A COMPARATIVE ANALYSIS OF AIRLINE PRODUCTIVITY OF SELECTED INTERNATIONAL AIRLINES

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***Abstract*: The high productivity of the airline industry is key to faster of economic growth of an economy. In this backdrop, this study estimates and compares average employee productivity of five International Airlines in India: IndiGo, Jet Airways, Air India, Spice Jet and Air India Express over the period from 2014-15 to 2017-18. The researcher took two objectives and The researcher used statistical tools; Descriptive statistics and Two-Way ANOVA. According to the results of the study, the IndiGo Airline is the best performance of Average employee productivity and Average stage length was also best performed. The Unit Cost is poorly performed of IndiGo. So, the IndiGo airline can improve Unit Cost. The Jet Airways are the best performer of Average Employee Productivity. The Average stage length also best performed and Unit Cost the best performed of Jet Airways, it can improve Average stage Length. The Air India airlines was best performed all three measures. The Spice Jet airline is the best performed of Average Employee Productivity, and the Average Stage Length is poorly performed. The Unit cost also performed poorly so Spice Jet can improve on Unit Cost. The Air India Express airline also was best performed all three measures.**

Keywords: Average Employee Productivity, Average Stage Length, Unit Cost.

INTRODUCTION

The airline industry being the fastest means of transportation plays a vital role in the economy in multifaceted dimensions. They improve first, it enhances globalization and increase economic cooperation among nations. The next it facilitates the international movement of goods, services and factors of production. The next increase its impact by directly Aviation in India, broadly, divided into military and civil aviation, is the fastest-growing aviation market in the world (IATA data) and Bangalore with 65% national share is the largest aviation manufacturing hub of India. UDAN scheme is driving the growth of civil aviation connectivity and infrastructure in India.

The avionics business in India is the most quickly developing aeronautics area of the world. With the ascent in the economy of the nation and pursued by the advancement in the flying division. The flying business in India need through a total change in the ongoing time frame. Common flight incorporates air transport (business carriage via air), non-business flying, (for example, private flying), business, non-transport, (for example, ethereal harvest cleaning and looking over), framework, (for example, air terminals and air route offices) and assembling, (for example, flying machine, motors, and flying). The air transport has generally experienced higher development than most different businesses. Interest for air transport is firmly connected with Indian financial improvement; in the meantime air transport is a driver in an economy. The commitment of air transport and related common avionics businesses to nearby, local or national economies incorporates the yield and employments straightforwardly owing to common aeronautics just as the multiplier or the progressively outstretching influence upon different enterprises all through the economy.

IMPORTANCE OF THE STUDY

With the development of modern technological era, the modes of transportation have undergone massive transformation and one among them is the aviation industry. The airline means of transportation plays an important role in the globalised economy. The affordability, accessibility and quality services provided by the aviation industry makes it a major player in the transportation and logistics sector. Also now-a-days it plays a major role in cultural exchanges because of the affordable rates provided by the airlines. Even the governments of different countries are focusing on the development of infrastructure which are airport and aviation-led. This in-turn will boost the economic growth of the country. It will also reduce the regional disparities in the nation.

REVIEW OF LITERATURE

John Bitzan and James Peoples (2010)[1] in their study analyze between the expense and efficiency changes of full-benefit bearers (FSCs), minimal effort transporters (LCCs) and 'other' transporters named territorial or contract firms. Discoveries show cost decreases of 17 percent for FSCs, 11 percent for LCCs, and 8 percent for others from 1993 to 2010. Nontrivial efficiency

[1]John Bitzan and James Peoples(2010), **"A comparative analysis of cost change for low cost full-service and other carriers in the US Airlines Industries".**

increases because of increment in load factor and stage length clarify the discoveries for FSCs. Decrease in info costs clarify the cost decays for LCCs, while efficiency increases because of increment in load factor and stage length and unexplained specialized change add to cost decreases for 'other' conveys.

Andre Luis De Castro Moura Duarte (2011)[2] in their study activities the board field, operational practices like all out quality administration or without a moment to spare have been viewed as an approach to enhance operational execution and extreme budgetary execution. Restricted because of Research structure and the innate challenges of utilizing execution as a reliant variable. In the examination tried the connection between chose operational practices in money related execution result productivity and development. An example of 1200 firms, examination utilizing different relapses investigated direct impact of practices and their cooperation with industry measurement.

Khalil Ahmed and M.Mukhlar Khan (2011)[3]In this study the higher profitability of the aircraft business is the way to quicker financial development of an economy. In this scenery, this examination gauges and think about normal representative efficiency (for example Incomplete Productivity) of three Asian Airlines; Pakistan International Airline; Singapore International; Airline and Air Lanka over the period 1995-2009. The specialist finds the outcome the Singapore carrier played out the best as far as Average representative profitability and Average stage length. Air Lanka played out the best as far as Unit Cost. The Pakistan worldwide aircraft performed ineffectively as far as all the three measures. The Pakistan global aircraft can enhance in all the three fields, Singapore can enhance in unit cost terms and Air Lanka can enhance in normal stage length and normal worker efficiency.

Dr.A.Muthusamy and G.Kalpana (2018)[4] in this study researcher concludes that indigo airlines have higher productivity, performance when compared to other international airlines in India. Other airlines have a productivity performance is fluctuating stage. The high productivity of the airline industry is the key to quicker economic growth of an economy. Airline services are one of the finest an easiest mode of transportation across the world for the people flying to different countries. It's suggested that Indian and International airlines need to improve productivity.

OBJECTIVES OF THE STUDY

The present study has been set out to accomplish the following objectives.

- ✓ To measure the Average Employee Productivity of selected International Airlines in India
- ✓ To analyze the Unit Cost comparison and Average Stage Length comparison of selected International Airlines in India

METHODOLOGY

The sample international airline is selected on the basis of convenience sampling method. This study uses descriptive methods for explaining the main various concepts related to airlines 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.

PERIOD OF THE STUDY

The present study covers a period of four years, taking from 2014-15 to 2017-18.

STATISTICAL ANALYSIS

Statistical techniques such as Mean, Standard Deviation, Co-efficient of variation, Minimum, Maximum and Two way ANOVA are used for analyzing and interpreting the data and test result.

SAMPLING DESIGN OF THE STUDY

A Sample of five international airlines in India has been selected on the basis available for data and the five airlines are highlighting International Airlines in India.

- IndiGo
- Jet Airways
- Air India
- Spice Jet
- Air India Express

TESTING OF HYPOTHESES

[2] Andre Luis De Castro Moura Duarte (2011), **"Operational Practices and Financial Performance: an empirical analysis of Brazilian Manufacturing Companies".** Vol.8, no. 4, art.3, pp.395-411, Dec 2011 http://www.anpad.org.br/bar

[3] Khalil Ahmed and M.Mukhlar Khan (2011), **A Comparative Analysis of Productivity of Airline Industry: evidence from selected Asian Airlines.** Vol.2 No.15, August 2011, International Journal of Business and Social Science.

[4] Dr.A.Muthusamy and G.Kalpana (2018) , **Operational and Productivity efficiency of International Airlines in India,** Vo.2, ISSN: 2456-6683, International Journal of Research Culture Society.

The researcher had formulated hypothesis for the study. The following hypothesis is tested.

i. There is no significant difference in the value of the Average Stage Length of the selected International Airlines in India.
ii. There is no significant difference in the value of the Average Stage Length during the different years from 2014-15 to 2017-18.
iii. There is no significant difference in the value of the Unit Cost Comparisonsof the selected International Airlines in India.
iv. There is no significant difference in the value of the Unit Cost Comparisonsduring the different years from 2014-15 to 2017-18.

PRODUCTIVE EFFICIENCY

The aircrafts today are very unique to the ones working before the censorious changes ordered in the India amid the late. Today the chasing issue with them has been their asset profitability like that of an airplane which now because of innovative headways has turned out to be increasingly flexible, proficient, prevalently as far as its working financial matters. The comprehension of carrier profitability requires acclimation with its fundamentals which have been emotionally connoted in this paper. The 'profitability' factors are of huge significance in the operational execution model of any aircraft.

Operating and Environment Variables:

- Average Flight Length
- Passenger revenue as a percentage of total revenue
- Scheduled service revenue as a percentage of total revenue
- International passenger revenue –kilometers as a percentage of total passenger revenue kilometers
- Average load factor
- Expenditure on passenger services per revenue passenger- kilometer
- Expenditure on ticketing sales and promotion per revenue passenger -kilometer[5]

OPERATING PERFORMANCE MODEL

The equation for operating profit may be written as:

Whereas shows the operating profit

$YD = (\sum R_{PK}) - UC (\sum A_{SK})$

$\frac{\sum Ro}{\sum Rpk}$ ΣRo total operating revenue and ΣR_{Pk} are aggregate traffic

$YD = \frac{\sum Ro}{\sum Rpk}$ = Seats sold x AL (Average Stage Length)

$\frac{\sum Eo}{\sum Ask}$ ΣEo total operating expenses and ΣASk are aggregate productivity

$UC = \frac{\sum Eo}{\sum Ask}$

= Seats produced x AL

For making a course increasingly gainful in Unit Perspective, getting the full advantages of economies of scale, degree and thickness are presently vital as the airplane limit can't be changed in the short run in light of numerous imperatives. Like Indigo can't trim down the seating limit of any flying machine in the short rushed to its ideal dimension to dodge yield deterioration as after push back the vacant payload goes died. At the very start, it is fundamental to separate among limit and profitability obviously, which in carriers is synonymously taken as same regularly. The profitability is the genuine yield (ASKs/ATKs) which a carrier delivers over a characterized time period. A proficient bearer is extremely near a base hole between the two. Their exceptional cost conduct requires total comprehension to stay productive and how payload extend figures can be utilized while choosing the market and building up the related administrations.[6]

AVERAGE EMPLOYEE PRODUCTIVITY

The airline productivity is defined as the number of ATKs/ ASKs produced in a year, which is one ton payload or one seat respectively carried over a stage length of one kilometer and the factor productivity is taken as total ATKs divided by the resource/ employees of the concerned airlines which is the productive efficiency of an airlinei.e. employee/ resource productivity or average labour/ resource product.

Average employee productivity (AE) is calculated with the help of following formula:
AE=

[5]Dr.A.Muthusamy and G.Kalpana, Operational and Productivity efficiency of International Airlines in India, Vol.2, Issue 1, 2018, ISSN:2456-6683, IF: 3.449, International Journal of Research Culture Society
[6]Khalil Ahmed, government college women university Sialkot, international journal of business and social science.

Available ton $\frac{\sum ATK}{\sum NE}$ kilometers divided into Number of Employees in a company

The following table 1 Average Employee Productivity of IndiGo airlines in the year from 2014-15 to 2017-18.

Table 1

Employee Productivity of IndiGo

(Million of Kilometers)

Year	ATK	AE
2014-15	3572.1	0.339
2015-16	4595.1	0.371
2016-17	5935.2	0.406
2017-18	6890.5	0.471
Minimum	3572.1	0.339
Maximum	6890.5	0.471
Average	5248.2	0.396
S.D σ	1461.1	0.056
C.V%	27.84	14.14

Source: Computed from DGCA.

The above table shows that Average Employee Productivity (AE) of the IndiGo airline company under the study period 2014-15 to 2017-18. The IndiGo airlines have a better performed for Average employee productivity in the year of 2014-15 was 0.339 and continuously increased next three years also 0.371, 0.406, 0.4711 fluctuating trends of average employee productivity (AE) of IndiGo airlines. The average of employee productivity compared with four years was 0.396. The Standard deviation of IndiGo (AE) was 0.056 and Coefficient of variation is (AE) 14.14 per cent. The minimum average employee productivity 0.339 in the year of 2014-15 and the maximum average employee productivity 0.471 in the year of 2017-18.

The available ton kilometer of IndiGo airline under the study period from 2104-15 to 2017-18. The IndiGo airline ATK in the year of 2014-15 was 3572.1. In the year of 2017-18 was 6890.5 so continuously increased by the four year period. The average ATK of IndiGo was 5248.2. The standard deviation of ATK was 1461.1 and the Coefficient of variation of ATK was 27.84 per cent. The minimum ATK 3572.1 in the year of 2014-15 and the maximum ATK 6890.5 in the year of 2017-18.

The following table 2 Average Employee Productivity of Jet Airways airlines in the year from 2014-15 to 2017-18.

Table 2

Employee Productivity of Jet Airways (Million of Kilometers)

Year	ATK	AE
2014-15	5090.2	0.377
2015-16	5623.8	0.381
2016-17	6071.5	0.397
2017-18	7001.2	0.457
Minimum	5090.2	0.377
Maximum	7001.2	0.457
Average	5946.6	0.403
S.D σ	809.40	0.037
C.V%	13.61	9.18

Source: Computed from DGCA.

The above table shows that Average Employee Productivity (AE) of Jet Airways airlines company under the study period 2014-15 to 2017-18. The Jet Airways airlines have a better performed for Average employee productivity in the year of 2014-15 was 0.377 and continuously increased next three years also 0.381, 0.397 and 0.457, fluctuating trend of average employee productivity (AE) of Jet Airways airlines. The average of employee productivity compared with four years was 0.403. The Standard deviation of Jet Airways (AE) was 0.037 and Coefficient of variation is (AE) 9.18 per cent. The minimum average employee productivity 0.377 in the year of 2014-15 and the maximum average employee productivity 0.457 in the year of 2017-18.

The available ton kilometer of Jet Airways airline under the study period from 2104-15 to 2017-18. The Jet Airways airline ATK in the year of 2014-15 was 5090.2. In the year of 2017-18 was 7001.2 so continuously increased by the four years period. The average ATK of Jet Airways was 5946.6. The standard deviation of ATK was 809.40 and the Coefficient of variation of ATK was 13.61 per cent. The minimum ATK 5090.2 in the year of 2014-15 and the maximum ATK 7001.2 in the year of 2017-18.

The following table 3 Average Employee Productivity of Air India airlines in the year from 2014-15 to 2017-18.

Table 3
Employee Productivity of Air India (Million of Kilometers)

Year	ATK	AE
2014-15	6556.6	0.307
2015-16	6854.3	0.532
2016-17	7269.9	0.610
2017-18	7780.4	0.653
Minimum	6556.6	0.307
Maximum	7780.4	0.653
Average	7115.3	0.525
S.D σ	531.20	0.154
C.V%	7.465	29.33

Source: Computed from DGCA.

The above table shows that Average Employee Productivity (AE) of the Air India airline company under the study period 2014-15 to 2017-18. The Air Indiaairlines have a better performed for Average employee productivity in the year of 2014-15 was 0.307 and continuously increased next three years also 0.532, 0.610 and 0.653 fluctuating trends of average employee productivity (AE) of Air India airlines. The average of employee productivity compared with four years was 0.525. The Standard deviation of Air India (AE) was 0.154 and Coefficient of variation is (AE) 29.33 per cent. The minimum average employee productivity 0.307 in the year of 2014-15 and the maximum average employee productivity 0.653 in the year of 2017-18. The available ton kilometer of Air India airline under the study period from 2104-15 to 2017-18. The Air India airline ATK in the year of 2014-15 was 6556.6. In the year of 2017-18 was 7780.4so continuously increased by the four years period. The average ATK of Air India was 7115.3. The standard deviation of ATK was 531.20 and the Coefficient of variation of ATK was 7.465 per cent. The minimum ATK 6556.6 in the year of 2014-15 and the maximum ATK 7780.4 in the year of 2017-18.

The following table 4 Average Employee Productivity of Spice Jet airlines in the year from 2014-15 to 2017-18.

Table 4

Employee Productivity of Spice Jet

(Million of Kilometers)

Year	ATK	AE
2014-15	1264.2	0.301
2015-16	1128.5	0.210
2016-17	1434.8	0.207
2017-18	1693.0	0.245
Minimum	1128.5	0.207
Maximum	1693.0	0.301
Average	1380.1	0.240
S.D σ	243.33	0.043
C.V %	17.63	17.91

Source: Computed from DGCA.

The above table shows that Average Employee Productivity (AE) of the SpiceJet airline company under the study period 2014-15 to 2017-18. The SpiceJetairlines have a better performed for Average employee productivity in the year of 2014-15 was 0.301 and continuously decreased next three years also 0.210, 0.207, 0.245fluctuating trends of average employee productivity (AE) of SpiceJet airlines. The average of employee productivity compared with four years was 0.240. The Standard deviation of SpiceJet (AE) was 0.043 and Coefficient of variation is (AE) 17.91 per cent. The minimum average employee productivity 0.207 in the year of 2016-17 and the maximum average employee productivity 0.301 in the year of 2014-15. The available ton kilometer of SpiceJetairline under the study period from 2104-15 to 2017-18. The SpiceJet airline ATK in the year of 2014-15 was 1264.2. In the year of 2017-18 was 1693.0 so continuously decrease and increased of fluctuating with the four year periods. The average ATK of SpiceJet was 1380.1. The standard deviation of ATK was 243.33 and the Coefficient of variation of ATK was 17.63 per cent. The minimum ATK 1693.0in the year of 2014-15 and the maximum ATK 1693.0 in the year of 2017-18.

The following table 5 Average Employee Productivity ofAir India Express airlines in the year from 2014-15 to 2017-18.

Table 5

Employee Productivity of Air India Express

(Million of Kilometers)

Year	ATK	AE
2014-15	659.4	0.530
2015-16	817.5	0.827
2016-17	1079.8	1.006
2017-18	1276.4	1.189
Minimum	659.40	0.5300
Maximum	1276.4	1.1890
Average	958.27	0.8880
S.D σ	273.93	0.2807
C.V %	28.58	31.61

Source: Computed

The above table shows that Average Employee Productivity (AE) of Air India Expressairline company under the study period 2014-15 to 2017-18. The Air India Expressairlines have a better performed for Average employee productivity in the year of 2014-15 was 0.339 and continuously increased next three years also 0.371, 0.406, 0.4711 fluctuating trends of average employee productivity (AE) of Air India Expressairlines. The average of employee productivity compared with four years was 0.396. The Standard deviation of Air India Express (AE) was 0.056 and Coefficient of variation is (AE) 14.14 per cent. The minimum average employee productivity 0.339 in the year of 2014-15 and the maximum average employee productivity 0.471 in the year of 2017-18. The available ton kilometer of Air India Express airline under the study period from 2104-15 to 2017-18. The Air India Express airline ATK in the year of 2014-15 was 659.4. In the year of 2017-18 was 1276.4 so continuously increased by the four years period. The average ATK of Air India Expresswas 958.27. The standard deviation of ATK was 273.93and the Coefficient of variation of ATK was 84 per cent. The minimum ATK 0.339 in the year of 2014-15 and the maximum ATK 0.471 in the year of 2017-18.

AVERAGE STAGE LENGTH (AL) COMPARISONS

The airline speed essentially contributes its hourly yield as it is the result of its cruising pace and its payload limit. The high thickness hardware with increasingly relative speed can't generally be favored over the slower and littler airline in light of the fact that the flying machine are intended for a specific sort of stage length and the traffic blend on the load up. The one of the crucial parameters influencing the aircraft's working economies has been its normal stage length (AL). As the normal stage length increment, the speed of the aircraft expands, which is determined based on its square time, which is taken motor on with motor off including dead time at runway, runway, cook's garment, and so on. The expansion in average stage length by decreasing the average cost raises normal worker efficiency of aircraft entity.

The average stage length is measured by the following formula:

$$\text{ASL} = \frac{\sum Ro}{\sum Rpk}$$

The following table 6 Average Stage Length of selected International Airlines in India in the year from 2014-15 to 2017-18.

Table 6

Company-Wise Average Stage Length

(Million of Kilometers)

Year	IndiGo	Jet Airways	Air India	Spice Jet	Air India Express
2014-15	2223.2	2953.0	4391.9	1395.2	2350.6
2015-16	2219.8	2946.9	6200.2	1714.0	2374.6
2016-17	2252.5	2912.7	6405.1	1844.3	2574.2
2017-18	2390.9	2971.9	6471.9	1684.4	2618.5
Minimum	2219.80	2912.70	4391.90	1395.20	2350.60
Maximum	2390.90	2971.90	6471.90	1844.30	2618.50
Average	2271.6	2946.1	5867.2	1659.4	2479.4
S.D σ	80.876	24.694	990.353	189.381	136.51
C.V	3.56	0.83	16.87	11.23	5.50

Source: Computed from DGCA.

The above table 6 reflects that the average stage length was highest IndiGo, Jet Airways Air India and Air India Express. The lowest average stage length is Spice Jet during the period. The IndiGo had the 3.56 per cent of Coefficient of variation, the Jet Airways had the 0.83 per cent of Coefficient of variation, Air India had the 16.87 per cent of Coefficient of variation, Spice Jet had the 11.23 per cent of Coefficient of variation, and Air India Express had the 5.50 per cent of Coefficient of variation. That is IndiGo, Jet Airways and Air India Express increased their average stage length while Spice Jet could not improve it.

TEST OF HYPOTHESIS

Table 6.1 gives the relevant details whether the Average Stage Lengthof the five International Airlines in India differed significantly and whether the stage length differed across the four years. Two way ANOVA was used.

Two sets of Null Hypothesis

Set-1: Ho: There is no significant difference in the value of the Average Stage Lengthof the selected International Airlines in India.

Set-2: Ho: There is no significant difference in the value of the Average Stage Lengthduring the different years from 2014-15 to 2017-18.

Table 6.1

ANOVA-Average Stage Length

	Sum of Square	Degrees of freedom	Mean Square	F-Ratio	P-value	F crit
Between column	43250	4	10812	61.697	6.6808	3.2591
Within Row	10243	3	34144	1.9483	0.175718	3.4902
Residual	21030	12				
Total	46377	19				

Sources: Computed * Significant at the 5 % level

RESULT

Set-1: Ho: The critical value of 'F' at the 5% level of significance (3.2591) is less than the calculated value of 'F'(16.697), so the null hypothesis is rejected. Hence there is a significant difference in the value of the Average Stage Length of the five International Airlines in India.

Set-2: Ho: The calculated value of 'F' at the 5% level of significance (1.9483) is less than the critical value of 'F' (3.4902), so the null hypothesis is accepted. Hence there is no significant difference in the value of the Average Stage Lengthof the different years from 2014-15 to 2017-18.

UNIT COST COMPARISON (UC)

The route cost of air terminal tasks like reservation, ticketing, and general taking care of descend in correlation when AL increment like five travelers going by PIA on a 1000 km adventure and one traveler going on a 5000 km venture. This all prompts bring down unit cost with longer AL as the settled costs will cover more yield and the variable expenses don't increment in extent to increment in excursion remove.The formula for unit cost calculated is as:

$$UC = \frac{\sum Ro}{\sum Rpk}$$

Where $\sum E_O$= Total expenses of an airline, $\sum$ASKs is the total number of seats/kilo meters carried and UC is the unit cost.

The following table 7 Company – wise Unit Cost comparison of selected International Airlines in India in the year from 2014-15 to 2017-18.

Table 7

Company-Wise Unit Cost Comparisons

(Million of Kilometers)

Year	IndiGo	Jet Airways	Air India	Spice Jet	Air India Express
2014-15	0.3530	0.5108	6.0864	0.4215	3.2877
2015-16	0.3229	0.4388	4.7720	0.3741	2.9282
2016-17	0.3155	0.4272	4.7649	0.3596	1.9308
2017-18	0.3281	0.4447	5.1633	0.3775	1.7777
Minimum	0.3155	0.4272	4.7649	0.3596	1.7777
Maximum	0.3530	0.5108	6.0864	0.4215	3.2877
Average	0.3298	0.4553	5.19665	0.3831	2.4811
S.D σ	0.0162	0.0376	0.62169	0.0267	0.7411
C.V	4.91	8.25	11.96	6.96	29.86

Source: Computed from DGCA.

The above table 6 shows unit cost trends of the five international airline companies under the study. The Air India and Air India Express had the highest Unit Cost during the period. IndiGo, Jet Airways and Spice Jet had the lowest Unit Cost during the period. The IndiGo had the 4.91 per cent of Coefficient of variation, the Jet Airways had the 8.25 per cent of Coefficient of variation, Air India had the 11.96 per cent of Coefficient of variation, Spice Jet had the 6.96 per cent of Coefficient of variation, and Air India Express had the 29.86 per cent of Coefficient of variation. That is Air India and Air India Express increased their average Unit Cost while IndiGo, Jet Airways and Spice Jet could not improve it. The later also underwent larger fluctuations over time.

TEST OF HYPOTHESIS

Table 7.1 gives the relevant details whether the Unit Cost Comparisonsof the five International Airlines in India differed significantly and whether the Unit Cost differed across the four years. Two way ANOVA was used.

Two sets of Null Hypothesis

Set-1: Ho: There is no significant difference in the value of the Unit Cost Comparisonsof the selected International Airlines in India.

Set-2: Ho: There is no significant difference in the value of the Unit Cost Comparisonsduring the different years from 2014-15 to 2017-18.

Table 7.1

ANOVA-Unit Cost Comparisons

	Sum of Square	Degrees of freedom	Mean Square	F-Ratio	P-value	F crit
Between column	71.892	4	17.973	118.27	1.5709	3.2591
Within Row	0.9912	3	0.3304	2.1744	0.144028	3.4902
Residual	1.8235	12	0.1519			
Total	74.707	19				

Sources: Computed * Significant at the 5 % level

RESULT

Set-1: Ho: The critical value of 'F' at the 5% level of significance (3.2591) is less than the calculated value of 'F'(118.27), so the null hypothesis is rejected. Hence there is a significant difference in the value of the Unit Cost Comparisonsof the five International Airlines in India.

Set-2: Ho: The calculated value of 'F' at the 5% level of significance (2.1744) is less than the critical value of 'F' (3.4902), so the null hypothesis is accepted. Hence there is no significant difference in the value of the Unit Cost Comparisonsof the different years from 2014-15 to 2017-18.

CONCLUSION

The study concludesfrom the study, the IndiGo Airline is the best performance of Average employee productivity and Average stage length was also best performed. The Unit Cost poorly performed of IndiGo. So, the IndiGo airline can improve Unit Cost. The Jet Airways are the best performer of Average Employee Productivity. The Average stage length also best performed and Unit Cost the best performed of Jet Airways, it can improve Average stage Length. The Air India airlines was best performed all three measures. The Spice Jet airline is the best performed of Average Employee Productivity, and the Average Stage Length is poorly performed. The Unit cost also performed poorly so Spice Jet can improve on Unit Cost. The Air India Express airline also was best performed all three measures.

REFERENCE

[1] Khalil Ahmed, A comparative analysis of productivity of airline industry: evidence from selected Asian airline, Vol.2 No.15, August 2011, International Journal of Business and Social Science.
[2] Dr.A.Muthusamy and G.Kalpana, Operational and Productivity efficiency of International Airlines in India, Vol.2, Issue 1, 2018, ISSN:2456-6683, IF: 3.449, International Journal of Research Culture Society
[3] G. Kalpana, Dr.A.Muthusamy, An Empirical Analysis of Working Capital Mangement of Selected airline companies in India. DOI:10.18843/ijms/v5i2(5)/08. ISSN:2231-2528. International Journal Management Studies.
[4] https://business.mapsofindia.com
[5] www.ICAO.OACI.NKAO
[6] www.jetairways.com
[7] www.airindia.com
[8] www.interglobeaviation.com
[9] www.airindiaexpress.com
[10] www.spicejet.com