IMPACT OF GOVERNMENT SPENDING ON INDUSTRIAL SECTOR PRODUCTIVITY IN INDIA

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Abstract:

The sole purpose of the study is to empirically examine the effects of government spending on the industrial productivity in India for the period 2005-06 to 2011-12. The study employed two variable regression analysis model specified on the basic of hypothesized functional relationship between governments spending as the explanatory variables, while IIP of six use based industries constituted the explained variable. The model for the study was estimated using the ordinary least square (OLS) technique. The result shows that public spending has statistically significant impact on the industrial productivity of the economy in the period of reviewed.

Keywords: Government Spending, Industrial Productivity, Regression, Use Based Industries, Ordinary Least Square**.**

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Introduction

Public expenditure plays a significant role in the economic growth as well as Economic development of economy. Public expenditure refers to Government expenditure i.e. Government spending. It is incurred by Central, State and Local governments of a country. The government spending typically consists of expenditure on general, social and economic services. In practice, these expenditures are also classified under current and capital heads where current expenditure represents the consumption and capital expenditure represents asset creation by the government. Alternately, the government expenditure can also be classified in terms of developmental and non-developmental categories so as to assess their welfare impact. The developmental expenditure mainly includes spending on economic services (agriculture, industry, energy, communication, transport, science, technology and environment) and social services (education, health, employment, nutrition, housing and others). The remaining categories such as government administration, interest payments, pensions, defense and other non-productive services constitute non-developmental expenditure. The economic growth is normally more responsive to developmental expenditure, in general, and capital outlays, in particular. The achievement of equity goal depends on the social expenditure such as poverty alleviation, education, health and employment generation which also forms developmental expenditures. Overall government expenditure affects macroeconomic stability through movements in deficit indicators. Throughout the 19th Century, most governments followed laissez faire economic policies and their functions were only restricted to defending aggression & maintaining law & order. The size of public expenditure was very small. But now the expenditure of governments all over has significantly increased. In the early 20th Century, John Maynard Keynes advocated the role of public expenditure in determination of level of income and its distribution. In developing countries, public expenditure policy not only accelerates economic growth & promotes employment opportunities but also plays a useful role in reducing poverty and inequalities in income distribution. A planned scheme of public expenditure provides for an optimum resource allocation which is not guaranteed by the market, and also reduces the inequality in the distribution of resources by properly directing the expenditure towards education, medical and health care of the low income section of the community. Besides, public expenditure counteracts inflationary pressures and helps to stabilize the economy by formulating suitable fiscal policies such as drawing up the budget, providing surpluses in deficit and boom in

recessions by accelerating the rate of development expenditure in the public sector steadily. The attainment of these goals of the state governments depends on the fiscal policy of the central government and the autonomy of the state governments in raising revenue and spending it. Before independence, there was no planning in India and hence no effort was made on the part of the government to provide welfare services but the accelerating growth of government expenditure began in late seventies. The ratio of public expenditure to GDP has increased steadily from 9.1% in 1950-51 to 28.3 in 2005-06. There has been tremendous increase in total public expenditure during the period 1960-61 to 2005-06. The total public expenditure increased from Rs.2,631 crores in 1960-61 to Rs.9,99,563 crores in 2005-06. The ratio of Public Expenditure to national income in India is one of the highest in developing countries. It is the government which starts such industries in a planned economy. India needs a strong network of infrastructure including transport, communication, power, fuel, etc. The public sector has created a strong infrastructure as a support base for our industrial sector by investing huge capital. The government has not only improved the rail, air and sea transport but has also expanded them manifold.

Apart from this introduction, this paper is divided into four sections. Section two discusses the previous studies related to relationship between government spending and different aspects of Economic growth, source of data and methodology, while section three analyzes the relationship between Government spending and Industrial productivity in India during 2005 to 2011, section four highlights the main findings, limitation and suggestions.

SECTION II

REVIEW OF LITERATURE, OBJECTIVES, HYPOTHESIS, DATA SOURCES, MODEL SPECIFICATION AND ESTIMATE TECHNIQUE

II.I Review of literature

A lot of studies have been done on the different aspects Government spending and economic growth relation at national and international level. A few studies have been taken for review:

Lall(1969)has established a relationship between per capita income and expenditure disaggregated as current economic services, health services and agriculture, in forty-six developing countries by using cross-section data. The countries have been divided into three

groups on the basis of their per capita income. His study shows that there is no significant relationship between per capita Gross National Product and total government expenditure expressed as per cent of Gross Domestic Product. The changes in per capita income explain a relatively smaller part of the changes in government expenditure.

Hazell(2000), examined the impact of public expenditure on poverty in rural India using state level data for period 1970-93, a simultaneous equation model was developed to estimate the direct and indirect impact of different types of government expenditure on rural and productivity growth in India. The results show that in order to reduce rural poverty, the Indian government should give highest priority to additional investment in road, agricultural research and education.

Musila and Belassi (2004) investigate the impact of public education expenditure on economic growth in Uganda during the period 1965-99. This study used cointegration and error correction model to investigate the impact of government expenditure on real GDP. the empirical work highlights capital and labor inputs as some of the key variables that seem to effect the long run growth performance of the country. The result indicate that average education expenditure per worker has positive and significant impact on economic growth.

Niloy Bose (2007) examined the growth effects of government expenditure for a panel of 30 developing countries over the 1970s and 1980s, with a particular focus on disaggregated government expenditures. The result was in two fold. First, the share of government capital expenditure in GDP was positively and significantly correlated with economic growth, but current expenditure was insignificant. Second, at the disaggregated level, government investment in education and total expenditures in education were the only outlays that was significantly associated with growth once the budget constraint and omitted variables are taken into consideration.

Joseph(2012) Investigate the effects of government spending on industrial productivity in Nigeria. Ordinary least square multiple regressions were adopted to carry out analysis on the relationship that exists between public expenditure and industrial sector productivity. In the model adopted, Index of industrial Production (IIP) serves as proxy for industrial productivity,

while Total Government Expenditure (GEXP), Government Expenditure on Administration (GADM), Government Expenditure on Economic Services (GESC), and Government Expenditure on Social and Community Services (GSCS) and Government Expenditure on Transfer (GTRS) were proxies for government expenditure. The regression results showed that both government expenditure on administration and government expenditure on economic services have negative relationships with industrial productivity. Also when GSCS and GTRS were increased, IIP also increases. The impact of each independent variable either negative or positive on industrial productivity was insignificant. This findings revealed the fundamental reasons why Nigerian economy remain underdeveloped, despite the huge amount spend every year for the past 52 years since her political independence. It was found out that all the explanatory variables in the model collectively explained about 86% changes in the behavior of industrial productivity in Nigeria.

Olayemi (2012) examined the relationship between human capital investment and industrial productivity in Nigeria for period 1978 to 2008. Co-integration and Error Correction Mechanism (ECM) was employed to examine the nexus between human capital investment and industrial productivity. Granger causality test was also adopted as a supplementary estimation method to explore the nature of causality among the variables established in the model. The study found that government expenditure on education maintained a positive long run relationship with index of industrial production while government expenditure on health and Gross Capital Formation exhibited long run negative relationship with the dependent variable.

Moreover, a lot of studies have been done on the relationship between government spending and different aspects of economic growth at national and international level. Our research study is somewhat unique in the sense that so far, no study has been covered impact of government spending on use based Industrial productivity in during the period 2005 to 2011-12 at national level. There is enough scope of research in this area.

II.II Objective of the paper:

The main objective of this paper is to investigate relationship between government spending and Industrial productivity in India. We want to empirically investigate the effect of government

spending on Productivity of six used based Industries (Basic Goods, Capital goods, Intermediate goods, consumer goods, consumer Durable Goods, consumer non durable goods) in India during 2005-06 to 2011-12.

II.III Hypothesis

We have proposed the following hypothesis for this study:

H0: There is no significant effect of government expenditure on Industrial productivity.

II.IV Data Sources

This study employs investigative and empirical methods to analyze the relationship between government spending and Industrial productivity in India in the last 7 years. We use Index of Industrial productivity of six use based Industries (Basic Goods, Capital goods, Intermediate goods, consumer goods, consumer Durable Goods , consumer non durable goods) and total public expenditure (both Development and Non development) in our analysis for the period 2005-06 to 2011-12. The data from 2005-2011 has been collected from Economic Survey and Handbook of Statistics on the Indian Economy publication of the RBI.

The main divergence of the present from the existing literature is that it has utilized the IIP (index of Industrial Productivity) of six used based Industries, to analyze the impact of Government spending on the productivity of these Industries in India.

II.V Model Specification

The model for the study is specified as:

$$\mathbf{BSC} = \alpha_0 + \alpha_1 \mathbf{TEXP} + \mu_1$$

$$\mathbf{CPG} = \alpha_{01} + \alpha_2 \mathbf{TEXP} + \mu_2$$

$$\mathbf{IMTG} = \alpha_{02} + \alpha_3 \mathbf{TEXP} + \mu_3$$

$$\mathbf{CMG} = \alpha_{03} + \alpha_4 \mathbf{TEXP} + \mu_4$$

$$\mathbf{CDG} = \alpha_{03} + \alpha_5 \mathbf{TEXP} + \mu_5$$

$$\mathbf{CNDG} = \alpha_{04} + \alpha_6 \mathbf{TEXP} + \mu_6$$

TEXP = Total Government Expenditure

BSC = Basic Goods Industries

CPG = Capital Goods Industries

IMTG = Intermediate Goods Industries

CMG= Consumer Goods Industries

CDG = Consumer Durable Industries

CNDG= Consumer Non - Durable Goods Industries

α_0 and α_1.....α_6 are the parameters of the intercept and slopes of the coefficients, while μ represents other variables that could have lent further explanation to explained variables but not included in the model.

II.VI Estimate Technique

The modern econometric approach for analyzing the relationship is employed. We adopted ordinary least square regression (OLS) for analyzing above models.

SECTION III

REGRESSION RESULTS

The computation of the model parameter is based on the data shown in the table 1 to 7.

Table 1

Descriptive Analysis of Data

Variable	BSC	CPG	IMTG	CMG	CDG	CNDG	TEXP
Mean	128.85	215.74	129.35	153.11	215.11	128.55	900789.3
Maximum	150	278.90	145.30	186.10	295.10	268.76	1284321
Minimum	106.10	118.10	106.60	110.70	116.20	108.76	519737
Std. Deviation	15.03	61.25	13.85	26.61	68.43	10.98	302084.4

Source: Researcher's own calculation based on TEXP and IIP data 2005-2011.

Table 1 presents the descriptive statistics of the data used in the empirical analysis. This table shows the mean, maximum, minimum and standard deviation of IIP (Index of Industrial Production) of BSC, CPG, IMTG, CMG, CDG, CNDG and TEXP. The index of BSC averaged 128.85 between 2004-05 to 2011-12. It varied from a minimum of 106.10 in 2005 to a maximum of 150 in 2011-12. The index of CPG averaged 215.74 between 2004 to 2011-12 and varied from a minimum of 118.10 in 2005 to a maximum of 278.90 in 2011-12. The index of IMTG averaged 129.35 between 2004-05 to 2011-12. It varied from a minimum of 106.60 in 2005 to a maximum of 145.30 in 2011-12. The index of CMG averaged 153.11 between 2004-05 to 2011-12 and varied from a minimum of 110.70 in 2005 to a maximum of 186.10 in 2011-12. The index of CDG averaged 215.11 between 2004-05 to 2011-12. It varied from a minimum of 108.76 in 2005

to a maximum of 295.10 in 2011-12. The index of CNDG averaged 128.55 between 2004-05 to 2011-12 and varied from a minimum of 108.76 in 2005 to a maximum of 268.76 in 2011-12. The index of TEXP averaged 900789.3 between 2004-05 to 2011-12. It varied from a minimum of 519737 in 2005 to a maximum of 1284321 in 2011-12.

Model I

$BSC = \alpha_0 + \alpha_1 TEXP + \mu_1$

Dependent variable: Index of Industrial Productivity of Basic Good Industries

Independent variable: Total Government Expenditure.

Table 2

Variable	Coefficient	Std. Error	t- Statistics	Probability
Constant(C)	85.190	4.73	18.01	0.0000
TEXP	4.847	5.01	9.66	0.0002

Source: Researcher's own calculation based on TEXP and IIP data 2005-2011.

BSC = 85.190 + 4.847-05*TEXP

$R^2 = 0.94$ F-statistics= 93.43

The regression coefficient of TEXP is positive. This show that a unit increases in Government expenditure leads to 4.84 increase in the index of Industrial productivity of Basic good Industries. The F- test for the model also indicates it is highly significant, F = 93.43 at sig F= .0002. This result also indicates that the t- test for the significance of individual independent variables indicates that at the significance level of 0.95(confidence level of 95%), independent variable is statistically significant in the model. The R^2 value is 0.94 which shows that 94% of the variation in Index of Industrial productivity is explained by the independent variable (TEXP).

Model II

$CPG = \alpha_0 + \alpha_2 TEXP + \mu_2$

Dependent variable: Index of Industrial Productivity of Capital Goods Industries

Independent variable: Total Government Expenditure

Table 3

Variable	Coefficient	Std. Error	t- Statistics	Probability
Constant(C)	45.61	31.13	1.46	0.2028

TEXP	0.000188	3.30	5.72	0.0023

Source: Researcher's own calculation based on TEXP and IIP data 2005-2011.

CPG = 45.610 + 0.0001889*TEXP

R^2= 0.86, F-statistics= 32.74

From regression coefficient it is clear that there is minimum positive relationship between TEXP and CPG. The positive effect is low and significant. According to the result, a unit change in government expenditure led to 0.000189 increases in Industrial productivity of capital good industries. The F- test for the model also indicates it is highly significant, F = 32.74 at sig F= .0002. This result also indicates that the t- test for the significance of individual independent variable indicates that at the significance level of 0.95(confidence level of 95%), independent variables are statistically significant in the model. From the above regression result, it is found that coefficient of determination is about 0.86. This implies that about 86% of the total variation in index of industrial productivity is explained by TEXP. The remaining 14% left unaccounted for by the model is attributed to the error term.

Model III

IMTG= $\alpha_0 + \alpha_3$TEXP+μ_3

Dependent variable: Index of Industrial Productivity of Intermediate Goods Industries

Independent variable: Total Government Expenditure

Table 4

Variable	Coefficient	Std. Error	t- Statistics	Probability
Constant(C)	89.604	5.26	17.01	0.0000
TEXP	4.417	5.58	7.90	0.0005

Source: Researcher's own calculation based on TEXP and IIP data 2005-2011.

IMTG = 89.60 + 4.413*TEXP

R^2= 0.92 F-Statistics = 62.47

The regression coefficient is positive. It is clear that there is positive relationship between TEXP and IMTG. The positive effect is high and significant. According to the result, a unit change in government expenditure led to 4.413 increases in Industrial productivity of Intermediate good

industries. The F- test for the model also indicates it is highly significant, F = 62.47 at sig F= .0005. This result also indicates that the t- test for the significance of individual independent variable indicates that at the significance level of 0.95(confidence level of 95%), independent variables are statistically significant in the model. From the above regression result, it is found that coefficient of determination is about 0.92. This implies that about 92% of the total variation in index of industrial productivity of Intermediate good industries is explained by TEXP. The remaining 8% left unaccounted for by the model is attributed to the error term.

Model IV

CMG= $\alpha_0 + \alpha_4$TEXP+μ_4

Dependent variable: Index of Industrial Productivity of Intermediate Goods Industries

Independent variable: Total Government Expenditure

Table 5

Variable	Coefficient	Std. Error	t- Statistics	Probability
Constant(C)	76.40	9.55	7.99	0.0005
TEXP	8.52	1.01	8.40	0.0004

Source: Researcher's own calculation based on TEXP and IIP data 2005-2011.

CMG = 76.406 + 8.515*TEXP

R^2=0.93 F- statistic= 70.67

From regression coefficient it is clear that there is high positive relationship between TEXP and CMG. The positive effect is high and significant. According to the result, a unit change in government expenditure led to 8.515 increases in Industrial productivity of consumer good industries. The F- test for the model also indicates it is highly significant, F = 70.67 at sig F= .0003. This result also indicates that the t- test for the significance of individual independent variable indicates that at the significance level of 0.95(confidence level of 95%), independent variables are statistically significant in the model. From the above regression result, it is found that coefficient of determination is about 0.93. This implies that about 93% of the total variation in index of industrial productivity of Consumer Goods Industries is explained by TEXP. The remaining 7% left unaccounted for by the model is attributed to the error term.

Model V

$CDG = \alpha_0 + \alpha_5 TEXP + \mu_5$

Dependent variable: Index of Industrial Productivity of Consumer Durable Goods Industries

Independent variable: Total Government Expenditure

Table 6

Variable	Coefficient	Std. Error	t- Statistics	Probability
Constant(C)	13.13	13.60	0.96	0.378
TEXP	0.000224	1.44	15.54	0.0002

Source: Researcher's own calculation based on TEXP and IIP data 2005-2011.

CDG = 13.1354 + 0.00022*TEXP

R^2= 0.97 F-statistic= 241.60

The regression coefficient of TEXP is positive. This show that a unit increases in Government expenditure leads to 0.000224 increase in the index of Industrial productivity of consumer durable good Industries. The F- test for the model also indicates it is highly significant, F = 241.60 at sig F= .00002. This result also indicates that the t- test for the significance of individual independent variables indicates that at the significance level of 0.95(confidence level of 95%), independent variable is statistically significant in the model. The R^2 value is 0.97 which shows that 97% of the variation in Index of Industrial productivity is explained by the independent variable (TEXP).

Model VI

$CNDG = \alpha_0 + \alpha_6 TEXP + \mu_6$

Dependent variable: Index of Industrial Productivity of Consumer Non-Durable Goods Industries

Independent variable: Total Government Expenditure

Table 7

Variable	Coefficient	Std. Error	t- Statistics	Probability
Constant(C)	101.53	8.68	11.69	0.0001

TEXP	2.999	9.20	3.25	0.0225

Source: Researcher's own calculation based on TEXP and IIP data 2005-2011.

CNDG = 101.53 + 2.999*TEXP

R^2= 0.67 F-Statistic = 10.61

From regression coefficient it is clear that there is high positive relationship between TEXP and CNDG. The positive effect is high and significant. According to the result, a unit change in government expenditure led to 2.999 increases in Industrial productivity of consumer non durable good industries. The F- test for the model also indicates it is significant, F = 10.67 at sig F= .0024. This result also indicates that the t- test for the significance of individual independent variable indicates that at the significance level of 0.95(confidence level of 95%), independent variables are statistically significant in the model. From the above regression result, it is found that coefficient of determination is about 0.67. This implies that about 67% of the total variation in index of industrial productivity of Consumer non durable Goods Industries is explained by TEXP. The remaining 33% left unaccounted for by the model is attributed to the error term.

SECTION IV

CONCLUSION, LIMITATIONS AND SUGGESTIONS

IV.I Conclusion

The objective of this study was to investigate and empirically analyze the impact of government spending on the Industrial productivity in India for the period 2005-06 to 2011-12. From the above results and analysis we could draw the conclusion as below:

- Industrial productivity of all six use based industries has increased with increase in Total Government spending.

- From regression coefficient it was clear that there was very high and significant positive relationship between Total government spending and productivity of Consumer goods Industries.

- There was positive but medium and significant relationship of government spending and Intermediate Goods Industries, Basic goods Industries and Consumer Nondurable goods Industries.

- There was positive but low and significant relationship of government spending, in case of Consumer Durable Goods and Capital goods Industries

IV.II Limitation of the study:

The limited database, short time period and selected variables are some of the major limitations of this study. However in future research scholars or students can work on more variables which will provide better experience to the students for their bright career.

IV.III Suggestions

From policy point of view it is suggested that more thrust may be given for government spending like development expenditure(Research and Development, Education , road, Health etc.) in the economy because these types of government spending have a much larger impact on Industrial Productivity. Public as well as private development spending should be increased in order to achieve higher industrial productivity growth in Indian economy.

References

1) Gupta, A.P.,(1977), "Who Benefits From Central Government Expenditure", Economic and Political Weekly, Feb.1977, pp.267-286.

2) Hazell(2000) "Impact of Public Expenditure on Poverty in Rural India" , Economic and Political Weekly, Vol.35.No.40 pp.3581-3588.

3) Joseph (2012), "Effects of Public Expenditure on Industrial Sector Productivity in Nigeria", Canadian Social Science, Vol. 8, No. 1, 2012, Pp. 204-214

4) Lal1(1969) "A Note on Government Expenditure in Developing Countries", The Economic Journal, June.1969, pp.413-417.

5) Musila and Belassi (2004), "Impact Of Public Education Expenditure On Economic Growth In Uganda: Evidence From Time Series Data", Journal Of Developing Areas, Vol.38, No.1, Pp.123-133.

6) Niloy Bose (2007), "Public Expenditure and Economic Growth: A Disaggregated Analysis For Developing Countries", The Manchester School Vol. 75 No. 5, pp.533-556 September 2007

7) Olayemi (2012), "Human Capital Investment and Industrial Productivity In Nigeria", International Journal Of Humanities And Social Science, Vol. 2 No. 16.

8) Sohrab and Yousefi(1988), "Growth of Government Expenditure, The Case of Canada", Public Finance Quarterly, Vo1.16, Jan.1988, p.78.