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Performance of ICT Sector In India Under Globalised Regime: 1991-2007

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The process of globalization has led to the spread of new technologies across the world, particularly in the form of ICT, which has become the new buzzword for economic development both at global and local levels. Information and Communication Technologies (ICT) has quickened the pace of exchange and transactions thus have proved to be the vehicle of global integration. The 1990s have seen progressive integration of Indian economy into global economy. Indian ICT industry is of recent origin, but has attained an important place in the economy. The industry's contribution to national economic output has escalated nearly by six times, from less than 1 per cent in 1991-92 to 6.46 per cent in 2006-07. India enjoys enormous comparative advantage in the export of IT services. The rapid growth of the industry has been attributed to availability of human capital, entrepreneurship, social networking, favourable policy environment and entry of multinationals. Keeping in mind the importance of this sunrise sector in the Indian economy the present study proposes to highlight the productivity performance, financial performance of the ICT industry and to investigate the determinants of profitability of ICT sector.

Field of Research: Economics

1. Introduction

The digital revolution has opened up new opportunities for mankind to generate new kinds of wealth and prosperity by ushering in the knowledge economy. The new millennium has unfolded a vital sense of interconnectedness all over the globe manifesting in a kind of knowledge revolution, which has increased the extensity, intensity, velocity and impact of global interaction, changing the configuration of global power.

New ideas, methods, skills and know-how are intangible assets of a knowledge economy. They have not only contributed to physical capital accumulation and accelerated growth of these societies, but such immaterial investment in knowledge building through education, and research and development (R&D) has further accentuated knowledge accumulation at a still accelerated rate. The knowledge economy is often taken to mean only high technologies industries or information and communication technologies (ICTs). It would be more appropriate, however, to use the concept more broadly to cover how any economy harnesses and uses knowledge to enhance productivity of agriculture, industry and services for overall welfare.

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India has created profitable niches in Information Technology (IT) and is becoming a global provider of software services. Developing countries are looking at India to find technological solutions for their social problems. Over the past decade, the Indian ICT sector has become the country's premier growth engine, crossing significant milestones in terms of revenue growth, employment generation and value creation, in addition to becoming the global brand ambassador for India. Indian IT service segment have evolved from application development and maintenance, to emerge as full service players providing testing services, infrastructure services, consulting and system integration. Motivated by the current growth trends and projected future potential, the study attempts to provide an analytical framework to evaluate the competitive strength of ICT industry in India. The objective of the study is to examine the financial performance of the ICT industry and to investigate the determinants of profitability of ICT sector.

The paper is divided into four sections. First section reviews the literature pertaining to growth of ICT industry in the emerging knowledge economy of India under globalized regime; Second section explains the data and methodology used to explore the growth of ICT industry. Third section examines the productivity performance of ICT sector and investigates the determinants of profitability of ICT industry which infect steered the Indian economy to unprecedented heights and finally Fourth section concludes the findings.

2. Literature Review

Globalization and knowledge accumulation have been mutually supportive of each other and ICT revolution, known as Digital divide during the contemporary phase of globalization has facilitated the accumulation of knowledge; accelerated the process of globalization and has accentuated in the process of rapid wealth accumulation and growth. ICT is permeating all aspects of business and society. A consensus has emerged that faster growth can be traced at least in part to the effects of ICT revolution (Oliner and Sichel, 2000; Timmer and Ark, 2005). In an effort to reduce cost, to coordinate large scale operations, and to provide new or enhanced services, American firms have been investing in information technology at a furious pace. Indeed business investment in computer and peripheral equipment, measured in real terms, jumped more than four-fold between 1995 and 1999. The stocks of computer hardware, software, and network infrastructure have swelled, boosting their contribution to growth. Growth in labour productivity picked up from 1.5 per cent per year in first half of 1990s to nearly 2.6 per cent in second half. The evidence also supports the idea that the acceleration of aggregate productivity is a real phenomenon and not just a cyclical one. The strong and robust correlation between IT intensity and subsequent productivity acceleration, however, implies a deeper relationship between IT investment and productivity growth.

Brynjolfsson and Hitt (2000) show how changes in information technology costs and capabilities lead to a cluster of changes in work organization and firm strategy that increases demand for skilled labour. A variety of industry level studies also show a strong connection between investment in high technology equipment and demand for skilled and educated workers (Berndt et al., 1992; Autor et al., 1998).

Joseph (2009) highlights the experience of Indian IT sector. The performance of software and IT enabled services exports has been remarkable. The recorded

annual compound growth rate has been over 50 per cent in the 1990s and 38 per cent since 1997-98 and such a record has been unprecedented in independent India. As of now, the software and service exports is over 20 per cent of merchandise exports and even higher than one of India's principle commodity-textile and textile products in India's exports.

Ramesh (2009) observes that IT industry in India is in an intensive phase of economic upgrading. It is expected to bring certain favourable results in the economy as well as labour market. It include enhanced contribution to GDP and export earning, advancement in technology and economic infrastructure, gain in employment level and quality of employment, increase in labour standards, increased allocation of funds towards training and up gradation of workforce, more resources for social spending and so on.

Various studies have examined the effect of skilled workforce on the efficiency of the different industries over time (Burange, 1999; Siddharthan and Lal, 2004; Veermani and Goldar, 2005; Murthy and Behera, 2008). The expansion of trade in services has important implications for growth around the world. Some expected standard gains from trade include reallocation of resources to their most productive uses and welfare will increase. Moreover, there are likely to be large multiplier effects, as services are important input into nearly all sectors.

Some other existing studies pertaining to the analysis of financial performance of ICT sector and identify the determinants of its profitability are very scant. However, in the present study financial performance of the ICT sector has been analysed with the help of ratio analysis as it reveals the relationship between variable in a more meaningful way. In addition to it, labour productivity growth of ICT sector has been analysed, as it is a crucial factor in determining growth of an industry. Besides, profitability is the most significant criterion of an enterprise's financial performance. Therefore, identification of factors that determine the profitability of the industry has been undertaken in this study.

3. Data and Methodology

In the globalised world under new economic reforms, India resolved to strengthen its knowledge economy so as to provide a robust/vigorous growth trajectory to the economy, that's why driven by an ample massive professionally trained knowledge based manpower since the opening of the economy, India's IT sector has been strengthened.

The term ICT has been used in different ways in different countries. For instance, in India, it has been predominantly used to denote one particular sub-sector- IT and ITES. In some other countries, the term may encompass the communication or hardware sector. However, in the present study we restrict the scope on the following constituents of ICT sector namely telecommunication service industry and IT-ITES industry.

Secondary data have been used for the present study. The hypothesis to be analysed is that profitability of the ICT sector is directly related with market concentration, relative factor share and technical coefficients. The data relating to IT industry and telecom segment of ICT sector were collected from different reports

published by Center for Monitoring Indian Economy (CMIE) and annual reports published by Ministry of Communication and Information Technology. The data have been deflated by using implicit GDP deflator to transform these into real values for their true effect. In order to study the financial performance, productivity performance and determinants of profitability data were collected for the period 1991-92 to 2006-07 as it merges with the period of economic reforms since when ICT sector witnessed explosive growth. Productivity performance in ICT industry has been judged with respect to the key resource i.e., the human resources. In order to measure industrial performance, we have used ratio analysis. We have used linear regression analysis for the determinants of the profitability of ICT sector in India for period 1991-92 to 2006-07.

4. Analysis of Results and Findings

One of the world's largest economies-India, has made tremendous strides in its economic and social development in the past two decades. Over the past decade, the Indian ICT sector has become the country's premier growth engine, crossing significant milestones in terms of revenue growth, employment generation and value segment have evolved from application development and maintenance, to emerge as full service players providing testing services, infrastructure services, consulting and system integration. IT outsourcing has exhibited a strong growth, in line with the global trend, due to increased spend in the remote infrastructure management, application management and testing. The rapid growth of the industry has been attributed to availability of human capital, entrepreneurship, social networking, favourable policy environment and entry of multinationals (De and Dutta, 2007).

The Indian IT industry is of recent origin, but has attained an important place in the economy. It represented around 2 per cent of overall global IT market in 2000, but in 2006 its share has risen to 6 per cent. The IT sector accounted for 6.5 per cent of the GDP in India in 2006-07. In absolute terms, it has grown from Rs. 1316 crore in 1991-92 to Rs. 184956 crore in 2006-07 at a high and statistically significant rate of 35.98 per cent per annum, while the GDP in India has grown from Rs. 1099072 crore to Rs. 2864309 crore at a statistically significant rate of 6.33 per cent per annum during the same period. The industry's contribution to national economic output has nearly escalated by 6 times from less than 1 per cent in 1991-92 to 6.46 per cent in 2006-07.

4.1 Labour Productivity in the ICT Sector in India

Labour productivity has been measured in terms of revenue per unit of wage bill (Kumar, 2001). Table 1 highlights the trends in labour productivity in both the segments of ICT industry. Of the two segments of the ICT sector, telecommunication segment has higher ratio of revenue per unit of wage bill than that in IT segment, probably owing to lower rates of employee compensation. Telecommunication sector has been able to improve productivity since 2002-03 even after taking care of wage cost. It appears that over the past few years, telecom segment has made an effort to improve efficiency in the use of human resource (Figure 1). On the other hand, in IT segment, labour productivity declined from 1216 per cent in 1991-92 to 243 per cent in 2006-07. It appears that over the past years, the industry is witnessing rising costs, growing scarcity of trained manpower and higher rates of employee compensation. The government should intervene to ensure that firms stimulate

increase in in- house research and development expenditure so that apart from increasing technological capability the efficiency of resource utilization also increases.

Table 1: Trends In Labour Productivity

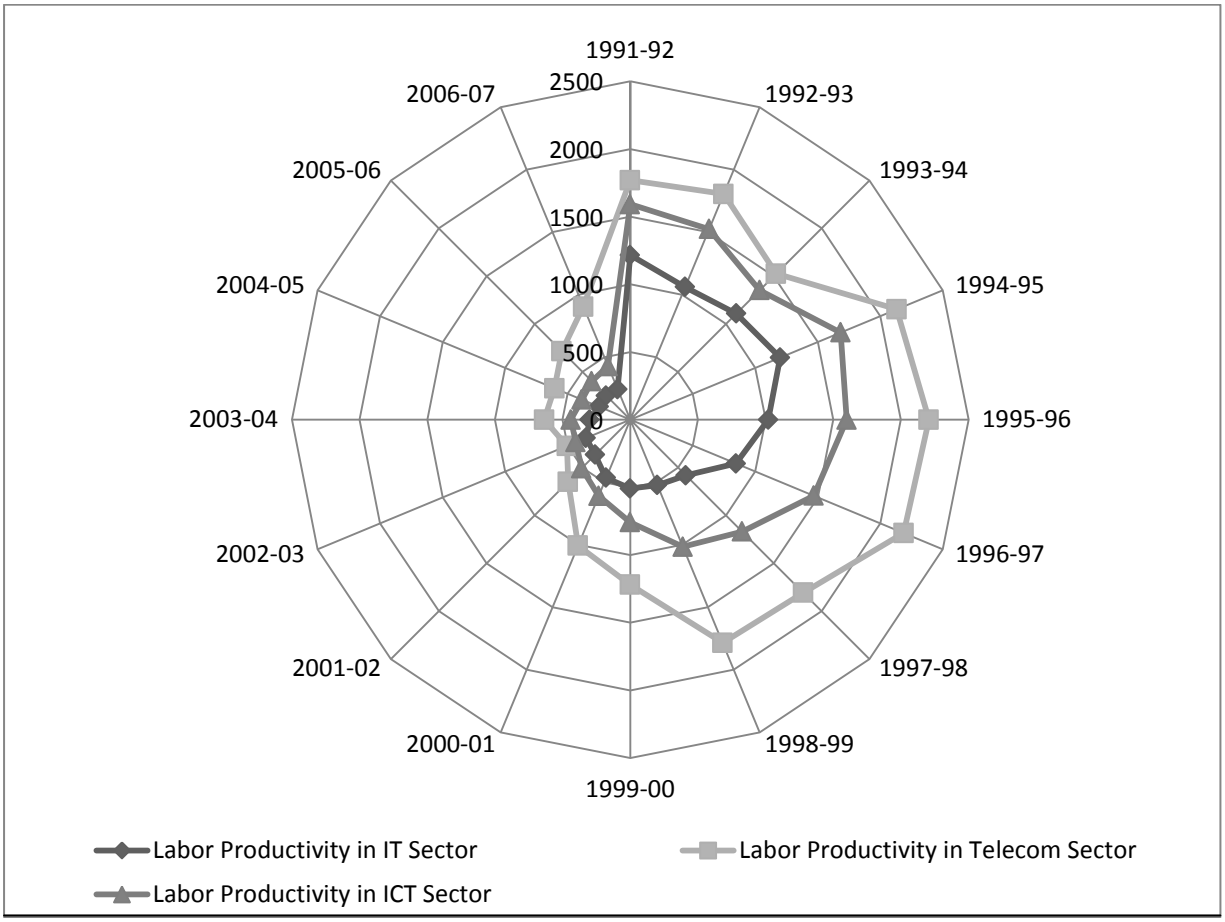
Years	Labour Productivity (%)		
	IT Sector	**Telecommunication Sector**	**Overall ICT Sector**
1991-92	1216	1769	1592
1992-93	1061	1805	1524
1993-94	1109	1526	1353
1994-95	1200	2132	1683
1995-96	1021	2207	1600
1996-97	846	2188	1468
1997-98	582	1808	1169
1998-99	524	1785	1017
1999-00	509	1219	758
2000-01	465	1007	610
2001-02	366	649	509
2002-03	353	506	435
2003-04	298	635	439
2004-05	250	605	386
2005-06	250	716	401
2006-07	243	904	428

Source: (i) Own calculations from CMIE data.
(ii) CMIE (Various Issues). *Financial Aggregates and Ratios,* Mumbai: CMIE, Economic Intelligence Service.

4.2 Financial Performance of ICT Sector

Financial analysis provides extremely useful information about the strength and weakness of a firm/industry and we obtain a better understanding of firm's position and performance. In order to measure industrial growth and performance, a number of studies have used ratio analysis. To quote a few are: Kumar (2001); Siddharthan and Lal (2003); Rohini (2004).

Figure 1: Trends In Labour Productivity



Source: Based on Table 1

Gross Profit Margin and Net Profit Margin in the ICT Sector

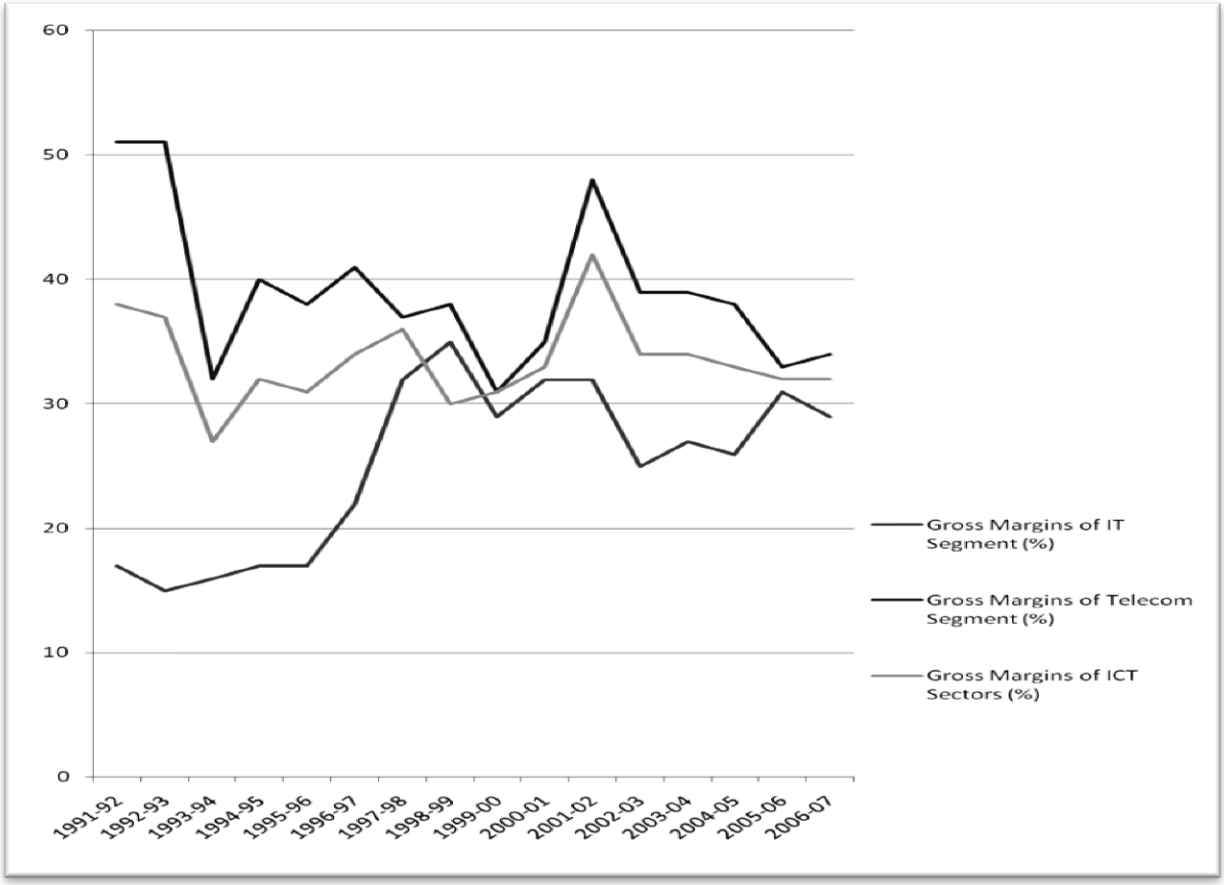
Besides indicating overall efficiency, profit margins of firms competing on basis of costs are generally under pressure because of rising competition. Firms moving up the value chain may be able to improve their margins. The profit margin measures the relationship between profit and sales. Table 2 summarizes the trend pertaining to profit margins of ICT sector in India. The Telecommunication sector has higher gross margin of 48 per cent in 2001-02 followed by ICT industry as a whole with gross margin of 42 per cent and IT industry with 32 per cent in 2001-02. The analysis of gross margin and net margin shows that both the ratios have declined in telecommunication sector since 1991-92 to the turn of the century. It is remarkable that the growth of public sector undertaking was very slow during the monopoly period of 1948-1998 (Baijal and Jain, 2007). The New Telecom Policy 1999 provided the basic framework for the development and growth of telecom sector in the country and the technological development in telecom sector helped India a global IT super power (Bhatt and Illiyan, 2009). The gross margins and net margins have started to increase since 2000-01 and in 2006-07 gross margin and net margins were 34 per cent and 11 per cent respectively. On the other hand, growth of gross margin and net margin in IT sector is on the rise since early 1990s except for the period 2002-03. In 2006-07 net margins was 22 per cent as against 24 per cent in the previous year. Net margins in IT industry have been increasing at a faster rate than in the telecom sector since 1997-98 as shown in Figure 2. It may be due to the efforts of IT firms to

Table 2: Trends in Gross Profit Margin and Net Profit Margin of ICT Sector (%)

Years	Gross Profit Margin			Net Profit Margin		
	IT Sector	Telecom Sector	ICT Sector	IT Sector	Telecom Sector	ICT Sector
1991-92	17	51	38	03	13	09
1992-93	15	51	37	01	12	08
1993-94	16	32	27	05	09	08
1994-95	17	40	32	08	12	11
1995-96	17	38	31	09	12	11
1996-97	22	41	34	09	13	12
1997-98	32	37	36	18	13	14
1998-99	35	38	30	21	12	15
1999-00	29	31	31	19	09	14
2000-01	32	35	33	22	12	14
2001-02	32	48	42	20	15	17
2002-03	25	39	34	16	04	09
2003-04	27	39	34	17	05	09
2004-05	26	38	33	19	12	15
2005-06	31	33	32	24	09	15
2006-07	29	34	32	22	11	15

Source: (i) Own calculations from CMIE data.
(ii) CMIE (Various Issues). *Financial Aggregates and Ratios,* Mumbai: CMIE, Economic Intelligence Service

Figure 2: Gross Profit Margin of ICT Sector



Source: Based on Table 2

move up the value chain and increasing export orientation. The analysis of net margin of ICT sector reveals a rise during the period of study.

Asset Turnover Ratio in the ICT Sector

Asset turnover ratio explains the effective utilization of assets in generating sales of a company. A firm's ability to provide a large volume of sales for a given amount of net assets (capital employed) is most important aspect of its operating performance. The analysis of asset turnover ratio (Sales/Capital Employed) in Table 3 reveals a declining trend in ICT industry, but IT sector has relatively more asset turnover ratio than telecom sector. In IT sector the ratio has improved marginally since 2003-04 and in 2006-07 it was 157 per cent meaning thereby IT sector is producing Rs. 157 of sales for one hundred rupee of capital employed. On the other hand, there is poor utilization of assets in turning over sales in telecom sector, as asset turnover ratio stood at 70 per cent in 2006-07 as against 79 per cent in 1995-96.

Table 3: Trends In Asset Turnover Ratio And Return On Investment (%)

Years	Asset Turnover Ratio			Return on Investment		
	IT Sector	Telecom Sector	ICT Sector	IT Sector	Telecom Sector	ICT Sector
1991-92	221	39	57	33	14	15
1992-93	220	38	57	28	13	15
1993-94	190	66	95	25	16	17
1994-95	287	77	94	24	26	26
1995-96	146	79	93	21	25	24
1996-97	132	59	74	19	21	20
1997-98	70	69	69	17	18	18
1998-99	108	60	71	31	18	21
1999-00	98	70	81	23	16	19
2000-01	148	68	98	29	17	25
2001-02	1.16	44	57	25	10	09
2002-03	122	44	59	25	03	07
2003-04	156	47	67	32	06	11
2004-05	168	57	79	36	09	14
2005-06	161	62	83	43	08	15
2006-07	157	70	91	39	11	18

Source: (i) Own calculations from CMIE data.
(ii) CMIE (Various Issues). *Financial Aggregates and Ratios,* Mumbai: CMIE, Economic Intelligence Service.

Return on Investment (ROI) in the ICT Sector

Return on capital employed (ROCE) is one of the type of return on investment (ROI) (operating profits/capital employed). It provides a test of profitability related to the source of long term funds. The higher the ratio, the more efficient is the use of capital employed. It is evident from the Table 3 that in terms of ROCE; IT sector recorded a comparatively high profitability. It declined from a high of 33 per cent in 1991 to 17 per cent in 1998, but showed an upward trend to rise to 43 per cent in 2006. In 2007, return on investment in IT segment was 39 per cent. The reason for increase in ROI from 25 per cent to 39 per cent lies in asset turnover ratio which has increased from

122 per cent to 157 per cent during the same period meaning thereby that the increase in capital employed has been profitably utilized.

On the other hand, in telecommunication sector, it has increased till 1994-95, started to decline and in 2006-07 the ratio was just 11 per cent. In other words, we can say that increase in capital employed has not been profitably utilized in telecom sector. The analysis of ROCE in ICT industry reveals a mixed tendency. The ratio was highest at 25 per cent in 2000-01, declined afterwards and finally it stood at 18 per cent in 2006-07.

Return on Equity (ROE) in the ICT Sector

Return on equity indicates how well the firm has used the resources of owners. This ratio (Profit after Tax/Net Worth) reflects the accomplishment of the profitability objective. Tale 4 reveals that return on equity in IT sector has increased from 14 per cent in 1991-92 to 28 per cent in 1998-99 but it declined to 12 per cent in 2002-03 and in 2006-07 it stood at 23 per cent. A high return on equity ratio reveals the performance and strength of the company in attracting future investment. In contrast to IT sector, the return on equity ratio is on the decline in telecommunication sector. It declined from 28 per cent in 1994-95 to 2 per cent in 2002-03. Since 1992-93, the return on equity in IT segment of ICT sector has been rising and in 1998-99 it was highest at 28 per cent, as profit after tax in 1998-99 recorded more than 80 per cent growth. While the year 2002-03 registered a lesser return of 12 per cent on equity due to negative growth rate of -6.29 per cent in profit after tax on account of recessionary tendencies in global markets. The year 1994-95 recorded a maximum return on equity of 28 per cent in telecom segment as net profits registered more than 50 per cent growth due to liberalized policy of Government of India. On the other hand, return on equity was 2 per cent in 2002-03 due to global recessionary conditions (Bhatt and Illiyan, 2009).

Earning Power in the ICT Sector

Earning power of a firm may be defined as overall profitability of an enterprise. The earning power of a firm can be computed by multiplying the net profit margin (PAT/Sales) and investment turnover (Sales/ Total assets). It is evident from the Table 4 that earning power of IT sector is higher than that of telecommunication sector and ICT industry. From the analysis it is observed that the earning power of IT sector has grown from 3 per cent in 1991-92 to 16 per cent in 2006-07, whereas in telecommunication sector it marginally declined from 4 per cent to 3 per cent during the same period. In ICT industry a mixed trend is observed.

Since 1992-93, the earning power in IT segment of ICT sector has been rising and in 1998-99 it was highest at 19 per cent, as profit after tax in 1998-99 recorded more than 80 per cent growth. While in the year 2002-03, earning power was less at 8 per cent due to negative growth rate of -6.29 per cent in profit after tax on account of recessionary tendencies in global markets. On the other hand, telecom sector experienced maximum earning power of 7 per cent in1994-95 and 1997-98 as net profits registered more than 50 per cent

Table 4: Trends in Return on Equity and Earning Power (%)

Years	Return on Equity			Earning Power		
	IT Sector	Telecom Sector	ICT Sector	IT Sector	Telecom Sector	ICT Sector
1991-92	14	17	17	03	04	04
1992-93	04	17	15	01	04	03
1993-94	13	23	20	05	05	05
1994-95	20	28	25	08	07	07
1995-96	17	22	22	06	06	06
1996-97	21	16	17	05	04	04
1997-98	25	19	21	10	07	07
1998-99	28	14	19	19	05	08
1999-00	19	09	15	15	04	08
2000-01	19	12	16	16	05	10
2001-02	14	09	11	09	05	06
2002-03	12	02	05	08	01	01
2003-04	23	03	07	11	01	03
2004-05	28	08	12	14	04	07
2005-06	26	06	12	17	02	05
2006-07	23	08	13	16	03	06

Source: (i) Own calculations from CMIE data.
(ii) CMIE (Various Issues). *Financial Aggregates and Ratios,* Mumbai: CMIE, Economic Intelligence Service.

growth in 1994-95 due to liberalized policy of Government of India and in 1996-97 with the introduction of mobile telephony, the competitiveness of telecom sector increased. Earning power declined to 1 per cent in 2002-03 due to global recessionary conditions (Bhatt and Illiyan, 2009).

4.3 Determinants of Profitability in the ICT Sector in India

Profitability is the most significant criterion of an enterprise's financial performance. In the present study net return on capital has been chosen to represent profitability. The empirical work on determinants of profitability explores the effect of size, concentration ratio, product differentiation and foreign trade on profitability.

In the present study, the regression model deployed is based on the following explanatory variables:

$Y= a+\beta_1X_1+ \beta_2X_2+ \beta_3X_3+ \beta_4X_4+ \beta_5X_5+ \beta_6X_6 + \mu$
Where,
Y= Net return on capital (ratio of profit after tax to total assets).
X_1= Concentration Ratio (H-Index of software industry).
X_2= Ratio of compensation of employees to total cost of ICT Sector.
X_3= Advertising intensity (ratio of advertising expenditure to sales of ICT sector).
$X_{4=}$ Capital-output ratio
X_5= Growth of demand (growth in sales of ICT sector).
X_6= Export intensity (ratio of export to sales of ICT sector).
μ= Disturbance term and
β_1, β_2---------- β_6 are the parameters to be estimated.

The regression equation takes the following form:
Log $Y = a+\beta_1 \log X_1+ \beta_2 \log X_2+ \beta_3 \log X_3+ \beta_4 \log X_4+ \beta_5 \log X_5+ \beta_6 \log X_{6+}\mu$
Where,
Y, X_1---------- X_6 are as indicated in the model.

To analyse association relationship, we have regressed profitability (net return on total assets) of ICT sector on concentration ratio (H-Index of software industry), capital-output ratio, growth of demand measured in terms of growth in sales, product differentiation variable measured in terms of ratio of advertising expenditure to sales, export intensity measured in terms of ratio of exports to sales, and wages as a percentage of total cost of ICT sector for the period of 1991-2007 as depicted in Table 5. The results show that positive effect of increase in product differentiation variable measured in terms of advertising expenditure to sales ratio on ICT sector's profitability is very strong with beta co-efficient of 3.597. It means when advertising intensity rises by one unit, the expected increase in industry's profitability will be 3.59 units. The coefficient is statistically significant and important.

Table 5: Linear Regression Results

Variables	**β Coefficient**	**Standard Error**	**t- ratio**
Constant	11.244	1.788	6.288
X_1	-15.252	90947	1.533
X_2	-0.197**	0.773	2.548
X_3	3.597*	1.791	2.008
X_4	-2.720**	0.837	3.251
X_5	0.448**	0.171	2.615
X_6	0.327	0.035	0.929
R^2 (F-Ratio)	0.8364 (7.67)		
Adj. R^2 (t-statistic)	0.7274 (2.262)		
D-W Statistics	1.565		
No. of observations	17		

Note: * and ** statistically significant value at 10 per cent and 5 per cent level of significance respectively.

Similarly growth of demand appears to be a significant variable with beta coefficient 0.448. It is statistically significant. There is general agreement that rapid increase in demand maintains pressure on capacity and thus tends to increase margins. So, the coefficient of demand may be positive.

The study confirms negative and insignificant relationship between concentration ratio and profitability of ICT sector with concentration ratio coefficient -15.252. The influence of export intensity on profitability has been found positive. The export intensity coefficient comes out to be 0.327. However, the export intensity coefficient is insignificant. Capital-output ratio has been found inversely related to the profitability of ICT sector in India. The relationship is statistically significant. The coefficient of wages to total cost ratio is found to be -0.197 meaning thereby that there is inverse relationship between profitability and ratio of wages to total cost. The relationship is significant. R-square signifies that 83.64 per cent of variation in profitability is explained by the explanatory variables whereas adjusted R-square explains that 72.74 per cent variation in profitability of ICT sector is explained by

significant variables. Durbin-Watson statistics shows that serial correlation is present among the time series variables. Co-integration regression model is also run as value of R-square comes out to be high.

Co-integration is a technique for investigating common trends in multivariate time series. It shows that two series cannot wander off in opposite direction for a very long without coming back to a mean distance eventually. Table 6 shows that co-integration is absent among all the co-integrating variables as t-values come out to be insignificant.

Table 6: Co-integration Regression Results

Variables	**β Coefficient**	**Standard Error**	**t- ratio**
Constant	8.242	1.245	6.619
X_1	-25.547	13.378	-1.910
R^2	0.207		
Adj. R^2	0.150		
Constant	7.151	1.457	4.909
X_2	-0.060	0.075	-0.795
R^2	0.043		
Adj. R^2	0.025		
Constant	5.653	1.156	4.892
X_3	0.578	1.316	0.439
R^2	0.014		
Adj. R^2	0.057		
Constant	10.979	2.594	4.233
X_4	-2.640	1.371	-1.926
R^2	0.0113		
Adj. R^2	0.045		
Constant	5.574	0.962	5.795
X_5	0.021	0.031	0.675
R^2	0.032		
Adj. R^2	0.038		
Constant	4.310	0.993	4.343
X_5	0.065	0.031	2.102
R^2	0.240		
Adj. R^2	0.186		

5. Conclusion

The process of globalization has led to the spread of new technologies across the world, particularly in the form of ICT, which has become the new buzzword for economic development both at global and local levels. Information and Communication Technologies (ICT) has quickened the pace of exchange and transactions thus have proved to be the vehicle of global integration. The 1990s have seen progressive integration of Indian economy into global economy. In the early 1990s, liberalization of investment, and foreign exchange regime stimulated industrial and service growth. It has been found that of the two segments of the ICT sector, telecommunication segment has higher ratio of revenue per unit of wage bill

than that in the IT segment, probably owing to lower rates of employee compensation. Telecommunication sector has been able to improve productivity since 2002-03. On the other hand, in IT segment, labour productivity has declined over the period under consideration. Gross profit margins and net profit margins have been increasing in the IT industry and ICT sector as a whole since 1995-96 except for 1999-00 and 2002-03. In ICT sector, asset turnover ratio has been rising since 1997-98. As a result, return on investment has increased in the ICT sector implying that the increase in capital employed has been profitably utilized. A high return on equity reveals the performance and strength of the firms in attracting future investment. Return on equity and earning power in ICT sector has been rising since 2002-03. Earning power represents overall profitability of an enterprise/sector.

An analysis on determinants of profitability explores the effect of size, concentration ratio, product differentiation and export intensity on profitability. We find that out of six variables, four variables namely, advertising intensity, capital-output ratio, growth in demand and ratio of wages to total cost are found statistically significant for variation in profitability of ICT sector in India, and 72.74 per cent variation in profitability of ICT sector is explained by those significant variables.

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