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ANALYZING THE NEXUS BETWEEN FOREIGN DIRECT INVESTMENT AND INDUSTRIAL PRODUCTION INDEX: THEIR IMPACT ON PAKISTAN'S GDP

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ABSTRACT

This study investigates the dynamic relationship between Net Foreign Direct Investment (NFDI), the Industrial Production Index (IPI), and Pakistan's Gross Domestic Product (GDP), with an emphasis on determining both short-term and long-term linkages among these variables. The research utilizes annual time series data spanning from 2010 to 2022, analyzed using EViews 9.0. To achieve robust results, the study employs several econometric techniques, including the Johansen Co-integration test, the F-Bound test, the Augmented Dickey-Fuller (ADF) test, and the Auto-Regressive Distributed Lag (ARDL) model. The findings reveal that all variables are stationary at first differences with intercepts. The Johansen Co-integration test confirms the existence of a long-term equilibrium relationship between NFDI, IPI, and GDP. Additionally, both the F-Bound and ARDL tests further corroborate the long-run dynamics among the variables. The results suggest that while NFDI positively influences Pakistan's GDP, IPI has a negative impact. These findings contribute valuable insights into the role of foreign investment and industrial production in shaping Pakistan's economic performance, offering implications for policymakers aiming to foster sustainable economic growth.

Keywords: *Net Foreign Direct Investment, Industrial Production Index, Gross Domestic Product, Pakistan, Co-integration, ARDL, Economic Growth.*

INTRODUCTION

The Industrial Production Index (IPI) is a vital economic indicator that offers insights into an economy's manufacturing, mining, utility, and other industrial sectors (Adnan Khurshid, Khalid khan , 2020). Primarily, it measures the output in these sectors, serving as a barometer of industrial activity and economic health (Mughal, M.Y. and Anwer, A.I, 2012). This research delves into the nuances of the IPI, its calculation, significance, and its impact on various aspects of the economy, including stock markets (Alfaro, L., Chandra, A., Kalemli-Ozcan, S., & Sayek, S., 2004).

National statistical agencies, like the Federal Reserve in the United States, calculate the IPI. The index is typically normalized to a base year, allowing for easy comparison over time. The components of the IPI vary by country, reflecting the unique industrial composition of each

economy. It generally encompasses manufacturing, mining, electric, and gas utilities and sometimes includes other sectors like water supply and waste management (Board of Governors of the Federal Reserve System, 2020).

The IPI is a leading indicator of economic performance. A rise in the index suggests an expanding industrial sector, often correlating with increased employment, higher consumer spending, and overall economic growth. Conversely, a decline can indicate a contracting industrial sector, potentially signalling economic downturns (Bernanke, 1983).

The relationship between the IPI and stock market returns is substantial. Chen, Roll, and Ross (1986) noted that industrial production is a significant risk factor affecting stock returns. The stock market tends to react positively to higher-than-expected industrial production figures, reflecting investor optimism about economic growth and corporate profitability. On the other hand, lower IPI readings can lead to bearish market sentiments (Chen et al., 1986). The IPI measures the industrial sector's output, including manufacturing, mining, and utilities. A higher IPI indicates increased industrial activity, signaling economic growth, which can lead to positive investor sentiment and increased stock prices. Conversely, a decline in the IPI can signal an economic slowdown, potentially leading to reduced earnings for companies and lower stock prices (Ahmed, J., 2012). Central banks extensively use the IPI in shaping monetary policy. A growing IPI may prompt a tightening of monetary policy to control inflation, while a shrinking IPI could lead to easing policies to stimulate the economy (Mishkin, 2007).

In a global context, the IPI is crucial for international economic analysis. Multinational corporations and investors monitor countries' IPIs to make informed decisions about investments, production adjustments, and market expansions (Krugman, 1994). Despite its importance, the IPI has limitations. It predominantly focuses on the industrial sector and does not account for the services sector, which forms a significant part of many modern economies. Additionally, changes in technology and production processes can affect the relevance and accuracy of the index over time (Blinder, 1993).

Recent trends in the IPI have been influenced significantly by global events like the COVID-19 pandemic. The pandemic led to a sharp decline in industrial production across many countries, reflecting disruptions in supply chains and decreased demand. However, post-pandemic recovery patterns in the IPI indicate economic resilience and the adaptability of industrial sectors (IMF, 2021). Hence, the Industrial Production Index remains a critical tool for economic analysis, offering valuable insights into the health and direction of the industrial sector. While it has limitations, its utility in economic forecasting, policy-making, and investment decisions must be balanced. As economies continue to evolve, so too will the role and interpretation of the IPI, making it an essential component of economic analysis for the foreseeable future.

The impact of the Industrial Production Index (IPI) on stock returns is a well-studied area in financial economics. The Industrial Production Index is considered a leading indicator of a country's economic health, and changes in the IPI can significantly influence stock market returns.

The federal and provincial governments are the most resource-strapped at this time. They are the ones who are in desperate need of them. Pakistan's economy has long been plagued by systemic issues, and despite assurances from successive governments in power, many of them remain unsolved, the most notable of which is the country's low tax-to-GDP ratio.

Tax collection in Pakistan has decreased, and the Federal Board of Revenue is issuing tax refunds. Supplemental grants are used to boost revenue collection. According to independent economists, the government is stifling its inefficiencies by blaming the pandemic for everything that goes wrong. Increasing the tax base is a powerful political problem caused by the need for revenues, and it is a demand made by the IMF as one of its loan conditions regularly. As a result, every year's budget includes going.

Governments set unreasonable tax collection goals; in this year's budget, the government wants to collect 27% more revenue than it did the previous fiscal year, despite a pandemic and a declining economy. Provinces plan their budgets based on expected tax revenue that never

materializes, forcing them to cut development spending to make up the difference. Nonetheless, the same principles apply to governments.

In FY2020, Pakistan's real GDP growth slowed by 0.4%. The lockdown began in the second part of March 2020 and was lifted two months later. As a result, the COVID-19 issue wreaked the most havoc in the fourth quarter of this fiscal year.

COVID-19's influence on the real sector of the economy has been assessed by the National Coordination Committee (NCC) Subcommittee.

Exports and imports fell by about 55% and 35%, respectively, year over year in April 2020. While the drop in exports is primarily due to a drop in external demand as well as poor domestic manufacturing activity, the drop in imports is most likely due to a drop in retail and wholesale commerce. Similarly, tax receipts and sales of vehicles, cement, and petroleum products have significantly reduced.

Products also point to a generalized economic downturn. While the impact of the Industrial production index was felt across the board regarding GDP sectoral split, the industrial and services sectors were the worst impacted. The table is given below:

Table-1: Sector-wise GDP growth rate 2019-18 (Before and After)

Items	Unit	Prov.2018-19	Before	After
			2019-2018	2019-2018
			Proj.	Prov. Actual
Real Section				
Real GDP Growth	%	1.9	3.3	-0.4
Agriculture	%	0.6	3.0	2.7
Major Crop	%	-7.7	2.8	2.9
Live Stock	%	3.8	3.2	2.6
Industrial sector		-2.3	0.7	-2.6
Manufacturing	%	-0.7	0.5	-5.6
LSM	%	-2.6	-1.3	-7.8
Services	%	3.8	4.2	-0.6
Wholesale &Trade	%	1.1	3.2	-3.4
Financial Business	%	5.0	4.7	0.8
Inflation (GDP deflector	%	8.4	11.8	9.1
Nominal GDP Growth	%	10.5	15.4	8.6
Investment	-	15.6	15.6	15.4
Fixed investment	-	14.0	14.0	13.8
Public investment	-	3.7	3.8	3.8
Private investment	-	10.3	10.2	10.0
Nominal Saving	-	10.8	13.4	13.9
Domestic saving	-	4.1	6.4	6.8
Foreign Saving	-	4.8	2.2	1.5

Source: State bank of Pakistan

Although there have been no severe disruptions to the agriculture sector, there are still concerns owing to restricted labor mobility for wheat harvesting in Punjab and partial barriers to wheat procurement, storage, and distribution

When faced with industrial closures and the evident unwillingness of banks to issue loans,

private investment is anticipated to plummet in the next months due to potential investors' weakened liquidity and heightened risk perceptions. According to UNCTAD research, the COVID-19 epidemic might result in a 30-40% decrease in global foreign direct investment (FDI) flows in 2020 and 2021. Due to the economic recession, a significant portion of FDI, namely the reinvested earnings, would be lost.

The slowdown and lockdown of the economy in the aftermath of the COVID-19 epidemic has had a significant impact on FBR tax collecting operations. From July through February of FY2020, tax collection grew at a pace of almost 17%. During March following the start of the COVID-19 pandemic, the average negative growth rate was 13.4%. In comparison to the previous year, in 2020 and April 2020. During FY2020, FBR tax collection is anticipated to stay around Rs 3.9 trillion, compared to a target of Rs 4.8 trillion.

Due to a combination of income shortfalls, reprioritization of expenditures, and an increase in public spending as a result of the fiscal stimulus package, the budget deficit is anticipated to surpass the objective of 7.5 percent of GDP and may reach 9.4 percent of GDP.

Pakistan is anticipated to confront more problems in the upcoming fiscal year, which begins in July 2020, following its first contractionary year since 1952 due to the COVID issue. Under normal conditions, Pakistan would have reaped the advantages of the past year's macroeconomic stability and launched on a higher growth path of above 3%, Despite efforts to contain the epidemic, COVID-19's widespread and long-lasting impacts offer major difficulties to the economy, which is still vulnerable to its aftermath. With next year's anticipated growth rate of 2%, which is even lower than the population growth rate, problems like unemployment and poverty are likely to remain and worsen.

Pakistan's economy appeared to be on the mend towards the end of the first half of the season. The trade deficit had decreased significantly, the fiscal deficit had been largely contained, the foreign exchange reserve situation had improved to a comfortable level, the nation's debt score was changed from lower to solid, and its Efficiency to Do Enterprise Indicator ranking increased 28 points. The trade deficit, on the other hand, narrowed as a result of the loony binge. Lower imports came at the price of economic growth, and fiscal consolidation was aided by a decrease in development spending rather than tax revenue mobilization. FDI inflows were not significant despite ranking high on the ease of doing business scale. Fears of a worldwide epidemic sparked the 2H20, which quickly turned into a local concern, resulting in lockdowns around the country. In combination with the worldwide downturn, the economy was shattered, resulting in the first growth decline since 1952.

In FY20, GDP growth is expected to be minus 0.4 percent, down from 3.3 percent in FY19. For the first time since 1952, the economy has shrunk and has fallen short of nearly every important goal. Currency depreciation and inflationary pressures were the main causes of the negative growth rate, in addition to the impact of COVID-19. The ratio of investment to GDP was 15.4 percent in 9m20, compared to 15.6 percent in the same time last year. the previous calendar year in 9m20, national savings as a percentage of GDP was 13.9 percent, up from 10.8 percent the previous year. Because of a decrease in the trade deficit and a rise in worker remittances, the Savings-Investment Gap was narrowed.

Agriculture grew at a robust rate of 2.7 percent, far faster than the previous year's 0.6 percent. The agriculture sector grew by 3.0% while main crops (wheat, rice, maize, sugarcane, cotton) grew by 2.9 percent. Agricultural credit was PKR912 billion as of 9m20, up 13.3% from the same time the previous year. The administration has implemented a new policy that announced a five-year “Prime Minister's Agriculture Program” aimed at increasing agricultural output, adding value, and reducing reliance on imports. Because of locust infestations, the Food and Agriculture Organization (FAO) has warned that numerous countries, including Pakistan, might face a major food security problem this year.

The industrial sector's expansion was severely hampered by the COVID-19-related shutdown. The industrial sector is expected to contract by -2.6 percent, owing to falls of 8% and -7.8% in the mining and quarrying and large-scale manufacturing sectors, respectively.

The lockdown in the country had a major impact on the services sector, particularly the wholesale and retail trade and transportation sectors, which both fell by -3.4 percent and -7.1 percent, respectively, as a result of the lockdown. The government has unveiled a PKR1.2 trillion fiscal stimulus plan as well as a construction-related package that includes tax exemptions, an amnesty scheme, and PKR30 billion in funding to boost growth.

1.2 Foreign Direct Investment (FDI)

The South Asia exchange rate volatility, which started in Bangkok in June 1997, as well as spread to other Asia regions such as Indonesia, Korea, among Malaysia, has underlined the necessity of responsible international investment administration and analysis in rising economies with undeveloped national economic systems (Alam, M.& Zubayer, M., 2010). As a result of the crisis, developing countries confront several problems, along with the ability to properly supervise commercial firms, maintain international currency resources and networks, as well as wisely handle international borrowing as well as projects. The crisis underlines the urgent necessity to reassess the best mix of foreign capital, i.e., the right composition of concessional public loans, commercial loans, and Foreign direct investment (FDI) and portfolio investment are two types of FDI. The Asian crisis was sparked by volatile portfolio investment movements, which were exacerbated by panicked short-term commercial credit withdrawals. However, because of its great stability, it had no relationship with FDI. This emphasizes the importance of FDI in DMCs, particularly in the developing world (Khan, M.A., & S.A, 2011; Alam, M.& Zubayer, M., 2010).

Domestic financial markets are weak and liquidity is scarce in the group of least developed DMCs. This category includes Pakistan. It has a relatively tiny financial market and a fragile foreign exchange and debt situation. For over the previous couple of decades, Pakistan's international currency resources have stayed around below $1.3 $Billion, hardly enough to cover 4-5 weeks' worth of imports. commodities. Furthermore, quick credit had also increased from about 12 percent of total credit mostly in the 90s to 20 percent points presently.

As a result of these changes, Pakistan's need for FDI has grown. Foreign direct investment (FDI) is a large long-term commitment that is integrated into the host economy. Both portfolio investing and commercial bank financing were offered. Concessional brief advancement aid, respectively multilateral and transnational, will become progressively rare due to domestic economic restrictions in main benefactors like imperial Japan, but also Pakistan's greater rivalry with some other low-income states like Malaysia, Mongolia, Sri Lanka, and Cambodia. Multilateral development is important. Development organizations such as the Asian Development Bank will prioritize food insecurity reduction and smooth industries (food production, regional advancement, public schooling, surroundings, social inequality, but instead nutrition), while the corporate industry, overseas investment firms, and also the Pakistani govt will solid industries (production and huge national facilities).

Another advantage of foreign direct investment is that it boosts confidence effect. While the local economic climate determines a country's overall level of investor confidence, FDI inflows may bolster that confidence, leading to the emergence of a positive process that benefits not just domestic as well as overseas investments, but mainly international trade and production Such behavior is eerily similar to the past patterns of foreign direct investment inflows in Asia and the West. At first, Direct investment poured towards the emerging industrialized economy (Organization for Economic Cooperation) Bangkok, Asia, Malaysia, as well as Taiwan, Chinese., before moving to ASEAN nations. Recently, it has moved its attention to the public of China, Bangladesh, but also Burma. Such fluctuating stream of Foreign direct investment demonstrates that degree of self-belief, Foreign direct investment and FDI outflows are all on the rise., and the rate of economic growth are all changing. In the Asia-Pacific area, economic growth appears to be positively correlated.

Foreign direct investment (FDI) into Pakistan is limited and focused on a few sectors, namely the electricity industry. Pakistan received 0.2 percent of global FDI in 1997, less than 1% of FDI in

developing and Asian nations, and 18 percent of FDI in South Asia. 2 Despite liberalizing its formerly inward-looking FDI system, reducing or eliminating barriers to international investors, and Pakistan's success in attracting FDI has been disappointing, according to a variety of incentives. Why, despite liberalizing its payments and exchange regimes, as well as its inbound FDI policy, has Pakistan been unable to attract adequate amounts of FDI? The current research seeks to answer this question. Rather, since 1995, a rather substantial FDI infusion into the electricity industry has generated considerable adversity. A large growth in capital goods exportation for electricity production, as well as an ongoing dispute among the government and international individual energy makers over the electricity cost the elected government charged IPPs under the sales agreement, were the most substantial negative impacts. Another drawback of FDI dominance in the power business is that since revenues grew, so did the cost of power. When IPP remittances began to rise, the balance of payments was severely stressed, especially because foreign exchange revenues from goods and services exports remained low. 3 Pakistan's negative FDI trend may teach rising nations a valuable lesson: governments should be wary about admitting large quantities of FDI into non-international exchange revenue businesses during a stag fluxionary era. FDI must be promoted at the start in the international currency exchange business and later in the local-oriented business, or in all sectors at the same time.

When Pakistan gained independence in 1947, it was mostly an agricultural economy. For processing locally generated agricultural raw material, its industrial capability was insignificant. Successive governments were forced to increase the country's manufacturing capabilities as a result of this. Various sorts of industrial strategies have been implemented at various times to attain this goal. Having a skewed focus on whether the private or social side Government initiatives sought to boost the private sector in the 1960s, but the public sector gained Centre stage in the late 1960s. In the mid-1980s, the corporate industry was granted a prominent role once again. Pakistan, notably in the nineties, adopted progressive, business practices. Government action has designated the private sector as the driver of economic growth. Pakistan has also lured overseas entrepreneurs with a competitive benefits scheme.

There is a large review on the benefits of FDI inflows to recipient countries, such as Falki (2009), who explains that FDI inflows benefit host countries by increasing employment opportunities because when a foreign firm invests in a host country, it sets up its systems, which employ many locals. FDI is also equipped with cutting-edge technology, which boosts productivity and profits. Exports increase as a result of increased human capital, resulting in a reduction in the balance of payment deficits. Furthermore, modern technology makes it easier to use and allocate local raw materials properly.

Capital formation and economic growth are influenced by a variety of variables. In terms of geography, geology, technical advancements, politics, and institutional frameworks, these variables may change from country to country. The goal of this study is to identify the effect of FDI on Pakistan's GDP.

FDI has shown to be part of the most effective ways of attracting cash from other countries. In developing nations all around the world, this approach has become an important part of capital formation. However, in recent years, the proportion of these nations' investments in other countries has decreased. The situation is different for underdeveloped countries. Foreign direct investments' beneficial impact is growing in popularity as a strategy for economic growth and strengthening (Muhammad 2007).

Improved aggregate productivity, enhanced job possibilities, increased export outflow, and exchange of technical development between the investor and the nation are among the most compelling benefits of FDI implementation. In a developing country, having foreign direct investment allows for the employment and exploitation of natural and human resources, as well as the implementation of new enterprises. management and marketing techniques, in addition to aiding in the reduction of the budgetary shortfall Another benefit of Foreign direct investment is that it avoids the risks and restrictions of foreign loans while simultaneously enhancing the role of people

resources through on job instruction. States with a scarcity of income and technical capabilities grow more slowly than those with an abundance of both. Foreign direct investment, according to several studies, can help with technology and knowledge transfer (Dunning &Hamdani 1997).

Foreign direct investment (FDI) is critical to the growth of developing countries. One argument is that FDI aids in the transfer of advanced technology know-how while also increasing employment in host nations. Economists think that FDI puts pressure on indigenous businesses while making markets more competitive through new technology and high-standard management. Furthermore, FDI has a large and favorable impact on the economy. Externalities to emerging economies, such as labor management and training opportunities, raise the production function's standard. Technology transfer helps the economy of underdeveloped nations, allowing them to stand on their own two feet. (Easterly, 2006; Bauer, 1991).

FDI helps the economy by creating jobs, transferring skills and technology, increasing productivity, and ensuring long-term growth in underdeveloped nations, according to the World Investment Report (2008). It is also a significant source of foreign capital inflow for the host nations. It encourages the transfer of innovative technologies and fosters international trade. In the host nations, it improves leadership and management abilities while also sustaining economic growth (Hussain and Stimuli, 2012).

Pakistan's newly formed state faced several problems in 1947, the most pressing of which was the question of its existence. Other commercial pursuits were pushed to the side in the face of such fundamental requirements. Pakistan kept a tight grip on FDI and liberalization policies throughout the first 11 years (1947-1958), owing to the country's insecurity. There are two periods in Pakistan's history. From 1947 to 1971, there was the first phase. Due to two wars, Pakistan lost half of its resources in the form of Bangladesh during this period (East Pakistan). From 1972 to the present, the second phase was active. Pakistan was once again confronted with two wars, terrorism, and severe political insecurity during this period. The war in Afghanistan between the United States and Afghanistan, as well as the war in Afghanistan, Pakistan's economy is also being harmed by a series of political instabilities. International trade restrictions imposed in response to nuclear weapons tests have had a significant negative impact on Pakistan's economy. As a result, FDI inflows fluctuated year after year throughout history.

FDI has emerged as a key source of much-needed cash, as well as a vital route for developing nations to obtain sophisticated technology and intangibles like organizational and management skills, as well as marketing networks. FDI has increased at a higher rate than foreign commerce in recent years on a global scale. The record was mostly influenced by developed countries. FDI flows increased dramatically, reaching as high as $150 billion in 1997 for developing nations. In what ways have FDI inflows influenced the level of economic activity in host countries? In recent years, a lot of research has been done on this subject. 22 Foreign direct investment has the potential to either “crowd in” or “crowd out” domestic development, and its influence on reserves is unknown. FDI has a favorable impact on GDP, but the magnitude of this advantage is determined by the host economy's human capital.

The cumulative inputs of Foreign Direct Investment and the collective shipments of host countries have been found to have a significant positive relationship, while FDI tends to increase the host state's importing. The effect of Foreign direct investment on the equilibrium of trade, on the other hand, is a point of contention. Critics argue that while FDI has a positive initial effect on the home balance of trade, it has a detrimental intermediate impact. Imports of intermediate goods are increasing, and profits are being repatriated, which has a harmful effect. The impact of Foreign direct investment on the equilibrium of trade, on the other hand, is considered to be reliant on the currency rates a dynamic currency rate system, any interruption in international currency producers and consumers is corrected by currency fluctuation rate. In the case of a constant currency rate structure, a net increase in international currency demands from the FDI projects will result in a smaller balance or a bigger shortfall inside the equilibrium of trade. According to empirical

research, FDI inflows have a larger beneficial impact on host country exports than on host country imports. As a result, if there are any balance of payments issues, they will be minor. tiny in size (WTO 1996). Foreign direct investment (FDI) is not only a new phenomenon in Pakistan, but it also does not account for a significant portion of GDP or local fixed investment. Due to substantial FDI in the electricity industry, FDI as a proportion of GDP stayed below 1% until 1994/1995, when it increased to 1.69 percent in 1995/1996. Between 1984/1985 and 1995, Foreign Direct Investment accounted for 3.5 percent of net investment spending.

Foreign Direct Investment is not projected to have a substantial influence on many economic sections due to its low percentage of GDP and fixed investment. What effect did the sanctions have on Pakistan's imports and exports? To begin with, most empirical evidence indicates that FDI inflows tend to boost imports in the host nation. One explanation is that multinational corporations have a high proclivity for importing intermediate inputs, such as raw materials and money. products and services are not easily available in the host nations. 24 According to certain research, FDI influx has little or only a minor influence on a host country's imports (Hill 1990). When foreign direct investment is dominant in import-substituting sectors, it is expected to damage imports since formerly imported goods are currently manufactured locally in the home nations of foreign investors (Fry 1996).

1.3 Research gap

In this study, we fill the gap that other recent studies take the Foreign direct investment (FDI) data as FDI inflows but in this study, we take FDI data as net FDI. Recent research is taken to analyze the FDI influences on the economic growth of Pakistan. In this study, we fill the gap and analyze the Foreign direct investment (FDI) and COVID-19 influences on the gross domestic product (GDP) of Pakistan. Through these changes, more accurate outcomes are received.

1.4 **Research Objectives**

The objectives of this research are:

a) To analyze the impact of the Covid-19 pandemic on Pakistan's GDP.

b) To evaluate the effects of Net Foreign Direct Investment (NFDI) on Pakistan's GDP.

c) To explore whether there is a short-term or long-term relationship between the dependent variable (GDP) and the independent variables (Covid-19 and NFDI).

1.5 Research question

a) Does the COVID-19 pandemic have a positive or negative impact on Pakistan's GDP?

b) Does Net Foreign Direct Investment (NFDI) positively or negatively influence Pakistan's GDP?

c) Is there a short-term or long-term relationship between Net Foreign Direct Investment (NFDI), the Covid-19 pandemic, and Pakistan's Gross Domestic Product (GDP)?

1.6 Limitations of study

a) In this study 13 years of data is taken for the analysis using time series data.

b) Net foreign direct investment (NFDI) as a whole data is taken for the analysis.

c) COVID-19 data is taken by combining the two sectors first one is cotton-ginning and second one is mining and quarrying.

d) Gross domestic product (GDP) data is taken by combining two sectors that include first one is finance & insurance and second one is transport storage & communication.

Literature Review

2.1 Literature Review

Numerous researches have been published that investigate the connection between IPI and GDP. In the long, GDP is connected to all three income categories, according to Ozturk et al. (2010). There is also a unidirectional causal relationship. For middle-income nations, a line connects energy usage to GDP. Economic development and energy consumption are influenced by a variety of factors across 174 nations, according to Chen et al. (2012). Lu (2017) investigated the current link between

economic growth and energy consumption in Taiwan and discovered a long-term relationship with bidirectional causality. Gregor et al. Because in OECD nations, higher GDP and better economic growth are linked. In top economies, Shahbaz et al. (2018) found a positive correlation between energy use and economic growth. In addition, China, India, Germany, and France have a poor connection in the bottom quantile. In the upper quantile for the United States, Canada, and the United Kingdom, a similar relationship is observed. The relationship between uncertainty shocks and growth has been studied in the United States, Canada, Brazil, and South Korea. Economic policy uncertainty was evaluated in 138 developing countries by Lensink et al. (1999), who found a negative relationship between uncertainty and economic development. Asteriou and Price (2005) found that investment and growth are both reduced when there is ambiguity about the investment. Between 1966 and 1992, growth was measured in 59 developed and developing nations. Sujan and Redek (2008) looked at the link between uncertainty shocks and growth and found that there is a negative association between the two. Christensen et al. (2018) showed that more climate change might result in significantly higher uncertainty. Bidirectional causation, according to Rathnayaka et al. (2018),

In recent years, industrialized countries, as well as emerging and less developed countries, have paid a lot of attention to foreign direct investment (FDI) as a development accelerator component. The effect of foreign direct Investment on the GDP of the host country has been a source of growing worry among economists. In a closed economy, foreign instruments and savings are unavailable, therefore this sort of economy is unsustainable. Domestic savings and investment are the only sources of income for this economy. However, Investment in an expanding market comes from both domestic deposits and overseas fund inputs such as FDI. FDI allows the host nation to invest at a level that exceeds its capacity, therefore increasing GDP and economic growth. In 1997, net foreign resource flows to developing nations were 45 percent due to FDI. In 1986, just 16% of the population was female (Perkins, 2001). In addition, according to the World Bank (2002), developing countries got 36% of overall FDI flows in 1997. Many studies demonstrate a favorable relationship between foreign direct investment and GDP in home countries; however, this study focuses on Foreign direct investment's impact on GDP and its significance in emerging countries' economies. Balasubramanian et al. (1996).

According to De Mello (1999), FDI is more important for improving economic growth since it is dependent on exogenous variables such as skilled labor and its influence on the nation and condition-specific elements. According to Todaro and Smith (2003) and Hayami (2001), FDI bridges the gap between required and domestic investment levels, as well as increasing tax revenues, effective management, and technological advancements. The host nations will need both technology and trained personnel. FDI is anticipated to help host nations expand economically, Jenkin and Thomas think (2002). According to Accoley (2003), Fedderke and Romm (2006), Nonnemberg and Caroso de Mendonca (2006), economic growth is one of the drivers of increasing FDI influx (2004). Whereas Alfaro (2003) discovered an unclear link between Foreign direct investment and Gross domestic production, He furthermore claims that its impact on the host country varies depending on the host country's trade and foreign direct investment regulations. According to Adegbite and Ayadi (2010), FDI helps advanced economies solve the domestic resource mismatch since most growing nations lack the necessary investment. Must produce money to cover their expenses First and foremost, the author is motivated to investigate this link because, even though several types of research have been conducted in this area, these studies have revealed unclear results in the host nation. As a result, the author is researching this area to determine the link between Foreign direct investment and Gross domestic production.

Because foreign direct investment is such a large part of fund inflow for emerging regions, its impact on GDP is fiercely contested, though most economic experts believe that the benefits outweigh the disadvantages (Musila and Segue, 2006; Mc Aleese, 2004). Second, through FDI, host nations assist in improving or correcting trade balances by increasing capital account surpluses. Third, because developing host nations have lower

rates of capital accumulation, FDI can help boost domestic investment and boost economic growth. FDI is a collection of qualities that can help boost growth. GDP has been improved or increased" (Mc Aleese, 2004; Boransztain De Gregorio and Lee, 1998; and Collier and Dollar, 2001).

Farkas (2012) investigated the impact of FDI on GDP using regression analysis, indicating that foreign direct investment has a favorable relationship with Gross domestic product and that its affect is reliant on the host country's adsorption ability, social resources, and commercial market development. Bashir and Hameed (2012) use economic modeling to look at the influence of foreign direct investment on GDP in MENA nations. An econometric model is a mathematical model that calculates the value of a variable They conclude that FDI promotes economic growth, although the rate of growth varies by area and time. They also looked into how local investment and international trade openness to influence FDI.

Onakoya (2012) assessed the effect of foreign direct investment on Gross domestic product in various industries of Nigeria using the three-stage linear regression technique and a Microeconomic framework of system of equations. He discovered that FDI had a small effect on GDP but a large effect on the economy's production. The link between FDI and GDP in Pakistan was studied by Zeeshan and Antique (2012). Product of Cobb and Douglas to derive conclusions from data from 1971 to 2001, a production function was combined with a regression equation.

He concluded that the impacts of import substitution and export-oriented economies are distinct, confirming Bhagwati's theory that the latter economy's FDI spillover effect is considerably higher than the former. Tue and colleagues (2010) researched Vietnam to examine the impact of FDI on the country's economy. The findings of the endogenous growth model are obtained at the micro-level, there isn't much evidence of FDI spillover effects. Using cross-sectional data, Makki and Somwaru (2009) analyze the influence of FDI on trade and GDP in 66 developing countries.

They concluded that FDI boosts domestic investment and interacts favorably with trade. It was also determined that solid policies and stability are necessary for FDI to boost GDP growth. The econometric model for the production function was used to generate all of the results. Karimi& et al. (2009) used time-series data from 1970 to 2005 to perform their research in Malaysia. The approach was simple. based on the Toda Yarn Moto test and Bounds testing for causality influence on relationships (ARDL).

They conclude that foreign direct investment has an indirect impact on GDP. Noormamode (2008) investigated the influence of FDI on economic growth as well as the social and economic circumstances in the host country's impact on Foreign direct investment spillage consequences. Using a group Vector autoregressive, the authors found there is no strong proof of foreign direct investment development effect Turkcan and colleagues (2008) looked at the endogenous connection between FDI and GNP. From 1975 to 2004, GDP was calculated using panel data from 23 OECD nations. They utilized two simultaneous equations in combination with generalized techniques of moments to conclude that all these aspects affect the economy, and Foreign direct investment is the primary contributor to accelerating the Gross domestic product rate and Gross domestic product, in most circumstances, determines the degree of FDI.

Johnson (2005) used a regression equation to analyze the panel data and looked at the effects of two Foreign direct investment spillovers, innovation, and intellectual resources, among Ninety states between 1980 and 2002.FDI inflows boost GDP in poor nations, but not in developed countries, according to him.

In a study of the impact of FDI on GDP in Sri Lanka, Athukorala (2003) discovered that while FDI helps to accelerate GDP growth, it is not the only factor that influences GDP. He used an Econometric framework to obtain these results because regression was not very helpful in that situation. Foreign inflow is not statistically significant, according to Akinlo (2003) and Adelegan (2000). The increase in the level and pace of economic growth in Nigeria, as well as the majority of emerging host nations, is statistically significant. In addition, FDI has a detrimental impact on domestic investment. This conclusion

was reached through the use of seemingly unrelated regression techniques (SURE).

De Mello (1999) investigated the influence of FDI on GDP using a panel and time-series data from 32 industrialized and developing countries between 1970 and 1990. He utilized stationarity tests to derive conclusions, however, the findings revealed that FDI and GDP have a poor connection.

Pakistan has a history of foreign direct investment dating back to 1947. In Pakistan, Siemens was the first German telecom firm. In the chemical and pharmaceutical production industries, the second company was the British corporation ICI. Later, the Lever Brothers (now Unilever), Imperial Tobacco, Shell, and Burma Oil also contributed to the early days of Pakistan's economy.

Pakistan's economy saw tremendous development throughout the 1950s and 1960s. At the same time, the nation pursued a strategy of trade and investment restrictions, which hindered foreign direct investment (FDI) into Pakistan. According to Sahoo (2006), the goal of the first FDI policy was to keep the bulk of stakes with indigenous businesses. Rescuing rat, according to Mughal (2008), Pakistan's unemployment rate has decreased below 15%, while investment has increased to about 17%. As a result of this, there was a discrepancy between savings and investments, forcing the government to rely on foreign money to bridge the gap. Pakistan too adopted a strategy of self-reliance throughout the 1950s, 1960s, and 1970s, boasting import substitute items in the nation, and had no choice but to rely on overseas aid to make up the difference in terms of investment and savings.

According to Khan and Khilji (1997), Pakistan's government liberalized its industrial investment policy in the 1960s by opening twenty-four important industries to private investors. The private sector dominated the 1960s, although FDI was not allowed in the banking, finance, and other service sectors, thus these industries remained dominated by the private sector. investors from the US (Zakaria, 2008). The government shifted from the 1960s' liberalized policies to a strategy of nationalization under the banner of advancing socialism in the 1970s, which significantly reduced FDI entry into Pakistan (Khan and Khilji, 1997, Zakaria, 2008). Following a conceptualization of nationalized units' and other institutions' poor performance, the government changed its policy on private domestic and foreign investment. To promote foreign investment, the Foreign Investment Act of 1976 was passed, and foreign investors were guaranteed by it.

By auctioning a fraction of public shares in several organizations in 1980, the government created public-private partnerships. At the same time, the administration liberalized its policies to attract international investment. The currency rate was no longer under control, resulting in the creation of an export processing zone (EPZ). The Export Processing Zone was made up of several different types of businesses. Duty-free imports and exports were allowed, as well as a five-year tax vacation (Zakaria, 2008).

According to Anwar (2002), the Pakistani government implemented further regulatory steps to encourage foreign direct investment in the 1990s. Capital movement limitations were gradually loosened. Without the need for previous clearance, foreign investors were able to own 100% of the company. The transfer of shares to non-residents, the transfer of dividend profits, and the disinvestment are all things that need to be considered. Without previous clearance from the central bank, disinvestment was permitted. Khan (2008) is a good example of this. In 1997, the Pakistani government also permitted foreign businesses to engage in formerly prohibited sectors such as agriculture and services, which had previously been prohibited following Pakistan's independence (Sahoo, 2006). Other incentives were tax reductions, dividends, and royalties, among others. Royalties, profit transfers, and even the whole investment capital were all permitted.

To entice FDI, the government began privatizing and deregulating the economy in the early 2000s (Zakaria, 2008). According to Khan (2007), the government has opened up all sectors (including the service sector) to foreign direct investment, which was previously prohibited. Pakistan's government also assured that Organizations that are entirely owned by foreign investors cannot be municipalized or taken over by other methods. The government has completed the processes for getting a certificate of no objection from the local

government, allowing anybody to begin a project anywhere in the state.

The above-mentioned actions made by the Pakistani government during the previous three decades were aimed at increasing FDI in all sectors of the country. However, owing to other reasons like corruption, political unrest, weak diplomatic connections overseas, and inefficiencies in the legal system, the impact of the FDI influx has remained stifled.

Balasubrammanyam and Sapsford (1996) and De Mello (1999) define foreign direct investment as a mix of invested resources, experience, and technologies that may be utilized to improve an economic growth present stock with quality management, developing skills, coaching, and organizational structure. In both researches, Foreign direct investment has a beneficial influence on emerging nation GDP.

Unciad (1999) discovered that foreign direct investment has both positive and negative effects on economic development, depending on the variables included in estimate models. Political instability, trade terms, GDP per capita, domestic investment ratio, education level, and the black market are some of the characteristics that might be considered.

Borenstein E, Grigio J, S Lee J. found in 1998 indicated the impact of foreign direct investment varies based on the scale of people resources in the receiving country. The absorption ability of foreign technology is determined by the density of human capital, according to this study. The amount of FDI influx in recipient nations was influenced by the degree of human capital. Based on this, this theory was formed.

Amna et al. (2010) examined the influence of foreign direct investment and rising prices on Pakistan's economic growth using time-series data from 1981 to 2010. A multi-regression technique was used to construct the models. According to the findings, foreign direct investment has a favorable and significant impact on the economy, while price level has a negative impact on Pakistan's economy.

Using panel data from 1990 to 2006, Mamoun Benmamoun and Kevin Lehnert (2013) investigated the effects of FDI, worker remittances, and official development aid (ODA) on the macroeconomic progress of emerging countries. System generalized approach methods may be used to assess the impact of foreign direct investment, remittance, and formal developmental support (ODA) on emerging country macroeconomic output. It is reported in underdeveloped countries. They also discovered that worker remittances contribute more to economic growth than foreign direct investment (FDI) and official development assistance (ODA).

Nigel Driffield and Chris Jones (2013) looked into how FDI and ODA helped developing countries thrive economically. To test for intrinsic endogeneities, they utilized a system technique. They also looked at the relevance of institutions, not just in terms of growth but also in terms of interactions between institutions and other growth drivers. Total foreign money has a beneficial influence on the global economy, they observed. When entities are included, it has a beneficial and considerable influence on growth. Using panel data estimates, Manelle Lahdhiri and Mohamed Amine (2012) discovered that foreign direct investment (FDI) and official development assistance (ODA) had positive and significant benefits on developing countries' economic growth.

Durham (2004) claims that foreign direct investment has a negligible and negative influence on developing country's economic growth. He concluded that the capacity of receiving nations to absorb technology determines the flow of FDI.

According to Ali Sharafat (2014), FDI and inflation have detrimental long-term implications on the GDP of Pakistan. The narrow analysis confirmed bidirectional causality from foreign direct investment, corporate borrowing, rising prices, and literate level to development. He estimated data from 1972 to 2013 using the Johansen co-integration approach and Granger causality.

Bende–Nebende, A., Ford, J., Santoso, B., Sen, S. (2003) illustrated the theory described before. In the case of less developed nations like Thailand and the Philippines, they discovered that the FDI influx had considerable and beneficial long-term effects. In nations with stronger economies, such as Taiwan and Japan, however, the effects are negative.

FDI has a negative influence on GDP, according to Görg and Greenwood, (2003). FDI, on the other hand, does not help the receiving nations' economies expand faster. Spillover concerns, according to Görg and Greenwood (2003), have a detrimental influence on FDI. Additionally, foreign businesses do not generate positive GDP externalities. Negative connotations were discussed by Hermes and Lensink (2003). Having a detrimental impact on the recipient nations' financial situation They determined that the FDI effect is negative for the strong financial nations after analyzing panel data from 67 developing countries throughout Asia, Africa, and Latin America.

Carkovic and Levine (2002) demonstrated whether foreign direct investment harmed beneficiary state development by using cross-country statistics from 1960 to 1995 and applying a broad method technique for estimations. Their findings contradicted the assumption that FDI benefits receiving nations' economies.

As a result, the effect of Foreign direct investment is still debatable. Various studies have been conducted to evaluate the economic effect of foreign direct investment. According to estimated factors such as politics, economics, and technical circumstances in recipient countries, some studies found favorable benefits and others found negative impacts.

The link between FDI inflows and Pakistan's economic growth is the focus of this portion of the literature study. Since Pakistan is a developing country, a high rate of economic development is critical for emerging countries to join the club of developed nations. Chenery and Shout (1966) underlined the same idea, and they said that the current priority of all emerging countries is education. Countries are working to achieve a high pace of economic and social growth. Foreign aid is playing the most essential role in achieving this aim, which is contributing to increased economic growth.

Iqbal and Zahid (1998) performed empirical research to investigate the influence of several key macroeconomic factors on Pakistan's economic growth. According to the authors, Pakistan has been experiencing a declining trend in economic growth due to insecure political and economic situations, including an increase in foreign debt, low demand for Pakistani exports in international markets, and a lack of legal protection. and law and order issues, as well as a lack of physical and human capital. The empirical findings showed that Pakistan's economy was more open, which aided growth. To enhance human capital, the government should also give education.

Several factors influence economic growth in Pakistan, but FDI inflows are the most important among them. As a result, several studies have experimentally investigated the link between FDI inflows and Pakistan's growth rate. Malik (2015) conducted an empirical study to assess the influence of FDI inflows on Pakistan's economic growth over time.

Between 2008 and 2013, researchers discovered that FDI is not the sole element driving rapid economic growth; trade liberalization and domestic capital also play a role. The author also suggested that the government make efforts to promote both international and local investment, as well as give protection to domestic sectors, to improve overall output, which would lead to higher GDP.

Atique et al. (2004) conducted empirical research utilizing Pakistani data from 1970 to 2001, concluding that the beneficial impact of FDI on Pakistani economic growth rises under an export promotion (EP) system as opposed to an import substitution (IS) regime. They stated that because Pakistan's economic growth is heavily dependent on FDI inflows, the country should implement policies that favor such inflows.

FDI inflows are essential. Another empirical research conducted by Gudaro et al (2010) examines the influence of FDI inflows on Pakistan's growth rate, using a multiple regression model using data from Pakistan from 1981 to 2010. They discovered that an increase in FDI inflows leads to greater growth rates, therefore the government should focus on policies to foster a business-friendly climate. This has the potential to attract international investment.

Using time-series data from 1994 to 2014, Zafar et al (2016) empirically examined the influence of FDI flows and trade openness on Pakistan's growth rate. They discovered that FDI has a positive and substantial influence on the growth rate, whereas

trade openness has a negative, but significant, link with the growth rate after using the Johansen Co integration test and ECM. The authors go on to say that Because FDI has a positive association with GDP, factors such as political stability and improvements in macroeconomic variables can strengthen this relationship over time. Although trade openness is important, it has a negative connotation because Pakistan is a developing country is now unable to compete with foreign products, resulting in losses in both national and international markets for native products and industries. They claimed that more open trade policies would have a favorable influence on growth rates.

According to Ghazali (2010), FDI inflows have a substantial influence on Pakistan's economic activities and play a vital part in growing exports and the country's economic growth rate. Over the period 1981-2008, the author conducted an empirical analysis to evaluate the causal link between FDI inflows, domestic investment, and Pakistan's economic development. According to the findings, FDI increases domestic investment, which leads to a greater rate of economic growth, and the relationship is reciprocal. Domestic savings, according to the findings, should be promoted in Pakistan since they contribute to a rise in both domestic and international investment, resulting in a better growth rate.

Javaid (2016) used time-series data from 1966 to 2014 to perform an empirical investigation of the relationship between FDI inflows and Pakistan's growth rate. The findings of using the ARDL-ECM approach revealed that FDI inflows had a considerable and beneficial influence on Pakistan's growth rate, both in the short and long term.

Many studies, on the other hand, show that FDI has either no effect or a negative impact on Pakistan's economic growth rate. In his study, Ali (2014) examined the influence of foreign capital flows on economic development in Pakistan from 1972 to 2013. Foreign capital flows were classified into three groups in the study: foreign debt, FDI, and worker remittances. Foreign capital flows hampered long-term growth, according to research. Because Pakistan's economy is hampered by huge foreign loans, the study suggests that local investors should be encouraged to achieve a high rate of economic development. Furthermore, FDI may be good for the long-term growth and development of Pakistan's economy when combined with stronger macroeconomic policies and human capital.

Similarly, Saqib et al (2013) note in their study that while the economic performance of any nation is influenced by a variety of factors, FDI inflows are the most important predictor of economic development in developing countries. The authors used time-series data from 1981 to 2010 to empirically examine the link between FDI inflows and Pakistani economic development. Debt, trade, inflation, and domestic investment are all assessed in addition to FDI inflows. In comparison to earlier research that looked at the relationship between FDI inflows and growth rate, the findings are completely different. According to their results, FDI inflows and Pakistan's growth rate have a negative connection. The outcomes were the same for both groups. Other variables have a positive influence on the growth rate, except for domestic savings. The gains taken back by the investing nation may be owing to the host country's poor capacity to absorb new knowledge and technology supplied through FDI inflows, which may be the cause of the contradictory outcomes.

The link between FDI inflows and economic development was determined to be the same by Arshad (2012). The author used Pakistani time-series data from 1965 to 2005, and after applying the Co integration VAR framework to the variables of FDI, trade (exports and imports), and economic growth, he discovered that both exports and imports have a positive long-run relationship with growth, but that trade (exports and imports) has a negative long-run relationship with growth. FDI has a negligible influence on economic growth. The Granger causality test also indicated that FDI drives GDP growth rather than the other way around.

An empirical study was done by Yasir and Ramazan (2013) to investigate the link between FDI inflows and Pakistan's growth rate. This research used time-series data from 1978 to 2010 and applied the ARDL (Auto-Regressive Distributed Lag) model. The findings show that FDI and exports have a weak long-term relationship with economic growth. The authors

suggested that Export promotion strategies should focus on specialization in production and economies of scale, according to policymakers. This would encourage Pakistan to import high-quality items and contemporary technology to enhance the local industry, resulting in a favorable influence on FDI-led economic growth as the country would be able to absorb new techniques and improve its productivity. FDI inflows are allowing technologies to be transferred.

The majority of research indicates a positive link between FDI inflows and growth rates; however, many studies also advise that more FDI-friendly policies be developed to attract more FDI. In their research, Ahmad et al. (2012) looked at the link between FDI inflows and Pakistan's economic development. They discovered this after using the Co integration test and ECM on Pakistani time-series data from 1971 to 2007. that, both in the short and long run, there is a positive relationship between growth rate and FDI influx Furthermore, the authors suggested that policymakers develop FDI-attractive policies to maintain economic growth.

In a similar vein, Najaf and Najaf (2016) discovered a link between FDI inflows and Pakistan's economic development. They tested the link between important macroeconomic factors and FDI inflows using data from Pakistan from 1991 to 2011. Their findings showed that foreign direct investment had a favorable link with Pakistan's growth rate, but that inflation has a negative influence on FDI. Likewise, to attract greater FDI, political stability is critical. They also underlined the importance of political stability and a welcoming environment in Pakistan to attract more FDI. They used their language to express themselves.

"Political stability is necessary for a dynamic market economy to function at its best. Then it's out. Because of the drop in investment, political instability causes economic uncertainty. Investors' faith in our country is being eroded by political uncertainty. Decisions in the corporate world are mostly influenced by political stability rather than government style. The atmosphere must be conducive to business. To attract significant FDI, attention should be given to the development of infrastructure. Pakistan must continue to focus on improving human capital and technology to reap the benefits of FDI. When compared to the service industry, jobs for unskilled people."

Foreign investors, according to Moran (1978), undermine host nation political systems by adopting local elites and/or using their clout in their home countries. The advantages of FDI are said to be unequally divided between MNCs and the host countries. MNCs begin with a financial surplus that could have been used to fund worldwide expansion. During the 1970s and 1980s, economists largely supported the FDI dependence hypothesis and its influence on developing country's economic development.

Furthermore, Kentor (1998) corroborated the notion in his study that nations with relatively significant foreign capital dependence (measured as accumulated foreign stock) had slower economic development than those that were less reliant. Dixon and Boswell's studies also back with these conclusions (1996). Foreign investment is measured differently by Kentor (2003). Concentration is computed as a proportion including all foreign direct investment equities taken into account by the leading financier country, and it takes into account a lengthy unfavorable influence. Foreign investment concentration, according to Kentor, has a considerable, long-term negative influence on growth; the impact is greatest in the first five years and then fades.

In developing nations, Graham and Krugman (1991) argue that FDI is more productive than local investment. This assumption is based on the notion that, as compared to international businesses, home firms have a superior understanding of and approach to domestic markets. As a result, if a foreign company decides to enter the market, it must compensate domestic companies for their advantages.

Similarly, a foreign company investing in another nation benefits from cheaper costs and better productivity than its domestic competitors. In developing nations, on the other hand, a combination of sophisticated managerial abilities and contemporary technology would result in increased FDI efficiency (Graham and Krugman 1991).

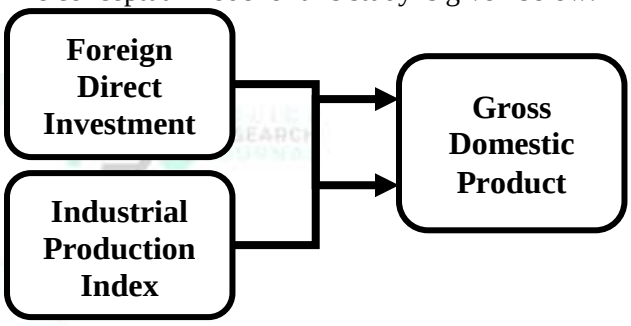
Caves (1974); Wang and Blomström (1992) found that the host nation market has become more

competitive as a result of the admission of foreign partners. Domestic businesses are compelled to employ resources more efficiently and embrace sophisticated productive technologies as a result of competition, resulting in increased productivity. Competition, on the other hand, might have unfavorable consequences. Can relax as a result of increased domestic competition, Domestic businesses' market strength can be restricted, and their market share might be reduced. Domestic enterprises will be compelled to work on a smaller scale while spreading the benefits of technical breakthroughs to customers in other countries if lower market shares cause decreased capacity utilization in existing companies or the usage of smaller production facilities.

Since 1947, Pakistan's economic growth has shown a variety of trends, with a variety of factors contributing to these changes. Although policymakers and governments have taken various steps to improve economic conditions, the economy has experienced both upward and downward trends over time. With the help of the diagram below, one can observe trends in Pakistan's economic growth.

2.2 Conceptual model

The conceptual model of this study is given below:



Here, GDP is the dependent variable, and FDI and IPI are independent variables.

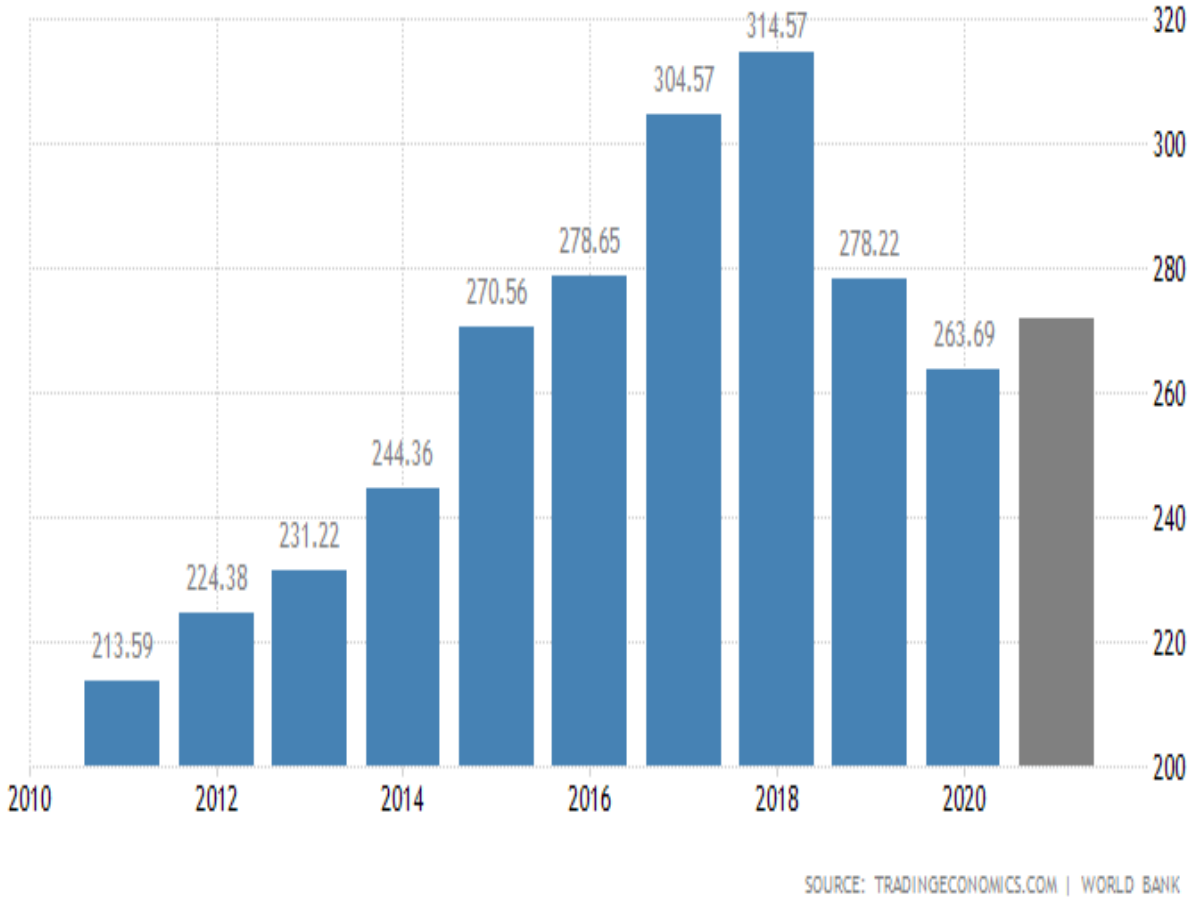
2.3 Pakistan GDP growth rate overview from 1960 to 2022

Table-2: Pakistan GDP growth rate overview (1960 to 2022)

Actual	Previous	Highest	Lowest	Dates	Unit	Frequency	
263.79	278.22	314.57	3.75	1960to 2020	USD Billion	Yearly	Cumulative

Pakistan GDP	Last	Previous	Highest	Lowest	Units			
GDP Annual growth rate	_ 0.47	2.10	10.22	_ 1.80	Percent	(+)		
GDP			263.69	278.22	314.57	3.75	US Dollars	(+)
GDP constant prices			13777357.00	13159092.00	13777357.00	8216160.00	PKR millions	(+)
Gross national product			15262040.00	14435389.00	15262040.00	3778155.00	PKR millions	(+)
Gross Fixed Capital Formation			1910389.00	1829962.00	2008186.00	1268315.00	PKR millions	(+)
GDP per Capita			1168.34	1185.46	1197.84	302.02	USD	(+)
GDP per capita PPP			4622.77	4690.48	4739.47	2915.90	USD	(+)

GDP from Agriculture	2502181.00	2362209.00	2502181.00	1775346.00	PKR Millions	(+)
GDP from Construction	340146.00	318064.00	344104.00	186380.00	PKR Millions	(+)
GDP from Manufacturing	1667362.00	1663118.00	1667540.00	1065323.00	PKR Millions	(+)
GDP from Mining	309823.00	349684.00	356667.00	254345.00	PKR Millions	(+)
GDP from Services	8041169.00	7803812.00	8041269.00	4324274.00	PKR million	(+)



Source: TradingEconomics.com
2.4 Pakistan GDP graph (2010 to 2022)
Source: TradingEconomics.com

RESEARCH METHODOLOGY

3.1 Data

That research aims to examine the effect of the FDI as well as IPI on Pakistan's GDP. This study is quantitative and time-series data has been used from 2010 to 2022. secondary data are taken from the Pakistan Bureau of Statistics, State Bank of Pakistan, and also invest.gov.pk/statistics. GDP is the dependent variable in this study. FDI and IPI serve as independent variables.

The explanation of independent variables is discussed below**:**

POLICY RESEARCH JOURNAL
ISSN (E): 3006-7030 (P) 3006-7022

Foreign Direct Investment (FDI)

An investment process in which an individual and also any company invest in foreign countries rather than their homeland country. In simple, individuals or companies want to increase their monetary value by investing in foreign companies to make more profit in return. FDI also plays a vital role in the gross domestic product (GDP) of a country in which FDI occurs. It takes a percentage of GDP.

In this study, FDI data is taken as net foreign direct investment (Net FDI) as a whole from 2010 to 2022 to examine the influence of FDI on Pakistan's also relationship with them. It is shown as NFDI in both historical and data analysis techniques.

The Industrial Production Index

The Industrial Production Index (IPI) is a vital economic metric, that quantifies the volume and performance of a nation's industrial sector over a defined period. As an essential tool for assessing manufacturing, mining, and utility activities, the IPI offers valuable insights into economic trends (Bachmeier & Leiva-Leon, 2013). Policymakers, analysts, and investors rely on the IPI to comprehend the dynamics and fluctuations within a country's industrial landscape, aiding strategic decision-making and economic forecasting.

3.2 Model Specification

The Auto Regressive Distributed Lag (ARDL) techniques are applied to see the relationship between the foreign direct investment (FDI) and industrial production index (IPI) with the gross domestic product (GDP) of Pakistan by using EViews 9.0. The following theoretical model is used which is given below.

LGDP=F (LNFDI, LIPI) (1)

The primary goal of our research is to determine whether foreign direct investment and industrial production index have a positive or negative influence on Pakistan's GDP and also have short or long run relationship between our independent variables and dependent variables. The Auto Regressive Distributed Lag (ARDL) methodology, which is shown below, is used to examine the relationship between foreign direct investment (FDI) and industrial production index (IPI) with Pakistan's (GDP).

$\Delta LGDP=Lagged (\Delta LGDP, \Delta LNFDI, \Delta LIPI) +ut$ (2)

Here, LGDP stands for Log Gross Domestic Product, this is a dependent variable. LNFDI stands for Log Net Foreign direct investment and LIPI stands for the Log Industrial production index. These are the independent variables. It stands for white noise errors and Δ shows the first difference of variables.

3.3 Techniques and Tests

There are many statistical techniques and tests to be applied in this study which are given below:

(i) Descriptive statistics
(Mean, Minimum, Maximum, Standard Deviation, Skewness, Kurtosis, Jarque-Bera).
(ii) ADF unit root test
(iii) F-statics bound test
(iv) Johansen co-integration test
(v) Autoregressive distributed lag (ADRL) model

3.4 Descriptive Data

The below table shows the historical data for both dependent and independent variables.

POLICY RESEARCH JOURNAL
ISSN (E): 3006-7030 (P) 3006-7022

Table 3: Historical Data

Year	GDP(Rs.)	$NFDI	IPI(Rs.)
2010	1473570	1634	7647987
2011	1609500	820	7954885
2012	1530886	1456	8234509
2013	1670998	1698	8617618
2014	1759703	1033	9045956
2015	1850811	2392	9636367
2016	1954308	2406	10238755
2017	2013309	2780	10863280
2018	2106126	1362	11039572
2019	2048098	2561	10847295
2020	2073675	1847	11347100
2021	2148097	2061	11847279
2022	2473684	2201	12347100

3.5 Graphically Representation of Descriptive Data

Data Analysis and Explanation

Now, we explain all the tests and techniques that we analyzed in this study and also interpret all the results step by step in detail.

This study's purpose is to find out the relationship of FDI and IPI with Pakistan's GDP. Whether there is a short or long relation and also whether they have positive or negative associations with each other. The results are described below.

4.1 Descriptive Statistics

The outcomes of descriptive statistics show the abstract of the statistics variables. All the variables are converted in the log which gives the more accurate statistics data of variables. The mean value of log net foreign direct investment (NFDI) is 3.23 and the median is 3.22 which shows the center of data. The maximum value is 3.44 which is the largest net foreign direct investment from 2010 to 2022. Same as, all the variables show their mean, median maximum, and other key values. The Jarque-Ber (JB) value of LGDP is 1.04 which shows that the data of LGDP is normally distributed because of Jarque-Bera statics concerning the p-value if its value is higher than 5% then the data shows normality. Other variables Net foreign direct investment (NFDI) and industrial production index (IPI) are 0.71 and 0.58 which also indicates that both variables' data are normally distributed. So, we don't reject the null hypothesis that data is normally distributed. Either we accept the null hypothesis that data is normally distributed.

POLICY RESEARCH JOURNAL
ISSN (E): 3006-7030 (P) 3006-7022

Table 4: Descriptive Statistics.			
	LGDP	**LIPI**	**LNFDI**
Mean	6.258387	6.977722	3.231584
Median	6.267362	6.983913	3.229938
Maximum	6.323484	7.054885	3.444045
Minimum	6.168371	6.883547	2.913814
Std. Dev.	0.055906	0.06239	0.168667
Skewness	-0.3346	-0.197726	-0.47912
Kurtosis	1.647948	1.52046	2.247275
Jarque-Bera	1.043109	1.074985	0.680541
Probability	0.593597	0.584211	0.711578
Sum	68.84226	76.75494	35.54742
Sum Sq. Dev.	0.031255	0.038925	0.284484
Observations	13	13	13

4.2 ADF unit root test

After analyzing descriptive statistics, we apply the Augment Dicky fuller test (ADF) test to see the stationarity of data. Whether the variables are stationary at level or stationarity at the first difference and also at the second difference with trend or intercept. If the p-value is less than 5 % then the variable is stationary. The second method to see the stationary is that if the t-statistics value is greater than plus minus 2 then we also reject the null hypothesis that the variable is not stationary and accept the alternative hypothesis that the variable show stationary. In both methods variables are significant and the p-value is less than 0.5%. In our analysis, both dependent and independent variables are stationary at 1st differences with the intercept. Because all variables are significant and p-values are less than 5%. Also, the T-statistics values for all variables are greater than plus minus 2. The results are given below in Table 5.

Table 5: Result of ADF unit root test

variables	level			1st difference		
	t-statistics	critical value at 1%	p-value	t-statistics	critical value at 1%	p-value
GDP	-1.211484	-4.297073	0.6238	-3.978891	-4.420595	0.0183
CVD	-0.652991	-4.297073	0.8152	-3.743245	-4.582648	0.0288
NFDI	-2.591819	-4.297073	0.1257	-6.041492	-4.420595	0.0014

The Johansen Co-Integration Test is used to determine if there is a long-term link among indicators. It shows if the p-value is greater than 5% and the critical value at 5% and 1% is greater than the trace value and also matches Trace statics Eigen then there is one Co-Integration occurring there. Hence the long-run relationship is occurring. Our outcomes are fully completed and match the above criteria hence it shows that there is a long-run relationship between GDP, NFDI, and also IPI by using the below equation.

LGDP=Bo+B1(LFDI)+B2(LIPI)+ut (3)

The results of Johansen co-integration tests are given below in Table 6 and Table 7. The co-integrating equation has the following form that is given below.

(0.5085) GDP = (0.0401) NFDI+(1.0919) IPI+(0.7161) ut (4)

The above-given outcomes indicate that if net foreign direct investment (NFDI) increases by 1 unit then there would be an increase of 0.0401 units in Pakistan's GDP. If there is a 1 unit increase

in Industrial Production Index IPI so there would be a decrease of 1.0919 units in Pakistan's GDP

Table 6: Johansen co-integration Test (Trace Value Statistics)				
Hypothesis		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistics	Critical value	Prob.**
None *	0.900799	36.41331	30.79707	0.0075
At most 1	0.694592	14.30722	17.49471	0.104
At most 2	0.134646	2.446161	4.841466	0.2291

Trace test indicates 1 co-integrating equ(s) at the 0.05 level, * denotes rejection of the hypothesis at the .05 level.

Table 7: Johansen co-integration Test (Maximum Eigenvalue statistics)				
Hypothesis		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistics	Critical value	Prob**
None*	0.900799	23.10609	20.1612	0.026
At most 1	0.694592	11.86106	16.2646	0.116
At most 2	0.134646	2.446161	4.84167	0.2291

Max eigenvalue that indicates 1co-integrating equ(s) at the 0.05 level, *denotes rejection of hypothesis at 0.05.

4.4 F-Bound Test

After checking the Johansen co-integration Test, we apply the F-bound test to collect another result that the variables have a long-run relationship. Criteria for this test is that if the F-statics value is greater than the upper bound at a 5% level of significance then is long-term relationship occurs. If doesn't match with the above criteria, then there is no long-term relationship occurs. In our outcomes, the F-statics value is 5. 143. The lower bound value(I0) is 3.68 at 5% of significance and the upper bound (I1) value is 4.13. So, the F-statics value is greater and hence it shows the long-run relationship between variables. The outcomes are given below in Table 8.

4.5 Auto Regressive Distributed Lag (ARDL) Model

The Johansen co-integration test shows that there is a long-run relation among variables and also there is a chance of a short-run relation for analysis variables. For this reason, Last, we apply auto-regressive distributed lag (ARDL) to confirm that there is a short or long-run relation among variables. The equation for this model is already given in chapter three equation no.2 The outcomes of the auto-regressive distributed lag model (ARDL) are given below in Table 9.

Table 8: F-statistics Bond Test		
Test statics	Value	K
F-statics	5.143	2
Critical value Bound		
Significant	I0 Bound	I1 Bound
10%	3.15	4.10
5%	3.68	4.13
2.50%	4.41	5.50
1%	5.12	6.36

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Table -9: ARDL Model

Variables	Coefficient	Std-Error	t-Statics	P-value
CointEq1	-0.06085	0.053211	-2.393175	0.0252
D (LGDP (-1))	0.508502	0.630335	3.806717	0.0056
D(LCVD)	-1.091926	0.710018	-2.537885	0.0367
D (LCVD (-1))	-1.39004	0.965891	-3.439127	0.0038
D (LCVD (-2))	-0.774935	0.624578	-1.240735	0.4319
D(LNFDI)	0.04101	0.053067	3.772796	0.0058
D (LNFDI (-1))	0.067692	0.079116	2.855599	0.0449
D (LNFDI (-2))	0.041534	0.059257	0.700909	0.6108
C	2.001949	2.102413	3.952215	0.0041
R-squared	0.947421			
Adjusted R-square	0.57937			
F-statics	2.574158			
Prob(F-statics)	0.047141			
Durbin-Watson statics	2.09665			

The R square value is 0.94% which means that the model is fitted for this data because it is greater than 0.60%. The outcomes of the Adjacent coefficient are very short show a 6.08% short-term deviation towards the other changes in model-dependent variables. Hence only 6.08% of other variables are variances with dependent variables that are not included in this model. In simple, the model is significant and then there is no serial correlation between the variables because the Durbin Watson statics value is greater than 2 which is good for our selected model. The study outcomes indicate that Net foreign direct investment (NFDI) has a positive influence on Pakistan's GDP and another side industrial production index (IPI) has a negative influence on Pakistan's GDP.

CONCLUSION

5.1 Discussion

FDI plays a key role in the improvement of the whole infrastructure, education, gross domestic product (GDP), and other sector that includes towards the development of the nation. The key aim of the research is to investigate the influences of net FDI and industrial production index (IPI) on Pakistan's GDP and also find out where there is a long-term or short-term relationship between Net foreign direct investment (NFDI), industrial production index (IPI) and also Gross domestic product (GDP) of Pakistan. The time series data is taken annually from 2010 to 2022 for getting the results. After that, the data is converted into log form using Excel. In the analysis process first, we apply the Augment dicky fuller test (ADF) test. All the indicators are stationary at 1st differences with intercept. To find out the long-term relationship different tests are applied to check out whether there is a long-term relationship occurring between dependent variables and independent variables. Secondly, we apply the Johansen co-integration test outcomes to indicate that there is a co-integration occurring between variables and also show that there is a long-term relationship occurring between variables. To check more accuracy of the long-term relationship occurring between dependent and independent variables we apply the F-Bound test outcomes also indicate that there is a long-term relationship occurring between a dependent variable and independent variables also supports the Johansen co-integration test outcomes. The co-integration equation indicates that there is a positive association between GDP and net FDI and the other side industrial production index (IPI) and gross domestic product have a negative association. In Last, keep the outcomes of Johnson co-integration and ADF unit root test in mind that shows co-integration between indicators and also all the indicators are stationary at 1st differences. We apply Auto auto-regressive distributed lag (ARDL) model that selects the number of logs automatically based on the number of observations in our study there are 11 numbers of observations so the ARDL model selects only

log 1&2. The outcomes indicate that the adjacent coefficient is 6.08% of short-term deviation toward long-term equilibrium. So, the rate is very short toward long-term relationships, this outcome is acceptable and also satisfied our model and results.

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