

The effect of foreign direct investment on macro economic variables during the period 2000 to 2010

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Abstract

Macro economics is the study of issues pertaining to the total income of the country, investments – domestic and foreign, consumption, employment, interest rates, exchange rates etc. Foreign direct investment is investment made by foreign companies in a country in direct manufacturing and service activities.

Foreign countries rely on the macroeconomic aggregates to finalize their investment decision. Market size, market potential, per capita consumption, increase in demand, education and infrastructural improvements are not the only decision making variables. Firms decide based on the movement of macroeconomic variables before investing in a foreign land.

Literature reviews are done to find important macro economic variables and also identify the gap in the existing literature in order to explore and find more foreign direct investment determinants. The paper discusses in length the identification of key macro economic variables from an Indian perspective. The period taken up for the study is from 2000 to 2010 since this period saw many foreign companies setting their foot firmly in India even though fully fledged reforms started in India from the 1990's. Key variables are identified and discussed from an Indian stand point.

Key words: Macro economics, Foreign direct investment, macro economic variables, investment – domestic and foreign, National income, interest rates, employment rates, short run and long run economic growth, business cycles, government debt, foreign exchange reserves.

Importance Of Macro Economic Variables In Making Foreign Direct Investment Decisions – A Retrospective Study In Indian Context

The study of macroeconomic variables is considered to be important for making major investment decisions ever since trade and commerce moved beyond the shores of a country and more so in the current globalised context.

Understanding the meaning of macro economics and its related issues/variables is paramount before embarking on Foreign Direct Investment and macroeconomic variables association. Macro economics is a field of economics that studies the behavior of the aggregate economy. The examination of the aggregate economy is wide and farfetched.

The focus is on the movement and trends in the economy as a whole on issues such as national income, unemployment, inflation, price levels, consumption, investment (domestic and foreign), exchange rate management etc. The success of an economy lies in the overall management of these variables and their related issues. A country strives for increasing its national income and therefore carefully plans its policies and

programmes in order to avoid major catastrophes that may happen due to forces of the external environment.

From a macro economic sense, the main consideration for any country is to make its economy grow (normally referred to as Gross Domestic Product) and other macro variables are tuned through policy measures to support this objective either in the short run or in the long run. This brings to another major discussion – Economic growth in the short run and in the long run.

According to Parkin and Bade, economic growth can be split into two:

- 1) Short run: is the time period in which the quantity of at least one variable is fixed and the quantities of other variables are varied. With this change a country tries to achieve growth in the short run.
- 2) Long run: is the time period in which the quantities of all the variables are varied and policies are based to achieve long run growth.

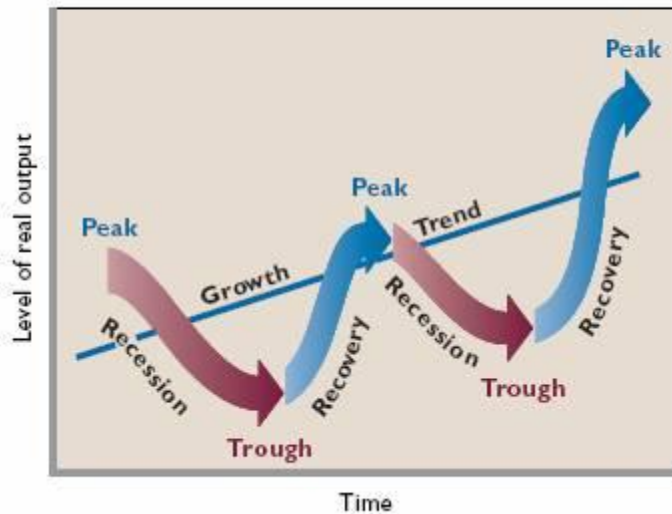
From the above, it can be noted that the growth imperative depends on the effective management of variables in the short run and in the long run. Economists have time and again reiterated the importance of controlling the variables in the short and long run. The effective management and control of these variables will steer a country towards a long and sustainable economic growth.

In the short run, the vagaries and the fluctuations in the business cycle affect the growth progress significantly which can prove vital in the long run. Generally, business cycles can be explained in four stages viz.,

- a) Expansion – a period where the production is at full capacity followed by low inflation and optimal prices.
- b) Crisis – a period where the economy is overheated and due to this syndrome there is a price war and eventually firms go for mergers and acquisition routes for survival. The economy also experience stock market crashes and bankruptcies of firms.
- c) Recession - a period where the business confidence is low which is reflected in low productivity and low interest rates.
- d) Recovery - this period witnesses a strong comeback of the firms in terms of productivity and business confidence of the firms. The prices take off and favorable sentiments prevail in the stock market.

Figure No:1

The business cycle. Economists distinguish four phases of the business cycle; the duration and strength of each phase may vary.



Source:

<https://demisimiforeducation1111.wordpress.com/2012/06/11/business-cycles-and-economic-instability/>

The management of the business cycle becomes essential as the interplay of macroeconomic variables such as inflation, unemployment, consumption, investment (domestic and foreign) among themselves and with Gross Domestic Product will affect the country in the long run. It is through the intervention of the central government in the form of fiscal and monetary policies; the economy is steered manipulated based on its long term agenda.

India had an inward looking development policy since independence till the 1990's. Caught off guard by the sudden increase in oil prices due to the gulf war in 1990-1991, the current account deficit ballooned and India had no way except to accept the terms and conditions imposed by the International Monetary Fund (IMF) for a bailout package. The signing of the agreement brought with it many reforms in trade and a gradual process of hiving off the less profitable public sector units to the private sector. The turn of events in 1991 exposed India to the rest of the world, the callous attitude with which it was handling its macroeconomic issues. At the same time period, many countries in the world were leaning towards globalization and many countries were opening up their economies for harvesting the benefits of globalization. Many developing countries were inviting foreign companies to invest in their economies as they felt that foreign capital is necessary for the growth of their respective economies. The thirst for foreign capital was not confined to mere capital but also due to many other factors such as technology, positive spillovers, managerial and technical skills etc.

Many economies firmly believed foreign direct investment was the only external capital which did well to them than other forms of capital. On the other hand the foreign

investors made some elaborate economic studies and after getting themselves reassured they started investing in these economies. If that was the writing on the wall, what did the foreign investors look while investing in India was the next pertinent question.

Review of literature.

Literature reviews were done for finding the key macro economic variables that were found important from an investor's point of view. This was done in order to understand the determining factors of foreign direct investment and cull out the most important factors for examination.

Worldwide, foreign direct investment was robust in 1990's after a brief slump in mid-1980 when many countries took to globalization. While some of them resorted to globalization due to compulsion by the International Monetary Fund, many took it as an opportunity to build their economies. Majority of the home country companies sought to expand their market share and also to take benefit out of cheap labor.

Kinuthia Ng'ang'a, P. (2005) constructed a theoretical model and classified that trade openness and infrastructural development in a country were the important variables for the consideration of foreign direct investment by the home country. He also cited that labour and capital were major factor endowments only up to certain level and after that diminishing return sets in.

Gijon-Spalla, Jose Gijon-Spalla, J. (2005) explained that liberalization of capital account, legal and institutional reforms created the path for increased foreign direct investment flows into a country. The results were based on data from 80 and also confirmed that foreign direct investment was mandatory for economic development.

Investigating 24 developing countries, Kok, Recep; Bernur Acikgoz Ersoy (2009) analyzed foreign direct investment determinants with one important question framed by Dunning (1993) "Why do companies invest abroad". The indicators tested were based on empirical literature and United Nations Conference on Trade and Development (UNCTAD) parameters. The following were the variables taken for the study ; foreign direct investment, electric power consumption, total external debt, technology gap, total debt, inflation, Gross fixed capital formation, telephone mainlines, trade openness and Gross Capital Formation.

The study found that FDI with Total debt/ GDP and inflation had a negative effect. Trade openness, Telephone, Gross Capital Formation and GDP per capita had a positive effect on FDI. They concluded that FDI policies should be "country specific" based on their own 'economic structure'.

Literature reviews of over 150 articles covering FDI determinants were studied by Liang, Haitao (2010). After performing a meta-analysis test to look into the reliability of the previous studies, cluster analysis tool was used to segment economies based on income levels. The findings clearly revealed that income played a significant role in foreign direct investment flows. With growing incomes in developing countries, foreign direct investment flows increased.

The other key findings matched with the empirical studies. It was found that high education levels, good and consistent physical infrastructural development, expanding market potential, Gross Domestic Product (per capita) were some of the key

determinants of foreign direct investment. The study also rejected that a weak currency dislodged foreign direct investment flows.

Changwatchai, Piyaphan (2010) found Gross Domestic Product per capita, trade openness, low industry tariff had a positive effect while studying the foreign direct investment determinants in ASEAN countries (Indonesia, Malaysia, Thailand and Vietnam). Wages, education and distance had a negative effect.

Lin, Kelly et al (2012) analyzed foreign direct investment determinants across four regions in China. Market size, labour cost, degree of economic openness and government incentives were examined. Multiple regression statistical tool was employed for each region and the results were then compared with other regions. Different results were found in each region and each of them indicated a separate trend which did not match with the others. Labour quality had nil effect in the central region but had a positive effect in the coastal and north east region.

The authors were of the view that different kinds of industries could be identified at a regional level based on the specific drivers of foreign direct investment in each region. They recommended that policies could be region-specific based on regional social-economic features.

Ho, Catherine SF et al (2011) investigated country specific foreign direct investment and macro-economic variables in five ASEAN countries (Indonesia, Malaysia, Philippines, Singapore and Thailand) from 1975 to 2009. The outcome of the study revealed two key macro-economic determinants. Growth in gross domestic product and trade openness were the two key determinants for the increased flows. Country specific factors such as skills and knowledge, infrastructure, income levels had a positive effect on foreign direct investment flows was their conclusion.

Are their differences in FDI determinants between developing and developed countries? To answer this question, Shahmordai, Behrooz et al (2010) did a cross – sectional analysis among twenty three (23) high income countries. GDP, outflow, inflow, exports, imports and labour variables were selected for the study. Multiple regression (add up method) was employed and the research found that all foreign direct investment determinants under study were equally relevant.

Employing panel data analysis in BRIC (Brazil, Russia, India and China) nations, a study was conducted by Ranjan, Vinit et al (2011) for a period of 35 years (1975 – 2009) to find out the key FDI determinants. The results showed that trade openness, market size; labour cost, infrastructural facilities, macro-economic stability and economic growth as the key determinants of FDI inflows in BRIC nations. Gross Capital Formation and quality of labour had no impact in the economic development.

Guru – Gharana, Kishore (2012) had employed the most recent Toda – Yamamoto – Dolado - Lutekephol technique for 3 different time periods. The study found a significant positive relationship between foreign direct investment, trade and economic growth.

India accounted for nearly one-fifth of the global GDP growth in the last five years and the second largest recipient of Foreign Direct Investment after China- roughly five times more than what was recorded in 2001 (\$22.8 billion in 2007 versus 4.00 billion in 2001). Citing the granger causality tests as an incorrect way of examining the relationship, the authors employed the Toda and Yamamoto (1995) and Dolado and Lutekephol (1996) tests for assessing the relationship. They concluded that the post

liberalization period in India had gone through structural breaks and in spite of the inconsistencies, foreign direct investment had greatly influenced Gross Domestic Product which in turn had boosted Indian exports to a great extent.

Several policy inferences were made in this paper. First, it suggested to strengthen the ongoing liberalization efforts and expanded in scope. Second, it recommended for a higher trade openness regime, much higher than the World Trade Organization (WTO) stipulations. Since foreign direct investment supports the growth of exports indirectly, export sector had to be given full thrust and the limiting factors should be weeded at the earliest, they added with the note on the three macro-economic variables being fundamental for a country's economic growth.

Economic growth had stagnated over the years from its peak due to a number of factors ranging from lack of political will, weak governance, policy paralysis, unstable macro economic factors and political parties' apathy towards reforms. According to Andrew Kenningham of Capital Economics, there was a great likelihood of India resorting to populist decisions and hence economic reforms will take a beating in the long run. Inflation, an important macroeconomic variable has gone beyond the limits, passing the double digit since December 2010 and not in control especially in the food sector. Many economists are of the view that foreign direct investment in multi-brand retail will help control inflation to a certain extent.

Another factor very much worth considering as a foreign direct investment determinant is the huge work force India has currently. India's demographic dividend could be better harnessed if changes are made in the employment rules and regulations and make it challenging. Opening of the retail sector to foreign investors without much hobnobbing on its disadvantages will put India in the driver's seat.

Similarly, the financial sector reforms especially in the banking sector will help improve the systems and strengthen the financial institutions in due course of time. Another area of concern is the ballooning CAD (Current Account Deficit), mainly due to gold imports. Gold is the second largest commodity imported next to oil.

Pradhan.R (2012) examined foreign direct investment flows into India from 2001 to 2010 using panel data. Availability of power, domestic investment, profits were the main determinants when dynamic panel data was used. A disturbing finding was the insignificance of infrastructure amongst the determinants.

Studies had found the correlation between the two variables, foreign direct investment and infrastructure to be highly correlated. Some of the studies had advocated for clustering of industries to take advantage of the infrastructure spend. Other policy measures that were suggested ranged from changes in labour laws to sectoral caps to macroeconomic stabilization.

Loksha, B.K and Leelavathy, D.S (2012) had gone for an extensive analysis on foreign direct investment determinants both inward and outward. They concluded that flows into India were determined by multitude of factors besides the policy framework. Some of them were market size, domestic competition and economic and political stability.

A comparative study of China and India by Zeng, Ping (2009) explored the gaps in the literature. Similarities and dissimilarities were found between the two countries. Gross Domestic Product per capita, imports, labour costs, political risk and uncertainty, and policy liberalization were found to be the key quantitative and qualitative determinants for both the countries. Geographical distance and cultural

distance were too important in Indian context whereas exports, market size and borrowing costs were considered to be important in the Chinese context.

A study involving India, Pakistan and Indonesia was done by Azam, Mohammad and Lukman, Ling (2010) on the same subject using time series data from 1971 – 2005. Log linear regression statistical techniques were applied. The findings revealed that market size, external debt, domestic investment, trade openness and physical infrastructure were the main determinants of foreign direct investment flows in all the three countries investigated.

Interestingly, India and Pakistan had the same determinants except for two viz., trade openness and government consumption. The authors had discussed in length the need for ensuring political and economic stability, peace and security, law and order, increase in domestic investments, bringing down external debt and giving equal importance to fiscal and monetary policies for promoting foreign direct investment.

Srinivasan (2011) broaching on the same subject did a study on the SAARC (South Asian Association for Regional Cooperation) nations for the time period 1970 – 2007 and

employed fixed effects and random effects model to find out the key foreign direct investment determinants in SAARC nations.

After the fixed and random effects estimation, the Hausman specification test was conducted. The result was the same as the fixed and random effects. It revealed that market size, Gross Domestic Product per capita, trade openness, infrastructure facilities and inflation, degree of risk and uncertainty and SAARC countries cooperation as significant contributors to foreign direct investment flows.

A study by Baniak, Andrej (2005) et al analysed the legal environment in particular apart from other determinants of foreign direct investment in transitional economies. The analysis revealed the following:

- 1) Instability in macro-economic variables reduced FDI flows
- 2) Volatility of fiscal and business regulations reduced FDI flows
- 3) Legal and macro-economic instability reduced FDI inflows

Hence for attracting foreign direct investment flows a stable economic and a good legal environment was of paramount importance, the authors concluded.

Does FDI influences all the sectors or are there any specific determinants in each sector? Sen C. (2011) attempted to answer the above question by taking services sector for analysis. Since service sector saw a phenomenal growth in terms of foreign direct investment flows, the services sector was taken up for an in-depth study and it was found that foreign direct investment influenced service sector growth. In this sector; trade, hotels and restaurants, transport, storage and communication were the top determinants.

Sajid Anwar (2006) in his study on the manufacturing sector growth in Singapore (1980-2004) highlighted some of the challenges faced by the country in this sector. The study concluded proving that the manufacturing sector's output increased with the increase in foreign direct investment flows in manufacturing. The real manufacturing output per unit of employment, foreign investment per-unit of

employment and human capital per-unit of employment were co integrated in the long run.

Jaejoon, Weo (2009) investigated the effect of foreign direct investment on TFP (Total Factor Productivity) for a large number of countries for the period 1970-2000. The results were found negative. In other words there was no correlation between foreign direct investment and total factor productivity. It also statistically proved that Total Factor Productivity depended on the host country's ability to absorb technology.

A similar study by Borensztein et al (1998) on foreign direct investment affects on economic growth and manufacturing sector in particular showed varied results. In a cross country framework, the result suggested that foreign direct investment was of principal importance in transferring technology and also contributed more than the domestic investment in the manufacturing sector. Many argued that FDI could bring in higher productivity only when there was minimum level of human capital which can absorb latest technologies.

The impact of foreign direct investment in Portuguese manufacturing sector was studied by Flores Jr, Renato G. et al (2007). He found that there was a significant positive spill over of technology due to sharp differences in technology usage between foreign and domestic industries. More the difference, the domestic industries would try and latch up with their foreign counterparts and thus indirectly help in the economic growth of the country through reduced costs and innovative products.

Chandra V.G.R. et al (2008) did a similar study on foreign direct investment and manufacturing growth in Malaysia. The period of study was from 1970-2003. The study was the first of its kind in Malaysia and examined the short and long term growth in Malaysia. The result revealed foreign direct investment in the short run to be statistically significant and in the long run a 1% increase in foreign direct investment paved way for a 115% increase in manufacturing.

An empirical study on foreign direct investment flows and the sectoral growth pattern was done by Bhattachya, Mausmi (2013) with the objective of finding the casual relationship between foreign direct investment and sectoral growth pattern viz., primary, secondary and tertiary. Granger causality test conducted in a multivariate framework resulted in tertiary sector being the cause for foreign direct investment flows. When regression analysis was employed, it revealed that both secondary and tertiary sectors growth rate were the cause of foreign direct investment flows during the investigation period.

An analysis of the factors affecting foreign direct investment in Malaysian manufacturing sector was undertaken by Karim et al (2012). The study examined thirteen Malaysian states and one federal territory. The study examined labour productivity, market demand, socio-economic development and provision of industrial estates effects on FDI flows. The findings showed positive relationship between FDI and the factors flows. It also identified labour productivity as the key factor.

Examining the effect of Foreign Direct Investment on the Nigerian Manufacturing Sector from 1975-2008, David Opaluwa et al found that foreign direct investment had a negative effect on its manufacturing sector. Based on the findings they recommended that the government should take steps to weed out negative factors and in the process create an enabling environment that will help the economy grow in a sustainable manner.

Benefits from Foreign Direct Investment can be either horizontal or vertical. A study on horizontal and vertical spill over was done by Reganati, Filippo et al (2007) with panel data (firm-level) of the Italian industries. Statistical analysis proved the existence of vertical spill over.

The decade 1980-1990 witnessed high melodrama in the Indian manufacturing sector. It witnessed de-licensing of many sectors, increase in production capacities, major boost in infrastructural facilities and a marked shift from quota control to tariffs. As per government estimates manufacturing contributed to roughly 26% of India's Gross Domestic Product and employed around 12% of the workforce and used 24% of the renewable stock of capital.

Indian manufacturing sector till the 1990's was mainly state led and inward looking. Many economists alleged that the sector neither delivered growth nor gave any adequate market returns to all its stakeholders. Subsequent crisis stunted the growth of Indian manufacturing but it showed no signs of waning. In fact, it sought to increase productivity at all levels and the Indian government was also conducive to its growth by slowly getting rid of all unnecessary controls.

The policy initiatives to boost the Indian economy in 1991 had a lot of critics. There were apprehensions on allowing foreign investments as many thought it would eventually kill Indian industry and entrepreneurship. The major disadvantage, many felt, by allowing foreign direct investment in manufacturing sector, manufactured exports (Made in India) will take a big hit. There was a general sentiment that the Indian exports consisting of handicrafts, gems and jewellery, biotechnology, IT products and services will slow down. Studies by and large had commented on many issues chiefly physical and government infrastructure as the major constraints.

Laura Alfaro (2003) in his study on foreign direct investment and sectoral growth examined the effect of foreign direct investment on primary, secondary and tertiary sectors. Using cross country data for the period 1981 to 1999, the results were found ambiguous. Primary sector had a negative growth while manufacturing sector results were ambiguous. He also added that investments in agriculture, mining and services had little spill over or no spill over at all.

The study of foreign direct investment and its effects should be on a long term since FDI is long term. Chawla, S. et al (2013) did a sector level study based on Indian economy based on the above mentioned dictum. The purpose of the study was to examine the long-term relationship of foreign direct investment on gross output, exports and labour productivity. The sectors taken up for study included primary industrial equipments, electronically equipments, transport, chemicals, food processing, metallurgical, drugs and pharmaceuticals, textiles and industrial machinery.

The analysis, the author complemented, will give the Indian government an in-depth knowledge and idea to open up the economy further. The results showed that foreign direct investment had a co-integrated relationship with the gross output in five sectors v.i.z., electrical equipments, fuels and power, food processing, transport and industrial machineries. In exports, there was a negative relationship in transport, chemicals and food processing sectors. In labour productivity, the results showed that there was a positive co-integrated relationship in two sectors v.i.z., transport and metallurgy.

Finally, the result showed that there was a positive co-integrated relationship between foreign direct investment and gross output, exports and labour productivity in two sectors viz., transport and metallurgy and had no effect on the food processing sector and industrial machinery.

Mosumi, Bhattacharyya et al (2012) tried to find out the causal relationship between foreign direct investment flows and industrial sub-sectors growth pattern of the Indian economy from 1996-97 to 2006-07.

The study had employed two methodologies mentioned below:

1. Statistical Analysis
2. Econometric Analysis

The regression results revealed that all the sub-sectors (manufacturing, mining and quarrying, electricity, water and gas supply) induced foreign direct investment flows. It also revealed that trade openness as an important factor for foreign direct investment flows in the manufacturing sector.

Babu, Harish. S et al (2012) in his paper on “Foreign Direct Investment in India and its Economic Significance” for the financial years 2005-2008 to 2010-2011 made many significant contributions to the existing literature. With exports growing faster than the Gross Domestic Product growth in India, he stated that the investment policies should be tailored for the foreign investors’ needs and makes India an export hub using the low cost advantage. He reiterated at many stages of the discussion that the manufacturing sector needed technical inputs which were world class.

Gupta, Poonam and Kumar (2010) examined the performance of the Indian manufacturing sector in the post reforms period. The study pointed out that India’s manufacturing sector was skill intensive and quoted Panagariya (2004) to highlight the same. They had discussed in length the Indian policy framework starting from 1950’s and the importance given by the policy makers to protect the domestic industries.

The Industries Development and Regulation Act of 1951 put in place a number of obstacles starting from registering of the company to implementation, prior to the economic reforms. Many bottlenecks had to be faced by the industrialists on the import-export front due to biased trade policies. With the nationalisation of banks, credit availability and other facilities were restricted or given only to those who had political connections.

In 1985, with the dismantling of the industrial licensing system automatic entry was allowed in 25 sectors. In 1991, further liberalization took place and only few industries had to get industrial licenses. The authors put on record many factors that had inhibited growth of the industrial sector in India. They pointed out the outdated labour laws as a great disadvantage for foreign direct investment flows to India. Other detrimental or negative factors include the problems in acquiring land, institutional financing and bureaucratic procedures and delays.

Bikam Ranjan Mishra (2011) studied the firm-specific advantages of Indian manufacturing industries due to inward FDI flows in India for the period 2006 to 2010.

The study used panel data of 22 sectors in Indian manufacturing sector. They identified the following variables for study.

1. Research and development intensity
2. Advertising intensity.
3. Technological intensity
4. Degree of internationalization
5. Age, size and sales volumes of domestic firms.

The selection was based on reviews and the availability of data. The study found that all the variables were not much significant in attracting foreign direct investment in the manufacturing sector. Technological intensity (in-house and import) and product differentiation had negatively contributed. Exports, Age, Assets and Sales volumes were the firm specific characteristics that were crucial for the foreign investors.

Dr. Sharma (2011) did a sectoral analysis of foreign direct investment flows in India for the period 2005-2010. He acknowledged that FDI in services sector had grown leaps and bounds during the study period. In contrast, the manufacturing sector had grown only at a tidy pace. Construction, automobiles, metallurgy were recognized as sun rise sectors and for these sectors careful planning should be done at the policy level to gain worldwide superiority.

There were some distinguishing features in the growth of manufacturing sector in post reforms India pointed out Chandi, Sudip (2012).The beginning of 2000 was rosy for the manufacturing sector (registered and unregistered) as it grew by 8.8% CAGR (Compounded Annual Average Growth Rate) between 2001-02 to 2007-08. The important element of the discussion was the growth of manufacturing sector during the reforms period and how it had contributed to the national economy. The article stated that the growth rate during the reforms (1991 to 2008 - 7.8%) was only marginally higher than the previous three 5 year plan periods (6.5%).

Whether foreign direct investment is necessary at all in manufacturing sector or to what extent should foreign direct investments flow in the manufacturing sector? A study in IIM (A) was done by Rakesh Basant (2012) et al titled “How has the Indian corporate sector responded to two decades of economic reforms in India?. An exploration of patterns and trends pointed out that the rate of growth in the Indian industrial sectors had not accelerated after economic reforms.

The increased competitiveness had only made them to adopt new strategies and outsource wherever possible thereby reducing their vertical integration. Most of the companies had relied on Mergers & Acquisitions than Greenfield investments and the authors provided scope for further research in areas such as technical absorption and product differentiation. They concluded highlighting the various policy initiatives taken by the government and how the firms responded.

Analysis

The following variables were selected for analysis after a deep review of related literature available on the macroeconomic and national income growth conundrum. Among them the most important variables that affect the Foreign Direct Investment were culled for further analysis.

- a) Trade Openness to Gross Domestic Product expressed as a ratio of G.D.P.
- b) Current Account to Gross Domestic Product expressed as a ratio of G.D.P.
- c) Foreign Reserves to Gross Domestic Product expressed as a ratio of G.D.P.
- d) Government borrowings to Gross Domestic Product expressed as a ratio of G.D.P.
- e) External debt to Gross Domestic Product expressed as a ratio of G.D.P.

- f) Gross Total Debt of Gross Domestic Product expressed as a ratio of G.D.P.
- g) Treasury Bills (prime lending rate).
- h) Index of Industrial production.
- i) Wholesale Price Index.

1) Trade openness to Gross Domestic Product ratio: is a frequently used ratio to measure the importance of international transactions relative to domestic transactions. It is calculated based on the sum of exports and imports of goods and services relative to Gross Domestic Product of a country.

Gross Domestic Product: According to the World Bank, Gross Domestic Product is defined as a measure of the total output of goods and services for final use occurring within the domestic territory.

It should be noted that a low or high ratio does not by itself reveal the country's openness about the country. The country's performance in trade performance may be due to other factors such as economy size, young population eagerness to consume imported products, geographical distance from potential trading partners, culture, tradition etc., and the general structure of the economy.

2) Current Account to Gross Domestic Product ratio: According to World Bank "Current Account balance is the sum of net exports of goods and services, net primary income, and net secondary income". Current account covers all transaction that involves economic value and occurs between a country and other countries. It covers both manufacturing goods and services. Specifically, the major classifications are goods and services income and current account transfers and include omissions/errors as per International Monetary fund (IMF).

Gross Domestic Product: According to the World Bank 'Gross Domestic Product' is defined as a measure of the total output of goods and services for final use occurring within the domestic territory.

Current Account to G.D.P ratio is a measure which is a ratio of the sum of the balance of trade and services (net earnings on exports minus payments for imports) factor incomes and cash transfers relative to the Gross Domestic Product of a country measured in real terms (i.e. prices adjusted after inflation).

3) Foreign Exchange Reserves to Gross Domestic Product ratio: Foreign exchange is the quantum of foreign currency reserves that are held by the Central Bank of a country (Reserve Bank of India). It includes gold and International Monetary Fund reserves. Foreign Exchange Reserves to Gross Domestic Product ratio is a measure to understand a the country's reserve (foreign exchange) position vis-à-vis Gross Domestic Product at real prices.

Foreign Exchange Reserves ensure that foreign investments are available for meeting a specified range of objectives of a country such as supporting and maintaining the sovereignty of a country, exchange rate management, confidence building among other nations and assisting the government in meeting the foreign exchange needs, external debt obligations and also to maintain a reserve for national disasters or any exigencies.

4) Government borrowings to Gross Domestic Product ratio:

Government borrowings are those borrowings made by a countries official administrator or government. It is also called as Debt to Gross Domestic Product ratio.

Government borrowings are the sum total of internal debt. (Securities, treasury bills, bonds, loans against savings etc., (foreign debt) and other liabilities such as national small savings funds, provided fund etc. form part of the internal or government debt.)

The ratio indicates the financial health of a country with regard to payments of debts interest etc., without incurring further debt.

5) External debt to Gross Domestic Product ratio:

External debt refers to the debt received from multilateral agencies such as IDA (International Debt Assistance), IBRD (International Bank for Reconstruction and development) ADB (Asian Development Bank) etc., on a long term variable rate linked to LIBOR (London Interbank Offered Rate). It is used for financing projects of the central and state governments.

External debt to Gross Domestic Product ratio is an indicator of the country capacity to meet its external financial obligations and also the financial strength vis-à-vis Gross Domestic Product measured in real prices.

6) Gross Total Debt to Gross Domestic Product ratio:

Gross Total Debt includes the private sectors' debt along with the government and other external debt. Gross Total Debt to Gross Domestic Product is a measure to find out a country's overall financial soundness in terms of its payments obligations.

The ratio is of recent significance due to increased globalization and privatization as capital and financial transfers are more across countries due to globalisation.

7) Treasury bills:

Treasury bills are short term borrowings of the central governments which mature within a year. They are issued at a discount of the face value and mature at face value. It is done through auctioning and it reflects the current and the future interest rates that would prevail in a country. Foreign investor would like to see stability of interest rates in a country and hence look at treasury bills for decision making. Treasury bills act as guide for the Reserve Bank of India on monetary policy issues and management. Absolute values of treasury bills are taken for analysis.

8) Index of Industrial Production:

Index of Industrial Production often referred to as IIP gives the details of growth of the manufacturing sector of the Indian economy. Apart from manufacturing it also comprises of mining and electricity. As an abstract number it reveals the production status of the industrial sector of India for a given period of time against a reference point of time.

Investor would be benefitted by taking note on the ongoing industrial activity of the country and since the study pertain to the industrial sector this variable is considered to be important and hence taken for study along with other macro-economic variables. Absolute values of Index of Industrial Production are taken for analysis.

9) Whole Sale Price Index:

It represents the price of goods at the wholesale stage where goods are sold in bulk and traded between business organizations and not the end consumers. Released every Thursday in India, it monitors the price movements that reflect supply and

demand and this helps the investors to know about the inflation trend and other macro and micro economic conditions prevailing in the country.

The objective was to study the role of the macro economic variables as determinants of Foreign Direct Investment. As already discussed the macro economic variables which are crucial for investment decisions have been taken up for study.

A factor analysis was done to find out the key macroeconomic determinants. Following the factor analysis, a regression analysis was done to find out the model fit and its statistical significance. The purpose of doing a factor analysis is to reduce the number of variables that are highly inter correlated and have a meaningful uncorrelated variables that can be processed for further analysis. The questions that factor analysis should answer can be broad based into two areas,

- 1) How many factors (components) should be ideal to represent the extracted variables?
- 2) What do these factors represent or what they can be called collectively?

Table No: 1 Communalities

	Initial	Extraction
Trade openness	1.000	.938
Current account	1.000	.919
Exchange reserves	1.000	.906
Govt borrowings	1.000	.955
External debt	1.000	.815
Gross total debt	1.000	.982
Treasury bills	1.000	.938
IIP	1.000	.899
WPI	1.000	.932

Extraction Method: Principal Component Analysis.

A principal component analysis was conducted initially. Communalities indicate the amount of variance in each variable. The above communalities table revealed the above table (Table No: 1) values. The initial communalities values are always the estimates of the variance that is accounted for by all the variables/components. It is always equal to zero in Principal Component Extraction.

Extraction communalities are estimates of the variance in each variable are accounted for by the components. As the values of the extracted communalities are high, it indicates that all the extracted components represent the variables also.

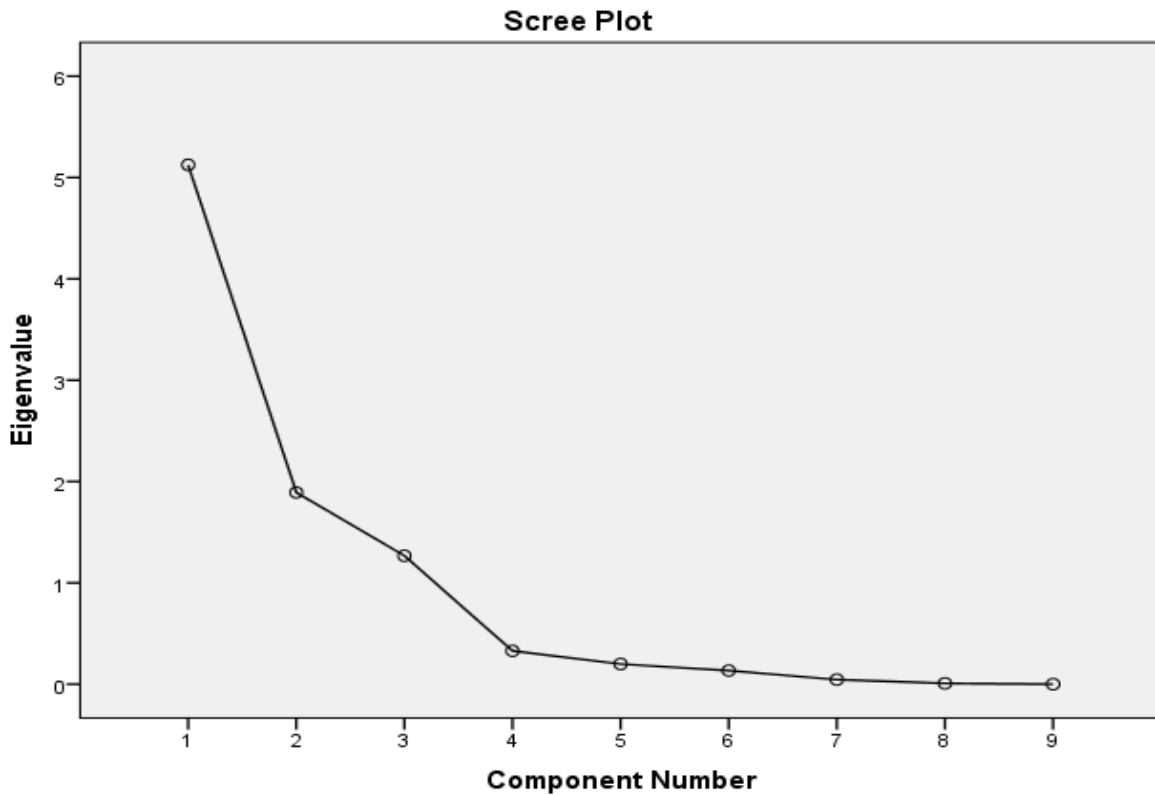
Table No: 2 Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.125	56.947	56.947	5.125	56.947	56.947	3.536	39.293	39.293
2	1.892	21.024	77.971	1.892	21.024	77.971	3.202	35.579	74.871
3	1.267	14.082	92.053	1.267	14.082	92.053	1.546	17.182	92.053
4	.329	3.656	95.710						
5	.199	2.210	97.920						
6	.134	1.488	99.408						
7	.045	.498	99.906						
8	.008	.094	100.000						
9	1.001E-013	1.017E-013	100.000						

Extraction Method: Principal Component Analysis.

Table No: 2 show the initial Eigen values and the cumulative column (cumulative column gives the percentage of variance accounted by the first n components). It can be seen that the first three components account for 92.05% of the variance. Hence the first three factors or components can be taken for further analysis.

FigureNo:2



The scree plot helps us to determine the optimal number of components and from figure no: 2 it can be again reiterated that the number of components be three. The fourth component can be excluded since the drop from the third to the fourth is very sharp.

Table No: 3 Rotated Component Matrix

	Component		
	1	2	3
Trade Openness	.623	.703	.237
Current Account	-.574	-.678	-.360

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

From the rotated components matrix it can be determined which variable in each component is highly correlated and conclusions can be made. The above table values of Rotated Component Matrix shows that the first component Government Borrowings is highly correlated, the second component shows the Index Of Industrial Production

as highly correlated and the third component shows that Exchange Reserves also as highly correlated variable.

Hence the variables Government Borrowings, Index of Industrial Production and Exchange Reserves play a significant role among the nine variables taken up for study. To progress with the identified variables, a multiple linear regression was run to find the relationship of the variables. The results are found below.

Table No: 4 Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.811 ^a	.657	.510	70541.778

a. Predictors: (Constant), EXCHANGERESERVES, GROSSTOTALDEBT, IIP

Table No: 5 ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	66816279406.563	3	22272093135.521	4.476	.047
1 Residual	34832996803.437	7	4976142400.491		
Total	101649276210.000	10			

a. Dependent Variable: FDI

b. Predictors: (Constant), Exchange reserves, Gross total debt, IIP

Table No: 6 Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Partial	Tolerance	VIF
(Constant)	197591.485	129145.448		1.530	.170	-502971.942	107788.973					
Gross Total Debt	1.458	.544	.598	2.679	.032	.171	2.744	.644	.712	.593	.981	1.019
IIP	1273.059	571.635	.535	2.227	.061	-78.642	2624.760	.537	.644	.493	.847	1.181
Exchange Reserves	-.261	.338	-.185	-.772	.465	-1.060	.538	.083	-.280	-.171	.850	1.177

a. Dependent Variable: FDI

Table No: 7 Collinearity Diagnostics

Model	Dimension	Eigen value	Condition Index	Variance Proportions			
				(Constant)	Gross Total Debt	IIP	Exchange Reserves
1	1	2.966	1.000	.00	.04	.00	.03
	2	.648	2.139	.00	.42	.00	.39
	3	.371	2.828	.01	.54	.02	.36
	4	.015	14.233	.99	.00	.98	.21

a. Dependent Variable: FDI

Under this model all the three variables were taken into account and enter method of regression analysis was used.

“A multiple linear regression (enter method) statistical analysis was used to find out the strength of the relationship between Foreign Direct Investment and the three

macro-economic variables taken up for study v.i.z, Gross Total Debt, Index Of Industrial Production and Foreign Exchange Reserves”.

The results are as follows:

$$\text{FDI (Macro Economic Variables)} = F(4, 5) = 4.476, P = 0.047$$

The F value valued at 4.476 is an indication of the strength of the relationship between Foreign Direct Investment and the three macro economic variables - Government Borrowings, Index of Industrial Production and Exchange Reserves. The model summary in table no: 4 shows that the strength is good ($R = 0.811$) and around 65.7% (R^2) explain the dependent variable Foreign Direct investment. The adjusted R square value of .510 indicates that the coefficients of the predictor variables will have no impact even if any new variables are inducted.

The correlation of the zero order, partial and part correlation do not signify any sort of inter correlation among the predictor macro-economic variables as there is no downward movement in the variables. The tolerance level for all the variables is not near to zero value indicating no multi-co linearity. Also the variance inflation factor indicates that there is no co linearity among the variables. The Eigen values and Condition index also reflect that the macro economic variables do not have multi co linearity among the variables. Thus it can be said that these three variables are linearly correlated with each other.

Hence from the model summary we can form the equation as follows.

$$\text{FDI (Macro Economic Variables)} = -197591.485 - 1.458 (\text{Gross Total Debt}) + 1273.059 (\text{Index of Industrial Production}) + 0.261(\text{Foreign Exchange Reserves})$$

Conclusion:

It may be concluded that increases in the Index of Industrial Production and Foreign Exchange Reserves will bring an increase in Foreign Direct Investment and decreases in Gross Total Debt will bring down the Foreign Direct Investment flows. Serious efforts should be made to reduce the government debt as it may cause resentment among the foreign investors and foreign direct investment turning negative in the near future.

To end, the above three macro economic variables are considered to have a serious bearing on the Foreign Direct Investment flows into India. While some macro economic variables did not have the requisites for good standing it cannot be assumed that these variables are not important. The study of macro economics has become important in the current context and therefore it should be ensured that the management of these variables is taken up seriously by the Indian government.

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