

**DETERMINANTS OF FDI IN SERVICE SECTOR OF INDIA:
AN EMPIRICAL ANALYSIS**

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ABSTRACT

This paper explores the determinants of foreign direct investment (FDI) in service sector of India by applying multiple regression. The study is based on secondary data covering the period from 1996 to 2016. Researcher has selected six macro-economic variables from the existing literature for analysis. The study has used foreign direct investment in service sector as dependent variable and exchange rate, inflation, openness(SFDI/SGDP), manufacturing FDI, external debt and gross domestic product growth (GDPGR) as explanatory variables. The result of empirical analysis reveals that manufacturing FDI, GDPGR and openness are the significant determinants of FDI in service sector while external debt, exchange rate and inflation are insignificant. The findings of this study suggest that efforts should be made by government for attracting higher inflow to manufacturing sector. In addition to that, policymakers should focus on designing stable and transparent policies to gain the confidence of foreign investors in Indian economy.

Keywords: *Determinants, Foreign Direct Investment, India, Service Sector.*

1. INTRODUCTION

In recent times, there has been a dramatic shift in the global trend of foreign direct investment (FDI) flow from manufacturing and mining towards service sector. In 1980's service sector accounted for a quarter of the total world stock of FDI whereas in 1990's it increased to 49 per cent (Amirahmandi, Hooshang and Wu, 1994). The rising share of FDI in service sector is largely attributed to the pattern of economic development, policy changes, technological changes and the strategies adopted in both services and industrial transnational corporations. As per the latest sectoral data available with WIR 2015, during 1990 to 2012 the share of service sector in world FDI stock increased from 49 per cent to 63 per cent with a corresponding decline in manufacturing sector from 41 per cent to 26 per cent while the share of primary sector remained stable at about 7 per cent. The ongoing shift in the sectoral composition of FDI from

manufacturing to service sector is the result of increasing liberalisation in services which has enabled higher FDI inflows, particularly in sectors that were traditionally closed to foreign investors such as finance and telecommunication (World Investment Report, 2015). Following the international trend, FDI inflows in India has also diverted towards service sector. (Banga, 2005). Among developing countries, India is one of the largest recipient of service related FDI (Mukherjee & Goyal, 2013). The growing importance of foreign investments in India's service sector is also reflected in her policy regime. In the post liberalization period, service sector like telecommunication, hotel and tourism, trading, financial and non-financial service received significant amount of FDI inflows in the country.

Despite the increasing inflow of FDI in service sector, literature on determinants of FDI in service sector is very limited. Some of the important studies include the work by Kolstad & Villanger (2008); Ramasamy & Yeung (2010); Riedl (2010); Awan et al. (2010) and Yin et al., (2014). The purpose of the present study is to fill the gap in literature. In this paper, an attempt has been made by the researcher to identify the determinants of FDI in service sector of India by applying multiple regression. The paper has been organized into six sections including the present one. Section 2 deals with the review of existing studies. Section 3 gives brief description of the selected explanatory variables. Section 4 discusses data sources and methodology applied in the study. Section 5 deals with data analysis and discussion. Section 6 provides conclusion of the study.

2. REVIEW OF LITERATURE

Vast literature is available on determinants of FDI, however most of these studies have been conducted at national or regional level. Very few empirical studies have been done at industrial or sectoral level. Specifically, literature on determinants of FDI in service sector is very scant. Some relevant literature on determinants of FDI in service sector has been reviewed in this section.

Kolstad, I., & Villanger, E. (2008) analysed the determinants of FDI inflows in the service sector of host economies. The study is based on industry level foreign direct investment data from fifty seven countries for the period 1989-2000. The result of the study shows that in terms of political economy variables, democracy and institutional quality are found to be more important for FDI in services than general investment risk or political stability. The study further reveals that FDI in the service sector is market seeking and is unaffected by trade openness of the host countries. The study also finds a strong correlation between FDI in manufacturing and FDI in producer's services (such as finance and transport) indicating that these type of services follow their clients abroad, binding vertically disintegrated production chains together.

Ramasamy, B., & Yeung, M. (2010) analysed the determinants of FDI in service sector by using dynamic panel data model. The study is based on OECD countries data covering the period from 1980 to 2003. The result of empirical analysis indicates that lagged inward manufacturing FDI, lagged inward services FDI, degree of openness, GDP, infrastructure, degree of risk, GDP growth rate and skilled labour force are the important determinants of FDI in services.

Riedl, A. (2010) in her study made a sectoral analysis to identify the changes in potential determinants of FDI in manufacturing and services sector by using FDI stock data from eight new European Union member states for the period 1998-2004. The result of the study shows that due to low installation cost, services sector adjust at a fast pace to its desired stock level as compare to FDI into the manufacturing sector. In terms of location factor, the study found that as services are comparatively less tradable than manufacturing goods, FDI inflow in service sector is largely influenced by market seeking motive.

Awan, M. Z., Uz Zaman, K., & Khan, B. (2010) in their paper made an attempt to identify the key determinants of FDI inflows in Services sector by using quarterly time series data for the period 1996 Q1 to 2008 Q4. In this study, FDI inflows in Services Sector of Pakistan is taken as dependent variable whereas degree of trade openness(TO), inflation rate(INF), current account balance (CAB), gross domestic fixed capital formation (GDFCF), exchange rate(ER) and per capita income (PCI) are taken as independent variables. The study applied regression, co integration and error correction model for estimation of result and found that except trade openness all the other variables are statistically significant. GDFCF, INF, PC are statistically significant with positive sign while CAB and ER are statistically significant with negative sign. The study concludes that GDFCF, CAB, INF, ER and PCI are important determinants of FDI inflows in the services sector of Pakistan.

Yin, F., Ye, M., & Xu, L. (2014) analysed the locational determinants of FDI in the service industry of China both theoretically and empirically. The study formulated 10 hypothesis regarding the location determinant of FDI in services and these hypothesis are tested through panel data model for seventeen provinces and cities of China from 2000-2010. The study has found growth potential, purchasing power, development of service industry, wages cost and agglomeration effects as the important location determinant of FDI in service industry of China.

3. SELECTION OF THE VARIABLES

From the forgoing literature review, six macroeconomic variables have been selected by researcher for the analysis of FDI inflow in the service sector of India. These include exchange rate, inflation, openness, manufacturing FDI, external debt and gross domestic product growth. These six variables have been selected particularly because they are dominating in FDI literature

as they meaningfully explain the inflow of FDI in the given country, region or sector. Some of the variables have been dropped to avoid the problem of multicollinearity and some for the unavailability of data. The brief description of the selected explanatory variable is as follows:

Market Size

Market Size is considered as the most important determinant of FDI in service sector as most of the services are non-tradable and requires physical presence of investor in the host economy (Kolstad & Villanger, 2008). To measure the market size, we usually use proxy variables like gross domestic product (GDP), per capita GDP, GDP growth or the size of middle class population (Ranjan & Agrawal, 2011; Tripathi et al., 2015). Countries with large market size are expected to attract higher FDI inflows as larger market provide more and better opportunities to MNC's to exploit their ownership advantage (Kaur and Sharma, 2013). In the present study, we have used gross domestic product growth (per cent annual) as proxy variable for market size.

Inflation

A country with better macro-economic environment (high and stable growth rate etc.) is expected to receive more FDI inflows than the country that is reverse in nature (Ranjan & Agrawal, 2011). Inflation is one of the measures of economic stability in a country. Low inflation rate reduces uncertainty and encourages MNC's to make investment into the country. On the other hand, high inflation rate discourages foreign direct investment inflows to the country as it increase input prices, cost of raw material, wages, land prices and cost of capital. Therefore, it can be concluded that FDI inflows and inflation are inversely related. In India, inflation rate is measured by using different price indices such as wholesale price index, consumer price index and GDP deflator. In this study, we have used GDP deflator (annual per cent) as a proxy for measuring inflation as it reflects the change in general price level of goods and services produced domestically in an economy

External Debt:

External debt is that portion of a country's debt which is borrowed from foreign lenders including commercial banks, governments or international financial institutions. It has to be paid back in the currency in which it is borrowed. High level of external debt increases uncertainty regarding economic and business prospects of the host country and therefore makes the country less attractive for foreign investors (Chopra, 2003). Thus, we conclude that there exists a negative relation between FDI inflow and external debt of the host economy. In this study, external debt stocks (% of exports of goods, services and primary income) has been taken as a proxy variable for measuring the level of external debt in India.

Exchange Rate:

Exchange rate is defined as the domestic currency price of a foreign currency. It shows relative strength of the domestic currency in relation to the foreign currency. Depreciation in the host country's currency increases the overall rate of return to foreign investors and leads to increase in FDI inflows to the host economy while appreciation in host country's currency reduces profitability of the foreign investors resulting in decline in FDI inflows to the host economy. Therefore, we can say that depreciation in the host currency raises FDI in the host country and vice versa (Froot and Stein, 1991).

Openness:

FDI openness of an economy is measured as the ratio of inward FDI to its GDP (ARIC). A high value indicates a more open economy and vice versa. As in this study we are concerned about service sector performance, therefore we have calculated openness by taking the ratio of FDI inflow to GDP of the service sector. Openness basically is an indicator of integration of an economy or a sector in international economy. The method of calculation is as follows:

$$OPEN = \frac{SFDI}{SGDP}$$

Manufacturing FDI:

The rationale behind the selection of this variable is that manufacturing and service sector are complementary in nature. Prominent services like financial and non-financial services, telecommunication and transportation which are often referred as producer services acts as intermediary goods for further production activities and helps in binding the production chain together. Kolstad and Villanger (2007), Ramasamy and Yeung(2010) and Yin et al. (2014) considered FDI in manufacturing sector as a relevant variable for assessing the determinant of FDI in service sector and found a positive relationship between the two. Therefore, manufacturing FDI has been taken, considering it as one of the important determinants of FDI in service sector.

4. DATA AND METHODOLOGY

The study is based on secondary data covering the period from 1996 to 2016. This period has been chosen for the very reason that sector wise data on FDI prior to 1996 is not available in public domain. The data for GDP growth, GDP deflator (inflation) and external debt has been collected from world development indicators (WDI DATABANK), 2018. The data for exchange

rate (USD/INR) is taken from Reserve Bank of India database. The data for FDI in manufacturing sector and service sector has been compiled in accordance to NIC 2008 classification from the statistics released by Secretariat Industrial Assistance newsletter (various issues), Department of Industrial Policy and Promotion.

The study covers the time period of 21 years which is too short to go for advance econometric applications. Therefore, after checking stationarity of the dataset through Augmented Dickey Fuller and Phillips Perron unit root test, we have simply employed ordinary least square to estimate the results. Some variables like service FDI and manufacturing FDI have been taken in log form to neutralise the unit effect and also to make interpretation in proportionate terms. Other variables such as exchange rate, gross domestic product growth, inflation, external debt and openness (SFDI/SGDP) have not been taken in log form because these variables are already in percentage terms.

5. DATA ANALYSIS AND INTERPRETATION

5.1 Descriptive Statistics

Table 1 shows descriptive statistics of the variables gross domestic product growth (GDPGR), manufacturing FDI (LNMFDI), service FDI (LNSFDI), debt (DBT), exchange rate (EXRT), inflation (INF) and openness (OPEN) for the period 1996 to 2016. Descriptive statistics give summary information of the variables in a dataset. From the above table, we can see basic structure of the variables through mean, standard deviation, range and coefficient of variation of the variables. Mean value states the average figure of the data points used in the analysis while standard deviation (SD) and range tells us about the dispersion of a set of data from its mean value. Coefficient of variation (CV) is a measure of dispersion that helps to compare variation across variables with different units or with different means. If any variable have higher coefficient of variation, it is called more dispersed than the one with lower CV. In this dataset, high dispersion is found in the variables such as openness, gross domestic product growth and inflation.

Table 1: Descriptive Statistics of the variables used in the study

Variable	Obs.	Mean	SD	Min	Max	CV
LNSFDI	21	11.85	1.46	9.86	14.41	0.12
LNMFDI	21	12.40	1.11	10.89	14.12	0.09
DBT	21	121.17	49.20	70.81	221.69	0.41
EXRT	21	48.00	8.42	35.43	67.19	0.18
OPEN	21	10.61	9.46	1.42	30.33	0.89
GDPGR	21	7.00	2.05	3.80	10.26	0.29
INF	21	5.55	2.19	1.79	8.98	0.39

Source: Researcher’s own calculation.

5.2 Correlation Matrix

Table 2: Correlation Matrix

	LNSFDI	LNMFDI	DBT	EXRT	OPEN	GDPGR	INF
LNSFDI	1.00						
LNMFDI	0.94*	1.00					
DBT	-0.71*	-0.64*	1.00				
EXRT	0.61*	0.53*	-0.46*	1.00			
OPEN	0.92*	0.87*	-0.56*	0.44*	1.00		
GDPGR	0.85*	0.15	-0.33	0.03	0.04	1.00	
INF	0.21	0.24	-0.1252	-0.45*	0.26	-0.01	1.00

Source: Researcher’s own calculation.

Note: Significant at 5 per cent.

Figure in parentheses are p-value.

Table 2 shows pairwise correlation between the variables. The value of correlation depicts the degree of association between independent and dependent variables. The table reveals that FDI inflows in service sector is positively related to manufacturing FDI, exchange rate, openness,

GDP growth and inflation while it is negatively related to external debt. The value of correlation shows that LNMFDI, GDPGR and OPEN are highly correlated with FDI in service sector as compare to other variables.

5.3 Unit Root Test

Table 3: Unit root test results -With Intercept

<i>Variables</i>	<i>ADF</i>		<i>PP</i>	
	Level	First Diff	Level	First Diff
<i>Independent Variables:</i>				
<i>LNMFDI</i>	-1.93	-7.64*	-1.7	-7.94*
<i>DBT</i>	-2.54	-3.53*	-2.57	-3.54*
<i>EXRT</i>	0.40	-3.32*	0.40	-3.35*
<i>OPEN</i>	-1.39	-4.05*	-1.24	-4.31*
<i>GDPGR</i>	-3.72	-6.15*	-3.7	-6.20*
<i>INF</i>	-2.62	-6.11*	-2.33	-6.01*
<i>Dependent Variable:</i>				
<i>LNSFDI</i>	-1.14	-5.21*	-0.77	-6.73*

Source: Researcher’s own calculation.

Note: * Significant at 5 per cent

Table 4: Unit root test results -With Intercept and Trend

<i>Variables</i>	<i>ADF</i>		<i>PP</i>	
	Level	First Diff	Level	First Diff
<i>Independent Variables:</i>				
<i>LNMFDI</i>	-3.71	-7.50*	-3.69	-7.74*
<i>DBT</i>	-0.65	-4.49*	-0.17	-5.09*
<i>EXRT</i>	-2.29	-3.36*	-0.62	-3.27*
<i>OPEN</i>	-2.24	-4.00*	-2.31	-4.20*
<i>GDPGR</i>	-3.93	-5.96*	-3.91	-15.52*
<i>INF</i>	-2.97	-5.95*	-2.27	-5.86*
<i>Dependent Variable:</i>				
<i>LNSFDI</i>	-3.00	-5.11*	-2.96	-6.01*

Source: Researcher’s own calculation.

Note: * Significant at 5 per cent

Table 5: Unit root test results –Without Intercept and Trend

<i>Variables</i>	<i>ADF</i>		<i>PP</i>	
	Level	First Diff	Level	First Diff
<i>Independent Variables:</i>				
<i>LNMFDI</i>	1.06	-7.51*	0.98	-7.55*
<i>DBT</i>	-2.77	-3.30*	-2.77	-3.30*
<i>EXRT</i>	2.59	-2.68*	2.59	-2.66*
<i>OPEN</i>	-0.27	-4.03*	0.11	-4.03*
<i>GDPGR</i>	-0.86	-6.31*	-0.67	-11.83*
<i>INF</i>	-1.16	-6.21*	-1.13	-6.00*
<i>Dependent Variable:</i>				
<i>LNSFDI</i>	0.91	-5.03*	2.90	-5.20*

Source: Researcher’s own calculation.

Note: * Significant at 5 per cent.

Unit root test is used to check stationarity of a data set. In time series analysis, it is essential to make the data series stationary otherwise, results will be spurious. A stationary time series is one whose statistical properties such as mean, variance, autocorrelation etc. are all constant over time. There are various tests for checking stationarity of a time series such as Augmented Dickey Fuller test (ADF), Phillips Perron test (PP), KPSS etc.

In this paper, we have applied ADF and PP test to check stationarity of the data set. Table 3, 4 and 5 shows the result of ADF and PP tests with three different approaches. The result of both the tests with all the three approaches suggests that the series is not stationary at level rather it is stationary at first difference. Therefore, for the application of regression analysis series is made stationary at first difference and after that OLS is run on the following estimated model:

$$\Delta \ln SFDI_t = \alpha + \Delta \ln MFDI_t + \Delta DBT_t + \Delta EXRT_t + \Delta OPEN_t + \Delta GDPGR_t + \Delta INF_t + s_t$$

Where,

Δ =First Difference of the variable ($Y_t - Y_{t-1}$)

α = intercept

$\ln SFDI_t$ = FDI inflow in service sector taken in log form

$\ln MFDI_t$ =FDI inflow in manufacturing sector taken in log form

DBT_t = External Debt stocks (% of exports of goods, services and primary income)

$EXRT_t$ = Exchange Rate (USD/INR)

$OPEN_t$ =Openness (Ratio of service FDI to service GDP)

$GDPGR_t$ =Gross domestic product growth (per cent annual)

INF_t =Inflation (GDP deflator, per cent annual)

s_t = Error term

5.4 Regression Result

The result of regression analysis presented in table 6 shows that the slope coefficient for all the explanatory variables included in the model has positive relationship with FDI in service sector. However, among all the explanatory variables only OPEN, GDPGR and MFDI is found to be statistically significant as the p-value is less than 0.05 for these variables.

Table 6: Regression Results

Variable	Coefficient	Std. Error	t-statistics
C	0.07	0.15	0.50 (0.625)
Δ LNMFDI	0.42	0.13	3.16* (0.008)
Δ DBT	0.01	0.01	0.57 (0.578)
Δ EXRT	0.02	0.05	0.43 (0.674)
Δ OPEN	0.07	0.02	3.56* (0.003)
Δ GDPGR	0.14	0.05	2.80* (0.017)
Δ INF	0.07	0.05	1.36

			(0.195)
R-squared	0.86	Prob. (F-statistic)	0.000
Adjusted R-squared	0.79	Durbin-Watson stat	2.14

Source: Researcher's own calculations.

*Note: * Significant at 5 per cent.*

Figure in parentheses are p-value

The coefficient of LNMFDI is 0.42 which means that one per cent increase in manufacturing FDI causes 0.42 per cent increase in service FDI. When fragmentation of production activities takes place, the demand for producer services increases and hence, encourages FDI inflows in service sector. This result substantiate with the findings of other related studies like Kolstad and Villanger (2007), Ramasamy and Yeung (2010) and Yin et al. (2014).

The coefficient of GDPGR is 0.14 which implies that 1 per cent increase in GDPGR leads to 14 per cent increase in service FDI indicating that higher economic growth leads to higher FDI inflows to service sector. The result is consistent with the findings of Ramasamy and Yeung (2010) and Yin et al. (2014) suggesting that countries with large market size having high potential for further growth are usually preferred by investors for FDI in service sector.

The coefficient of openness of service sector is measured as the ratio of FDI to GDP of service sector. The value of this ratio is 7, which implies that one per cent increase in openness lead to 7 per cent increase in service FDI. This increase may be attributed to the changing pattern of global FDI flow and also to the economic policies pursued by government in the post reform period.

The value of coefficient of determination i.e. R^2 shows the goodness of fit of the model which is 0.86 indicating that 86 per cent of FDI inflow in service sector is explained by the selected variables employed in the model. In order to detect the problem of auto correlation, the Durbin - Watson statistics (D-W) test is used. The Durbin-Watson statistic always lies between 0 and 4. A value of 2 means that there is no autocorrelation in the series whereas values approaching 0 indicate positive autocorrelation and values toward 4 indicate negative autocorrelation. The D-W Statistic is found to be 2.1 which confirms that there is no autocorrelation problem in the dataset. Since the value of D-W statistics is greater than R-square, it further assures that the model used for estimation is statistically fit.

6. CONCLUSION

The objective of the present study is to examine the determinants of FDI in service sector of

India. The result of regression analysis reveals that manufacturing FDI, GDPGR and openness (SFDI/SGDP) are the significant determinants of FDI in service sector while external debt, exchange rate and inflation are insignificant. The findings of this study suggests that since FDI in manufacturing sector has significant positive relationship with FDI in service sector therefore, instead of attracting FDI inflows to service sector efforts should be made by government for encouraging investment in manufacturing sector. The presence of significant positive relation of FDI in service sector with openness and GDPGR indicate that government should design stable and transparent policies to enhance the confidence of foreign investors in Indian economy.

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