Asia Pacific Management Review 20 (2015) 285–292

Contents lists available at ScienceDirect

Asia Pacific Management Review

journal homepage: www.elsevier.com/locate/apmrv

A DEA study of airlines in India

Ravi Kumar Jain [a, *], Ramachandran Natarajan [b, 1]

[a] Symbiosis Institute of Business Management, Symbiosis International University, India
[b] College of Business, Tennessee Technological University, USA

ARTICLE INFO

Article history:
Received 23 September 2013
Accepted 3 March 2015

Keywords:
Airlines in India
DEA
Input efficiency profiling
Technical efficiency
Scale efficiency

ABSTRACT

The objective of this study is to investigate the technical and scale efficiencies of all airlines across service type, size and ownership structures operating in India during 2006–2010. The variable returns to scale (VRS) model of Data Envelopment Analysis (DEA) with two inputs and two outputs is used. For additional insights, Input Efficiency Profiling (IEP) model of DEA is also used. The key findings are: a large majority of budget airlines have been found to be efficient; while smaller private sector airlines have been efficient, both the larger and smaller public sector airlines have also been efficient; the public sector airlines, although incurring financial losses, are also operating at their most productive scale size; of the two inputs, there is greater inefficiency with respect to the operating cost input. These findings are consistent with other studies of airlines that found size, type of service and ownership to impact efficiency.

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1. Introduction

The civil aviation industry in India has come a long way since the Air Corporation Act was repealed in the year 1994 allowing private airlines to operate in scheduled services category. Several private operators showed interest and were granted the status of scheduled carriers in the year 1995. However, many of those private airlines soon shut down. Only Jet Airways and Sahara Airlines survived and continued to offer scheduled services (Table 1). Till the years 2001–2003, the Indian civil aviation sector was characterized by the domination of government owned national carriers like Indian Airlines (domestic) and Air India (international), excessive regulations (e.g., control of aviation fuel) and taxation. All this resulted in high cost of operating airline services which acted not only as an entry barrier for the private players but also made air travel an expensive affair giving it an image of elitist mode of travel.

However, the scenario has changed rapidly over the last decade and the sector has witnessed a significant growth not only in terms of the entry of new private players but also in terms of increase in passenger traffic (16 percent CAGR between 2001 and 2011 with a more rapid growth at an average of 19 percent in the latter half of the decade from 2006 to 2010, Fig. 1). All this can be attributed arguably to the introduction of structural reforms, entry of new private airlines especially with different cost structures e.g., low cost – no frills, airport modernizations, and improvement in service standards (ICRA Research Report; March 2012). Also, as the Indian economy began to grow faster, international passenger traffic into and out of India also began to grow (Fig. 1).

In the year 2003, India's first low-cost carrier (LCC), Air Deccan, entered the market. This was a landmark event for this industry, which triggered an entry of several other private players. The year 2005 was also a watershed year for the Indian civil aviation sector as several private low cost and full services carriers (such as Kingfisher, IndiGo, SpiceJet, GoAir, and Paramount) commenced their operations (Table 1). This led to the rapid increase in capacity as measured by Available Seat Kilometers (ASK). Some of the new entrants – Air Deccan, Spice Jet, GoAir and IndiGo – were pursuing a different strategy and competed as low cost carriers (LCC).

The entry of the LCCs has significantly expanded the civil aviation market by making air travel both affordable and accessible to the middle class. Low fares offered by LCCs have made air travel very attractive, prompting travelers to switch to air travel from road and rail travel. In the early days of Air Deccan 40 percent of its passengers were first-time flyers. SpiceJet, for instance, targeted passengers who were traveling by air-conditioned classes in Indian Railways. LCCs ushered in a new era of competition among airlines. For instance, LCCs competitive pricing set off a price war with the

* Corresponding author. Kothur Mandal, Mamidipalli village, Mahabubnagar District, Hyderabad 509216, India.
E-mail address: director_sibmhyd@siu.edu.in (R.K. Jain).

Peer review under responsibility of College of Management, National Cheng Kung University.

[1] Tel.: +1 931 372 3001.

http://dx.doi.org/10.1016/j.apmrv.2015.03.004
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Table 1
Evolution of the Indian civil aviation industry.

Year	Major milestones
1953	Nine Airlines existed including Indian Airlines & Air India
1953	Nationalization of all private airlines through Air Corporations Act;
1986	Private players permitted to operate as air taxi operators
1994	Air Corporation Act repealed; Private players allowed to operate scheduled services
1995	Jet, Sahara, Modiluft, Damania, East West granted scheduled carrier status
1997	4 out of 6 operators shut down; Jet & Sahara continue
2001	Aviation Turbine Fuel (ATF) prices decontrolled
2003	Air Deccan starts operations as India's first LCC
2005	Kingfisher, SpiceJet, IndiGo, GoAir, Paramount start operations
2007	Industry consolidates; Jet acquired Sahara; Kingfisher acquired Air Deccan
2010	SpiceJet starts international operations
2011	IndiGo starts international operations, Kingfisher exits LCC segment. Air India and Indian airlines merger completed.
2012	Government allows direct ATF imports, FDI proposal for allowing foreign carriers to pick up to 49 percent stake under consideration. Kingfisher goes bankrupt.
2014	Falling international crude prices lead to sharp cuts in the price of aviation turbine fuel (ATF) or jet fuel. Debt-ridden SpiceJet cancels flights, cuts third of its fleet and seeks help from the government.

Source: ICRA research.

incumbent Full Service Carriers (FSCs) such as Indian Airlines, Jet Airways, and Air Sahara. This compelled the FSCs to discount their fares by as much as 60–70 percent in some routes to match the prices of LCCs. While the aggressive pricing strategy of LCCs has both deepened and widened demand which has percolated to non-metro http://www.domain-b.com/Aerospace/recommend.aspx towns and Tier-II cities, this has hurt not only the profitability of LCCs but also the revenues, margins, and market shares of FSCs. For instance, Jet Airways, which controlled about 50 percent of the domestic market in 2003, saw its share (including that of its acquisition Jet Lite) drop to about one-third by 2007.

According to Kaul (2007) of Centre for Asia Pacific Aviation, "… the aggressive expansion of the LCC segment comes at a cost to the whole sector. India's airlines are expected to post a combined loss of approximately USD$500 million in the current financial year ending 31-Mar-07,"

Aggressive expansion of capacity and inability to control costs were other factors which contributed to the mounting losses. These conditions can lead only to two types of outcomes for the airlines—either some of them go bust in a market shake-out or they

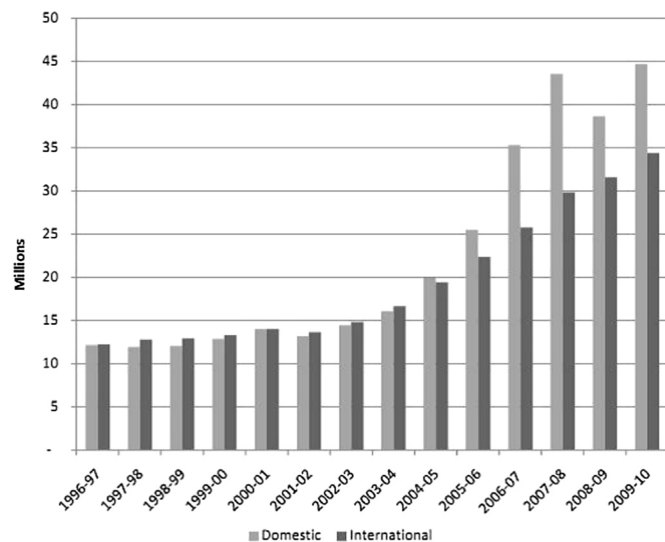

Fig. 1. Domestic and international passenger traffic growth.
Source: Centre for Asia Pacific aviation (2010) preparing for long term growth of Indian aviation, New Delhi. Arushi and Stefan Drews (2011).

merge/get acquired by other airlines or business groups. Whereas in the 1990s, many private carriers went bust, this time around the industry has witnessed a wave of consolidation. Year 2007 became a landmark year in the industry when major consolidation took place (Table 1).

In 2008, there was a steep fall in the domestic air travel due to the slowdown in the Indian economy, the H1N1 flu scare, and the terrorist attack in Mumbai in November 2008 (Fig. 1). There was excess capacity all around and the airlines responded by developing plans to lay off employees and by offering deeply discounted fares to stimulate demand. Rival airlines Jet Airways and Kingfisher formed a strategic alliance for code sharing and cutting costs. The trend was to shift more capacity to LCC operations. The Indian economy slowed in 2008–09 but there was no recession and as the economy picked up in the second half of 2009, the demand for air travel made a comeback (Fig. 1). Interestingly, the "pure" LCCs like SpiceJet and IndiGo made profits while carriers like Kingfisher, Jet Airways, Air India and Indian Airlines operated both FSC and LCC services, experienced huge losses. The anticipated cost reduction due to synergies from the mergers could not be realized. In 2012, the slowing economy affected the overall demand for air travel and the domestic demand was down by 4.9 percent compared to 2011. The airlines were also adjusting their capacities downwards to more realistic levels (IATA, 2013).

Despite these setbacks and massive losses, the long term prospects for the industry appear to be quite good. The reason why foreign airlines such as Air Asia (Asia's largest low cost airline wants to take 49 percent stake in a joint venture with the Tata Group) and Abu Dhabi-based Etihad (which announced to buy a stake in Jet Airways in early 2013) find the Indian market attractive is the huge potential for growth in air travel (Kazmin, 2013). India accounts for only about 2 percent of global air traffic. Only about 4 percent of India's population of over 1.1 billion people had ever been on a flight. Industry estimates suggest that the total passenger traffic will grow from 143 million in 2010–11 to 290–300 million by 2020 making India the third largest civil aviation market in the world. To meet this demand, a fleet of over 1000 aircrafts will be required with around 350–400 operational airports across the country (The Association of Private Airport Operators, 2013). This makes Indian civil aviation industry very attractive. Low cost and budget airlines are better positioned to dominate this market which is highly price sensitive.

The above backdrop raises the research question whether the developments described have brought about any significant change

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