INVESTIGATING THE EFFECT OF FOREIGN DIRECT INVESTMENT (FDI) AND FOREIGN REMITTANCES ON ECONOMIC GROWTH IN PAKISTAN (1990-2018): A TIME SERIES ANALYSIS USING ARDL MODEL APPROACH

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ABSTRACT
This study is conducted to find the effect of foreign remittances, foreign direct investment (FDI) on economic growth in Pakistan. Time series data is used which is covering from 1990 to 2018, collected from the world development indicator data bank. ARDL bound test is used in which GDP is dependent variable while foreign remittance and foreign direct investment (FDI) are independent variables. The form the Auto Regressive Distribution Lag (ARDL) model suggest that there is long run relationship between FDI, foreign remittance and economic growth of Pakistan.

Keywords: Foreign Direct Investment (FDI), Foreign Remittances, Economic Growth
JEL Codes: F21, F24

I. INTRODUCTION
In recent decades, main factors of economic growth were significantly studied. Meanwhile, foreign direct investment and remittance and their impacts on economic growth were considerably investigated because these economic characteristics are explicitly highlighted in developing countries, particularly in Pakistan. The foreign direct investment (FDI) plays an important role in the economic development of a country. In any economy, there are various determinants that force FDI for contributing positively or negatively, for example, Carkovic et al. (2002) analyzed the association between growth and FDI for 1960 to 1995, and found that the relationship depends on trade openness, education level, financial and economic development of the recipient country. Similarly, Ek (2007) showed that FDI has not significant impact on economic growth in China for 1994-2003. Saqib et al. (2013) investigated that FDI negatively affect the economy of Pakistan for 1981-2010. Falki, N. (2009) exposed that FDI has not played a role to enhance economic growth in Pakistan. Similarly, Khan and Khan (2011) exposed that FDI is an accelerating factor of GDP in the long run for Pakistan for 1981 to 2008. Johanson, A. (2006) showed that FDI enhance the host country economic growth with the help of technology and inflows of capital during 1980 to 2002.

However, external factors such as foreign direct investment, foreign remittances, and import from foreign countries are also equally important for improving economic growth especially for developing countries (Erik and Ruiz-Arranz, 2006; Salahuddin, 2010; Almfrsji and Almasfir, 2014). Remittance means the transfer of finds international migrants to their family members in their home country (Ahmad, Ahmad and Hayat, 2013). According to (Tahir, Khan and Shah, 2015) showed that foreign direct investment and foreign remittances have a significant positive role in the growth process of Pakistan economy. Junaid Ahmed (2011) finds the impact of remittances, exports and money supply on economic growth in Pakistan. He uses time series data for the period of 1976-2009. The study finds positive and significant impact of remittances on economic growth of Pakistan in short and long run while Muhammad Javid (2012) documents the importance of remittances for the economic progress of the country. (Ahmad, Ahmad and Hayat, 2013) investigated the impact of foreign remittances on economic growth of Pakistan. His uses secondary time series data for the period 1978 to 2011. The finds of the study showed that foreign remittances have positive and significant relation with GDP of Pakistan.

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II. REVIEW OF LITERATURE

Siddique, Ansar and Naeem (2018) examined the nexus between foreign direct investment and economic growth for Pakistan for 1980 to 2016. Using autoregressive distributed lag bounds co-integration and granger causality test. The results of ARDL bounds test show the existence of co-integration between economic growth, FDI, trade, physical capital and human capital. The results indicate the unidirectional causality from economic growth to FDI, to physical capital and to trade. The finding also expresses the one-way causality from human capital to labor force and physical human capital. Ojewumi and Akinlo (2017) investigated the effect of foreign direct investment (FDI) on Pakistan's economic growth during 1960 to 1980 has remained in cyclic position, but during the period of 2000 to 2006 has remained healthy because number of multinational companies including foreign economies focused Pakistan form labor, trade and HRD point of view and preferred to invest in Pakistan.

Ali and Malik (2017) analyzed the short and long run impact of foreign direct investment (FDI) on economic growth of Pakistan form the period 1976 to 2015. For the stationarity of data augmented dickey fuller (ADF) test was used and auto regressive distributed lag (ARDL) model was used to check the long-term co-integration among variables. The results of the study showed that the FDI has significant positive impact on economic growth of Pakistan in short run whereas; it has insignificant negative impact on long run at 5% significant level. Rahman (2014) studied the impact of foreign direct investment (FDI) on economic growth of Pakistan. They use time series data which is comprises from 1981 to 2010, collected from the world data bank. The results of the multiple regression showed that there is a positive relationship between the FDI and GDP and have a negative relationship with CPI. When FDI increase the GDP of Pakistan will positively have affected by foreign direct investment (FDI).

Sohail and Mirza (2020) investigated the impact of foreign direct investment on economic growth of Pakistan using time series data from the period 1996 to 2015. The results of the study showed that there is a significant relationship between foreign direct investment and gross domestic product of the country. Saqib, Masnoon and Rafique (2013) analyzed the impact of foreign direct investment on the host country's economy. The data used for this research study has spanned over the time period of 1981 to 2010. The finding of the study showed that Pakistan's economic performance is negatively affected by foreign investment while its domestic investment has benefitted its economy. Moreover, the nation's debt, trade and inflation have found to have negative impact on its gross domestic product (GDP).

Khan and Shah (2015) investigated the relationship between foreign direct investment, foreign imports, foreign remittance and economic in Pakistan. The empirical analyses and carried out with time series econometric techniques using data over the period 1977 to 2013. The results of the study showed that external determinants such as foreign remittances, foreign investment, and foreign imports matter from a growth perspective. Foreign remittances and foreign direct investment have a significant positive role in the growth process of Pakistan economy. Dilshad (2013) examined the impact of worker's remittances on economic growth of Pakistan by investigating time series data of twenty-two years from 1991 to 2012. The study used regression model to identify the relationship between the variables. The results of the study showed that there exists a significant positive relationship between worker's remittances and economic growth in Pakistan.

Hassan (2018) analyzed the influence of worker's remittances on the economic growth along with few economic indicators in Pakistan. They used panel data for the time period 1971 to 2016 is taken to examine the empirical linkage between the worker's remittances and economic growth. By applying the ARDL and bound cointegration approach, the study showed that there is a positive impact of remittances on the economic growth of Pakistan in the short run and long run. Wakayama (2011) wrote a thesis on remittance and GDP growth in developing countries and after analyzing the Europe and central Asia region countries concluded that there is no correlation between remittance and GDP per capital growth therefore remittance cannot express GDP correctly in countries whose ratio of remittance to GDP as suggested by core. Siddique and Selvanathan (2010) conducted a study on remittance and economic growth on major south Asian countries i.e. Bangladesh, India and Sri Lanka and after empirical analysis identified that remittances have a mixed response with the economic growth. In Bangladesh remittance is not the cause of economic growth and same is the case with India no causal relationship is found between remittance and economic growth but in Sri Lanka a two-way causal relationship is found between remittance and economic growth which effects vice-versa.

III. DATA AND METHODOLOGY

The selection of variables have been carry though with the help of existing literature e.g. Ali (2011), Ali (2015), Ali (2018), Ali and Bibi (2017), Ali and Ahmad (2014), Ahmad and Ali (2016), Audi and Ali (2016), Ali and Audi (2016), Ali and Audi (2018), Ali and Rehman (2015), Audi and Ali (2017), Ali and Naeem (2017), Audi and Ali (2017), Ali and Zulfiqar (2018), Ali et al., (2016), Arshad and Ali (2016), Ashraf and Ali (2018) Haider and Ali (2015), Sajid and Ali (2018), Ali and Senturk (2019), Kassem et al, (2019), Ali and Bibi (2020), Sulehri and Ali (2020) and Audi et al., (2021). This research study entails annual time series data set covering the period from 1990 to 2018. The time series data of gross domestic product, foreign direct investment and foreign remittances where collected from world development indicator WDI. The augmented Dickey Fuller test (ADF-1980) is used to test the stationary. The ADF test is based on the following equation.

$$\Delta X_t = \alpha + \alpha_t + \alpha X_{t-1} + \delta_i \sum_{i=1}^{\rho} \Delta X_{t-1} + \epsilon_t$$

Where X show the time series variables used in study α shows constant parameter and optimum lag length of dependent variable and Δ shows difference. This study also uses ARDL approach to analyze the co-integration between foreign direct investment, foreign remittance and economic growth of Pakistan.

In the first stage which is based on bound testing and established by (Pesaran et al. 2001) the ultimate objective is to test whether the series under consideration are co-integrated or not. Following (Pesaran et al. 2001) modeling approach, in order to capture the foreign direct investment, foreign remittance, and economic growth, the ARDL model is generally specified as follows.

$$EG_t = f(\mathrm{FDI}_t, \mathrm{FR}_t)$$

where EG show economic growth; FDI is foreign direct investment and FR is foreign remittances. The general specification of ARDL used in our study are given below:

$$\Delta EG_t = \delta_1 + \beta_2 FDI_{t-i} + \beta_3 RE_{t-i} + \sum_{i=1}^{c} \varphi_1 \Delta\, EG_{t-i} + \sum_{j=1}^{e} \omega_2 \Delta\, FDI_{t-j} + \sum_{v=1}^{l} \delta_3 \Delta\, RE_{t-v} + \mu_t$$

where δ_1 is the autonomus parameter, the short un coefficient is represented by φ_1, ω_2, and δ_3, while long run parameters coefficient is represented by δ_1, β_2, and β_3. We used ARDL bounds testing co-integration approach which shows the co-integration relationship between the variables. If the error correction term is negative it shows the existence of long run co-integration relationship among the variables.

IV. RESULTS AND DISCUSSION

Table 1. Descriptive Statistics

	GDP	FDI	Remittance
Mean	25.42378	20.75770	4.320243
Median	25.30801	20.64203	4.026424
Maximum	26.47453	22.44425	7.135673
Minimum	24.41241	19.31784	1.453638
Std. Dev.	0.669054	0.929791	1.788462
Skewness	0.163708	0.160761	0.082939
Kurtosis	1.543611	1.935485	1.833042
Jarque-Bera	2.692495	1.494186	1.678746
Probability	0.260215	0.473742	0.431981
Sum	737.2897	601.9734	125.2870
Sum Sq. Dev.	12.53372	24.20633	89.56071
Observations	29	29	29

The above table 1 shows the descriptive statistics of all the variables included in the study. We can see the average GDP that is (25.42378), the maximum and minimum value of remittance during the studied year's i.e. (max. 4.02642 & min. 1.45363) and max and min value of FDI is (max. 22.44425 & min. 19.31784), the standard deviation of remittances and FDI during the studied years (1.788462 and 0.929791), and other related descriptive statistics that have been gathered by the estimation results.

Table 2. ADF test

Variables	Figures at level	Result	Figure at difference	Result
GDP	0.9421	Non stationary	0.0010	Stationary
FDI	0.4797	Non stationary	0.0035	Stationary
PC	0.8066	Non stationary	0.0003	Stationary

Source: Author own calculation

The table 2 shows results regarding stationary of data. The unit root test ADF has been applied to test the stationary of data at level and at first difference. All the above given variables are stationary and statistically significant, all variables are non-stationary at level and after the first difference all variables then get stationary.

Since unit root tests have applied, the next step is to employ the ARDL approach, developed by Pesaran et al. (2001) to determine the existence of a long run relationship between foreign direct investment, foreign remittance and economic growth. The results of the ARDL cointegration test are illustrated in table 3.

Table 3. ARDL bounds test results

Bound Test		
F-statistic	5.35	
Critical Values		
Significance Level	**I(0)**	**I(1)**
10%	3.17	4.14
5%	3.79	4.85

Source: Author own calculation

The results obtained from ARDL bounds test and the estimated F-test indicate the presence of long run relationship between variables. The decision rule is based on the F-statistics (5.35) that is above the upper bound critical value of 4.85, at 5% level of significance, as such we reject the null hypothesis of no co-integration.

The results obtained in table 3 confirmed that co-integration between exist, we then move to the second phase to determine the long run relationship. The ARDL co-integration test was performed, and the result obtained a tabulated in Table 4. The results obtained confirm a positive relationship between FDI, foreign remittance and economic growth. Specifically, the coefficient of foreign direct investment (FDI) shows that a 1% increase in FDI causes a 0.750% increase in economic growth at 5% at the level of significance. Similarly, the coefficient of foreign remittance indicates that a 1% change in foreign remittance causes 0.1224% change in economic growth at 5% level of significance.

Table 4. Model coefficients in long-term

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	0.750441	0.179758	4.174728	0.0011
Remittance	0.122412	0.049980	2.449202	0.0293
C	9.924791	3.381866	2.934709	0.0116

Source: Author own calculation

After estimating the long run coefficients, the next step is to estimate the short run dynamic growth model. The results for the short run are illustrated in table 5. It is shown that ECM (-0.228216) is negative and significant, which affirms the existence of the long run relationship between foreign direct investment (FDI), foreign remittance and economic growth. The negative and significant error correction term shows the long run relationship among the variables.

The results for the diagnostics tests are shown in table 5 and 6, which reports about the diagnostic tests. The results of diagnostic test demonstrate that our model is free from serial correlation and heteroscedasticity.

Table 5. results of short-term or error correction model (ECM)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGDP(-1))	-0.146242	0.198923	-0.735167	0.4753
D(LNGDP(-2))	-0.297973	0.236564	-1.259583	0.2300
D(LNGDP(-3))	-0.378706	0.209661	-1.806278	0.0941
D(LNFDI2)	0.111502	0.039247	2.841006	0.0139
D(LNFDI2(-1))	0.049327	0.039814	1.238921	0.2373
D(LNFDI2(-2))	0.042227	0.041044	1.028829	0.3223
D(LNFDI2(-3))	-0.107318	0.033918	-3.163993	0.0075
D(PCP)	-0.019193	0.019212	-0.998998	0.3360
ECM(-1)	-0.228216	0.075767	-3.012064	0.0100
R-squared	0.996174	F-statistic	307.7160	
Adjusted R-squared	0.992937	Prob(F-statistic)	0.000000	
Durbin-Watson stat	2.430779			

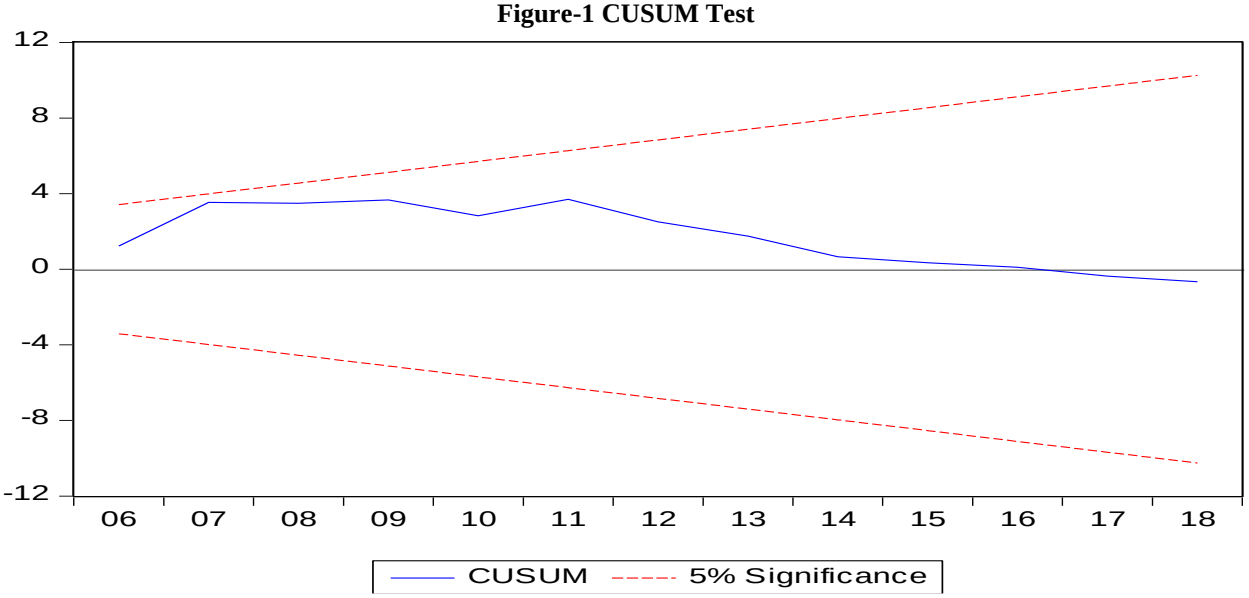
Table 5. Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.574540	Prob. F(2,11)	0.5790
Obs*R-squared	2.364540	Prob. Chi-Square(2)	0.3066

Table 6. Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.391235	Prob. F(11,13)	0.2824
Obs*R-squared	13.51735	Prob. Chi-Square(11)	0.2609
Scaled explained SS	5.695343	Prob. Chi-Square(11)	0.8929

Figure-1 CUSUM Test



The above graphs show that CUSUM test are lying within the critical bounds so our model is structurally stable. The data and variables of all models are stable because the plots of CUSUM (cumulative Sum of recursive residuals) are not crossing critical boundary lines. The present CUSUM chart at 5% significant showing that blue line is not crossing the red line on both sides. So, there is no problem of recursive residuals in mean terms. So, there is no need to add a variable, which is sensitive to structural break.

V. CONCLUSIONS

This study investigates the effect of foreign remittances, foreign direct investment (FDI) on economic growth in Pakistan by using time series data from the period 1990 to 2018. ARDL bound test approach is used to check the relationship between economic growth and independent variables foreign direct investment, remittances. ADF test shows all variables is stationary at first difference. So ARDL bound testing approach is used to check the relationship between the variables. The results show that foreign direct investment and foreign remittances have positive and significant effect on economic growth of Pakistan. If 1% increase in foreign direct investment (FDI) will increase GDP by 0.7504. similarly, the coefficient foreign remittances show that a one percent increase in foreign remittances will rise GDP by 0.1224. diagnostic test shows that our model is free from serial correlation and heteroscedasticity while error term is normally distributed that show the stability of our model.

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