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Empirical Analysis of Macroeconomic Indicator as Determinants of Foreign Direct Investment in India

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Abstract: India is recognized as one of the most striking long-term investment destinations in the world. The existence of large domestic market, fairly well developed financial Institutions and cheap skilled human resources, can attract much larger foreign investments than it has done in the past. The present study attempts to empirically examine the determinants of FDI in India by taking time series data for the period 1991-2010 .First review of literature has been studied for relevant variables, second examine the link between these variable. It used Ordinary Least Square (OLS) method for this purpose. The results indicate that GDP, inflation and Trade Openness are significant in explaining FDI inflows in India whereas Foreign Exchange Reserves are not significant in explaining FDI inflows in India.

Keyword: FDI, GDP, Trade openness, Inflation, Foreign Exchange Reserve

I. Introduction

FDI usually represents a long term commitment to host country and contribute significantly to GDP in developing country. FDI has several advantages over other type of capital flows and its greater stability. Emerging issues in the areas of FDI are essential part of the core process of globalization. FDI play a key role in improving capacity of host country FDI is no longer regarded with suspicion by the developing countries and controls and restrictions over the entry and operations of foreign firms are now being replaced by selective policies aimed at FDI inflows, like incentives, both fiscal and in kind (Banga, 2003).

There are several determinants of the FDI. Whether particular action of an investor or government is responsible for increase or decrease in the investment for a given period is treated as determinant. There is not a single variable, which would influence investment to rise or fall but it is comprised of a set of variables. It would be very valuable to review the key determinants and factors of FDI based on the theories of international investment.

For this, the present paper is divided into three parts, the first one reviews latest literature on the subject so as to discuss issues, the second one show variables, factors for FDI flows, hypotheses, methodology and Model building, whereas, the third one explains results and their interpretations.

II. Review of Literature

There are several studies undertaken by the scholars so as to know determinants and variables affecting FDI flows in the developing countries. However, a mention may be made a few of those. These include,

1. Sahni P(2012) has empirically examined in his study, the determinants of FDI in India by taking time series data for the period 1992-93 to 2008-09. It applies regression analysis method for this purpose. The author's results indicate that inflation and Trade Openness are important factors GDP, in attracting FDI inflows in India during post-reform period, whereas, Foreign Exchange Reserves are not important factors in explaining FDI inflows in India.

2. Pradhan (2010) has investigated the role of trade openness on FDI during 1980-2007. He has found that trade openness has a significant positive impact on FDI inflows. Globalization has not only brought interdependence in economic relations through trade, investment, Finance and the organization of production globally but also social and political interactions among the organization at global level. He has used a multivariate regression model, where FDI is dependent variable and current account deficit as percentage of GDP, growth rate of real GDP, rate of inflation, Net term of trade, infrastructure investment and real effective exchange rates are independent variables.

3. Megon M(2011) The paper provides the brief synthesis of the regime and analyzes the economic and policy variables as the important determinants of FDI inflows to India. For that, researcher has analysed FDI as dependent variable and GDP, Foreign exchange reserve, trade openness have been taken as exploratory variables. He also emphasizes the areas, where the policy needs to be reviewed and to be made more conducive for foreign investment. .

4. Dash &Sharma(2011) has examined empirically the inter link-age between FDI, Trade, Growth. They used a vector Auto regression model to measure relationship between FDI and growth. They developed two hypotheses. 1. FDI causes export, import and economic growth. 2. Export, Import, economic growth causes FDI. The authors concluded that three variables are theoretically related but causality is running from export to FDI and not Vice-a-versa. So the role of FDI in export promotion is not substantiated, however, complimentary relation between FDI and Imports indicate that FDI in India is domestic market-seeking rather than Export-seeking.

5. Sinha. S (2008), the study has identified the gap in the literature by analyzing state level data between 1992-2005 in India and its comparison with Chines data for the period of 1978-2005. According to her, Market size, market growth rate, political stability, corruption, exchange rate, labour productivity, economic freedom infrastructure, openness, human capital, and taxes affect FDI flows.

6. Kamath B(2008) has estimated and analysed the impact of FDI on Gross Domestic Product and Exports in India during 1991-2005. The data are analysed by using simple Linear Analyses to find the impact of FDI on various variables.

7. Hooda S (2011) has examined inflows of FDI in India since 1948 to 2010 so as to view trends and patterns of FDI inflow, assess the determinates of FDI inflow and examine impact of flow of FDI on Indian Economy. She analyzed the data with simple regression technique and model given by her shows growth pattern of different segment of Indian economy.

8. Dunning J (2001) studied an Eclectic Paradigm of International production in mid-1950 to 2001. He concluded that Eclectic Paradigm is still a powerful and robust framework to examine contextual specific theories on FDI and International production. He expressed that it is in appropriate to compare merits and demerits of Eclectic Paradigm with that of Internationalization and other theories of the firm.

III. Factors and Variables Affecting FDI Flows

In the present section, an attempt is made to empirically examine the major factors, which have determined the inflows of FDI in India in from 1991 to 2010. FDI in a host Country is determined by economic determinants. FDI faces variability of basic macroeconomic factors such as economic performance, growth, inflation, budget deficit, interest rates, exchange rates, Foreign Exchange Reserve etc. with reference to across countries analysis. Moreover, the Country Risk theory explains that foreign investors extend their operations across borders and regulatory regimes, they face a complex set of risks. The critical risk, affect the operations of foreign direct investors in a host country range from government regulation to political and economic instability.

Country economic risk is equivalent to operation risk in corporate finance. It refers to the instability of macroeconomic performance, which is often measured by real gross domestic product (GDP) and growth. It is a key risk factor in international investments because a country's macroeconomic environment plays a fundamental role in shaping the outcome of individual investments undertaken within its borders.

Currency risk is the most extensively known element of country risk. It can be defined by the level and volatility of the exchange rate. The exchange rate has major consequences on a country's level and composition of output and consumption, as well as on its overall economic well-being. It also has major consequences for non-residents investing in the country or doing business with it. Apparently profitable transactions can suddenly turn sour if the exchange rate moves in the wrong direction.

Macroeconomic stability is one of the important determinants of foreign investment. One indicator of a steady macroeconomic environment is an evidence of price stability. Where inflation rates are high, potential direct investors may distinguish difficulty even in making short-term pricing decisions. Low inflation indicates to investors how committed and convincing the government is. In addition, high inflation indicates the failure of the Central Bank to conduct appropriate monetary policy (Schneider and Frey, 1985). It indicates domestic policy failures that daunt both savings and investment. Inflation also may slow up export sales from the country, thus making resource-seeking FDI less attractive. It concludes that, foreign investors may avoid making investments in countries with high inflation.

Trade and Openness to International Markets

Various studies have suggested that foreign investments in countries are positively related to indicators of "openness" (measured as exports plus imports of both goods and services to GDP). Foreign investors select countries with relatively liberal trade regimes, possibly within free trade arrangements. On the other hand it depend on the type of FDI, the level of openness of a host country could have a positive or negative impact on a country's ability to attract FDI. FDI focused on exploiting the local market would be attracted to a country with a less open economy, and FDI focused on exports (export-oriented FDI) would be positively related to openness.

Following factors are taken as Proxy variable for macroeconomic variable the Therefore one can safely developed hypotheses for possible testing.

Determinants	Definition	Reason for inclusion
EXRES	Foreign exchange reserve in US$	Indicate the strength to pay back the capital. Increase foreign investor confidence.
GDP	GDP in US$	Captures demand for goods and services provides a representation of the market size.
TO	Trade openness (total trade) US$	Total trade sum of export and import. A measure of openness of the economy which indicate the degree of International exposure.
Inflation	Wholesale Price Index	Wholesale Price Index used to measure inflation rate.

Hypothesis 1: The higher the economic performance of a host country indicated by real GDP and Growth, the higher will be the foreign direct investment inflows. GDP indicates also the market size of an economy. Foreign direct investment is positively related to host country market size

Hypothesis 2: The higher the inflation rate of a host country - measured as percentage change in consumer prices - the lower will be the foreign investment inflows.

Hypothesis 3: More Foreign Exchange Reserves has positive impact on FDI flows in the host country.

Hypothesis 4: Openness (Total Trade) is not expected to have an effect on foreign direct investment inflows in the host country.

IV. METHODOLOGY

Methodology, Model Building and data analysis

The time period taken for the study is from 1991 to 2010 because the economic liberalization was initiated in India from 1991 onwards. Multiple regression analysis Method has been used to find out the determinants of FDI in India from the period 1991-2010. Regression model is used in which the dependent variable is FDI in India and the independent variables considered in the model are Gross Domestic Product (GDP), Trade Openness, Inflation and Foreign exchange reserves. To Measure Inflation, this researcher has used data on wholesale Price Index (WPI) considering 1993 as base year. To measure Trade openness Total trade has been use as independent variable. All the relevant data are obtained from Handbook of Statistics on Indian Economy (various issues), Reserve Bank of India Bulletin (Various issues of SIA new letters). This researcher has applied Ordinary Least Square (OLS) method of estimation has been used. The natural log transformations for each of these models are fitted and specified. The prime objective of generating natural log transformation regression equations (i.e. log to the base 10) is to determine the degree of sensitivity of the dependent variable to change in the explanatory variables.

Model Building

FDI= f (GDP, TO, INF, FOREX) ......(1)

Where,

(1) FDI = Foreign Direct Investment Million USD

(2) GDP = Gross Domestic Product Million USD

(3) TO = Trade Openness Million USD

(4) INF = Inflation (WPI)

(5) FOREX = Foreign Exchange Reserves Million USD

More specifically, the variable to the left-hand side of the equality symbol represents the dependent variable, while those to the right-hand side are referred to technically as explanatory variable. The estimated model is :

$$\textbf{In FDI} = \beta + \beta_1 \textbf{ In GDP} + \beta_2 \textbf{ In TO} + \beta_3 \textbf{ In WPI} + \beta_4 \textbf{ In FOREX} + \textbf{U} \quad .... \ (2)$$

Table -1 Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.952[a]	.906	.880	.21360	.906	35.946	4	15	.000	1.058

Table -2 ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	6.560	4	1.640	35.946	.000[b]
Residual	.684	15	.046		
Total	7.244	19			

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-6.317	2.687		-2.351	.033
WPI	-1.308	.670	-1.056	-1.952	.070
GDP	5.912	1.771	1.344	3.339	.004
TO	-1.172	1.500	-.421	-.781	.447
EXRES	1.697	1.276	1.061	1.33	.203

In this Model, Least Square technique is used for time series data to test the strength and significance of the explanatory variables against the dependent variable. There are 95% relationship between FDI can be explained by four exploratory variable i.e WPI, GDP, Total Trade and Foreign Exchange reserve. The Durbin-Watson (D.W) statistics showed that it fall under non-collusive region and therefore the presence of serial correlation could not be confirmed. The results significantly disclosed that the value of Coefficient of GDP, Trade openness, Inflation and Foreign Exchange reserve are (R square=0.9), which has revealed to be statistically significant $F(4,15) = 35.9$, $p<0.25$ (Table 2). Observation of exploratory variables are shown in table no 3, which has revealed that WPI (Beta=-1.308, p=0.070) is significant predictor of FDI, but it represents inverse relation with FDI , GDP (Beta=5.912, P=0.004) is significant predictor of FDI. Trade Openness (Beta=-1.172, P=0.63) is significant predictor of FDI. Foreign Exchange Reserve (B=1.697 P=.203) is not significant predictor of FDI.

V. CONCLUSION

It can be safely concluded for a country like India that variables measured to affect FDI flows are statistically significant. The empirical results of Determinants of FDI inflows in India shows that GDP, Foreign Exchange Reserves exhibit a positive relationship with FDI while trade openness and Inflation exhibit negative relationship with FDI inflows in the country during the period 1991-2010.More over More Foreign Exchange Reserves has positive impact on FDI flows, by keeping in mind the macro variables, the government of India should continue FDI flows in the sectors, which have high potentiality to grow. This means that Foreign Investment Promotion Board need to identify projects, which have absorbing capacity of FDI, which may lead to higher GDP, production, Employment and exportable surpluses.

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