

Physical Performance Analysis of Air India

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Abstract - Air India has been in news in recent years because of unfavourable reasons. It has been incurring net losses since the time it was merged with Indian Airlines way back in 2007. Government of India is planning to privatise it as it could possibly be only option to revive it from its current situation. The overall profitability of an organisation is very much affected by its physical and operational performance. This paper will be helpful in order to enhance efficiency of Air India as Physical Performance of Air India has been analysed to know its overall operational picture. Physical Performance is measured in terms of some significant variables as Aircraft Utilisation, Aircraft-Employee Ratio and Passenger Load Factor etc.

Key Words: Aircraft-Employee Ratio, Air India, Available Seat Kilometres, Average Aircraft Utilisation, Passenger Load Factor, Revenue Passenger Kilometre.

I. INTRODUCTION

Indian Civil Aviation Industry is facing a troubling phase, and the financial condition of the country's one and only flag carrier Air India Limited is worst among all the airlines operating in Indian Market. Air India is a national carrier of India, which is under the control of government of India. It serves various National and International destinations and has a fleet of Airbus and Boeing aircraft. Air India is headquartered at Gurudwara Rakabganj Road, in New Delhi. Its primary hub is at Indira Gandhi International Airport, New Delhi and secondary hub at Chhatrapati Shivaji International Airport, Mumbai. With the nationalization of Indian Airlines and Air India in 1953, the Indian domestic civil aviation came under the purview of Government. Before year 2006, Air India undertook the domestic flights only and the erstwhile Indian Airlines was operating the international routes. In year 2006-07, the GOI decided to merge both Air India and India Airlines with the objective to accelerate growth. Hence, the National Aviation Company Limited was formed with the merger of Air India and India Airlines.

Between years 2007 to 2012, Air India has faced multiple problems including escalating financial losses. Stiff competition from private low cost carriers led to the decline in the market share of Air India from 19.2% to 14%. Further, the situation of the national carrier is more devastating in year 2013 & 2014. The present case is focused on the key operational areas that should be addressed in order to know the defect in the physical parameters of Air India Limited. Depreciation of rupee, rise in fuel prices and highly leveraged balance sheets are the biggest challenges for the ailing airline. The sharp increase in ATF prices, increase in the maintenance cost, keeping the ticket fare low to fight competitions are some of the challenges faced by Air India Limited. Moreover, a ray of hope is that Air India Limited became 27th member

of STAR Alliance on 11 July, 2014, which will give an additional value proposition to improve its performance. Researcher attempted to find out the various reasons of the sufferings of Air India Limited keeping the operating environment of the aviation sector in India in mind.

While financial performance of an organisation may be considered as one of the most important indicators of efficiency, under competitive conditions, physical and operational parameters also assume importance as indicators of efficiency and soundness. In view of the nature of air transport industry and because the financial performance itself is significantly influenced by physical and operational performance, effective and optimum utilisation of physical resources is a must for an air transport organisation for the efficiency of operations and improvement of profitability. It has become more imperative in the present circumstances when Air India (AI) has been incurring losses for last several years.

The physical resources should be utilised properly to improve earnings, to reduce cost and to provide better services to the travelling public. Further, a major part of the capital employed in air transport organisation is in the shape of aircraft fleet, constituting operating capital. Thus, in order to find out whether the organisation has utilised its aircrafts efficiently and economically, it is necessary to assess the physical performance. This has been rightly remarked that "Any interpretation of the financial performance is likely to be misleading, without having an idea of physical and operational performance of the undertaking."¹

The physical performance of a transport undertaking can be evaluated with the help of a number of parameters. As regards the selection of parameters for appraising the physical performance, the following two aspects must be kept in mind:

- i) The parameter should give independent i.e. non-overlapping information on the different aspects of the physical performance of the organisation and,
- ii) The parameter should have a close, direct or inverse relationship with the cost of operation or revenue earned.

Based on the above mentioned criteria, the following parameters have been selected and used for the purpose of assessing the physical and operational performance of AI:

- i) Average Aircraft Utilisation
- ii) Passenger Carried
- iii) Cargo Transported
- iv) Aircraft-Employee Ratio
- v) Passenger Load Factor

II. LITERATURE REVIEW

Saranga and Nagpal (2016)² made an attempt to find out the linkages between various performances drivers, operational efficiencies and market performance. The study was conducted by using Data Envelopment Analysis (DEA) technique and the findings concluded that while some of the structural and regulatory factors have an undesirable impact on airline performance. It also found that the low cost carriers in India have managed to achieve significant operational efficiencies. In the study, cost efficiency is defined as technical efficiency which brings in better market performance by means of pricing power in the airline industry in India.

Barros and Peypoch (2009)³ conducted a study to evaluate the operational performance of European Airlines. In the study, DEA was used in two stage procedure. In the first stage, ranks were assigned to airlines as per their overall efficiency with the help of DEA model and then the operating efficiency of airlines was evaluated by applying a bootstrapped truncated regression. The study resulted that there were significant differences in efficiency among the airlines.

Capobianco and Fernandes (2004)⁴ made an attempt to evaluate the financial performance and capital structure adopted by civil aviation companies. Data envelopment analysis technique was used with the aim to test the hypothesis that the airline industry's financial performance depends on companies keeping a reasonable level of leverage. The analysis of study concluded that there is an optimal range for financial leverage which depends upon size, return on assets and the level of fixed assets. The study found a direct relation with the level of efficiency for the companies with low (high) indebtedness and high (low) return.

III. RESEARCH METHODOLOGY

The present study is an attempt to analyse the physical and operational performance of Air India based on some significant variables. Secondary source of information has been used for this study. Data has been mainly collected from annual reports of Air India and Directorate General of Civil Aviation, from their respective websites and Economic Survey. The study covers the period of eleven years starting from 2007-08 to (2017-18). 2007-08 has been taken as the starting year of the study as Air India and Indian Airlines got merged in 2007. The tools and techniques used in the study are Mean, Index, Percentage, Standard Deviation, Co-efficient of Variation and Compound Annual Growth Rate.

IV. OBJECTIVES OF THE STUDY

The main objective for performing this study is to analyse the physical performance of Air India as this area is still unexplored by the researchers. For analysing physical performance main objectives are further divided into following sub objectives:

- i) To study the trend in Average Aircraft Utilisation of Air India;
- ii) To analyse the trend in passenger and cargo carried by Air India;
- iii) To evaluate the Passenger Load Factor of Air India.

V. ANALYSIS AND FINDINGS

Following are the important findings of the study-

i) Average Aircraft Utilisation:

Aircraft being the most important resource available to an air transport organisation, its utilisation is measured in terms of revenue hours covered by an aircraft per day and it determines to a large extent the operational efficiency of an organisation. Higher the rate of Aircraft Utilisation results in lower fixed cost per unit and vice versa.

An increase in the Aircraft utilisation indicates better utilisation of resources. The improvement in aircraft utilisation also strengthens the economy of the undertaking by reducing the need for new aircrafts. The formula mentioned below is used for Average Aircraft Utilisation:

$$\text{Average Aircraft Utilisation} = \frac{\text{Number of hours flown by the Aircraft} * 1}{\text{Number of Aircrafts}} \quad 365$$

Table 1 Average Aircraft Utilisation of Air India

Year	Total Revenue Hours Flown	Aircraft strength	Average Aircraft Utilisation(in hours)
2007-08	3,74,826	108	9.51
2008-09	3,72,285	103	9.90
2009-10	3,59,778	109	9.04
2010-11	3,91,401	106	10.12
2011-12	3,18,910	94	9.29

2012-13	3,05,783	93	9.01
2013-14	3,22,319	96	9.20
2014-15	3,37,335	101	9.15
2015-16	3,56,182	107	9.12
2016-17	4,05,164	111	10.00
2017-18	4,34,955	120	9.93
Mean		9.48	
S.D.		0.43	
C.V. (%)		0.05	
Minimum		9.01	
Maximum		10.12	
CAGR (%)		-0.91	

Source: Annual Reports of Air India of respective years,

Economic Survey 2017-18.

Table 1 show that Total Revenue Hours Flown shows a fluctuating trend as Fleet Strength. If there are more Aircrafts available, there will be more Revenue Hours Flown. In table 1, we can see that fleet size increased from 103 in 2008-09 to 109 in 2009-10, but Total Revenue Hours Flown decreased from 3,72,285 to 3,59,778. It means more number of aircrafts remain grounded than hired. The fleet strength ranged between 93 (2013-14) and 120 (2017-18). Total Revenue Hours Flown also goes with the same flow and was minimum 3,05,783 in 2012-13 and maximum 4,34,955 in 2017-18. Average aircraft utilisation also shows a fluctuating trend but maintains an average of 9.48 hours throughout the study period. Standard deviation stood as 0.43 throughout the study period. CAGR shows -0.91 per cent growth.

ii) Passengers Carried:

The success of any airline depends on the number of passengers carried from one place to another. Passenger carried is one of the very important parameters for evaluating the physical performance of a transport undertaking. There is a positive correlation between the number of passengers carried and the revenue earned by the undertaking. Higher the number of passengers, higher will be the amount of revenue earned and vice versa. Increased number of passengers also brings down the operating expenses and at the same time it helps the transport undertaking to put the fare rates down. The number of passengers carried by an airline is calculated by counting each passenger on particular flight (with one flight number) once only and not repeatedly on each individual stage of that flight, with a single exception that a passenger flying on both the international and domestic stages of the same flight are counted as both a domestic and international passenger.

Table 2 Passengers Carried by Air India

Year	No. of Passengers Carried (in crore)	Index (in %age)
2007-08	1.33	100.00
2008-09	1.05	78.95
2009-10	1.20	90.23
2010-11	1.31	98.50
2011-12	1.31	98.50
2012-13	1.43	107.52
2013-14	1.58	118.80
2014-15	1.72	129.32
2015-16	1.84	138.35
2016-17	1.94	145.86
2017-18	2.09	157.14

Source: Annual Reports of Air India of respective years.

The table 2 presents the passengers traffic carried by Air India from 2007-08 to 2017-18. The table clearly indicates that in the beginning year number of persons carried showed a decreasing trend and it came down from 1.33 Crore (2007-08) to 1.05 Crore (2008-09). After that number of passengers carried have been continuously showing increasing trend and the figure rose from 1.05 Crore (2008-09) to 2.09 Crore (2017-18), a growth of 157.14% in comparison to the base year. The average number of passengers carried by Air India during eleven years of the study period stood as 1.53 crores.

iii) Cargo Transported:

Air India serves the country not only by carrying the passengers from their place of stay to the place of visit and vice versa but also plays a very useful and significant role in transporting the valuable goods, fragile items, dangerous goods, perishable and wet cargo, live animals, weapons, ammunitions and explosives, live organs, human remains; including the air mail and excess luggage of the passengers to different parts of the nation within minimum possible time.

Table 3 Cargo Transported by Air India

Year	Cargo Transported (in tonnes)	Index (in %age)
2007-08	1,70,843	100.00
2008-09	1,41,966	83.10
2009-10	1,54,752	90.58
2010-11	1,74,466	102.12
2011-12	1,36,809	80.08
2012-13	1,58,219	92.61
2013-14	2,11,162	123.60
2014-15	1,93,495	113.26
2015-16	1,92,809	112.86
2016-17	1,96,918	115.26
2017-18	2,19,524	128.49

Source: Annual Reports of Air India of respective years.

The number of tonnes of freight carried is obtained by counting each tonne of freight on a particular flight (with one flight number) once only and not repeatedly on each individual stage of the flight. The freight flown on both the domestic and international stages of the same flight is considered in computation both as domestic and an international shipment or dispatch. The same principle is used in calculating mail tonnes carried.

Table 3 represents the cargo transported by Air India during 2007-08 and 2017-18. A look at table reveals that there has been fluctuating trend in cargo transported. It was minimum (136809 tonnes) in 2011-12 and maximum (2,19,524 tonnes) in 2017-18, during the study period. Cargo transported shows a growth of 128.49 per cent, assuming 2007-08 as the base year.

iv) Aircraft-Employee Ratio:

Human resource is an important element to run an organisation smoothly. Any organisation spends a major share of its total operating expenses on its employees. Employees per Aircraft is the number of employees engaged on an aircraft. It is calculated with the help of following formula:

$$\text{Aircraft Employee Ratio} = \frac{\text{Number of Employees}}{\text{Fleet Size}}$$

Table 4 Aircraft-Employees Ratio of Air India

Year	No. of Employees	Fleet Size	Employees per Aircraft
2007-08	32,287	108	299
2008-09	31,107	103	303
2009-10	29,914	109	275
2010-11	28,085	106	265
2011-12	26,851	94	286
2012-13	25,048	93	270
2013-14	23,259	96	243
2014-15	14,136	101	140
2015-16	12,882	107	121
2016-17	11,912	111	108
2017-18	10,887	120	91
Mean			218.23
S.D.			84.18
C.V. (%)			0.39
Minimum			91
Maximum			303
CAGR (%)			-0.97

Source: Economic Survey 2017-18.

Annual reports of DGCA.

Table 4 shows that the total number of employees shows a decreasing trend during the study period. It was maximum (32,287) at the start of the study i.e. 2007-08 and minimum (10,887) at the end of the period i.e. 2017-18. Air India

tried hard to control its operating expenses by controlling its aircraft-employee ratio. The efforts showed the result as the drastic change can be seen as the employees per aircraft ratio came down from 270 to 140 within a span of two years. It was because of the reason; employees were hired to please the political bosses not as per the need. Air India managed its employees well as the average of the ratio stood as 91 employees per aircraft which can be seen as very good ratio.

v) Passenger Load Factor:

Passenger Load Factor (PLF) is one of the basic parameters for appraising the physical performance of a transport undertaking. This is the Revenue Passenger Kilometres Performed divided by Available Seat Kilometres and expressed as a percentage. So, passenger load factor can be calculated in the following manner:

$$\text{Passenger Load Factor} = \frac{\text{Revenue Passenger Kilometres (RPKMs)}}{\text{Available Seat Kilometres (ASKMs)}} * 100$$

Table 5
Passenger Load Factor of Air India

(in Crore)

Year	ASKMs	RPKMs	PLF(%)
2007-08	4,926.4	3,129.5	63.53
2008-09	4,469.1	2,643.6	59.15
2009-10	4,574.8	2,944.8	64.37
2010-11	4,612.3	3,044.8	66.01
2011-12	4,525.4	3,058.2	67.58
2012-13	4,105.3	2,888.0	70.35
2013-14	4,570.4	3,327.9	72.81
2014-15	4,905.0	3,600.0	73.39
2015-16	5,151.7	3,869.5	75.11
2016-17	5,451.9	4,131.6	75.78
2017-18	5,794.3	4,597.0	79.34
Mean			69.77
S.D.			6.15
C.V. (%)			0.09
Minimum			59.15
Maximum			79.34
CAGR (%)			-0.89

Source: Annual Reports of Air India

Table 5 shows the PLF of the Air India for a period of eleven years (2007-08 to 2017-18). PLF has varied between 59.15 per cent (2008-09) and 79.34 per cent (2017-18). The data clearly indicate that PLF of Air India has been continuously improving year after year except in 2008-09. In that year the percentage came down to 59.15 per cent as compared to the previous year 2007-08. The performance of the Air India from the point of view of

PLF ratio has been appreciable. In spite of this improvement there is every scope for further improvement in PLF. If the PLF ratio goes up, it will bring more revenue earnings and thereby improve the financial health of the airline. The average of PLF stood as 69.77 per cent during the study period. It shows standard deviation of 6.15 and CAGR of -0.89 per cent.

VI. CONCLUSION

As per the study performed, it was found that average of Aircraft Utilisation is 9.48 hours which is very low for a profitable airline company. Passengers Carried and Cargo transported has increased approximately 1.5 times and 1.3 times respectively over the years. Aircraft-Employee ratio was very poor at the beginning of the study period but has come down to 91 in the last year of the study which is a good score. Average of PLF is 69.77 per cent which is very low as other profit making airlines are claiming almost 90 per cent PLF. So it can be concluded that Air India has performed reasonably well in recent years but there is so much scope for improvement. As Air India is debt ridden and Government is in process to privatise it, Air India should not repeat the mistakes which it had done in past. There is a need to upgrade its fleet composition as many of its aircrafts are outdated and remained grounded for maintenance and overhaul for a good amount of time. The study reveals that Air India has overcome the problem of excess manpower over the years. The organisation is needed to use more fuel efficient fleets on less populated and low load factor routes. After taking good care of its policies and help from the Government, it may be assumed that Air India will be able to compete with other private airlines in upcoming years.

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