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## Trends and revealed comparative advantage of ICT services exports from India (2005 - 2018)

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### Abstract

Information and communications technology (ICT) services have not only been a vital contributor to the economic growth and development of India, it has also been a crucial category in the service exports bundle of India. This paper investigates the trends, growth, and revealed comparative advantage of ICT service export of India for the period 2005-2018. Our analysis, based on the UNCTAD data, exposed that the ICT service export of India was growing slightly faster than that of the rest of the world; however, its rate of growth was decelerating over the years. The share of ICT services in the total service exports and in the total exports of India was around four-times and six-times higher than that of the world average, respectively. The estimated revealed comparative advantage (RCA) index showed that India had very strong comparative advantage in the production and exports of ICT services during the study period; and comparative advantage of the country was around seven times higher than of the world average. Nevertheless, the intensity of the RCA of the country in the ICT trade has been showing a declining trend over the years. This cautions that if appropriate policies are not formulated and implemented in time, the comparative of the country in this product may not last for a long time.

**Keywords:** Competitiveness, compound annual growth rate, information and communications Technology, revealed comparative advantage

### Introduction

Services are the most important economic activities, which account for around 55 percent of the GDP of India in 2019-20. Technological advancement and reduction in the cost over time made the services more and more internationally tradable. Presently, information and communications technology (ICT) services have become the most significant category in the service exports bundle of India.

The ICT has been widely identified as a major contributor to innovation, productivity growth and which in turn lead to the growth and development of a country. The United Nations Conference on Trade and Development (UNCTAD) defines the ICT sector as “comprising economic activities whose products are intended to enable and/or fulfill the function of information processing and communication, including the production of both goods and services” (UNCTAD, 2015, 3) [16]. Trade in ICT services usually encompasses trade in telecommunications services and in computer and information services.

This paper analyses the trends, growth, and revealed comparative advantage in the export of ICT services from India during 2005-2018. More specifically, this study attempts to answer the following research questions: (i) Is the exports of ICT services from India growing since 2005? (ii) What is the proportion of the ICT services in the total service exports as well as total exports of India and the rest of the world? Does India enjoy comparative advantage in the production and exports of ICT services? This study is relevant because we could not come across any serious studies in the literature examining India's trade in ICT services and revealed comparative advantage of the country in the ICT service exports.

The paper is organized in six sections. The following section describes the data and methods used in the study. Section 3 illustrates the trend and growth in the ICT services exports from India. Section 4 shows the trends in the share of ICT in the total services exports from India and the world. Section 5 presents the relative comparative advantage of India in the ICT services exports. Section 6 presents the conclusions of the study.

### 2. Materials and Methods

This study is based on a time series data set extracted from the UNCATD for a period from

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2005 to 2018. The period of study is fixed, mainly, on the basis of the availability of data. The annual growth in the trade of ICT services are analysed by computing simple annual percentage growth rate; and the average annual growth rate has been found out by estimating the compound annual growth rates using semi-log trend equation.

The comparative advantage of a country in the production and exports of a product is generally measured by using the revealed comparative advantage (RCA) index originally formulated by Balassa (1965) [3]. In this study, India’s revealed comparative advantage in the ICT services exports is measured by using the Balassa’s original RCA index; the index for a particular year can be expressed as:

$$RCA = \frac{(X_{ij}/X_{it})}{(X_{wj}/X_{wt})} \quad \text{----- (1)}$$

Where  $X_{ij}$  represents ICT services exports from India,  $X_{it}$  is the total exports from India,  $X_{wj}$  is world ICT services exports, and  $X_{wt}$  is the total world exports. The numerator of equation (1) is the share of ICT services exports of India in its total exports; and the denominator is share of world ICT services exports in the total world exports of goods and

services.

The index calculation is based on the observed trade patterns and the index, numerically, ranges between zero and infinity ( $0 \leq RCA \leq \infty$ ). The comparative advantage of a country in a product is “revealed” if value of the index exceeds unity ( $RCA > 1$ ), conversely, RCA value less than unity ( $RCA < 1$ ), reveals the comparative disadvantage of the country in the product.

**3. Trend and Growth in India’s ICT Exports During 2005 -2018**

There was a steadily increasing trend in India’s ICT services exports during 2005-2018 (see Figure 1). The compound annual growth rate of the exports was estimated at 8.7 percent during this period. However, the growth rate was very high in the initial years, but it has declined after 2008 (see Table 1), reflecting the global economic slowdown. Almost similar trend could be observed in the case of world ICT service exports during this period. But, the growth rates of the world ICT services exports were marginally lower than that of India (see Table 1 and Figure 2). The analysis suggests that the growth in the exports of ICT services of India was marginally, though not remarkably, higher than that of the world during the study period.

**Table 1:** Trends and Growth in ICT Services Exports from India and the World (2005-2018)  
(Amount in US dollars at current prices in millions)

Sl. No.	Year	India's ICT services exports		World ICT services exports	
		Amount	Annual Growth Rate (%)	Amount	Annual Growth Rate (%)
1	2005	16698.2	---	175000	---
2	2006	22152.0	32.7	205770	17.6
3	2007	28190.0	27.3	250750	21.9
4	2008	36276.2	28.7	299370	19.4
5	2009	33577.6	-7.4	287490	-4.0
6	2010	39915.9	18.9	313790	9.1
7	2011	46938.0	17.6	368080	17.3
8	2012	48617.7	3.6	384260	4.4
9	2013	53628.4	10.3	413480	7.6
10	2014	54292.9	1.2	440770	6.6
11	2015	54849.7	1.0	442600	0.4
12	2016	53469.1	-2.5	458560	3.6
13	2017	53961.0	0.9	495390	8.0
14	2018	57927.1	7.3	568250	14.7
		CAGR#	8.7	CAGR#	8.3

**Note:** #Compound annual growth rate during 2005 - 2018.

**Source:** UNCTAD

**4. Trends in the Share of ICT in the Total Services Exports from India and the World (2005 -2018)**

Service exports constituted 38.7 percent of the total exports from India in 2018, while it was only 23.1 percent in the case of total world exports. The average share of services in the total exports from India was 35.3 percent during 2005 – 2018, whereas, it was 21.2 percent in the case of total world exports during the same period. These figures clearly indicate the significance of services in the exports as well as in the global scenario.

Share of ICT in India’s total service exports is displayed in Table 2; the same for the world is also presented in the table. The share of ICT in India’s total service exports ranged between 28 percent and 36 percent during 2005 and 2018 and the average share of ICT services in the total services export of India was 33.2 percent during the period.

Whereas, the share of ICT in the total service exports of the world steadily increased from 6.6 percent in 2005 to 9.7 percent in 2018; the average share of ICT services in the total global service exports during the study period was 11.4 percent. Share of ICT in India’s total service exports was relatively stable around the average (33%) during the study period, as reflected by the coefficient of variation (CV) reported in the table. On the contrary, the share of ICT in the total global service exports was relatively unstable during the study period as indicated by the CV, and it was due to the steady growth of the share of ICT services in the total service exports of the world during the period. Overall, the share of ICT services in the total services exports of India, on average, was around four times higher than that in the world during the study period.

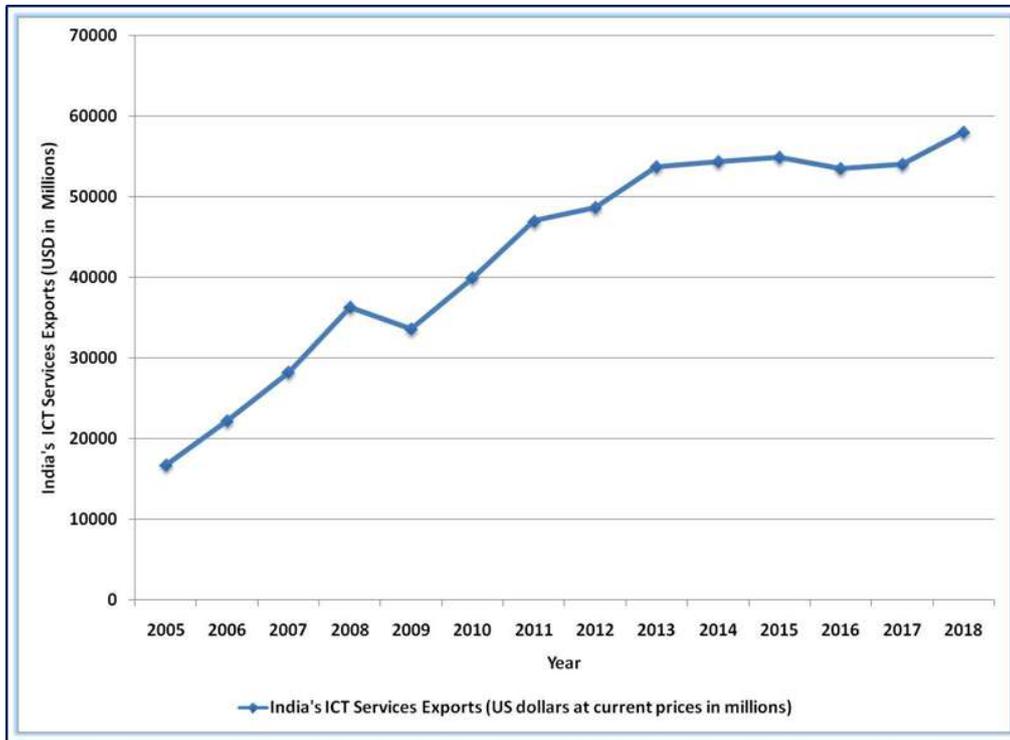


Fig 1: Trends in ICT Services Exports from India during 2005 -2018

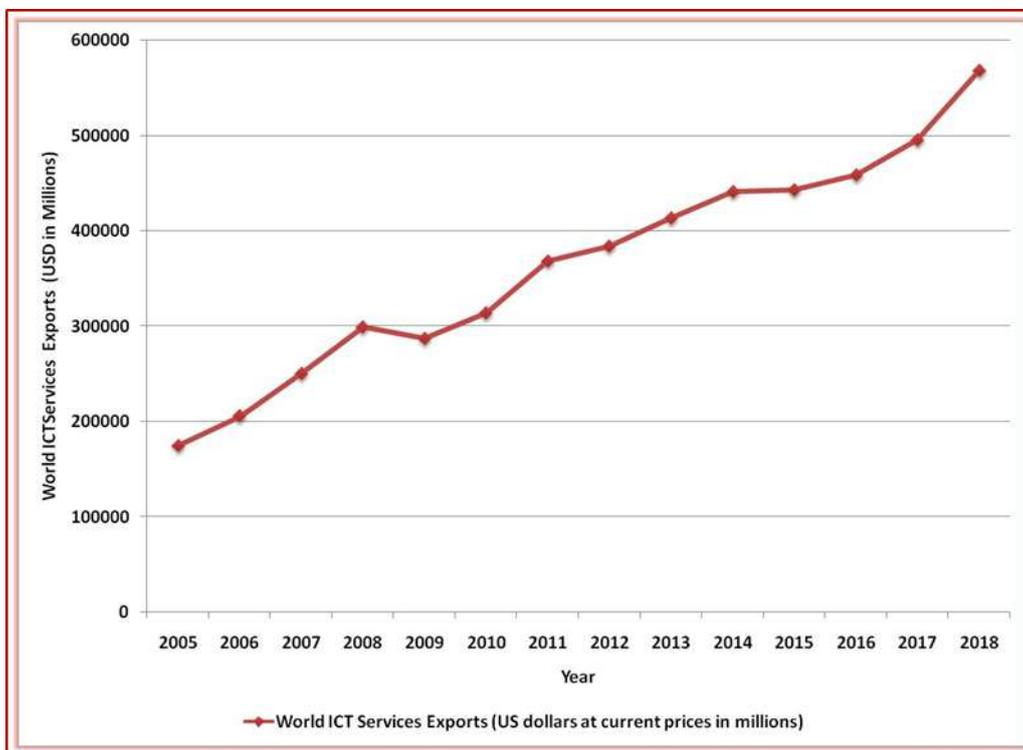


Fig 2: Trends in World ICT Services Exports during 2005 -2018

Table 2: Trends in the Share of ICT in the Total Services Exports from India and the World (2005 -2018)

Year	Share of ICT in India's Total Services Exports (%)	Share of ICT in Total World Services Exports (%)
2005	32.0	6.6
2006	31.9	6.9
2007	32.6	7.0
2008	34.2	7.4
2009	36.1	8.0
2010	34.1	8.0
2011	33.9	8.3
2012	33.4	8.5
2013	36.0	8.5

2014	34.5	8.5
2015	35.1	8.9
2016	33.0	9.1
2017	29.1	9.1
2018	28.2	9.7
Average (%)	<b>33.2</b>	<b>8.2</b>
C. V.	6.9	11.4

Source: Author’s Computations Based on UNCTAD Data

**5. India’s revealed comparative advantage in the ICT service exports during 2005 - 2018**

As already discussed, the revealed comparative advantage of India in the production and exports of ICT services in relation to the rest of the world is computed by taking the ratio of the share of ICT services in India’s total exports to the share of ICT services in the total world exports. It is evident from Table 3 and Figure 3 that the share of ICT services in India’s total exports ranged between 10.6 percent

to 12.9 percent during 2005 and 2018; and the average share was found to be 1.7 percent during this period. There were no much fluctuations in the share of ICT services in the total export basket of India during the study period, as indicated by the CV. But, the share of ICT services in the total world exports, during this period was much less than that of India; and it gradually increased from 1.3 percent in 2005 to 2.2 percent in 2018.

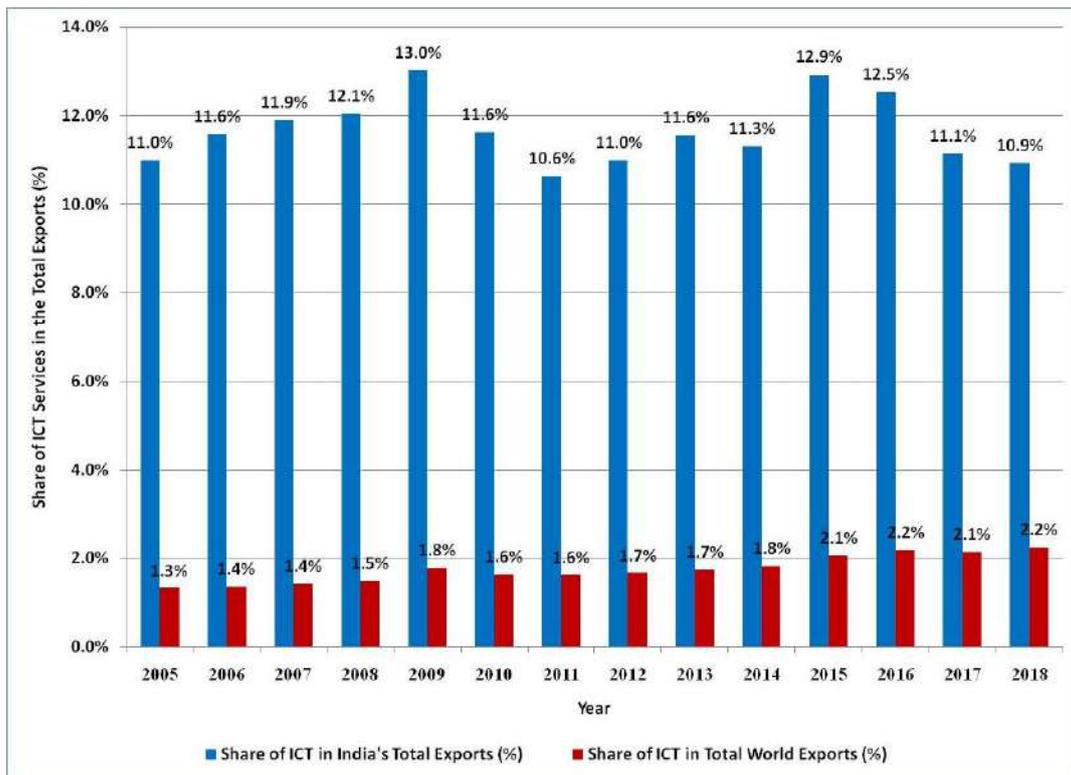


Fig 3: Trends in the Share of ICT in the Total Services Exports from India and the World (2005 -2018)

The RCA index for the ICT service export of India ranged between 4.9 and 8.5 during 2005 and 2018, and the average value of the index during this 14 year period was 6.8 (see Table 3). The calculated RCA index of India suggests that the country has strong comparative advantage and competitiveness in the production and exports of ICT services in relation to that of the rest of the world. It can be

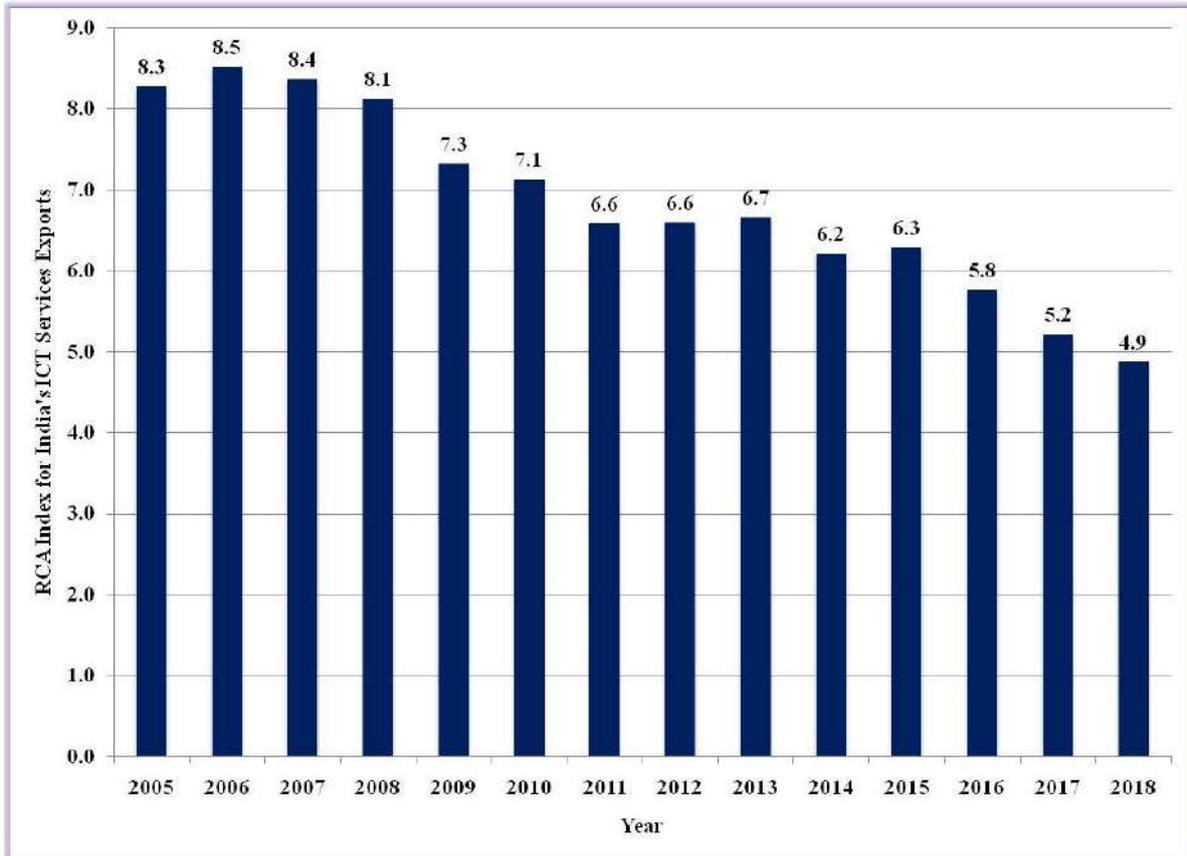
inferred from the results that India is, on average, around seven times more competitive in the production and exports of ICT services relative to all countries in the world. However, it is apparent from Figure 4 that the intensity of relative comparative advantage of India in the ICT services production and exports has been declining over the years.

Table 3: Trends in the Reveled Comparative Advantage of India in ICT Service Exports (2005-2018)

Year	Share of ICT in India's Total Exports (%)	Share of ICT in Total Global Exports (%)	RCA Index*
2005	11.0	1.3	8.3
2006	11.6	1.4	8.5
2007	11.9	1.4	8.4
2008	12.1	1.5	8.1
2009	13.0	1.8	7.3
2010	11.6	1.6	7.1
2011	10.6	1.6	6.6
2012	11.0	1.7	6.6

2013	11.6	1.7	6.7
2014	11.3	1.8	6.2
2015	12.9	2.1	6.3
2016	12.5	2.2	5.8
2017	11.1	2.1	5.2
2018	10.9	2.2	4.9
Average	<b>11.7</b>	<b>1.7</b>	<b>6.8</b>
C.V.	6.5	17.5	17.0

**Note:** \*Revealed comparative advantage index of India for its ICT services exports against the world ICT services exports  
**Source:** Author’s Calculations Based on UNCTAD Data



**Fig 4:** Trends in the Revealed Comparative Advantage of India’s ICT Services Exports (2005 – 2018)

**6. Concluding Observations**

This study has examined the trend, growth and revealed comparative advantage of India in its ICT services exports during 2005-2018. Our analysis based on the UNCTAD data has shown that the ICT service export of India, on average, was increasing at the rate of 8.7 percent per annum during the study period and the growth in the ICT service export from India was marginally higher than that of the rest of the world during the period. However, annual growth rate in the export of ICT services from India was declining over the years.

The ICT services constituted around one-third of the total service exports of India during the study period; while, the share of ICT in the total service exports of the world was much less (i.e., 25 percentage points less). While the share of ICT services in the total service exports have been increasing in the world, it was almost stable in India.

India had very strong comparative advantage in the production and exports of ICT services during the study period. India was, on average, around seven times more competitive in the production and exports of ICT services relative to all countries in the world during the study period. Nevertheless, the intensity of the revealed comparative

advantage of India in the ICT trade has been declining over the years.

Overall, the ICT services have been a prominent item in the export basket of India during 2005-2018; moreover, India had been enjoying comparative advantage in the export of these services during this period. However, if India does not formulate and implement appropriate policies to promote this sector, the comparative of the country in this product may vanish over the years as the other competing counties started exhibiting tremendous progress in the production and export of these services.

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