

## PREDICTIVE ANALYSIS OF FOREIGN DIRECT INVESTMENT IN INDIA USING BUSINESS INTELLIGENCE (BI) TOOL- TABLEAU

Ms. Nidhi, Assistant Professor  
Bharati Vidyapeeth's Institute of Management and Information Technology  
Navi Mumbai (India)  
mca.nidhipoonia@gmail.com

Jayesh Kishor Patil, Student  
Bharati Vidyapeeth's Institute of Management and Information Technology  
Navi Mumbai (India)  
jayeshkpatil1@gmail.com

Satish Shivaji Pachakar, Student  
Bharati Vidyapeeth's Institute of Management and Information Technology  
Navi Mumbai (India)  
satish.pachakar148@gmail.com

### ABSTRACT

Foreign investment is vital for every country, mostly in the financial progress of developing countries worldwide. Countries try to attract FDI inflows with their policies and it becomes a key battleground in the markets. Foreign Direct Investment (FDI) has become a crucial source of investment for many countries, including India, due to its potential to bring in capital, create jobs, transfer technology, and super economic growth. This paper highlights the trend of FDI in India in state-wise and countrywide shares of FDI. Business Intelligence (BI) Tool- Tableau is used to get analyzed data in the form of different visualizations like tables, and line graphs which are easy to understand for investors. In this paper, secondary data is being used which is collected from the official website of RBI. This data will cover FY. 2000-2022 and using this data we can predict and visualize the upcoming year 2025 inflow. This analysis will help to make decisions for the growth of Indian states.

**Keywords:** Indian Economy, FDI inflows Trend, FDI Prediction, Analysis of Foreign Direct Investment in India, Business Intelligence (BI) Tool- Tableau

### Introduction

FDI was announced in India in 1991 by former finance minister Dr. Manmohan Singh under Foreign Exchange Management Act. The Indian government makes rules and laws on equity craft for foreign investors in different sectors and the Indian government has taken several measures to attract Foreign Investors, such as streamlining the FDI policy and eliminating sectoral capson the foreign project in numerous industries. As a result, FDI inflows into India have increased significantly in recent years. In the Study of UNCTAD, only China is ahead of India in foreign investments and because of globalization and liberalization, FDI is considered a machine for raising lucrative progress and advancement. If we observe the frugality of India, it'll be moving widely due to this India will uprising from a developing country to an advanced country. Transmogrification needs an enormous sign of wealth in the form of both fiscal and directorial and in this process, FDI remnants the most reachable and active option for fiscal capital in India. Hence we can say that Foreign Direct Investment is defined as a fiscal method of incoming capital from a country outside the boundaries of a nation and because of this capital flux which rises the creation capacity of several sectors of miserliness is nominated as Foreign Direct Investment. Planning Commission plays an important roles the government of a country must frame, apply and run the FDI plans. To a great level, the size and significance of FDI in any country can be dependent upon its macroeconomic programs. If we study the data of (FDI) in India has been gradually growing in recent years, although the COVID-19 pandemic had an impact on FDI inflows in 2020. For making better decisions FDI data is to be analyzed but for analyzing such a huge quantity of data some Business Intelligence tools are essential to help investors to understand the pattern of data which is available in the market or published by the government on the RBI website. In this paper, we are using the Business Intelligence (BI) Tool- Tableau data which will help us to understand the total FDI till the current date and we can analyze the top sectors, states, countries of inflow, etc. that have higher FDI inflow.

### Literature Review

Singh (2019), had studied the various policies of FDI India and given proposals for policies also and according to her, the Indian economy is one of the topmost developing marketplaces all over the world. Kumar (2021) talks about the topmost foreign inflow places in the world, studied data from 2000-2021, and investigated the existing FDI rules and tendencies. In the paper, we get a detailed overview of the trend of FDI and its policy

framework. Ramasamy (2017), discusses the properties of FDI spillover on local efficiency and shows that the technology, human capital, and various provisions of FDI have a substantial imprint on local output. This paper research and development shows that FDI has a significant impact on regional productivity in India.

Rani (2020), learning says that the Indian economy is the fastest-emerging economy and talks about statistical tools like CAGR. It also talks about the GDP and uses the secondary data set for study in India. Merajothu (2020), surveyed the FDI impact on GDP and tested hypotheses using simple linear regression and took 19 years of data from 2000-19, where talked about India its availability of large amounts of natural resources, well market environments, and extremely proficient and knowledgeable capitals, which provide a better platform for reserves. Patil (2014), effects of FDI on Sectors of the economy of India such as software, pharmaceuticals, IT services, automobile, industry, and e-commerce which have received the prime sum of FDI in India.

Anitha (2012), talks about Foreign Direct ventures in India where there is the accessibility of large amounts of natural capital as well as better marketplace environments and highly proficient and practiced resources, which offer a better stage for reserves and Economic Growth in India. Bhargava (2018), Premeditated on the Visualization of data sets and different methods, also the process of making significant data by the visual framework and data analysis where it's executed after the data correction. Sharma (2011), explores the effectiveness of BI in strategies for an organization for employees also it explains business intelligence outcomes and categories distribution. It talks about performance management and steps to create a balanced scorecard.

Tvrđiková (2007), talks about business intelligence applications and tools in operational data. It says BI tools are necessary for data mining and they help to get information from big datasets. The main focus is on data warehouses and on new tools. Duggal study says domestic and foreign investments play an important role in the growth of India. Foreign investment can decrease the domestic savings gap. It covers a 13-year period to analyze and examine the trend and pattern of FDI. Miyamoto (2003), says that max human capital is a key ingredient to attracting FDI, and it's beneficial to host countries in the form of their activities. Rahate (2021) assured that BI tools can compress large datasets into their insights. The motto behind the created paper is to demonstrate an idea regarding data analytics. It is focused on data exploration and visualization, and model development. Implementation is done on the tableau tool.

### Research Objective

The key objective of a research paper are stated below

- To study the trends of FDI inflows in India using the Tableau BI tool.
- To identify State-wise inflow of FDI in India using the Tableau BI tool.
- To detect the country-wise flow of FDI into India by using the Tableau BI tool.
- To determine the sector-wise distribution of FDI inflows in India using tableau.
- To Predict/Forecast FDI inflows in India whether increasing/ decreasing by using Tableau BI tools.

### Problem Statement

As FDI data is an enormous amount of data, formerly analysis was done manually and it takes time to recognize lots of data but by using analytics tools we can easily predict future analyses or forecasts. Critical tools like tableau will be also helpful for FDI data analysis. There is one benefit: if we have lots of data, we can get more accurate predictions with the help of that data. Using the Business Intelligence (BI) Tool- Tableau analysis like the current inflow of any particular country or state and according to that we also get the predicted inflow for upcoming years using these tools we analyze and investing is very helpful for investors.

### Research Methodology

**Data Collection and Filtration:** In the research, we collected secondary data. The database is created by gathering info and data from several consistent sources like the Department of Industrial Policy and Promotion (DIPP), the Reserve Bank of India, and other resources like Online databases of the Indian economy, articles, journals, etc.

**Data Analysis by visualization tool:**In figure 1Tvrđiková (2007), the process of the system flow is shown. Data were analyzed by a visualization tool tableau where we get the statistical data and created many visualizations like a trend line that tells the trend of the current situation of the FDI in India and created the forecasted line and graphs chart which shows the predicted inflow of upcoming years based on the previous data.

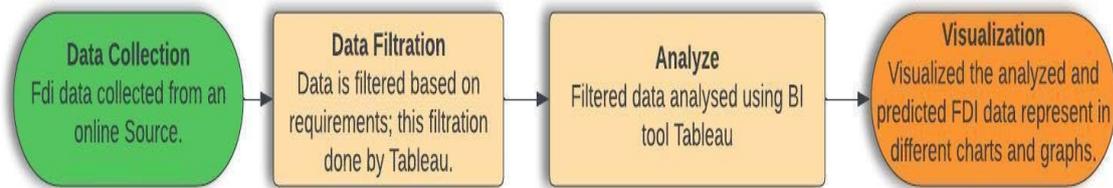


Figure 1: System Flow of research problem

**Design Of Experiment**

- Select a sample of FDI data in India from the online source.
- Visualize and predict the FDI inflow in India using the BI tool Tableau.

**Selection Of Samples**

Data on FDI is collected from the Reserve bank of India's official website and other online sources. In this research paper, we analyzed the last 22 years' data which is the year 2000 – 2022. The total amount of inflow in the last 22 years is 8, 87,762 USD millions The used data set is a secondary data set and data is filtered according to requirement, here we use only those data which is related to FDI This research paper only focuses on FDI. Using the given last 22 years of data set we predicted the upcoming trend of FDI in India which is increasing or decreasing.

**Conduction Of Experiment**

Data collected from Reserve Bank of India official site and online sources undergo the experiment as mentioned below:

Collection of Data: In this step data will be collected from different sources and data will be secondary.

Data Filter: Based on research requirements to filter the data only useful data will be used and others will be filtered.

Analyze: Once we get the required data then the data was used for analysis purposes for BI tools. In analysis, we get the final output.

Visualization: In visualization, we can present the analyzed data in the form of a table, map, or any other chart. We can use an understandable chart for specific output visualization. Figure 1, shows the dashboard of the BI tool Tableau Used for FDI data visualization.



Figure 2: FDI Tableau Dashboard

Figure 2 shows the tableau dashboard for analyzing collected data.

**Data Analysis And Result**

**Trends of FDI Inflows in India Using Tableau BI Tool:**The Foreign Direct Investment (FDI) trend in India has been encouraging in current years. India has arisen as one of the most striking termini for FDI internationally, due to its large customer bazaar, trained labor force, and favorable government policies.

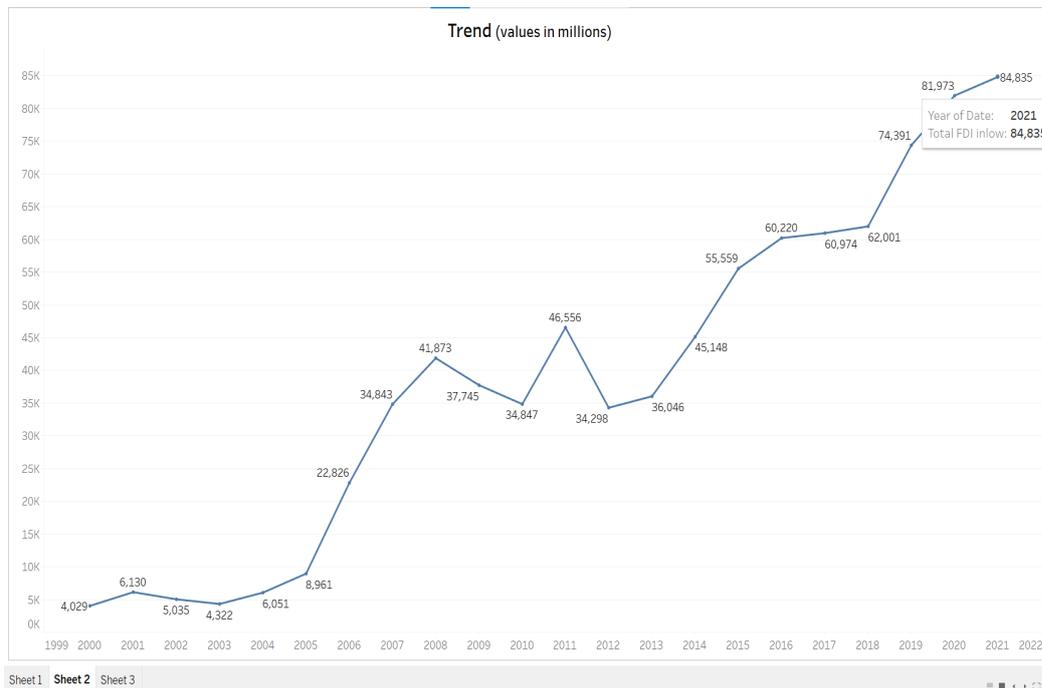


Figure 3: Analysis using Tableau (BI) tool on Current Trend From 1999 – 2022 Values in US Million

Figure 3, created using the BI tool with the help of data which is collected from (dpiit.gov.in) shows the trend of FDI in India which is positive and is expected to continue growing in the near term, driven by India's huge consumer market and FDI inflow in each as shown in the above figure. As we see in 1999 the inflow of FDI was 4,029 million it increased from 1999 to 2005 and is not consistent. As we see in Figure 3, there is massive growth after FY. 2005 - 2008 it will reach 41,873 million from 8,961. There is \$ 32,912 million growth in 3 years. The major cause behind the increase in FDI was the introduction of automatic routes.

**Impact Of Foreign Direct Investment On States Of India**

Foreign Direct Investment (FDI) has a significant impact on the states of India. It can enhance economic growth, create jobs, and improve infrastructure. Some of the key benefits of FDI for the states include increased investment. FDI brings in fresh capital that can be used to finance development projects and support the growth of local businesses.

Statement On State-Wise FDI inflow from October 2019 to September 2022	
State Name	FDI inflow (values in US million)
Maharashtra	47,165
Karnataka	39,361
Gujarat	30,660
Delhi	22,197
Tamil Nadu	7,896

Table 1: Top 5 States Value in US Million (Source: FDI Statistics from FDI fact sheet released by dpiit.gov.in)

Every State of India makes different FDI inflows as per the Reserve Bank of India. Table 1 shows state-wise data for the top 5 States by FDI inflow in US millions these top 5 states are according to FY. October 2019 to September 2022. In order to top states. Maharashtra received the highest inflow in USD millions. The state of Maharashtra is the highest receiver of FDI which is \$47,165 million.

State Name	FDI inflow (values in US million)
Meghalaya	1.097
Jammu And Kashmir	1.055
Tripura	0.562
Ladakh	0.188
Nagaland	0.014

Table 2: Bottom 5 States Values in Us Millions (Source: FDI Statistics from FDI fact sheet released by dpiit.gov.in)

Table 2 gives the bottom 5 states with their inflow this state received the least inflow. The state of Nagaland is the lowest receiver of FDI which is \$ 0.014 million.

**Country-Wise Flow of FDI into India by Using Tableau BI Tool**

Country-wise FDI in India data is stated below which shows the top 10 countries by FDI inflow in US millions these 10 countries belong to the last 22 years.

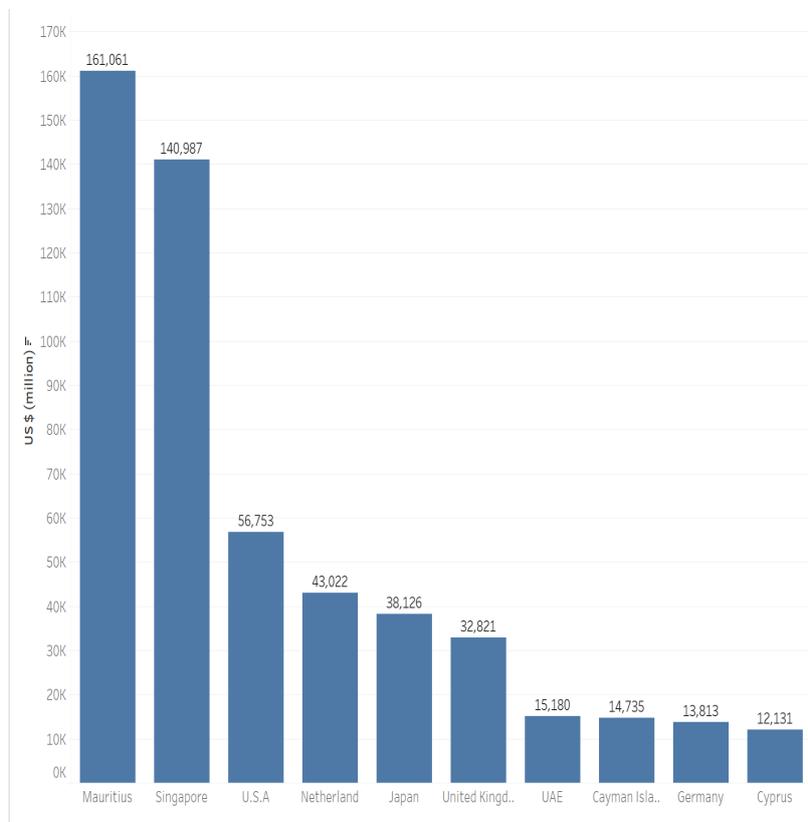


Figure 4: TOP 10 Countries By Inflow Values in US Million (Source: created using BI tools with the help of data which is collected from (dpiit.gov.in))

<b>Statement On Country-Wise FDI Inflow From April2000 to September 2022</b>	
Country Name	FDI inflow (values in US million)
Mauritius	1,61,061
Singapore	1,40,987
U.S.A	56,753
Netherland	43,022
Japan	38,126

Table 3: Top 5 Country Values in US Million (Source: Analyzed FDI Statistics from FDI fact sheet released by (dpiit.gov.in))

Table 3 shows that in the last 22 years of country investment top investors such as Mauritius have valued 1,61,061 US million.

**Sector-Wise Distribution of FDI Inflows in India**

The inflow of FDI in India is mostly diversified into different sectors. The top 5 most attractive sectors for investment in India according to analyses are mentioned below the top 5 sectors according to the last 22 years.

STATEMENT ON SECTOR-WISE FDI INFLOW FROM APRIL 2000 TO September 2022	
Sectors	FDI inflow (Values in us million)
SERVICES SECTOR	98,356
COMPUTER SOFTWARE & HARDWARE	91,799
TELECOMMUNICATIONS	39,025
TRADING	38,021
AUTOMOBILE INDUSTRY	33,774

Table 4: Top 5 sector Values in million (Source: Analyzed FDI Statistics from FDI fact sheet released by dpiit.gov.in)

Table 4 shows that the top sector that received FDI in India is SERVICES SECTOR \$98,356 million and Computer Software & Hardware sector is having a good number \$91,799 million.

**Predict/Forecast FDI Inflows in India**

Here we can Predict / forecast the FDI inflow in India using tableau up to FY. 2025 Figure 5, below shows that total inflow is increasing year by year according and it will increase by a value of 98925 million in the year 2025.

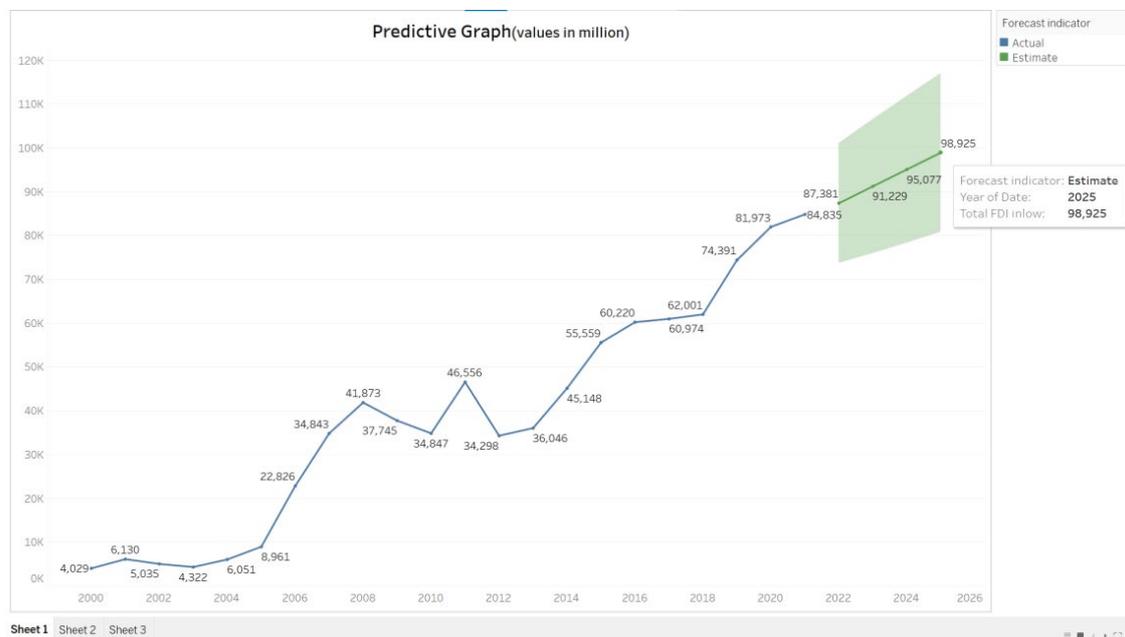


Figure 5: Predictive FDI Inflow from FY.2022-2025 (source: Researcher)

Figure 5 is created using BI tool with the help of data which is collected from the department for the promotion of industry and internal trade(dpiit.gov.in)

**Conclusion**

In the research, we can conclude that the appreciation rate or trend in FDI has not been very stable but has positively gone up in spite of the predominant ups and downs in the economy. Visualization and analysis of the

states-wise FDI data in India show that FDI not only attracts richer states but also goes to poor states; there is a difference in both states like Maharashtra, Delhi, and TamilNadua developed states that are the reason they received more. At the same time, FDI has proved very much helpful in the growth of poor states like Bihar and Jharkhand. Indian state governments like Madhya Pradesh, Orissa, Rajasthan, Bihar, Jharkhand, and some north Eastern States should alter norms for FDI towards giving a boost to sales, acquiring resources, improving infrastructure, increasing the supply in the market, and making it less risk-oriented. The topmost Sectors that attracted foreign investment are services, computers, telecommunication, construction, and hardware. According to data analysis Mauritius, Singapore, the U.S.A, the Netherlands, and Japan, this country are leading sources of FDI. This Top 5 country covers 71% of FDI inflow in India. The decisions governing FDI have been spread over many areas that have to be streamlined or a practical policy has to be developed because of the impact of the reforms in India on the policy environment for Foreign Direct Investment. With all the measures the government has taken we can predict/forecast from the study that it will grow more and will achieve 98925 million dollars in 2025 FDI helps the country in removing infrastructure bottlenecks, increasing exports, providing skilled and trained manpower, removing local disparity in the states and helping in accomplishing an all-round development of each and every part of the states in India.

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