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DETERMINANTS OF ECONOMIC GROWTH IN INDIA: AN EMPIRICAL ANALYSIS

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ABSTRACT

The study estimates the linear relation between determinants of country's economic growth and Gross Domestic Product in India by applying time series analysis. Multivariate Analysis are used to analyze the annual data from 1980-81 to 2009-10. And data have been collected form Hand Book of Statistics on Indian Economy published by the Reserve Bank of India except foreign direct investment data because of data are not available from 1980-81. So we have taken data from 1990-91 to 2009-10. The result suggests that Gross Domestic Capital Formation, Consumption of Fixed Capital, Employment and Export have positive effect on India's GDP growth where as Import and external Assistance have negative effect. From empirical analysis of the present study, we found that, when FDI included as an additional determinant of GDP after 1990-91, it has been influencing the coefficient of gross domestic capital formation (GDCF). That means GDCF is more effective for GDP growth in our country. Export is also influenced by FDI when it incorporated after 1990-91. But, its contribution to GDP has been recorded low in comparison of 1980-81. We have seen that during the period 1980-81 to 2009-10, import was significant at 5% level but it is found insignificant during the period 1990-91 to 2009-10. External Assistance is also insignificant when FDI was included after 1990-91. Consumption of Fixed capital is influencing more to GDP when FDI is included after 1990-91 in comparison to 1980-81. Similarly, Employment is also influencing more to GDP when FDI is included after 1990-91 in comparison to 1980-81.

KEYWORDS: *GDP, GDCF, FDI and CFC.*

INTRODUCTION

In a developing country like India where rapid economic growth has become a national goal, examine the determinants of growth assumes special significance not only because it helps to find out what has and what has not been important in the growth which has already occurred, but also because of the obvious implications it has for the macroeconomic strategy and policies that affect the future growth - its rate as well as pattern. I feel that an analysis of the factors leading to the significant acceleration in the growth of Indian economy witnessed during the last fifteen years would be useful in assessing the possibilities of a further acceleration in India's economic growth over the next decades.

Almost since the days of Adam Smith, economists have been concerned with the theme of economic growth. However, it is only during the post-war period that special attention has been given to a detailed analysis of the sources of economic growth. The empirical evidence emerging from the initial studies in this direction shed new light on the role of technological advance

in the process of growth by assigning to it nearly half of the growth of national income and more than four-fifths of the growth of output per person employed in the United States (Solow 1957).

After Independence, India has been adopted the strategy of planned economic development rather than market oriented development. The strategy which was formulated by the government under the leadership of Nehru, aimed at doubling the average living standards of India's vast population over a period of two decades, which implies the target of 3.5% growth rate of real per capita income. During the first three decades of planned economic development after Independence, the main element of India's development strategy was import substitution led industrialisation with an explicit focus on the public sector. The strategy was implemented by creating the framework of a highly regulated economy that was for all practical purposes insulated from the rest of the world. Various kinds of fairly rigid restrictions were imposed not only on imports but also on the entire range of transactions involving foreign exchange. Within the domestic market, the large scale private sector was subjected to highly restrictive system of licensing and a variety of other discretionary controls which involved case by case disposal. These controls created formidable mobility barriers and eliminated the operational flexibility required by the private enterprises for responding to the changing market conditions and the rapidly changing technology. High rates of protection, inflation, steadily rising rates and coverage of indirect taxation, inefficient scale and lack of competition resulted in moderate industrial growth characterised by high cost and low productivity. Under such conditions, exporting was always going to be a difficult proposition, but what compounded the problem was the fairly severe and deep-rooted export pessimism which characterised India's macroeconomic strategy during the pre-liberalisation period.

It is not surprising, therefore, to find that Indian economy could not achieve an average growth rate of even 4% nor could the non-agricultural sector achieve an average growth rate of 5% during any of the first three decades of planned economic development after Independence. In fact, the performance of both the agricultural as well as the non-agricultural sectors declined considerably during the seventies, which turned out to be the worst decade for both sectors. Under these conditions, the growth and efficiency of private non-agricultural sector would be severely constrained and if the public sector could not deliver, the economy would never attain the desired rate of growth. That is precisely what happened. Against the target of 3.5% rate of growth of real per capita income, the actual growth rate during the pre reform period (1950-51 to 1989-90) turned out to be just around 1.5%. While low rates of overall growth of the economy during the pre reform period made it difficult to achieve a significant reduction in the incidence of poverty, the anti-export bias in the country's industrialisation strategy led to a sharp decline in India's share in world exports.

There was a marked contrast in the growth experience of Indian economy during the post reform period. The process of economic liberalisation that was initiated around mid-eighties and pursued more vigorously from 1991 onwards has brought about a significant turnaround in Indian economy. The shift in macroeconomic strategy from import substitution based and public sector led planned economic development to export-oriented and private sector led economic development driven by the market forces has not only resulted in a significant increase in the growth rate of real GDP but also led to a large scale transformation of the economy. During the post-1985 period, the agricultural sector has grown at an average rate of more than 3%, while the non-agricultural sector has grown at more than 7% leading to an overall growth rate of around 6%.

In the light of above discussion and theoretical underpinnings of GDP growth, present study makes an attempt to examine Determinants of Gross Domestic Product in India Since 1980.

LITERATURE REVIEW

Gross Domestic Product is the major debated issues among the researcher and the academician in the present time. There are a number of studies those draw the attention and develop the idea about the recent work in fields of Indian GDP. There are many empirical literature based on Determinants of the Indian GDP. This section mainly focuses on those studies which support findings the determinants of the Indian GDP such as:

There are some authors who talk about the determinants of GDP growth. Determinants of GDP growth are great phenomena which determine high growth rate of GDP. Mishra et al. (2010), Malhotra and Meenu (2009), Chandana Chakraborty and Peter Nunnenkamp (2008), Damooei & Tavakoli, (2006), Dutta and Ahmed (2004), Dholakia (2003), Laura Alfaro (2003), Liu (2001), Humpage (2000), Iscan (1998), Tong (1995), Barro (1991), and Lucas (1988); Romer (1990) has been found causal relationship between GDP and its Determinants.

Mishra et al. (2010) found bi-directional causality and support for the import-led growth hypotheses for Pacific Island nations. Malhotra and Meenu (2009) analyzed the causal relationship

between imports and economic growth in India for the period 1974–1975 to 2003–2004 and the results support the unidirectional causation from GDP to total imports.

Chandana Chakraborty and Peter Nunnenkamp (2008) said that booming foreign direct investment in post-reform India is widely believed to promote economic growth. Dutta and Ahmed (2004) investigated the behaviour of Indian aggregate imports during the period 1971-1995. According to his econometric estimates of the import-demand function for India, import-demand is largely explained by real GDP.

Dholakia (2003) finds a two-way causality between human and economic development. At the macro level, the ―new growth theories‖ assert that higher level of education of the workforce leads to higher overall productivity of capital because of its positive effects on innovation (Lucas 1988; Romer 1990).

Laura Alfaro (2003) finds that FDI flows into the different sectors of the economy (namely primary, manufacturing, and services) exert different effects on economic growth. FDI inflows into the primary sector tend to have a negative effect on growth, whereas FDI inflows in the manufacturing sector a positive one. Evidence from the foreign investments in the service sector is ambiguous. He has discussed the determinants of FDI over the regions of a large economy like India.

Liu (2001) in his research revealed that import has a strong role in the promotion of national economy by analyzing the data of China from 1980 to 1998. Humpage (2000), in his study claimed that there is a positive relationship between imports and economic growth. However, the direction of influence between imports and economic growth is less certain. According to his study, the direction of causality seems to run predominantly from income to imports at quarterly frequencies, not the other way around.

Iscan (1998) argues that trade contributes to economic growth by increasing the variety of intermediate inputs and by increasing the size of the market. Exports earn valuable foreign exchange which is essential for importing the much-needed capital and intermediate inputs (Damooei & Tavakoli, 2006). Therefore, the importance of imports, particularly when imports constitute capital and intermediate inputs, needs to draw more attention as a source of economic growth compared to exports.

Tong (1995) explored the relationship between economic growth and import, and he recognized that import at different times contributed to economy differently, but as a whole, there was a positive correlation between import and economic growth. The sources of economic growth, human capital, can be measured in terms of education level and health. As such, Barro (1991), for 98 countries in the period 1960-1985, concludes that the growth rate of real per capita GDP is positively related to initial human capital.

Barro (1991), have shown the positive effects of education on Economic Growth. The empirical findings indicate that when a country has achieved some level of economic development only then the exports have a positive and significant impact on economic growth.

From above reviews it is obvious that most of the studies examine about GDP growth and how and when it accelerated or decelerated but least studies have been found on Trends, Pattern and Determinants of Gross Domestic Product in India Since 1980. Hence, this study is an attempt to fill this gap.

MODELLING AND EMPIRICAL RESULTS

Growth is often considered as the end of all economic activities. So understanding the determinants of economic growth is not only important from the policy perspective but also is the key component for macro management. It is determined by internal as well as external macro variables of an economy such as Import, investment, employment, money supply, general price level, fiscal deficit, level of export, foreign capital etc. But here, we are taking some specific determinants of Economic growth such as Import, Export, Gross Domestic Capital Formation, External Assistance, Consumption of Fixed Capital, Employment and Foreign Direct Investment.

This chapter deals with the issue of econometrics modelling of the Determinants of Gross Domestic Product in India. For this purposes we have used multivariate analysis and semi-logarithmic regression model which are explained as follow:

Multivariate Analysis:-

Multivariate Analysis is a statistical technique that allows us to predict someone's score on one variable on the basis of their scores on several other variables. In this regression, I have selected time period from 1980-81 to 2009-10, regarding access of data set.

Multivariate Analysis model is as follows:

$$GDP = \beta 0 + \beta 1GDCF + \beta 2EXP + \beta 3IMP + \beta 4EXAST + \beta 5CFC + \beta 6EMP + ui$$

..... (4)

$\beta 0$ = intercept term

β1, β2, β3, β4, β5 and β6 are coefficient of given variables.

GDP = Gross Domestic Product which is dependent variable.

GDCF = Gross Domestic Capital Formation

EXP = Export

IMP = Import

EXAST = External Assistance or Foreign Aid

CFC = Consumption of Fixed Capital

EMP = Employment

Multivariate analysis is a statistical tool for the investigation of relationships between dependent variables and an explanatory variable (all above determinants including with FDI) from time period 1990-91 to 2009-10.

$$GDP = \alpha 0 + \alpha 1GDCF + \alpha 2EXP + \alpha 3IMP + \alpha 4EXAST + \alpha 5CFC + \alpha 6EMP + \alpha 7FDI + ui$$

..... (5)

$\alpha 0$= intercept of GDP

$\alpha 7$= coefficient of FDI

εi= Error term

FDI = Foreign Direct Investment

I have not included FDI as variable in multivariate analysis model of equation (4) because of data is not available from 1980-81. FDI data is available from 1990-91. Therefore, I have included FDI as additional determinants of GDP in multivariate analysis model of equation (5).

The **F-ratio** provides evidence of existence of a linear relationship between the response or dependent variable and the explanatory variables or predicted variable.

If we may wish to know whether there is a relationship between the response variable and the explanatory variables. We can test for this by looking at the **t-ratio**. The t-ratio is computed from the coefficient of explanatory variable divided by standard deviation of those explanatory variables.

In a regression analysis with more than one explanatory variable the coefficient of **determination R^2** is defined as:

Sum of squares has been explained by the model (i.e. Regression sum of Squares) /Total Sum of Squares.

The coefficients for each of the variables indicates the amount of change one could expect in GDP given a one-unit change in the value of that variable, given that all other variables in the model are held constant.

Data, Variable Selection and Empirical Results:-

In this empirical analysis, the yearly Gross Domestic Product and its determinants data have taken from 1980-81 to 2009-10 have been collected form Hand Book of Statistics on Indian Economy published by the Reserve Bank of India except foreign direct investment data because of data are not available from 1980-81. So we have taken data from 1990-91 to 2009-10. We have taken some data on employment from national sample survey organization. The base year of GDP and its

determinants data are 2004-05 at constant price. The study has been shows the trends of GDP, structural breaks in GDP and Multiple relationship between GDP and its determinants. The test results of GDP and its determinants have discussed below.

Multivariate Analysis (1980-81 to 2009-10):-

This section provides the idea about the determinants of GDP growth and GDP in the Indian economy. Further, the table's given below provides the idea about the determinants of GDP growth in the entire period (1980-81 to 2009-10).

$$GDP = \beta 0 + \beta 1 GDCF + \beta 2 EXP + \beta 3 IMP + \beta 4 EXAST + \beta 5 CFC + \beta 6 EMP + ui$$

$$GDP = 153775.8 + .2619942\ GDCF + 1.573314\ EXP - .8137303\ IMP - 1.821069\ EXAST + 6.69024\ CFC + 62412.66\ EMP$$

Table-1 Result of Multivariate Analysis (1980-81 to 2009-10)

Model	Observations	Parameters	RMSE	"R-square"	F	P
GDP	30	7	31603.79	0.9993	5430.783	0.0000
	Coefficient.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
Intercept	153775.8	41165.54	3.74	0.001	68618.35	238933.2
GDCF	.2619942	.107854	2.43	0.023	.0388813	.4851072
Export	1.573314	.7789095	2.02	0.055	-.0379828	3.184611
Import	-.8137303	.3423174	-2.38	0.026	-1.521868	-.1055928
External Assistance	-1.821069	1.673533	-1.09	0.288	-5.283037	1.640898
Consumption of Fixed capital	6.69024	.7463172	8.96	0.000	5.146366	8.234115
Employment	62412.66	23484.83	2.66	0.014	13830.58	110994.7

The **F-ratio** is 5430.783 and it is significant at p = .000. This provides evidence of existence of a linear relationship between the GDP and the explanatory variables Gross Domestic Capital Formation, Export, Consumption of Fixed Capital, Employment, Import and External Assistance. The value of R-Square is 0.9993; therefore, about 99.93% of the variation in the GDP is explained by Gross Domestic Capital Formation, Export, Consumption of Fixed Capital Employment, Import and External Assistance. The regression equation appears to be very useful for making predictions since the value of R^2 is close to 1.

In the model, the Gross Domestic Capital Formation (GDCF) is statistically significant at the 0.05 level (p=0.023) and its t-statistics is 2.43. The coefficient is positive that means GDCF is contributing positively to our GDP growth. And we are 95% confident that for every single-unit increase in GDCF, the GDP increases between .0389 to .485 crores.

Similarly, Consumption of Fixed Capital (CFC) is also statistically significant at the 0.05 level (p = 0.000). The coefficient is positive, indicate that CFC is positively related to GDP and its t-statistics is 8.96. This shows that effect of CFC on GDP is greater than all remaining variables. In addition, we are 95% confident that for every single-unit increase in CFC, the GDP increases between 5.146 and 8.234 crores.

Employment is too statistically significant at the 0.05 level (p = 0.014). The coefficient is positive which would indicate that Employment is positively related to GDP and its t-statistics is 2.66. Which show that effect of Employment on GDP is high. Lastly, we are 95% confident that for every single-unit increase in Employment, the GDP increases between 13830.58 and 110994.70 crores.

Import is statistically significant at the 0.05 level (p= 0.026). The coefficient is negative which shows that Import is negatively related to GDP and its t-statistics is also negative, its value is -2.38. Export is statistically insignificant at the 0.05 level or 5% because its P value is 0.055 but it is significant at the 0.10 level or 10%. Its t-statistics is 2.02. Likewise, external Assistance is also statistically insignificant at the 0.05 level or 5% because its P value is 0.288. Its t-statistics is -1.09.

Multivariate Analysis (1990-91 to 2009-10):-

This part of the work provides the idea about all the above determinants of GDP growth of the Indian economy with FDI from time period 1990-91 to 2009-10.

$$GDP = \alpha 0 + \alpha 1 GDCF + \alpha 2 EXP + \alpha 3 IMP + \alpha 4 EXAST + \alpha 5 CFC + \alpha 6 EMP + \alpha 7 FDI + ui$$

..... (5)

$$GDP = -487932.098 + 0.328244012\ GDCF + 1.360532804\ EXP - 0.591402789\ IMP - 1.452433824\ EXAST + 5.733458343\ CFC + 264069.9003\ EMP + 0.522699347\ FDI$$

Table-2: Result of Multivariate Analysis (1990-91 to 2009-10)

Model	Observations	Parameters	RMSE	"R-square"	F	P
GDP	20	8	29992.84	0.9994	2816.90	.000
	Coefficient.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
Intercept	-487932.098	217034.2989	-2.25	0.044	-960809.2124	-15054.98363
GDCF	0.328244012	0.106549725	3.08	0.009	0.096092105	0.560395919
Export	1.360532804	0.752529252	1.81	0.096	-0.27908758	3.000153192
Import	-0.591402789	0.387494099	-1.53	0.153	-1.43567990	0.252874325
External Assistance	-1.452433824	1.641052625	-0.89	0.394	-5.02798033	2.123112685
Consumption Fixed of capital	5.733458343	0.851604659	6.73	0.000	3.877971189	7.588945497
Employment	264069.9003	72652.8382	3.63	0.003	105772.9645	422366.8361
	0.522699347	0.652381172	0.80	0.439	-0.89871711	1.944115812

The **F-ratio** is 2816.90 and significant at p = .000. This provides evidence of existence of a linear relationship between the GDP and the explanatory variables Gross Domestic Capital Formation, Export, Consumption of Fixed Capital, Employment, Import, External Assistance and FDI in the second phases (1990-91 to 2009-10) which is explained earlier. The value of R Square is 0.9994; therefore, about 99.94% of the variation in the GDP is explained by Gross Domestic Capital Formation, Export, Consumption of Fixed Capital Employment, Import, External Assistance and FDI. The equation (5) appears to be very useful for making predictions since the value of R^2 is close to 1.

In the model, the Gross Domestic Capital Formation (GDCF) is statistically significant at the 0.05 level (p=0.009). The coefficient is positive which would indicate that GDCF is positively related to GDP and its t-statistics is 3.08. Ahead of one step, we are 95% confident that for every single-unit increase in GDCF, the GDP increases between 0.096 to 0.560 crores.

Similarly, Consumption of Fixed Capital (CFC) is also statistically significant at the 0.05 level (p = 0.000). The coefficient is positive which would present that CFC is positively related to GDP and its t-statistics is 6.73. Which show that effect of CFC on GDP is greater than all remaining variables. At 95% confident level every single-unit increase in CFC, the GDP increases between 3.878 to 7.589 crores.

At the same time, Employment is too statistically significant at the 0.05 level (p = 0.003).

The coefficient is positive which reflects that Employment is positively related to GDP and its t-statistics is 3.63. And the effect of Employment is high on GDP. Additionally, we are 95% confident that for every single-unit increase in Employment, GDP increases between 105772.965 and 422366.836 crores.

However, Import is statistically insignificant at the 0.05 level (p= 0.153). The coefficient is negative which would direct that Import is negatively related to GDP and its t-statistics is -1.53.Regarding this, at 95% confident level every single-unit increase in import, minor (- to +) increase has been found in GDP. Similarly, Export is statistically insignificant at the 0.05 level or 5% because its P-value is 0.096 but it is significant at the 0.10 level or 10%. Its t-statistics is 1.81. And healthy increment in GDP has been seen owing to increase in single-unit of export.

Meanwhile, External Assistance is statistically insignificant at the 0.05 level or 5% because its P value is 0.394. Its t-statistics is -0.89. From above table we can easily inferred that external assistance is no longer contributing to our GDP growth.`

In the model, the Foreign Direct Investment (FDI) is statistically insignificant at the 0.05 level (p=0.439) and its t-statistics is 0.80. The coefficient is positive which would indicate that FDI is positively related to GDP that means FDI is beneficial to our country but its range challenge us that there is also need a strong regulatory body for watch out of all FDI transactions carefully.

From above results, if we conclude, we found that, when FDI included as an additional determinant of GDP after 1990-91, it has been influencing the coefficient of grass domestic capital formation (GDCF). That means, GDCF is more effective for GDP growth in our country. Export is also influenced by FDI when it incorporated after 1990-91. But, its contribution to GDP has been recorded low in comparison of 1980-81. We have seen that during the period 1980-81 to 2009-10, import was significant at 5% level but it is found insignificant during the period 1990-91 to 2009-10. External Assistance is also insignificant when FDI included after 1990-91. Consumption of Fixed capital is influencing more to GDP when FDI is included after 1990-91 in comparison of 1980-81. Similarly, Employment is also influencing more to GDP when FDI is included after 1990-91 in comparison of 1980-81.

CONCLUSION

In our multivariate analysis model of the GDP's determinants, results shows that Gross Domestic Capital Formation, Consumption of Fixed Capital, Employment and Import are statistically significant at 5% level and positively related to GDP growth while Export, External Assistance are statistically insignificant at 5% level. Though, Exports are statistically significant at 10% level. And the value of R Square is 0.9993; therefore, about 99.93% of the variation in the GDP is explained by Gross Domestic Capital Formation, Export, Consumption of Fixed Capital Employment, Import and External Assistance. The regression equation appears to be very useful for making predictions since the value of R^2 is close to 1.

From empirical analysis of the present study, we found that, when FDI included as an additional determinant of GDP after 1990-91, it has been influencing the coefficient of gross domestic capital formation (GDCF). That means, GDCF is more effective for GDP growth in our country. Export is also influenced by FDI when it incorporated after 1990-91. But, its contribution to GDP has been recorded low in comparison of 1980-81. We have seen that during the period 1980-81 to 2009-10, import was significant at 5% level but it is found insignificant during the period 1990-91 to 2009-10. External Assistance is also insignificant when FDI was included after 1990-91. Consumption of Fixed capital is influencing more to GDP when FDI is included after 1990-91 in comparison to 1980-81. Similarly, Employment is also influencing more to GDP when FDI is included after 1990-91 in comparison to 1980-81.

POLICY RECOMMENDATIONS

Following recommendations have been made on the basis of this study:

1. If, India wants to sustain at high growth path it is necessary to increase its volume of investment through the more liberalized way in several sectors.
2. The government should focus on achieving high growth rate via generating maximum employment.
3. For sustainable and maximum growth rate, the government policy should be more flexible, especially for foreign trade sector.
4. Government should try to reduce its import as it has been inversely related to the GDP during 1980-81 to 2009-10.

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