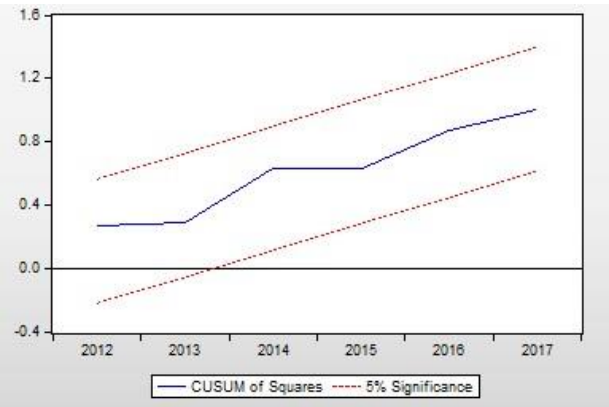
Stability test

To check the stability of the model CUSUM test is used in our analysis. Results of the test shows that the parameters are stable because the CUSUM statistics graph lie within the limits of boundaries at 5% significant level.

Graph: 5.1 CUSUM



Graph:5.2 CUSUM



6 Conclusion

Pakistan has also moved towards trade liberalization. This study uses the ARDL (Augmented Dickey-Fuller) econometric technique to show the effect of TOP, GFCF, FDI, EXC, on economic growth of Pakistan in both long run and short run. This research work uses the time series data from 1980-2017. The study utilizes the ADF (Augmented Dickey-Fuller) test to check the level of integration of variables. The result of the ADF test conclude that all the independent variables TOP, FDI, GFCF, EXC and literacy rate are integrated on order 1 or stationer at 1st difference while GDP which is dependent variable is stationer at level. The result states that in the short run TOP, FDI, and GFCF have the significant and positive impact on economic growth of Pakistan. The results of the bound test show the long run correlation between the variables. The long run results show that TOP, and GFCF are the important factors for bringing the long run economic growth. In long run EXC and FDI do not have any contribution in boosting economic growth. All the results are according to the theories of international trade that predicts that trade are significant on economic growth from 1980 to onward when government of Pakistan made the new tariff reforms and started the growth of industrial sector. After reduction in tariff rates Pakistani industries started to import the raw material and intermediate goods which increased the labor productivity as a result this lead to faster economic growth.

On the basis of results, it is suggested that:

- Policy makers should make the liberalized policies in Pakistan in order to increase the economic growth, because trade openness has very strong positive impact on economic growth of Pakistan.
- The policy makers should make the policies which enhance the foreign investment in Pakistan because FDI has insignificant impact on growth in short run. Pakistan should improve their infrastructure in order to attract the foreign investment.
- The government should take action to control inflation and literacy rate because in the case of Pakistan literacy rate have negative impact on economic growth.

- It is highly recommended that government should reduce the tariff and more tariff barriers at the same time policy makers should make export production policies for economic growth of Pakistan.
- The state bank of Pakistan should stop from devaluating Pakistan rupees. It has also the negative impact on economic growth Pakistan because it increases exchange rate which means reduction in foreign exchange in our country. It has adverse effects on our economic growth.

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