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Causality Interconnection between Foreign Direct Investment and Economic Growth of Pakistan. An Investigation Using Granger Causality.

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Abstract

In the current era of globalization, every foreign indicator plays an integral part in every nation's economic development. FDI, GDP, imports, exports, and exchange rates are always given topmost superiority in emerging economies like Pakistan. The primary goal of the research is to check the association between Foreign Direct Investment, Gross Domestic Product, Imports, Exports, Per Capita Income, and Exchange Rate in Pakistan. Secondary information was gathered from 2001 to 2022, and data was composed from the World Bank, Pakistan Bureau of Statistics, and State Bank of Pakistan websites, which used the most authentic sources of information. The outcomes of the study are retrieved through Descriptive statistics, Correlation matrix, OLS, Unit roots, and VAR Granger Causality using EViews software. GDP is the dependent variable, while FDI, Imports, Exports, Per capita Income, and Exchange Rate are independent variables. Results revealed that FDI negatively correlated to GDP while other variables positively correlated. Moreover, OLS exposed that FDI, Exports, Per Capita Income and Exchange Rate positively impact GDP, but Imports harm GDP. Furthermore, granger causality results indicate that Economic Growth leads to FDI. Practically, this study will provide inside knowledge related to investment to investors, Govt, and relevant authorities; lastly, the study recommended that the administration should focus on attracting potential foreign investment players, which will boost the country's exports, cut down on imports, uplift the living standard of people by increasing per capita income, and embark on the country's economic growth. Foreign direct investment enables the hosting countries to create more employment opportunities and introduce modern manufacturing and production procedures.

Key-Words: FDI, GDP, Unit Root, Granger Causality, Infrastructure

Introduction

Economic development and growth are the objectives of all countries. There are penalties for factors that facilitate economic factors, namely, a tremendous amount of capital investment, advanced technology, a vigorous transport and communication system, experienced human capital, and a tax collection process. Growth is determined by the variation of all these indicators and the inflow of investment. Foreign direct investment includes the transfer of technology, arrangement of merger and acquisition, treatment of balance of payment, and balance of trade. (Agrawal & Khan, 2011). Financial features consisting of trade openness, exchange rate, infrastructure, and market size have been repeatedly discussed (Masuku & Dlamini, 2009; Leitao & Faustino, 2010; Alam & Shah, 2013). Political influences embrace radical solidity, government efficiency, law and order, and level of dishonesty (Asiedu & Lien, 2006; Mina, 2009; Qian et al., 2010). Universally, Pakistan is among the nations with emerging economies and is measured as the 24th largest economy in terms of PPP (purchasing power parity) and 46th in terms of nominal GDP (gross domestic product); per capita income in 2023 was 1474 $ and considered the 5th largest country in the contrast of population. As per the World Bank statistics, Pakistan's GDP will increase at a rate of 5.5% by 2018 due to a heavy inflow of investment by China in the Chinese Economic Corridor. Cross-border investors from one country exhibit a long-term relationship, interest, and significant degree of influence over the business of another country when they make foreign direct investments. The growth of the home economy and global economic growth depends heavily on foreign investment. Several macroeconomic gauges, including exports, imports, foreign direct investment, currency rates, Per Capita Income, and inflation rates. Influence the economic growth of any nation. According to data on foreign direct investment, new investment boosts economic growth through knowledge transformation and effective spillover. These aids, however, are not automatically provided; instead, they depend entirely on the receiving nation's ability to absorb them. (Tocar S., 2018)

There are multiple reimbursements between the host state and the participating nation in the case of foreign direct investment. Explore by Hossain and Hossain (2012), Ram and Zhang (2002), and Frenkel, Funke, and Stadtmann (2004) concluded that many advantages occur due to foreign direct investment, such as transfer of advanced technology, transfer of knowledge, uplift the foreign reserves of the hosting country, tough rivalry in the markets of the host country, reduce the problem of imports and enhance the exports and enhance the training skills of the labor of the country. Moreover, foreign investors encourage the market players of the host country to innovate and deal with foreign countries. Furthermore, FDI assists the hosting country to enter in the foreign market and competing with different market players, which enables the uplift of the globalization procedure of the host country (Dondeti & Mohanty, 2007). Some emerging countries have skilled and well-literate labor and human capital that attract foreign direct investment. Many developing countries have huge populations and vital education and training vocational centers. Foreign investors evaluate numerous factors before selling a country for investment because investors are the providers of advanced technology, the best labor force, and furnished infrastructures. (Ilgun, Koch & Orhan, 2010).

Research Objectives

The study aims to find the association between FDI and GDP by using additional macroeconomic variables that affect the GDP, such as Imports, Exports, Exchange Rate, and Per Capita Income. Some detailed points are:

- Impact of FDI on GDP

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- Impact of Imports on GDP
- Impact of Exports on GDP
- Impact of Per Capita Income on GDP
- Impact of Exchange Rate on GDP

Literature Review

Raghutla, C. (2020). This study explored the research of five emerging countries to check the effect of FDI on GDP. Data was collected from 1993 to 2016. GDP is a dependent variable, while foreign direct investment, financial development, inflation, the labor force, and technology are independent variables. It was concluded that all variables had a solid positive long-run relationship. Majeed et al. (2021) researched to check the influence of FDI on the economic development of Asia, Europe, Latin America, and Africa. Data was gathered from 1990 to 2020, and numerous statistical tools such as OLS, Regression, and augmented mean group techniques were used to find the results. The research conclusions exposed a statistically significant association between FDI, trade openness, inflation, and financial development. There was a negative link between inflation and economic growth on all continents. Because of the higher cost of many factors, low-income and middle-income economies attract and get more investment than developed countries. Begum, S. et al., (2023). The primary purpose of the research was to look at the relationship between FDI, GDP, Exports, and industry value. Secondary statistics are from the World Bank and Bangladesh Databank from 1987 to 2020. SPSS statistical software was used to find the desired outcome of the study, and Regression and Correlation analysis were used among the variables. Results unveiled the positive link between FDI and GDP, Exports, and Industry value. Ateik et al. (2023) stated that the study aimed to find the association between FDI and the growth of Asian economies. Pakistan, India, and Bangladesh were the main focus of the study, and data was collected annually from 1991 to 2020. Penalty tests such as Cointegration, d granger causality tests, and Regression were used to check the impact of each country. The findings revealed that FDI, Economic development, and exports have a strong relationship. Results clinched that more investment could be inflow if a favorable environment were created for foreign investors.

Meilisa, M. (2024). A study was conducted to find the impact of foreign debt and foreign direct venture on Indonesia's economy. Moreover, exports are used as a control variable. The research used comprehensive time series data from 1990 to 2022. Bounds test the *cointegration* approach, and the ARDL model was used to finalize the consequences. The findings exposed that foreign debt and foreign direct investment positively impact growth, while exports have a negative association with the GDP of the Indonesian economy. Solomon, O., (2024). They researched to find the impact of FDI on the GDP of Nigeria's Agriculture sector from 1981 to 2022. GSP was the dependent variable, while FDI, Exchange Rate, and Inflation were the independent variables. Regression analysis and unit roots were employed to retrieve the outcomes. The study's outcome expressed an encouraging impact of agriculture FDI on the economy of Nigeria.

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Furthermore, results showed a positive and meaningful relationship with the exchange rate but a negative association with inflation. Humta, H., & Şahin, I. E. (2024) examined the panel data for seven Arab economies from 2010 to 2021 (Algeria, Comoros, Egypt, Jordan, Kuwait, Lebanon, Mauritania, Oman, and Qatar). Foreign Direct Investment was the Explained variable, while Financial Development was the Explanatory variable used in the study. The study employed a variety of tests, including the OLS, correlation, chow test, Hausman test, Jarque-Bera normalcy test, and Wooldridge test, to ascertain its findings. The findings showed a positive correlation between interest rates, financial development, and foreign direct investment. Additionally, the study found a negative correlation between the inflation rate and the Arab League's economic performance.

Research Methodology

The fundamental goal of the research is to check the influence of FDI on Pakistan's economic growth. The study employs the time series statistics set from the historical of 2001 to 2022, and data was composed of the World Bank and State Bank of Pakistan; numerous variables such as Foreign Direct Investment, Gross Domestic Product, Imports, exports, Per Capita Income, and Exchange used for the study. Gross Domestic Development is used as a dependent variable, while the rest are operated as independent variables. Descriptive statistics, Correlation Matrix, OLS, and Granger Causality Tests are used to retrieve the results through E-Views software.

Model Specification

The research will conduct a regression analysis of the variables to determine Pakistan's affiliation with GDP and FDI. The specification model is as follows.

Y= Gross Domestic Product (Dependent Variable)

= Foreign Direct Investment

= imports

= Exports

=Per Capita Income

=Exchange Rate

B= Coefficient of independent variables

α= Constant

£= error item

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Table: 1 Variable Descriptions

Variables	Labels	Details	Source/ Supported Studies
Gross Domestic Product	GDP	Natural Log of Annual GDP	World Bank, S. Chandrachud & N. Gajalakshmi (2013), Bilgili et al. (2012)
Foreign Direct Investment	FDI	FDI/GDP*100	World Bank, Bhavya Malhotra (2014), Pradhan and Kelkar (2014).
Imports	IM	Natural Log of Annual Imports	Pakistan Bureau of Statistics, Mohd. Yameen and Izhar Ahmad (2014)
Exports	EP	Natural Log of Annual Exports	Pakistan Bureau of Statistics, Misbah Nousheen (2013)
Per Capita Income	PCI	Natural Log of Annual Capita Income	State Bank
Exchange Rate	EXR	Natural Log of Exchange Rate	State Bank

GDP Gross Domestic Product Trend

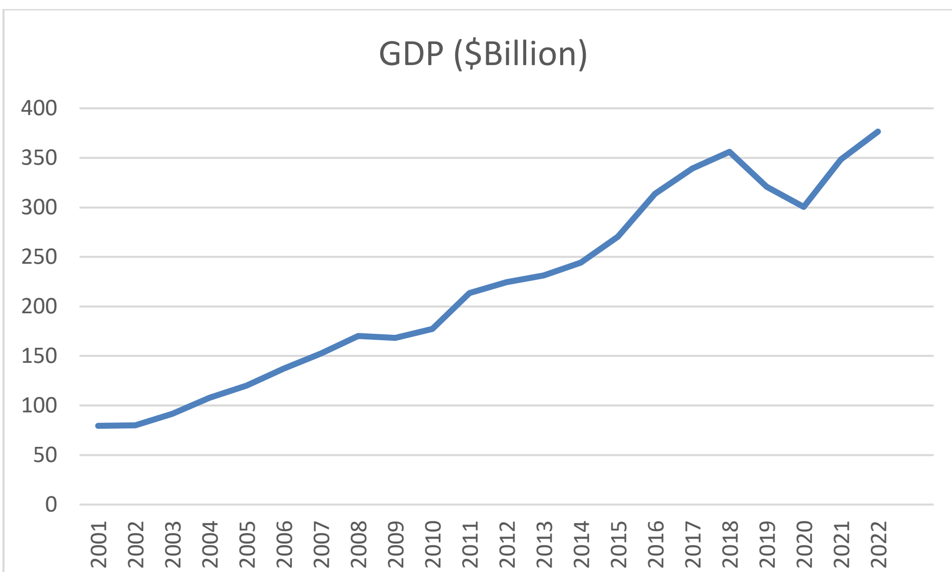

Figure 1. GDP Distribution

The above figure demonstrates the GDP distribution from 2001 to 2022. The lowest value of GDP was $ 79.48 in 2001, while the maximum was $ 376.53 in 2022. There was a steady increase in GDP till 2008, a downward trend in 2009, and a sharp increase till 2018. A recession period of economic growth was witnessed during the pandemic rea. Moreover, there was a revival in economic growth in the post-Covid.

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Foreign Direct Investment Trend

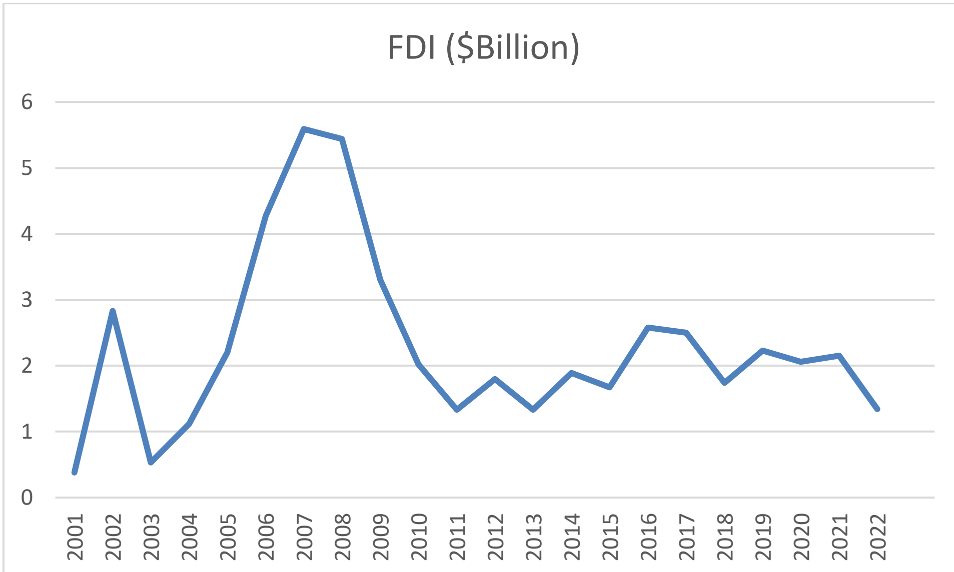

Figure 2. FDI Distribution

Figure 2 reveals the FDI distribution from 2001 to 2022. The minimum value of FDI was in 2001, and the highest was in 2007. Foreign direct investment has been calculated in millions over the last 22 years. The figure demonstrates the upward and downward trends in the previous 22 years.

Imports Trend

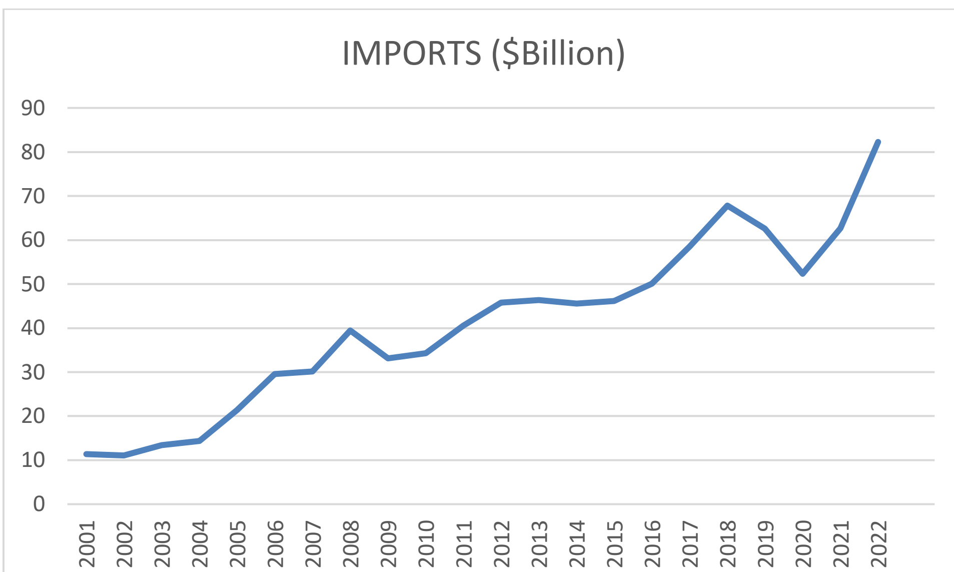

Figure 3. Imports

Figure 2 shows Pakistan's imports from 2001 to 2022. The minimum value of imports is found in 2oo1, and the maximum value was demonstrated in 2022. An increasing trend of imports can be seen until 2018. Due to COVID, the government banned international trade and reduced

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imports. Only necessary items, such as petroleum, automobiles, etc., were imported, and an upward trend can be noted post-COVID.

Exports Trend

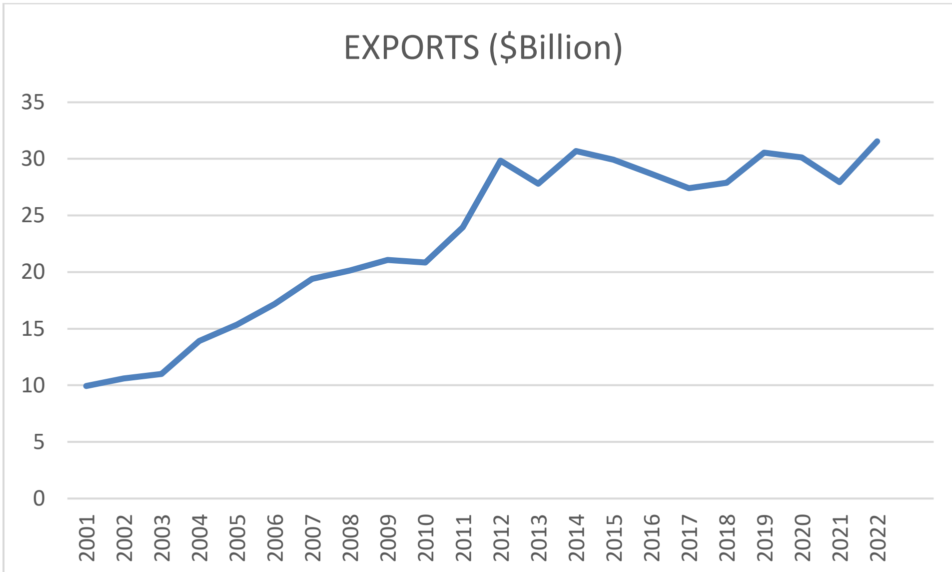

Figure 4. Exports.

Figure 4 demonstrates the export trend from 2001 to 2022. The lowest amount of exports took place in 2001 and the maximum in 2022; there has been an upsurge and falling trend in exports over the last 22 years.

Per Capita Income

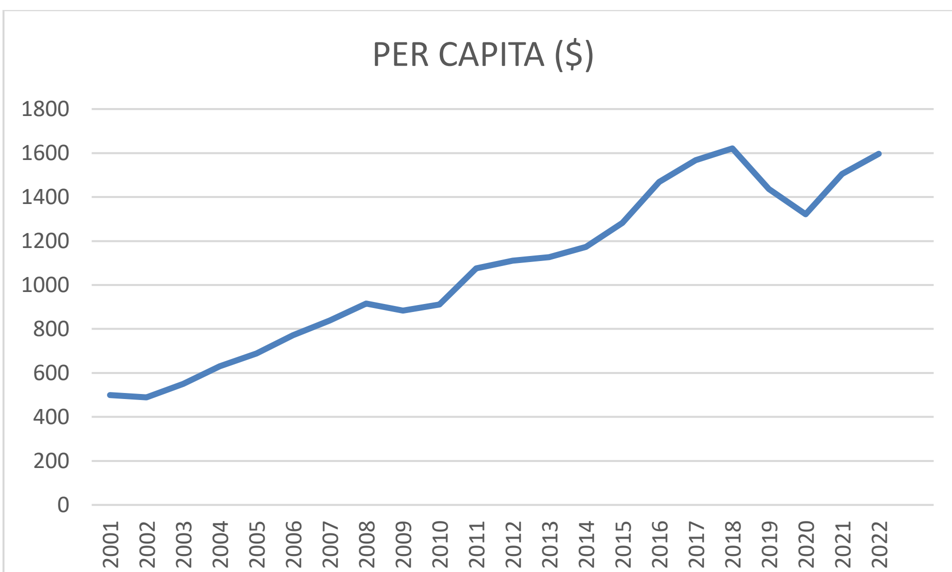

Figure 5. Per Capita Income

The figure shows Pakistan's per capita income over the last 22 years. An improvement in per capita income can be seen over the period. Unfortunately, during the Covid-19 pandemic, the

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unemployment rate increased. People were mostly linked with digital marketing, digital business, and online business instead of physical business. During the pandemic, most brokers, investors, entrepreneurs, and business people gained worldwide knowledge of the stock markets.

Exchange Rate Trend

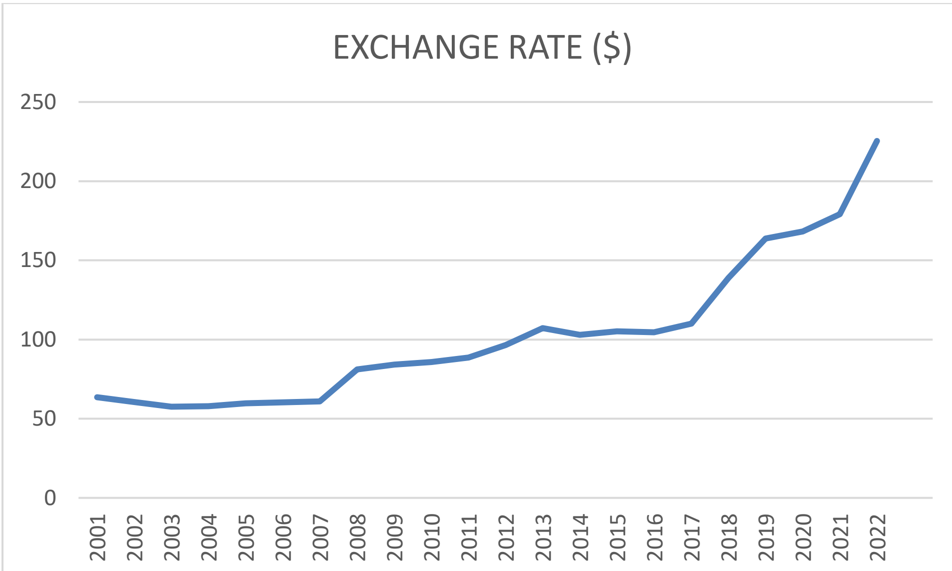

Figure 6. Exchange rate

Figure 6's findings indicate an upward trend in the country's exchange rate. The minimum exchange rate was in 2001, and the maximum was in 2022. The exchange rate moved upward sharply even in the COVID-19 era.

Result and Discussion

Descriptive Analysis

The mean GDP value is 5.28 with a standard deviation of 0.503, and skewness is negative. FDI has an average value of 2.28, and the deviation is 1.350. Furthermore, the Mean value of IMP is 3.59, and the standard deviation is 0.591. The average EXP is 3.75, with a standard deviation value of -0.378. Moreover, the PCI average value is 6.906, and the standard deviation is 0.386. Lastly, the Exchange rate has a mean value of 4.54 and a standard deviation of 0.409. GDP, IP, EXP, and PCI were negatively skewed, while the other variables were positively skewed.

Table: 2 Descriptive Statistics

	GDP	FDI	IMP	EXP	PCI	EXR
Mean	5.28	2.286	3.569	3.075	6.906	4.549
Median	5.389	2.04	3.761	3.243	6.996	4.527
Maximum	5.931	5.59	4.41	3.452	7.391	5.418
Minimum	4.376	0.38	2.404	2.297	6.192	4.053
Std. Dev.	0.503	1.35	0.591	0.378	0.386	0.409
Skewness	-0.432	1.175	-0.786	-0.865	-0.465	0.475
Kurtosis	1.973	3.935	2.522	2.436	2.043	2.257

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Observations	22	22	22	22	22	22

Correlation Matrix

Table: 3 Correlation

	GDP	FDI	IMP	EXP	PCI	EXR
GDP	1.00					
FDI	-0.020					
IMP	0.975	0.108				
EXP	0.956	0.041	0.961			
PCI	0.999	-0.001	0.976	0.954		
EXR	0.894	-0.199	0.857	0.813	0.873	1.000

The correlation matrix in Table 2 indicates that Foreign Direct Investment is negatively correlated with Gross Domestic Product. In contrast, imports, exports, per capita income, and exchange rates positively relate to gross domestic product. The results demonstrate that increased imports, exports, per capita income, and exchange rate lead to economic growth.

Unit Root Result

Table 3: Unit Root Result

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.5422	< 0.01
Test critical values:	1% level	-4.949133	
	5% level	-4.443649	
	10% level	-4.193627	

Dependent variable: D(GDP)VAR Granger Causality/Block Exogeneity Wald Tests

Table: 4 VAR Granger Causality/Block Exogeneity Wald Tests

Dependent variable: D(GDP)

Excluded	Chi-sq	df	Prob.	Do causality exist?
D(FDI)	0.071538	1	0.789	NO
All	0.071538	1	0.789	

Dependent variable: D(GDP)

Excluded	Chi-sq	df	Prob.	
D(GDP)	1.782465	1	0.182	NO
All	1.782465	1	0.182	

Ordinary Least Squares

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Table 5: OLS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.423	0.172	-19.906	0.000
FDI	0.001	0.003	0.396	0.697
IMP	-0.039	0.029	-1.323	0.205
EXP	0.091	0.028	3.267	0.005
PCI	1.157	0.037	31.296	0.000
EXR	0.125	0.016	7.822	0.000
			R-squared	1.000
			Adjusted R-squared	0.999
			Prob(F-statistic)	0.000

The value of the Coefficient of FDI is 0.001, and its P value is insignificant, more significant than the significance level of 5%. FDI has a progressive but insignificant impact on Pakistan's economic progress. The outcome of the research retrieved is that imports have an adverse and negligible effect on the country's gross domestic product. Furthermore, the coefficient value of exports is 0.091, and the P value is less than 5%, which describes the increase in Pakistan's exports, uplifting the country's economic development. Moreover, Per Capita Income strongly impacts economic progress positively and significantly. Additionally, results reveal that the Exchange rate is linked with economic growth. Lastly, the value of (R2) designates that 99% of independent variables explain the dependent variables.

Conclusion

Predictably, FDI will benefit the host countries by providing capital, technology, infrastructure, and foreign reserves. Most emerging economies attract foreign direct investment by offering several benefits, such as Tax incentives, capable and trained workers, and liberalization in trade. Inflows mainly accrue towards developed nations instead of developing countries. The primary purpose of this study is to determine the impact of FDI on GDP by using other independent variables such as Imports, Exports, Per Capita Income, and Exchange Rate. Data was gathered annually from 2001 to 2022, and statistical information was collected from the World Bank website. GDP is a dependent variable, while FDI, imports, Exports, Per Capita Income, and Exchange Rate are independent variables for the current study. EViews statical software retrieves the outcome through descriptive, correlation, OLS, unit roots, and VAR Granger Causality tests. Correlation explains the results in Table 4 and shows that GDP and FDI are negatively correlated with each other while there is a positive relationship between the rest of the variables. OLS findings revealed that FDI, exports, per capita income, and exchange rate positively impact GDP, while imports have an inverse association with economic growth. Moreover, no Granger Causality exists among the variables.

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Recommendations

Based on the above findings, FDI and economic growth positively impact the whole. The flow of investment enhances the technology transformation, inflow of capital, literacy, and training of human capital, and it improves the infrastructure of the hosting country. The Government of Pakistan should facilitate the foreign market players by granting them ease in credit facilities and tax rebates and ensuring more subsidies. The law-and-order circumstances of the host country are also very impactful in fascinating the inflow of investment from other countries.

Future Research

Future studies may include more countries to attain the desirable consequences. Research may be conducted by adding more macroeconomic indicators from countries such as the SAARC, G7, and G20. Moreover, to strengthen the research's outcomes, future researchers may increase the sample size of data.

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