

Foreign Direct Investment Impact on Economic Indicators of the SAARC Countries

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Research Article

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ABSTRACT

Investments made by one company in another based in another country are Foreign Direct Investments (FDI). In open markets, rather than closed markets for investors, FDIs are actively used. The FDI types are horizontal, vertical, and conglomerate. In another country, Horizontal establishes the same type of business, while vertical is related but differentiated, and conglomerate is an unrelated company. FDI promotes technology transfer, enhances competition in the domestic input market, leads to the growth of human resources, and FDI-generated income add to corporate tax collections in the host country. FDI is one of the essential factors for economic growth of the country. This paper aims to study the influence of Foreign Direct Investment on the Economic Indicators of the SAARC Countries. Data analysis is conducted using the approach of Panel Data Analysis. The tools/software used for analysis are Eview11 Software and MS Excel. FDI is considered as independent factor and GDP, Population, Unemployment, Imports and Exports.

INTRODUCTION

Foreign Direct Investment (FDI) has been a significant non-debt financial resource for India's economic progress, apart from being a vital driver of economic growth. In order to take advantage of comparatively lower wages, special investment opportunities like tax exemptions, etc., multinational companies invest in India. It also means achieving technological know-how and creating jobs for a nation where foreign investment is being made.

The favourable policy regime and robust market environment of the Indian Government has ensured that foreign capital continues to flow into the region. In recent years, the government has taken several steps, including easing

FDI standards through industries such as defence, PSU oil refineries, telecommunications, power exchanges, and stock exchanges, among others.

According to the CII and the EY report, India is expected to draw foreign direct investment (FDI) of US\$ 120-160 billion per year by 2025. The nation has seen a 6.8% growth in GDP over the last 10 years, with FDI rising to 1.8% of GDP. In terms of attractiveness, investors rated India #3; over the next 2-3 years, ~80% of investors expect to invest in India, while ~25% registered investments worth >US\$500 million, the Economic Times reported.

Data reveals that a rise in FDI results in higher rates of growth in financially developed countries relative to rates in financially developing countries. The effect of FDI on economic growth is determined by local factors, such as the development of financial markets and the educational level of a country.

The focus of the study is to examine the short and long-term relationship between the selected major economic indicators. The Panel correlation and regression model has been used for evaluating the relationship of variables. Cross sectional data the country wise data the SAARC countries and longitudinal time series data from the year 2000 to 2020 are considered for study as Panel Data.

MATERIALS AND METHODS

In this study the researcher directed policies denoting an overall inward development policy, he stated little association between FDI and economic growth. In a sample of developing countries taken from the 1970s and 1980s, Tsai (1994) creates a simultaneous equation model with economic growth and FDI per capita as dependent variables, but does not find any solid, general effects of FDI on growth.

In the period 1971-1995, the researcher checked the causality of FDI and economic growth in 24 developing countries using the method of estimating fixed effects and random effects panel data. They find that the impact of FDI on economic growth differs across developed countries, as a consequence of econometric research. Despite the variations between countries, the findings show that the influence of FDI is on economic growth is higher in open economies.

The researcher has used modern statistical techniques and two new databases, they examined the relationship between FDI and economic growth in 72 countries during the 1960-1995 period. First, a panel data set was created, linked to the World Bank data set and based on an average of seven five-year periods from 1960 to 1995. In addition, using the FDI data obtained from the IMF database, the findings were checked. Generalized Moment Approaches (GMM) has been methodologically used. It has been shown, according to the findings of empirical applications, that FDI does not exclusively have an effect on economic development.

The researcher focused on studying the influence of FDI on Economic Growth. Two economic conditions have been estimated for a positive relationship between FDI and economic growth: an acceptable level of human capital and well-developed financial markets. However, these two variables can, in the sense of growth accounting, be fundamentally different catalysts for FDI to boost economic growth. Using data from 1970-1989 from 69 countries, they find that FDI only encourages productivity growth when the host country reaches the threshold number of human resources, and that FDI only encourages capital growth when a certain level of financial development is achieved.

In this paper researcher has used sectoral FDI inflows to 12 Asian economies from 1987 to 1997, good evidence has been found to have a positive and substantial impact on FDI inflows and economic growth in the host economies. The study also finds that non-manufacturing sector FDI inflows do not play an important role in boosting economic development. In addition, without the breakdown of total FDI inflows, the effect of manufacturing FDI on host country's economic growth is understated by at least 48%.

The researcher examines the effect of foreign direct investment on Pakistan's development (GDP). This paper studies the long-term relationship between foreign direct investment and Pakistan's gross domestic investment. They show that there is a long-run relationship between the two variables by using cointegration analysis. The GDP is considered viable dependent, while FDI is regarded as independent. From 1980 to 2010, the data used for this study varied. The outcome indicates that a long-term relationship exists between GDP and FDI.

The purpose of researcher is to describe the effect of foreign direct investment on the economies of the Baltic countries. Nowadays, the foreign direct investment trend is becoming increasingly important. The impact analysis of the FDI showed that FDI had a positive impact on the economies of the Baltic countries because the strong relationship between FDI and GDP as well as between FDI and labour productivity was noticed. Coefficients of linear regression models showed that FDI influence differed in all the Baltic countries. It was found that FDI had a positive impact on two relevant economic indicators of all the Baltic countries [1-7].

Theoretical background

Foreign Direct Investment (FDI) is an investment in a company or organization in another country by a group in one country with the intention of establishing a lasting interest. Term interest separates FDI from transactions in a global fund where investors buy shares from a foreign country passively. By gaining a permanent interest or by extending one's company to a foreign country, a foreign direct investment may be made. FDI, a form of international factor movements, is defined by the influence of an organization located in another country over the management of a commercial enterprise in one country. Foreign direct investment, a passive investment in shares in another country, such as public stocks and bonds, is distinguished from foreign portfolio investment by the 'control' element.

The internationally agreed 10 percent threshold of voting shares is used by standard definitions of control, but this is a grey area as often a smaller block of shares can give control in widely held companies. In addition, technology regulation, management, even vital inputs will confer de facto control [8].

History and development of FDI

The large accumulation of capital in the world's money centres, which far exceeds the prospects for home investment, has contributed to international investment expanding across the entire surface of the earth.⁵ Indeed, one of the key reasons behind the extension of European empires to the four corners of the world in early pre-modern times was the establishment of foreign investment. The history of foreign investment in Europe is believed to date back to ancient times, and these investments are being made in Asia, the Middle East, Africa and elsewhere in the world. The Phoenicians, a civilization that flourished from 1500 BC in what is known as Israel and Palestine, were one of the earliest examples of foreign investment in its purest form. The Phoenicians traded ships with the Greeks and founded outposts across the Eastern Mediterranean, from which they could sell items such as wood

and textiles from their homeland. Such permanent outposts must be regarded as a permanent presence in a foreign country.

The Silk Road trade routes were developed between Europe (the Roman Empire), the Middle East and the Pacific Ocean a few centuries after the Phoenicians, stretching over 6000 km across the deserts, plains and mountains of Asia. The Silk Road remained a vital link between Europe and Asia until the Middle Ages, when both international investment and international trade became dominated by sea transport. There was an extensive trade relationship between Europe and China, as well as India, at the start of the fifteenth century.

Western European states continued to establish permanent settlements in the areas they had previously visited because of trade missions during the early fifteenth century and onwards. In order to conduct trading operations in Indonesia, the Dutch East India Company was established in 1602 to be identified as the first multinational organization in the world. The Portuguese are now starting to set up colonies in India and Africa, as are the British and French. In North America, the latter two states had set up colonies where fur trapping was a lucrative business. By the mid-seventeenth century, motivated by the acquisition of gold, Portugal and Spain had already started to settling Central and South America ^[9].

Investments were primarily made in the sense of colonial conquest during the eighteenth and nineteenth centuries. Investments are unilateral from the imperialist states to the colonial states during this time and tend against natural resources in general. The European powers' practice of colonization was rooted in the economic aim of leveraging the abundant wealth and cheap labour available in less developed countries. *Via* military and administrative presence, it was achieved. Wealth created by foreign investment was itself related to the political objective of land conquest and extension of the major European powers' territorial sovereignty. The riches of the colonies, especially gold and silver, enriched the home country, which in turn financed the raising of larger armies and navies. Most of the world's technology was built by FDI at the start of the twentieth century, including electricity in Brazil and telecommunications in Spain. Similarly, before WWI, German chemical firms, including U.S. car factories, were spreading beyond Germany. British businesses have also participated from an early stage in the manufacture of consumer products overseas.

Developments of the 20th Century: By 1914, the global stock of FDI was valued at \$15 billion; the United Kingdom was the largest source of investment, followed by the United States and Germany; on the other hand, the United States was also the largest beneficiary of FDI. By 1938, the stock of world FDI had grown to \$66 billion, though UK companies were already the largest holders. Most of the investment was made in Latin America and Asia, with a major contribution to agriculture and mining. These trends began to change as US companies became the primary source of FDI; spending in manufacturing became more prevalent. Global investment in developing countries at the beginning of the 20th century was primarily driven by the extraction of natural resources and the development of railways, investment in highly productive FDI (textiles and clothing in East Asia from the 1960s, the automobile industry in Asia and Latin America) and strategic asset-seeking FDI (technology activities in Singapore and Malaysia).

In the 1970s, oil prices continued to escalate. This had two FDI effects, one positive and one negative. First, high prices promoted increased FDI in the extractive sector, especially in the oil and gas sectors. Second, surplus

balance of payment of commodity-exporting countries offered an ample source of investment resources. This capital has been recycled to developed countries by large-scale sovereign lending by commercial banks [10-12].

Thus, developed countries have been more interested in sovereign borrowing than in attracting FDI. At the end of the 1970s, the economic boom of many developed countries has prompted politicians to follow inward-looking policies. Following this, a number of countries have tightened policy limits on FDI. Investors have responded by reducing their FDI in developed countries. Economic depression continued in the first half of the 1980s. Commodity costs have begun to decline, developed economies have faced a recession and global interest rates have increased, both of which have sparked a debt crisis. Inward-looking and state-oriented economic strategies have resulted in low competitiveness and insulation from the global economy. Many countries have begun structural reform programs to redirect their markets to the private market, international exchange and productivity. These reforms have included lowered taxes, the liberalization of the market climate and the deregulation of FDI. In reaction to these shifts, FDI flows to developed countries started to rise in the second half of the 1980s.

The direction and structure of the FDIs have shifted over time. Two thirds of the world's FDI flowed to developed countries in the early 1900s. In 1914, on the eve of World War I, FDI accounted for 40% of GDP in developed countries. Now that this has improved, IDF in developed countries is as much as IDF in emerging countries. The degree and distribution of foreign investment has also changed over time. In 1914, 70% of US FDI in developed countries was in agriculture, mining or petroleum; 26% in services; and just 1% in manufacturing. In 1998 these figures were 14 per cent, 59 per cent and 27 per cent respectively. As a result, there has been a marked move from FDI natural capital to knowledge-intensive operations.

Current trends: Today, foreign direct investment and foreign companies are growing their value and share in the international arena. Foreign direct investment rose by 38% to \$1.7 trillion in 2015, the fastest since the 2009 recession. Starting in 2015, the FDI had a long decline, with a fall in FDI for the third straight year. Global FDI flows have started to slide in 2018, dipping by 13 per cent to \$1.3 trillion from a revised \$1.5 trillion in 2017. Global FDI flows have fell by 20% relative to the last half of 2018 to USD 572 billion in the first half of 2019. FDI flows declined by 5 percent to USD 361 billion in Q1 2019 and by 42 percent to USD 210 billion in Q2 2019. Despite this downturn, direct investment remains one of the most important players in the global economy for both developed and emerging economies.

Today, as the world is struggling to deal with the coronavirus outbreak, the economies of the countries have been hit hard. This unusual condition and the global dissemination of the virus are felt around the world and have an impact on all industry sectors. It was a tragedy like no other, shutting down factories and schools, closing borders and putting half of mankind under some sort of lockdown. It has contributed to a sharp decline in the cash flow of corporations and a possibility of mass insolvencies. Unfortunately, this is not over, with cases continuing to grow globally and economies continuing to suffer losses.

Developed and developing countries have dedicated huge funds to fight this epidemic, and a contraction has already begun. It can be predicted that this crisis situation would have a long-term effect on the economy. Countries would need to take some steps to solve this challenge in the economy as quickly as possible; however, it is unlikely for these steps taken within the world to be adequate to restore the economy. Foreign investment and foreign investors are growing their value at this point in time. Based on the increase would be of considerable significance in supplying the tools required by countries for the reorganization of their economies.

Types of Foreign Direct Investment

There are two major types of FDI: horizontal and vertical.

Horizontal: Company is extending its domestic activities to a foreign country. In this situation, the organization carries out the same operations but in a different country. For e.g., the opening of McDonald's restaurants in Japan will be called a horizontal FDI.

Vertical: Company is expanding into a new country by shifting to a particular stage of the supply chain. In other words, an organization carries out various operations overseas, but these activities are also connected to the core sector. By the same example, McDonald's might buy a large-scale farm in Canada to produce meat for their restaurants.

Two other types of FDI have also been observed: conglomerate and platform.

Conglomerate: An unrelated company is purchased in a foreign country. This is unique, since it involves overcoming two obstacles to entry: entering a foreign country and entering a new sector or sector. An example of this would be if Virgin Group, based in the United Kingdom, had acquired a line of clothing in France.

Platform: company is spreading to a foreign country, but production from foreign activities is sold to a third country. This is often referred to as an FDI export platform. The FDI network usually operates in low-cost locations within free-trade zones. For example, when Ford acquired manufacturing plants in Ireland for the primary purpose of exporting cars to other EU countries.

Factors influencing FDI

The following are the different considerations which the FDI is looking for before investing:

Government stability: A secure Government is a required condition for any investment. The investor will still follow a Government that promotes investment and does not take any anti-investment initiatives. The lender should have no fear of being taken over by the Government. This would make it easier for him to go for expansion.

Flexibility in the policy of Government: Certain investments have not been permitted in the hands of FDI, but such a restrictive approach would not lead to the development of industries. With the WTO law, the government must follow flexible policies, allowing FDIs to be enforced in all regions, including those where they have historically been prohibited.

Pro-active Government steps to encourage investment (infrastructure): Proactive steps such as port expansion, captive power, highway growth, nuclear power, etc. should also be taken by the Government. These initiatives would draw more direct foreign investment.

Stability of the exchange rate: The economic feasibility of every FDI is dependent on the stability of the exchange rate. This means that the value of the domestic currency does not collapse abnormally enough that, when repatriating the money, the foreign investor would lose heavily. The exchange rate should be more or less the same as at the time of investment.

Tax policy and concessions: The Government should follow uniform tax policies in compliance with international standards. Strong excise duty or income tax or customs duty prohibits foreign direct investment. A mild tax policy should help to make the FDI more relaxed. Big multinationals, such as Apple, Google and Microsoft, have sought to invest in countries with lower corporate tax rates. Ireland, for example, has been active in gaining funding from both Google and Microsoft. In reality, it was problematic because Google has sought to route all revenues into Ireland, despite having operations in all European countries.

Scope of industry: Market scope: FDIs must be in a position to take advantage of the demand and develop both in the domestic and international markets. This would decrease their manufacturing costs and provide them with enough space for diversification.

Other favourable considerations (including logistics and labour) for the location: Labour production in the country should be high. There should be sufficient skilled labour available, especially in technical areas. There should be various transport services available, with proper communication between land, rail and air.

Return on investment: The bonus or the return they get for the investment made is one of the main attractions for FDIs. They would not explore for investment until the return is considerably greater than what they might have received in other nations. It should also be consistent with the return and it should rise over a period of time. When undertaking investment, these aspects are carefully investigated. Return on investment is also a significant driving factor for FDIs when investing in foreign countries. They would also like to ensure that the payback period is also shorter in order to maintain the return over a short period of time ^[13,14].

Research questions

1. Whether there is any influence of FDI on other economic factors?
2. Is there any long term and short-term relationship between the variables?
3. Is there any cause-and-effect relationship between the variables?

Objectives of the study

1. To identify the impact of FDI on other economic factors
2. To examine the short and long-term relationship between the variables
3. To identify cause and effect relationship between the variables.

Research methodology

The study is based on secondary data and the influence of FDI on selected major economic factors is considered. The study has been conducted by using yearly observations. Data has been obtained from the World Bank Database from year 2000 to 2020 (Table 2).

The countries selected for the study and the economic factors/indicators as follows:

Table 1. Countries Selected for the study.

Sl.No	Country
1	Afghanistan
2	Bangladesh
3	Bhutan
4	India
5	Iran
6	Maldives
7	Nepal
8	Pakistan
9	Sri Lanka

Table 2. Economic Factors considered for study.

Sl.No	Variables	Label
1	FDI (Foreign Direct Investment)	Natural logarithm is applied Lfdiin, lfdiout
2	Imports	Natural logarithm applied- limports
3	Exports	Natural logarithm applied- lexports
4	Unemployment	unemp
5	Inflation	inflation
6	Population	Natural logarithm applied- lpopulation
7	Human Development Index	Hdi
8	Gross Domestic Product	Natural logarithm is applied Lfgdp

Panel Data Analysis method is followed for the study as the multiple countries at different time interval. The tools and techniques used are Panel Unit Root Test, Panel Cointegration test, Granger Causality Test, Cross Correlation and Regression tests. E Views 11 Software used for Data Analysis (Table 2).

RESULTS AND DISCUSSION

Data analysis

Descriptive statistics: The below Table 3a and 3b provides the descriptive analytics report for the above-mentioned economic factors in Table 2. The sample period is from year 2000 to 2020 for the countries selected for study listed in Table 1.

Table 3a. Descriptive Statistics (2000-2020).
(Note: FDI inflow, FDO Outflow, Exports are in natural logarithm)

Variables/ Statistics	HDI	INFLATION	LFDIIN	LEXPORTS	LFDIOUT
Mean	0.6	8.37	18.81	16.14	10.78
Median	0.59	6.43	19.89	16.2	17.67
Maximum	0.8	50.89	24.65	20.12	23.68
Minimum	0.35	-2.2	-16.62	12.8	-20.61
Std. Dev.	0.11	7.71	6.23	1.97	14.88
Skewness	0.12	2.39	-4.41	0.24	-1.36
Kurtosis	2.07	10.41	24.37	2.05	3.04
Jarque-Bera	7.11	573.39	3963.02	7.49	41.89
Probability	0.03	0	0	0.02	0
Sum	110.19	1481.22	3348.81	2550.53	1455.15
Sum Sq. Dev.	2.12	10473.99	6877.2	610.38	29655.4
Observations	184	177	178	158	135
Kurtosis Analysis	Platykurtic	Leptokurtic	Leptokurtic	Platykurtic	Leptokurtic
Skewness Analysis	Approximately Positively symmetric	Highly Positively skewed	Highly Negatively skewed	Approximately Positively symmetric	Highly Negatively skewed

Skewness is a representation of symmetry, or, more specifically, of lack of symmetry.

Kurtosis is a measure of whether the data are heavy-tailed (peakedness) or light-tailed (flatness) compared to normal distribution(Table 3a).

Table 3b. Descriptive Statistics (2000-2020). (Note: GDP, Imports and population are in natural logarithm).

Variables/ Statistics	LGDP	LIFEEXP	LIMPORTS	LPOPULATION	UNEMP
Mean	24.34	68.72	14.27	42351.84	5.38
Median	24.7	68.65	14.31	18.11	4.29
Maximum	28.68	78.63	17.87	530953	13.52
Minimum	19.87	55.84	8.76	13.29	0.4
Std. Dev.	2.26	5.25	1.68	122871.2	3.69
Skewness	-0.08	-0.14	0.05	2.7	0.7
Kurtosis	2.07	2.33	3.42	8.76	2.21
Jarque-	6.65	3.74	1.3	467.18	20.44

Bera					
Probability	0.04	0.15	0.52	0	0
Sum	4308.58	11750.76	2426.47	7623332	1017.71
Sum Sq. Dev.	902.6	4686.84	476.9	2.7E+12	2559.48
Observations	177	171	170	180	189
Kurtosis analysis	Platykurtic	Platykurtic	Leptokurtic	Leptokurtic	Platykurtic
Skewness analysis	Approximately negatively symmetric	Approximately negatively symmetric	Approximately positively symmetric	Highly positively skewed	Moderately positively Skewed

The descriptive statistics from Table 3a and 3b all the variables are not normally distributed which is confirmed by Jarque-Bera Test. The skewness values within the range from -0.5 to 0.5, -1 to -0.5, 0.5 to 1, -1 and Beyond and +1 and beyond considered as Approximately symmetric, moderately negatively skewed, Moderately Positively Skewed, Highly Negatively skewed and Highly Positively skewed respectively.

The Kurtosis value equals to 3, greater than 3 and less than 3 considered as Mesokurtic, Leptokurtic and Platykurtic respectively (Table 3b).

The mean, median and mode for all the variables are positive.

Table 4. Panel unit root test (Augmented Dickey Fuller Unit Root Test).

Variables	Deterministic	At Level		First Lagged Difference		Inference
		t statistic	Probability	Tstatistic	Probability	
LGDP	Intercept	27.3579	0.0725	61.7679	1.06E-06	No Unit root at first lagged difference
Limports	Intercept	28.7859	0.0511	104.063	3.97E-14	No Unit root at first lagged difference
lexport	Intercept	23.6453	0.167	93.5871	3.26E-12	No Unit root at first lagged difference
Lifeexp	Intercept	96.8549	8.31E-13	-	-	No Unit root at Level
lpopulation	Intercept	42.2284	0.001	-	-	No Unit root at Level
Unemp	Intercept	34.2048	0.0119	-	-	No Unit root at Level
HDI	Intercept	31.3685	0.0261	-	-	No Unit root at Level
LFDIIN	Intercept	64.3874	3.92E-07	-	-	No Unit root at Level
lfdiout	Intercept	24.3976	0.041	-	-	No Unit root at Level
Inflation	Intercept	57.2025	0.000006	-	-	No Unit root at Level

There are two generations of experiments within the panel unit root-testing framework. The first generation of tests suggests that cross-sectional units are cross-sectionally independent, while this principle is relaxed by the second generation of panel unit root tests and encourages cross-sectional dependencies. Table 4 reports the analysis of Panel Unit Root test (ADF). According to Akaike Info Criteria, the lag length choice was assigned (AIC). The Unit Roots are rejected at GDP, import and export levels. The possible serial association in the terms of error by adding the regressand's lagged difference terms. Therefore, the null hypothesis is rejected at 5 percent by the Panel Unit root test where p value<0.05 and supports the stationarity of the economic variables. This shows variables are stationary at level and first difference as listed in table and justifies the need for cointegration test (Table 4).

Table 5a. Panel Cointegration test.

	t-Statistic	Prob.
ADF	5.435931	0
Residual variance	1.73E-05	
HAC variance	1.23E-05	
Note: Kao Residual Cointegration Test Series: HDI INFLATION LEXPORTS LFDIIN LFDIOUT LGDP LIFEEXP LIMPORTS LPOPULATION UNEMP; Date: 02/15/21 Time: 06:28; Sample: 2000 2020; Included observations: 189; Null Hypothesis: No cointegration; Trend assumption: No deterministic trend; Automatic lag length selection based on SIC with a max lag of 2 Newey-West automatic bandwidth selection and Bartlett kernel		

Table 5b. Panel Cointegration test using Variable and coefficients.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.45533	0.077313	-5.88394	0
R-squared	0.237504	Mean dependent var	0.000133	
Adjusted R-squared	0.237504	S.D. dependent var	0.004863	
S.E. of regression	0.004246	Akaike info criterion	-8.0766	
Sum squared resid	0.002002	Schwarz criterion	-8.05233	
Log likelihood	453.2898	Hannan-Quinn criter.	-8.06676	
Durbin-Watson stat	1.884381			

Note: Augmented Dickey-Fuller Test Equation; Dependent Variable: D(RESID); Method: Least Squares ; Date: 02/15/21 Time: 06:28; Sample (adjusted): 2002 2018; Included observations: 112 after adjustments

Results of Kao Residual Panel Cointegration test is applied for checking whether long term relationship between the variables. The p value<0.005, hence the null hypothesis is rejected. This proves that there is a long-term relationship between the factors considered for the analysis (Table 5).

Granger causality test

A statistical hypothesis test for evaluating whether one time series is useful for predicting another is the Granger causality test. If the likelihood value is less than some amount, the hypothesis at that α level will be rejected. Pairwise Granger Causality Test reveals that the below mentioned variables granger cause in the specified direction (Table 6).

Table 6. Granger Causality Test.

Direction	Lags: 2	
	F-Statistic	Prob.
HDI---->INFLATION	5.65621	0.0043
HDI---->LIMPORTS	4.30399	0.0153
LEXPORT---->INFLATION	4.37181	0.0145
LGDP---->INFLATION	4.43341	0.0134
LIMPORTS---->INFLATION	3.82828	0.024
UNEMP---->INFLATION	5.92765	0.0033
LEXPORTS---->LFDIIN	4.74411	0.0102
LGDP---->LEXPORTS	3.12757	0.047
LPOPULATION---->LIFEEXP	3.82353	0.024

Table 7. Multiple Correlations Test.

Correlation	HDI	INFLATION	LFDIIN	LEXPORTS	LFDIOUT	LGDP	LIFEEXP	LIMPORTS	LPOPULATION	UNEMP
HDI	1									
INFLATION	0.303143	1								
LFDIIN	0.067032	0.048136	1							
LEXPORTS	0.090742	0.118922	0.943497	1						
LFDIOUT	-0.1271	0.050739	0.591114	0.691764	1					
LGDP	-0.09874	0.036062	0.883608	0.957537	0.797416	1				
LIFEEXP	0.934241	0.22663	-0.05959	-0.07793	-0.2817	-0.28046	1			
LIMPORTS	0.411081	0.291627	0.389452	0.54296	0.483297	0.54763	0.243043	1		
LPOPULATION	0.277545	-0.03586	-0.39491	-0.54464	-0.84058	-0.71897	0.474299	-0.52382	1	
UNEMP	0.301557	0.199143	-0.04721	0.101253	0.053984	0.107584	0.093402	0.641484	-0.19637	1

Multiple correlation tests

In statistics, the multiple correlation coefficients are a measure of how well it is possible to estimate a given variable using a linear function of a number of other variables. That is the correlation between the values of the variable and the best predictions that can be computed from the statistical variables linearly. The above correlation matrix from Table 7 provides reflective view about the inter relationship between the different variables (Table 7).

Regression model

Panel regression, also called longitudinal data or cross-sectional data, is a modelling approach applied to panel data. In econometrics, where the action of mathematical units (i.e., panel units) is followed over time, it is commonly used. When estimating regression coefficients, panel regression enables monitoring of both the panel unit effect and the time effect.

Post checking multicollinearity the Limports variable is dropped from regression model. From the below panel least squares method results, p value<0.005 and R squared value is 84.04% which sounds as great model.

Table 8. Panel regression Model.

Variable	Coefficient	Std. Error t-Statistic	Prob.
Hdi	92.7195	112.1178 -0.826983	0.4105
Inflation	0.140537	0.105486 1.332279	0.1862
Lexports	-6	3.482331 -1.675538	0.0974
Lgdp	6.72154	6.144403 1.093929	0.277
Lifeexp	6	2.156129 2.714237	0.008
Lpopulation	-3.00E-05	3.50E-05 -0.906419	0.3672
Unemp	-1	0.695474 -1.885777	0.0626
C	-425	209.5296 -2.029804	0.0454
Effects Specification			
Cross-section fixed (dummy variables)			
Period fixed (dummy variables)			
R-squared	0.840496	Mean dependent var	-10
Adjusted R-squared	0.78612	S.D. dependent var	14
S.E. of regression	6	Akaike info criterion	6.76957
Sum squared resid	3604	Schwarz criterion	7
Log likelihood	-372	Hannan-Quinn criter.	7
F-statistic	15.457	Durbin-Watson scat	2
Prob(F-statistic)	0		
Note: Dependent Variable: LFDI; Method-Panel Least Squares; Date: 02/16/21; Time: 15:22; Sample (adjusted): 2001 2018; Periods included: 18; Cross-sections included: 7; Total panel (unbalanced) observations: 119			

Estimation equation

$$LFDI=C(1)*HDI+C(2)*INFLATION+C(3)*LEXPORTS+C(4)*LGDP+C(5)*LIFEEXP+C(6)*LPOPULATION+C(7)*UNEMP+C(8) + (CX=F, PER=F)$$

Substituted Coefficients:

$$LFDI=92.7195037275*HDI+0.140536534047*INFLATION+5.83477814315*LEXPORTS+6.7215403946*LGDP+5$$

.85224427815*LIFEEXP-3.1758431405e05*LPOPULATION-1.31150852674*UNEMP-425.303889565+ (CX=F, PER=F)

Whereas,

LFDI=Natural Logarithm applied for FDI Netflow (FDI Netflow=FDI Outflow-FDI Inflow).

HDI, LExports=Natural logarithm applied for Exports, LGDP=Natural logarithm applied for GDP, LIFEEXP=Life expectancy, LPOPULATION=Natural logarithm applied for Population and UNEMP=Unemployment (Table 8).

The study is conducted only for selected countries belong to SAARC countries. Further the study can be extended to other countries also comparative analysis can also be made. Only few major economic factors are considered whereas in future the other micro and few less affecting macro-economic factors can be also implemented for better and accurate results. Further the better modeling technique can be used in future with latest tools and techniques.

CONCLUSION

This study focusses on the effect of FDI on selected major economic factors. Variables considered are based on yearly data for the time period of 2000 to 2020. The SAARC countries are selected for the study. The findings of the Kao Residual Panel Cointegration test indicate that the variables have a long-term relationship. There is a short-term relationship and causal effect from the Granger Causality test between a few factors such as HDI, inflation, imports, exports, GDP, etc. The correlation matrix provides the interrelationship between different variables. It also provides strong correlation between few variables. There are also other economic factors that are influenced by FDI. From the regression model with R squares of 84.04% from model variation in FDI Net Flow is explained by independent variables.

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