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# EXAMINING THE INFLUENCE OF MACROECONOMIC FACTORS ON ECONOMIC DEVELOPMENT IN PAKISTAN: A STUDY OF INFLATION, EXCHANGE RATES, TRADE DYNAMICS, AND FOREIGN DIRECT INVESTMENT

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## Abstract

This research considers the effects of the inflation rate, currency exchange, export, import, FDI, and economic development in Pakistan. This research surveys the economic development of Pakistan from 2001 to 2023, with inflation, exchange rate, export, import, and FDI as independent variables and economic growth as the dependent variable. Firstly, the study gives the group statistics of the variables, and it is conducted with the help of an Augmented Dickey-Fuller (ADF) test to assess the unit root of the variables. For the analysis of the connection between the variables, the Least Square method (including NLS and ARMA models) and Granger Causality tests are used. Therefore, it can be inferred that the Granger causality analysis is a one-sided causal connection between the GDP and FDI and the inflation rate. On the other hand, there is a bi-directional connection between GDP and the level of imports, as well as the exchange rate and GDP. However, there are no significant causal relationships between the other variables. On top of it, the results of the Least Square (NLS and ARMA) method propose that the inflation rate has a cardinal non-favourable impact on Pakistan's economy. On the contrary, the exchange rate, exports, and FDI also have a significant favourable impact on Pakistan's economic growth. These findings can help politicians to make effective policies for the stabilization of the macroeconomic environment and sustainable development in the country.

**Keywords:** Inflation, Exchange Rate, Granger Causality, NLS and ARMA.

## Introduction

Economic growth and the macroeconomic variables have been of significant interest and concern to the researcher as well as policymakers. The analysis of inflation, exchange rates, import, export and FDI for the enhancement of economic growth is pertinent for formulating proper economic policies and for the development of any country. Therefore, the purpose of this study is to determine the environment of Pakistan and offer empirical evidence of the impact of inflation, exchange rates, import, export and FDI on economic growth.

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Some of the factors that have an impact on the economic development in Pakistan are inflation, exchange rate, imports (source abroad), exports (trade internationally) and FDI or overseas investment. In this paper, a literature review will show the relationship between these attributes and the impact that such a relation had on the development of the country's economy.

Inflation, particularly food inflation, has recently posed itself as one of the major challenges to the growth of Pakistan's economy. Inflation rates increase the deterioration of the purchasing capability of the citizens and slow down the growth of the economy. Research evidence indicated that there was an inverse relationship between inflation and the GDP growth rate in Pakistan, and as such, a 1% rise in inflation reduces the GDP growth rate by a 0.29% decrease in GDP.

Exchange rate and economic development concerns are of interest in Pakistan. There have been changes in the country's exchange rate. This has impacted the estimated cost of importing (source of aboard) and exporting (trade internationally) as well as the competitiveness of the products and goods produced in the country in the world market. According to the findings, a cross-rate increase of 1% results in a 0. 55% decrease in GDP.

In trading, Pakistan's position remains in perpetual deficit through imports – goods bought from foreign countries – and extreme exports. Foreign exchange reserves and net balance of this nation's current account. Have been under pressure. From the works of scholars, imports that come from abroad are found to exert a negative impact on the development of the economy, while exports that are done internationally have a positive effect. Evaluating the standard of exporting goods and balancing up the trade is therefore very essential for establishing Pakistan's welfare.

FDI had been postulated to be one of the driving forces of economic development in Pakistan. It can provide the required funds, technology and, subsequently, the expertise that is lacking in any given economy. The relationship between FDI and Economic Growth has also been established from this regression as a positive one, meaning that if FDI is enhanced by 1%, this actually leads to a 0. 37%5 increase in GDP. However, the problem is that Pakistan has failed to attract adequate FDI due to several factors, such as political instability, security issues, and an unfriendly business environment.

At present, in September 2023, Pakistan is also facing a number of economic problems: high inflation, less economic growth, and a big trade deficit. The economy of the country is largely driven by agriculture, which occupies approximately 20% of the gross domestic product; the services sector occupies nearly 60% of the GDP. No matter how much the manufacturing sector contributes, only 20% of the GDP, the sector is crucial for economic development.

A deliberate macroeconomic phenomenon that impacts economic growth is inflation. High inflation rates can cause a reduction in the purchasing power of consumers, a situation that slows down economic growth. The government has been exercising different policies with a view to combating inflation, but this has not been very successful. In Pakistan, inflation has had a rather random movement in the past

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years, ranging from 3.7% to 19. The total healthcare prevalence has increased to 87% in the past decade.

The exchange rate is another parameter that should be mentioned among macroeconomic factors influencing economic growth. It is the ratio at which the country's currency is equivalent to other currencies. Exchange rates express the value of the domestic currency in terms of foreign currencies. Disappointing export sales can occur if the exchange rate is enormously large, thus slowing economic growth. The government has been trying formulations in a bid to regulate the exchange rate, and while some of these formations have had positive impacts, some have yielded negative impacts. In the last two and a third decades, therefore, Pakistan has gone through some volatility in its exchange rate. The exchange rate volatility continues to be a major determinant of the country's economy, with the rates varying from 60 to 280 PKR/USD.

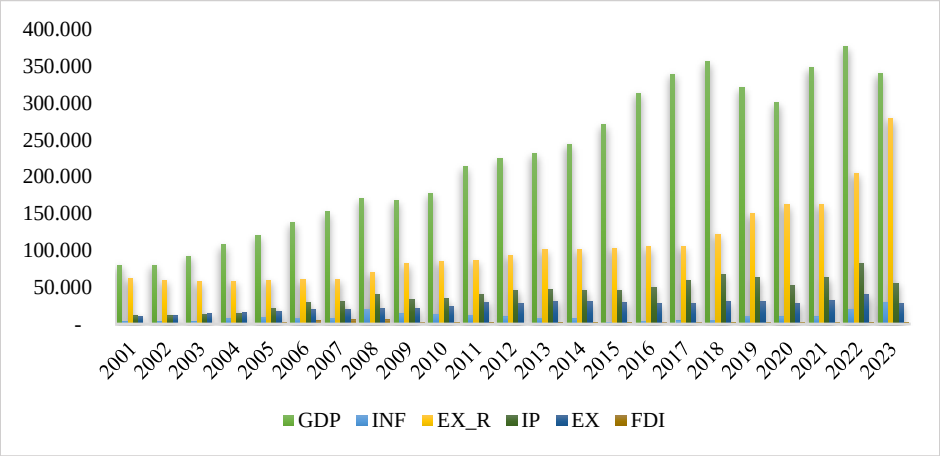
Import and export also count as some other macroeconomic factors that have an impact on economic growth. For some time now, Pakistan has been experiencing a trade deficit, which means that the country is importing more than exporting internationally. This may culminate in the slowing down of economic growth. Other policies that have been in operation by the government include the promotion of exports and discouragement of imports, whereby the effectiveness of such measures has not been so encouraging. Pakistan's exports have remained almost unchanged over the last decade, while imports have been on the rise. It was $14, down by 30 per cent compared with the trade deficit of the previous period. 9 billion. Data from the Pakistan Bureau of Statistics and the Ministry of Commerce indicate that for the first eight months of the current financial year. In March 2024, Pakistan's trade balances were evidenced to be in the negative stand at a figure of 2.2 USD billion and moving up from a negative balance of 1.7 USD billion in the last month I mentioned, expanded trade by 8 per cent during the same month, reaching 340 USD billion.

Pakistan has experienced fluctuations in FDI inflows and its effect on economic development over the past decades. Pakistan faced several political and economic difficulties following its independence in 1947. that affected its ability to attract and benefit from FDI. FDI can take a part in the economic development of a host country like Pakistan. FDI can fill the gap between domestic investment and savings, bring in new technologies and management skills, and generate employment and government revenue through taxes. FDI inflows have generally been declining, with $1.42 billion recorded in 2022, $2.15 billion in 2021, and $2.06 billion in 2020. The United States and the United Kingdom have been the main study cases for FDI in Pakistan, with respective shares fluctuating over the years, ranging from as low as 8.8% for the U.S. and 4.7% for the U.K. to as high as 63.7% and 35.2%, respectively. More recently, China has emerged as the largest investor in Pakistan, particularly in infrastructure projects under the China-Pakistan Economic Corridor (CPEC).

Studies have been conducted on the impact of inflation, exchange rate, import, export, and FDI on growth. These studies have argued that the implications of macroeconomic factors and growth in the middle of these two subjects are not straightforward. Some studies have established the role of trade openness, exchange rates, and Foreign Direct Investment as being determinants with a positive influence on economic growth. Thus, high inflation and trade deficits have negative effects. In

addition, it has revealed a positive and significant relationship between the FDI and the economy and a negative relation between inflation and the economy. Also, the interaction between inflation, exchange rate, FDI, and GDP has been examined as a complex relationship, as specified by the arrows. This outcome underscored the fact that more research was required to raise awareness of the specific function of these macroeconomic factors in Pakistan's economic development.

**Figure 01:** Graph of GDP, Inflation, Exchange rate, Export, Import and FDI.




This brings us to one of the biggest challenges affecting economic growth in Pakistan: inflation, especially in the area of basic foods. High inflation rates decrease real income and put a halt to the flow of investments in the economy. For Pakistan, increased food prices mean problems for government subsidies for the poor population, as well as current account and budget deficits.

It has seen a rise and drop in exchange rate. This has made the price of imported goods rise as well as the exported goods. Research has proposed that an increase in the exchange rate should increase exports and thus the demand for products, which may lead to enhancement of growth.

Since joining WTO as a member country, Pakistan has been running a trade deficit with exports far below import figures. This has implications for the foreign exchange reserves and the current account balance. With regard to exports, they have a positive impact on the generation of foreign exchange earnings and the process of economic development.

FDI is important for Pakistan's growth as it provides capital, technology, and know-how. However, the country has been experiencing difficulties in the attraction of large amounts of investments, FDI in particular, because of political risks and security issues. Its role is viewed in terms of either the growth stimuli with the capability to complement the domestic sector's saving investment, improve global efficiency, or even create employment openings.

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## Problem Statement

Such aspects as inflation and exchange rate, trade and balance of trade and other factors such as FDI create the economic environment of Pakistan. Appreciation of the linkages between these variables and their effects on economic development is highly essential for policymakers, investors and organizations. The about of the employed research topic, which is "The impact of inflation, exchange rate, import, export, foreign direct investment on the economic growth of Pakistan", is to the following effect:

Pakistan's Economic Issues: The country is faced with significant economic problems, such as a high inflation rate, unpredictable exchange rates, trade deficits, and low FDI.

These abnormalities impact the stability and or development of the country as well as its economy. Solving these problems involves an understanding of how price level, foreign exchange rate, import and export and FDI work and how each of these impact the Pakistan economy.

Inflation and Economic Growth: High inflation rates in Pakistan can have detrimental effects on the citizens' purchasing power parade and the economy at large. Inflationary consequences are based on persistent pressure for expenditures and choices made for investments that affect the stability of the economy at large. For one to be in a position to formulate appropriate qualitative monetary policies and methodologies of kindling inflationary pressures, one has to have an adequate appreciation of the relationship between inflation and economic development.

Exchange Rate Volatility: The variation of the exchange rate is very closely associated with trade balance, competitiveness, and the general performance of the Pakistani economy. Examples of fluctuations in non-debt creating failing include exchange rate: Fluctuations in the exchange rates often affect the balance of import and export, thus the current account and foreign exchange reserves. The stability of the exchange rate is a central factor in growth and improving competitiveness in the trade balances.

Trade Imbalances: Thanks to imports, Pakistan has an image of a country with a trade deficit, which hinders its economic growth. It might affect foreign exchange reserves and the current account balance and affect the overall development of the country's economy. To understand the impact of imports and exports on economic development, it is crucial to portray the lack of relation and to find ways how to improve economic growth.

Foreign Direct Investment Challenges: Although FDI has been very useful in the embarkation of economic development, the challenges faced by Pakistan in attracting higher levels of FDI include Political instabilities, Security concerns, and an Unconducive business environment. Hence, there is a need to boost the FDI stock to attract external capital, technology and expertise, which are vital to the expansion and development of the country's economy.

Research Gap and Need for Analysis: Some of the previous studies that look at the relationship between inflation, exchange rate, imports, exports and FDI on economic growth in Pakistan solely the need and thus, this paper seeks to fill this gap by establishing the relationship between all these variables at once. Appreciation of these factors as antecedents of economic development is a way forward in the formulation of integrated policies and strategies towards tackling the burgeoning issues of the economy of Pakistan.

**Research Questions**

1. How do inflation, exchange rates, trade dynamics, and FDI collectively impact the development of Pakistan's economy?

2. What are the interconnections between inflation, exchange rates, imports, exports, FDI, and economic development in Pakistan?

3. How can policies and strategies be identified to promote economic growth within the factors of exchange rates, inflation, imports, exports, and FDI?

**Research Aims and Objectives**

For the Purpose of Evaluating the impact of inflation on the growth of the economy. Explain the ways in which inflation in Pakistan inhibits the advancement of the economy. Examine the relationship between the increase in the GDP and the degree of inflation. Explain the consequences of huge inflation on the economy's steadiness so as to examine how changes in currency rates could boost economic expansion. Examine the effects of change in currency rate to determine its effect on Pakistan's trade balance. Analyze the effect of the oscillating currency rate on imports (source of abroad) and exports (foreign trade). Critic and analyze the impact of imports and exports on economic development. Understand the stability of exchange rates and their role in the process of economic development. How do trade balances impact Pakistan's economic growth? After you've answered the question below, go to the real-time application and use the formula to calculate the contribution of imports and exports to GDP growth. What is the importance of imports and exports? On this page, reflect on the use of exports in earning foreign currency. To determine the importance of FDI in the development of the economy with the help of necessary hypotheses.

DEM predicting the importance of FDI in the Pakistan economy progress. A study is worth undertaking to establish the effects that FDI has on the GDP growth and productivity of a country. Peculiarities of FDI attraction: the case of Pakistan. Analyze the figures to see how these variables have impacted Pakistan's overall growth economy. Compare the effect of inflationary pressures, the Forex rate, imports and exports, and FDI on the process of economic development. Try to define which policies or strategies lead to growth within these factors. Produce some input for the policymakers to improve economic stability and sustainable growth in Pakistan.

Evaluate the impact of trade liberalization on the growth of the economy. Examine the role of trade control in Pakistan's economic growth. Analyze the relationship that exists between trade openness and progress in the stock of GDP. Examine the effect of different currency rates on growth in Gross Domestic Product.

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Research the impact of exchange rate movements on development, the aspects of the exchange rate in the encouragement of export business, and the general performance of the economy. Find out how the balance of payments may be brought to balance in Pakistan. In your view, how can we make sense of such things as inflow and outflow deficits in relation to the stability of a country's economy? The relationship between Economic development on the one hand and inflation on the other hand. Analyze how inflation slows down the advancement of GDP. Examine the behaviour of FDI in the context of economic growth. Examination of the impact of FDI on the economic growth of Pakistan. Analyze the FDI to improve and upgrade productivity and generate employment. Therefore, the relationships between the variables are revealed. Analyze the finest and worst correlations between inflation, currency rate, imports, exports, FDI and economic growth. Examine these factors and changes that occur in the course of time and their relation to economic development. Identifying growth supporter policies inside the Variables. State the policies and strategies that create economic development within the scope of the variability of the currency rate difference, inflation rates, imports, exports and FDI.

**Significance of the Research**

Pakistan is one of the developing nations that has been struggling with a number of economic issues for some time. Pakistan has a large relative exchange rate compared with other currencies, which has a direct impact on the buying power of the population. The interest rate is also high, thus undermining the ability of the business to access loans for investing in big projects. It shows that the currency rate differences in Pakistan are very changeable, which interferes with the country's imports and exports. This is because the country's import bill is high, meaning that a lot of pressure is put on the country's reserves against other currencies. The export sector has also been under pressure from a number of factors, including lack of competitiveness, energy crunch or power cuts and political instability. The FDI stock is also relatively small and thus does not enable the country to fund new projects and promote employment. Last but not least, the unemployment rate prevailing in the country is comparatively high, and this is a major policy concern.

Hence, this research compares chronological inflation, interest, currency rate, import, export, FDI and unemployment rate on the economic growth of Pakistan.

Prior research has also underscored the importance of investigating the impact of these variables on economic development. For instance, in his study, Akinlo (2004) discovered that inflation and interest rates have negative impacts on the development of Nigeria's economy. More publications by Bahmani-Oskooee & Ratha (2004) revealed that the depreciation of the currency rate could enhance the economic growth of developing nations.

In addition, studies have also been carried out in this area, which are focused on Pakistan. For example, Hussain & Malik (2017), working on the theoretical framework of structuralism & institutionalism, pointed out that inflation is detrimental to economic development in Pakistan; conversely, Ali et al. (2018) employing the econometric models noted that export has a positive impact on economic development in Pakistan.

Ultimately, the significance of the research falls in its ability to offer a deeper knowledge of the complicated relationships between key economic factors and their influence on Pakistan's GDP, informing policymaking, enhancing economic resilience, and fostering supportable economic development in the country.

## Theoretical Framework

It includes key study variables such as inflation, exchange rates, trade dynamics, and FDI in relation to economic development in Pakistan. This framework aims to elucidate the interrelationships among these variables and their collective effect on a country's economic growth.

## Conceptual Framework

The theoretical foundation of this research is based on a framework whose concepts include key study variables such as inflation, exchange rates, trade dynamics, and FDI relative to economic development in Pakistan.

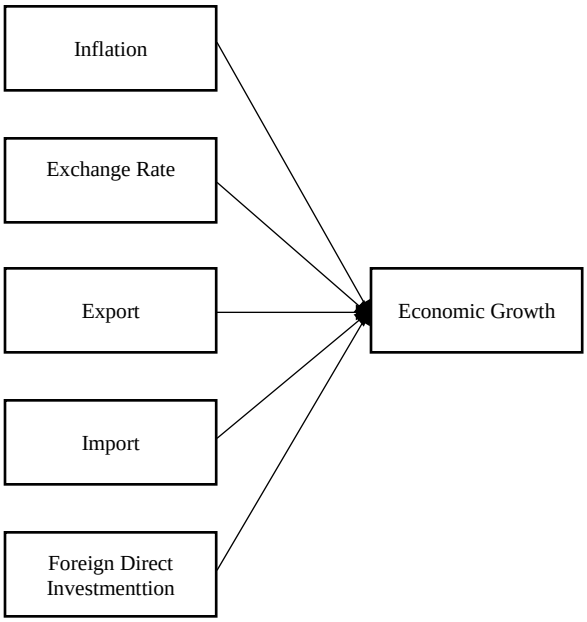



**Figure 02:** Conceptual Framework

## Hypotheses

The hypotheses of the research study are presented below.

**$H_1$:** Economic growth is significantly impacted by inflation.

**$H_2$:** Economic growth is significantly impacted by the exchange rate.

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**$H_3$:** Economic growth is significantly impacted by the import he imports.

**$H_4$:** Economic growth is significantly impacted by the export.

**$H_5$:** Economic growth is significantly impacted by the FDI.

## Literature Review

The goal of the literature report is to offer a comprehensive analysis of the extant research on the impact of interest rates, inflation, exchange rates, import, export, FDI, and unemployment on economic development. The analysis will examine the methodology and actual results of previous studies to identify the key factors that affect economic growth.

Research by Suhana Mohamed, Nurulashikin Romli, and Zuraidah Ahmad (2022) investigated how population, imports, and exports affect Malaysia's economic growth over 62 years. This assignment utilizes secondary information from global development indicators and then analyzes them using the Eviews software, including descriptive, correlation, and various regression analyses. The various regression examinations show that imports and population have a favourable impact on economic development. Otherwise, exports have an unfavourable impact. Pearson correlation coefficient specifies a strong favourable correlation among exports, imports, population, and economic development. The study highlights the significance of the population in influencing the economic development of Malaysia over the last 62 years. The findings suggest Malaysia has a trade deficit due to imports exceeding exports, and the study recommends limiting imports and promoting exports to boost economic development. This research concludes that population is the most significant predictor of economic growth in Malaysia, followed by imports. Exports also play a significant role in economic development. This report suggests that policymakers consider the impact of population and imports when drafting economic policies for the country.

Through the People's Business Credit, Riska Hawang, Rahmatia, and Fatmawati (2021) look at the effects of exchange rates, inflation, and interest rates on economic development in Indonesia. Utilizing data from a time series spanning more than 14 years, route analysis is the method used in this quantitative research technique. The method of gathering data used is library research, which entails gathering information from published books, theses, dissertations, and research journals. People's Business Credit's direct or indirect effects on economic growth are estimated by simultaneous linear regression analysis utilizing the Amos software. The goal is to find out if there is a relationship between variables.

Nevertheless, the results imply that inflation, interest rates, or currency rates do not impact Indonesia's economic development much. The policies put in place, like controlling inflation, interest rates, and the value of the rupiah, have a favourable impact on how People's Business Credit is distributed, which boosts Indonesia's economic growth. Overall, the analysis finds that although exchange rates, interest rates, and inflation have no direct effect on Indonesia's economic growth, their stabilization through policy measures like the distribution of People's Business Credit can have an indirect effect.

The impact of interest rate, exchange rate and European business climate on economic growth in Romania is examined in new research by Mariana Hatmanu, Mihaela Ifrim and Cautisanu Cristina (2020). The study looked at the data regarding the industrial production index, monetary policy interest rate, real exchange rate, and Euro area business climate indicator for 17 years. The data was collected from the websites. Results from the ARDL model show that Monetary policy interest rate, real exchange rate and European business climate affect economic growth. The long-run coefficients can be used to identify causality relationships between variables. The currency e rate has a favourable influence on economic development, while the interest rate has no favourable influence. Economic growth in the Euro area is affected by the business climate. The business climate in the Euro area has mixed effects on economic growth. The results are consistent with economic theory and previous empirical analyses, indicating that interest rate reduction can stimulate economic activity in the short run. Still, attentiveness is needed to avoid inflation and financial instability in the long term. The study also validated the favourable connection between the middle currency rate and economic development in the short period, particularly for developing countries. However, the long-term effects of currency depreciation, such as financial instability and inflation, limit the sustainability of this relationship. The findings highlight the significance of managing the rate of interest and currency rates to sustain economic development in Romania. The interdependence between the internal and external environment is being considered.

Research by Ljupco Davcev, Nikolas HThe study Vouliades & Jasmin Komic (2018) examines the effect of rate of interest and inflation on economic progress in FYROM, Bulgaria, and Romania by using a theoretical framework and quantitative analysis. The data was gathered for 14 years from the state office in three countries, FYROM, Bulgaria, and Romania, as well as from the central banks of the countries. They used cointegration analysis and Granger causality analysis to analyze the relationships in the middle of interest, Inflation, and GDP. The analysis reveals that there is no unit root for Inflation in Romania and FYROM, indicating the data series are stationary. In FYROM, No Bi-directional Granger causality between variables, but there is Unidirectional causality among GDP and interest rates and inflation and interests. Correlation matrices for three countries suggest that interest and inflation affect GDP, with specific causal relationships identified between them. Interest rates and Inflation in Bulgaria have a marginally non-favourable relationship with GDP, while in Romania, the negative correlation is significantly larger. The correlation between inflation and rate of interest in Romania is almost perfect, indicating a monetary policy closely following price level changes. In FYROM, there is a weak correlation between inflation and GDP, and interest rates have a non-favourable correlation with GDP. The variables in Bulgaria seem to be cointegrated, suggesting a long-term relationship among them. Otherwise, no cointegrating is found between the rate of interest and GDP in Romania and FYROM.

Another research study by Amalendu Bhunia (2016) examines the connection between inflation, interest, and economic development in India using yearly time series data spanning 1992–2015. The data was analyzed by the study using correlation, cointegration tests, ADF and P.P. unit root tests, vector error correction model, and Granger causality test. It can be shown from the results of the ADF and P.P. unit root tests that the macroeconomic variables were stationary at the first difference but not at

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the level. In India, there is a long-term causal relationship between inflation interest rates and economic growth. Indicating that changes in economic development can influence inflation and interest rates. The findings suggest the same directional causality between economic development and interest rates, indicating economic development has a favourable effect on interest. Empirical results highlight the importance of maintaining low inflation and favourable interest to promote economic development in the country. The study emphasizes the role of the State Bank of India in controlling inflation and keeping interest rates unaffected to support economic growth. The correlation shows that economic development is undesirably linked with the rate of interest, and inflation, representing higher economic development, is associated with lower interest and inflation.

Another research study on the effect of imports and exports on economic growth was conducted by Mitra Lal Devkota (2019) using time series data from India. The seasonally adjusted quarterly time series data for India from Q2 of 1996 to 2019 are used in the analysis. Q2 employs the vector error correction model, the augmented Dickey-Fuller, the Philips-Perron unit root, and Johansen's cointegration test. The study concludes that while the time series variables for India's economic growth, imports, and exports are stationary at first differences, they are non-stationary at levels. The Johansen cointegration test supports the existence of a long-run equilibrium relationship between export, import, and economic growth in India. The Vector Error Correction Model's (VECM) output shows a unidirectional causal connection between economic development and imports, suggesting that an increase in the nation's income leads to increased spending, including on imports. The empirical findings reject the ELG (Export-Led Growth), GLE (Growth-Led Export), and ILG (Import-Led Growth) hypotheses for India. The study admits that the results should be viewed with caution due to the limitations of the causality tests employed and the use of a shorter period of 24 years of quarterly data. The paper highlights the importance of considering another variable that might impact economic development and growth and the need for longer periods for cointegration tests.

The existing literature provides a foundation for understanding the role of these macroeconomic factors in shaping Pakistan's economic growth. By conducting a thorough examination, the goal of this study is to advance knowledge of how these factors collectively influence economic growth in Pakistan. The results of the study can potentially provide insightful information to stakeholders and policymakers to help them create economic policies that would support Pakistan's sustainable and healthy economic growth.

## Research Methodology

This study is based on a quantitative research design, specifically path analysis with time series secondary data collected annually from (2001 – 2023) to study relation among the exchange rate, inflation, interest, export, import and foreign direct investment towards economic development in Pakistan, the data has collected from World Development Indicators (Databank) and Macrotrends.net. The data studied in this research are detailed in Table 4.1. The collected data are analyzed using Eviews software, including descriptive statistics, Granger Causality test, enhanced Dickey-Fuller unit root test and Least Square (NLS and ARMA) Method test.

## Descriptive Statistics

Descriptive statistics provides a quantitative description of a data collection. (Table 1), focusing on its main features and characteristics. These statistics include computation of variance, skewness, kurtosis, variance, median, range, and standard deviation.

## Unit Root Test

Determining whether time series data is stationary is the main goal of a unit root test. It aids in examining the possibility of a unit root, a sign of non-stationarity in a variable. The series is assumed to be stationary if the unit root test rejects the null hypothesis that there is a unit root. It indicates that the series is non-stationary and shows a trend if the null hypothesis is accepted.

## Granger Causality Test

A one-time series' suitability for forecasting another is established using the Granger Causality test. It looks at the direction in which the two variables are going. In a Granger Causality test, the null hypothesis is that the first variable does not Granger cause the second variable.

## Least Square (NLS and ARMA)

The Least Squares (NLS and ARMA) methods are used for estimating non-linear regression models, including those with autoregressive and moving average (ARMA) components.

## Measurement of Study Variables

| Variables | Particulars | Proxy | Description |
|---|---|---|---|
| Dependent Variable | Economic Growth | GDP | Economic growth (GDP) is measured as the finished goods and services provided within a specific time by a country in percentage change of billions of US$. |
| Independent Variable | Inflation | INF | Inflation (INF), inflation refers to an increase in the general level of prices for goods and services over time. The purchasing power of money decreases as time passes. |
| Independent Variable | Exchange Rate | EX_R | The exchange rate (EX_R) is measured as the rate at which one currency can be exchanged for another. |
| Independent Variable | Export | EX | Exports (EX) are measured as finished goods and services provided by country one country and received by another country in billions of U.S. $. |
| Independent Variable | Import | I.P. | Imports (I.P.) are measured as goods and services bought by a country from another country in billions of US$. |
| Independent Variable | Foreign Direct Investment | FDI | Foreign Investment (FDI) is measured as when a business entity, any individual, or government bodies invest in assets or any business entities of another country in billions of US$. |

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**The equation Model for This Research Is as Follows:**

Economic Development (GDP) = β0 + β1 * Inflation (INF) + β2 * Exchange Rate (EXR) + β3 * Import (IP) + β4 * Export (EX) + β5 * Foreign Direct Investment (FDI) + ε

Described below:

- β0 refers to intercept.
- Here β (1,2,3,4,5) are used as the numbers of the independent factors (which indicate direction and magnitude)
- ε term refers to an error (captures the impact of all further factors that disturb economic progress but are not included in the model)

**Results Analysis and Discussions**

The study presents the graphical movements for the variables over the past 23 years. After that, the study covers the group statistics of variables and unit tests as well as the Augmented Dickey-Fuller (ADF) test's execution and analysis. Then, the Granger Causality test is used to observe the interaction among variables, and the study analyzes the Least Square (NLS and ARMA) Method.

**Groups Statistics**

**Table 01: Group Statistics**

| Variable | GDP | INF | EX_R | EX | IP | FDI |
|---|---|---|---|---|---|---|
| Mean | 224.52 | 9.53 | 105.74 | 24.49 | 41.49 | 2.08 |
| Median | 224.38 | 7.92 | 93.40 | 27.82 | 45.59 | 1.89 |
| Maximum | 376.53 | 29.20 | 279.53 | 39.42 | 82.28 | 5.59 |
| Minimum | 79.48 | 2.53 | 57.75 | 10.60 | 11.07 | 0.38 |
| Std. Dev. | 98.48 | 6.47 | 54.90 | 7.40 | 19.26 | 1.36 |
| Skewness | 0.01 | 1.46 | 1.66 | -0.33 | 0.03 | 1.43 |
| Kurtosis | 1.62 | 5.03 | 5.58 | 2.42 | 2.36 | 4.50 |
| Jarque-Bera | 1.81 | 12.10 | 16.98 | 0.74 | 0.40 | 9.98 |
| Probability | 0.40 | 0.00 | 0.00 | 0.69 | 0.82 | 0.01 |
| Sum | 5163.85 | 219.08 | 2431.96 | 563.18 | 954.19 | 47.81 |
| Sum Sq. Dev. | 213368.40 | 919.91 | 66313.94 | 1203.71 | 8163.23 | 40.63 |
| Observations | 23.00 | 23.00 | 23.00 | 23.00 | 23.00 | 23.00 |

**Unit Root Tests**

The study determines if a time series variable is non-stationary by using unit root tests. When the mean, variance, and autocorrelation of a time series remain constant over an extended period, it is said to be stationary. A unit root indicates that the series is non-stationary. The unit root null hypothesis is rejected if the probability

is less than 5%. This suggests the absence of a unit root and the stationary nature of the series. The null hypothesis, which implies that the series is non-stationary and shows a trend, is not rejected if the likelihood is greater than 5%.

| **Matrix 02A: GDP Unit Root: At level** | | | |
|---|---|---|---|
| Null Hypoth: GDP has the root of unit | | | |
| Exoge: Constant | | | |
| Length of Lag: 2 (Autom - SIC, maximumlag=4) | | | |
| | | **T-Stats** | **Probability** |
| Statistic = Augmented Dickey-Fuller | | (3.11) | 0.04 |
| Critical results: | level-1% | (3.81) | |
| | level-5% | (3.02) | |
| | level-10% | (2.65) | |

Based on the test results, the probability indicates that the hypothesis is rejected. The series is stationary and contains no unit root.

| **Matrix 02B: Root test GDP: First, Differ** | | | |
|---|---|---|---|
| Null Hypoth: D(GDP) has the root of the unit | | | |
| Exoge: Const | | | |
| Length of Lag: 1 (Autom - SIC, maximumlag=4) | | | |
| | | T-Stats | Probability |
| Statistic = Augmented Dickey-Fuller | | (3.58) | 0.02 |
| Critical results: | level-1% | (3.81) | |
| | level-5% | (3.02) | |
| | level-10% | (2.65) | |

Results obtained from the test conclude that the probability rejected the hypothesis. The result has a unit root so that the series is stationary.

| **Matrix 03A: Root test Inflation: Level** | | | |
|---|---|---|---|
| Null Hypoth: INF has the root of the unit | | | |
| Exoge: Const | | | |
| Length of Lag: 0 (Automatic – SIC, maximumlag=4) | | | |
| | | T-Stats | Probability |
| Statistic = Augmented Dickey-Fuller | | (0.45) | 0.88 |
| Critical results: | level-1% | (3.77) | |
| | level-5% | (3.00) | |
| | level-10% | (2.64) | |

As per the test results, the probability specifies that the hypothesis is not rejected. The series is un-stationary and contains a unit root.

| **Matrix 03A: Root test Inflation: First, Differ** |
|---|

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| | | | |
|---|---|---|---|
| Null Hypoth: D(INF) has the root of the unit | | | |
| Exoge: Const | | | |
| Leg Length: 0 (Autom - SIC, maximumlag=4) | | | |
| | | T-Stats | Probability |
| Statistic = Augmented Dickey-Fuller | | (4.01) | 0.01 |
| Critical results: | level-1% | (3.79) | |
| | level-5% | (3.01) | |
| | level-10% | (2.65) | |

The results of the test explain that the probability refers to the hypothesis being rejected. The series is stationary and contains no unit root.

| **Matrix 04A: Unit root of Exchange Rate: Level** | | | |
|---|---|---|---|
| Null Hypoth: EX_R has the root of the unit | | | |
| Exoge: Const | | | |
| Length of Lag: 3 (Autom - SIC, maximumlag=4) | | | |
| | | T-Stats | Probability |
| Statistic = Augmented Dickey-Fuller | | 0.90 | 0.99 |
| Critical results: | level-1% | (3.83) | |
| | level-5% | (3.03) | |
| | level-10% | (2.66) | |

From the results, probability shows that the hypothesis is not rejected. The result gains unit root so that the series is non-stationary.

| **Matrix 04B: Root test Exchange Rate: First difference** | | | |
|---|---|---|---|
| Null Hypoth: D(EX_R) has root of unit | | | |
| Exoge: Const | | | |
| Length of Lag: 2 (Autom - SIC, maximumlag=4) | | | |
| | | T-Stats | Probability |
| Statistic = Augmented Dickey-Fuller | | (0.90) | 0.77 |
| Critical results: | level-1% | (3.83) | |
| | level-5% | (3.03) | |
| | level-10% | (2.66) | |

The study may observe that the unit root is present. The data sets are non-stationary since the investigation does not reject the Null hypothesis.

| **Matrix 05A: The unit root of Export: Level** | | | |
|---|---|---|---|
| Null Hypoth: EX has the root of the unit | | | |
| Exoge: Const | | | |
| Length of Lag: 2 (Autom - SIC, maximumlag=4) | | | |
| | | T-Stats | Probability |
| Statistic = Augmented Dickey-Fuller | | (2.10) | 0.25 |
| Critical results: | level-1% | (3.81) | |
| | level-5% | (3.02) | |
| | level-10% | (2.65) | |

Observation from the results says that the unit root exists. The data sets are non-stationary, so we can conclude the investigation does not reject the Null hypothesis.

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| **Matrix 05B: Root test Export: First, Differ** | | | |
|---|---|---|---|
| Null Hypoth: D(EX) has the root of the unit | | | |
| Exoge: Const | | | |
| Length of Lag: 1 (Autom - SIC, maximumlag=4) | | | |
| | | T-Stats | Probability |
| Statistic = Augmented Dickey-Fuller | | (4.86) | 0.00 |
| Critical results: | level-1% | (3.81) | |
| | level-5% | (3.02) | |
| | level-10% | (2.65) | |

The study determines if the data series are stationary by rejecting the Null Hypo, as evidenced by the probability. The unit root does not exist.

| **Matrix 06A: Root test Import: Level** | | | |
|---|---|---|---|
| Null Hypoth: I.P. has the root of the unit | | | |
| Exoge: Const | | | |
| Length of Lag: 2 (Autom - SIC, maximumlag=4) | | | |
| | | T-Stats | Probability |
| Statistic = Augmented Dickey-Fuller | | (1.43) | 0.55 |
| Critical results: | level-1% | (3.81) | |
| | level-5% | (3.02) | |
| | level-10% | (2.65) | |

We can see from the observation that the unit root exists. The data sets are non-stationary since the investigation does not reject the Null hypothesis.

| **Matrix 06B: Root test Import: First, Differ** | | | |
|---|---|---|---|
| Null Hypoth: D(I.P.) has the root of the unit | | | |
| Exoge: Const | | | |
| Length of Lag: 1 (Autom - SIC, maximumlag=4) | | | |
| | | T-Stats | Probability |
| Statistic = Augmented Dickey-Fuller | | (6.64) | - |
| Critical results: | level-1% | (3.81) | |
| | level-5% | (3.02) | |
| | level-10% | (2.65) | |

From the running of test results, the probability shows the hypothesis is not accepted. So, the unit root does not exist. We can say the existence of stationary series.

| Matrix 07A: Root test of FDI: Level | | | |
|---|---|---|---|
| Null Hypoth: FDI has the root of the unit | | | |
| Exoge: Const | | | |
| Length of Lag: 1 (Autom - SIC, maximumlag=4) | | | |
| | | T-Stats | Probability |
| Statistic = Augmented Dickey-Fuller | | (2.80) | 0.08 |
| Critical results: | level-1% | (3.79) | |
| | level-5% | (3.01) | |
| | level-10% | (2.65) | |

Running the test, observe that the result exists unit root. The data sets are non-stationary since the investigation does not reject the Null hypothesis.

| Matrix 07B: Root test FDI: First, Differ | | | |
|---|---|---|---|
| Null Hypoth: D(FDI) has the root of unit | | | |
| Exoge: Const | | | |
| Length of Lag: 0 (Autom - SIC, maximumlag=4) | | | |
| | | T-Stats | Probability |
| Statistic = Augmented Dickey-Fuller | | (3.24) | 0.03 |
| Critical results: | level-1% | (3.79) | |
| | level-5% | (3.01) | |
| | level-10% | (2.65) | |

As per our test results, the probability rejected the considered hypothesis in the test. So, we can conclude that the unit root does not exist in the results, and the series is stationary.

## Granger Causality

The Granger Causality test was employed in the study to ascertain the causal relationship among the variables. In a Granger Causality, the Null Hypoth states that there is no Granger cause between the first variable (X) and the second variable (Y). Assume that the Granger Causality test's p-value is smaller than the selected significance level of 5%. That means that the first variable (X) does Granger cause the second variable (Y), rejecting the Null Hypoth. Assume that the p-value exceeds the level of significance. In that instance, there is no proof that the first variable (X) Granger causes the second variable (Y), so the Null hypothesis is not rejected.

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| **Matrix 08: Granger Caus. Test** | | | |
|---|---|---|---|
| Results of Granger Causality: | | | |
| Date on:08/02/24 Timeframe: 21:35 | | | |
| Sample: 2001 2023 | | | |
| Lags: 2 | | | |
| Hypoth Null: | Observation | F-Stat | Probability |
| GDP is not granger cause by the Inflation | 21 | 4.338 | 0.031 |
| Inflation is not greater caused by the GDP | | 0.794 | 0.469 |
| GDP is not greater caused by the EX_R | 21 | 13.517 | 0.000 |
| EX_R is not Granger caused by the GDP | | 5.067 | 0.019 |
| GDP is not Granger caused by the EX | 21 | 1.896 | 0.182 |
| EX is not Granger cause the GDP | | 1.199 | 0.327 |
| GDP is not a granger caused by the I.P. | 21 | 8.471 | 0.003 |
| IP is not granger cause by the GDP | | 10.799 | 0.001 |
| GDP is not granger cause by the FDI | 21 | 0.501 | 0.614 |
| FDI is not granger cause by the GDP | | 0.169 | 0.845 |

The Granger causality study indicates a unidirectional causal relationship between GDP FDI and Inflation. In the meantime, there is a bi-directional causal relationship between GDP and currency rate difference. as well as between imports and GDP. However, no significant causal relationships were found between the other variables.

## Least Square (NLS and ARMA) Method

| **Table 09: L.S. Method** | | | | |
|---|---|---|---|---|
| Dependent Variable: GDP | | Included observations: 23 | | |
| Method: Least Squares | | Sample: 2001 2023 | | |
| Variable | Coeff. | Error of standard | T-Stats | Probability |
| C | 2.014 | 0.640 | 3.148 | 0.006 |
| Inflation | (0.014) | 0.005 | (2.550) | 0.021 |
| EX_R | 0.512 | 0.158 | 3.240 | 0.005 |
| EX | 0.028 | 0.010 | 2.700 | 0.015 |
| IP | 0.006 | 0.005 | 1.186 | 0.252 |
| FDI | 0.064 | 0.024 | 2.657 | 0.017 |
| R-square | 0.960 | Dependent mean variable | | 5.304 |
| R-square Adjusted | 0.949 | S.D. variable dependent | | 0.504 |
| S.E - Regression | 0.114 | Akaike criterion | | (1.281) |
| Sum of squared resid | 0.222 | Schwarz criterion | | (0.985) |
| Log-likelihood | 20.729 | Hannan-Quinn criteria. | | (1.206) |
| F-stat | 82.261 | Durbin-Watson | | 1.366 |

| | | | | |
|---|---|---|---|---|
| Probability (F-stat) | - | | | |

The study results obtained through the Least Square (NLS and ARMA) method indicate that the rate of inflation has a significant non-favorable effect on Pakistan's economic development. The findings of the study by Ljupco Davcev Nikolas, Vouliades, and Jasmin Komic (2018), which looks at how interest rates and inflation affect GDP in FYROM, Bulgaria, and Romania, are in line with these findings. The outcome demonstrates that the rate of inflation significantly hampers economic growth. Amalendu Bhunia (2016) conducted a second study to investigate the connection between interest, inflation, and economic progress in India. The findings indicate that inflation has a major detrimental effect on economic growth. Another study by Xiuyun and Nouman Shafiq (2020) looks at the effects of trade openness and money supply, and the result shows that inflation has a significant non-favourable effect on economic development.

The study indicates that the currency rate has a significant favourable effect on Pakistan's economic development. These outcomes are reliable with the results given in the details in the research by Mariana Hatmanu, Cautisanu Cristina & Ifrim Mihaela (2020), which looks at how Romania's economic growth is affected by the real exchange rate, business climate in the Euro region, and interest rate policy in the monetary policy, the outcome demonstrates that the exchange rate significantly boosts economic developments.

The outcomes of the study tell us that exports have a significant favourable effect on Pakistan's economic growth. The outcome of the research is reliable, as shown by the results described in the research by Alfred Leonard, Tanti Novianti, and Sri Mulatsih (2021). Examine of the impact of investment and export on Indonesian economic development demonstrates that exports have a substantial favourable effect on economic development.

Study results show that foreign investment has a significant favourable effect on Pakistan's economic development. These outcomes are reliable, as are the results defined in the research by Panagiotis Pegkas (2015), which examines the effect of foreign investment on economic development in Eurozone countries. The outcome shows FDI has a favourable effect on economic development. Another research study by Xiuyun and Nouman Shafiq (2020) investigates the influence of FDI, capital creation, money supply, inflation, and trade openness on the economic development of Asian countries. The results report that inward investment exerts a considerable impact on economic growth.

## Conclusion

Consequently, the economic study conducted by the current authors expresses that assessments have been made about complicated macroeconomic variables of Pakistan, the variables that, in turn, had the most inertia in growth.

Result obtained from least square (NLS and ARMA) method The study can conclude inflation has a significant unfavourable effect on the economic development of Pakistan. In contrast, the exchange rate, exports, and FDI have a significant

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favourable effect on Pakistan's economic development. The rate of inflation has a significant unfavourable effect on economic development, suggesting that a high rate of inflation can lead to a decrease in customer purchasing power and hinder GDP progress. The currency rate difference has a favourable effect on Pakistan's economic development, suggesting that a favourable currency exchange can increase exports, appeal to foreign investment, and improve competitiveness in international markets, thereby contributing positively to GDP growth. The exports have a significant positive effect on economic development in Pakistan, suggesting increased export activities lead to higher foreign exchange earnings, job creation, and enhanced productivity in domestic industries, all of which contribute to economic development expansion. Foreign investment has a significant favourable effect on Pakistan's economic development, suggesting foreign investment acquires capital, technology, expertise, and market access, stimulating economic development, creating employment opportunities, and fostering innovation, thus positively impacting GDP development.

Results obtained from the Granger test analysis reveal a unidirectional causal relationship between the rate of inflation, FDI, and GDP. Meanwhile, a bi-directional causal relation exists between the currency exchange rate and GDP, as well as between imports and GDP. However, no significant causal relationships were found between the other variables. Unidirectional causality from inflation rate to GDP suggests changes in inflation might result in a change in GDP, but not vice versa. In Pakistan, high inflation can erode purchasing power and disc. The study age investment, potentially slowing economic growth (GDP). However, economic growth itself might not directly influence inflation in the short term. Unidirectional causality from foreign direct investment to GDP suggests that Pakistan's economic growth may be enhanced by foreign direct investment (FDI) inflows. GDP. Foreign investment can acquire new capital, technology, and proficiency, which faster productivity and economic activity. Bidirectional causality exchange rate and GDP suggest a more complex relationship. A weaker Pakistani Rupee (depreciation) can make exports cheaper and imports more expensive. This could stimulate exports and potentially lead to higher GDP. However, a weaker Rupee can also lead to inflation by making imports more expensive.

Conversely, strong economic growth (higher GDP) might attract foreign investment and increase demand for the Rupee, leading to appreciation. Bidirectional causality between imports and GDP suggests a two-way relationship. Higher GDP might enhance demand for imports as customers and businesses acquire more money to spend. Conversely, imports can be a study of investment goods and raw materials, which can contribute to economic growth (GDP). No significant causality between other variables was included in the study. This doesn't necessarily mean there's no connection, but it might indicate a weaker or more complex relationship that Granger causality couldn't detect.

The findings from the study highlight the importance of the rate of inflation to avoid non-favourable repercussions on economic growth in Pakistan. Moreover, leveraging a favourable exchange rate, promoting exports, and attracting foreign direct investment are vital strategies for promoting supportable economic development and development in the country. Policymakers can use these insights to formulate effective policies aimed at enhancing macroeconomic stability and promoting long-term prosperity in Pakistan.

## Limitations of The Study

- The research concentrates on the data from 2001 to 2023, which may not accurately represent the long-term trends or cyclical patterns that could affect the relationships between the variables.
- Due to the complexity of the economic system, there may be additional variables or interactions among the studied factors that were not considered in the analysis.
- The study does not explore the potential differences in the impact of these macroeconomic factors on various divisions of economies, which might provide valuable perceptions of economies for policy interventions.
- The findings of the research are based on statistical analyses and may not fully capture qualitative aspects or behavioural factors that could also play a role in shaping economic growth.
- This content generalizability could be limited to the specific framework of Pakistan and may not be explicitly applicable to other countries or regions with diverse economic structures and challenges.

## Recommendation

Analysis conducted in the report regarding the influence of several macro-economic variables on the economic growth of Pakistan, the following recommendations can be made:

**Inflation Management:** Given the significant unfavourable effect of inflation on economic development, policymakers in Pakistan must focus on managing inflation rates effectively. Implementing measures to control inflation can help maintain consumer purchasing power and support GDP growth.

**Exchange Rate Policies:** Leveraging a favourable exchange rate Contributes significantly to boosting exports, increasing foreign direct investment, and enhancing competitiveness in international markets. Policymakers should consider strategies to maintain a competitive exchange rate to support economic growth.

**Export Promotion:** Promoting exports is essential for driving economic growth in Pakistan. Increasing export activities can lead to higher foreign exchange earnings, job creation, and improved productivity in domestic industries. The study of ageing export-oriented policies can contribute significantly to GDP expansion.

**Foreign Direct Investment (FDI) Attraction:** Fostering an environment conducive to foreign investment is important for stimulating economic growth in Pakistan. Foreign investment acquires capital, expertise, technology and market access that can drive innovation, create employment opportunities, and positively impact GDP growth.

**Policy Formulation:** Policymakers should utilize the insights from the study to formulate effective policies aimed at enhancing macroeconomic stability and

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promoting long-term prosperity in Pakistan. By aligning policies with the findings on inflation, exchange rates, exports, and FDI, Pakistan can work towards sustainable economic growth and development. By implementing these recommendations and aligning policies with the insights derived from the study, Pakistan can strengthen its economic foundations, attract investments, boost exports, and ensure sustainable growth for the future.

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