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## FOREIGN DIRECT INVESTMENT, FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: AN EMPIRICAL STUDY OF PAKISTAN

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### Abstract

*The purpose of this study is to examine the relationship among foreign direct investment, financial development and economic growth in Pakistan using time series data over the period from 1970 to 2016. ADF (1981) and PP (1988) unit root tests are used to check the stationary properties of the series, Johansen's (1988) cointegration test is used to find the long-run equilibrium relationship among variables, Granger causality (1988) test is used to find the direction of long run relationship between variables. OLS is applied to better understand the relationship among variables. The findings indicate that all the data series are non-stationary at level and stationary at first difference. There are both long run and short run relationship between variables. Moreover, the results indicate that both FDI and financial development promote economic growth in Pakistan. This study is recommended for appropriate reforms in the financial sector and as well as attracting FDI inflows to achieve economic growth in Pakistan. The findings will be very useful for policy makers of Pakistan in order to attract FDI inflows and to maintain parallel expansion of financial sector to achieve high economic growth.*

**Keywords:** Economic growth, FDI, Financial development, FDI-growth theories,

## 1. Introduction

Economic growth is considered as the most significant criteria for evaluating the performance of an economy. There is a massive literature on identifying the main potential sources of the country's economic growth and its core drivers. All these studies indicate that there are different drivers of growth including financial sector development, domestic investment, foreign direct investment (FDI), export etc. The objective of this study is to investigate and examine empirically the existence of long-run and short-run relationship between foreign direct investment, financial development, and economic growth by employing time series analysis techniques. It has been clearly documented in more literature that FDI plays positive and constructive role in the country's economic growth. Although, there are conflicting views concerning the major role that FDI plays in promoting economic growth. Both De Mello (1999) and (Alfaro et al., 2004) are credited with being the first to indicate that FDI has a significant and positive impact on growth and showed the existence of positive and significant relationship between economic growth and foreign direct investment. (Edmore E Mahembe et al., 2016) claimed that both the empirical and theoretical literature showed that FDI have contributed positively in the economic growth of the host country. In theory FDI should improve and enhance the economy of a host country by way of technological spillovers and by increasing investible capital OECD (2002). The studies Kobrin (2015) and (Le, M. H et al. 2006) argued that Pakistan is facing the problem of saving investment gap like all other developing countries. Moreover, FDI inflows effects economic growth process by filling up the gap of saving investment, creation of employment, enhancement of transferring advanced technology, increasing productivity, and boosting competition. To get the related advantages, like all other developing countries Pakistan has also been encouraged to make their policies and kept their doors open to attract more FDI inflows.

The relationship between financial development and growth has been an issue of debate in the modern history among scholars. To better understand the role and impact of financial development in country's economic growth, Goldsmith (1969) following by McKinnon (1973) and others who had well studied and researched the relationship between economic growth and financial development. They have generated some important evidences, whether the economic growth of a country actually led development of financial sector. However, the results seem mostly mixed. There are three different views in theoretical literature on the direction of the interrelation between financial development and economic growth based on different empirical studies. The first view is given by Robinson (1952) stated that economic growth is the main driving force in increasing the demand of financial services and in financial development sector this is called as "Demand-following". The second view states that the development of financial sector is the core driving force behind economic growth; this is called as "Supply leading" proposed by Schumpeter (1911) and Patrick (1966). The third view has proposed by (Demetriades et al. 1996) stated that there is a bi-directional causality between both economic growth and financial development.

The research conducted by Niels Hermes and Robert Lensink (2003) claimed that for the recipient country, the development of financial sector is an essential condition and prerequisite for foreign direct investment to have a positive and constructive impact on recipient country's economic growth. Furthermore, argued that the improving financial system increases the efficient allocation of resources and with respect to FDI inflows, it increases the absorptive capacity of a country. Moreover, pointed out that the significance of the domestic financial system as a prerequisite for the positive growth effects of FDI could be shown with a simple model of technological change. Theoretically through the spillovers effects of new knowledge and capital goods, the FDI inflows could boost technological change but underlying the size of FDI contribution is the whole business climate in the recipient countries (Chamarbagwala et al., 2000). (Chien-Chiang Lee, Chun-Ping Chang, 2009) claimed that if financial development is supplemented with an active economic policy it will make easy to attract even more FDI inflows in the long run; there are strong and clear indications that a strong and well-developed financial system could bring source of numerous comparative advantages for a country, and in turn these advantages make it easier for the country to stimulate the overall economic performance by absorbing the positive impact of FDI.

All the early research studies suggest that the relationship among financial development, FDI, and economic growth is changeable with the different variables being taken in the studies to indicate the financial development. Additionally, the findings of these studies suggest that the outcomes among these sectors are different for every country. Most of the researches on this issue are facing limitations such as; researches are mostly based on cross-country analysis which can not address the specific issue of a country, and most of the studies are suffering from exclusion of variables and drowning results by using bivariate analysis. The literature on Pakistan is limited and there are not much detailed studies to well address the relationship and role of FDI, financial development in promoting growth of its economy. Johansen's co-integration and Granger causality tests have been used in this study to find the direction of causality between foreign direct investment, financial development and economic growth. Augmented Dickey Fuller and Philip Peron tests have been used to check the nature of the series. Tests are not just limited to these tests but other tests have also been applied such as ordinary least square and vector error correction model to better understand the interrelationship among FDI, economic growth, and financial development for Pakistan.

## 2. Literature review

The related theoretical and empirical studies have tried to link the relationship among foreign direct investment, financial development, and economic growth. Most of the literature reviews showed significant and positive relationship among economic growth, financial development, and foreign direct investment. (Laura Alfaro, Areendam Chanda, et al. 2004) claimed that countries having well-developed financial markets are gaining significantly from FDI. Furthermore, the developing countries have changed their attitude after following the debt crisis in 1980s and 1990s for attracting more FDI inflows as they believed that FDI can contribute to the development of financial sector and economic growth of the country; the benefits of FDI are restricted to well use of its resources but can introduce new processes to financial markets, and seek to improve the cost of doing business and local regulatory authority. Chien-Chiang Lee and Chun-Ping Chang (2009) argued that there is a strong long-run interrelationship between FDI, financial development and economic growth. Furthermore, the financial development has more strong effect on economic growth than does FDI. Moreover, their study claims that in the short run there is a weak relation, while in the long run the relationship among these variables are unequivocal and it is important to note that there is a strong sign of bi-directional causal relationship among FDI, financial development and economic growth.

(W.N.W. Azman-Saini et al., 2010) study claimed that when financial markets development exceeds the threshold level then only in that case FDI has a positive and strong impact on economic growth. Until then, the advantages of FDI inflow for economic growth are non-existent. Further, claims the policies that are made by government to attract more FDI should go hand in hand with financial development and shouldn't happen before that aims only for promoting the development of financial markets. Edmore E Mahembe and Nicholas M Odhiambo (2016) study has shown that economic growth is positively impacted by foreign direct investment only when the following circumstances are met; high level of education and competency, high level of technological diffusion and favorable political, economic, social and cultural conditions. Laura Alfaro (2003) indicated that not all forms of FDI flows are advantageous for the economic growth of the host countries. Now this might suggest differentiated efforts for attracting FDI inflows, even there can be negative incentives in some types such as in natural resources. Moreover, in effect, most of countries now started to improve and pursue targeted policies for attracting more FDI to improve their economic growth. (Laura Alfaro, Areendam Chanda, Sebnem Kalemli-Ozca, et al., 2010) findings indicate that an increase in the share of FDI lead to an additional increase in the economic growth of financially well developed economies as compare to less developed economies. Further their finding indicates that the effect of growth is huge when goods are produced by MNCs and domestic firms should be substitutes rather than complements and when the financial system of the country is developed enough then the host country benefits from the backward links between domestic and foreign firms with positive and constructive spillovers to the rest of the economy.

Ihtisham Abdul Malik and Shehla Amjad (2013) suggested that the causality between economic growth and development of aggregate stock market is uni-directional and between economic growth and FDI there is a bi-directional causality. Furthermore, claimed that in the long run FDI has a positive role in improving aggregate stock market development in Pakistan and there FDI has positive impact in sectors where there is high concentration of FDI but negative in those with less concentration of FDI. (E. Borenszteina, J et al., 1998) claimed that foreign firms which invest in the host countries enjoy higher productive efficiency and lower cost than being enjoyed by domestic firms. While in case of developing countries the higher efficiency of FDI would result from the combination of modern technology and advanced management skills; as FDI could be the main channel for transforming the advance technology to the host countries and FDI is a complementary for to the domestic investment. Mohammad Arshad Khan and Shujaat Ali khan (2011) argued that FDI causes economic growth in the service and primary sector while in manufacturing sector growth causes FDI inflows is found and there is small portion of FDI in export-oriented sector that's why there is a limited role of FDI in improving and promoting export of Pakistan

(Madhu Sehrawat et al. 2015) empirical study indicated that there is a long-run co-integration relationship exists between financial development and economic growth and further suggested that increase in the number of branches is not sufficient only for enhancing the economic growth and financial accessibility. However, the transactions and business of banks should be increased that in turn it will increase the deposits and credit that will encourage the economic growth and will decide the extent of financial accessibility. Abdul Jalil and Mete Feridun (2011) indicated that financial development helps in reducing risks through diversification and ensures the presence of liquidity in financial system. Moreover, argues that financial intermediation works as a channel to effectively channel the funds from savers to the borrowers and further suggests that a well-developed and sound financial system is important to increase the economic growth of Pakistan.

On the issue regarding the relationship among financial development, FDI, and economic growth, we indicated a wide literature review, but for the discussion of these issues we still have a room for more empirical and theoretical studies on relationships among these variables.

### **3. Data, Variables and Methodology**

#### **3.1. Data Source**

The data used in this study is form of annual time series that cover the period from 1970 to 2016. The data used in study are obtained from various sources, including state bank of Pakistan's reports, International Financial Statistical yearbooks that are published by International Monetary Fund and World Bank database (2014).

### 3.2. Definitions of Variables

To examine the relationship among financial development, FDI, and economic growth for Pakistan, the following variables are considered in this study:

- Foreign direct investment is measured by FDI, which indicates FDI inflows as % of GDP. It can be calculated as follows:

$$FDI = \frac{\text{Foreign direct investment inflows (\$)}}{\text{Gross domestic product (\$)}} \times (100) \dots\dots\dots (1.0)$$

- Financial Development is measured by two variables: first one is, CB, “domestic credit to private sector by banks as % of GDP”. This refers to all financial resources that are provided to private sector by other depository corporations that establish a claim for repayment, such as, through purchases of non-equity securities, trade credits, loans and other accounts receivable; second, CF, which is domestic credit provided by financial sector as % of GDP”. In which the domestic credit is provided by financial sector contains all credit to different sectors on a gross basis, except the credit to the central government, which is net. The financial sector includes deposit money banks, monetary authorities, and as well as other financial corporations. Both indicators are calculated as follows:

$$CF = \frac{\text{Domestic credit provided by financial sector (\$)}}{\text{Gross domestic product (\$)}} \times (100) \dots\dots\dots (2.0)$$

$$CB = \frac{\text{Domestic credit provided by banks (\$)}}{\text{Gross domestic product (\$)}} \times (100) \dots\dots\dots (3.0)$$

- Economic Growth is measured by Per capita GDP (Current US\$). GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Per capita GDP is calculated as follows:

$$Per\ capita\ GDP = \frac{\text{Gross domestic product (\$)}}{\text{Population}} \dots\dots\dots (4.0)$$

In this study the dependent variable is per capita GDP, whereas FDI, CB and CF are considered as independent variables.

### 3.3. Regression Equation

Per capita GDP is regressed on three independent variables. The relationship among FDI, financial development and economic growth can be written in the following equation.

$$Per\ capita\ GDP_t = \beta_0 + \beta_1 FDI_t + \beta_2 CB_t + \beta_3 CF_t + \mu_t \dots\dots\dots (5.0)$$

Where *Per capita GDP<sub>t</sub>* is to indicate economic growth, measured as natural log at time *t*. *FDI<sub>t</sub>* is foreign direct investment as percentage of GDP, *CB<sub>t</sub>* is domestic credit to private sector by banks as percentage of GDP, *CF<sub>t</sub>* is the domestic credit to private sector by financial sector as percentage of GDP, and *β<sub>s</sub>* is expected signs of coefficients.

### 3.4. Unit Root Investigations

To find the unit root in the series, following two unit root tests are employed.

#### 3.4.1. Augmented Dickey Fuller Test

A stationary time series variable is one whose basic properties, mean, variance and auto-covariance is constant over time and there is no upward and downward trend in the variable. If any of these properties are not met then, the time series variable is referred to as non-stationary. The null hypothesis for ADF and PP tests is that the series has a unit root test and if the time series of variable is non-stationary, then to make the series stationary we take the first difference. A stationary series if difference, is denoted as I(d) where d is the order of integration and stationary series is denoted with I(0). ADF tests work as under

$$X_t = \alpha \cdot X_{t-1} + \varepsilon_t \quad \dots\dots\dots (6.0)$$

The above autoregressive model is called stationary, in which the value of  $\alpha$  is less than 1. If subtract  $X_{t-1}$  from both sides of the equation results in

$$(X_t - X_{t-1}) = (\alpha - 1) \cdot X_{t-1} + \varepsilon_t \dots\dots\dots (7.0)$$

$$\Delta X_t = \beta_1 \cdot X_{t-1} + \beta_1 \Delta X_{t-1} + \varepsilon_t \dots\dots\dots (8.0)$$

In the equation lagged value of X is augmented term. This is how Augmented Dickey-Fuller test works, where  $\beta_1$  is equal to  $(\alpha-1)$ . The above equation can be run with intercept or trend and can also run without intercept or trend. The null hypothesis of the ADF test is

$$H_0 = \beta_1 = 0$$

$$H_1 = \beta_1 < 0$$

When  $\beta_1$  is zero, and  $\alpha$  will be 1 so we can conclude that there exist unit root in the time series. To reject the null hypothesis means that in the series the unit root will be rejected. In the ADF test Schwartz criteria will be used for decision making with or without inclusion of intercept.

#### 3.4.2. Phillip Peron Test

This test is also applied to test unit root in the series. In unit root test of PP the null hypothesis states that there exist unit root in the series and the interpretation of PP test is same as ADF. Phillips Peron (1988) test is based on following first order auto regressive model

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \mu_t \quad \dots\dots\dots (9.0)$$

Where  $\Delta$  is the difference,  $Y$  is the dependent variable to be estimated,  $\alpha$  is intercept,  $\beta$  is coefficient and  $\mu$  is white noise.

### 3.5. Cointegration Test

If we want to check whether two series move together or not over time, then Johansen's (1988) cointegration technique is applied. This test can be applied when there is the same level of integration in all variables. If two times series are co-integrated then this means that there exists long run relationship among variables and these variables move together over time. Johansen's (1988) Cointegration test is based on the following equation

$$X_t = \alpha_0 + \sum_{j=1}^k \beta_j X_{t-j} + \varepsilon_t \quad \dots\dots\dots (10.0)$$

Where  $X_t$  is  $n \times 1$  vector of variable that is stationary at first difference and contain unit root,  $\alpha_0$  is  $n \times 1$  constant,  $k$  is the number of lags,  $\beta_j$  is coefficients, and  $\varepsilon_t$  is the error term. The equation (6.0) is reformed into the following vector error correction model

$$\Delta X_t = \alpha_0 + \sum_{j=1}^{k-1} \beta_j \Delta X_{t-j} + \delta X_{t-k} + \varepsilon_t \quad \dots\dots\dots (11.0)$$

$$\text{Where } \delta = -I + \sum_{i=j+1}^k \beta_j \quad \dots\dots\dots (12.0)$$

Where  $\Delta$  is the difference,  $X_t$  is variable,  $I$  is identity matrix.

### 3.6. Granger causality test

To check the direction or association of long run relationship between Per capita GDP, FDI, CB and CF, granger causality test will is applied. It is the situation in which one time series variable is predictably or consistently changes before change in another variable. The test of Granger causality is employed if there the relationship exists between two variables but it is not confirmed that which variable will cause to move the other variable. Suppose E and S are two variables, to check whether E in the equation granger causes S or S causes E. Granger (1988) suggests the following causality model

$$E_t = \beta_0 + \beta_1 E_{t-1} + \dots + \beta_p E_{t-p} + \alpha_1 S_{t-1} + \dots + \alpha_p S_{t-p} + \varepsilon_t \quad \dots\dots (13.0)$$

In order to check the relationship in each direction, running of two tests are needed at the same time in the granger causality test. The model of the second test is

$$S_t = \beta_0 + \beta_1 S_{t-1} + \dots + \beta_p S_{t-p} + \alpha_1 E_{t-1} + \dots + \alpha_p E_{t-p} + \varepsilon_t \quad \dots\dots (14.0)$$

In the equation (13.0) the test of causation is running from S to E while, in the equation (14.0) the test of causation is running from E to S. the null hypothesis of granger causality test is that when the coefficients of E ( $\alpha$  s) in the equation (14.0) and the coefficients of S ( $\alpha$  s) in equation (13.0) are both equal to zero. In the equation (14.0) the null hypothesis rejection indicates that causation is running from E to S, whereas, in the equation (14.0) the rejection of null hypothesis shows that S granger causes E. for the accuracy of result, the number of lags need to be selected on the basis of their significance in the specifications of granger causality.



### 3.7. Ordinary least square

This is a method for estimating the unknown parameters in a linear regression model. The purpose of this test is minimizing the sum of the squares of the differences between values of the variable being predicted in the given dataset or observed responses, and those predicted by a linear function of a set of explanatory variables. The overall purpose of ordinary least square is minimizing or handling the error. For the interpretation OLS, R-Square ( $R^2$ ) and Adjusted  $R^2$  are used to check the goodness fit of the overall model, to check the goodness fit of the individual parameters ( $\alpha$ ,  $\beta$ ) then T-statistics is employed, F-statistics is used to check the significance of overall model.

## 4.1. Results and discussions

### 4.1. Descriptive Statistics

<b>Variables</b>	<b>Per capita GDP</b>	<b>FDI</b>	<b>CF</b>	<b>CB</b>
Mean	6.106003	0.749383	48.04813	23.31796
Median	6.073114	0.530000	49.13000	24.01000
Maximum	7.291786	3.670000	57.79000	29.79000
Minimum	4.608166	-0.060000	36.85000	15.38200
Std. Dev.	0.674840	0.806694	5.359219	3.689277

### 4.2. Unit root tests results

Apparently, all the four series are seen as a non-stationary at the level and have unit root test as the small negative values for each series cannot exceed the critical values of that series. The stationary natures of all four series are investigated by Augmented Dickey Fuller test and Philip Peron test. Lags have been selected for using Schwartz criteria for both Augmented Dickey Fuller test and Philip Peron test.

<b>Table 2.0</b> ADF and PP test results: T-stat and P-values								
<b>Statistics at Level</b>	<b>Per capita GDP</b>		<b>FDI</b>		<b>CF</b>		<b>CB</b>	
	T-stat	P-value	T-stat	P-value	T-stat	P-value	T-stat	P-value
<b>Intercept (ADF)</b>	-0.0495	0.9487	-2.7945	0.0671	-2.4287	0.1397	-2.2454	0.1938
<b>Intercept &amp; Trend (ADF)</b>	-2.3090	0.4208	-3.4078	0.0630	-2.4005	0.3745	-1.7124	0.7297
<b>None (ADF)</b>	-2.8199	0.9985	-1.7380	0.0779	-0.0914	0.6468	-0.8357	0.3484
<b>Intercept (PP)</b>	-0.0385	0.9498	-1.8913	0.3334	-2.4923	0.1239	-1.7813	0.3849
<b>Intercept &amp; Trend (PP)</b>	-2.4956	0.3288	-2.4523	0.3492	-2.5545	0.3020	-1.7124	0.7297
<b>None (PP)</b>	-2.8628	0.9986	-1.2366	0.1955	0.0639	0.6982	-0.8196	0.3555
<b>Statistics at 1<sup>st</sup> difference</b>	<b><math>\Delta</math> in per capita GDP</b>		<b><math>\Delta</math> in FDI</b>		<b><math>\Delta</math> in CF</b>		<b><math>\Delta</math> in CB</b>	
	T-stat	P-value	T-stat	P-value	T-stat	P-value	T-stat	P-value
<b>Intercept (ADF)</b>	-5.6941	0.0000	-4.7226	0.004	-5.3611	0.0001	-5.3825	0.0000
<b>Intercept &amp; Trend (ADF)</b>	-5.6549	0.0001	-4.6776	0.0026	-5.3107	0.0004	-5.3627	0.0003
<b>None (ADF)</b>	-5.0251	0.0000	-4.7716	0.0000	-5.4233	0.0000	-5.4098	0.0000
<b>Intercept (PP)</b>	-5.6155	0.0000	-4.6878	0.0004	-5.2901	0.0001	-5.2905	0.0001
<b>Intercept &amp; Trend (PP)</b>	-5.5699	0.0002	-4.6378	0.0029	-5.2161	0.0005	-5.2221	0.0005
<b>None (PP)</b>	-5.0431	0.0000	-4.7391	0.0000	-5.3800	0.0000	-5.3287	0.0000

In the table (2.0) and table (2.1) shows the result of ADF and PP. Table (2.0) shows T-stat and p-value of PP and ADF tests at level and at first difference for four series. Table (2.1) shows critical values at 1% and 5% of ADF and PP tests at level and first difference respectively for all the series. In the Table (2.0) ADF and PP tests results indicate that all the series contain unit root test at level form and it is non-stationary as in table (2.1) the statistics of both ADF and PP tests for all four series doesn't exceeds critical values at 1% and 5%. All series are stationary at their first difference and significant at 1% and 5% respectively. It means all the series are integrated of order one I(1) as they become stationary at first difference.

<b>Table 2.1</b> ADF and PP test results: Critical values (C.V) at 1% and 5%								
Statistics at Level	Per capita GDP		FDI		CF		CB	
	C.V at 1%	C.V at 5%	C.V at 1%	C.V at 5%	C.V at 1%	C.V at 5%	C.V at 1%	C.V at 5%
Intercept(ADF)	-3.5811	-2.9266	-3.5847	-2.9281	-3.5811	-2.9266	-3.5847	-2.9281
Intercept & Trend (ADF)	-4.1705	-3.5107	-4.1756	-3.5130	-4.1705	-3.5107	-4.1705	-3.5107
None (ADF)	-2.6162	-1.9481	-2.6173	-1.9483	-2.6162	-1.9481	-2.6162	-1.9481
Intercept(PP)	-3.5811	-2.9266	-3.5811	-2.9266	-3.5811	-2.9266	-3.5811	-2.9266
Intercept & Trend (PP)	-4.1705	-3.5107	-4.1705	-3.5107	-4.1705	-3.5107	-4.1705	-3.5107
None (PP)	-2.6162	-1.9481	-2.6162	-1.9481	-2.6162	-1.9481	-2.6162	-1.9481
Statistics at 1 <sup>st</sup> difference	$\Delta$ in per capita GDP		$\Delta$ in FDI		$\Delta$ in CF		$\Delta$ in CB	
	1% C.V	5% C.V	1% C.V	5% C.V	1% C.V	5% C.V	1% C.V	5% C.V
Intercept(ADF)	-3.5847	-2.9281	-3.5847	-2.9281	-3.5847	-2.9281	-3.5847	-2.9281
Intercept & Trend (ADF)	-4.1756	-3.5130	-4.1756	-3.5130	-4.1756	-3.5130	-4.1756	-3.5130
None (ADF)	-2.6173	-1.9483	-2.6173	-1.9483	-2.6173	-1.9483	-2.6173	-1.9483
Intercept (PP)	-3.5847	-2.9281	-3.5847	-2.9281	-3.5847	-2.9281	-3.5847	-2.9281
Intercept & Trend (PP)	-4.1756	-3.5130	-4.1756	-3.5130	-4.1756	-3.5130	-4.1756	-3.5130
None (PP)	-2.6173	-1.9483	-2.6173	-1.9483	-2.6173	-1.9483	-2.6173	-1.9483

Note: FDI for foreign direct investment as a percentage of GDP, CF is domestic credit provided by financial sector as % of GDP, CB is domestic credit to private sector by banks as % of GDP,  $\Delta$  is 1<sup>st</sup> difference, and C.V is the critical value.

#### 4.4. Johansen's cointegration test results

Johansen's cointegration test is used for Per capita GDP, FDI, CF and CF that are integrated of the same order under the assumption of linear deterministic trend in the data with lag interval of 1 to 4. In the Table (3.0) of the trace test result show that there is at least two co-integration equations at the 0.05 level that can explain the long-run equilibrium relationship between all four variables series.

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 critical value	Prob.
None *	0.463836	72.92140	63.87610	0.0072
At most 1 *	0.403483	46.74219	42.91525	0.0198
At most 2	0.323925	25.04297	25.87211	0.0631
At most 3	0.185198	8.602024	12.51798	0.2064

#### 4.6. Granger causality test results

In the table (5.0) the result indicates that there is uni-directional relationship between per capita GDP and CB, FDI and CF, and CF and CB. On the other hand in the result bi-directional relationship exist between Per capita GDP and CF, and between FDI and CB. Table (5.0) result also reveal that the Granger Causality is running from FDI; which is a proxy for Foreign direct investment, and per capita GDP; which is a proxy for economic growth, from CF to per capita GDP, from CB to per capita GDP, from CF; which is proxy for financial development, to FDI, from CB; which is a proxy for financial development, to FDI, from CF to CB.

Null hypotheses	T-statistics	P-value
FDI does not Granger cause per capita GDP	0.72787	0.7029
per capita GDP does not Granger cause FDI	2.58727	0.0709
CF does not Granger cause per capita GDP	4.42610	0.0183
per capita GDP does not Granger cause CF	6.71994	0.0030
CB does not Granger cause per capita GDP	1.52354	0.2303
per capita GDP does not Granger cause CB	3.49051	0.0401
CF does not Granger cause FDI	1.39801	0.2518
FDI does not Granger cause CF	2.53148	0.0404
CB does not Granger cause FDI	2.43914	0.0541
FDI does not Granger cause CB	3.05850	0.0227
CB does not Granger cause CF	0.53361	0.7780
CF does not Granger cause CB	2.53147	0.0438

According to Granger Causality test result in case of Pakistan, economic growth drives and causes financial development, and financial development drives and causes economic growth. Furthermore, foreign direct investment causes financial development, and financial development drives and causes foreign direct investment.

#### 4.7. Ordinary least square results

In table (6.0) the value of R-squared is 0.642522 which means that in overall model the contribution of foreign direct investment and financial development; CF and CB, have 64.2522% in economic growth; per capita GDP. T-stat values are 7.965350, 2.494225, - 6.462959 for FDI, CF, and CB respectively. All the coefficients of independent variables are positive except for CB, T-statistics values of all independent variables are beyond  $\pm 1.96$ , the F-statistics values are also greater than 3 and the p-values of all independent variables; foreign direct investment, CB and CF are significant at 0.05. So to make the hypothesis, alternative hypothesis  $H_1$  is accepted and rejects the null hypothesis  $H_0$ .

<b>Table 6.0 OLS results</b>				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
FDI	0.658012	0.082609	7.965350	0.0000
CF	0.031113	0.012474	2.494225	0.0165
CB	-0.124339	0.019239	-6.462959	0.0000
C	7.017316	0.593546	11.82270	0.0000
R-squared	0.642522	Mean dependent var		6.106003
Adjusted R-squared	0.617582	S.D. dependent var		0.674840
S.E. of regression	0.417321	Akaike info criterion		1.171343
RSS	7.488741	Schwarz criterion		1.328802
Log likelihood	-23.52656	Hannan-Quinn criter.		1.230596
F-statistic	25.76241	Durbin-Watson stat		0.443136
Prob(F-statistic)	0.000000			

#### 5. Conclusion and Findings

In this study, an attempt has been made to examine, investigate and analyze the short-run and long-run relationship among FDI inflows, financial development, and economic growth of Pakistan by employing a time series data for the period of 1970 to 2016. Economic growth is measured as Per capita GDP, FDI is measured as a FDI inflows as percentage of GDP, and two variables are taken to measure the financial development, the first one is CB, which is domestic credit to private sector by banks as percentage of GDP; second, CF, which is domestic credit provided by financial sector as percentage of GDP. Finance-growth and FDI-growth theories have been explained to theoretically explain the relationship among variables; to check the stationary properties of the variable series, ADF and PP tests are used; Granger causality test is employed to find the direction of long-run relationship between variables, while the test of Johansen's cointegration is used to find long-run equilibrium relationship among variables; to estimate the unknown parameters in a linear regression model, ordinary least square is applied, while VECM is used to check the speed of adjustment, After employing ADF and PP tests, the study found that

all four series of variables are stationary at their first difference and are integrated of order one I(1) while, non-stationary at level. Johansen's co-integration test confirms that in the trace test result there is at least two co-integration equations that can explain the long-run equilibrium relationship among all variables at the 0.05 level. The results of Granger causality test confirms that there is a bi-directional relationship exists between per capita GDP and CF, and between FDI inflows and CB. There is uni-directional relationship between per capita GDP and CB, FDI and CF, and between CF and CB. The results of vector error correction model confirms that the adjustment of disequilibrium is due to first and second error terms and 12.61 years are required to adjust the short run disequilibrium among the variables series but the second error has more the speed of adjustment. The results of ordinary least square shows that the value of R-squared means that in the overall model the contribution of FDI, CB and CF is 64.2522%. All the coefficients of independent variables are positive except for CB, T-statistics values of all independent variables are beyond  $\pm 1.96$ , the values of F-statistics values are significant at 0.05 p-value and in the hypothesis of t-statistics, F-statistics and P-values, alternative hypothesis  $H_1$  is accepted and null hypothesis  $H_0$  is rejected.

### **5.1. Suggestions and recommendations**

The results of this empirical evidence suggest that both financial development and foreign direct investment play important role in contributing to economic growth of Pakistan. However, to get full potential of FDI, a healthy development of financial sector is very crucial to accelerate the economic growth. The findings suggest both FDI inflows and financial development have positive impact on the economic growth for Pakistan if the following conditions are met: political stability, high quality infrastructure, assurance of security, and dynamic financial system reforms are crucial for sound financial sector which will in turn, promote the economic growth. Thus, policy makers should more focus on attracting FDI inflows and make broad financial reforms in the financial sector to achieve country's developmental goals.

### **5.2. Suggestions for future research**

Following are the directions for future research: time series tests are used in this study and further tests can be applied with the inclusion of different indicators for FDI, financial development and economic growth with different time period.

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