



## **Forecasting Commercial Service Exports in India and China Using Growth Models**

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### **Abstract**

Growth of service sector has a lot of significance specifically for developing countries like India and China. With the increase in communications and computer technologies, most of the services have become tradable across the borders. India and China are among the top ten exporters in the world in commercial services. The objective of the paper is to forecast commercial service exports in India and China. Since service exports are related to technological growth and follows 'S' curve, therefore growth model is used to forecast. The result indicates that average annual forecasted growth rate till 2017 in China would be higher than in India.

Keywords: India, China, Forecast, Commercial Service Exports, Growth Models.

### **Background Information**

Service sector is the backbone of the social and economic development of the region. As the process of development began the importance of services in low income countries increased. Trade in Services have grown over the years in developing as well as developed countries since 1980s. International services does not necessarily cross national borders physically so is not affected by

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customs tariffs and other merchandise taxes. The sector contributes to about two fifths of China's GDP and roughly a half of that of India.

Since 1990s onwards, India and China have undergone a spectacular growth trajectory, growth rate averaging 10.4 and 6.2 percent in China and India respectively. These two Asian giants have also contributed in terms of service sector. India has the fourth largest service sector in the world on account of purchasing power. It has the largest share in the GDP, accounting for 57 percent in 2012, up from 15 percent in 1950 (India Budget, 2013). Information technology and business process outsourcing are among the fastest growing sectors in India ( Dutt and Sundaram, 2009).

The service sector in China has also shown a substantial growth since 1990s. Its contribution to GDP in 2012 was 44.6 percent (CIA, 2013). However its proportion of GDP is still low compared with the ratio in more developed countries, and the agricultural sector still employs a larger workforce. Telecommunication, Tourism and Insurance are some of the fastest growing service sectors industries in China since 1990s onwards.

Figure 1, shows the annual growth rate of service sector value added in India and China. It is clearly evident from the graph that India and China have started from different points. In 1960 India has started from a positive growth of 5.95 percent in the service sector, whereas during the same period, China had a negative growth of 20.61 percentages. This shows that how China has increased its investment in the services and grown in volumes with the decades. From 1981 to 1985, the annual growth rate of China's service sector increased more than India's. From 1995 onwards the annual growth rate of both India and China's services are approximately the same. However, in volumes India has a higher share of growth as compared to China in services.

Commercial service exports in India and China both show an increasing trend. The data of commercial service exports for both the countries are in constant US dollars and is being taken from the World Bank. From 1981 to 1985 the five year growth rate of commercial service exports is approximately the same, thereby from 1986 to 1996 China overtook India and the average five year growth rate in China was 15.12 percent, whereas in India during the same period was 7.29 percent. This shows that unless India opened up its economy commercial service exports was quite less in India. However, after 1996, with the increase in GDP and rigorous investment in the service

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sector lead to the increase of commercial services and it grew at a five year average rate of approximately 20 percent. However, China also doesn't lag much behind India and in the race of it too.

In India, service sector grew immensely after reforms of 1990s. It is due to the high income elasticity of demand for services since 1990s which has triggered service growth in India (Gupta, 2003). It has to be noted that Compound Annual Growth rate of Services in China and India during 2001-10 was respectively 11.3 percent and 9.4 percent which implies that even if at present the CAGR in China is less as compared to India but the rate at which it is growing indicates that the share of services in China may surpass even India in future. It has been observed that the various sub sectors of services show different kinds of variations. IT, communications and trade have grown faster than over all service sector growth, whereas defence services, transport, legal services, real estate have grown at the same rate as overall service sector (Jim Gordon, 2003). The share of services in India's GDP at factor cost (at current prices) increased from 33.3 percent in 1950-51 to 56.5 per cent in 2012-13 (Economic Survey 2012-13).

With the increase in communications and computer technologies, most of the services have become tradable across the borders. India and China were among the top ten exporters in the world in commercial services. Growth has been very fast in some of the services such as software and business services. The average annual growth rate of commercial service exports has been constantly increasing since 1993. In spite of the fact that the growth shows the negative growth rate in some of the years in 1980s, 1992 and 2009 but the average annual growth rate since 1975 is 16.82 percent which is considerably a decent figure ( Economic Survey, 2009). In 1980s, India's share in world exports in services was 0.78 percent. It reached 3.3 percent in 2013 ( WTO database, 2013).

Although the service industry in China is growing rapidly but is being characterized by lower proportion of employment, value added and per capita (Dazhong, 2003) . Before reforms in China its service sector was basically operated by the state and had shops, which had regulated prices. After reforms in 1978, this sector too expanded, with the onset of a huge commercial sector. In the eighties more foreign technologies were infused into the system which helped in the production capabilities of this sector.

The increased pace of growth of this sector took place in the nineties. Foreign investment played a major role for the growth of this sector in the late nineties and early 2000. China became the world leader in the early 21st century, in terms of number of cell phone subscribers.

### **Commercial Service Growth in India and China**

According to figure 2, commercial service exports growth in India has shown exponential growth since 2000. Although the growth in commercial services has started picking up since 1990 onwards, it gained momentum post 2000. The ten year cumulative average growth rate from 1991 to 2000 was 8.13 percent. On the other side the ten year cumulative average growth rate from 2001 to 2010 was 58.58 percent. This shows that post 2000, there is being exponential growth in the commercial service exports in India.

Figure 3 depicts the growth of commercial service imports in India since 1975 to 2010. The ten cumulative average growth rate from 2001 to 2010 is 20.02 percent, whereas from 1991 to 2000 is 12.68 percent. The average CAGR since 1975 to 2010 is 15.26 percent. This shows that even the imports in commercial services has increased tremendously, however the rate of increase on commercial service exports is much higher than commercial service imports.

China's commercial service exports and imports have picked up since 1992 and have gained momentum from 2000 onwards. There is not much significant difference in the exports and imports in the commercial service from 1978 to 1992. From figure 4, it can be concluded that there was a positive balance in the commercial services. However, from 1992 onwards commercial service imports rose higher than the exports and maintained a negative balance. At the end of 2013 China's global trade exceeded 4.16 trillion dollars. Mainly China's imports consist of industrial supplies and capital goods, machinery and high tech equipments mainly from Japan and US. We have seen in table 4.3, that the rate of growth of commercial service trade has increased from 2000 onwards.

### **Review of Literature**

Few comparative studies in the service sector of India and China is being done. However several studies are being focussed for the individual countries. One such study is conducted by Wu , 2007 which gives a comparative study of service sector growth in these two Asian giants (Wu,

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2007). It shows that in both the countries there is a rapid growth of service sector since 1990s. China's service sector is lagging behind India's, however now, it is picking up pace and is compatible to India. It is predictable that services will expand further as Chinese companies outsource their communications, legal and accounting services and as urbanization accelerates in the coming decades.

In a study conducted by Yousaf et al, comparative analysis in manufacturing and services is being discussed in both the countries. He concludes that although India would be leading in services such as software, business processing, and consulting, but China will continue to achieve a commanding lead in low, medium and high tech industries. However in the coming decade the prospects of India to be close to China's exports are very bleak in consumer products (Shahid Yusuf, 2005).

A paper by Nikomborirak D, implies that specifically financial, distribution and logistics services are likely to undergo drastic transformation with the incursion of foreign investments in the next few years. Surprisingly, India's service sector's future liberalization prospects are difficult to estimate. It also concludes that China's service sector is integrated with the global economy in terms of both cross-border trade and investment (Nikomborirak, 2006).

A study conducted suggests measures how China can improve in the service sector and India in the manufacturing. China needs to focus on the exports of these services in order to make it grow. At present China have maximum domestic software producers with domestic companies. To develop its manufacturing sector, India would need to improve its infrastructure, and increase FDI inflows in the manufacturing (Patricia Costa, 2005).

### **Development of Model : Forecasting of Commercial Service Exports**

The data of commercial service exports is extracted from World Bank database, whereas in China it is taken from ceicdata.com. Data is from 1975 to 2010.

Commercial services exports in India and China shows S shaped or sigmoid growth. In S shaped growth curve Growth model is appropriate to use according to literature.

In natural growth model, the changes in the commercial service exports with respect to time

$(\frac{dS_t}{dt})$  is proportional to the export growth in time  $t$  is  $S_t$  i.e.  $\frac{dS}{dt} \propto S_t$ .

Therefore, the corresponding differential equation is  $\frac{dS_t}{dt} = bS_t$  (1)

where  $b$  is proportionality constant i.e. growth rate.

Integrating the above differential equation (1), we get  $\int \frac{dS_t}{S_t} = \int b dt \Rightarrow \ln S_t = bt + c$

$\Rightarrow \exp(\ln S_t) = \exp(bt + c) \Rightarrow S_t = e^c e^{bt} = ae^{bt}$  (2)

where  $a = e^c$  is the constant of integration.

This solution (2) is known as the natural growth function. The parameters  $a$  and  $b$  are the location and shape of the natural growth function, which is estimated by using ordinary least square approximation procedure, after transforming the equation (2) into logarithmic linear form i.e.

$\ln(S_t) = \ln a + bt$  (3)

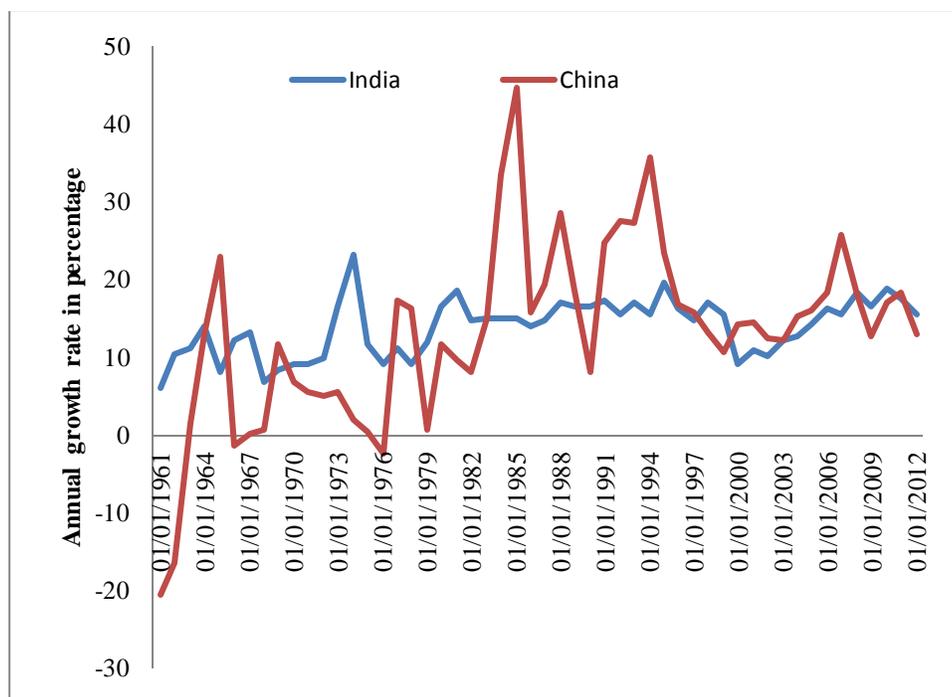
### Estimation of Growth Model of Forecasting

Commercial service exports show S curve growth; therefore growth model is fit for such kind of curves. The average annual growth rate of commercial service exports in India is 16.82 percent whereas in China it is 17.05 percent till 2010. However the forecasted average growth rate from 2011 to 2016 in India is 12.74 percent whereas in China it is 16.18 percent. Therefore can say that there is a cutting edge in commercial service exports in China as well and China is growing at a faster rate than India and is predicted to grow faster in the near future. Figure 5 and Figure 6 depicts the actual and forecasted growth of service exports in India and China. There is a gap in actual and forecasted from 2005 onwards in both the countries as there was rapid economic

growth and various volatile factors influenced the growth rate in services during this period which was difficult to capture. There was also rapid changes in exchange rate , as a result of which there is gap between actual and forecasted.

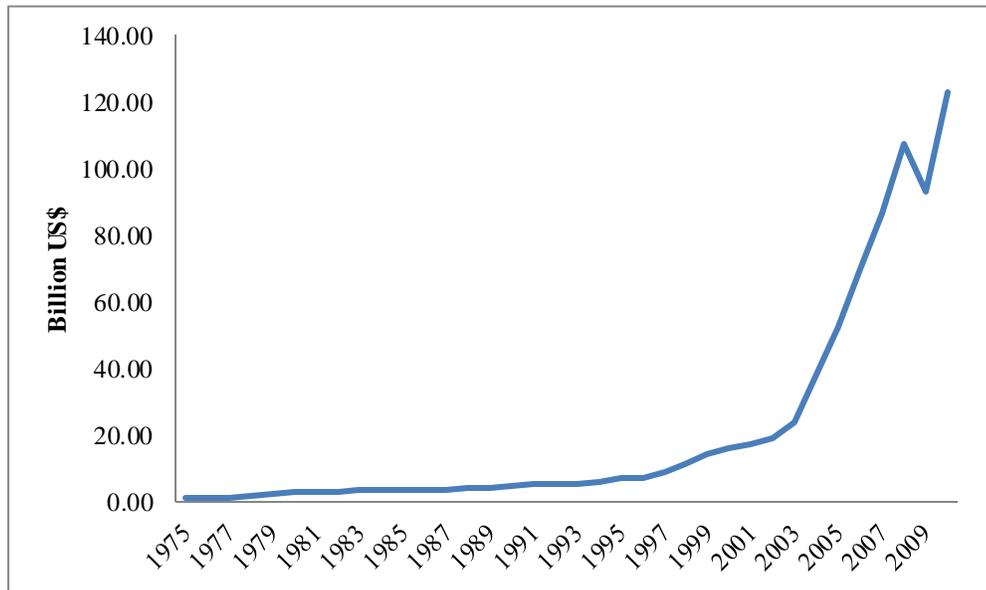
**Appendix:**

**Figure 1: Annual Growth Rate of Service Sector in India and China (In Percentage)**



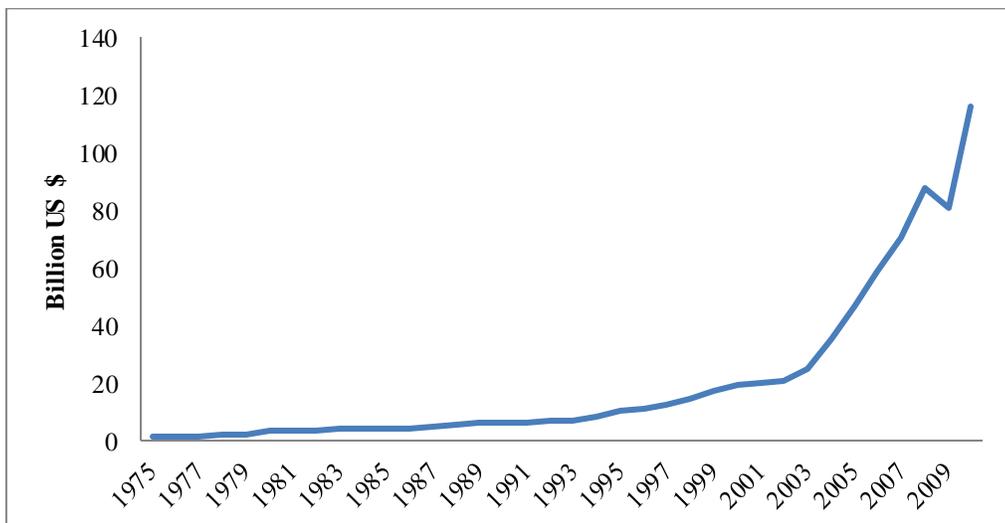
Source: China data: [www.stats.gov.cn](http://www.stats.gov.cn), and India data: [worldbank.com](http://worldbank.com).

**Figure 2: Commercial Service Exports of India (In Billion US\$)**



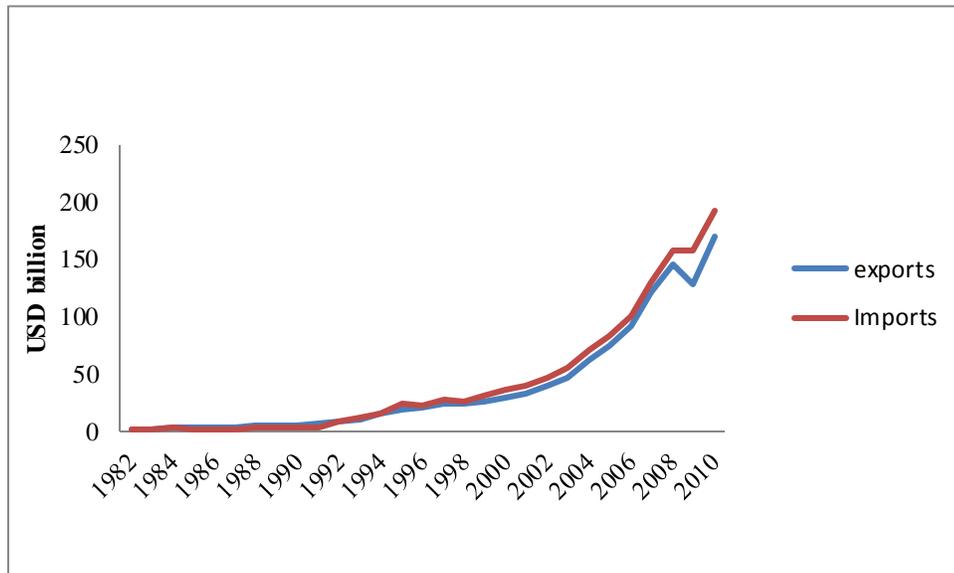
Source: World Bank database

**Figure 3: Commercial Service Imports of India (In Billion USD)**



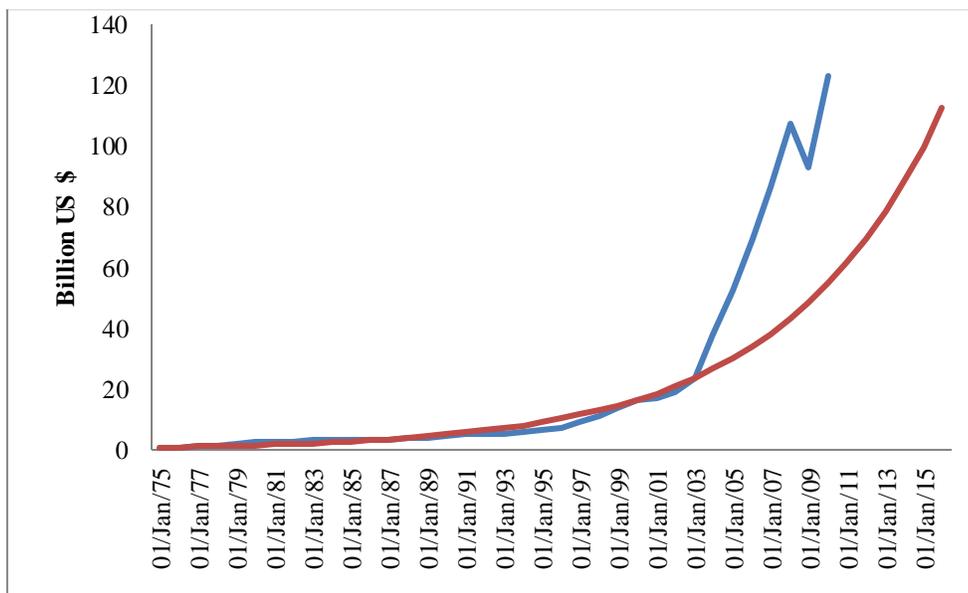
Source: World Bank database

**Figure 4: Commercial Service Exports and Imports in China (In Billion USD)**



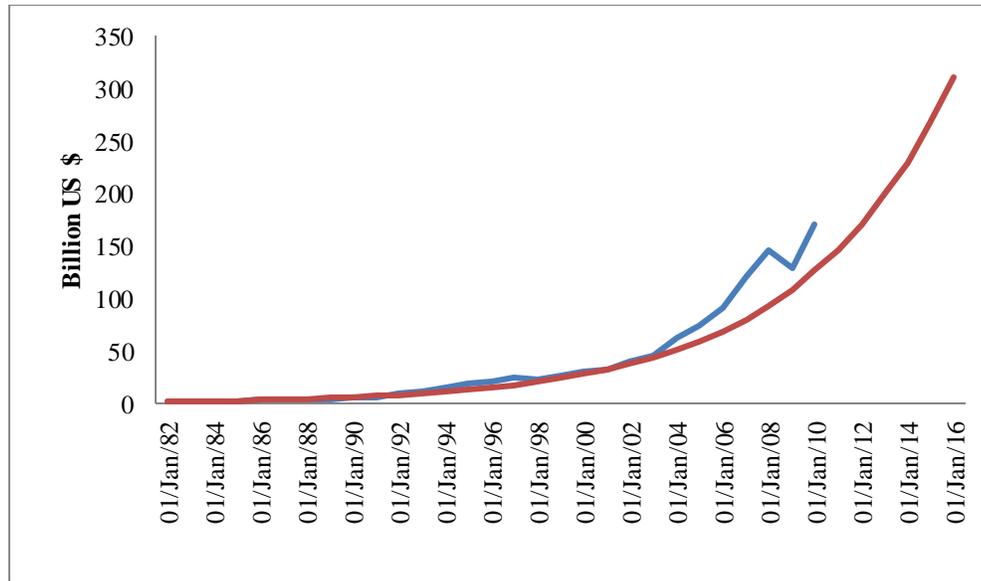
Source: World Bank database

**Figure 5: Forecasting of Commercial Service Exports in India (In Billion USD)**



Source: Worldbank.org

Figure 6: Forecasting of Commercial Service Exports in China (In Billion USD)



Source: Worldbank.or

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