FOREIGN DIRECT INVESTMENT AND SECTORAL GROWTH DYNAMICS: EVIDENCE FROM PAKISTAN

Waqas Kamal[1], Syed Muhammad Noaman Ahmed Shah[2], Iqbal Hussain[3], and Syed Mujtaba Ali Nizami[4]

Abstract

This study explores the sector-wise impact of Foreign Direct Investment (FDI) on Pakistan's economic growth using time series data from 1997 to 2022. The research focuses on three key sectors—primary (agriculture), secondary (manufacturing), and tertiary (services)—and employs Johansen Co-integration and Vector Error Correction Model (VECM) to analyze long-run and short-run relationships between GDP and FDI. Results reveal a strong positive long-term impact of FDI in all sectors, with the secondary sector showing the most significant contribution to GDP growth. In contrast, the services sector displays a negative impact, likely due to capital outflow and crowding-out of local businesses. The primary sector, despite potential, faces constraints like low infrastructure and rising unemployment from mechanization. The study recommends targeted policies to attract FDI in the manufacturing sector, improve infrastructure, and ensure technology absorption. Findings emphasize on the importance of sectorial focus to maximize the economic benefits of FDI in developing economies like Pakistan.

Keywords: FDI, Economic Growth, Vector Error Correction Model, Manufacturing Sector, Developing Economics

INTRODUCTION

Foreign direct investment somehow is in one of the major factors of economic growth in developing countries, however there must be some other factors that are also involved in the capital formation and in GDP growth. These factors are categorized through environmental, geographical, political, and by the technological aspects. The purpose of this research is to examine the sector wise impact of foreign direct investment on the GDP of Pakistan. These combined theoretic views created thoughts that there is some relationship between economic growth and foreign direct investment as evidenced through various empirical studies of (Alfaro, 2003), (Zhang, 2003), (Somwaru, 2004), (Kinoshita, 2002) and (Borensztein, 1998) amongst another. For example (Balasubramanyam, 1996) found this in his study that foreign direct investment is more significant and effective in those countries where educated and highly skilled labor force is available and also these countries focusing on promotion of exports rather than substitution of imports trade policies. (Zhang, 2003) concluded this in his study that effectiveness of foreign direct investment is higher in those countries where the policies about foreign direct investment, trade and business are liberal and infrastructure is well developed. (Kinoshita, 2002) reported that foreign direct investment only has positive impact on growth when there will be a pure transfer of technology to the host country. Likewise (Carkovic and Levine, 2005) stated this in their combine work that significant positive impact of foreign direct investment on growth at micro level can be treated as skeptical.

Nowadays though for attracting foreign investors there is some evidence that host countries offer incentives to foreign investors and firms have arisen some questions. To promote this debate there exist experimental suggestions and evidence for positive spillovers due to foreign direct investment to host countries which is unclear at overall micro and macro levels. For example, there were spillovers due to

[1]Lecturer, Benazir School of Business (BSB), Benazir Bhutto Shaheed University Lyari (BBSUL), Karachi, Pakistan. Email: waqas.kamal@bbsul.edu.pk
[2]Assistant Professor, Qasim Ibrahim School of Business (QISB), Villa College, Malé, Maldives. Email: syed.muhammed@lecturer.villacollege.edu.mv
[3]M.Phil. Scholar, Applied Economics Research Centre (AERC), University of Karachi, Karachi, Pakistan. Email: iqbaldadi85@gmail.com
[4]PhD Scholar, Applied Economics Research Centre (AERC), University of Karachi, Karachi, Pakistan. Email: mujtaba311@gmail.com

positive effect of foreign direct investment found in Australia by (caves 1974) and same in Mexico by (Kokko 1994). Though (Hadda and Harrison 1993) and (Aitken and Harrison 1999) did not find the positive spillovers hypothesis in morocco and Venezuela respectively. In 2001 (Henson) stated that the foreign direct investment creates positive spillovers is weak argument. (Lipsey 2002) worked on micro level and he found out that there is positive impact but reviewing from macro level he argued that though consistent relation between foreign direct investment and growth were not present but there is need to investigate all the aspects and circumstances which can cause positive spillovers. (Kinoshita, 2002), (Xu 2000) and (Alfaro, 2003) concluded this that good infrastructure, level of education and well established financial institutions play most important part for positive impacts of foreign direct investment to occur. (Blomstrom and Kokko 2003) suggested that spillovers not occurred easily neither they are automatic, however, local factors plays an important role for adoption of modern and foreign skills and technologies.

Foreign direct investments not only increase the economic growth but also improve the technological infrastructure and increase the employment level of the host country. With better management and good environment for working foreign direct investment puts pressure on local manufacturers which increase the healthy competitive fights in economy that leads increase in production. (Weinhold et.al 2001) concluded that in underdeveloped countries foreign direct investment has been increased more than 17% per year since last two decades. The theories which are common in contemporary literature states that there are multiple ways for foreign direct investment to generate or increase the level of growth of the country. Foreign direct investment increases the amount of capital and financial resources in the country, due to this growth rate of total output also increases. Some other significant channels are through multinational corporations that have advance research and developmental activities. Thus, multinational corporations are also one of the biggest resources of foreign direct investment and technological transfers. From the past 100 years multinational corporations are the major players for foreign direct investment and as such the assets of multinational corporations are often larger than the most economies. In fact, if we take a look of world's 100 largest economies, we found out that 51 economies are multinational corporations (global corporations). This shocking information tells us that the world's economies are running by these multinational corporations. The collective trades of the world's top 200 multinational corporations are far bigger than 25% of the world economic activities which is almost equal to the us GDP ($18 trillion) (Anderson & Cavanagh, 2002).

Foreign Direct Investment in Pakistan: History and Background

The history of foreign direct investment in south Asia is very old but evidently, it starts with the entrance of East India Company in 1604. At the time of partition, the world was divided into two parts (the USA and Soviet Union). Further, just after that, the cold war started which led Pakistan to join American block and India to the Soviet Union. At that time Pakistan got support from foreign in terms of aid and as well as foreign direct investment. In 1960s Pakistan was one of the fast-growing economies at some time, its GDP growth rate was more than 9%. For capital formation, the level of savings and investments are essential. In fact, higher the level of both savings and investment lead to the high levels of capital formation as well. As we know that in underdeveloped countries the level of local savings always lies below the expected level due to the low level of per capita GDP (Khan, 2007). According to World Bank, Pakistan's gross domestic savings as % of GDP was 5.78% in 2019 which was very low. Subsequently, there are multiple ways to fulfill this gap between domestic savings and desired investment and foreign direct investment is one of them (Zaidi 2004). To attract foreign investment for increasing in foreign direct investment liberalized economic policy is required. Government can do many things to get this

position like relaxing controls on financial institutions; offer incentives for example tax concessions and reducing the tariff (Zaidi, 2004).

After the reform and liberalization, there was a boom in foreign direct investment in Pakistan, the inflows of foreign direct investment shifted from secondary sector to tertiary sector as service sector became more important in the world wide, whereas, primary sector was continuously facing insufficient amount of foreign direct investment inflows. Sector wise inflows of foreign direct investment increase the productivity of labor respectively and there are also spillover effects between different sectors in Pakistan. The industrial and service sectors have significant and positive effect of foreign direct investment due to their depth (Sarfaraz, 2018), whereas, agriculture sector also have positive effect but inflow of foreign direct investment is more in services and manufacturing sector than agriculture. Although this sector has great potential to absorb foreign direct investment but it is the most backward sector in Pakistan (Ullah et al., 2012). Ironically, this sector has the more than 21% shares in GDP of Pakistan and it is providing employment to 44% of labor force.

Investment in manufacturing sector is more beneficial than in any other sectors like agriculture or service; to support this conjecture we present examples of two countries which are Pakistan and India. Over the period when India was in the Soviet bloc there was no economic boost in Indian economy from the year 1947 to 1990, however, when Soviet Union broke in parts and India opened its doors to western manufacturers then the Indian GDP increase significantly. On the other hand, foreign direct investment was continuously coming in Pakistan from American bloc especially in military regimes. Although Bhutto's nationalization policy nearly destroyed Pakistan economy but just after him President Zia's regime started in which investors showed there confidence again in Pakistan after the gap of 5 years (1972 to 1977). In 1990s, Pakistan faced the political instability but in 2000s both countries have huge investments from abroad. In Pakistan most of the foreign direct investment, directed to the service sector like telecommunication and banks etc. However, foreign direct investment was also invested in the manufacturing sector like automobiles. Having said that, just after Musharraf's era investors ran out from Pakistan and its economy severely felt this negative shock. But India emerged as one of the most emerging economies, in that period after China.

Problem Statement and Rationale for Research

The effects of foreign direct investment on economic growth are positive and significant, in general. There are so many examples related to the topic, like: a 1% increase in foreign direct investment leads to 0.07% increase in China's GDP (Agrawal, 2011). Moreover, the contemporary literature on sector wise investigation show that there is a positive impact of foreign direct investment in manufacturing sector but a negative impact on agriculture and the results are unclear in service sector (Alfaro, 2003). This study gives the clear picture and it will be added in literature in different ways. (a) This research will talk about the detail information about effects of foreign direct investment in Pakistan's economic growth, (b) In which sector foreign direct investment is more useful? (c) What policy government should implement about gaining more investment, (d) Why the results in agriculture sector are not positive? (e) Finally, we discuss that how manufacturing sector will give positive and significant results regarding foreign direct investment.

Objective of the Study

Main purpose or objective of the study is not only to find out the impact of foreign direct investment on Pakistan's economic growth but suggest and recommend the strategies and policies which can help

government to increase the level of national income through which the living standards will also be better. In this vein, the manufacturing sector has more capability and depth to absorb new technology rather than any other sector because in developing countries foreign direct investment in agriculture sector also has negative impact (Alfaro, 2003). The reason being inadequate infrastructure and increased unemployment (like: using of crushing machine in wheat cutting is prohibited in Punjab province) due to the use of modern technology in agriculture sector. If we take a look of world's economy from past 30 years, we can see the two countries China and |India which are growing rapidly no matter when the World had suffered a great recession in 2007 to 2009. In that period, their GDP continuously grows approximately in between 7% to 9%. Thus, foreign direct investment played an important role in the growth of these two countries according to (Agrawal, 2011). The study shows that if foreign direct investment increases by 1% in China, then it will cause the positive 0.07% increase in the GDP of China. Whereas, a 1% increase in foreign direct investment in India will impact around 0.02% increase in India's GDP.

Review of Contemporary Literature

The modern economic history of humankind tells us that the evidence of foreign direct investment is far too old. However, in modern times we can say that the East India Company is the pioneer of modern foreign direct investment techniques. Though the intentions and history of the East India Company is very harsh and cruel but we cannot take the credit from them to be at the first modern firm to use foreign direct investment for economic gain. After World War II, the dynamics and priorities of the world changed. The United Nations aim to promote economic growth and consequently, IMF and the World Bank was formed. The impact of foreign direct investment in economic growth is clear from the contemporary literature though there are some negative examples as well.

(Solow, 1957) stated this in his growth model (Solow Growth Model) that a country's long run output growth depends upon technological advancements and capital accumulation. However, with all the limitations and weaknesses of the Solow model, technological advancements and capital accumulation are the main determinants of the economic growth of any country in long run, whereas, FDI is a major source of transferring the technology. According to Solow Growth Model if an economy reached at the steady state level than technological advancements will increase the rate of growth. From the last 500 years, those countries who have a greater number of inventions are the richest and their economies are at top. If we explore the world economies we can see that European countries are super powers after medieval time which is also called the Renaissance Era. For them, new inventions and modern technology are the major factor of their growth. Whereas, for the last 200 years, the United States have the largest amount of inventions and thus have the largest economy in the world. In this global era, FDI technology can transfer legally from one country to the other. (Agrawal, 2011)f in his study that foreign direct investment has positive and significant impact on GDP. The author analyzed the cross country data of India and China and he found that GDP will increase by 0.07% if foreign direct investment will increase by 1% in China and a 1% increase in foreign direct investment will increase GDP of India by 0.02%. Further, the study shows that foreign direct investment impacts more positively in China than in India. (Sharma Reetu1, 2013) reports from UN's conference on trade and development that India is at number 3 for foreign investors in 2005 and remain in top 5 countries in 2009. As such Indian economy is preferred by foreign corporations to invest. The study outlined that liberalized and free economy is more attractive to foreign investors. Moreover, developed infrastructure and independent financial institutions are also important for foreign direct investment. Further, there is a positive relation between foreign direct investment and GDP while negative relation between inflation and foreign direct investment denotes the macroeconomic

instability.

In a similar vein, we can develop a theoretical link between economic growth and foreign direct investment with the help of dependency and modernization theories (Adams, 2009). According to modernization theory with the help of capital investment from foreign direct investment there will be economic growth due to the underlying principle that capital investment increases the economic growth (Adams, 2009). Though underdeveloped economies always lack in basic infrastructure like education, political stability, socio economic stability and liberalized financial institutions, so modern growth theories suggest to transfer the technological advancements through foreign direct investment (Calvo and Sanchez-robles, 2002) and (Adams, 2009). Besides transfer of technology there are some other beneficial transfers as well from foreign direct investment like managerial and organizational skills, market reading and marketing techniques (V. N. Balasubramanyam, 1996), (Kumar and Pradhan, 2002) and (Adams, 2009). In 2005, Nath states that foreign direct investment plays double role in economic growth. The author argues that the foreign direct investment not only increases the total factor of production but it also helps economy by capital accumulation. However, according to dependency theories foreign direct investment creates negative impact on both income distribution and growth. Further, due to dependency on foreign investment, foreign direct investment also causes the underutilization of resources because it creates monopolies in manufacturing sector which also means that economy is not working at its potential (Bornschier and Chase-Dunn, 1985) and (Adams, 2009). This means that the country's economy is under the control of foreigners and it is not growing naturally but it grows marginally (Amin, 1974). Thus, there will be no significant impact of multiplier and the growth is stagnant which is not good for any developing economy (Adams, 2009). The study from (Alfaro, 2003) is most relevant to our topic as she analyzed cross country data to find out the effects of foreign direct investment on different sectors. The author found that in primary or agriculture sector, foreign direct investment created negative impact whereas, on service sector the effect is unclear, while the manufacturing sector has a positive impact of foreign direct investment. (V. N. Balasubramanyam, 1996) and (De Mello, 1999) found that foreign direct investment is a mixture of financial and money stock, technology and information, which might easily increase the current stock of economy with the help of managerial exercise, skills and expertise progress, training and structural procedure. Both studies concluded that foreign direct investment has a significant and positive impact on the growth of the economy for developing countries. (Blomstown, M.Lipsey and R.S Zejan, 1996) uses panel estimation to find out that foreign direct investment has a positive impact on economic growth of a country. The researchers' main focus is one developing countries in their paper. (Unciad, 1999) concludes both positive and negative impacts based on the variables included in the model. The variables used are political situation, term of trade, GDP per capita of education and the presence of black economy in the country.(Borensztein, 1998) concluded that the impact of foreign direct investment in a country can vary according to the availability of human capital in the country. The human capital has the absorbing power for the foreign investment and technology flowing in from abroad. The hypothesis and the results are based on the empirical research in that study.(Durham, 2004) concludes that foreign direct investment has insignificant and negative impact on an economy, and the impact of foreign direct investment depends on the technology absorption capacity of a country.

The study of (Bende-Nebende, A Ford, and Santoso, 2003) was an example of the theory stated above. They found that in long run, the impact of FDI is significant and positive in situation of under developing countries like Thailand and Philippines. Though, the effects are negative in the economies, like Taiwan and Japan which have stronger economies. The study further conclude that in the long run foreign direct investment has an overall positive impact on less developed economies but in case of

developed economies the foreign direct investment has negative impact.

Multinational enterprises generate new knowledge and they upgrade local human power plus deduction in the cost of production in hosting countries (Buckley & Casson, 1976). On the other hand, hosting countries requires foreign direct investment to increase their efficiency. Moreover, the additional resources provide impetus to the economic growth especially in labor intensive economies. Further, foreign direct investment and technology improves labor skills and working ability along with infrastructure (Conner, 1991), whereas multinational enterprises prefer countries which have economic, social and political homogeneity (Dunning, 1980). These united markets provide infrastructure, trade patterns, communication, networking structure and availability of inexpensive raw materials to multinational enterprises. Western multinational enterprises follow this regional pattern in Asia, Africa and Latin America to exploit low-cost inputs for international integration (Dunning, 1998).

According to (Vu and Nov, 2009) and in their empirical paper by using sectorial data sets of OECDs six members. They tried to examine the results of foreign direct investment's impact on economic growth sector wise in established and advanced countries. The study used cross country regression and found that there is positive and negatives both impacts of foreign direct investment. It depends on either the level of production of labor or impact on economy directly. They also found various results across sectors and countries. There was positive impact on some sectors and negative on other sectors, financial and real estate sectors have a significant but negative effect. Only quarrying and mining has significant and positive impact of foreign direct investment. The authors further concluded that foreign direct investment in some sectors is more effective and labor productive and that the productivity is varying from sector to sector. The expected aspects did play a crucial role in the improvement of foreign direct investment (Reuber, 1973) but fiscal policy (tax regulations) and stability in political situation also inclined investment decisions especially in developing world (Dunning & Enterprises, 1993). (Sharafat, 2014) concludes that foreign direct investment and inflation in the long run have negative impact on the economy of Pakistan. He uses the Johannsen co-integration technique and the granger causality for his analysis and covers the period from 1972 to 2013.

(Javaid, 2014) studies the impact of foreign direct investment on the gross domestic product of Pakistan. The researcher took data from 1966 to 2014. The method used is autoregressive distributed lag-error correction model (ARDL-ECM) technique to find the results both in the short term and long term. The report concludes that foreign direct investment has significant and positive impact on the GDP of Pakistan both in the long and short term. The inflation and population growth also shows significant effect on the GDP in the long run, lastly the gross fixed capital formulation (gfcf) and trade have no significant effect on the economic growth of Pakistan. (Alam, 2008) found in his study that the countries which were in former USSR gain significant level of economic growth in past years after the collapse of Soviet Union because of increase in foreign investment. The author also found that the increase in level of productivity growth is one of the major factors in economic growth. As productivity increases it tends to increase in overall level of investment and profit. Furthermore, increasing in labor wages leads to improve the living standard which increases level of productivity. The study restricted to three major sectors like primary (agriculture), secondary (manufacturing) and tertiary (services). Allocated resources to related sectors faced direct positive effects of sectorial productivity growth and also affected the labor too. As investment increased in those sectors (secondary and tertiary) which are flexible and holding the depth to absorb technology which increases labor productivity. Further, labor also move to those sectors from less compensated sector (primary). When labor move to those sectors the level of production also increased in those sectors as well. Thus, the study also states that the isolation of labor can't determine the production

level of labor where sector wise productivity and productivity of labor are linked and rely on each other. (Khan, 2011) found that in Pakistan, foreign direct investment causes growth in services and primary sector whereas in manufacturing sector the growth caused the foreign direct investment. The study used panel co-integration and granger causality on the data from 1981 to 2008, and found that in long-run there is an evidence of causality between foreign direct investment and GDP whereas short run results states that there is two ways causality between foreign direct investment and GDP. (Sarfraz, 2017) investigated the sector wise impact of foreign direct investment on labor productivity, she used panel data from 1997 to 2016, she concluded that foreign direct investment has a positive impact on labor productivity in different sectors of Pakistan while she also found that there is spillover effect in different sectors. (Adeel Ahmad Dar, 2016)) used VECM to analyze the sector wise impact of foreign direct investment. The study compiles the data because in Pakistan the proper sector wise data of foreign direct investment is unavailable. The author puts nutrition, drinks, tobacco, sugar, leather and leather goods, pulp and paper, latex and latex goods in primary sector whereas elements and compounds, medicines and fertilizers, petrochemicals and fuel purifying, mining and quarrying, cement, elementary metals, metallic goods, gas exploration economic groups, heavy and light machinery other than electrical, electrical equipment, electronics, transportation equipment, construction, power and lubricant used for manufacturing and wholesale and retail trade, traveling and tourism, transportation, storing and communication, monetary businesses for tertiary sector. Further, the study lacks to find any relation between foreign direct investment and GDP. (Amna et Al., 2010) explore the data from 1981 to 2010, to study the impact of foreign direct investment on economic growth of Pakistan. The researchers use multivariate regression to estimate the model. The paper concludes that foreign direct investment has positive and significant impact on the economic growth of Pakistan.

For capital formation the level of savings and investments are essential. In fact, higher the level of both these savings and investment the level of capital formation will also be high. As we know that in underdeveloped countries the level of local savings always lies below the expected level due to low level of per capita GDP (Khan, 2007). According to the World Bank, Pakistan's gross domestic savings as % of GDP was 5.78% in 2019 which is very low. There are multiple ways to fulfill the gap between domestic savings and desired investment. To which, the foreign direct investment is one of them (Zaidi, 2004). To attract foreign investment for increase in foreign direct investment, liberalized economic policy is required. Government can do many things to get this position like relaxing controls on financial institutions, offer incentives, for example; tax concessions and reducing the tariff (Zaidi, 2004). Underdeveloped countries which are trying to get foreign investors attentions for investments in their country can get benefits from liberal trade and business policies which will help them to reduce their trade deficit. Hence, these countries need to focus on export-based sectors for investment. To confirm that foreign direct investment encourages local economy and business activities, host country must need to make policies which lead foreigners to utilize a healthy amount of domestic manufactured products and raw material for producing the finish item and final product (Zaidi, 2004). The local policies played an important role for host countries to get handsome amount of foreign direct investment from foreign investors. The host economy needs to implement business friendly and concrete policies. Further, developed infrastructure is called to be pre-requisite for attracting foreigners to invest in any economy. According to some economists there will be some negative impacts of foreign direct investment as well. The main reason of negative impact of foreign direct investment is due to bad governance and corruption in the contemporary literature. We have added some reviews which supports the negative impact of foreign direct investment. There is some evidence of negative impact of foreign direct investment on

primary sector in developing countries this is because foreign direct investment increases the productivity of labor or the technology which is mostly capital abundant, consequently reduces the labor which caused unemployment (Kirti and Prasad, 2016). Foreigners have their own interests, there are some evidences about observing that host country suffered from huge loss of natural resources and sometimes serious health problems due to the technology which were used to took out the minerals. Especially in African countries these problems created some bad law and order situations and Solomon Island is one of the example of health issues due to biased interests of foreign investors.

However, even when a country's investment environment is congenial to invest, there must be the presence of biased foreign interest as well. As we know that, state to state relations depend on mutual benefits and interests, for example: when Soviet Union was strong and India was part of soviet bloc there were no western investment in India. In fact, the American bloc invested in Pakistan and they support the economy at that time but as Soviet Union collapsed, Western foreign direct investment increased very rapidly in India, whereas in Pakistan, the Western interest ends with Soviet Union, so there investment too. However, after 9/11 their investment increases rapidly due to the US self-interest in this region. But as the USA retired from the Afghan war their interest and investment both were retracted again.

METHODOLOGY AND TECHNICAL APPROACH

In the case of Pakistan, researchers have used different approaches to find out the relation between foreign direct investment and growth. In contemporary literature panel data approach was common in all studies like (Khan & Khan, 2011) and (Daar, Taj, & Bhatti, 2016). Some literature has time series analysis as well, but not in the case of Pakistan (Alfaro 2003). The relation between GDP and foreign direct investment is one of the most wrongly estimated one. In this matter, to get the best model and to avoid mis specified modeling problem, we focused on the most relevant literature.

Pakistan has a very dramatic and weird history of foreign direct investment. Actually Pakistani economy is connected with international politics and it is a very influential factor which affects Pakistan's economy. Apart all from this in Pakistan, foreign direct investment is a very important source of investment for years. It is very difficult to find the data in developing countries same as Pakistan, as we mentioned that foreign direct investment simultaneously impacts on three major sectors (primary, secondary and services). In this regard, we have to compile the data from different sectors. To achieve this objective we put nutrition, drinks, tobacco, sugar, leather and leather goods, pulp and paper, latex and latex goods in the primary sector. Whereas elements and compounds, medicines and fertilizers, petrochemicals and fuel purifying, mining and quarrying, cement, elementary metals, metallic goods, gas exploration economic groups, heavy and light machinery other than electrical, electrical equipment, electronics, transportation equipment, construction, power and lubricant used for the manufacturing sector. Finally, the wholesale and retail trade, traveling and tourism, transportation, storing and communication, monetary businesses are included in tertiary sector. (Khan & Khan, 2011) used Pedroni's (1999) panel cointegration technique to check the cointegration between variables and for relation they used panel dynamic least square technique. The study found out that in Pakistan foreign direct investment causes growth in services and primary sector whereas, in manufacturing sector foreign direct investment attracts when there is growth present or growth caused the foreign direct investment. (Daar, Taj, Bhatti, 2016) have used panel cointegration VECM to find the relation between growth and foreign direct investment and they found that in panel approach results were signified in both short run and long run relationship among foreign direct investment and GDP. But they did not find sector wise relationships. Hence, foreign direct investment has showed short run relationship with GDP only in primary sector. So,

there is a wide variety of techniques in contemporary literature to find out the relation and cointegration between GDP and foreign direct investment. In this vein, let us focus on our estimation technique with the help of contemporary literature.

In this study, we have used time series data and the methodology consists three parts. To check the unit root in time series data there are many tests but in this paper, we have applied Augmented Dicky-Fuller test, as per our unit root test results, we have used Johansen Cointegration test for cointegration between variables in the second part, whereas, in the third step VECM is used for exploring the short run relation.

Models and Functional Specifications

To estimate the sector wise impact of foreign direct investment on growth, we made three different functions which examine the results of individual sectors. In this matter, only core variables are replaced in every model whereas, control variables are remains unchanged. Further, all the variables are in log form because log compressed the large values and it will convert ordinary function into elasticity (the percentage change that we are trying to investigate). Specific equations are as follows:

Model 1

$$\mathbf{LogGDP= \beta_0 + \beta_1 LogFdi\_pri + \beta_2 LogGFCF + \beta_3 LogER + \beta_4 LogInflation + u_i}$$

Model:2

$$\mathbf{LogGDP= \beta_0 + \beta_1 LogFdi\_sec + \beta_2 LogGFCF + \beta_3 LogER + \beta_4 LogInflation + u_i}$$

Model:3

$$\mathbf{LogGDP= \beta_0 + \beta_1 LogFdi\_ser + \beta_2 LogGFCF + \beta_3 LogER + \beta_4 LogInflation + u_i}$$

Gross Domestic Product = Gdp
Foreign Direct Investment for Primary Sector = Fdi_Pri
Foreign Direct Investment for Secondary Sector = Fdi_Sec
Foreign Direct Investment for Services Sector = Fdi_Ser
Gross Fixed Capital Formation = Gfcf
Exchange Rate = Er
Inflation = Inf

Data

Our research is to examine the impact of foreign direct investments on the GDP of Pakistan sector wise over the time period of 1997 to 2022. Our data source is from World Development Indicators of the World Bank which is the most reliable source of data collection and the State Bank of Pakistan. For our model, GDP is used for economic growth which is dependent variable while independent variables are foreign direct investment (FDI), gross fixed capital formation (GFCF), exchange rate (ER) and inflation (Inf). The gross fixed capital for local investment and exchange rate can cause the multicollinearity but historically it has a direct relation with foreign direct investment. In this research, secondary data is used to find the sector wise impact of foreign direct investment in Pakistan. The data of foreign direct investment is taken from the State Bank of Pakistan; the data for other variables have taken from the World Bank's Database. Data have used from the year 1997 to 2022.

Other major data sources are as follows:

- World Bank's Pakistan Data Base

- Economic Survey of Pakistan (ECP)
- Pakistan Statistical Year Book
- State Bank of Pakistan Statistical Handbook

Theoretical Justification

Gross Domestic Product (GDP)

GDP is a degree and measure of financial and economic doings of any country. For a precise era of time, it highlights the entire market worth of both services and goods within geographic boundary of a country. When government spends money on expenditures, government itself be a part of GDP but these expenses are commonly improving the growth rate of economy (Keynes, 1936). From such expenses, countries develop their infrastructure, provide better health and education facilities to their citizens which made them skilled and increase their productivity. Hence, the contemporary literature often used GDP as the proxy for economic growth.

Foreign Direct Investment (Fdi)

Foreign direct investment is the investment which is done by a country or individual into another country. The foreign direct investment is different from direct investment like portfolio investment which invested directly into the stock exchange. According to most of the economists' foreign direct investment has positive significant impact on GDP while some economists believe that foreign direct investment impacts negatively. In this study, we have used foreign direct investment in different sectors. For this purpose, we compiled the data from different sectors to form three major sectors such as Primary, Secondary and Services. Hence, for this compilation, we have used same sectors which were used in previous papers (Ayesha Sarfaraz, 2017), (Khan & Khan, 2011) and (Daar, Taj, Bhatti, 2016).

Note: The Fdi of primary and services sector contains negative values and log of negative values is not defined so following the usual practice of precedents in the field we made them positive by adding highest negative figure.

Gross Fixed Capital Formation (Gfcf)

Gross fixed capital formation is used for domestic investment. It represents governments, individual households and firms' existing and new resources. There are some contradictions because "Gfcf" not tells the net value as there was no disposal of assets which are fixed inside the economy. In Gfcf, mineral reserves, subsoil assets and water forests are excluded and only land value is included.

Inflation (Inf)

Inflation can be used as a proxy for macroeconomic instability and it is normally occurred because of uncertainty. In the case of Pakistan, uncertain political conditions caused major economic instabilities especially in 1990s which causes the real decline in foreign direct investment. From the theories there is a negative relationship between instability and economic growth (Fischer, 1993) and (Bruno and Easterly, 1998). If there is instability and it's increasing so government will use more money and funds to stable the economy. This can be control from annual inflation rate (Ogbuagu, Patricia and Ifionu, 2013). Inflation as a proxy of uncertainty reduces the level of FDI. When there is inflation, it will increase the prices of domestic inputs which lead to increase the production cost.

Exchange rate (ER)

Exchange rate has a direct relation with foreign direct investment. As the exchange rate is higher the chances of foreign direct investment is also high because there will be low cost and high profit. The exchange rate is defined as the amount of local currency given for the one unit of foreign currency. In our study we took USD ($) to foreign currency, high exchange rate causes the slower growth of GDP.

Table 1
Summary of Data Source

Original Data	Sources	Transformation	Form of Variable
GDP, Constant Prices in USD.	WB	No Transformation applied.	Log(GDP)
FDI Primary Sector Stock, Current Prices in USD.	SBP	No Transformation applied.	Log(FDI_pri)
FDI Secondary Sector Stock, Current Prices in USD.	SBP	No Transformation applied.	Log(FDI_sec)
FDI Services Sector Stock, Current Prices in USD.	SBP	No Transformation applied	Log(FDI_ser)
Inflation	WB	N/A	Log(Inf)
Exchange Rate (Yearly Average)	WB	No Transformation applied	Log(ER)
GFCF(Constant LCU)	WB	No Transformation applied	Log(GFCF)

Note: SBP; *State Bank Of Pakistan*, *WB; World Bank*

EMPIRICAL ANALYSIS

In this section we are going to discuss the empirical results occurred from the given data, as per methodology, first we will check the unit root results and discuss them. In the second part, we will be going to examine the results from co integration results. As per unit root results, Johansen Co integration test have been applied to check the co integration between variables. Finally, in the third step, short run relationship will be discussed from Vector Error Correction Model.

Table 2
Summary of Unit Root Results

Variables	Test critical values: 5% level	Difference order	t-Stat at level	Prob.*	t-Stat at 1st Df	Prob.*
LogGDP	-3.020	I(1)	-0.079	0.939	-4.021	0.006
LogFdi_pri	-3.020	I(1)	-2.529	0.123	-4.890	0.001

LogFdi_sec	-3.020	I(1)	-1.002	0.731	-4.793	0.001
LogFdi_ser	-3.020	I(1)	-2.953	0.057	-5.678*	0.000
LogInf	-3.020	I(1)	-1.836	0.353	-4.791*	0.001
LogGfcf	-3.020	I(1)	-0.136	0.932	-3.051*	0.051
LogER	-3.020	I(1)	-1.346	0.586	-3.093*	0.045

Note: * Significance at 5%.

Unit Root Results & Discussion

Table 2 is showing the summary of the results of unit root test, for this purpose Augmented Dicky-Fuller (ADF) has been used. The Augmented Dicky-Fuller (ADF) is the most common and reliable test to check the unit root in time series data. First, we check our variables at level and found that our variables had unit root at level, this non stationary problem often occur in time series data which creates problem but all of our variables are stationary at 1st difference level. Our unit root test results guide us for further testing as we know that if we have all our variables stationary at first difference so we can use Johansen co integration test for long run relation.

Johansen's Cointegration Test

First we check the co-integration for primary sector, results based on trace statistics are shown in table below,

Primary Sector

Table 3

Cointegration Result Based on Trace Statistics (For Primary Sector)

Trace Test Result for CoIntegration Trace Statistics					
Null Hypothesis	**Alternative Hypothesis**	**Eigen Values**	**Trace Statistics**	***Critical Values at 5%***	**Prob.****
c=0	c=>1	0.848700	87.57756*	69.81889	0.001
c<=1	c=>2	0.686926	51.69622*	47.85613	0.020
c<=2	c=>3	0.439063	29.63120*	29.79707	0.052

(*) indicates statistical Significance at 5%

According to the results based on trace statistics there are three co integrating equations between the variables which mean there is long run relation between the LogGDP, LogFdi_pri, LogER, LogGFCF and LogInf. The value of trace statistics (87.57756) is greater than critical value (69.81889). According to these values null hypothesis which states that there is no co integration is rejected, followed by our results there are three co integrating equations.

Table 4

Cointegration Result Based on Max Eigen values (For Primary Sector)

Trace Test Result for Cointegration Trace Statistics					
Null Hypothesis	**Alternative Hypothesis**	**Eigen Values**	**Max Eigen Statistics**	***Critical Values at 5%***	**Prob.****
c=0	c=>1	0.848700	35.88134*	33.87687	0.002

c>=1	c=<2	0.686926	22.06502	27.58434	0.217

(*) indicates statistical Significance at 5%

Table 4 shows the results based on max eigen values statistics. According these results there is one co integrating equation shown in the table in row one, though the relation is weak but co integration is presence between variables.

Secondary Sector

Results with foreign direct investment of secondary sector are presented in table 5.

Table 5

Cointegration Result Based on Trace Statistics (For Secondary Sector)

Trace Test Result for Cointegration Trace Statistics					
Null Hypothesis	**Alternative Hypothesis**	**Eigen Values**	**Trace Statistics**	***Critical Values at 5%***	**Prob.****
c=0	c=>1	0.995101	146.0067*	69.81889	0.000
c<=1	c=>2	0.722982	44.94931	47.85613	0.0914

(*) indicates statistical Significance at 5%

Table 5 shows the results based on trace statistics. There is one co integrating equation present in the results which states that there is a long run relation between variables, there are multiple reasons of this weak co integration between variables. However, most important is the data constraint, we only have data of 20 years and we need at least 30 years of data to check the relation between variables.

Table 6

Co-integration Result Based on Max Eigen values (For Secondary Sector)

Trace Test Result for Cointegration Trace Statistics					
Null Hypothesis	**Alternative Hypothesis**	**Eigen Values**	**Max Eigen Statistics**	***Critical Values at 5%***	**Prob.****
c=0	c=>1	0.995101	101.0574*	33.87687	0.0000
c<=1	c=>2	0.722982	24.38980	27.58434	0.1217

(*) indicates statistical Significance at 5%

Table 6 is showing the results which are based on Max Eigen statistics values, in secondary sector. There is one co integrating factor between variables in both Trace statistics values and in Max Eigen values according to this there is weak co integration between variables and the reason behind this weakness elaborated earlier.

Services Sector

Results of service sector are shown in table 7(Trace Statistics) and Table 8 (Max Eigen values).

Table 7

Cointegration Result Based on Trace Statistics (For Services Sector)

Trace Test Result for Cointegration Trace Statistics					
Null Hypothesis	**Alternative Hypothesis**	**Eigen Values**	**Trace Statistics**	***Critical Values at 5%***	**Prob.****
c=0	c=>1	0.859527	89.12556*	69.81889	0.0007

c<=1	c=>2	0.683764	51.83352*	47.85613	0.0202
c<=2	c=>3	0.586925	29.95948	29.79707	0.0479

(*) indicates statistical Significance at 5%

There are three co integrating equations between the variables in service sector according to the results based on Trace statistics values. These results are supported due to the fact that there were huge amount of foreign direct investment came in Pakistan in primary and services sector specially in Gen Musharraf's era. The services sector was at boom because of telecommunications and financial sector. There were lots of new cellular networks arrived in Pakistan at that time and banking sector were also in great position as lots of new banks started their services in Pakistan during this era..

Table 8

Cointegration Result Based on Max Eigen values (For Services Sector)

Trace Test Result for Cointegration Trace Statistics

Null Hypothesis	**Alternative Hypothesis**	**Eigen Values**	**Max Eigen Statistics**	***Critical Values at 5%***	**Prob.****
c=0	c=>1	0.859527	37.29205*	33.87687	0.0188
c<=1	c=>2	0.683764	21.87404	27.58434	0.2269

(*) indicates statistical Significance at 5%

According to Max Eigen values statistics results there is a weak long run relationship one co integrating equation between variables LOgGDP, LogFdi_pri, LogER, LogGFCF and LogInf have long run relationship?

LONG-RUN COEFFICIENTS RESULTS & DISCUSSION

In this section we are going to discuss the long run coefficients for every sector. In this matter, all the three main variables are significant and all the control variables are also significant except inflation in model three, the reasons will be explored in the discussion for services sector section.

For Primary Sector

Table 9

Normalized Coefficients of Integration (Primary Sector)

Variables	**Coefficients**	**Std. Err**	**t-values**
LogFdi_pri	0.364617*	0.04300	8.4794
LogGFCF	-1.559018*	0.36880	-4.2272
LINF	0.210292*	0.07433	2.8290
LogER	1.194753*	0.16175	7.3883

*,** Shows significance at 1% and 5% .

In this section, we are going to discuss the results of long run coefficients of the variables. Table 9 shows the coefficients of the model for Primary Sector, in this model LogFdi_pri is our core and main variable whereas LogGFCF, LogINF and LogER are control. The results are clearly showing that our main variable is significant, and it has a positive impact on the GDP as compare to the previous literatures like (Alfaro 2003) and (Daar et al., 2016). The results suggesting that it has a huge impact on GDP as the coefficient states that when Foreign Direct Investment increases from 1% it will cause a 0.36% increase in the GDP. Results of control variables are similar to the theory except LogGFCF. There are multiple reasons for that, like may be labor is growing rapidly than the capital. So, when a country is labor

abundant and producing labor intensive commodities than this kind of negative relation occurred. Further, when capital has a higher depreciation rate it will also cause negative relation between GFCF and GDP. Sudden increase in population can also cause this, like migration from neighboring countries (migrant from Afghanistan due to 9/11 incident and Afghan war). In the case of Pakistan *Fdi* in primary sector causes unemployment because the developing countries who are labor abundant, technological advancements sometime caused unemployment especially in agriculture sector. Moreover, coefficient of inflation is positive as some economists believe that inflation is good and it has a positive relation with growth. This inflation may be occurred with higher rate of growth, in Gen. Musharraf era from 2002 to 2007 Pakistan's GDP was increasing rapidly.

For Secondary Sector

Table 10

Normalized Coefficients of Integration (Secondary Sector)

Variables	Coefficients	Std. Err	t-values
LogFdi_sec	1.043036*	0.02605	40.0397
LogGFCF	-1.541789*	0.07685	-20.0611
LINF	-0.093791*	0.01270	-7.3850
LogER	0.948209*	0.01841	51.5326

*,** Shows significance at 1% and 5% .

Table 10 is showing the results for the model of Secondary sector here we have higher coefficient and very high t statistics values which indicates that there is a very strong long run relation and impact of secondary sector's foreign direct investment on GDP. In this model LogFdi_pri is our core and main variable whereas LogGFCF, LogINF and LogER are control variables. During the time of our data period lots of investment came in automobile sector such as motor bike manufacturing. All the variables are significant in this model. The negative sign of LogGFCF has discussed in model for primary sector's section whereas the sign of Loginf is positive in model 1 but here we have negative relation between inflation and growth. Hence, both the signs are theoretically correct. The previous literature such as (Khan & Khan, 2011) and (Daar, Taj, Bhatti, 2016) didn't find positive and significant relation between secondary sector's FDI and growth but according to our results there is a significant and positive impact of foreign direct investment of secondary sector on GDP. This difference of results may be due to the time difference as we know from 2015 there is a huge amount of foreign direct investment coming in secondary sector especially in power and construction sector after CPEC (China Pakistan Economic Corridor). CPEC is called a game changer in Pakistan economy. However, there is lots of things which are still unclear yet. Although apparently it seemed to be very beneficial for Pakistan because of huge amount of investment in power sector, as power and electricity shortage is the biggest problem for Pakistan since last 10 years.

For Services Sector

Table 11

Normalized Coefficients of Integration (Services Sector)

Variables	Coefficients	Std. Err	t-values
LogFdi_ser	-0.090470*	0.01434	-6.3089
LogGFCF	2.760640*	0.21281	12.9723
LINF	0.008238	0.03194	0.2579

LogER	0.616239*	0.09925	6.2089

*,** Shows significance at 1% and 5%

Our main purpose of this study to find out that in which sector FDI is more significant and effective. During 2002 to 2008 there were huge amount of foreign direct investment came in Pakistan, especially in IT and Financial sector. Lots of new cellular companies and software manufacturers started their businesses in Pakistan. Whereas, new banks and financial institutions were also arrived which helped economy to grow and the GDP in that period was increasing more than 6 to 7% a year. However, as we can see that there is a negative impact of Fdi in services sector on growth. As we know that foreign direct investment can cause crowding out and crowding in both effects to host country's economy (Agosin and Mayer, 2002). During our data coverage period there can be multiple reasons for this negative impact. May be the recipient country earned more and the capital outflowed from host country (Sharafat, 2014). Monopoly could be another reason of this negative impact. Further, host countries (capital starved economy) sometimes offer special shelter and incentives to foreign investor which discourages local investors. Hence in Pakistan, nepotism and corruption are also one of the main reasons. All the other variables LogGFCF, LogInf and LogER have positive significant impact on GDP in the short run.

SHORT RUN RESULTS AND DISCUSSION

Table 12
Short Run: Error Correction Results

Variables	Coefficient	T-stats .
CointEq1 (Primary sector)	0.018350	0.25897
CointEq1 (Secondary sector)	-0.219725	-2.52237
CointEq1 (Services sector)	0.064257	0.41189

Table 12 is showing the ECM results. There is a cointegrating equation only in secondary sector; these results are showing that only Secondary sector has a short run relation between GDP which is our main hypothesis (foreign direct investment is more effective in secondary sector). This is because secondary sector has more potential and capacity, (specially the manufacturing and industrial sector) to absorb technology rather than other two sectors. Although primary sector also has great potential to absorb Fdi but it will cause unemployment in countries, like Pakistan who is labor abundant. Consequently, it will harm the economy to counter this issue, like the use of wheat crushing machines were banned in the Punjab province.

CONCLUSIONS

The main purpose of this research is to explore the sector wise impact of foreign direct investment on economic growth in Pakistan. Further, we inquire which sector using the foreign direct investment is more beneficial to the host economy. For this we used Johansen cointegration and ECM techniques for empirical analysis. Our results showed that there is a long run relation between GDP and FDI in every sector but our short run results are showing that in the secondary sector there is a significant relation between FDI and GDP. Post liberalization period expresses that there is a huge amount of foreign investment arrived in Pakistan and the preference was a shift to service sector from manufacturing sector. During this period lots of financial institutes started their operations in Pakistan while agriculture and food sector supported primary sector. The International food chains arrived in Pakistan during this period

like KFC, McDonalds etc. According to Robert Solow, technological advancements is one of the major factors of growth when an economy is at steady state. The technological shifts can increase the rate of growth through every sector has great potential to absorb technology but secondary sector has more capability because it will be beneficial to labor abundant economies. Further, it is beneficial for capital abundant nations as well. We know that technology reduces human efforts so those countries who are based on agriculture face the problem of unemployment because of the technology. Consequently, governments need to provide alternate employment options to counter this issue. Technology in secondary sector creates new opportunities of employment. China and India are the best examples of this, at the pre liberalization period. Although both economies have a large domestic market but they were not in the position to match with developed economies. However, when they both liberalized their economies and welcomed the foreign investors their rate of growth increased rapidly and now they both are in the top 10 economies of the world. Pakistan economy is directly connected to the international economy. The international politics directly affects Pakistan's economy. So, FDI in service sector is not effective to transfer technology except software manufacturing. We conjecture that it is part of the manufacturing sector so it must have to fall in the secondary sector. Although FDI can bring managerial betterment as well but technological transfer is more important for growth because when capital shifted local investment can use the technological advancement. In turn it will be beneficial during the time of foreign investment in Pakistan. For this, the pharmaceutical industry is one of the most appropriate examples. The foreign owners sell their assets to domestic investors which used them efficiently, whereas, the pharmaceutical sector is still having a noticeable share in exports. On the other hand, after Gen. Musharraf and shifts in international politics, foreign investment in service sector also eroded and Pakistan's financial sector faced decline (lots of mergers were done in this time especially in banking sector).

Effects of Covid-19

As the world has suffered from a global pandemic of corona virus (Covid-19), it affected the whole world in every aspect specially the health sector and the economy of the world. This pandemic destroyed the whole economy of the world specially the manufacturing, aviation and the tourism sectors. Though this pandemic, almost every sector of the economy was affected. However, we can get some positivity from this scenario. We have divided whole economic sector in three major sectors so to check the impact of this pandemic. This pandemic effect the secondary sectors the most because people focused to necessities rather than luxuries. Consequently, primary sector will get help from agriculture and food sector. Although tourism is almost ended due to this virus but service sector can get support from entertainment and IT industries. After this pandemic economist needs to focus on agriculture and entertainment sector rather than industrial sector because after food, clothes and shelter, the entertainment is a necessity now and not a luxury commodity.

REFERENCES

Adeel Ahmad Dar, H. M. (2016, May). *https://www.pide.org.pk/psde/index.php/14-sample-data-articles/127-32nd-agm-papers*. Retrieved from https://www.pide.org.pk/psde/pdf/AGM32/papers/FDI%20and%20Economic%20Growth%20in%20Pakistan.pdf

Agrawal, K. (2011, October). *www.ccsenet.org/ijbm*. Retrieved from http://dx.doi.org/10.5539/ijbm.v6n10p71

Alfaro, L. (2003, May). *www.researchgate.net*. Retrieved from :

https://www.researchgate.net/publication/228966060

Anderson,S., & Cavanagh,J. (2002). *STATE OF THE DEBATE on the Free trade Area of the Americas.*Institute for Policy Studies.

Borensztein, E. (1998, may). *www.olemiss.edu*. Retrieved from https://olemiss.edu/courses/inst310/BorensztеinDeGLee98.pdf

Doytch,N,(2014,September).https://www.unescap.org/sites/default/files/FDI_by_industries_Asia_preliminary_Nadia%20Doytch.pdf

Khan, M. A. (2011). *www.pide.org.pk*. Retrieved from http://www.pide.org.pk

Kinoshita, N. F. (2002, April). *www.papers.ssrn.com*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=307094

Sarfraz, A. (2017, September). *www.researchgate.net*. Retrieved from https://www.researchgate.net/publication/319527174_Ayesha_Serfraz_Foreign_Direct_Investment_Inflows_and_Labor_Productivity_in_Pakistan_A_Sector-Wise_Panel_Cointegration_Analysis

Serfraz, A. (2018). Foreign direct investment inflows and labor productivity in Pakistan: A sector-wise panel cointegration analysis. *Asian Journal of Economics and Empirical Research*, *5*(1), 1-18.

Sharafat, A. (2014, January). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2418056

Sharma Reetu1, K. N. (2013, Feburuary). *www.managementjournal.info*. Retrieved from https://pdfs.semanticscholar.org/a0ed/b2ec779967c1ffe296089d9ec76cb9aa827d.pdf?_ga=2.192501929.203903412.1579882636-242777329.1579882636

Somwaru, S. S. (2004, August). *www.econpapers.repec.org*. Retrieved from https://onlinelibrary.wiley.com/doi/abs/10.1111/j.0002-9092.2004.00627.x

Ullah, A., Khan, M. U., Ali, S., & Hussain, S. W. (2012). Foreign direct investment and sectoral growth of Pakistan economy: Evidence from agricultural and industrial sector (1979 to 2009). *African Journal of Business Management*, *6*(26), 7816.

V. N. Balasubramanyam, M. S. (1996, january). Retrieved from www.ideas.repec.org: https://www.jstor.org/stable/2234933?seq=1

Zhang, K. H. (2003, January). *www.karyiuwong.com*. Retrieved from http://karyiuwong.com/confer/beijing06/papers/zhang.pdf