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Forecasting investment and capacity addition in Indian airport infrastructure: Analysis from post-privatization and post-economic regulation era

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ABSTRACT

Indian economy has been on the high growth trajectory for last two and half decades and it is expected to remain a high growth economy for few more decades given the favorable demographic structure and macroeconomic fundamentals. As the per capita income increases in an open economy, the opportunity cost of time consumed for travelling goes up, thereby, the demand for civil aviation increases. Indian economy is no exception as the middle class population, which has been progressively increasing, is opting for safe and less time consuming air travel. The same is true for transportation of high value-added products thorough air freight. In this context, the aim of this study is to forecast air traffic, capacity addition and investment required for capacity expansion in Indian civil aviation sector for next 20 years. In order to achieve this, we have collected last 20 years' data on air traffic, Gross Domestic Product (GDP) and Index of Industrial Production (IIP) from Airport Authority of India (AAI), World Bank website and India STAT website respectively. This data has been used to work out GDP and IIP elasticity of traffic. Using these elasticities, air traffic has been projected for next 20 years, which has been used to forecast required capacity additions and investment. In a nutshell, the findings of this study are that in next 20 years 866 million passenger terminal capacity and 7.53 thousand Metric Tons (MT) cargo terminal capacities will be required at the investment of about US$ 25.94 billion.

1. Introduction

With the advent of economic liberalization during 1991 there has been increase in the economic activities. Additionally with the resultant economic boom, disposable income of individuals has touched new heights. The real per capita GDP of India, which was growing at a compound annual growth rate (CAGR) of 3.9% during 1992–2001, started growing at an accelerated CAGR of over 6% during 2014–2015. Even during the recent global meltdown, India's economy was least affected, and in any case it recovered faster than the recovery of any other economy, thus, explaining the strong economic fundamentals of Indian economy. The recent trend in economic growth reveals that Indian economy is expected to be on a high growth trajectory during the next 20 years and Indian Aviation Sector will also grow at faster pace in tandem with the economy. Thus, along with increase in growth, India would need to develop its' aviation infrastructure in order to accommodate the projected demand.

Before economic liberalization and introduction of open sky policy in 1991, aviation was traditionally viewed as an elite activity. The two government airlines i.e., Air India and Indian Airlines were the only Indian carriers. With the advent of open sky policy, private airlines entered into the Indian sky, first as air taxi operators and then as scheduled operators. Indian aviation sector witnessed an unprecedented change and growth after 2003. During this period, the importance of aviation, for the development of business, trade and tourism was recognized, and the industry saw dramatic reforms across the aviation value chain.

In 2003, there were just three private carriers viz., Jet Airways, Air Sahara and Air Deccan-all operating full service models. The private carriers in those days were limited to operating domestic routes only. In 2015, there are six private carriers viz., Jet Airways, Kingfisher, Spice Jet, Indigo, Vistara and Go Air. These are operating

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List of acronym

GDP	Gross Domestic product
IIP	Index of Industrial Product
AAI	Airports Authority of India
India STAT	Statistical database of India
CAGR	Compound Annual Growth Rate
LCC	Low Cost Carrier
US	United States
MOCA	Ministry of Civil Aviation
ICAO	International Civil Aviation Organization
TU	Traffic Units
RPK	Revenue Passenger Kilometers
RTK	Revenue Tones Kilometers
PPP	Public Private Partnership
FDI	Foreign Direct Investment
DGCA	Directorate General of Civil Aviation
CNS	Civil Navigation Services
ANS	Air Navigation Services
MT	Metric Tones
MPPA	Million Passengers per Annum
MMTPA	Million Metric Tons per Annum
TPA	Traffic per Annum
ATU	Airport Throughput Unit

under nine brand names, and three of them are permitted to operate on international routes.

During the 11th Five Year Plan Period, domestic carriers embraced the Low Cost Carrier (LCC) model. The market share of LCC during 2014–15 had crossed 40% of the total domestic traffic. During the current 12th Five Year Plan period, the domestic traffic for Indian carriers is growing at a healthy average annual rate of around 9%. Also, the traffic growth has resulted in increased capacity utilization of domestic carriers.

Ground handling business at Indian airports has grown to reach a size of about US$ 308 million. This segment also witnessed increased participation of private players, such as, SATS, Celebi, Bird Group, Menzies,[1] etc. In Joint Ventures (JVs), AIR India SATS (AISATS) is a JV between national carrier Air India and Singapore Air Transport Services. In 2011, Ministry of Civil Aviation (MOCA, 2015) announced a new ground handling policy, under which only three ground handlers were allowed at each of the six metro airports in the country. One was an Air India subsidiary, the other a subsidiary of the airport operator and the third one, an entity selected through competitive bidding.

Airports Authority of India (AAI) continued its leadership in creating air connectivity across the country by incurring expenditure to the tune of US$ 1.9 billion during the 11th Five Year Plan period and US$ 10. 8 billion has been planned for the 12th Five Year Plan period. AAI has upgraded and modernized 35 non-metro airports in the country, at an estimated cost of US$ 692 million. AAI is enhancing air connectivity in the Northeast by way of Greenfield airports at Pakyong (Sikkim), Itanagar (Arunachal Pradesh) and Cheitu (Nagaland).

The private sector played a major role during the 11th Five Year Plan in the development of airports through Public Private Partnership (PPP) model. These include development of Greenfield International airports at Bangalore and Hyderabad, and modernization of Delhi and Mumbai international airports through consortiums and Special Purpose Vehicles (SPVs).

In view of the above, airports are being viewed as commercial enterprises rather than public service organizations. Accordingly any progressive commercial enterprises require additional investment to sustain the future growth/addition in demand. The overarching question that arises here, in the above backdrop, is how much future investment is needed in airport sector in order to meet the growing demand of its services. The forecasting of investment requirement, being the major objective of the study, can be achieved with the help of forecasting air traffic, aircraft movement, and capacity enhancement for passenger and cargo terminals for Indian airports. Thus, forecasting of investment in airport sector will enable planners and policy makers to take correct decisions. Additionally, the government would need to allocate sufficient budget for major airports to meet growing demand of airport infrastructure services.

The remaining part of the study is presented as follows: The Section 2 presents the literature survey; Section 3 and Section 4 contain Methodology and Data source and Descriptive Data Analysis including explanation of variables respectively. Results and discussion are described in Section 5 and followed by Conclusions and Policy suggestions are given in Section 6.

2. Review of literature

A smooth-functioning air transport sector offers significant economic development benefits, particularly for landlocked, isolated, and low population-density countries (The World Bank). The ever growing demand for air travel has put pressure on airports to enhance their capacity. Understandably, it is in order to continuously provide smooth service to passengers (Zou, Kafle, Chang,&Park, 2015). The increasing demand for aviation services has led to significant pressure on existing airport infrastructure (Gelhausen et al., 2013; Saldıraner, 2013). Airports are not only locations for transport activity, but also act as hubs of commercial infrastructure (Wells and Young, 2004), that in turn offers numerous opportunities to airport owners to explore the commercial space with resultant enhanced financial gains. Aviation is a driver of economic and social development of a country. The turnover of the Indian Aviation Sector today exceeds US$ 15.38 billion. Private sector has played an unprecedented role for developing the airport sector in the country (Damodaran, 2015). Air Transport can play a key role in economic development and in supporting long-term economic growth. It facilitates a country's integration into the global economy, thereby providing direct benefits for users. It also accrues wider economic benefits through its positive impact on productivity and economic performance (ATA).

Since privatization there has been significant increased investment in Australian airports, with over $2.2 billion invested in new terminals, runways and other infrastructure at the leased federal airports (Australian Government, 2008). The “airport planning paradigm is shifting from the traditional pattern, being determined by high standards, established customers and long-term forecasts, to that of recognizing great uncertainty at forecasts, broad range standards and potential for a rapidly changing customer's base” (de Neufville, 2008; Magalhaes, Reis, & Maca'rio, 2015). Air transport

[1] SATS, Celebi, Bird Group, Menzies are global cargo handling companies.