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Article

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Effect of Foreign Direct Investment on Economic Growth of Pakistan: The ARDL Approach

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ABSTRACT

Purpose: This study investigates the effect of foreign direct investment on the economic growth of Pakistan. It also explores the role and contribution of various variables in the growth of the country's economy.

Design/methodology/approach: This study examines both the long run and the short run relationship between the variables over the period 1974 - 2018 by the Auto-Regressive Distributed Lag approach.

Findings: We find that in the long run, FDI, gross fixed capital formation and labor force participation have positive effect on the economic growth, whereas military expenditures have negative effect. In the short run model, however, gross fixed capital formation was indicative of having a significantly negative relationship with the economic growth while variables such as FDI, military expenditures and labor force participation were found to have positive impact. Inflation turned out to be significant but negative in both of the models while final consumption expenditure showed insignificance in both of the models.

Research limitations/implications: Notwithstanding its contribution to the literature, this study has limitations as well. Apart from those measures adopted in this research, there are also other important measures necessary for a country's economic growth such as skilled labor, work environment, infrastructure, security, technology, and so on. Yet, due to the lack or unavailability of reliable data source, we have not included these variables in our research. If incorporated in the analysis, these measures may provide more accurate results. Pakistan is a country where military engages in various business activities such as operating department stores, military schools, universities, and hospitals and as well as constructing roads and buildings. Thus such services and contributions of the military, if studied thoroughly, may provide better statistics regarding inward FDI and its contribution towards economic growth of the country. As a policy implication, this study suggests that the Pakistani government should focus on the necessary reforms to attract more FDI, since a low-capital country like Pakistan cannot underestimate the significance of FDI for a sustainable growth. Further researches may be conducted with a focus on the growth-investment possibilities of China Pakistan Economic Corridor. Studies can also be conducted which incorporate agricultural sectors, public and private investments, trust (between land/firm owners and labor) and the existing work/business environment in order to investigate the determinants of economic development of the country.

Originality/Value: To the best of our knowledge, there is only one study by Nilofer & Qayyum (2018) that uses the ARDL model to investigate the impact of FDI on economic growth of Pakistan. While they analyzed the variables including GDP, government consumption expenditure, public investment, FDI and lending rate, our study involves military expenditure, labor force participation, final consumption expenditure, gross fixed capital formation, inflation, and FDI. Also, we investigate the role of FDI on economic growth of Pakistan for a different time period 1974 to 2018 as compared to their study over the period 1970 - 2015.

Keywords: ARDL, Economic Growth, FDI, Pakistan

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I . Introduction

Pakistan, a South Asian country of a population of more than 200 million people, won its independence in 1947. It is still based on an agrarian economy, but has faced huge challenges in its socioeconomic circumstances in the past seven decades (Haider, 2018). The GDP growth has accordingly gone through fluctuations over time. Pakistan's GDP growth went up from 4.5% in 1962 to 10.4% in 1965 (World Bank, 2019a). After the 1965 war with India, the GDP growth declined to 5.7% in 1966. Again in 1970 the country's growth rate climaxed to its all-time highest of 11.3%. But shortly after the 1971 war with India and the separation of West Pakistan (today's Bangladesh), the growth rate declined to the country's lowest of 0.46%. The GDP growth restored back to 10.2% in the 1980's but it did not sustain this trend for any significant length of time. It reportedly went back to 7.6% in 2005, 4.7% in 2015 and 5.43% in 2018 (World Bank, 2019a).

As described above, Pakistan has been struggling to improve its poor economic situation and to achieve economic development from the very day of independence. It has received an increased amount of inward foreign direct investment (FDI) over time. In the year 1978, Pakistan received an FDI of USD 0.03 billion, which went up to USD 0.2 billion in 1988. The amount gradually increased to USD 0.506 billion in 1998 and USD 5.438 billion in 2008 while a downfall in the FDI was recorded in the next decade reaching USD 2.354 billion in the 2018. Along with the increase of inward FDI, GDP per capita of Pakistan also increased consistently. It achieved USD 135.1 in 1974, USD 337.8 in 1985, USD 489.9 in 1995, USD 683 in 2005 and USD 1,472.9 in 2018 (World Bank, 2019a).

The growth of an economy generally depends upon various factors including political stability, peace and security, infrastructure and communications, quality education, skilled labor force, advanced technological setups, savings and investments, exports and imports, inflation, agricultural and industrial advancements,

military spending, adaptation of modern research and development measures, foreign investments and other socio-economic factors.

A number of researches on the growth enhancing factors have been conducted around the world. As a very recent study, Švigir & Miloš (2017) studied the relationship between inflation and economic growth. Yildirim, Sezgen, & Öcal (2005) investigated the effect of military expenditure on economic growth. The impact of FDI on economic growth was explored in detail by Crespo & Fontoura (2007). FDI and its effect on economic growth has been of particular interest to researchers across countries. Given the rapid merging of production and monetary markets in the present economic activities, researchers are led to conclude that FDI is a crucial indicator regarding the development and an antidote for the economic hurdles in the emerging economies (Balioune-Lutz, 2004; Wong & Adams, 2002)

Literature on the relationship between FDI and economic growth indicate drastic variations in the findings of researchers from various economic backgrounds. Alexiou & Tsiliki (2007), for example, found no relationship whatsoever between FDI and economic growth and vice versa. Carbonell & Werner (2018) and Epaphra & Massawe (2016), on the other hand, reported a negative relationship between the two. Contrary to all, Jawaid & Saleem (2017), Nantwi & Erickson (2019), and Whyman & Petrescu (2017) reported a positive relationship between FDI and economic growth.

Literature particularly relevant to Pakistan, regarding the relationship between FDI and economic growth, also reveal a great deal of contradiction among researchers. Nilofer & Qayyum (2018) and Saqib, Masnoon & Rafique (2013) identified a negative relationship between FDI and economic growth in Pakistan. The works of Ali & Hussain (2017) and Siddique et al. (2017), however, indicated a positive relationship between FDI and economic growth in Pakistan.

The highly varied results reported by various scholars call for further investigation of the impact of FDI on the economic growth of Pakistan. The analysis presented here differs from most of the

previous studies in terms of the incorporated variables as well as the time frame under observation in Pakistan. Most of the available literature have used variables such as GDP, FDI, capital, total factor productivity, government size, trade openness, lending rate and public and private investment. Also the time frame under observation is limited like 40 years, 28 years, 16 years and 30 years. In this analysis, however, we have incorporated inflation, military expenditure, labor force participation, gross fixed capital formation, and final consumption expenditure in addition to FDI and GDP.

Although an adequate amount of literature is available on FDI and growth for Pakistan, clear consensus is absent on theoretical relationship between FDI and economic growth. Almost all of the researchers have studied the link between FDI and economic growth in piecemeal. For instance, Blejer & Khan (1984) used restricted least squares method for their models in nonlinear parameters, while Dutta & Ahmed (2004) and Ghazali (2010) used vector autoregressive (VAR) approach. Gudaro, Chhapra & Sheikh (2012) and Bint-e-Ajaz & Ellahi (2012) also studied the role of FDI on economic growth of Pakistan and presented empirical evidence. Devarajan, Swaroop & Zou (1996) and Khan (1996) among others argue that FDI might not have the desired impact on economic growth. Therefore, there still remain chances to present concrete evidence on this subject.

In this respect, this study attempts to look into the relationship between FDI and economic growth in Pakistan both in the long-run and the short-run, using the Auto-Regressive Distributed Lag (ARDL) approach. The ARDL model was used to investigate the impact of FDI on economic growth of Pakistan by Nilofer & Qayyum (2018). They analyzed the impact of FDI on economic growth for a time period ranging from 1970 to 2015 using variables such as GDP, government consumption expenditure, public investment, FDI and lending rate. Although this study is mostly based on their methodology, we incorporate military expenditure, labor force participation, final consumption expenditure, gross fixed capital formation

and inflation as well as GDP and FDI into the model. Another difference is that we investigate the role of FDI on economic growth of Pakistan for a different time period as compared to their study, ranging from 1974 to 2018.

In particular, unlike most studies on this subject, we aim at evaluating the impact of military expenditure (ME) on the economic growth of the country both in the long and the short run. Military expenditures are considered to have great significance of the country's economy since it is ever facing both internal and external threats like India-Pakistan tensions alongside its eastern border, Talibanization and terrorism over the past decade, Pak-Afghan tensions, and cross-border terrorist movements as well as internal security issues. All these threats may lead to high amount of spending on military and thus result in a negative effect on the economic growth of Pakistan.

II. Theoretical Background

A. Economic Growth and Foreign Direct Investment in Pakistan

Issues related to FDI have been addressed more and more, both at domestic and international level, and the majority of researches have highlighted this issue these days. Economists are, in general, of the opinion that FDI is one of the major elements of economic growth in all countries, especially in countries that are on the track towards development. FDI is basically the investment flow from one country into another, bringing new techniques and ideas that help promote and transfer technology and skills and generate new ways of doing things necessary to put an economy in the right direction towards development and growth.

Pakistan, among those countries, has always suffered from political instability, wars with the neighboring country, India, over the issue of Kashmir, terrorism, natural disasters like floods and earthquakes,

and high population growth rates resulting in poverty, lower literacy rates and indeed lower economic growth compared to other developing countries in the region. The country has also seen three periods of military rule jointly over 33 years since its independence in 1947.

Pakistan, at the time of its independence, was mostly an agrarian economy and the country didn't have industrial set up. The policy makers at that time had to focus on bringing reforms in the economic development with the special focus on establishing an industrial set up and utilizing the raw materials available in their early stages of the economic development initiative. However, these reforms in the form of investments in industrialization led the agriculture sector towards slipping into the whirlpool of underdevelopment and showed no significance in the economic development of the country (Nilofer & Qayyum, 2018)).

To increase the capital formation crucial for the economic development, a high level of savings and investments are required but developing economies like Pakistan considerably lack the required amount of national savings. Thus, a gap between the level of investment and the desired savings exists in Pakistan which can only be fulfilled through external capital inflows (Ali et al., 2017). Inbound FDI is one of the capital inflows from external sources which can play an important role in the economic development of a country.

So, the government of Pakistan offered its liberalization program in 1991-92 to attract foreign investors with 100% of foreign ownership of the capital, and to enable them to do business without getting registered in the stock exchanges providing them with unlimited overseas money transfers and with permits to withdraw their investments any time. Apart from offering such favorable and beneficial policies for foreign investors, Pakistan can provide a huge market potential with its population - over 200 million. These policy courtships led to an increase in the amount of FDI which rose from 10.7 million USD to 1,296 million USD in 1995-96 (Khan & Kim, 1999).

B. Literature Review

FDI is considered not only as a major source of important capital formation but also as a primary channel to access the advanced technologies and intangible factors including managerial as well as organizational skills and marketing networks, indicating its positive impact on the economic development of a country (Johnson, 2006 and Li & Liu, 2005). Compared to the international trade, the growth rate of FDI has been recorded to be very fast in recent years. The credit of this record FDI flows goes mainly to the developed countries. However, the developing countries also experienced remarkable increase in the FDI flows. The FDI flows to the developing countries were recorded to be 671 billion US dollars in 2018, seeing no recovery from the 10% drop in 2016 (UNCTAD, 2019).

The extent that the FDI inflows affect the economic activities of a host country has been explored extensively in recent years. The FDI flow can 'crowd in' or 'crowd out' the domestic investment and its effect on savings is very ambiguous.

The causal relationship of FDI, economic growth and the gross domestic investment was examined by Choe (2003) on 80 countries from 1971 to 1995 by using the panel vector autoregressive model. A bi-directional causality run was suggested between FDI and economic growth. Another study focusing the flows of FDI on the Mexican economy conducted by Ramirez (2006) reported a positive impact of the FDI on the labor productivity, implying that the superior technology of the foreign firms affects the productivity of the host country positively.

However, some researchers reported negative influence of FDI on domestic economy (Crespo & Fontoura, 2007). For instance, when multinational firms enter the domestic market, the competition between the foreign firms and the local firms may get fierce, which may lead to the low volume production and reduced efficiency of the local firms.

Thirlwall & Barton (1971) reported a positive relationship with the dataset collected from industrial countries while a negative relationship between

inflation and economic growth was reported in a dataset of 7 developing countries. Fisher (1993) and Ghosh & Phillips (1998) showed a negative relationship between inflation and growth. In another study concerning four neighboring countries such as India, Pakistan, Sri-Lanka and Bangladesh, Mallik & Chowdhury (2001) concluded with a positive relationship in the long run between economic growth and inflation.

Estimating the threshold level of inflation in Pakistan, Mubarik (2005) concluded that above the threshold level, inflation negatively affects the economic growth in Pakistan while below the level, inflation is conducive for the growth of the economy. Azar (2009), in his research upon US growth and inflation, indicated that the impact of inflation on economic growth is negative with statistical significance. Švigir & Miloš (2017) investigated the relationship between inflation and economic growth in Italy and Austria. Their regressive analysis confirmed that a statistically significant impact of inflation on economic growth does not exist. In their study of Korea and Japan, Prieto & Lee (2019) found that stock market index, economic growth and inflation have a long- term relationship.

When it comes to the relationship between military expenditure and economic growth, the literature do not have any generalized relationship between them across the countries and times. Atesoglu (2002) argues that there is a significantly positive relationship between military spending and economic growth in the United States. Yildirim, Sezgen, & Öcal (2005) found that military spending improves economic growth in Turkey and all of the countries in the Middle East. Pradhan et al. (2013) found an equilibrium relationship between economic growth and military expenditure using dynamic multivariate-causality tests on a dataset of 22 countries for a period of 24 years. The Keynesian theory is of the view that military spending enhances the aggregate demand by higher investment and the improved utilization of capital stock, which boosts the economic growth (Khalid & Alsalam, 2015). Exports and military expenditure have a significant positive impact on

the economic growth of Cameroon while FDI has shown no significant impact on the economic growth of the country (Pacific, Shan & Ramadhan, 2017). However, Lim (1983) found that higher defense spending hurts economic growth. Biswas & Ram (1986) reported that military spending does not significantly influence economic growth in the developing countries.

The study of Zareen & Qayyum (2014) on final consumption expenditure reveals that government size has a positive impact on the economic growth of Pakistan both in the long run and the short run. Rizeq (2015), in his research using the ARDL approach, discovered that total government spending has a positive but insignificant impact on the economic growth of Palestine, which, according to him, is consistent to the neoclassical theory. Shafuda (2015) explored the relationship between government final expenditure and the economic growth. He/She studied the Namibian economy in this regard while using Granger causality test, test of cointegration and vector error correction model. He/She concluded that there exists a unidirectional relationship between government expenditure and the economic growth in Namibia. His/Her empirical findings suggested that the government expenditure carries a significantly positive impact on the growth of Namibian economy. Alper & Verougstraete (2018) found that 1% increase in consumption increases growth by almost 0.41%. However, Jeff-Anyeneh & Ibenta (2019) found that there is no impact of the government consumption on the economic growth of Nigeria.

Dritsakis, Varelas & Adamopoulos (2006) found that gross capital formation increases the economic growth in Greece. Gibescu (2010) concluded that there exists a strong relationship between GFCF and GDP growth. Uneze (2013) stated that causality between gross fixed capital formation and economic growth is bi-directional. This means that increasing capital formation boosts economic growth or that higher economic growth results in higher capital formation. Ugochukwu & Chinyere (2013) found a positive and significant relationship between gross fixed capital formation and economic growth in

Nigeria. On the contrary to this result, Ajose & Oyedokun (2018) found after investigating capital formation and growth in Nigeria that there is an insignificantly negative relationship between GFCF and economic growth in Nigeria.

Skilled and learned labor force participation always plays a major role in the economic development of a country. Asghar, Awan & Ur Rehman (2012) found a significant and positive relationship between labor force participation and the economic growth of Pakistan. Tsani et al. (2013) and Lechman & Kaur (2015) found a “U” shaped reverse relationship between women workers’ participation and the economic growth. They further found that short-run deviations are close to long-run equilibrium figures. Amir, Khan & Bilal (2015) found that there is a significant and positive relationship between labor force and the economic growth of Pakistan in the long run. Dogan & Akyuz (2017), while studying women workers’ participation and the growth of the economy in Turkey, concluded that there exists a “U” shaped reverse relationship between women workers’ participation and the economic growth. While studying the relationship between GDP and labor force participation in Sri Lanka, Pakistan, India and Bangladesh, Rahman & Saqui (2018) concluded that an increase in the labor force participation has a direct relationship with the economic growth of these countries.

Finally, we can see that some of the micro and macro level studies showed positive relationships between economic growth and the variables such as FDI, Inflation, military expenditure, final consumption expenditure, fixed capital formation, and labor force participation. FDI by MNEs, in general, improves the level of experiences and knowledge, jobs and human development in the home country. However, if the home country has a lower absorptive capacity, FDI may show reverse effects. The related literature conclude that FDI may have positive or negative effect on the growth of an economy.

C. Sectors where FDI occurs most frequently in Pakistan

Pakistan has always been struggling to attract more FDI and to utilize this investment in such ways that it can flow towards achieving high goals of economic development, whereas the socio-economic and socio-political situations of the country have remained poor and not kept pace with the effort.

The investors usually take into account various aspects when they intend to do business in a country other than their home countries. There are a variety of factors which can help run a secured and successful business in the host country. On the other hand, there are also problems which hinder foreign investors from doing business in the host country, such as instability of the government, corruption, instable investment policy, inadequate infrastructure, government bureaucracy, and access to finance, among others, which can be the major problems of doing business in Pakistan. According to “Ease of Doing Business Rank” of World Bank in 2019, Pakistan ranks 108th out of 190 countries (World Bank, 2019b).

FDI in Pakistan comes mainly from countries including the U.S., Malaysia, Hong Kong, UK, the Netherlands, UAE, and Saudi Arabia. According to Board of Investment of Prime Minister Secretariat (2018), FDI inflows coming from these countries accounted for 71% of the total FDI inflows to Pakistan in 2007-2008. Table 1 shows the sector-wise net inflow of FDI in Pakistan. The data is from fiscal year 2011 to 2015.

The above data shows the inflow of FDI into Pakistan in various sectors. There is a huge inconsistency in the amount of investments in these sectors, which remains a big question for the National Investment Promotion Agencies (NIPA) of Pakistan.

Table 1. Sector-wise net inflow of FDI in Pakistan from fiscal year 2011 to 2015 (Unit: Million USD)

Sector	FY11	FY12	FY13	FY14	FY15
Food	37.5	15.6	532.7	83.3	-2.0
Beverages	9.4	27.8	20.0	23.0	96.6
Tobacco & Cigarettes	11.5	-3.3	0.4	34.2	11.2
Sugar	9.7	0.6	4.8	15.1	3.1
Textiles	25.3	30.3	13.9	-0.2	43.9
Rubber and Rubber Products	3.3	1.7	1.4	-0.3	4.4
Paper and Pulp	0.5	1.5	0.3	-	-
Leather and Leather Products	7.5	8.7	4.5	5.0	0.3
Chemicals	30.5	96.2	-47.1	94.9	55.3
Petro Chemicals	0.2	16.5	8.1	-0.5	-
Petroleum Refining	-18.4	14.7	106.8	2.7	-14.8
Mining and Quarrying	15.4	7.3	2.0	-23.2	-2.0
Oil and Gas Explorations	512.2	629.4	559.8	502.0	299.0
Pharmaceuticals and OTC Products	6.3	2.0	14.0	15.7	-48.8
Fertilizers	0.3	0.3	0.2	-	-
Cosmetics	1.6	0.2	-	-	-
Cement	65.2	-11.0	8.1	36.6	-185.2
Basic Metal	12.3	0.3	3.4	1.9	1.3
Metal Products	7.5	3.8	1.3	5.2	1.5
Machinery other than electrical	2.3	18.8	3.2	8.6	-55.2
Electrical Machinery	1.2	-5.2	2.6	1.0	0.0
Electronics	5.0	83.0	12.0	-10.7	-1.1
Transport Equipment	15.9	22.8	20.8	18.2	-0.3
Power	8.8	31.6	25.1	53.1	64.3
Construction	61.1	72.1	47.7	28.8	53.7
Trade	52.7	25.3	5.1	-3.2	50.0
Tourism	-	-	-	1.8	2.3
Storage facilities	0.1	0.2	13.9	-4.9	-0.2
Communications	-34.1	-315.2	-381.7	434.2	45.1
Financial Business	310.1	64.4	314.0	192.8	256.4
Social Service	0.4	3.6	7.3	0.1	0.3
Personal Service	28.0	21.2	18.4	102.2	36.4
Others	185.0	97.7	62.4	6.9	-18.1

Source: Statistics and Data Warehouse Department, State Bank of Pakistan (2016).

III. Data and Empirical Model

A. Sample and Data Collection

The dependent variable, real GDP is used as proxy for the economic growth over the period from

1974-2018. Because the data for labor force participation is not available before 1974, our time period starts from 1974. All the other variables include foreign direct investment (FDI), inflation (INF), military expenditure (ME), final consumption expenditure (FCE), gross fixed capital formation (GFCF) and

labor force participation (LFP). The data was taken from the World Bank Development Indicators. All of the variables (dependent and independent) used in this study are in real terms.

B. Empirical Model

Real GDP of Pakistan is used as the dependent variable and the inbound FDI as the independent variable. Control variables were incorporated based on prior studies such as inflation, military expenditure, final consumption expenditure, gross fixed capital formation and labor force participation. All the variables, except for inflation and labor force participation, are in real terms.

The functional form of the model used is as follows:

$$Y_t = f(FDI_t, INF_t, ME_t, FCE_t, GFCF_t, LFP_t, \varepsilon_t) \quad (1)$$

Where

Y_t : Real GDP

FDI_t : Foreign direct investment

INF_t : Inflation

ME_t : Military expenditure/GDP

FCE_t : Final consumption expenditure

$GFCF_t$: Gross fixed capital formation

LFP_t : Labor force participation

ε_t : Error term

The “ t ” in subscript stands for time “ t ” for each individual variable. GDP is not only depends theoretically upon FDI but also on other variables like FCE, GFCF, and LFP.

C. Auto-Regressive Distributed Lag (ARDL) Model

Among co-integration approaches, the autoregressive distributed lag model bears some advantages. Firstly, the ARDL approach is relatively more robust in the case of finite or small (25-80) samples (Pattichis, 1999; Mah, 2000). Secondly, based on a single

equation skeleton, the ARDL is more suitable to be utilized. This model clutches adequate number of lags and generates the data process in general to specific framework (Harvey, 1981). Thirdly, from ARDL approach, the error correction model (ECM) can also be easily drawn (Yildirim, Sezgen, & Öcal 2005). The ECM permits drawing outcome of long-run estimates while other traditional techniques of cointegration do not allow such kinds of inferences. Without losing long-run information, ECM combines short-run adjustments with long-run equilibrium (Pesaran & Shin, 1996). Fourthly, this approach estimates both the long-run and the short-run relationship simultaneously and gives efficient and unbiased estimates (Akram & Afzal, 2014). Fifthly, this approach can be used for regressors irrespective of their order of integration whether they are of I(0) or I(1), but none of them is of I(2) or higher. As in case of any of the regressors of I(2) or higher order, the ARDL model will be inefficient. Sixthly, this model captures the data generating process from general-to-specific framework by incorporating sufficient number of lags. In order to get optimal length of lags for variables, this model estimates $(p+1)^k$ no. of regressions, where “ p ” indicates the maximum number of lags to be used and “ k ” denotes the number of variables. Other cointegration approaches may face the endogeneity problems, whereas the ARDL technique can differentiate between regressor and regressand, and solves the problems which may arise because of the presence of endogeneity and autocorrelation.

Considering the aforementioned merits of the ARDL model, we utilized the model in the empirical analysis to dig out the role of FDI in economic growth in Pakistan. The generalized $ARDL(p,q)$ model is specified as below:

$$Y_t = a_{0i} + \sum_{i=1}^p \alpha_i Y_{t-i} + \sum_{i=0}^q \beta_i X_{t-i} + \varepsilon_{it} \quad (2)$$

Where “ Y_t ” is the dependent variable, “ a_{0i} ” is the intercept or the constant in the model, “ α_i ” is the coefficient of the dependent variable, β_i is the coefficient of the regressors, where $i = 1, 2, \dots, k, p$,

and q are the optimal lag orders. ε_{it} represents the vector of error terms.

D. The ARDL Model for Long and Short-run Estimation

The ARDL approach was used to test the cointegration. By incorporating sufficient lags, the ARDL model captures the data generating process in general to specific framework and assimilates the short-run dynamics through error correction model (ECM) without losing the long-run information (Laurenseson & Chai, 2003). The ECM can be conveniently obtained from ARDL by a simple linear transformation (Akram & Afzal, 2014). The dynamic ARDL model based on Pesaran & Shin (1996) is as follows:

$$\begin{aligned} \Delta \ln Y_t = & \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta \ln Y_{t-i} + \sum_{i=0}^{q_1} \beta_{2i} \Delta \ln FDI_{t-i} \quad (3) \\ & + \sum_{i=0}^{q_2} \beta_{3i} \Delta \ln INF_{t-i} + \sum_{i=0}^{q_3} \beta_{4i} \Delta \ln ME_{t-i} \\ & + \sum_{i=0}^{q_4} \beta_{5i} \Delta \ln FCFE_{t-i} + \sum_{i=0}^{q_5} \beta_{6i} \Delta \ln GFCF_{t-i} \\ & + \sum_{i=0}^{q_6} \beta_{7i} \Delta \ln LFP_{t-i} + \lambda_1 \ln Y_{t-1} + \lambda_2 \ln FDI_{t-1} \\ & + \lambda_3 \ln INF_{t-1} + \lambda_4 \ln ME_{t-1} + \lambda_5 \ln FCFE_{t-1} \\ & + \lambda_6 \ln GFCF_{t-1} + \lambda_7 \ln LFP_{t-1} + \varepsilon_t \end{aligned}$$

In equation (3), the upper delta “ Δ ” is a first difference operator. The coefficients “ β_{1i} ” to “ β_{7i} ” in the first part of the equation represent the short-run dynamics, while “ λ_1 to λ_7 ” represent the long-run relationship among the selected variables, respectively. “ β_0 ” is the constant or the intercept, “ p ” is for the optimal lag length used for the dependent variable and q_1, q_2, q_3, q_4, q_5 and q_6 , respectively, are the lag lengths used for exogenous variables while ε_t is used for the error terms.

The hypothesis was tested by applying the Wald-coefficient test and the ARDL equation was estimated using the OLS technique.

$$H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = \lambda_7 = 0$$

(No Cointegration)

H_1 : At least one λ is non-zero (Cointegration exists)

The estimated F-statistics was matched with the

critical values of bounds to check the cointegration among the variables.

The long and the short-term relationships among *GDP*, *FDI*, *INF*, *ME*, *LFCF*, *LGFCF* and *LFP* are examined in the next part of the manuscript.

Once cointegration is established, we obtain the short-run dynamic parameters allied with long-run estimates by estimating an ECM of the form:

$$\begin{aligned} \Delta \ln Y_t = & \omega_0 + \sum_{i=1}^n \omega_{1i} \Delta \ln Y_{t-i} + \sum_{i=0}^n \omega_{2i} \Delta \ln FDI_{t-i} \quad (4) \\ & + \sum_{i=0}^n \omega_{3i} \Delta \ln INF_{t-i} + \sum_{i=0}^n \omega_{4i} \Delta \ln ME_{t-i} \\ & + \sum_{i=0}^n \omega_{5i} \Delta \ln FCFE_{t-i} + \sum_{i=0}^n \omega_{6i} \Delta \ln GFCF_{t-i} \\ & + \sum_{i=0}^n \omega_{7i} \Delta \ln LFP_{t-i} + \varphi ECM_{t-1} + \mu_t \end{aligned}$$

Where $\omega_0, \omega_{1i}, \dots, \omega_{7i}$ indicate the short run dynamics, φ represents the parameter for speed adjustment and ECM_{t-1} is the one period lagged error correction model/term. A change in the dependent variable does not depend on the past errors if this coefficient is insignificant. The coefficient of ECM_{t-1} ranges from -1 to 0, where 0 implies no convergence toward equilibrium and -1 implies perfect convergence. That is, any shock is perfectly adjusted the next period if the value is -1 (Sarker & Khan, 2020). All the other things were already defined earlier.

E. The ADF Unit Root Test

The stationarity of the series was checked using the Augmented Dickey and Fuller (1979) test. This test comes with the augmentation for the error term which has the problem of autocorrelation and not white noise. It handles the issue of serial correlation of the error terms using the lagged dependent variable as additional repressors (Ahmad & Ahmed, 2002). In general, the ADF equation is given as below:

$$\Delta \ln Y_t = a + \beta T + p \ln Y_{t-1} + \sum_{i=1}^{p+1} \gamma_{t-i} \Delta \ln Y_{t-i} + \varepsilon_t \quad (5)$$

Where $i = 1, 2, 3, \dots, n$

Table 2. Descriptive statistics

Statistics	LY	LFDI	INF	ME	LFCE	LGFCF	LFP
Mean	10.98152	8.5453393	8.768421	5.114955	9.953084	10.23229	52.29943
Median	11.02060	8.624308	7.844265	5.503300	9.951353	10.28351	51.91400
Maximum	11.40518	9.747412	26.66303	6.991656	10.46742	10.56556	55.49900
Minimum	10.48875	6.602060	2.529328	3.265224	9.400102	9.790229	50.47000
Std. Dev.	0.266517	0.772069	4.920050	1.316962	0.293991	0.196538	1.387713

The null hypothesis for the ADF unit root tests the existence of unit root while the alternative hypothesis checks its nonexistence in the series.

H_0 : Unit root exists

H_1 : Unit root does not exist.

IV. Results and Discussions

The ARDL approach of cointegration was used as methodology in this research. Table 2 shows the summary of statistics with mean, median, maximum, minimum and standard deviation. These descriptive statistics show the logged values of GDP, FDI, FCE, and GFCF while the values of INF, ME and LFP are not logged.

As shown in Table 2, the mean of log real GDP is 10.98, and the mean of log GFCF (private sector) is 10.23. Mean values of log FDI and log FCE are 8.54 and 9.95, respectively. The mean values of inflation (consumer prices annual %) stays at 8.76 while military expenditure carries its mean as 5.11 percent of GDP.

A. Results of the ADF Unit Root Test

The ADF unit root test was used for checking the stationarity of the variables in this study. The results of showed that some of the variables are of order $I(0)$ and others of order $I(1)$. None of the variables were identified to be of order $I(2)$. Two models namely “the trend model” and “the trend

and intercept model” were included in this analysis. The results are shown in Table 3.

Table 3 shows the variables and their corresponding t-statistics values at level and at first difference. Using the ADF unit root test, the values of Y, FDI, ME, FCE, GFCF and LFP were found to be of order $I(1)$ while INF turned out to be of order $I(0)$. Based on the variable’s order of integration, ARDL approach has been used instead of Johansen cointegration and Engel Granger approaches.

B. Lag Selection

Table 4 shows VAR lag order by the selection criteria. The obtained results from the AIC, SIC and HQ criteria suggested 4 lags as the optimal number of lags to be incorporated in this analysis. The optimum number of lags as suggested by the AIC and HQ criteria is 4 for the selected model.

C. Cointegration: Bounds Test Result

The cointegration was tested using the bounds testing approach developed by Pesaran & Shin (1996). Table 5 shows the results of the Wald test of coefficient restriction applied on the estimated equation in order to check for cointegration among the variables. The null hypothesis of no cointegration was rejected at both the 1% and 5% level, where the F-Statistics value 6.73 was found to be greater than $I(1)$ bounds at both 1% and 5% level.

Table 3. ADF unit root test results

ADF test with intercept		ADF test with intercept and trend	
Variables	T-statistics	Variables	T-statistics
LY	-1.922	LY	-2.067
LFDI	-2.410	LFDI	-3.452
INF	-4.628*	INF	-4.219**
ME	-0.617	ME	-1.259
LFCE	-0.723	LFCE	-2.161
LGFCF	-1.484	LGFCF	-2.806
LFP	0.368	LFP	-1.330
Δ LY	-4.196*	Δ LY	-4.597*
Δ LFDI	-8.117*	Δ LFDI	-8.029**
Δ ME	-4.500*	Δ ME	-4.420*
Δ LFCE	-8.162*	Δ LFCE	-8.065*
Δ LGFCF	-4.759*	Δ LGFCF	-4.775*
Δ LFP	-7.376*	Δ LFP	-7.541*

Note; ** and * indicate significance at 5% and 1% level, respectively.

Table 4. VAR lag order by the selection criteria

Lag	AIC	SC	HQ
0	0.618793	0.911354	0.725328
1	-10.87297	-8.532479*	-10.02069
2	-11.89306	-7.504647	-10.29504
3	-12.53910	-6.102756	-10.19534
4	-14.95825*	-6.473983	-11.86875*

Note: Endogenous variables: LY, LFDI, INF, ME, LFCE, LGFCF, LFP. *indicates lag order selected by the criteria

Table 5. Bounds test result

Variables	F-statistics	Critical value 1%		Critical value 5%	
		I(0)	I(1)	I(0)	I(1)
LY LFDI, INF, ME, LFCE, LGFCF, LFP	6.73	3.15	4.43	2.45	3.61

(Note) Unrestricted constant and no trend F-Bounds Test

D. Results of ARDL Model of Cointegration

Table 6 shows the ultimate result of our ARDL cointegration. Both the long run and the short run coefficients of the respective variables are given in this table.

The coefficient of FDI in the long run model showed that FDI has a significantly positive impact on the economic growth at a significance level of

5%. The long run relationship shows that a 1 percent increase of FDI is associated with higher GDP growth of about 0.015 %. In the short run model, likewise, we found that FDI has a significantly positive effect on economic growth having its coefficients, at lag (1) and (3), 0.0234 and 0.0177, respectively, at a significance level of 1%. This result is consistent with the findings by Ur Rehman (2015), Jawaid & Saleem (2017), and Ali & Hussain (2017). However,

Table 6. Results of ARDL model

Long Run				Short Run				
Variables	Coefficients	T-statistics	P-value	Variables	Lags	Coefficient	T-statistics	P-value
				D(LY)	1	0.3477	2.6413	0.0132
				D(LY)	2	0.3182	2.3504	0.0258
				D(LFDI)	1	0.0234	3.7100	0.0009
LFDI	0.0155	2.6178	0.0133	D(LFDI)	3	0.0177	3.5113	0.0015
INF	-0.0016	-3.7793	0.0006	D(INF)	2	-0.0006	-2.2854	0.0298
ME	-0.0062	-2.9067	0.0065	D(ME)	2	0.0097	2.3118	0.0281
LFCE	-0.0145	-0.4196	0.6775	D(LFCE)	3	0.0070	0.3014	0.7652
LGFCF	0.1406	2.6535	0.0122	D(GFCF)	2	-0.1285	-2.9961	0.0056
LFP	0.0165	4.2934	0.0001	D(LFP)	3	0.0092	3.2538	0.0029
Constant	0.5541	2.9018	0.0066	Constant		0.5968	2.5715	0.0132
ECM (Derived from the residuals of long-run model)					1	-0.7825	-5.0939	0.0000
R ²						0.7104		

the results differ from Nilofer & Qayyum (2018) that FDI has a negative impact on Pakistan.

The coefficients of inflation in the long run and the short run model are significantly negative. A higher inflation is a symptom of lack of commitment and discipline in monetary policy, and therefore, higher inflation hinders economic growth by impeding productivity growth and investment (Fisher, 1993; Onafowora & Owoye, 2018).

The coefficient of military expenditure in the long term turned out to be negative and significant. This result is consistent with the findings of Khalid & Alsalim (2015). In the short run model, however, it proved to be positive and significant. This result is consistent with the findings of Pacific, Shan & Ramadhan (2017). This indicates the adverse effects of ME on the economic growth in the long run, whereas in the short run, it supports the economic growth.

The coefficient of final consumption expenditure turned out to be insignificant both in the long and the short run. The same insignificant result of this variable is reported by Rizeq (2015). This result is different from the study of Zareen & Qayyum (2014) who reported that FCE has a significantly negative impact on the economic growth.

The coefficient of gross fixed capital formation

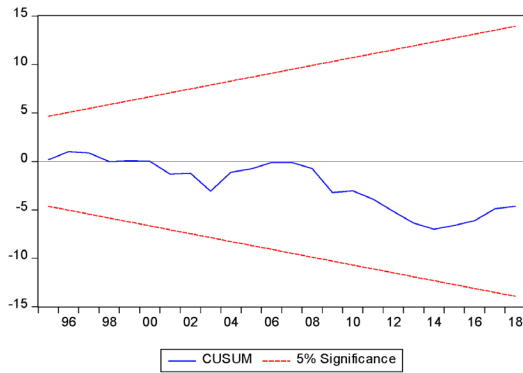
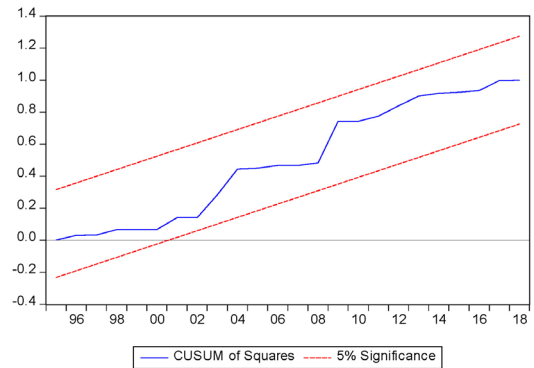
(private sector) has proved to be significantly positive in the long run like the study of Lach (2010) but significantly negative in the short run. It means gross fixed capital formation is an important factor in the economic growth in the long run, but may not appear so in the short run. The gross fixed capital formation covers four kinds of capital goods *i-e* equipment and machinery, furniture and fixture, structure, improvement of land and cultivated assets in orchard development and livestock sector. Given that Pakistan is a developing economy, it does not have sufficient resources to invest simultaneously in these sectors to yield enhanced productivity in the short run. Therefore, investment in these sectors appears to have negative effect on the economic growth of the country, even though it does contribute to the economic development in the long run (Arby & Batool, 2007).

The coefficient of labor force participation, like that of FDI, is also positive and significant in both the long run and the short run for economic growth. This result emphasizes the role the labor force plays in the economic development of Pakistan. This result is consistent with that of Asghar, Awan & Rehman (2012).

The coefficient of the ECM (-0.7825) is negative and statistically significant at 1 % level. ECM is one period lagged error correction model/term. The

Table 7. Stability diagnostic test results

Test	F-statistics	P-value
Serial correlation LM test	0.3998	0.6743
Heteroskedasticity test: Breush-Pagan-Godfrey	0.6292	0.7767
Heteroskedasticity test: ARCH	0.1054	0.7392
Jarque-Bera normality test	0.4222	0.8096

**Figure 1.** CUSUM test**Figure 2.** CUSUM of squares test

coefficient of ECM shows fast convergence of the variables to the equilibrium.

E. Results of Diagnostic Tests

Table 7 shows the stability test results. The values of F-Statistics and the corresponding P-values of the serial correlation LM test indicate that we cannot reject the null hypothesis of no serial correlation, meaning that this model has no serial correlation.

The Heteroskedasticity Test (Breush-Pagan-Godfrey, ARCH) reveals that the model does not suffer from Heteroskedasticity as the p-values of the F-Statistics are more than 5%, implying that we cannot reject the null hypothesis of no Heteroskedasticity.

Similarly, the results of the Jarque-Bera normality test indicate that the null hypothesis of normality cannot be rejected.

Other than the above mentioned tests, the CUSUM and QUSUMSQ techniques have also been applied based on the ECM model which was estimated. The following figures reveal that both the series are lying inside their critical bounds at 5% significance level

(See Figure 1 and 2). This verifies the stability of the ECM model with respect to all involved variables and also indicates that there are no structural breakpoints in the estimated model.

V. Conclusion

Focusing on the effect of FDI on the economic growth of Pakistan, we have examined the time series data for a period of forty-five years from 1974 to 2018. As a result of our empirical analysis, inward FDI has shown positive and significant relationship with the GDP growth, both in the long and the short run. The significant coefficient of FDI in the long run model reveals that a 1% change in FDI causes 0.015% change in the economic growth. This implies that an increase in FDI inflow set the economy of the country on the route to development.

In the long run model, inflation and military expenditure have shown significantly negative results while final consumption expenditure has shown

insignificantly negative result. Both gross fixed capital formation and labor force participation are significant with positive signs. In the short run model, military expenditure and labor force participation have shown significantly positive results while inflation and gross fixed capital formation have shown significantly negative results.

A. Policy Recommendations

Pakistan has been under certain pressures regarding internal and external issues such as peace, law and order situations, and political stability among others. The long hauled unrest and uncertainty of the country as well as other issues have kept foreign investors from investing and doing business in Pakistan. The government of Pakistan along with its armed forces, recently, has handled the situation of terrorism across the country in a well-mannered and organized way. In addition to tackling the security issues, the government attracted a USD 62 billion investment in the form of China Pakistan Economic Corridor (CPEC) in 2017 which is expected to change the economic situation of the country. Now, Pakistan is easing its policies and investment conditions for foreign investors in order to attract more FDI. In the latest report by the State Bank of Pakistan, the foreign investment has increased by 137% in the first trimester of fiscal year 2019 (State Bank of Pakistan, 2019), which seems to be quite encouraging.

Based on the results obtained by this study, it is recommended that the government of Pakistan should maintain investment policies relaxed and easy in order to attract more foreign investors.

Our empirical analysis has also shown that while military expenditure has a significantly positive effect on the economic growth in the short term, it has a significantly negative impact in the long term. This means that while the increase in military expenditure contributes to the economic growth by increasing domestic demand and investment in the short term, it leads to the decrease of investment in technology and infrastructure, thus weakening national com-

petitiveness in the long term.

Although Pakistan is heavily dependent on military forces to ensure peace and security and to resolve disputes with the neighboring countries such as India and Afghanistan, reducing tensions on borders and thus lowering its military expenses is crucial for its economic development in the long run.

There is an intense need of promoting education with special focus on technical education in the country. Technical education leads to producing skilled labor which is an important part of the production cycle. Pakistan needs to undertake various reforms in multiple areas in order to improve labor productivity and capital formation.

Trust building measures may play a vital role in the development of a country. Pakistan needs to take measures to build up trust between public and private sectors. Problems faced by business community in Pakistan must be identified through mutual discussions and steps by the government in order to reduce their stress regarding business security and to ensure creating healthy business environment in the country.

Besides the above mentioned policy recommendations, there are some other important points which, if taken into consideration, can help Pakistan's economy to develop fast:

First, Pakistan's economy is not able to maintain high growth rates for longer periods. Every few years, its economy faces issues like balance of payments. This has dented Pakistan's ambitions of becoming a middle-income country. The short-term growth periods in the country are due to the fact that these are driven by private and public consumption, not by raised investment.

Second, demands increase at a much higher pace than the supply of goods and services, which results in a need for high imports. The data provided by the State Bank of Pakistan, shown in Table 2 reveals that Pakistan is not targeting areas of research and development (R&D) sufficiently in order to promote production of goods and services on its own, which, otherwise, will surely reduce the burden of importing and relying on other countries. Pakistan should focus on R&D in order to promote production and meet

the needs of its people on its own since a lower income economy cannot bear the heavy burden of importing of even basic goods and services.

Third, improving power sector will help reduce power crises in Pakistan and ensure smooth running of industries within the country. Power shortages in the industrial sector have resulted in shutting down production units, which has resulted in unemployment and lower productivity as a whole.

Fourth, persistent macroeconomic instability discourages savings and private investment in the country, which results in low aggregate investment. This has also been one of the reasons for lower FDI in Pakistan compared to that in neighboring countries in the similar stages of economic development. FDI inflows towards Pakistan declined at 27% out of 2.4 billion USD as compared to those towards Bangladesh and Sri Lanka which both witnessed an increase in FDI inflows in 2018 (UNCTAD, 2019).

Fifth, Pakistan needs to restrict its population growth in order to reduce dependency ratio for improved savings. Pakistan's current rate of savings (13.6% of GDP) compares poorly with its neighboring countries (Waheed & Ghulam, 2019).

Finally, strengthening of public and private institutions, computerization and digitalization of the revenue records and strong inter-linkages between public departments will lead to achieving stability and create an environment of trust for foreign investors. This will surely put Pakistan on track towards achieving its goal of rising as a developed and prosperous country.

B. Prospects for Future Research

This study will guide both researchers and investors to looking at how Pakistan is intending to create an investor friendly environment and attract more foreign investment. Further researches on this subject may be conducted with a focus on the growth-investment possibilities of China Pakistan Economic Corridor (CPEC).

In exploring the linkages between FDI and

economic growth, further researches may have to examine the role of the military in Pakistan's economic development, because the military in Pakistan has a wide range of business activities in the country. For example, it engages in the service sector in the form of running department stores and shopping malls, roads and building construction, in education sector, in the form of operating military colleges, and in health sector in the form of military hospitals and medical laboratories, etc. Such types of activities by the military of Pakistan need to be explored further in order to investigate its impact on the economic development of Pakistan.

Studies must also be conducted regarding the existing education systems in the country with a special focus on technical education both at public and private level so that the effect of the education on the economic development of Pakistan can be highlighted as well.

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