OPERATIONAL AND PRODUCTIVITY EFFICIENCY OF INTERNATIONAL AIRLINES IN INDIA

Dr.A.MUTHUSAMY[2],   G.KALPANA[2]

[1] Dr. A. Muthusamy Professor, Department of International Business, Alagappa University, Karaikudi, Tamilnadu, India

[2] G. Kalpana Ph.D Scholar, Department of Commerce, Alagappa University, Karaikudi, Tamilnadu, India.
Email - muthuroja67rediff.com.   kalpanaganapathy24@gmail.com

***Abstract:** Indian aviation industry has helped in the growth of the Indian economy. They are playing an important role in air transportation of international airlines and cargo but also contribute substantial value addition in term of service quality, passenger satisfaction, innovation and cost effectiveness of the airlines in India. The factors have important impacts on the technical efficiency levels of airline companies. The airline industry is the fastest means of transportation. A developed and efficient airline industry in a country is the key to faster growth of the economy. The researcher has to analyse the productivity efficiency of International Airlines in India. The Productivity measurement requires clearly defined outputs and inputs that can be quantified. Airlines employ pilots, flight attendants, ground crews, and other personnel to transport passengers, freight and mail over various networks in airplanes powered with fuel. They also need to purchase materials and services in order to support their operations. In addition, some airlines provide catering services, ground handling and aircraft maintenance for other airlines, sales of technology, consulting services, and increasingly bookings of hotels, rental cars, and tour packages, etc. The higher productivity of airline industry is the key to faster economic growth of an economy. It is suggested that Indian Airlines needs to improve its productivity. This study has employed partial productivity which has limited scope due to its narrow coverage of inputs.*

***Key Words:** Productivity Efficiency, Inputs /Output Variables, Indian Aviation Industry.*

1. INTRODUCTION:

Indian aviation industry is one of the fastest growing airline industries in the world. India's civil aviation industry is on a high-growth trajectory. India aims to become the third-largest aviation market by 2026. The Civil Aviation industry has ushered in a new era of expansion, driven by factors such as low-cost carriers (LCCs), modern airports, Foreign Direct Investment (FDI) in domestic airlines, advanced information technology (IT) interventions and growing emphasis on regional connectivity have spurred the Indian aviation revolution. The passenger traffic during the January-December 2015 increased at a rate of 20.3 percent to 81.1 million from 67.4 million in the corresponding period a year ago. Indian domestic air traffic is expected to crore 100 million passenger by the year 2017. India is among the five fastest –growing aviation markets globally with 275 million new passengers the airlines operating in India are projected to record a collective operating profit of Rs. 8,100 crore (US$ 1.29 billion) in year 2016, according to Crisil Ltd.

The world has turned into a global village, it has become easier for people, living in extreme corners of the world, to connect to their loved ones as well as increase their business network, without much of a hassle. The aviation industry helped people travel to the nook and corners of the world, within just few hours. As a part of this global village, India is also witnessing a steep increase in the number of passengers, travelling to and from the country, via air. The prominent international airlines have been carrying on the operation in India mainly because of the fact that they attract people in India, largely the business and leisure travellers. The increase in the air passenger's traffic in India has resulted in an explosion in the number of international airlines flying to the county.

Airlines services are one of the finest an easiest mode of transportation across the world for the people flying to different countries. Most of the developed continents like Europe, Asia and America and many more countries have the best air services in the world today. It is very much needed that airlines sector must look into various aspects to promote efficiency and productivity in its operation. There are various issues like outsourcing, different types of business model, ownership and control, liberalization policy like de regulation, open sky policies etc are the core issues of this sector. There is a basic need of co-operation among different airlines companies which will make flying very easy task between the countries. One more aspects of satisfying the labor unions which is consider to the one of the strongest factor to be taken seriously by the different airlines company. It is expected that a good human practices is deliberately in a professional management style to affect the performance of the airlines company. The different airlines companies have different cost structures with different governance models .The impact of airlines size is that

large airlines tend to be allocating efficiently as compared with small airlines .Further it is expected that there are good strategic management practices adopted by different airlines companies to make his operations more efficient.

The Productivity measurement requires clearly defined outputs and inputs that can be quantified. Airlines employ pilots, flight attendants, ground crews, and other personnel to transport passengers, freight and mail over various networks in airplanes powered with fuel. They also need to purchase materials and services in order to support their operations. In addition, some airlines provide catering services, ground handling and aircraft maintenance for other airlines, sales of technology, consulting services, and increasingly bookings of hotels, rental cars, and tour packages, etc. Such non-airline businesses are often referred to as incidental or ancillary services, and are considered as part of an airline's outputs. The various measures of outputs and inputs have been defined and used in airline productivity and efficiency studies, often based on data availability. Number of passengers and revenue passenger miles (RPM) are the common output measures for scheduled passenger services, whereas revenue ton-mile (RTM) is used for air freight and mail services as well as non scheduled passenger and freight services. Available seat mile (ASM) has also been used as an output, albeit in theory ASM is more appropriate to be considered as "capacity" for airlines. There is no physical measure for incidental or ancillary services, thus an incidental output quantity index is often constructed in order to include the incidental or ancillary services as an output. The incidental output index can be estimated by deflating revenues from incidental services with a price index.

2. OPERATING AND ENVIRONMENTAL VARIABLES:

- Average Flight Length
- Passenger revenues as a percentage of total revenues
- Scheduled service revenues as a percentage of total revenues
- International passenger revenue-kilometres as a percentage of total passenger revenue kilometres
- Average load factor
- Expenditures on passenger services per revenue passenger-kilometre
- Expenditures on ticketing sales and promotion per revenue passenger-kilometre

3. IMPORTANCE OF THE STUDY:

Indian aviation industry has helped in the growth of the Indian economy. They are playing an important role in air transportation of international airlines and cargo but also contribute substantial value addition in term of service quality, passenger satisfaction, innovation and cost effectiveness of the airlines in India. The factors have important impacts on the technical efficiency levels of airline companies. The airline industry is the fastest means of transportation. A developed and efficient airline industry in a country is the key to faster growth of the economy. The researcher has to analyse the productivity efficiency of International Airlines in India.

3. REVIEW OF LITERATURE:

Robert A. Powell II (2012)[1] in their study Productivity is measured at the aggregate airline industry level in terms of multifactor productivity (MFP), the ratio of a single output to a combination of inputs, in order to compare industry productivity over time from 1978 to 2009. In addition, productivity is measured at the disaggregate carrier level in terms of total factor productivity (TFP), the ratio of total outputs to total inputs, to compare productivity growth across airlines and over time from 1995 to 2010 deregulation of the US airline industry resulted in tremendous productivity improvements that were passed on to consumers in the form of lower fares. While we understand to what extent productivity improved since deregulation, the ability to sustain financial performance is critical

Sergio G. Lazzarini (2004)[2] in his study global airline industry has witnessed the formation of multiple-partner alliances or "constellations" competing against each other for both clients and members. In this paper empirically evaluate the proposition that membership in airline constellations allows carriers to capture externalities from other firms in the form of direct or indirect traffic flow, thereby enhancing their operational performance. Analyzing patterns of membership in explicit groups involving formal, multilateral agreements (such as the Star Alliance, One world, Sky Team, etc.), find that membership benefits are greatest in constellations involving large aggregate traffic and for carriers contributing with a large portion of the group's capacity. The study find that carriers bilaterally linked with key players of such groups are able to increase their operational performance even if they do not belong to any explicit constellation.

[1] Robert A. Powell II (2012), Productivity Performance of US Passenger Airlines since Deregulation, Department of Civil and Environmental Engineering

[2] Sergio G. Lazzarini (2004), The Impact of Membership in Competing Alliance Constellations: Evidence on the Operational Performance of Global Airlines

Khalil Ahmad, M. Mukhtar Khan (2011)[3] In his study the higher productivity of airline industry is the key to faster economic growth of an economy. In this backdrop, this study estimates and compares average employee productivity (i.e. partial productivity) of three Asian airlines: Pakistan International Airline; Singapore International Airline; and Air Lanka over the period 1995-2009. According to results of this study, Singapore performed the best in terms of average employee productivity and average stage length. Air Lanka performed the best in terms of unit cost. Pakistan International Airline performed poorly in terms of all the three measures. Pakistan International Air line can improve in all the three fields, Singapore can improve in unit cost terms and Sri Lanka can improve in average employee productivity and average stage length.

Danish A. Hashim_(2003)[4] Financial performance of the state-owned Indian Airlines has been far from satisfactory since 1989-90. The main reason for poor performance has been the high growth in its unit cost. But so far no attempt has been made to study whether this was the result of decline in productivity or increase in prices of inputs, or both. The present study thus attempts to relate unit cost with productivity for the period 1964-99. To explain the relative roles of each determinant of productivity and factors' prices in the growth of unit cost, a decomposition analysis has also been undertaken by utilizing a translog variable cost function. The results reveal that during 1989-99, when many A-320 aircraft were inducted in the fleet, productivity of Indian Airlines turned negative and the unit cost increased at a much higher rate. It is also found that the productivity decline was the main reason for a rapid rise in unit cost. Hence, it is suggested that Indian Airlines needs to improve its productivity, and weigh more carefully the impact of inductions of new aircraft on its overall performance.

4. METHODOLOGY:
This study uses descriptive methods for explaining the main various concepts related to airline productivity. The analysis is enhanced with the help of tables and figures wherever needed. This will greatly help the reader quickly comprehending the main findings of the study.

5. PERIOD OF THE STUDY:
The present study covers a period of five years taking from April 2011 to March 2016.

6. SAMPLING DESIGN OF THE STUDY:
The sample international airlines are selected on the basis of convenient sampling method. Sample of three international airlines in India has been selected on the basis available of data and the three airlines are highlighting International Airlines in India.
- Indigo
- Air India
- Jet Airways

Productivity Analysis
There are three airlines productivity such as
6.1. Labor productivity
- Available seat miles per employee
- Passenger per full line employee
- Passenger per pilot and co-pilot
- Revenue passenger miles per employee
- Departed seats per maintenance staff
- Maintenance staff pr aircraft
- Departed seats per ground staff
- Monthly block hours per pilot
- Passenger, cargo and handling staff per aircraft.

6.2. Capital Productivity
- Average daily departures per aircraft
- Average daily airborne hours per aircraft
- Average daily block hours
- Load factor (occupied seat over total seats)
- Distance flown per aircraft

[3] Khalil Ahmad, M. Mukhtar Khan (2011) , A Comparative Analysis of Productivity of Airline Industry: Evidence from Selected Asian Airlines, International Journal of Business and Social Science, Vol. 2 No. 15; August 2011
[4] Danish A. Hashim (2003) A Comparative analysis of productivity and cost in Indian Airlines, 1964-99

- Revenue ton miles per aircraft
- Available seat miles per aircraft per day
- Average stage length

6.3. Fuel Productivity
- Revenue passenger miles per gallon of fuel
- Available seat miles per gallon of fuel
- Gallon per block hours
- Revenue ton-miles per gallon
- Aircraft miles per gallon
- Litters per 100 km per seats
- Litters per 100 revenue to kilometres
- Litters per 100 available to km

AIRPORTS IN INDIA (31st March, 2017)

LIST OF AIRPORTS	NO
AAI Airports	18
Civil Enclave	3
Private Airports (JVs)	3
Total International Airports	**24**
Civil Enclave	4
AAI Airports	4
Total Customs Airports	**8**
AAI Operational Airports	49
AAI Operational Civil Enclave	18
AAI Non-Operational	30
State/ Private /Government	4
Additional Airports being developed/ proposed (Pakyong, Bareilly(C), Adampur(CE) (Jallandhar)	3
Total Domestic Airports	**101**
Total Airports (All Types)	**133**

Source: Airport Authority of India (AAI)

Productivity analysis of Indigo, Air India and Jet Airways

The productivity analysis is the measurement and comparison of actual level of achievement of specific objectives. Possible objectives include having low cost, having the highlight of load factor, or being able to respond the fastest to ticket requests. To measure this value of outputs produced is divided by the value of input resource consumed.

$$Productivity = \frac{Output}{Input}$$

Inputs are assets related inputs such as Available Ton Kilometers, Facilities, Affiliated companies,(Reservation System, Hotels, Road Transportation) Current Assets, Other Assets and cost related Inputs such as labour Cost (Wages, Salaries, Benefits), Aircraft Fuel, Commission to Agent, Other cost. Outputs are Revenue Passenger Kilometers, Non-passenger Revenue (Cargo Revenue), Other Revenue.

Analysis of productivity performance of INDIGO Airlines

The following table 1shows that the Input and Output variables of Indigo Airlines in the years from 2011-21 to 2015-16

Table 1

Input /Output variable values and productivity of INDIGO in the year

From 2011-2012 to 2015-2016

(Rs.In.Million)

YEARS	INPUT			OUTPUT		PRODUCTIVITY
	Available	Operating	Non-	Revenue	Non-pass	Input

	ton km	Cost	flight Assets	Pass.km	revenue	Efficiency
2011-12	136.8	36743	23087	51948	2903.72	0.9147
2012-13	376.5	94943	35876	32563	3465.54	0.2746
2013-14	425.4	78654	48253	38725	1518.80	0.3160
2014-15	395.4	90898	31,680	28177	6338.80	0.2806
2015-16	500.1	94941	56,075	35968	7576.65	0.2873

Source: Computed

The data presented in the table reveals that the Input Efficiency of INDIGO airlines was 0.9147 year from 2011-2012. After the year of 2012-13 the Input Efficiency is decreased 0.2746. And continuously the next years fluctuating trend. The last year Input Efficiency is increased 0.2873 in the year 2015-16.

Analysis of productivity performance of Air India Airlines
The following table 2 shows that the Input and Output variables of Air India Airlines in the years from 2011-21 to 2015-16

Table 2
Input /Output variable values and productivity of AIR INDIA in the year from 2011-2012 to 2015-2016
(Rs.In.Million)

YEARS	INPUT			OUTPUT		PRODUCTIVITY
	Available ton km	**Operating cost**	**Non-flight Assets**	**Revenue Pass.km**	**Non-pass revenue**	**Input Efficiency**
2011-12	4813.0	128308.3	426716	114236.9	7549.7	0.2174
2012-13	3878.4	132503	469,736	124,944	8,549.0	0.2260
2013-14	4492.9	157710	476,043	141,507	10,659	0.2384
2014-15	4854.3	909425	34876	1523,12	6843.0	0.1638
2015-16	5113.7	198873	23840	157432	7524.8	0.1607

Source: Computed

The data presented in the table reveals that the Input Efficiency of AIR INDIA airlines was 0.2174 year from 2011-2012. The next following year of 2012-13 the Input Efficiency is decreased 0.2260. in year of 2013-14 the input efficiency is increased 0.2385 and following year of 2014-15 Input Efficiency is deceased 0.1638. The last year Input Efficiency is 0.1607 in the year 2015-16.

Analysis of productivity performance of Jet Airways
The following table 3 shows that the Input and Output variables of Jet Airways in the years from 2011-21 to 2015-16

Table 3
Input /Output variable values and productivity of JET AIRWAYS in the year from 2011-2012 to 2015-2016

(Rs.In.Million)

YEARS	INPUT			OUTPUT		PRODUCTIVITY
	Available ton km	**Operating Cost**	**Non-flight Assets**	**Revenue Pass.km**	**Non-pass revenue**	**Input Efficiency**
2011-12	3940.6	753667	334018	30643	133786	0.1506
2012-13	3648.0	822441	405013	29502	14241.2	0.0355
2013-14	3361.1	885152	399456	29747	138335	0.1305
2014-15	3733.1	864518	545292	34423	146926	0.1282
2015-16	3881.1	714052	619754	41299	140937	0.1362

Source: Computed

The data presented in the table reveals that the input efficiency of JET AIRWAYS airlines was 0.1506 year from 2011-2012. The next following year of 2012-13 the Input Efficiency is decreased 0.0355. In the year of 2013-14 input efficiency increased 0.1305 and the following year 2014-15 input efficiency is decreased 0.1282. The last year input efficiency is 0.1362 in the year 2015-16.

The following table 4 that the Year on Year Growth in Passenger and Passenger Load Factor (PLF) in year of 2014-15 and 2015-16.

Table 4
YEAR ON YEAR GROWTH IN PASSENGERS AND PASSENGER LOAD FACTOR (PLF)

Name of the Airline	Passengers (2014-15) (in Number)	Passengers (2015-16) (in Number)	Growth in Passengers (%)	PLF (2014-15) (%)	PLF (2015-16) (%)	Growth In PLF (%) Air
Indigo	23727080	31453451	32.6	79.4	84.1	5.9
Air India	11727171	12742163	8.7	77.2	79.2	2.6
Jet Airways	12473808	15961308	28.0	78.4	80.6	2.8

Source: Airport authority of India (AAI)

7. CONCLUSION:

By the present study researcher concludes that Indigo Airlines have higher productivity performance when compared to other International Airlines in India. Another Airlines have a productivity performance is fluctuating stage. The higher productivity of airline industry is the key to faster economic growth of an economy. Airlines services are one of the finest an easiest mode of transportation across the world for the people flying to different countries. It is suggested that Indian Airlines needs to improve its productivity. This study has employed partial productivity which has limited scope due to its narrow coverage of inputs.

REFERENCE
Journals
1. Khalil Ahmad, M. Mukhtar Khan (2011) , A Comparative Analysis of Productivity of Airline Industry: Evidence from Selected Asian Airlines, International Journal of Business and Social Science, Vol. 2 No. 15; August 2011
2. Robert A. Powell II (2012), Productivity Performance of US Passenger Airlines since Deregulation, Department of Civil and Environmental Engineering
3. Sergio G. Lazzarini (2004), The Impact of Membership in Competing Alliance Constellations: Evidence on the Operational Performance of Global Airlines
4. Danish A. Hashim(2003) A Comparative analysis of productivity and cost in Indian Airlines, 1964-99.

Annual Report
1. Annual report of Indigo Airlines (2011-12 to 2015-16)
2. Annual report of Air India Airlines (2011-12 to 2015-16)
3. Annual report of Jet Airways (2011-12 to 2015-16)

Web references:
- http://www.indigo.com
- http://www.jetairways.com
- http://www.moneycontrol.com
- http://www.airindia.com
- http://www.indianmirror.com