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IN INDIAN MANUFACTURING SECTOR**

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## Abstract

Investment plays a prime role in driving economic growth and development; it augments the productive capacity, productivity and efficiency in the economy and enables to produce more output. Private fixed investment; a component of aggregate investment is one of the major determinants of an economy's long-term growth; its increase in relative to GDP contributes higher growth and redirect available resources for expanding future production. It's an ideal indicator in explaining the business cycle oscillations. Over time interest in private investment grew because of its sensitivity to policy environment relative to public investment. It became even more policy relevant in the recent years after initiation of Structural Adjustment Programme (SAP) in several developing countries. The study investigates, whether financial liberalization improved the efficiency with which investment funds are allocated across different industries by using a measure of efficiency index developed by Galindo, A, Fabio Schiantarelli and Andrew Weiss (2005) for Indian manufacturing industries for the period 1990-2007. It measured whether investment funds are going to industries with a higher marginal return to capital in pre liberalisation and post liberalisation periods. By comparing the mean values of efficiency index in the pre- and post-liberalisation period the study finds that the efficiency index has improved for many (although not for all) industries in the sample, following the introduction of economic reforms.

**Keywords:** Private Investment, Manufacturing, Efficiency, Economic Reforms

**JEL Classification:** C2, L5, G28, O47

## 1. Introduction

Investment plays a prime role in driving economic growth and development. In the process by introducing new technology it augments the productive capacity, productivity and efficiency in the economy and enables to produce more output. Private fixed investment; a

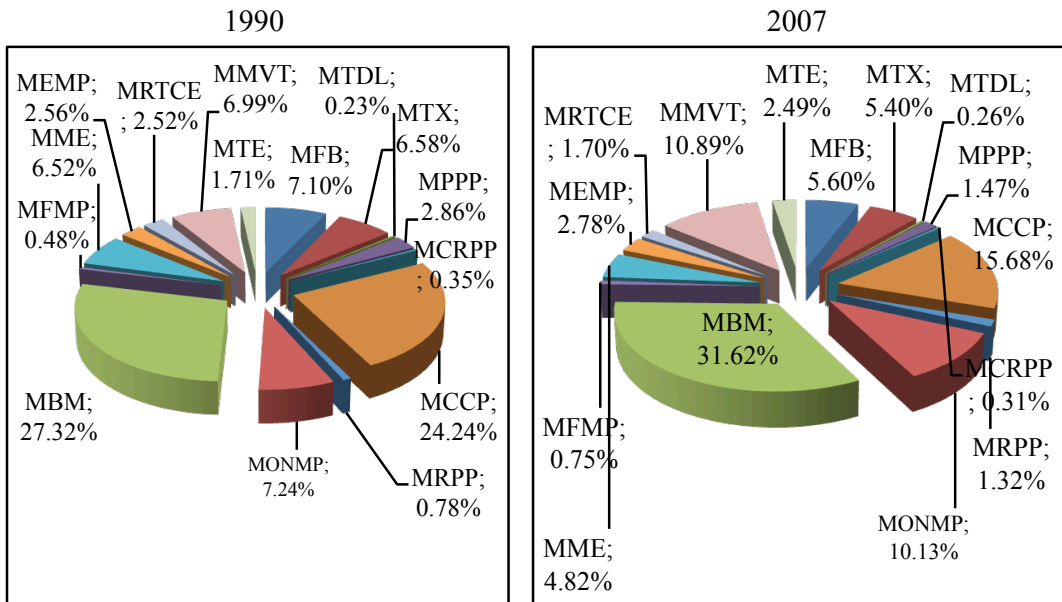
component of aggregate investment is one of the major determinants of an economy's long-term growth; its increase in relative to GDP contributes higher growth and redirect available resources for expanding future production. It's an ideal indicator in explaining the business cycle oscillations and hence it takes a central place in theoretical macroeconomics and in the analysis of economic growth. Even though business fixed investment typically represents a much smaller component of aggregate demand than does consumption, it determines the rate at which physical capital is accumulated. Recent studies have shown that private investment is more efficient and productive than public investment (Serven and Solimano, 1990; and Kahn and Reinhart, 1990). Over time interest in private investment also grew because of its sensitivity to policy environment relative to public investment. It became even more policy relevant in the recent years after initiation of structural adjustment programme (SAP) in several developing countries. The SAP therefore aimed at giving greater role for the private sector in the economy through liberalization and privatization measures. The success of a SAP in bringing about a sustainable recovery in economic activity in a given economy depends crucially on the behaviour of investment in the aftermath of the reform process. Since the expansion of public investment is usually constrained as part of fiscal austerity measures embodied in SAP, the required recovery of investment has to come largely from the private sector.

India, undergone significant changes both in its structure and pattern owing to the policy changes. Since the early 1950s up until the early 1980s the evolution of manufacturing sector was guided by protected industrial and trade policies, which restricted the growth of the economy in general and manufacturing sector, in particular. Under old industrial and trade policy regime, manufacturing sector was characterized by extensive public sector intervention, regulation of the private sector firms, restrictions on foreign investment, high tariff and non-tariff restrictions on imports, which held up the growth of the manufacturing sector. This has been replaced by a more liberal industrial and trade policy regime, through the inception of new economic policy under SAP in 1991. The major focus of these policies is to dismantle the complex web of controls that severely constrained the emergence and operation of the private entrepreneurs. It is observed that new policies had tremendous effect on the industrial sector, in terms of creating conducive business environment for investment and for future growth process of industries. As adequate capital investment in industries is critical for accelerated industrial growth, forecasts of investment and its efficiency of the private sector assumes considerable significance in determining the performance of industrial sector, and it provides the necessary backdrop to gauge the impact of reform policies on private investment. The behaviour of private investment has therefore been a major focus of attention in assessing the reform outcome. In regard to this one crucial question that needs to be addressed is whether the financial reforms part of the SAP that have been implemented have led to an improvement in the allocation of resources. To what extent has financial sector liberalisation, through the removal of credit constraints, contributed to efficient allocation of private investment as compared to other core determinants? In this paper, we attempt to address the above interesting questions in light of the Indian experience, over the period 1990-2007.

In order to examine the salient features of Indian private corporate manufacturing sector across the industries, the study make use of gross value added and fixed investment patterns, of the industries. For classification of industries we have followed the Annual Survey of Industries, National Industry Classification (NIC) code 2004, which is regarded as benchmark for industry classification, prepared according to their economic activity. According to NIC, the manufacturing sector starts from NIC 15 and ends at NIC 36. In whole the manufacturing sector contains 22, two digit industries and out of it the study selected 15,

two digit major industries for time series analysis for the period starting from 1990 to 2007. Since the nature of these industries varies according to their production process one can expect a substantial variation in gross value added, and investment patterns. The changes in gross value added of private corporate industries are shown in fig.1. The top five manufacturing industries are Manufacture of Basic Metals, Manufacture of Chemicals and Chemical Products, Manufacture of Other non-metallic mineral products, Manufacture of Food Products and Beverages and Manufacture of Motor Vehicles trailers and Semi-trailers add up to of about 72.89%, rest of ten industries contribute of about 24.60% of total value added in 1990, although these five industries remained in top in 2007 also, where there share increased marginally to a 74.12%. Manufacture of Other non-metallic mineral products and Manufacture of Motor Vehicles trailers and Semi-trailers increased their share from less than 8% to 11% and Manufacture of Chemicals and Chemical Products witnessed biggest decline in its share from 24.24% in 1990 to 15.68% in 2007. However, in mid 1990s almost all the top five industries experienced an increase in their share. The share of remaining ten industries declined from 24 % to 21% from 1990 to 2007. The five industries such as Manufacture of Fabricated Metal Products, Manufacture of Transport Equipment (MTE), Manufacture of Rubber and Plastic Products, Manufacture of Fabricated Metal Products and

**Figure 1:** Changes in the Composition of Gross Value Added of Manufacturing Corporate Sector

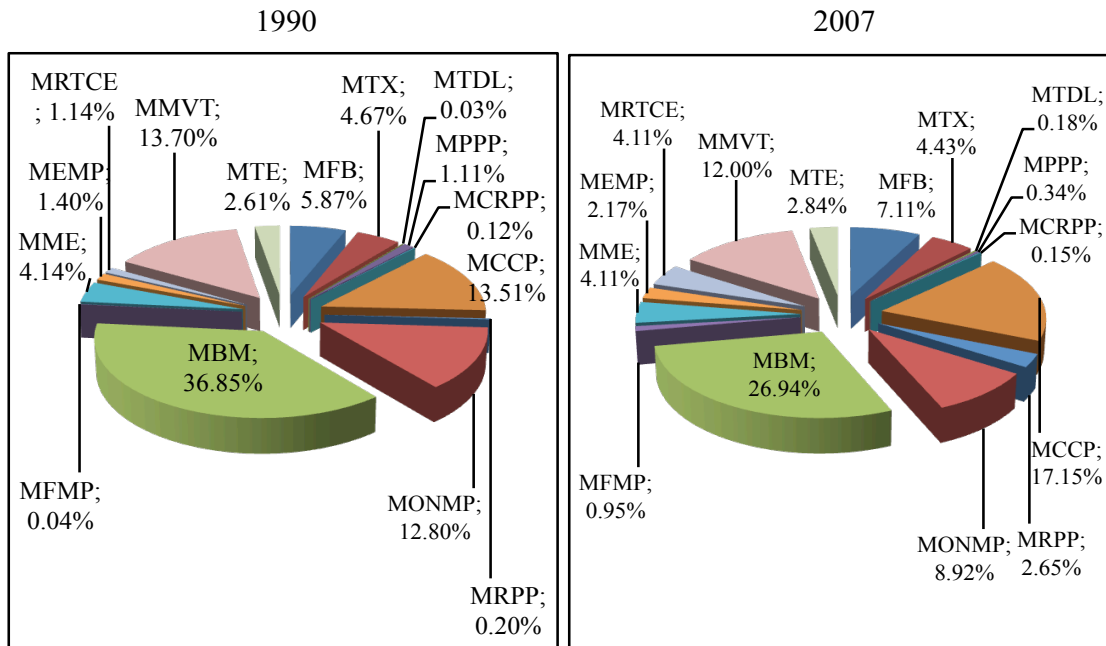


Source: CMIE Prowess Database and Author's Computations  
For Industries Abbreviations See Table 1 in Appendix

Manufacture of Tanning and Dressing of Leather experienced higher share contribution where as other five remaining industries declined in their share of total value added during the study period. The variation in the composition of fixed investment patterns across different industries in Indian Private Manufacturing Corporate Sector is presented in figure 2. It is manifested that the composition of investment patterns has changed tremendously across the industries owing to changes in industry characteristics. Examining the composition of fixed investment patterns, it is found that the top five industries which have higher share in gross value added also have highest investment patterns. These industries accounted of about

82.73% of total investment in manufacturing sector in 1990. However, their share declined substantially to 72.12% in 2007, owing to steep fall in share of Manufacture of Basic Metals and Manufacture of Other non-metallic mineral products. On the other hand, Manufacture of Radio, television and communication Equipment, Manufacture of Rubber and Plastic Products, Manufacture of Fabricated Metal Products and Manufacture of Tanning and Dressing of Leather experienced a higher share of investment growth in total manufacturing investment during the period 1990-2007.

**Figure 2: Fixed Investment Patterns of Industries in Private Manufacturing Corporate Sector**



Source: CMIE Prowess Database and Author's Computations  
For Industries Abbreviations See Table 1 in Appendix

## 2. Empirical Background

There exists vast literature, both theoretical and empirical, on the determinants and efficiency of investment behaviour. The gains in investment efficiency after financial liberalization have been documented in number of individual and cross country studies using firm level data. In the case of Ecuador, Jaramillo.F, Schiantarelli, and Andrew Weiss (1992) find that after financial liberalization, there was an increase in the flow of credit to technologically more efficient firms, and the flow of credit moved from smaller to larger firms after liberalization. The small scale firms are subsidized during the pre-reform period and the shift in credit towards large firms is therefore a case in which credit shifted to the area (technologically efficient large firms) that has been discriminated under the system of repression. Harris.J, F. Schiantarelli and M. Siregar (1994), analyzed the consequences of financial sector liberalization for a large panel of Indonesian manufacturing establishments. They found that economic reforms had a favorable effect on the performance of smaller establishments, where the more technologically efficient firm received the greater proportion of new credit. Credit increased for both small and large firms, whereas it decreased for

medium-size firms. Overall these results show that shifting from administrative toward market-based allocation of credit has increased borrowing costs, particularly for smaller firms, but at the same time, it has benefited firms by giving them widened access to finance. A similar study by Galindo.A, Fabio Schiantarelli and Andrew Weiss (2005) using firm level panel data from twelve developing countries (Argentina, Brazil, Chile, India, Korea, Malaysia, Mexico, Pakistan, Philippines, Taiwan and Thailand) explored the impact of financial liberalization on the allocation of investment funds. They constructed a summary index of the efficiency of capital allocation that measures whether investment funds are going to firms with a higher marginal return to capital is developed. By examining the relationship between the efficiency index and the various measures of financial liberalization they find that liberalization increases the efficiency of investment allocation. Maurel, Mathilde (2001) simultaneously estimated the determinants and efficiency of investment for Hungarian domestic and foreign firms for the 1992-1998 period. The study highlights two measures of efficiency firstly, computed as Total Factor Productivity (TFP) from a Cobb-Douglas technology and secondly gross and net of property structure. Gross efficiency is the fixed effect in the production function specification, which does not include property variables, while net efficiency is net of the effect of corporate governance on the ratio of production to factors contribution. The results show that overall investment in all entities depends upon internal funds, sales and wages where as real investment is higher in foreign firms and efficiency improvements due to investment are significantly higher in Hungarian domestic firms. Dollar. D and Shang-Jin Wei (2007) examine the presence of systematic distortions in capital allocation that result in uneven marginal returns to capital across firm ownership, regions, and sectors. The study provided a systematic comparison of investment efficiency among wholly and partially state-owned, wholly and partially foreign owned, and domestic privately owned firms, conditioning on their sector, location, and size characteristics. They find that even after a quarter-of-century of reforms, state-owned firms still have significantly lower returns to capital, on average, than domestic private or foreign-owned firms. Similarly, certain regions and sectors have consistently lower returns to capital than other regions and sectors. They provided evidence that the degree of inefficiency is economically and statistically significant. However, a very few empirical studies in the Indian context both at the firm and the industry level emerged in investigating the efficiency of investment allocation during the post reform period. Khasnabis.G. Basudeb and Saumitra N. Bhadure (2000) analyzed the efficiency of investment allocation across industrial sectors and changes in the allocation of capital among firms within the industry by using a simple measure of efficiency, developed by Schiantarelli, Weiss, Jaramillo and Siregar (1994). They hypothesize that financial reforms lead to enhance economic growth mainly by directing investment towards growing industries and firms. The results show that the financial reforms have failed to allocate capital efficiently in Indian industries. The authors attribute this lack of improvement in allocation efficiency to changes in the source and use of funds by Indian firms after liberalisation. Although equity capital increased sharply as a source of fund, there was no corresponding rise in investment in productive assets in the sample. Thus, the deterioration in the efficiency index may have been caused by the flawed investments by the firms, which did not lead to higher value added by the firms. Dimitriu.M. Caracota and Savu. B. Mathew (2010) by using NSS aggregate data for the entire manufacturing sector in India for 1994-2001 periods analyzed the productivity and efficiency of organized and unorganized sectors. Using stochastic frontier approach, and the maximum likelihood models, the efficiency in the two sectors is compared and verified against factors affecting the levels of efficiency obtained for each major industry category. By comparing all the econometric results of technical efficiency across the organized and unorganized sectors, the authors notice the expected gap in terms of better average efficiency in the organized sector as well



as a clear improvement in average efficiency over time across most industries. Further in a major empirical work Bhandari.A.K and Maiti.P (2007) using the translog stochastic frontier production function estimates the technical efficiency for textile firms for five years. They find that technical efficiency varies across the years and the individual technical efficiency vary with firm specific characteristics such as size and age. Further they conclude that public sector firms are relatively less efficient than private sector firms. Emphasizing on the implications of the recent structural adjustment policy reforms of 1990s, on investment behavior Athukorala and Sen (1998) examined the determinants of private corporate investment in India. The results of their econometric analysis suggest that the net impact of the reforms on corporate investment has been salutary. The decline in real public sector investment brought about by the fiscal squeeze carried out as part of the reforms seems to have had a significant adverse impact on corporate investment. However, this adverse impact was outweighed by the salutary effects of the reform process on investment operating through the decline in real rental cost of capital and favorable changes in investor perception in the aftermaths of the reforms. Finally, they indicated the strong complimentary relationship of public investment with private corporate investment in India. In Indian context large number of empirical works exists on production and technical efficiency aspects of Indian manufacturing sector, whereas studies relating to the efficiency of investment allocation, are very meager in Indian scenario.

### **3. Estimation Methodology for Measuring Efficiency of Capital Allocation**

The study investigates, whether financial liberalization improved the efficiency with which investment funds are allocated across different industries. The changes in the allocation of capital across industrial sectors are examined by using a measure of efficiency index developed by Galindo, A, Fabio Schiantarelli and Andrew Weiss (2005). In order to measure the efficiency of allocation of investment, firstly the marginal product of investment is to be estimated. In general one cannot obtain a direct measure of the marginal product of investment without knowing the parameters of the production function. Hence the standard assumption is made that the marginal product of capital is proportional to a particular measure of the average product of capital. The study used two principal proxies to measure the average product of capital they are sales to capital ratio and the ratio of operating profits to capital. The former is appropriate if the production function is Cobb-Douglas in capital, labour and materials. In this case the marginal return to capital is proportional to the sales to capital ratio, while the latter is an appropriate proxy for the marginal return to capital under a constant return to scale production function and perfect competition in the output market. To measure the efficiency of the allocation of investment in a year, each of the estimates of the total return on investment is compared to a benchmark index. The benchmark index used is an estimate of total returns if investment funds had been allocated to industries in proportion to their share of capital in the sector as a whole, independently from the returns to investment. Similarly the investment generated in this way is multiplied with actual returns for each industry and added across industries in order to obtain total returns for the benchmark allocation. Then our measure of total return actually achieved is divided by this benchmark index to obtain a measure of the efficiency with which investment funds were allocated in each year. This index is invariant to macroeconomic changes that raise the value of the marginal product of capital uniformly for all industries.

This approach generates two different measures of the efficiency of the allocation of investment funds; one where sales per unit of capital is used as a measure of the marginal



product of investment, the other where operating profits per unit of capital is used as the appropriate measure. The two versions of indices for year t are:

$$EI_{ts} = \frac{S_{it,t+1} K_{i,t+1} I_{i,t} S_{i,t+1} K_{i,t+1} \cdot K_{i,t} K_t T I_t T}{\text{or}}$$

$$EI_{t\pi} = \frac{\pi_{i,t+1} K_{i,t+1} I_{i,t} \pi_{i,t+1} K_{i,t+1} \cdot K_{i,t} K_t T I_t T}{\text{or}}$$

where  $S_{it}$  denotes industry  $i$  sales at time  $t$ ,  $\pi_{it}$  operating profits,  $I_{it}$  fixed investment, and  $K_{it}$  beginning of period capital.  $I_t^T$  and  $K_t^T$  represent, aggregate investment and aggregate capital at time  $t$ , respectively. It is assumed that each unit of investment in year  $t$  increases capital stock, and hence generates a return in year  $t+1$ .

In order to estimate the efficiency of investment allocation the study employed sales based measure as a benchmark index. In previous empirical works (Galindo.A, Fabio Schiantarelli and Andrew Weiss 2005), sales based index is preferred over the profit based index, by providing a set of explanations they are firstly, sales is measured more accurately in the balance sheets than operating profits. Similarly, calculation of operating profit requires a valuation of cost of goods sold and changes in inventories in raw materials, which create complexity in estimation. Secondly, sales based measure allows for a departure from perfect competition. However, the markup of prices over marginal cost is allowed to vary over time and the departure comes at the cost of making a parametric assumption about the production function. A final problem with using operating profits as a measure of the return to capital is that operating profits are correlated with cash flow and during the pre-liberalization period, the correlation between cash flow and investment is higher than during post liberalization period. Hence the operating profit measure of the efficiency of the allocation of investment might be biased in favour of the pre reform periods. Hence by considering these empirical explanations, the study employed sales based measure of the efficiency of the allocation of investment as a standard measure to estimate efficiency of capital distribution in Indian industries during the pre and post reform periods.

#### 4. Empirical Results

The study using sales based measure estimated the efficiency of investment allocation in Indian industries for the period 1990 to 2007. The period has been equally divided into two groups the pre- liberalization (1990-1998) period and the post liberalization (1999-2007) period. The reforms even though initiated in 1991, assumed to may have time effect in influencing the industries; hence in the study pre - liberalization effect is extended till the year 1998. The efficiency estimates of investment allocation of various industries are presented in table 2. The indices results reveal that in seven industries such as Manufacture of Food Products and Beverages (NIC 15), Manufacture of Textiles (NIC 17), Manufacture of Tanning and Dressing of Leather (NIC 19), Manufacture of Paper and Paper Products (NIC 21), Manufacture of Coke, Refined Petroleum products (NIC 23) Manufacture of Other non-metallic mineral products (NIC 26), and Manufacture of Motor Vehicles trailers and Semi-trailers (NIC 34), investment efficiency declined during post reform period. Meanwhile these industries such as Manufacture of Food Products and Beverages (NIC 15), Manufacture of Textiles (NIC 17), Manufacture of Tanning and Dressing of Leather (NIC 19), the share of investment in overall manufacturing sector during the study period has increased very

marginally whereas in the rest of the above seven industries they declined. In terms of sales, it increased in Manufacture of Food Products and Beverages (NIC 15), Manufacture of Textiles (NIC 17), Manufacture of Motor Vehicles trailers and Semi-trailers (NIC 34), decreased in Manufacture of Tanning and Dressing of Leather (NIC 19), Manufacture of Paper and Paper Products (NIC 21) and remained stable in Manufacture of Coke, Refined Petroleum products (NIC 23), Manufacture of Other non-metallic mineral products (NIC 26). In shares of profit it has decreased in Manufacture of Food Products and Beverages (NIC 15), Manufacture of Textiles (NIC 17), Manufacture of Tanning and Dressing of Leather (NIC 19), Manufacture of Paper and Paper Products (NIC 21), Manufacture of Coke, Refined Petroleum products (NIC 23), increased in Manufacture of Motor Vehicles trailers and Semi-trailers (NIC 34) and remained stable in Manufacture of Other non-metallic mineral products (NIC 26).

The tables in appendix reveal that on average in above seven industries sales increased but at the same time profit and investments declined. The decline in profits and investments may be caused due to lesser allocation of capital for inventories, which has a significant negative impact on output and profit growth, and thereby eventually affecting capital expenditure. The main reason attributed for decline in investments on productive assets is due to higher allocation of capital for financial investments such as loans and advances, securities and sundry credit in recent years in Indian industries. Meanwhile, the deterioration in the efficiency index may have been caused by the choice of the wrong types of investments to begin with, which did not lead to higher output and profits and ultimately reducing the growth of the industries. Meanwhile in Manufacture of Chemicals and Chemical Products (NIC 24), Manufacture of Rubber and Plastic Products (NIC 25), Manufacture of Basic Metals (NIC 27), Manufacture of Fabricated Metal

**Table 1:** Investment efficiency in Indian manufacturing sector

Industry/Period	Investment Efficiency Index Pre-liberalisation (1990-1998)	Investment Efficiency Index Post-liberalisation (1999-2007)	Difference
NIC 15	1.67	1.41	-0.26
NIC 17	1.56	1.35	-0.22
NIC 19	1.59	1.21	-0.38
NIC 21	1.86	0.7	-1.16
NIC 23	2.33	1.18	-1.15
NIC 24	0.88	1.13	0.26
NIC 25	0.65	1.35	0.71
NIC 26	1.86	1.25	-0.6
NIC 27	0.93	1.01	0.08
NIC 28	0.67	1.49	0.82
NIC 29	0.67	1.49	0.82
NIC 31	1.02	1.23	0.21
NIC 32	1.57	2.14	0.56
NIC 34	2.36	1.59	-0.77
NIC 35	1.79	3.19	1.39

Products (NIC 28), Manufacture of Machinery and Equipment (NIC 29), Manufacture of Electrical Machinery and Apparatus (NIC 31), Manufacture of Radio, television and communication Equipment (NIC 32) and Manufacture of Transport Equipment (NIC 35),

have shown improvements in the degree of efficiency in investment allocation during post reform period. Overall the results show that in majority of industries efficiency of investment allocation increased during the post reform period compared to pre reform period. On the other hand, tables 2-4 in appendix reveals a stable increase in sales, investments and profits in these industries during the study period. The general picture that emerges is that the industrial groups that show an increase in share of investment also tend to show an increase in the share of profitability. From the policy perspective, an implication of this finding is that investment funds of the economy went largely to groups of firms which are growing, profitable and efficient.

## 5. Conclusion

Private fixed investment; a component of aggregate investment is one of the major determinants of an economy's long-term growth; its increase in relative to GDP contributes higher growth and redirect available resources for expanding future production. It's an ideal indicator in explaining the business cycle oscillations. Over time interest in private investment grew because of its sensitivity to policy environment relative to public investment. It became even more policy relevant in the recent years after initiation of SAP in several developing countries. In this backdrop, the study examined efficiency of capital allocation in Indian manufacturing sector for the period 1990-2007. By using an efficiency index the study measured whether investment funds are going to industries with a higher marginal return to capital in pre reform and post reform periods. It provides a systematic comparison of investment efficiency among a sample of Indian manufacturing industries. The investment analysis indicates the complex nature of manufacturing industries where the factors influencing efficiency of investment are not identical across the industries. The results presents empirical support for the idea that economic reforms in general, industrial and financial sector reforms in particular have led to improvement in the efficiency with which investment funds are allocated in Indian manufacturing sector. By comparing the mean values of our efficiency index in the pre- and post- reform period it suggests that the index has improved for many (although not for all) many industries in the sample, following the introduction of economic reforms.

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## Appendices

**Table 2:** Sample of industries based on national industrial classification (NIC) Code 2004

NIC Code	Industries by economic activity
NIC 15	Manufacture of Food Products and Beverages
NIC 17	Manufacture of Textiles
NIC 19	Manufacture of Tanning and Dressing of Leather
NIC 21	Manufacture of Paper and Paper Products
NIC 23	Manufacture of Coke, Refined Petroleum products
NIC 24	Manufacture of Chemicals and Chemical Products
NIC 25	Manufacture of Rubber and Plastic Products
NIC 26	Manufacture of Other non-metallic mineral products
NIC 27	Manufacture of Basic Metals
NIC 28	Manufacture of Fabricated Metal Products
NIC 29	Manufacture of Machinery and Equipment
NIC 31	Manufacture of Electrical Machinery and Apparatus
NIC 32	Manufacture of Radio, television and communication Equipment
NIC 34	Manufacture of Motor Vehicles trailers and Semi-trailers
NIC 35	Manufacture of Transport Equipment

**Table 3: Industries Share of Investment in Total Manufacturing Investment**

Industry	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
NIC 15	5.87	7.29	7.74	8.65	8.27	7.78	8.00	7.71	6.96	8.24	8.86	7.81	8.21	8.24	7.39	7.21	7.11	7.11
NIC 16	1.70	1.90	2.18	2.63	2.44	2.08	2.15	2.15	3.81	4.49	3.66	3.21	2.91	4.29	5.62	6.44	5.53	3.89
NIC 17	4.67	4.81	6.48	8.72	12.15	12.24	14.26	13.22	11.87	10.90	10.89	9.84	7.84	8.33	10.37	9.29	8.85	4.43
NIC 18	.0002	.0002	.0184	.0010	.0348	.0238	.0358	.0345	.0308	.0241	.0492	.0525	.0606	.0507	.0287	.0240	.0696	.0715
NIC 19	0.03	0.23	0.26	0.24	0.28	0.19	0.94	0.96	0.77	0.48	0.50	0.28	0.13	0.43	0.24	0.18	0.24	0.18
NIC 20	0.06	0.07	0.02	0.06	0.03	0.11	0.09	0.13	0.21	0.09	0.08	0.08	0.13	0.13	0.08	0.11	0.14	0.10
NIC 21	1.11	4.60	4.59	4.80	3.38	2.80	3.42	3.76	0.85	2.37	2.13	1.78	1.32	1.46	0.72	0.61	0.54	0.34
NIC 22	.0002	.0002	.0002	.0002	.0001	.0001	.0099	.0241	.0227	.0216	.4000	.2544	.2011	.0057	.1439	.1134	.0764	.0541
NIC 23	0.12	0.38	0.48	0.80	1.05	1.02	0.69	0.39	0.41	0.50	0.40	0.06	0.42	0.52	0.18	0.32	0.25	0.15
NIC 24	13.51	20.42	22.43	18.38	14.33	13.79	14.35	15.29	13.99	17.41	18.37	18.39	18.08	17.72	17.93	18.68	18.17	17.15
NIC 25	0.20	0.33	0.34	0.98	1.46	1.07	1.30	1.57	1.29	1.87	2.29	2.49	3.18	2.63	2.28	2.45	3.08	2.65
NIC 26	12.80	12.62	13.05	11.84	11.08	11.74	8.16	7.55	7.57	7.82	6.03	7.56	9.26	8.78	8.37	8.14	8.45	8.92
NIC 27	36.85	27.41	22.47	22.90	23.33	22.56	20.66	20.46	19.54	18.99	19.93	20.07	19.51	21.22	20.55	19.84	20.17	26.94
NIC 28	0.04	0.11	0.17	0.19	0.15	0.16	0.58	0.73	0.51	0.69	0.82	0.64	0.70	0.79	0.70	0.66	0.79	0.95
NIC 29	4.14	3.91	4.07	5.49	6.03	5.53	5.36	5.52	12.20	6.55	5.81	5.03	4.63	4.70	2.46	3.05	3.31	4.11
NIC 30	0.02	0.01	0.01	0.01	0.13	0.16	0.15	0.30	0.38	0.26	0.34	0.38	0.47	0.60	0.60	0.93	0.47	0.52
NIC 31	1.40	0.99	1.25	1.40	2.03	2.63	2.51	2.66	2.69	2.86	2.95	2.58	2.51	2.32	1.85	1.74	2.41	2.17
NIC 32	1.14	3.83	0.70	4.71	5.24	4.28	3.31	4.21	3.26	2.80	2.53	8.30	9.98	6.97	5.36	5.07	4.06	4.11
NIC 33	0.01	0.00	0.01	0.06	0.07	0.07	0.21	0.18	0.18	0.21	0.16	0.19	0.17	0.10	0.13	0.16	0.15	0.13
NIC 34	13.70	8.98	12.13	6.79	7.11	10.59	12.79	11.95	12.61	11.75	11.87	9.00	7.34	6.97	11.21	10.84	11.50	12.00
NIC 35	2.61	2.09	1.56	1.29	1.14	0.95	0.79	0.99	0.87	1.40	1.64	1.68	2.62	3.33	3.16	3.56	3.41	2.84
NIC 36	0.03	0.02	0.02	0.05	0.26	0.22	0.24	0.22	0.24	0.28	0.30	0.30	0.34	0.41	0.44	0.59	1.24	1.18
Industry	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 4: Industries Share of Sales in Total Manufacturing Sales**

Industry	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
NIC 15	7.64	8.49	8.59	8.59	9.06	8.85	8.87	8.83	9.40	10.04	9.40	9.17	10.56	10.40	9.55	8.42	8.76	8.32
NIC 16	2.96	2.97	3.09	3.17	2.93	2.69	2.24	2.51	2.52	2.72	2.54	2.52	2.74	2.64	2.36	2.26	2.37	2.32
NIC 17	8.50	8.46	8.10	7.98	8.47	8.54	8.54	8.67	8.72	8.06	8.05	7.85	7.17	7.08	5.92	5.49	5.17	4.77
NIC 18	0.02	0.02	0.02	0.01	0.04	0.11	0.12	0.13	0.14	0.12	0.14	0.15	0.17	0.18	0.16	0.12	0.13	0.12
NIC 19	0.46	0.43	0.43	0.40	0.57	0.56	0.58	0.58	0.53	0.55	0.52	0.43	0.42	0.42	0.40	0.33	0.34	0.28
NIC 20	0.16	0.19	0.15	0.18	0.23	0.25	0.25	0.26	0.23	0.24	0.21	0.21	0.20	0.17	0.13	0.14	0.14	0.17
NIC 21	2.18	2.46	2.36	2.21	1.96	1.88	2.09	1.96	1.34	1.97	1.61	2.11	1.97	1.91	1.74	1.55	1.56	1.33
NIC 22	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.03	0.05	0.05	0.06	0.06	0.04	0.01	0.02	0.03	0.02	0.02
NIC 23	0.50	0.50	0.54	0.60	0.69	0.70	0.72	0.73	0.78	0.74	0.83	0.78	0.68	0.67	0.67	0.62	0.58	0.54
NIC 24	22.65	22.08	23.84	23.36	21.83	21.92	21.14	20.96	21.95	21.93	22.03	21.41	21.57	21.32	20.49	18.81	19.39	17.02
NIC 25	1.15	1.50	1.50	1.64	1.96	2.15	2.16	2.29	2.08	2.36	2.12	2.10	2.09	1.99	1.87	1.82	1.75	1.65
NIC 26	6.96	7.21	6.83	6.48	6.65	6.17	6.17	6.11	6.17	6.23	6.01	6.24	6.51	5.74	6.09	5.97	5.96	6.99
NIC 27	21.22	19.71	20.00	19.88	19.86	20.12	19.76	18.11	17.92	17.45	17.16	17.64	17.62	18.77	20.31	23.58	22.95	25.06
NIC 28	0.76	0.82	0.73	0.74	0.78	0.83	0.69	0.74	0.78	0.81	0.72	0.81	0.79	0.79	0.67	0.72	0.84	0.81
NIC 29	7.26	7.42	7.19	6.91	6.59	6.48	6.21	6.61	6.31	5.74	5.51	4.93	4.95	4.55	4.47	4.71	4.94	5.06
NIC 30	0.35	0.35	0.38	0.69	0.77	0.75	0.94	1.22	0.90	1.04	0.98	1.11	0.95	0.89	0.96	0.81	0.79	0.74
NIC 31	3.48	3.26	3.13	3.62	3.57	3.64	3.64	3.23	3.12	3.09	3.11	3.31	3.46	2.68	2.42	2.59	3.11	3.60
NIC 32	2.69	2.78	2.95	3.00	3.11	2.78	2.75	2.76	2.97	3.38	3.20	3.50	3.10	4.28	3.81	3.54	2.59	2.88
NIC 33	0.26	0.20	0.27	0.38	0.43	0.54	0.41	0.42	0.28	0.42	0.42	0.44	0.49	0.44	0.35	0.26	0.32	0.34
NIC 34	8.22	8.61	8.52	7.83	7.99	8.71	9.94	11.55	10.10	9.42	11.24	10.92	10.63	10.58	12.13	12.97	13.21	13.84
NIC 35	2.11	2.04	1.74	1.83	1.65	1.59	1.59	1.41	1.89	2.26	2.20	1.60	1.80	2.23	2.66	2.61	2.40	2.57
NIC 36	0.46	0.47	0.50	0.56	0.82	1.02	1.15	0.89	1.66	1.57	1.94	2.70	2.08	2.26	2.82	2.63	2.68	2.34
Industry	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 5: Industries Share of Profits in Total Manufacturing sector**

Industry	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
NIC15	7.04	7.39	6.54	6.55	8.03	6.32	5.84	6.07	7.34	7.66	7.32	6.72	7.45	5.81	5.13	4.75	5.11	5.06
NIC16	1.31	1.58	2.04	2.23	2.20	1.91	1.41	1.59	2.47	2.79	3.43	3.99	4.57	4.14	3.63	3.54	3.31	2.90
NIC17	6.57	7.70	7.05	7.07	8.63	8.63	7.38	8.01	6.89	6.13	6.62	7.05	6.31	6.33	7.62	4.95	6.21	4.93
NIC18	0.03	0.03	0.03	0.01	0.03	0.09	0.10	0.01	0.07	0.02	0.11	0.11	0.09	0.10	0.05	0.05	0.09	0.06
NIC19	0.23	0.24	0.26	0.23	0.54	0.41	0.29	0.20	0.32	0.42	0.42	0.25	0.19	0.27	0.32	0.25	0.21	0.17
NIC20	0.16	0.16	0.12	0.19	0.27	0.31	0.32	0.34	0.34	0.30	0.30	0.21	0.18	0.17	0.12	-0.08	0.15	0.13
NIC21	2.87	3.12	2.81	2.36	2.19	1.77	2.65	2.10	0.92	1.71	1.58	2.63	3.11	2.01	1.66	1.46	1.57	1.36
NIC22	0.01	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.07	0.12	0.08	-0.01	-0.02	-0.01	0.01	0.02	0.01
NIC23	0.35	0.46	0.56	0.64	0.64	0.65	0.71	0.74	0.80	0.93	0.89	0.66	0.40	0.65	0.51	0.48	0.37	0.30
NIC24	24.33	23.41	24.27	26.02	25.03	25.14	23.02	23.07	24.31	26.24	24.55	21.70	25.86	23.18	21.28	18.14	19.12	15.05
NIC25	0.79	1.15	1.34	1.39	2.14	2.23	2.07	2.08	1.94	2.07	2.04	1.94	2.42	2.31	1.87	1.27	1.35	1.22
NIC26	7.20	9.83	9.84	7.27	7.38	7.55	8.17	7.20	7.05	7.77	6.56	8.63	9.32	7.75	7.73	7.01	7.48	10.79
NIC27	27.37	22.11	23.61	23.46	20.78	22.95	25.10	21.78	22.46	19.13	19.38	23.00	16.61	22.88	27.90	36.92	31.25	34.90
NIC28	0.48	0.51	0.56	0.63	0.65	0.66	0.65	0.74	0.63	0.38	0.61	0.51	0.73	0.68	0.58	0.49	0.78	0.67
NIC29	6.53	7.00	6.92	6.69	5.68	5.55	5.39	6.12	6.05	5.53	5.01	4.81	3.91	3.46	3.11	3.57	4.73	4.29
NIC30	0.33	0.33	0.39	0.65	0.64	0.62	0.64	0.64	0.50	0.33	0.67	1.00	1.02	0.89	1.03	0.60	0.63	0.58
NIC31	2.53	2.36	2.51	3.12	3.15	3.14	3.12	2.87	2.51	2.60	3.04	3.70	2.85	1.89	1.41	1.75	2.66	2.57
NIC32	2.53	2.78	1.93	3.24	3.50	2.36	1.57	2.15	2.35	2.50	2.83	2.76	2.48	2.97	1.68	0.87	0.35	1.64
NIC33	0.22	0.17	0.18	0.33	0.43	0.26	0.36	0.37	0.18	0.48	0.54	0.38	0.54	0.32	0.04	0.05	0.19	0.20
NIC34	7.01	7.52	7.23	6.05	6.60	7.63	9.33	11.23	10.32	9.29	10.34	7.22	9.14	9.80	10.85	11.04	11.40	10.15
NIC35	1.70	1.68	1.25	1.33	0.73	0.90	0.96	2.10	1.40	2.45	2.33	1.19	1.73	3.42	2.80	2.25	2.32	2.18
NIC36	0.41	0.44	0.54	0.51	0.73	0.88	0.90	0.58	1.13	1.21	1.29	1.47	1.09	0.99	0.68	0.63	0.70	0.82
	100.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0



**Table 5: Industries Share of Profits in Total Manufacturing sector**

Industry <sup>1</sup>	1990:	1991:	1992:	1993:	1994:	1995:	1996:	1997:	1998:	1999:	2000:	2001:	2002:	2003:	2004:	2005:	2006:	2007:
NIC15:	7.04:	7.39:	6.54:	6.55:	8.03:	6.32:	5.84:	6.07:	7.34:	7.66:	7.32:	6.72:	7.45:	5.81:	5.13:	4.75:	5.11:	5.06:
NIC16:	1.31:	1.58:	2.04:	2.23:	2.20:	1.91:	1.41:	1.59:	2.47:	2.79:	3.43:	3.99:	4.57:	4.14:	3.63:	3.54:	3.31:	2.90:
NIC17:	6.57:	7.70:	7.05:	7.07:	8.63:	8.63:	7.38:	8.01:	6.89:	6.13:	6.62:	7.05:	6.31:	6.33:	7.62:	4.95:	6.21:	4.93:
NIC18:	0.03:	0.03:	0.03:	0.01:	0.04:	0.09:	0.10:	0.01:	0.07:	0.02:	0.11:	0.11:	0.09:	0.10:	0.05:	0.05:	0.09:	0.66:
NIC19:	0.23:	0.24:	0.26:	0.23:	0.53:	0.41:	0.29:	0.20:	0.32:	0.42:	0.42:	0.25:	0.19:	0.27:	0.32:	0.25:	0.21:	0.17:
NIC20:	0.16:	0.16:	0.12:	0.19:	0.27:	0.31:	0.32:	0.34:	0.34:	0.30:	0.30:	0.21:	0.18:	0.17:	0.12:	0.08:	0.15:	0.13:
NIC21:	2.87:	3.12:	2.81:	2.36:	2.19:	1.77:	2.65:	2.10:	0.92:	1.71:	1.58:	2.63:	3.11:	2.01:	1.66:	1.46:	1.57:	1.36:
NIC22:	0.01:	0.02:	0.02:	0.02:	0.02:	0.03:	0.02:	0.02:	0.02:	0.07:	0.12:	0.08:	-0.01:	-0.02:	-0.01:	0.01:	0.02:	0.01:
NIC23:	0.35:	0.46:	0.56:	0.64:	0.64:	0.65:	0.71:	0.74:	0.80:	0.93:	0.89:	0.66:	0.40:	0.65:	0.51:	0.48:	0.37:	0.30:
NIC24:	24.33:	23.41:	24.27:	26.02:	25.03:	25.14:	23.02:	23.07:	24.31:	26.24:	24.55:	21.70:	25.86:	23.18:	21.28:	18.14:	19.12:	15.05:
NIC25:	0.79:	1.15:	1.34:	1.39:	2.14:	2.23:	2.07:	2.08:	1.94:	2.07:	2.04:	1.94:	2.42:	2.31:	1.87:	1.27:	1.35:	1.22:
NIC26:	7.20:	9.83:	9.84:	7.27:	7.38:	7.55:	8.17:	7.20:	7.05:	7.77:	6.56:	8.63:	9.32:	7.75:	7.73:	7.01:	7.48:	10.79:
NIC27:	27.37:	22.11:	23.61:	23.46:	20.78:	22.95:	25.10:	21.78:	22.46:	19.13:	19.38:	23.00:	16.61:	22.88:	27.90:	36.92:	31.25:	34.90:
NIC28:	0.48:	0.51:	0.56:	0.63:	0.65:	0.66:	0.65:	0.74:	0.63:	0.38:	0.61:	0.51:	0.73:	0.68:	0.58:	0.49:	0.78:	0.67:
NIC29:	6.53:	7.00:	6.92:	6.69:	5.68:	5.55:	5.39:	6.12:	6.05:	5.53:	5.01:	4.81:	3.91:	3.46:	3.11:	3.57:	4.73:	4.29:
NIC30:	0.33:	0.33:	0.39:	0.65:	0.64:	0.62:	0.64:	0.64:	0.50:	0.33:	0.67:	1.00:	1.02:	0.89:	1.03:	0.60:	0.63:	0.58:
NIC31:	2.53:	2.36:	2.51:	3.12:	3.15:	3.14:	3.12:	2.87:	2.51:	2.60:	3.04:	3.70:	2.85:	1.89:	1.41:	1.75:	2.66:	2.57:
NIC32:	2.53:	2.78:	1.93:	3.24:	3.50:	2.36:	1.57:	2.15:	2.35:	2.50:	2.83:	2.76:	2.48:	2.97:	1.68:	0.87:	0.35:	1.64:
NIC33:	0.22:	0.17:	0.18:	0.33:	0.43:	0.26:	0.33:	0.37:	0.18:	0.48:	0.54:	0.38:	0.54:	0.32:	0.04:	0.05:	0.19:	0.20:
NIC34:	7.01:	7.52:	7.23:	6.05:	6.60:	7.63:	9.33:	11.23:	10.32:	9.29:	10.34:	7.22:	9.14:	9.80:	10.85:	11.04:	11.40:	10.15:
NIC35:	1.70:	1.68:	1.25:	1.33:	0.73:	0.90:	0.96:	2.10:	1.40:	2.45:	2.33:	1.19:	1.73:	3.42:	2.80:	2.25:	2.32:	2.18:
NIC36:	0.41:	0.44:	0.54:	0.51:	0.73:	0.88:	0.90:	0.58:	1.13:	1.21:	1.29:	1.47:	1.09:	0.99:	0.68:	0.63:	0.70:	0.82:
.	100.:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:	100.0:

1