IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

Impact of Sector-Specific FDI on Growth in India

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ABSTRACT

It is widely believed that foreign direct investment (FDI) has the potential to stimulate economic growth and consequently, attracting FDI has for long been an integral policy objective for the Indian Government. This paper aims to analyze the impact of FDI, both aggregate and sector-level, on the economic growth of India. Time series regression analysis is undertaken for the Indian economy over the period 2006-07 to 2019-20. The findings indicate that the total FDI inflows positively influence GDP. However, it is noteworthy that this effect is not uniform across sectors – FDI in the primary sector has an adverse effect on growth, while those in the secondary and tertiary sectors have beneficial outcomes.

KEYWORDS

Foreign Direct Investment, Growth, Sector, Gross Domestic Product, Indian Economy .

JEL CLASSIFICATION

F21, F43

I. INTRODUCTION

Foreign Direct Investment (FDI) is an investment by a foreign investor (an individual, a company, or some other entity) residing in one country, in a business entity in another country, which reflects a lasting or controlling interest. They are one of the most preferred forms of capital inflows owing to their stable and non-debt creating nature. The policies and regulations related to FDI in India have undergone a striking change since Independence.

Pre-1980, Government policies towards FDI were highly selective in nature and the Foreign Exchange Regulation Act, 1973 imposed even tighter restrictions on foreign investment in India. It is not a surprise that consequently, the average annual FDI inflows from 1970-1979 was merely around $37.3 million (United Nations Conference on Trade and Development – UNCTAD online database). The adoption of the Industrial Policy Statement (1980 & 1982) marked the start of liberalisation of FDI and trade policies in and helped improve the foreign investment scenario. From 1980-1989, India recorded average FDI inflows of $104.7 million per annum, almost threefold of the figure in the previous decade.

There is little doubt that India's efforts towards reform in 1991 have had a positive impact on foreign direct investment (FDI) inflows. The ratio of FDI stocks to GDP has seen a significant rise, going from less than 1% during the late 1980s and early 1990s to nearly 6% in 2004. (According to the Asian Development Bank's report in 2004, a significant alteration is predicted in the conduct of overseas investors and the advantages that recipient nations could gain from foreign direct investment after the modification of the policy environment.) Besides the 1991 Economic Reforms, the enactment of other measures in the 1990s such as the introduction of a dual route[1] and increase in investment limit by Non-Resident Indians (NRIs) in high priority sectors to 100% further boosted FDI inflows.

In recent years, the Indian Government has taken many steps to attract FDI into the country. This has been done by increasing the FDI limit in various sectors – (a) Retail – restricted until early 2006, and then raised from 51% to 100% in 2012; (b) Defence - from 49% to 74% in 2020 under the automatic route, and up to 100% through the government route; (c) Telecommunications – from 49% to 100% under the automatic route, in 2021. Moreover, institutions and platforms such as National Investment and Infrastructure Fund Limited (NIIFL) and Invest India have been set up to accelerate capital inflows and assist foreign investors. The Make in India initiative launched in 2014 has been instrumental in attracting FDI in the manufacturing sector, and the China Plus One strategy will also help in the achievement of similar objectives.

Here, it is necessary to understand the reasons behind this paradigm shift in the Government's outlook towards FDI. The rationale behind a more liberal foreign investment policy is the economic impact of FDI inflows and the

[1] The 2 routes are - the automatic (no approval) route and the Government (approval) route

advantages that come along with it. It is commonly acknowledged that foreign investment has a supplementary growth effect. However, the extent of this effect is not definitively known, particularly in the least developed nations. Such countries often struggle with inadequate educational and technological resources, as well as fragile financial markets, which may impede the advantages of FDI.

FDI has the potential to significantly impact competition within host-country markets. The presence of foreign enterprises can greatly benefit economic development by stimulating domestic competition, ultimately leading to increased productivity, decreased prices, and improved allocation of resources. It also possesses the ability to impart social and environmental advantages to host economies via the sharing of exemplary practices and technologies within multinational enterprises (MNEs), and by the subsequent transfer of knowledge to domestic firms. Nonetheless, there is a possibility that foreign-owned enterprises may employ FDI to relocate production processes that are no longer sanctioned in their home countries.

The degree of benefits realized from FDI is contingent on the measures taken by host countries to establish appropriate frameworks. Thus, FDI should be treated only as an additional external source of development, and not as a substitute to domestic growth strategies.

This paper aims to meet the following objectives:

(i) To examine the relationship between economic performance (GDP) and FDI.
(ii) To investigate whether the sector in which FDI is made is of any relevance in determination of the impact on economic performance.

The rest of the paper is organized as follows. Section II gives a review of the associated literature. Section III presents the data and methodology applied in this analysis. Section IV highlights the results and mentions the findings. Section V concludes this paper. Section 6 suggests certain policies to attract and leverage FDI inflows to boost economic growth.

II. LITERATURE REVIEW

Published studies and research in the domain of foreign investment have focused on wide topics and objectives, and thus, the literature is very rich and vast.

A few initial studies [Singer, H. (1950); Griffin, K. B. (1970); Weisskof, T. E. (1972)] showed the negative effect of FDI inflows on economic growth in developing countries. They postulated that FDI led to lower domestic savings

and that there was also a decline in terms of trade for developing countries as FDI was majorly directed towards inexpensive primary exports to developed countries.

Bhat et al. (2004) conducted the Granger Causality test and found no link or proof of causality between FDI and economic growth in India in the 1990s. The authors attributed the result to low levels of foreign investment (as a % of GDP), and called for greater liberalisation of FDI.

Kamalakanthan, A. & Laurenceson, J. (2005) suggested that FDI inflows in China and India do not contribute significantly to domestic gross capital formation, adding to the results of Krugman, P. (1993) who recognized foreign capital as an unimportant driver of income growth.

However, Mamingi, N. & Martin, K. (2018) showed that FDI has a beneficial impact on growth, although the indirect effect is much stronger than the direct effect.

Agrawal, G. (2015), in a study on BRICS economies, found a positive correlation and bidirectional causality between economic growth and FDI. Bouchoucha, N. & Ali, W. (2019) too point towards a favorable impact of FDI on growth levels both in the short-run and the long-run.

Other studies have focused on how the effects of FDI differ for developing and developed countries, and how it appears in the transfer of technologies and the development of human resources. (Rogmans, T., & Ebbers, H. (2013)). Borensztein, E. et al. (1998) explored the role of FDI in the economic growth in developing countries with emphasis on technology. According to their model, the stock of human capital must be greater than a certain minimum level for benefits for FDI to accrue to the domestic country.

The time period needed for FDI to fully impact an economy has also been an area of study. Gupta K., & Garg I. (2015) drew the inference that rise in FDI leads to greater economic growth but that the impact is most significant when a time lag of 3 years is considered, while Mustafa, A.M.M. and Santhirasegaram, S. (2013) postulated the time lag to be 2 years.

Few researchers have also attempted to model the impact of sector-wise FDI on the growth of the overall economy of different countries during specific time periods. Alfaro, L. (2003) examined the impact of FDI in the different sectors on growth by conducting a cross-section empirical analysis with 47 countries for the time period 1981-1999. The author concluded that the overall effect of FDI on economic growth is inconclusive, and that FDI in primary, manufacturing and service sectors exerted positive, negative, and ambiguous influences on growth respectively.

Chakraborty, C. & Nunnenkamp P. (2008) used a cointegration framework and employed causality tests to investigate the association between FDI and growth effects on various sectors in India. They found that FDI's favorable effects are mostly restricted to the manufacturing sector, with transitory impact on the services sector and no influence over the primary sector.

Iram, S. & Nishat, M. (2009) conducted a research on the impact of services and manufacturing FDI on economic growth in the context of Pakistan. They point that both services and manufacturing FDI have no significant effect on growth in the short-run, though the impact is notable in the long-run.

III. RESEARCH METHODOLOGY

The analysis uses secondary data on Gross Domestic Product (GDP), which has been collected from the Economic Survey 2022-23 published by the Ministry of Finance, India. GDP is defined as the market value of all goods and services produced within the domestic territory of a country during a particular time period (usually, a year). GDP at current prices is taken as a proxy variable, or indicator of economic growth.

The data on Foreign Direct Investment (FDI) has been compiled from the Annual Report of the Reserve Bank of India (RBI) for the years 2011 to 2021. The total FDI for any particular year is obtained as follows: FDI = PFDI + SFDI + TFDI + Others,

where PFDI, SFDI and TFDI denote FDI in the primary, secondary and tertiary sectors respectively. (See Appendix 1 and 2)

A Time Series Regression Analysis is performed to estimate the effect of FDI on GDP, both on an aggregate and sector level. The analysis begins from 2006-07, the year when India opened the retail sector (now, one of India's major sectors with roughly 10% contribution to the GDP) to foreign investment, allowing up to 51% FDI. It runs till 2019-20, just before the advent of the COVID-19 pandemic, which could have had a significant influence on FDI inflows and GDP such that the model does not become inaccurate.

(i) Model 1 - Total FDI inflows

The following simple regression model has been used for this analysis:

$$GDP_t = \beta_0 + \beta_1 FDI_t + u_t,$$

where:

The subscript 't' signifies the time period, t = 1, 2, 3, …, 14.

GDP_t is the dependent variable reflecting the GDP at current prices at time 't'.

FDI_t is the independent variable reflecting the total FDI inflows at time 't'.

β_0 denotes the unknown intercept.

β_1 denotes the unknown slope coefficient.

u_t represents the random disturbance (or, error) term.

(ii) Model 2 - Sector-wise FDI inflows

The following multiple regression model has been used for this analysis:

$$GDP_t = \beta_0 + \beta_1 PFDI_t + \beta_2 SFDI_t + \beta_3 TFDI_t + u_t,$$

where:

The subscript 't' signifies the time period, t = 1, 2, 3, …, 14.

GDP_t is the dependent variable reflecting the GDP at current prices at time 't'.

$PFDI_t$, $SFDI_t$, and $TFDI_t$ are the independent variables reflecting FDI inflows in the primary, secondary and tertiary sectors respectively at time 't'.

β_0 denotes the unknown intercept.

β_j, j = 1, 2, 3 denotes the unknown coefficients for the independent variables PFDI, SFDI and TFDI respectively.

u_t represents the random disturbance (or, error) term.

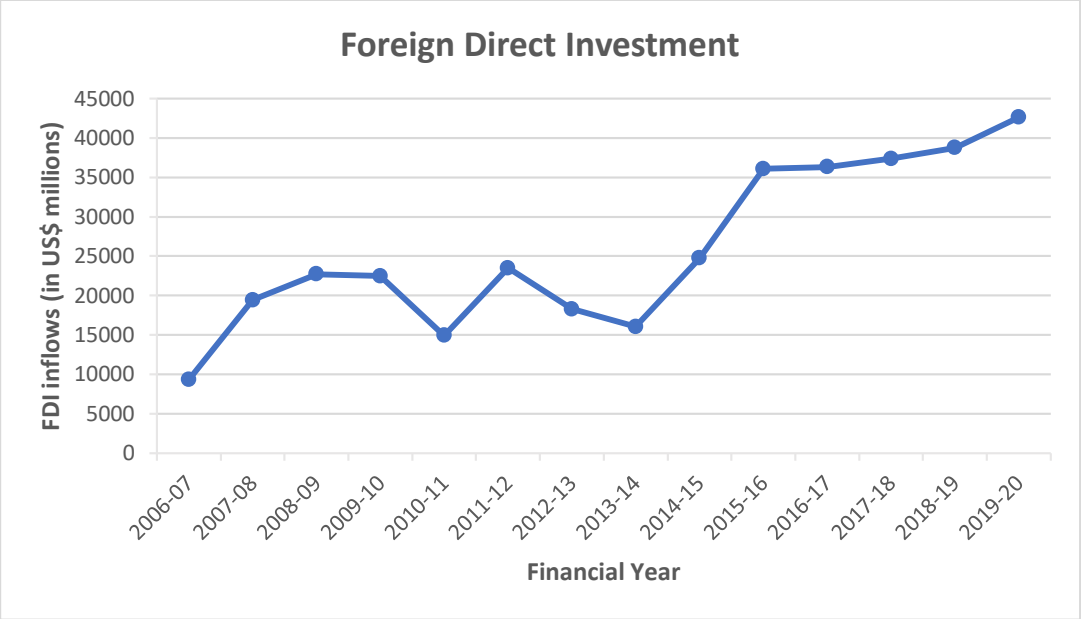
Here, Ordinary Least Squares (OLS) estimation method is employed for estimating the unknown parameters.

IV. DATA ANALYSIS AND FINDINGS

We study the FDI profile of India -the trends in foreign investment over the period of study, our major FDI partners and the sector-wise composition of FDI. The data for all the following graphs has been obtained from the Annual Reports of the RBI.

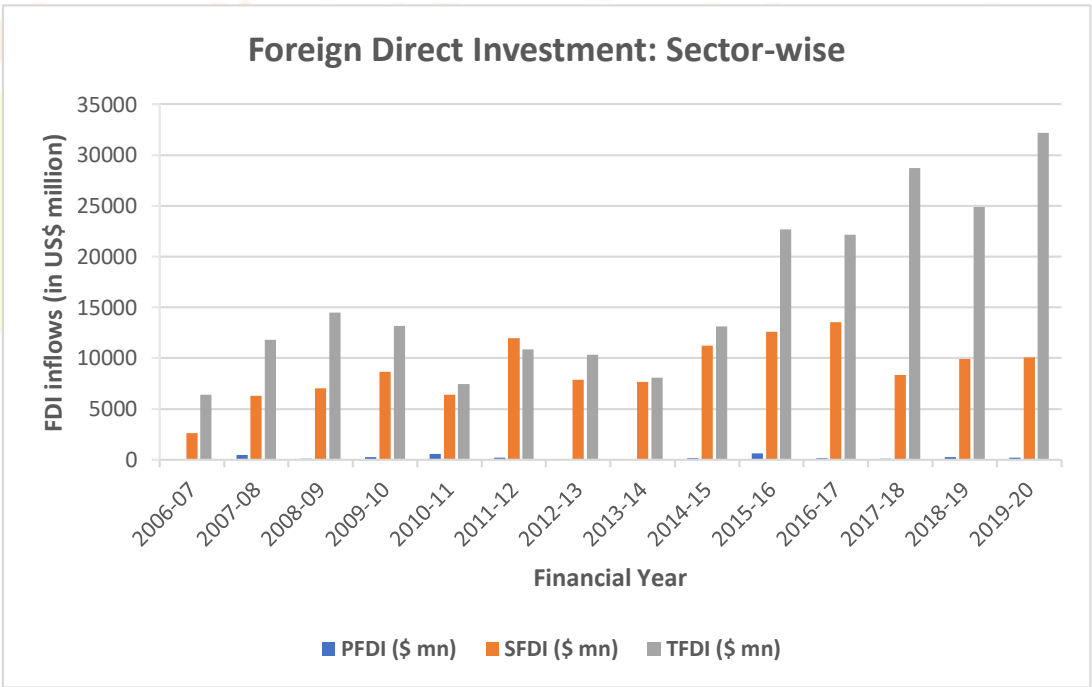
The graph below shows the trend of FDI inflows into the Indian Economy in previous years. The graph shows the overall increase in annual FDI inflows, and in particular, we find a sharp increase in FDI in in the years 2013-14 and 2014-15. This can be attributed to opening of erstwhile closed sectors, increase in FDI limit in certain sectors, and

the launch of the Make in India initiative in 2014. Even in subsequent years. FDI flows continued to rise at a steady pace.

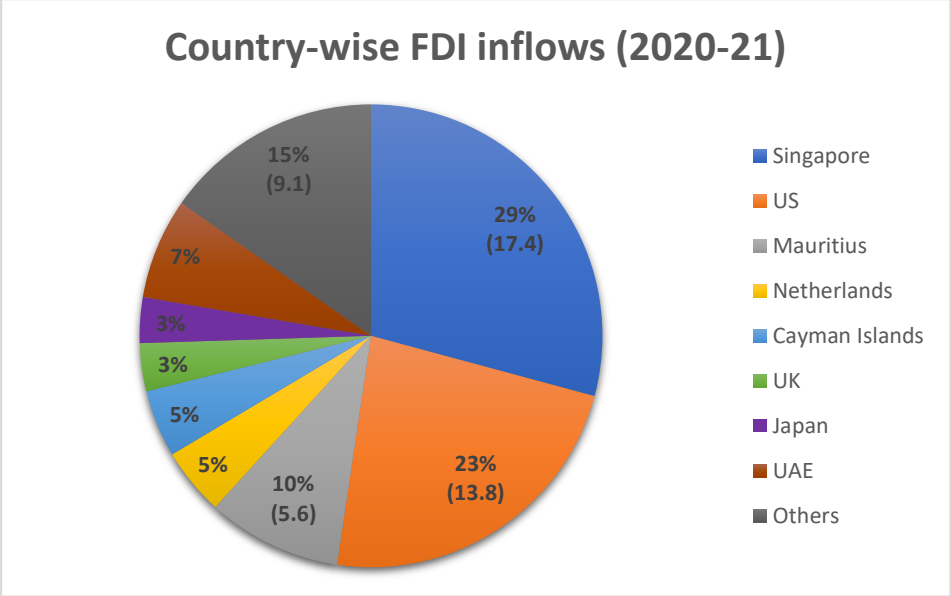


The following bar chart shows the segmentation of FDI inflows as per primary, secondary and tertiary sectors. We notice a sharp rise in services FDI from 2006 to 2019 with minor downside fluctuations, very low levels of FDI in the primary sector, and a moderate share of secondary FDI in total FDI inflows.

Data Source: Annual Report of the RBI



The countries that contributed most significantly to India's FDI inflows (in $ billions) in Financial Year 2020-21 are:



The table below shows the descriptive statistics of the response and explanatory variables.

Variables	*Observations*	*Mean*	*Standard Deviation*	*Minimum*	*Maximum*	*Median*
GDP (in ₹ crore)	14	11163375	5280849.605	4254629	20074856	10588768
FDI (in US$ million)	14	25893.86	10413.80514	9307	42629	23085
PFDI (in US$ million)	14	226.9286	192.1855931	24	596	172.5
SFDI (in US$ million)	14	8868.5	2932.519782	2608	13536	8503
TFDI (in US$ million)	14	16164.86	8353.65602	6395	32185	13142

From the table, it is evident that the mean FDI in the tertiary sector exceeds both mean FDI in the primary and secondary sectors by a huge margin, while mean FDI in the secondary sector is also significantly greater than that in the primary sector. Similar relations for the median, minimum and maximum figures suggest that service FDI has clearly dominated those in the other sectors for the time period under study.

The correlation matrix is shown in the following table:

	GDP	*PFDI*	*SFDI*	*TFDI*	*FDI*
GDP	1				
PFDI	-0.0813	1			
SFDI	0.605398	0.139292	1		
TFDI	0.857517	0.035968	0.516175	1	
FDI	0.878999	0.094441	0.701048	0.967731	1

MODEL 1: $GDP_t = \beta_0 + \beta_1 FDI_t + u_t$,

Test for Autocorrelation

Autocorrelation is a scenario in which the error terms of a regression model in different time period are correlated. This renders OLS estimators inefficient.

We use the Durbin-Watson test to measure the degree of autocorrelation. The Durbin-Watson statistic is defined as:

$d = \frac{\sum_{t=2}^{n}(e_t - e_{t-1})^2}{\sum_{t=1}^{n} e_t^2}$, where e_t are the residuals from OLS regression.

We can reject the hypothesis that there is positive autocorrelation if $d > d_U$, where d_U is the upper bound or upper critical value. Similarly, the hypothesis than there is negative autocorrelation can be rejected if $(4 - d) > d_U$.

We obtain the value of the statistic d = 1.379. The 1% significance points of d_L and d_U for our model with 1 regressor (k=1) and 14 observations (n=14) are $d_L = 0.776$ and $d_U = 1.054$ respectively. Since $d > d_U$ and $(4 - d) > d_U$, we can conclude that the error terms are not autocorrelated.

Test for Heteroskedasticity

Heterskedasticity occurs when the variance of the error term is not constant (it varies) across observations.

The Breusch-Pagan test (a chi-squared test) is carried out to test for heteroskedasticity. For our model, the following results were obtained:

[('Lagrange multiplier statistic', 1.5994268618062195), ('p-value', 0.2059844516773871), ('f-value', 1.5477609081276893), ('f p-value', 0.23721942663885262)]

Here, we consider the null hypothesis H_0 : The model is homoskedastic and the alternative hypothesis H_1 : The model is not homoskedastic (or, the model is heteroskedastic)

Since the p-value is greater than 0.05, we fail to reject the null hypothesis. Hence, there is not sufficient evidence to conclude that heteroskedasticity is present, implying that our model is homoskedastic.

Results

Now that our model has satisfied the requisite assumptions, we carry out the linear regression using the OLS method. We obtain the following results:

Regression Statistics	
Multiple R	0.878999028
R Square	0.772639291
Adjusted R Square	0.753692565
Standard Error	2620852.379
Observations	14

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	1	2.80109E+14	2.8E+14	40.77957	3.47429E-05
Residual	12	8.24264E+13	6.87E+12		
Total	13	3.62536E+14			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-378582.7757	1938398.023	-0.19531	0.84842	-4601989.258	3844824
FDI	445.7411682	69.80096658	6.385888	3.47E-05	293.6579267	597.8244

The regression coefficient is positive and statistically significant (its p-value < 0.05), suggesting that greater FDI inflows contribute to economic growth through increased GDP. Quantitatively, this means that a $1 million change in total FDI translates into a ₹445 crore change in the GDP.

The proportion of the total variability of the responses explained by a model is referred to as the coefficient of determination or R Square (R^2). We obtain a relatively high value of $R^2 = \frac{SS_{REG}}{SS_{TOT}} \simeq 0.7726$, which indicates that a significant majority of the variation in GDP is explained by the model (or, FDI), and hence the model is a good fit to the data. This is also verified by the large value of the F statistic ($F = \frac{MS_{REG}}{MS_{RES}}$), corresponding to which the p-value (Significane F) is 3.47429E-05, which is considerably smaller than 0.05, and so we can reject the null hypothesis of no linear relationship.

MODEL 2: $GDP_t = \beta_0 + \beta_1 PFDI_t + \beta_2 SFDI_t + \beta_3 TFDI_t + u_t,$

Test for Autocorrelation

We obtain the value of the statistic d = 1.499. The 1% significance points of d_L and d_U for our model with 3 regressors (k=3) and 14 observations (n=14) are $d_L = 0.547$ and $d_U = 1.490$ respectively. Since $d > d_U$ and $(4 - d) > d_U$, we can conclude that the error terms are not autocorrelated.

Test for Heteroskedasticity

For our model, the following results were obtained:

[('Lagrange multiplier statistic', 1.3327272785507984), ('p-value', 0.7213767181610542), ('f-value', 0.3507009250944552), ('f p-value', 0.7896453394714238)]

Since the p-value is greater than 0.05, we fail to reject the null hypothesis. Hence, there is not sufficient evidence to conclude that heteroskedasticity is present, implying that our model is homoskedastic.

Test for Multicollinearity-

Multicollinearity occurs when the independent variables of the model are correlated to each other, such that some variables become statistically insignificant.

Variance inflation factor (VIF) for each independent variable is calculated to estimate the presence of multicollinearity among the independent variables. VIF is calculated as:

$VIF_i = \frac{1}{1-R_i^2}$, where R_i^2 denotes the unadjusted coefficient of determination.

For our model, the following VIF values were obtained:

Variable	*VIF*
PFDI	1.020
SFDI	1.388
TFDI	1.364
Mean VIF	1.258

Since the VIF values for each variable and the mean VIF all are between 1 and 5 (in fact, very close to 1), there is slight to moderate multicollinearity which can be ignored.

Results

As our model has satisfied the requisite assumptions, we carry out the linear regression using the OLS method. We obtain the following results:

Regression Statistics	
Multiple R	0.8894787
R Square	0.7911723
Adjusted R Square	0.728524
Standard Error	2751500.1
Observations	14

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	3	2.86828E+14	9.56094E+13	12.62879	0.000977
Residual	10	7.57075E+13	7.57075E+12		
Total	13	3.62536E+14			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	610397.19	2517535.84	0.242458192	0.81332544	-4999022	6219817
PFDI	-3900.1316	4013.485191	-0.971756807	0.354089494	-12842.7	5042.471
SFDI	441.64019	306.9033375	1.439020481	0.180700634	-242.183	1125.463
TFDI	465.28982	106.7560561	4.358439558	0.001424627	227.4225	703.1571

We obtain mixed results for our independent variables. The regression coefficients for FDI in primary sector and secondary sector are negative and positive respectively. However, both are statistically insignificant since their p-value exceeds 0.05.

On the other hand, FDI in the tertiary (or services) sector is both positive and significant, with a $1 million change (increase or decrease) in TFDI leading to a ₹465 crore change (increase or decrease) in the GDP.

This model is capable of explaining a major proportion of total variation, as given by $R^2 = \frac{SS_{REG}}{SS_{TOT}} \simeq 0.7911$. That the model is a good fit to the data can also be inferred from the large value of the F statistic ($F = \frac{MS_{REG}}{MS_{RES}}$), corresponding to which the p-value (Significane F) is 0.00097. We can thus conclude that there is a linear relationship between the chosen variables, however, only FDI in the tertiary sector is of significance.

V. CONCLUSION

This study has analyzed the flows of foreign direct investment into India from 2006-07 to 2019-20 and how it affects economic growth. By modelling the relation in the form of a simple regression model, we found that there is a significant positive association between GDP and FDI. This may be due to the positive externalities that FDI creates. This is line with Feldstein, M. (2000) and Loungani, P. & Razin, A. (2001), who postulated that increased FDI contributes to higher domestic corporate tax revenue collection, development of human capital and technological advancement induced greater productivity.

The breakdown of FDI into sector-wise FDI inflows also yields some interesting results. We see a negative correlation between GDP and FDI in the primary sector, though it is hardly significant. Jana, S. S. et al. (2019) encountered a similar relation, and attributed it to the poor infrastructure and technological know-how of the primary sector in India, which limits the potential of FDI to create meaningful impact. The percentage contribution of PFDI to total FDI over the time period of this study was less than even 1% on average, and hence the dearth of FDI could also be a contributing factor to this negative association. Another possible explanation for this seemingly surprising result could be that PFDI is composed of investment in mining and extraction activities, which have week macroeconomic linkages, and thus the ability of FDI to affect growth is compromised.

Secondary sector FDI is positively related with the economic performance, although changes in SFDI do not lead to strong changes in GDP. Inflows in this sector have been robust over the past decade, and they have a huge scope to significantly influence growth, as the potential for spillover effects is immense.

We found that the tertiary sector FDI is the most vital contributor to GDP, owing in part to the sheer volume of FDI inflows in this sector. Being the largest sector of the economy, the industry possesses significant capital-intensive capabilities and the potential to establish linkages both within its sub-sectors or constituent industries, as well as with the broader economy.

Thus, it is important to not only look at FDI in its totality, but also examine the sector-breakup of FDI inflows so that appropriate policy measures can be taken to ensure that it results in maximum economic growth. We dedicate the next section to the discussion of some plausible Government responses to challenges in this strategic area.

VI. POLICY RECOMMENDATIONS

To attract foreign direct investment, India needs to facilitate greater ease in doing business (currently ranked 63rd) by easing regulatory compliances and procedural delays. The Government should continue to look at liberalising sectors where FDI is currently restricted.

Moreover, attention must be given to FDI in primary and manufacturing sectors, as they encompass some key industries of the economy and thus, have the potential to enhance development.

As businesses around the world are strategizing to establish manufacturing capacities in other countries apart from China, India is in an advantageous position to emerge as a global manufacturing hub. Production Linked Incentive (PLI) schemes need to be offered to manufacturers (both domestic and foreign) to catalyze investments into the country. However, to ensure that we can reap greater gains from this gradual shift, India needs to focus on developing its manufacturing sector and creating deeper backward and forward linkages, which will help spread the benefits of foreign investment both within the sector and to other sectors.

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VIII. APPENDIX

1. Note:

PFDI = Mining

SFDI = Manufacture + Construction

TFDI = Financial Services + Real Estate Activities + Electricity and other Energy Generation, Distribution & Transmission + Communication Services + Business Services + Miscellaneous Services + Computer Services + Restaurants & Hotels + Retail & Wholesale Trade + Transport + Trading + Education, Research & Development

2. The entire dataset used for the regression models in this paper is shown below:

Period	*GDP (₹ crore)*	*PFDI ($ mn)*	*SFDI ($ mn)*	*TFDI ($ mn)*	*FDI ($ mn)*
2006-07	4254629	42	2608	6395	9307
2007-08	4898662	461	6277	11803	19425
2008-09	5514152	105	7014	14481	22697
2009-10	6366407	268	8659	13150	22461
2010-11	7634472	592	6392	7449	14939
2011-12	8736329	204	11971	10879	23473
2012-13	9944013	69	7847	10327	18286
2013-14	11233522	24	7657	8080	16054
2014-15	12476960	129	11253	13134	24748
2015-16	13771874	596	12580	22677	36068
2016-17	15391669	141	13536	22170	36317
2017-18	17090042	82	8347	28711	37366
2018-19	18899668	247	9928	24867	38744
2019-20	20074856	217	10090	32185	42629