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Does Foreign Direct Investment Promote Economic Growth: Evidence from Pakistan Based ARDL to Cointegration Approach

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ABSTRACT

The study intends to examine economic growth in terms of national savings in the context Pakistan. It applies yearly data from 1972 to 2021. By means of Auto-Regressive Distributed Lag (ARDL) method the impact of national savings, foreign direct investment as well as employed labor force on economic growth of Pakistan is observed. The findings direct to conclude that there is significant long run relationship exist between national saving, foreign direct investment, employed labor force and economic growth in Pakistan. It suggests that employed labor force encourages foreign direct investment over long run period and savings increases real activity equally before and after the break, whereas economic growth causes saving. Thus, the current study also recommends that productivity-based and incentive-based measures are useful in producing more savings and supporting acceleration of income as well as growth.

1. Introduction

In today's world, economic growth is a critical aspect of most cultures. Voters desire a higher standard of living, and legislators are eager to deliver that level through economic growth (Abasimi, & Martin, 2018; Najarzadeh, Reed & Tasan, 2014; Buscemi, & Yallwe, 2012; Hevia, & Loayza, 2012). The degree of savings in each society is a crucial element in determining economic progress (Soylu, O2019; Whiteley, 2000). The inter cohort distribution of the tax burden of government spending is a far more important determinant of national savings than the tax structure. (Auerbach, & Kotlikoff, 2007; Abasimi, & Martin, 2018). During 1984-85, the real GDP growth rate was 8.7 %, while the sectorial contribution of total investment and national savings as a percentage of GDP were 18.3 and 12.9 respectively. The inflation rate, the budget deficit, and the current account deficit were 6.1, 7.8 and 5.4 respectively of the GDP. The Statistical data shows that the decreasing trend of economic growth since 2012 and little increasing trend in fiscal year 2015 to 2018. In 2019-2021, economic growth is continuously decreasing trend and becomes reaches -0.4 (State Bank of Pakistan, 2020-2021). It is clearly seen that value addition as a percentage of GDP in Pakistan is not very encouraging. The decreasing trend from the last twelve years depicts that it should be checked that why it is not increasing.

The total cost and volume of investments that can be done with given resources are also affected by the amount and composition of funding. Furthermore, they have social implications because they help to equalize the real burden of economic development by absorbing a portion of the income of one or more sectors of the population and, in the case of external financing, by distributing the

benefits between the national economy and foreign creditors (Emara, & Kasa; 2021 and Wang, & Choi; 2021). For several decades the relationship of Foreign Direct Investment (FDI) and economic growth is an inquiring question (Agrawal, 2015; Azam, & Ahmed, 2015; Har, Teo, & Yee, 2008; Karimi, & Yusop, 2009). In many countries policymakers are working on providing certain incentives to captivate interest in FDI, since it assumes to affect national economic development significantly.

National savings are imperative for an economic development of a country because savings generate investments. According to Krieckhaus (2002), the countries with less efficient capital markets rely heavily on domestic savings to fund development projects. An increase in aggregate savings results in higher investments and ultimately higher growth in GDP. Resultantly, the country's increase in savings rates increases the degree of capital which leads to increase in economic growth. Both are important because they generate income, create jobs, and contribute to economic growth. Because savings and consumption are both components of income, both savings and investment have an impact on current and future consumption. If savings increase, current consumption falls, and future consumption suffers as well.

It prefers for institutions dealing with small investors to facilitate financial inclusion and extend net social security for the deserving divisions of the society. Increase in aggregate savings results in increase in investments as well as increase growth in GDP (Pereira, & Gala, 2008; and Ribaj & Mexhuani, 2021). Subsequently, high savings in a country increase aggregate amount of capital, which leads to economic growth, since high savings imply increase in capital investment and decrease in consumption, which signifies growth in economy. In relation to this, it is notable that in case saving rate of individual increases, the growth rate of real GDP is high on average than in case it decreases. National savings, combined with foreign borrowings, increase investments, which boosts level of productivity and ultimately economic growth and living standards of an economy. Moreover, investments in different capital projects are a way to increase productivity and the pace of pollution's developing workforce (Soubbotina, 2004; Griffin, 1978; Mason, 1988). Hence increase in savings leads to increase in economic growth, and enables workforce to enhance the standard of living as well as to cover obligations imposed by the government.

Research Questions

1) - How does savings contribute to economic growth?

2) - Does inflation and foreign direct investment influence on economic growth of Pakistan?

Research Objectives

1) - To investigate the influence of national saving on economic growth of Pakistan

2) - To examine the effect of foreign direct investment and inflation on economic growth of Pakistan.

2. Literature Review

One of the distinguished components of economic growth is saving. Abasimi, & Martin, (2018) studies the factors contributing to national saving in the countries of West Africa. The study employed annual times series data from spanning 1997 to 2016. The ARDL bounds test is employed to scrutinize the parameters of national saving over short term as well as long term. The long run outcomes exhibit significant and positive relationship between real interest rate, per capita income, and gross domestic product, while insignificant and negative association with national saving.

Soylu, O. B. (2019) explores economic growth and how it is influenced by foreign direct investment and national savings in Poland over the period of 1992 to 2016. Since these components plays substantial role to attain sustainable economic growth. Moreover, high national saving rates are important to enhance resilience to any financial distress. The study affirms significant and positive relationship among national savings, foreign direct investment, and economic growth. The

association of foreign direct investment and economic growth motivates extensive experiential literature that covers developed and developing countries alike (Mehmood et al., 2022; Rahman, & Bakar, 2018; Chakraborty, & Nunnenkamp, 2008; Rahman, Bakar, & Idrees, 2019).

Foreign direct investment (FDI) plays prominent role for any economy's development. The policymakers from around the world believe that foreign direct investment (FDI) improves productivity in the home country which ultimately leads to economic development (Hoang, Wiboonchutikula, & Tubtimtong, 2010; Alfaro, et al., 2010; Razzaq, An, & Delpachitra, 2021).

There is an extensive literature that confirms the relationship between foreign direct investment and economic growth, and many studies carry out research to find causal relationship between foreign direct investment and economic growth. There is combination of findings from various researches by applying different methodologies like Frimpong and Abayie (2006) observe the causal relationship between foreign direct investment (FDI) and gross domestic product (GDP) growth in Ghana and finds positive relationship between foreign direct investment and the growth. Whereas, various research reports insignificant relationship between the two variables (Akinlo 2004; Popescu, 2014).

Hence according to economists around the world, national savings, and foreign direct investment directly or indirectly, hold fundamental importance in economic growth for any economy. Different theorists of economic growth emphasize on national savings in order to achieve economic growth. Usually, National savings exhibit favorable effect on growth. It becomes difficult to attain significant economic growth with significantly low rate of national savings in countries like South Africa. It requires awareness about the types of savings that contribute to economic growth critically, especially in order to formulate appropriate policy to improve economic growth. In the study multivariate co-integration analysis is applied to figure out the effects of savings from household, government, and business sectors on economic growth. The findings show that business saving has a strong positive long-term and short-term relationship with economic growth, while savings from household and government sectors turns out insignificant on economic growth. It requires policies to raise the level of education, and government programs and schemes to encourage family and public savings in South Africa (Amusa, Kafayat; 2014 and Hailu; 2016).

3 Data and Methodology

The underlined study covers annual data of Pakistan during 1972- 2020. The data of Gross National Saving (SAV) and foreign direct investment (FDI), both variables are measured by Constant 2010, USD, and labor force is calculated by number of employed person, while the data of dependent variable economic growth (GDP) is estimated by real output growth. The data is obtained from the Economic Survey of Pakistan.

3.1 Model Undertakes Various Results from Previous Literature

The study employs ARDL approach to measure the effect of labor force, savings and, foreign direct investment on economic growth as well as economic development of Pakistan. In order to apply co-integration model which is proposed by Perasan, Shin and Smith (2001), firstly the variables are integrated at none and first order to include in the ARDL bound testing econometric model. Contrary to this, Engle and Granger (1987) and Johansen (1995) are multivariate co-integration techniques that provide bound testing procedures for co-integration after defining integration order of time series that allows co-integration estimation by Ordinary Least Square Method (OLS) for small data sample.

3.2 Theoretical Framework

The study incorporates Solow's aggregate production by employing national savings and economic growth. It integrates endogenous growth model as recently, Mehmood, Azam, & Mahr, (2022), Opoku, Ibrahim & Sare (2019) and Rahman, & Bakar (2019) suggest in order to, investigate the impact of foreign direct investment, national savings, and labor force on the growth in Pakistan. The study

adds savings and economic growth to the econometric model to apply augmented production function as following;

$$\Delta lnGDP_t = \alpha_0 + \sum_{i=1}^{p} \beta_1 \Delta lnGDP_{i-1} + \sum_{i=0}^{p} \beta_2 \Delta lnSAV_{t-i} + + \sum_{i=0}^{p} \beta_3 \Delta lnEMP_{t-i} + \sum_{i=0}^{p} \beta_4 \Delta lnFDI_{t-i} + \Phi_1 lnGDP_{t-1} + +\Phi_2 lnSAV_{t-1} + \Phi_3 lnEMP_{t-1} + \Phi_4 lnFDI_{t-1} + \mu_t \alpha$$

where; β_1, β_2, β_3 and β_4 are parameters to be estimated;

GDP = Gross Domestic Product

EMPL= Employed Labor Force

FDI = Foreign Direct Investment

SAV = Saving

4. Results

The Table 1, exhibits the descriptive statistics to define the measures of central tendency of the data in terms of mean, median and mode of a random variable (Gujarati, 2004). Fundamentally, the descriptive statistics provides quantitative description of all the variables included in the econometric model;

Table 1

Descriptive Statistic

	SAV	EMP	FDI	GDP
Mean	48.0826	12.3223	0.6534	6.8811
Median	30.3326	13.2823	0.4847	2.9511
Maximum	143.9449	17.3590	3.6623	2.9012
Minimum	3.1857	6.7012	-1.2428	4.8509
Std. Dev.	46.9665	2.6818	0.8878	8.4811
Skewness	1.0082	-0.2019	1.4394	1.2080
Kurtosis	2.5739	2.3478	6.4556	3.2998

The standard deviation of a variable indicates the violence which is highly volatile for national savings and the economic growth. Kurtosis is a normality test with standard value of 3, the values of Kurtosis for foreign direct investment (FDI) and gross domestic product (GDP) turns greater than 3, indicating Leptokurtic distribution, whereas the values of savings (SAV) and employed labor force (EMPL) turns less than 3, indicating Platykurtic distribution.

4.1 Units Root Tests (ADF Test)

One common issue with data is non-stationary time series, which usually leads to spurious and misleading results (Granger, 1981). Initially, the unit root analysis verifies that the time series data is stationary, which means that the mean and variance of all the variables are constant. Since economic perspective, requires stationary time series which absorbs shocks immediately but not consistently. Therefore, econometric modeling requires all variables to transform into log values to eliminate fluctuations and smooth the time series of all the variables. Hence the study executes unit root test for stationary series and to check level of integration for each series in order to apply co-integration and causality of the variables of interest of the study. Hence variables including foreign direct investment (FDI), gross domestic product (GDP) and employed labor force (EMPL) are co-integrated in order to examine short term and long-term relationship by applying error correction model (ECM), rather VAR models. Secondly, the Augmented Dickey-Fuller (ADF) is applied to verify integration order of the variables under study.

Table 2

Augmented Dickey Fuller Test ADF for Unit Root

Variables	At Level		First Difference		Conclusion
	Intercept	Trend & Intercept	Intercept	Trend & Intercept	
GDP	-3.022	-3.201	-4.3422	-4.5281	1(0)
FDI	-1.805	-1.8223	-3.8821	-3.7862	1(1)
EMP	-1.234	-0.986	-3.2541	-3.1441	1(1)
SAV	-4.3531	-4.732	-6. 293	-6. 782	1(0)

Table 2 displays results of ADF test where variables are stationary at level and at first difference. Therefore, variables fulfill the condition to conduct ARDL approach for long term and short-term analysis of the study, since it is prerequisite that variables should be integrated at different orders, that is I (0) and I (1). It is to be noted that no variable is integrated at order I (2), which defies the application of ARDL approach.

4.2 ARDL Bound Test to Co-integration Approach

After variables are integrated at order I (0) and I (1), ARDL model is selected to observe the long-term relationship among the variables under study. Firstly, the maximum lag length order of the model is selected as Perasan and Shin (1997) suggests for yearly observations. Unlike traditional approaches of co-integration like (Engle-Granger, 1987; and Johansen's, 1991), Pesaran and Shin (1999) allows to apply co-integration and ARDL estimations without integrating time series data at order I (1), and specifying order of integration of variables at order I (0) or I (1). The Table 3 below shows the F-statistics by taking each variable as dependent variable in ARDL regression estimation. The results report the calculated value of F-statistics is greater than the critical value 7.851 in the upper bound at 5% as well as 10% confidence level. It means that there exists long-term relationship among the variables under observations.

This signifies the presence of co-integration among foreign direct investment, employed labor force and gross domestic product in Pakistan. Like, real output growth that is GDP has long term relationship with saving, foreign direct investment, and employed labor force. However, the findings of the study are inconclusive where value F-statistics lies somewhere between the lower bound and upper bound critical values. Moreover, null hypothesis of F-statistics states that there is no co-integration among these variables. The following Table 3; exhibits bound test co-integration;

Table 3

Bound Testing Co-integration

			Critical Bounds Value		
Test Statistic	**Value**	**k**	**Significance**	**I_0 Bound**	**I_1 Bound**
F-Statistic	7.851	5	10%	2.37	3.2
			5%	2.79	3.67
			2.50%	3.15	4.08
			1%	3.65	4.66

In ARDL approach, bound test is conducted in order to apply co-integration analysis between dependent variable and independent variables.

4.3 Estimation of Co-integration Analysis

Table 4 illustrates co-integration between dependent variables that is economic growth and independent variables including foreign direct investment, savings and employed labor force. The findings reveal positively significant relationship between all explanatory variables and real GDP growth in the country. It shows that 1% increase in the saving leads to 3.3001% the economic growth of Pakistan while a 1% raise in the FDI grow to 0.6194 output GDP. However, employed labor force is also significant and positive in prompting GDP growth. The findings validate that 1% increase in labor force leads to about 0.4155% rise in real GDP growth. These findings are aligned with preceding studies (Rahman, & Bakar, 2019; Wang, & Choi, 2021; Malik, 2015; Rahman, Bakar, & Idrees, 2019; Hamid & Pichler, 2009) and inconsistent findings with preceding literature (Mahmood & Siddiqui, 2000; Atlam, et al., 2017)

Table 4

Estimation of ARDL-Long Term Relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAV	3.3001	1.0810	3.0569	0.0051*
FDI	0.6194	0.2577	2.4031	0.0254**
EMPL	0.4155	0.1683	3.3044	0.0045*

Table 5

Estimation of ARDL- Short Term Relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)*	-0.5717	0.1851	-3.0993	0.0041*
D(SAV(-1))	0.1223	0.0223	3.3778	0.0045*
D(SAV(-2))	-0.2055	0.1239	-1.6585	0.1073
D(SAV(-3))	0.7403	0.1104	6.7000	0.0000*
D(EMPL(-1)	0.4144	0.0811	5.1142	0.0002*
D(EMPL(-2)	-0.2050	0.1230	-1.6528	0.1073
D(EMPL(-3)	-0.1684	0.0777	-2.1651	0.0478**
D(FDI(-1))	0. 5358	0.1231	4.8705	0.0002*
D(FDI(-2))	0.2648	0.1198	2.2113	0.0441**
ECT	-0.4007	0.1032	-4.0076	0.0013*

Note: ***, **, and *, demonstrates 1, 5 and10 percent significance, respectively. The following symbolizes employs: GDP, real output growth; SAV, saving; EMPL, employed labor force; and FDI: foreign-direct-investment

Table 5; specifies the findings, that there is direct positively significant relationship between foreign direct investment and real GDP. Since 1% increase in FDI leads to 0.5358% increase in the growth. Similarly, there is positively significant relationship between national savings and real GDP, as 1% increase in national savings leads to 0.1223% increase in the growth, and hence national savings contributes to the overall GDP growth rate in Pakistan.

4.4 Diagnostic tests

To test correlation, Breusch-Godfrey Serial Correlation (LM test) is applied at 5% confidence level, and for heteroscedasticity diagnostics ARCH test is applied at 5% confidence level. The findings of diagnostic testing express that there is no heteroskedasticity and auto-correlation present in the time series and the data is normally distributed. Therefore, the findings of the study are reliable, since the calculated values of t-statistics turns out to be greater than critical value of t-statistics at 5% confidence level. Hence, it is evident that there exists significant relationship between dependent variable (economic growth) and independent variables (foreign direct investment, savings and employed

labor force) in Pakistan. The positive sign confirms that there is positive relationship among these indicators in Pakistan.

Table 6

Diagnostic Tests Results

Breusch-Godfrey Serial Correlation LM Test:			
		Value	**Probability**
F-statistic	0.7848	Prob. F	0.4667
R-squared	2.3030	Prob. Chi-Square	0.3161
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.355	Prob. F	0.423
R-squared	11.567	Prob. Chi-Square	0.219

Ramsey RESET Test: Omitted Variable (Square of fitted value)

	Value	**Probability**
t-statistic	1.8761	0.1657
F-statistic	3. 7412	0.0761

5. Conclusion

The study analyzes the relationship between economic growth of Pakistan with foreign direct investment, national savings and employed labor force over period of 1972 to 2020. The bound testing approach of ARDL is utilized to find the presence of long-term relationship between the variables. The findings of the study demonstrate the co-integration relationship between the economic growth and foreign direct investment, savings and employed labor force. Since foreign direct investment, gross national savings and employed labor force are the basic indicators of the economic growth in Pakistan over long run. The study also concludes that any increase in foreign direct investment, national savings and employed labor force contributes to the real gross domestic product over the long run. The notable implication of the study is to apply employed labor force as the driving power to attract foreign direct investment to the country. Since Pakistan has dedicated potential human capital in terms of technical abilities and technological skills, yet there is the need that researchers, policy-makers and practitioners should emphasize on reforms and its implementation in the field of quality education, skills development programs, training and development and learning abilities particularly, to support and improve labor force, and ensure facilities to access jobs which ultimately increases productivity and hence encourages foreign investors.

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