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ANALYSIS OF THE FINANCIAL PERFORMANCE OF AIRLINE COMPANIES IN STAR ALLIANCE USING LOPCOW-TOPSIS METHODS

İbrahim YAVUZ¹ 00



This study aims to comparatively evaluate the financial performance of the airlines included in Star Alliance for the period 2018-2022 (pre-COVID-19, COVID-19 and post-COVID-19 periods). For the performance evaluation, 5 criteria and a total of 9 financial performance ratios were used. The LOPCOW method was used to determine the criterion weights of the calculated financial performance ratios and the TOPSIS method was used to determine the performance rankings. According to the results of the LOPCOW analysis, the most important criterion was determined as net profit/total assets (PR3) for 2018, net profit/total equity (PR2) for 2019 and 2021, short-term debt/total assets (FSR3) for 2020 and net profit/net sales (PR1) for 2022. The criterion with the lowest importance weight was net balance sheet position/equity (CA) for 2018, 2019, and 2021, net sales/ current assets (AT) for 2020, and short-term debt/total assets (FSR3) for 2022. According to the TOPSIS performance evaluation results, the best-performing airline was Shenzhen Airlines in 2018, 2019 and 2020, Thai Airways International in 2021, and Aegean in 2022. The airlines that ranked last in the performance ranking were Croatia Airlines in 2018, Asian Airlines in 2019, Thai Airways International in 2020, Air Canada in 2021, and Air China in 2022.

Keywords: Star Alliance Airlines, Financial Performance, Multi-Criteria Decision Making Techniques, LOPCOW, TOPSIS.

JEL Classification Codes: Z3, Z31, M4, M41

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INTRODUCTION

Air transportation has an important place in the transportation sector as it is fast, reliable, safe, and economical (General Directorate of Civil Aviation, 2014). In recent years, there have been many developments that have increased the importance of airline companies in both transportation and global commercial activities. The trade liberalization between countries, business model renewal, starting open markets, and expansion of the air transport networks have made the sector more competitive (Bakır et al., 2020). The increasing demand for air transportation has also raised issues, such as how to provide the most appropriate service to customers, and the adequacy of the level of performance and competitiveness (Belton & Stewart, 2002).

One of the important developments affecting the aviation industry is COVID-19. After COVID-19, the aviation sector has gone through a recovery process. The number of passengers carried by air increased by approximately 47%, and Revenue Passenger Kilometres (RPK) by approximately 70% in 2022 compared to 2021 due to the rapid recovery of most international routes. Annual

passenger revenues of airlines grew by 50% in 2022 compared to the previous year. With the strong recovery in airline passenger demand, passenger numbers in 2022 are estimated to have reached approximately 74% of the pre-pandemic number, and passenger revenues are estimated to have reached 68% of the revenue level in 2019 (Directorate General of Civil Aviation, 2022).

It has been stated that the total air traffic in 2022, based on paid passenger-km, increased by 64.4% compared to 2021, with the air traffic in 2022 at 68.5% of prepandemic (2019) levels. It was reported that in 2022, the international traffic increased by 152.7% compared to 2021 and reached 62.2% of pre-pandemic levels, while the domestic traffic increased by 10.9% compared to the previous year and reached 79.6% of the pre-pandemic levels. EUROCONTROL published a report containing the forecasts of the organizations regarding the elimination of the negative effects of COVID-19 on the aviation sector and the return to the pre-COVID-19 growth figures. According to the report, the European aviation sector was estimated to reach 92% of its 2019 level in 2023. These forecasts were based on the impact of the war in Ukraine, the pressure on energy prices, and the COVID-19 recovery.

According to the optimistic expectation, the recovery of the aviation sector was expected to continue until 2023 according to the optimistic forecast, until 2025 according to the baseline forecast, and until 2028 according to the pessimistic forecast (Directorate General of Civil Aviation, 2022).

Turkiye has recovered faster than other countries as a result of the support provided to the sector and the right steps taken during the COVID-19 process. According to EUROCONTROL's analysis for 2022, Turkiye ranked 6th among the countries with the highest number of takeoffs/landings in Europe with 948 thousand flights. Turkish Airlines ranked 3rd among the airlines with the highest number of flights with an average of 1,245 daily flights. Istanbul Airport, the meeting point of the world, was the busiest airport in Europe with an average of 1,156 daily flights (General Directorate of Civil Aviation, 2022).

Considering the above-mentioned data on the sector, it is believed that the impact of the aviation sector on the growth of national economies will also be significant. Potential and existing investors, shareholders, and lenders, who are among a wide range of stakeholders, make various performance measurements to evaluate the performance of airline companies. When measuring financial performance, multi-criteria decision-making techniques are utilized in financial measurements with multiple criteria and alternatives.

The purpose of this study is to examine the financial performance of airline companies listed on https://www. staralliance.com/en/ in the pre-COVID-19, COVID-19 and post-COVID-19 periods. In the research, the years 2018 and 2019 were selected as the pre-COVID-19 period, 2020 as the COVID-19 period, and 2021 and 2022 as the post-COVID-19 period, considering that the impact of the pandemic would decrease on the financial performance of Star Alliance airline companies. In the study, firstly, the literature review is given, then the methodology, research universe, financial performance ratios to be used in the research, and the methods used in the research are mentioned. The LOgarithmic Percentage Change-driven Objective Weighting method (the LOPCOW method) was used to determine the criteria (importance) weights of the calculated financial performance ratios, and the Technique for Order Preferences by Similarity to an Ideal Solution (the TOPSIS method) was used to determine the performance rankings.

LITERATURE REVIEW

When the literature is examined, it is seen that many studies have been conducted on the performance evaluation of enterprises using multi-criteria decision-making techniques. Considering the purpose and scope of the study, the literature review section includes studies on the evaluation of the financial performance of airline companies using multi-criteria decision-making techniques. Some studies using the LOPCOW method, which is the criteria weighting method used in this research, are also included.

Chang and Yeh (2001) analyzed the performance of 5 domestic airlines in Taiwan with the main criteria of cost, efficiency, service quality, price, and 11 sub-criteria. The Simple Additive Weighting (SAW), Weighted Product (WP), and TOPSIS methods were used in the analysis and the best-performing airline was found to be Eastern Airlines.

Wanke, Barros, and Chen (2015) analyzed the financial performance of 35 airlines operating in Asia for the years 2006-2012 using the TOPSIS method. The criteria used in the study were operating cost, total assets, revenues, depreciation, salaries, fixed assets, and Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA). It was found that cost structure, ownership type, market position, and the distance program offered have significant impacts on the efficiency levels of airline operations.

Avcı and Çınaroğlu (2018), analyzed the financial performance of five airlines operating in Europe (Turkish Airlines, Lufthansa, EasyJet, Air France-KLM, and Rynair) using the Analytical Hierarchy Process (AHP) and TOPSIS methods. Current ratio, financial leverage ratio, asset turnover ratio, return on assets, equity multiplier, cash ratio, equity turnover ratio, and return on equity were used as criteria. It was determined that Ryanair had the best financial performance and Lufthansa had the worst financial performance.

Dağlı (2021) calculated the financial ratios using the financial data of the seven airline companies in the top ten in Europe for the second quarter of 2019, the fourth quarter of 2019 and the second quarter of 2020, and performed a financial performance analysis using the TOPSIS method. The performance ranking in the second quarter of 2019 was Pegasus Airlines, International Airlines Group, Aeroflot Airlines, Norwegian Airlines, Air France-KLM Group, Turkish Airlines and Lufthansa, respectively. The financial performance ranking in the fourth quarter

of 2019 was as follows: Air France-KLM Group, Lufthansa, Aeroflot Airlines, Turkish Airlines, International Airlines Group, Pegasus Airlines and Norwegian Airlines. The financial performance ranking in the second quarter of 2020 was determined as Norwegian Airlines, Pegasus Airlines, Turkish Airlines, Aeroflot Airlines, Air France-KLM Group, International Airlines Group and Lufthansa.

Teker, Teker and Polat (2022), analyzed the financial performance of the top 11 airlines in the world for the period 2019-2020-2021 (Covid period) using the TOPSIS method. In the study, airlines are grouped as US Airlines, European Airlines and Chinese Airlines. The result of the analysis shows that the COVID period significantly affects the profitability and operational efficiency of airline companies. As a result of the study, it was observed that China-based airlines managed the COVID period better than US and European airlines.

Bektaş (2022) analyzed the performance of the Turkish insurance sector for the period 2002-2021 using the Method based on the Removal Effects of Criteria (MEREC), LOPCOW, COCOSO, and Evaluation based on the Distance from Average Solution (EDAS) method. According to the results of the study, the most important criteria were found as total claims paid, total equity, and total assets, respectively. With COCOSO and EDAS methods, it was found that the best performance was in 2020.

Ecer and Pamucar (2022) analyzed the performance of nine banks operating in Turkey and published sustainability reports by using LOPCOW and DOmbi Bonferroni (DOBI) methods. In the study, banks were analyzed in terms of three main dimensions of sustainability and seventeen criteria created from these dimensions. It was determined that average return on equity, electricity consumption, number of branches and number of employees are the four most important criteria for sustainability and Garanti BBVA had the best sustainability performance.

Bektaş (2023) analyzed Akbank's sustainability performance for the period 2009-2021 with the LOPCOW and Combined Compromise Solution (COCOSO) methods. The most important criterion in the economic category was return on equity. The most important criterion in the social category was the total number of ATMs. The most important criterion in the environmental category was Scope 1 emissions. According to the COCOSO analysis, the best sustainability performance was achieved in 2018, 2017, and 2014, respectively.

Sürmeli Sarıgül, Ünlü, and Yaşar (2023) analyzed the financial performance of 6 airlines operating in Europe for the years 2019-2021 based on 8 financial criteria. The Criteria Importance Through Intercriteria Correlation (CRITIC) method was used to determine the weight levels of the criteria, and Multi-Attribute Utility Theory (MAUT) and Measurement of Alternatives and Ranking according to Compromise Solution (MARCOS) methods were used to obtain the financial performance ranking. The most important criterion is asset turnover ratio in 2019. The most important criterion is the financial leverage ratio in 2020 and 2021. It was determined that the airline with the best financial performance was Air France in 2019, 2020, and 2021 according to the MAUT method, but Pegasus Airlines in 2019, and EasyJet in 2020 and 2021 according to the MARCOS method.

Gülcemal and İzci (2024) conducted a financial performance analysis of the Turkish Participation Banking sector for the period January 2021-October 2022 using LOPCOW and Multi-Objective Optimization on the basis of Simple Ratio Analysis (MOOSRA) methods. In the study, the performance of participation banks was evaluated on 6 criteria using total sector data. These criteria are dividends received, loans, return on equity, return on assets, foreign resources/total equity, and operating expenses/average total assets. The most important criterion is the foreign resources/total equity criterion. The sector's best performance period was October 2022 and the worst performance period was January 2021.

Apart from the studies summarized above, there are other studies on analyzing the financial performance of airline companies using multi-criteria decision-making techniques: Kurt and Kablan (2022), Bae, Gupta and Mau (2021), Ellibeş and Candan (2021), Köse (2021), Perçin and Aldalou (2018), Pestana Barros and Wanke (2015), Ömürbek and Kınay (2012), Torlak, Sevkli, Sanal & Zaim (2011), Wang (2008), Feng and Wang (2000).

RESEARCH METHODOLOGY

The research is designed in three stages. In the first stage, the financial ratios given in Table 2 were calculated from the financial statements of the airline companies for the relevant years. In the 2nd stage, the criteria (importance) weights of the financial ratios obtained by the LOPCOW method, which is an objective criteria weighting method, were obtained. In the 3rd stage, in order to determine the performance rankings of airline companies, the criterion weights obtained by the LOPCOW method were used in the TOPSIS method, which is a performance ranking method.

RESEARCH POPULATION AND VARIABLES TO BE USED IN THE RESEARCH

In this study, 26 airline companies listed on https://www.staralliance.com/en/were selected as the main population for the period 2018-2022. The following criteria were taken into consideration when determining the research population:

- While calculating the financial performance ratios, the consolidated financial statements of the group, if any, including the airline companies were taken into consideration.
- Airline companies that made financial reporting for the period January 1-December 31 were included in the research population. Accordingly, ANA, Air New Zealand, EGYPTAIR, Ethiopian Airlines, Scandinavian Airlines, Singapore Airlines, and South African Airways were excluded from the research population.
- 3. Air India and LOT Polish Airlines were not included in the research population since their annual financial reports were not available on the official website.
- Avianca's annual financial reports for the years 2018-2022, which is the research period, were not included in the research population as they were not fully available on the official website of Avianca.
- 5. Since Austrian Airlines, Swiss International Airlines and Brussels Airlines are part of Lufthansa Group, the financial performance ratio was calculated by using the annual reports of Lufthansa Group.

According to the information given above, the research population is as shown in Table 1 below:

Table 1: Research Population

The annual financial statement data for the years 2018 and 2022 were used in the study. The data were obtained from the official websites of the airline companies. Considering the research in the literature, the financial ratios that reflect the general performance results of airline companies were selected. Table 2 lists the financial ratios used in the study. If the annual activity report of the relevant airline is in a currency other than "euro", the financial statement data are converted into "euro/currency of the relevant country" at the end of the year and the financial ratios are calculated. The financial ratios/criteria to be used in the study, calculation method, target criteria, and symbol of the financial ratios/criteria are given in Table 2.

In column 3 of Table 2, the targets to be achieved in terms of the financial ratios are shown. Thus, the maximum asset turnover, profitability ratios, liquidity ratios, and capital adequacy ratios may positively affect both business performance and investor decisions in favor of the business. The minimization of shortterm debt/total assets and total debt/total assets, which are among the financial structure ratios, can be welcomed positively. While creating ideal solutions in the application stage of the TOPSIS method to be used in this study, which aspect (benefit factor/cost factor) is important for decision-makers in terms of the contribution of the relevant ratios to performance was taken into account. In addition, in the application stage of the TOPSIS method, the importance weights for each criterion were calculated by using the LOPCOW method.

	Code	Airline Operation	Country of Operation
1	ACAN	Air Canada	Canada
2	ACHN	Air China	China
3	AEA	Aegean	Greece
4	ASAIR	Asiana Airlines	South Korea
5	COPAIR	Copa Airlines	Panama
6	CROAIR	Croatia Airlines	Croatia
7	EVA	EVA Air	Taiwan
8	LUF	Lufthansa	Germany
9	SHEAIR	Shenzhen Airlines	China
10	TAP	TAP Air Portugal	Portugal
11	THAIR	Thai Airways International	Thailand
12	TUAIR	Turkish Airlines	Turkiye
13	UNAIR	United Airlines	USA

Table 2: Financial Ratios Used in the Study

Criteria	Calculation Format	Target	Symbol
Asset Turnover	Net sales/current assets	Maximum (benefit)	AT
	Current Assets/Total Assets	Maximum (benefit)	FSR1
Financial Structure Ratios	Total debt/total assets	Minimum (cost)	FSR2
	Short-term debt/total assets	Minimum (cost)	FSR3
	Net profit/net sales	Maximum (benefit)	PR1
Profitability ratios	Net profit/total equity	Maximum (benefit)	PR2
	Net profit/total assets	Maximum (benefit)	PR3
Liquidity ratio (Current Ratio)	Current assets/short-term debt	Maximum (benefit)	CR
Capital Adequacy	Net Balance Sheet Position/ equity	Maximum (benefit)	CA

METHODS USED IN THE RESEARCH

In this section of the study, two multi-criteria decision-making methods are described, namely the objective criteria weighting method, LOPCOW, and performance ranking method, TOPSIS.

The LOPCOW Method

The LOPCOW method is one of the multi-criteria decision-making techniques and was introduced to the literature by Ecer and Pamucar (2022). In this method, there is no limit to the number of criteria included in the decision matrix created in the first step. The LOPCOW method proposes a solution according to whether the criteria are benefit or cost-oriented. In case there is a dimension difference (data gap) in the data, the method eliminates this problem by taking the percentage of the standard deviation of the mean square values of the series. The LOPCOW method is not affected by negative values. The method consists of four steps (Ecer and Pamucar, 2022; Bektas, 2022).

Step 1: Creating the Decision Matrix

In the first step, the internal decision matrix (IDM) given in Equation (1) is constructed to identify and solve the decision problem. In Equation (1), m is the number of alternatives and n is the number of criteria. The decision matrix is created with the help of Equation (1).

$$IDM = \begin{bmatrix} x_{11} & \cdots & x_{1j} & \cdots & x_{1n} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ x_{m1} & \cdots & x_{mj} & \cdots & x_{mn} \end{bmatrix}$$
(1)

Step 2: Creating the Normalized Decision Matrix

Each criterion is subjected to the normalization process with the linear normalization technique (max-min), taking into account the cost and benefit characteristics of the internal decision matrix elements in the decision matrix. The normalization process is performed as in Equation (2) and Equation (3). If the criterion is cost-oriented (if it is desired to be minimum), it is calculated by Equation (2), and if the criterion is benefit-oriented (if it is desired to be maximum), it is calculated by Equation (3).

$$r_{ij} = \frac{x_{max} - x_{ij}}{x_{max} - x_{min}} \tag{2}$$

$$r_{ij} = \frac{x_{ij} - x_{min}}{x_{max} - x_{min}} \tag{3}$$

Step 3: Creating the PVij Matrix of Percentage Values for Each Criteria

The percentage value of each criterion is calculated as the mean square value as a percentage of the standard deviations of each criterion. Here, the difference (gap) due to the size of the data is eliminated. Percentile values are calculated as in equation (4):

$$PV_{ij} = \left| ln \left(\frac{\sum_{i=1}^{m} r_{ij}}{\sigma} \right) * 100 \right|$$
 (4)

Step 4: Calculation of Objective Weights (Wj)

The objective importance weight for each criterion is calculated by Equation (5).

$$w_j = \frac{PV_{ij}}{\sum_{i=1}^n PV_{ij}} \tag{5}$$

TOPSIS Method

The TOPSIS method was introduced to the literature by Hwang and Yoon (1981) and is one of the multi-criteria decision-making techniques that enables the selection of the alternative that is closest to the positive ideal solution (optimal solution, decision point) and the alternative that is farthest from the negative ideal solution. The positive ideal solution ensures that the benefit/maximum criteria are maximized and the cost/minimum criteria are minimized. The negative ideal solution minimizes the benefit/maximization criteria and maximizes the cost/minimization criteria. The TOPSIS method consists of six steps (Hwang and Yoon, 1981; Wang and Elhag, 2006; Tzeng and Huang, 2011; Behzadian et. al., 2012; Zhu et. al., 2012; Işık, 2019).

Step 1: In the decision matrix, the rows contain the decision points (decision units, decision alternatives) whose performance is to be compared up to "m1, m2,, mn" and the columns contain the decision criteria (evaluation factors) to be used in decision making. The size of the decision matrix (evaluation matrix) is m*n

$$X \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1n} \\ x_{21} & x_{22} & \dots & x_{2n} \\ \vdots & & & \vdots \\ x_{m1} & x_{m2} & \dots & x_{mm} \end{bmatrix}$$

$$(6)$$

Step 2: The decision matrix is normalized using equation (7) below:

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^{2}}}, i = 1, 2, 3, ..., m, \text{ and } j = 1, 2, 3, ..., n$$
(7)

Step 3: Normalized decision matrix: A weighted normalized decision matrix is obtained by multiplying the weight values of the decision units obtained by the LOPCOW method. Weighted normalized values () are calculated with the help of equation (8):

$$v_{ij} = w_j * r_{ij}, i = 1,2,3,...,m \text{ and } j = 1,2,3,...,n$$
 (8)

In the above equation, $w_j \sum_{i=1}^n w_j = 1$ denotes the weight of criterion *i*.

Step 4: Positive ideal solutions and negative ideal solutions are calculated with the help of equation (9) and equation (10) below:

$$A^{+} = \left\{v_{1}^{+}, v_{2}^{+}, ..., v_{j}^{+}, ..., v_{n}^{+}\right\} = \left\{\left(\max_{i} v_{ij} \middle| j \in J_{1}\right), \left(\min_{i} v_{ij} \middle| j \in J_{2}\right), i = 1, 2, ..., m\right\} (9)$$

$$A^{+} = \left\{v_{1}^{+}, v_{2}^{+}, ..., v_{j}^{+}, ..., v_{n}^{+}\right\} = \left\{\left(\max_{i} v_{ij} \middle| j \in J_{1}\right), \left(\min_{i} v_{ij} \middle| j \in J_{2}\right), i = 1, 2, ..., m\right\} (10)$$

Here, $J_{\scriptscriptstyle I}$ is the benefit criterion set, while $J_{\scriptscriptstyle 2}$ is the cost criterion set.

Step 5: Based on the Euclidean distance approach, the distances of each alternative to the positive ideal (D_i^-) and negative ideal (D_i^-) solution points are calculated with the help of equation (11) and equation (12) below:

$$D_{i}^{+} = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_{j}^{+})^{2}}, i = 1, 2, 3, ..., m$$
(11)

$$D_{i}^{-} = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_{j}^{-})^{2}}, i = 1, 2, 3, ..., m$$
(12)

Step 6: The relative closeness coefficient of each alternative to the ideal solution, C_i is calculated by the equation below:

$$D_{i}^{-} = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_{j}^{-})^{2}}, i = 1, 2, 3, ..., m$$
(13)

 $0 < C_i \le 1$ being in Equation (13), C_i the coefficient taking the value of 1 shows that the relevant alternative is at the positive ideal solution point, and taking the value of 0 shows that the relevant alternative is at the negative ideal solution point. At this stage, the C_i values are compared with each other, and the alternatives are ranked in descending order. The alternative with the highest C_i value is evaluated as the highest-performing alternative compared to the other alternatives.

FINDINGS

LOPCOW and TOPSIS methods were applied respectively for the relevant years and the results obtained are shown below in summary tables. More detailed analysis results are given in the Appendix.

LOPCOW Analysis Results

The LOPCOW criteria (importance) weights of the criteria for each year were calculated by applying the stages of the LOPCOW weighting method respectively, and the results are summarized in Table 3.

The most important criteria are net profit/total assets (PR3) for 2018, net profit/total equity (PR2) for 2019 and 2021, short-term debt/total assets (FSR3) for 2020 and net profit/net sales (PR1) for 2022. The criteria with the lowest importance weight are net balance sheet position/equity for 2018, 2019, and 2021 (CA), net sales/current assets for 2020 (AT), and short-term debt/total assets for 2022 (FSR3).

	2018	2018	2019	2019	2020	2020	2021	2021	2022	2022
Criteria	Wj	Rank	Wj	Rank	Wj	Rank	Wj	Rank	Wj	Rank
CR	0,0651	7	0,0857	8	0,0919	6	0,1110	5	0,0928	8
PR1	0,0457	8	0,1036	7	0,1543	2	0,0909	7	0,1399	1
PR2	0,1744	2	0,1692	1	0,1253	5	0,2089	1	0,1144	4
PR3	0,1926	1	0,1395	2	0,1349	4	0,1335	3	0,1101	6
AT	0,0888	6	0,1201	4	0,0372	9	0,0764	8	0,1216	2
CA	0,0376	9	0,0333	9	0,0709	8	0,0012	9	0,1151	3
FSR1	0,0942	5	0,1086	6	0,0852	7	0,1075	6	0,1005	7
FSR2	0,1430	4	0,1160	5	0,1379	3	0,1557	2	0,1130	5
FSR3	0,1585	3	0,1239	3	0,1624	1	0,1149	4	0,0926	9

Table 4: Relative Proximity Coefficients to the Ideal Solution and Performance Rankings-TOPSIS Analysis Results

Business Code	2018 ROCS	2018 Rank	2019 ROCS	2019 Rank	2020 ROCS	2020 Rank	2021 ROCS	2021 ROCS	2022 ROCS	2022 Rank
ACAN	0,5646	9	0,6288	2	0,6388	8	0,2268	13	0,5704	11
ACHN	0,6585	5	0,5455	8	0,7326	5	0,6126	10	0,2964	13
AEA	0,7414	2	0,6276	3	0,6355	9	0,6597	6	0,7918	1
ASAIR	0,2502	12	0,1489	13	0,7513	4	0,6221	9	0,7299	8
COPAIR	0,6062	8	0,6169	5	0,7060	7	0,6681	4	0,7821	3
CROAIR	0,2479	13	0,3478	10	0,6053	10	0,5700	11	0,5551	12
EVA	0,6423	7	0,5155	9	0,7927	2	0,6733	3	0,7317	6
LUF	0,6825	4	0,5510	7	0,5759	12	0,6283	8	0,7314	7
SHEAIR	0,7632	1	0,7394	1	0,8039	1	0,6890	2	0,7004	9
TAP	0,3077	10	0,2775	11	0,5938	11	0,5036	12	0,7600	4
THAIR	0,2561	11	0,1513	12	0,3270	13	0,8075	1	0,6507	10
TUAIR	0,6436	6	0,5585	6	0,7622	3	0,6655	5	0,7831	2
UNAIR	0,7014	3	0,6244	4	0,7212	6	0,6427	7	0,7478	5

TOPSIS Performance Ranking Results

The stages of the TOPSIS method were applied in order and the relative closeness coefficients to the ideal solution (ROCS) were calculated for each alternative and the performance rankings of the alternatives in line with these calculations are summarized in Table 4.

According to the data in Table 4, in the period covering the years 2018-2022, the position of the airline companies in the performance ranking varies over the years. The evaluations regarding the performance of airlines for the pre-COVID-19, COVID-19, and post-COVID-19 periods are summarized below:

1. The best-performing airline was Shenzhen Airlines in 2018, 2019, and 2020, Thai Airways International in 2021, and Aegean in 2022.

- The last airline in the performance ranking was Croatia Airlines in 2018, Asiana Airlines in 2019, Thai Airways International in 2020, Air Canada in 2021, and Air China in 2022.
- The airline companies whose performance ranking increased in 2020, which was selected as the COVID-19 period, compared to 2019, which was selected as the pre-COVID-19 period are Air China, Asiana Airlines, TAP Airlines, and Turkish Airlines.
- The airlines whose performance ranking decreased in 2020, the COVID-19 period, compared to 2019, the pre-COVID-19 period, were Air Canada, Aegean, Copa Airlines, Croatia Airlines, Lufthansa and United Airlines.

- In 2021 and 2022, the post-COVID-19 period, Aegean, Copa Airlines, and Lufthansa were the airlines whose performance ranking increased in both years compared to 2020, while Air China, Croatia Airlines, EVA, and Shenzhen Airlines were the airlines whose performance ranking decreased in both years.
- 6. Turkish Airlines ranked 6th in 2018 and 2019, 3rd in 2020, 5th in 2021 and 2nd in 2022 in the performance ranking.

CONCLUSION

The airline sector, which is one of the components of the transportation sector that brings together many different sectors of the national and international economy, is of great importance for the development of commercial and tourism activities, ensuring economic growth and sustainability. In fact, the volume of transactions related to both passenger transportation and the transportation of commercial goods and services from one place to another by air is increasing day by day. This situation has also created a great competitive environment for domestic and international transportation. As a result of competition, information users, such as customers, current and potential investors, and shareholders, conduct performance measurements to evaluate the performance of airline companies for use in future decisions. One of the social phenomena that made information users important for performance measurement was COVID-19. Closures around the world due to the pandemic negatively affected the airline industry. Based on this, it was thought that it would be important to measure the financial performance of airline companies before, during, and after COVID-19, and the study was designed accordingly.

The aim of the study is to measure the financial performance of 13 out of 26 airlines (Lufthansa Group includes Austrian Airlines, Swiss International Airlines, and Brussels Airlines) in the Star Alliance, which includes the best airlines, and smaller and regional member airlines operating worldwide, for the years 2018-2022. In the calculation of financial performance, 9 criteria were selected: Net sales/ current assets, current assets/total assets, net profit/net sales, net profit/total equity, net profit/total assets, current assets/short-term debt, net balance sheet position/equity, total debt/total assets, and short-term debt/total assets. While the first 7 of these criteria are benefit (maximum) oriented, the last 2 are cost (minimum) oriented.

After calculating the financial ratios of the airline companies for the period January 1- December 31, 2018-2022, the analysis process started. The LOPCOW method was used to determine the importance weights of the criteria and the TOPSIS method was used to determine the performance ranking.

The results of the LOPCOW method analysis determined net profit/total assets (PR3) for 2018, net profit/total equity (PR2) for 2019 and 2021, short-term debt/total assets (FSR3) for 2020, and net profit/net sales (PR1) for 2022. The criterion with the lowest importance weight was net balance sheet position/equity (CA) for 2018, 2019, and 2021, net sales/ current assets (AT) for 2020, and short-term debt/total assets (FSR3) for 2022. These results show that while profitability ratios were the criteria with the highest criterion weight in 2018 and 2019, short-term debt/total assets (PR3), which is one of the financial structure ratios, was the most important criterion in the COVID-19 period, and profitability ratios were again the most important criteria in the following years.

According to the TOPSIS method analysis results, the top-performing airlines were Shenzhen Airlines in 2018, 2019, and 2020, Thai Airways International in 2021, and Aegean in 2022. The worst-performing airlines were Croatia Airlines in 2018, Asian Airlines in 2019, Thai Airways International in 2020, Air Canada in 2021, and Air China in 2022. In 2020, the COVID-19 period, the performance ranking of some airlines increased and some decreased compared to 2019. Air China, Asiana Airlines, TAP Airlines, and Turkish Airlines improved their performance ranking, while Air Canada, Aegean, Copa Airlines, Croatia Airlines, Lufthansa, and United Airlines decreased their performance ranking. In 2021 and 2022, Aegean, Copa Airlines, and Lufthansa were the airlines whose performance ranking increased in both years compared to 2020, while Air China, Croatia Airlines, EVA and Shenzhen Airlines were the airlines whose performance ranking decreased in both years. The performance ranking of Turkish Airlines operating in Turkey was 6 in 2018 and 2019, 3 in 2020, 5 in 2021, and 2 in 2022.

The results obtained in the research show that the financial performance of Star Alliance airline companies was generally negatively affected during the COVID-19 period, but the COVID-19 effect gradually decreased in 2021 and 2022. In Dağlı's (2021) study, it was determined that the performances of 7 airline companies in Europe before and during COVID-19 differed. In addition, this study also provides evidence for the results of Kurt and

Kablan's (2022) study, which is also mentioned in the literature review. Similarly, Teker, Teker, and Polat's (2022) study shows that the COVID period significantly affects the profitability and operational efficiency of airlines.

This study, which analyzes the financial performance of airline companies operating worldwide and participating in the Star Alliance, is thought to make important contributions to the airline industry in terms of the results obtained. When the literature is examined, although there are many financial performance analysis studies on airline companies, this study is unique because it analyzes the financial performance of airline companies in Star Alliance and it is thought to contribute to the literature.

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APPENDIX 1: 2018 LOPCOW Analysis Results

				Decision Matrix	ix				
Target Criteria	Мах	Max	Max	Max	Мах	Мах	Мах	Min	Min
Criteria	ę	Ğ	ć	Ĝ	ţ	ć	100	C	COS
Alternative	5	ž	787	Š	₹	5	I NCT	T3K2	2AC
ACAN	1,23573	0,00924	0,04141	0,00870	0,94103	4,75998	0,32823	0,78992	0,26561
ACHN	0,48605	0,05831	0,08174	0,03371	5,93789	2,42450	0,09737	0,58754	0,09737
AEA	1,28046	0,05720	0,24441	95860'0	1,63580	2,61232	0,64859	0,61720	0,50653
ASAIR	0,44925	-0,02727	916/1′0-	-0,02391	4,74574	7,49285	0,18479	0,86654	0,41133
COPAIR	1,01616	0,03290	0,04786	0,02155	2,51640	2,22051	0,26034	0,54965	0,25620
CROAIR	0,44584	-0,05058	-0,26527	-0,09401	98689′2	2,82211	0,24170	0,64559	0,54213
EVA	1,24742	0,04010	0,10289	16670′0	2,36731	3,43974	0,31508	0,70928	0,25259
LUF	0,65705	0,06034	0,22595	09950'0	0,93801	3,99175	0,27881	0,74948	0,42433
SHEAIR	2,39793	25895'0	0,14713	98220'0	9/88£′0	1,90182	0,35311	0,47419	0,14726
TAP	1,13472	-0,01846	-0,55407	-0,02636	2,07482	21,02108	0,68813	0,95243	0,60643
THAIR	0,55729	-0,05904	-0,56555	-0,04305	3,95506	13,13633	0,18438	0,92388	0,33086
TUAIR	0,86921	0,06436	0,12930	80/20′0	0,57623	3,48664	0,21733	0,71319	0,25004
UNAIR	0,54385	0,05159	0,21402	0,04758	5,74610	4,49794	0,16050	0,77768	0,29511
Max	2,39793	25895'0	0,24441	95860′0	98689′∠	21,02108	0,68813	0,95243	0,60643
Min	0,44584	-0,05904	55595'0-	-0,09401	9/88£′0	1,90182	0,09737	0,47419	0,09737
			Nor	Normalization of Criteria	riteria				
Criteria	;	ì	į	į	ļ	į		i	
Alternative	క	PR1	PR2	PR3	AT	క	FSR1	FSR2	FSR3
ACAN	0,40464	0,10967	0,74936	0,54758	0,07564	0,14949	0,39078	0,33982	0,66951
ACHN	0,02060	0,18848	0,79916	0,68094	0,76004	0,02734	0,00000	0,76298	1,00000
AEA	0,42756	0,18669	1,00000	1,00000	0,17080	0,03716	0,93307	0,70097	0,19625
ASAIR	0,00175	0,05103	0,47704	0,37372	0,59676	0,29243	0,14797	0,17959	0,38326
COPAIR	0,29216	0,14767	0,75733	0,61611	0,29141	0,01667	0,27586	0,84220	0,68800
CROAIR	0,00000	0,01358	0,37074	00000′0	1,00000	0,04813	0,24431	0,64159	0,12632
EVA	0,41063	0,15923	0,82527	99099′0	0,27099	0,08044	0,36853	0,50842	0,69510
LUF	0,10820	0,19175	0,97720	0,80297	0,07523	0,10931	0,30712	0,42436	0,35772
SHEAIR	1,00000	1,00000	0,87989	0,91364	0,00000	0,00000	0,43290	1,00000	0,90201
TAP	0,35290	0,06517	0,01418	0,36068	0,23093	1,00000	1,00000	0,00000	0,00000
THAIR	0,05710	00000′0	00000′0	0,27168	0,48846	0,58760	0,14728	0,05971	0,54134
TUAIR	0,21688	0,19819	0,85788	0,69890	0,02568	0,08289	0,20306	0,50025	0,70011
UNAIR	0,05021	0,17769	0,96247	0,75487	0,73377	0,13579	0,10685	0,36541	0,61156

				Square Matrix	×					
Criteria										
Alternative	ម	PR1	PR2	PR3	АТ	5	FSR1	FSR2	FSR3	
ACAN	0,16373	0,01203	0,56155	0,29984	0,00572	0,02235	0,15271	0,11547	0,44824	
ACHN	0,00042	0,03552	998£9′0	0,46368	99//5′0	0,00075	000000'0	0,58213	1,00000	
AEA	0,18280	0,03485	1,00000	1,00000	0,02917	0,00138	0,87061	0,49135	0,03852	
ASAIR	00000'0	09700′0	0,22757	29681'0	0,35612	0,08551	0,02190	0,03225	0,14689	
COPAIR	0,08536	0,02181	0,57355	0,37959	0,08492	0,00028	0,07610	0,70931	0,47335	
CROAIR	00000'0	0,00018	0,13745	00000′0	1,00000	0,00232	69650'0	0,41164	0,01596	
EVA	0,16862	0,02535	0,68107	0,43648	0,07344	0,00647	0,13581	0,25849	0,48316	
LUF	0,01171	2/980′0	0,95492	0,64475	99500′0	0,01195	0,09432	0,18008	0,12796	
SHEAIR	1,00000	1,00000	0,77421	0,83473	00000′0	00000'0	0,18740	1,00000	0,81363	
TAP	0,12454	0,00425	0,00020	0,13009	0,05333	1,00000	1,00000	0,00000	0,00000	
THAIR	0,00326	00000′0	00000′0	0,07381	0,23859	0,34528	0,02169	0,00356	0,29305	
TUAIR	0,04704	0,03928	0,73595	0,48847	99000′0	0,00687	0,04123	0,25025	0,49015	
UNAIR	0,00252	0,03157	0,92636	0,56983	0,53842	0,01844	0,01142	0,13352	0,37400	
Total	1,79000	1,24422	7,21148	5,46093	2,96370	1,50159	2,67287	4,16807	4,70490	
٤	13	13	13	13	13	13	13	13	13	
total/m	0,13769	0,09571	0,55473	0,42007	0,22798	0,11551	0,20561	0,32062	0,36192	
Square Root(total/m)	0,37107	0,30937	0,74480	0,64813	0,47747	0,33986	0,45344	0,56623	0,60159	
Standard Deviation (Standardization of Criteria)	0,27847	0,25292	0,34503	0,27715	0,32277	0,28790	0,29930	0,30145	0,29904	
Square Root(total/m)/Standard Deviation	1.33754	1.22319	2,15865	858887	1.47978	1.18051	1,51499	1.87840	2.01172	
(Standardization of Criteria)										
pwij	28,70855	20,14642	76,94844	84,95207	39,15549	16,59443	41,54096	63,04179	69,89925	440,987
wj	0,06510	0,04568	0,17449	0,19264	0,08879	0,03763	0,09420	0,14296	0,15851	1
Rank	7	8	2	1	9	6	5	4	3	

APPENDIX 2: 2018 TOPSIS Analysis Results

Target Criteria	Max	Max	Max	Max	Max	Max	Max	Min	Min
Weight Values	0,06510	0,04568	0,17449	0,19264	0,08879	0,03763	0,09420	0,14296	0,15851
Criteria	CR	PR1	PR2	PR3	AT	CA	FSR1	FSR2	FSR3
ACAN	1,23573	0,00924	0,04141	0,00870	0,94103	4,75998	0,32823	0,78992	0,26561
ACHN	0,48605	0,05831	0,08174	0,03371	5,93789	2,42450	0,09737	0,58754	0,09737
AEA	1,28046	0,05720	0,24441	95860'0	1,63580	2,61232	0,64859	0,61720	0,50653
ASAIR	0,44925	-0,02727	-0,17916	-0,02391	4,74574	7,49285	0,18479	0,86654	0,41133
COPAIR	1,01616	0,03290	0,04786	0,02155	2,51640	2,22051	0,26034	0,54965	0,25620
CROAIR	0,44584	-0,05058	-0,26527	-0,09401	2,68986	2,82211	0,24170	0,64559	0,54213
EVA	1,24742	0,04010	0,10289	0,02991	2,36731	3,43974	0,31508	0,70928	0,25259
LUF	0,65705	0,06034	0,22595	09950'0	0,93801	3/166′8	0,27881	0,74948	0,42433
SHEAIR	2,39793	0,56357	0,14713	982/0'0	0,38876	1,90182	0,35311	0,47419	0,14726
TAP	1,13472	-0,01846	-0,55407	-0,02636	2,07482	21,02108	0,68813	0,95243	0,60643
THAIR	0,55729	-0,05904	-0,56555	-0,04305	3,95506	13,13633	0,18438	0,92388	0,33086
TUAIR	0,86921	0,06436	0,12930	0,03708	0,57623	3,48664	0,21733	0,71319	0,25004
UNAIR	0,54385	0,05159	0,21402	0,04758	5,74610	4,49794	0,16050	0,77768	0,29511
				Normalization of Criteria	on of Criteria				
	(i	i	i i	ļ	ţ	i	1	i i
Alternative	ž	ž	rk2	PK3	Ā	5	FSKI	FSK2	FSK3
ACAN	0,31672	0,01575	0,04258	0,04578	0,06886	0,17015	0,26109	0,29891	0,20034
ACHN	0,12457	0,09933	0,08406	0,17742	0,43452	<i>2</i> 9980′0	0,07746	0,22233	0,07345
AEA	0,32818	0,09743	0,25135	0,49235	0,11970	88860'0	0,51592	0,23355	0,38206
ASAIR	0,11514	-0,08747	-0,28977	-0,53794	0,70513	0,10844	0,21148	0,31082	0,47376
COPAIR	0,26044	0,05604	0,04922	0,11342	0,18415	28640'0	0,20709	0,20799	0,19324
CROAIR	0,11427	-0,08616	-0,27280	-0,49472	0,56273	0,10088	0,19226	0,24430	0,40891
EVA	0,31971	0,06831	0,10581	0,15740	0,17324	0,12296	0,25063	0,26840	0,19052
LUF	0,16840	0,10279	0,23236	0,29786	0,06864	0,14269	0,22177	0,28361	0,32006
SHEAIR	0,61458	0,96000	0,15131	0,40711	0,02845	0,06798	0,28088	0,17944	0,11107
TAP	0,29083	-0,03145	-0,56980	-0,13870	0,15183	0,75142	0,54737	0,36041	0,45741
THAIR	0,14283	-0,10056	-0,58161	-0,22655	0,28942	0,46957	0,14667	0,34960	0,24955
TUAIR	0,22278	0,10963	0,13297	0,19515	0,04217	0,12463	0,17288	0,26988	0,18859
UNAIR	0,13939	0,08789	0,22010	0,25039	0,42049	0,16078	0,12767	0,29428	0,22260
			Multiplica	Multiplication of Normalized Matrices by Weight Values	d Matrices by Wei	ght Values			

Criteria Alternative	ម	PR1	PR2	PR3	АТ	5	FSR1	FSR2	FSR3
ACAN	0,02062	0,00072	0,00743	0,00882	0,00611	0,00640	0,02459	0,04273	0,03176
ACHN	0,00811	0,00454	0,01467	0,03418	0,03858	0,00326	0,00730	0,03178	0,01164
AEA	0,02136	0,00445	0,04386	0,09485	0,01063	0,00351	0,04860	68880'0	95090'0
ASAIR	0,00750	-0,00400	95050′0-	-0,10363	0,06261	0,00408	0,01992	0,04443	0,07509
COPAIR	0,01695	0,00256	65800′0	0,02185	0,01635	0,00299	0,01951	0,02973	0,03063
CROAIR	0,00744	-0,00394	-0,04760	08560'0-	0,04996	08800′0	0,01811	0,03492	0,06481
EVA	0,02081	0,00312	0,01846	0,03032	0,01538	0,00463	0,02361	0,03837	0,03020
LUF	0,01096	0,00470	0,04055	0,05738	60900'0	0,00537	0,02089	0,04054	0,05073
SHEAIR	0,04001	0,04386	0,02640	0,07843	0,00253	0,00256	0,02646	0,02565	0,01761
TAP	0,01893	-0,00144	-0,09943	-0,02672	0,01348	0,02828	0,05156	0,05152	0,07250
THAIR	0:600'0	-0,00459	-0,10149	-0,04364	0,02570	0,01767	0,01382	0,04998	0,03956
TUAIR	0,01450	0,00501	0,02320	0,03759	0,00374	0,00469	0,01629	85880'0	0,02989
UNAIR	0,00907	0,00402	0,03841	0,04824	0,03734	0,00605	0,01203	0,04207	0,03528
			Positive	Positive ideal solutions and negative ideal solutions	d negative ideal s	olutions			
A +	0,04001	0,04386	0,04386	0,09485	0,06261	0,02828	0,05156	0,02565	0,01164
Α-	0,00744	-0,00459	-0,10149	-0,10363	0,00253	0,00256	0,00730	0,05152	0,07509
	D	istance of each alt	ernative to the pc	Distance of each alternative to the positive ideal and negative ideal solution points and performance ranking	egative ideal solu	tion points and po	erformance rankir	gr.	
Alternative	Di+	-iO	כו	Rank					
ACAN	0,12672	0,16429	0,56455	6					
ACHN	0,10147	0,19566	0,65849	5					
AEA	0,08762	0,25121	0,74141	2					
ASAIR	0,24004	0,08010	0,25019	12					
COPAIR	0,11399	0,17549	0,60622	8					
CROAIR	0,22947	0,07565	0,24794	13					
EVA	0,10447	0,18760	0,64232	7					
LUF	0,10100	0,21706	0,68245	4					
SHEAIR	0,07424	0,23927	0,76320	1					
TAP	0,21117	0,09386	0,30770	10					
THAIR	0,21878	0,07533	0,25613	11					
TUAIR	0,10785	0,19476	0,64361	9					
UNAIR	0,09095	0,21361	0,70138	3					

APPENDIX 3: 2019 LOPCOW Analysis Results

Comman					Decision Matrix	ķ				
ACAN O.96669 O.07715 O.03345 O.03499 AT CA FSR1 FSR2 ACAN O.96669 O.07716 O.027469 O.027469 O.027469 O.027495 O.58090 O.07716 O.027469 O.027476 O.027469 O.027476 O.027470 O.006569 O.17718 O.027470 O.006569 O.027470 O.006769 O.027470 O.006769 O.07748 O.027470 O.006769 O.027470 O.006769 O.027470 O.006769 O.027470 O.006769 O.027470 O.006769 O.027470 O.027470 O.027470 O.027470 O.006770 O.027470 O.027470	Target Criteria	Мах	Мах	Max	Max	Max	Max	Max	Min	Min
ACAN 0.96669 0.07715 0.33545 0.05317 2.54537 6.30886 0.27076 0.68149 ACHN 0.31828 0.05180 0.07168 0.02469 5.65999 2.90346 0.06435 0.65582 ACHN 0.31828 0.06011 0.23913 0.05690 1.82939 4.06023 0.75370 0.06558 ASAR 0.34239 -0.11741 0.00007 0.00657 0.05659 2.19322 2.2198 0.13589 0.75370 CROAIR 0.40924 -0.1741 0.00007 0.00657 2.19222 2.2198 0.28352 0.75370 LUF 0.40924 -0.04824 0.01239 0.01352 2.24813 0.15839 0.15836 0.75869 SHENR 0.40924 0.02007 0.00650 0.17139 0.01382 2.3213 0.15869 0.75869 0.75869 0.75869 0.75869 0.75869 0.75869 0.75869 0.75869 0.75869 0.75869 0.75869 0.75869 0.75869 0.75869 0.	Criteria	క	PR1	PR2	PR3	AT	5	FSR1	FSR2	FSR3
ACAN 0.96669 0.07715 0.33545 0.02493 2,54537 6,50866 0,27076 0,04499 ACAN 0.031828 0.051809 0,02469 5,66099 2,90346 0,52830 0,53852 0,53870 ACAN 1,41084 0,06001 0,05880 1,82939 4,06023 0,53870 0,03570 ASAR 0,24239 0,11741 0,90047 0,06880 1,82939 1,486689 0,11558 0,53870 CROAIR 0,24239 0,11741 0,90047 0,06820 0,01329 1,22330 0,16890 0,13580 0,53814 0,53830 EVA 0,03648 0,02077 0,06209 0,01360 2,24813 0,16890 0,17806 0,03880 0,28449 0,83816 0,78840 0,18806	Alternative									
ACHN 0.31828 0.05189 0.07168 0.02469 5,65099 2,90346 0,65558 0,65558 ASAIR 1,41084 0,02047 0,203913 0,02890 1,48099 0,01359 0,035520 0,73552 0,73542 0,735429 0,735429 0,07350 0,735429 0,735429 0,07350 0,735429 0,01750 0,01750 0,00677 4,6208 1,23574 0,03524 0,03524 0,00677 0,00677 4,6208 1,24509 0,13529 0,03524 0,23527 0,03524 0,03524 0,03524 0,03529 0,01850 0,13509 0,13509 0,13509 0,03509 0,13	ACAN	69996'0	0,07715	0,33545	0,05317	2,54537	9880£′9	0,27076	0,84149	0,28009
AEA 1,41084 0,06001 0,23913 0,05890 1,82939 4,06025 0,53552 0,53274 COPAIR 0,04239 0,11744 0,00467 0,005690 1,41084 0,01153 0,11758 0,53274 CROAIR 0,04924 0,01246 0,02669 0,01366 2,1932 2,51313 0,16349 0,53842 EVA 0,093642 0,024824 0,02429 0,01362 2,4813 2,55133 0,16349 0,58866 SHEAIR 0,035642 0,02420 0,01362 2,4813 6,16319 0,03249 0,63860	ACHN	0,31828	0,05180	0,07168	0,02469	66059′5	2,90346	0,08435	0,65558	0,26503
ASAIR 0,34239 -0,11741 -0,90047 -0,00650 4,46308 0,11558 0,11558 0,93274 CODAIR 1,23337 0,01324 0,013249 0,01324 0,015398 0,11539 0,15399 0,015390 EVA 0,93642 0,04824 0,04824 0,04824 0,04824 0,04824 0,04824 0,04824 0,04829 0,05293 0,05393 0,05489 0,05293 0,01319 0,02918 3,22765 4,15942 0,24599 0,78966 HARR 0,70593 0,05480 0,15018 0,07186	AEA	1,41084	0,06001	0,23913	06850′0	1,82939	4,06025	0,53652	0/2370	0,38028
CCPAIR 1,23737 0,09123 0,12766 0,05699 2,19322 2,25198 0,28390 0,55595 CROAIR 0,04924 0,04824 0,12425 0,06217 7,8847 5,51313 0,16349 0,81861 LVA 0,04924 0,04827 0,04827 0,04827 0,02418 0,02918 3,22765 4,55903 0,16349 0,78588 EVA 0,70539 0,02418 0,12139 0,02918 3,22765 4,15442 0,78589 0,78588 SHEAIR 0,70539 0,02417 0,42268 0,12139 0,02918 3,22765 4,55903 0,18597 0,78589 0,78589 THAIR 0,508173 0,02696 0,10398 0,03388 2,65069 3,6002 0,19299 0,97389 Mix 0,54795 0,06960 0,26201 0,03388 2,68063 1,93085 0,18269 0,78189 Mix 0,54795 0,06960 0,26201 0,033188 0,03784 3,50022 0,19259 0,78189	ASAIR	0,34239	-0,11741	-0,90047	<i>2</i> 5090′0-	4,46308	14,86689	0,11558	0,93274	0,33757
FLAAR 0,40924 -0,04824 -0,34275 -0,006217 7,88247 5,51313 0,16349 0,81861 EVA 0,935442 0,02677 0,06209 0,01362 0,013620 0,013600 0,78966 0,78966 LUR 0,07053 0,02478 0,01386 0,1518 0,07778 0,53185 1,59085 0,24569 0,78066 TAP 1,06892 -0,02931 -0,10866 -0,01886 0,07788 0,53180 1,92085 0,43589 0,43299 0,93466 TAMR 0,58013 -0,02690 0,1086 -0,01882 2,60393 2,19298 0,93466 0,93884 0,93896 0,93466 0,9388 0,9389 0,93466 0,9388 0,9389 0,93466 0,9388 0,9389 0,9389 0,9388 0,9389 0,9389 0,9388 0,9388 0,9389 0,9388 0,9389 0,9388 0,9388 0,9388 0,9389 0,9388 0,9388 0,9389 0,9388 0,9388 0,9388 0,9388 0,9388 0,9388	COPAIR	1,23737	0,09123	0,12766	69950'0	2,19322	2,25198	0,28330	96555'0	0,22895
EVA 0,93642 0,02677 0,06209 0,01362 2,34813 4,55903 0,21670 0,78066 LUF 0,07533 0,02348 0,12139 0,02318 0,12139 0,02454 0,75858 0,7898 SHEAIR 0,07533 0,12268 0,12396 0,7186 0,07778 1,73901 38,30027 0,34598 0,7898 TAHAIR 0,28713 0,06665 1,02131 0,04682 1,02891 0,13299 0,93189 0,7824 UNAIR 0,58713 0,06668 0,11094 0,03388 2,65069 3,63027 0,13299 0,93189 MIA 0,58713 0,06668 0,11094 0,03388 2,65069 3,63027 0,13299 0,73244 MiA 0,31828 0,11741 1,02131 -0,06217 0,63189 1,23585 0,73889 Min 0,31828 0,11741 1,02131 -0,06217 0,53185 1,93085 0,18269 0,73889 ACAN 0,31828 0,11741 0,0231 <t< th=""><th>CROAIR</th><th>0,40924</th><th>-0,04824</th><th>-0,34275</th><th>-0,06217</th><th>7,88247</th><th>5,51313</th><th>0,16349</th><th>0,81861</th><th>05668'0</th></t<>	CROAIR	0,40924	-0,04824	-0,34275	-0,06217	7,88247	5,51313	0,16349	0,81861	05668'0
LUF 0,70593 0,03418 0,12139 0,02918 3,22765 4,15942 0,26454 0,75958 SHEARR 2,09171 0,42268 0,15018 0,07778 0,53185 1,93085 0,34599 0,42050 TAP 1,08922 -0,10393 -0,101086 -0,101856 1,75901 38,20027 0,34599 0,93738 THAR 0,80015 0,06663 -1,02131 -0,04862 3,65002 3,119488 0,13299 0,13299 0,95716 UNAIR 0,80015 0,06603 0,11094 0,033088 2,65069 3,60022 0,13299 0,95724 Max 2,09171 0,42268 0,13288 0,03308 2,65069 3,60022 0,13299 0,75224 Min 0,31828 0,17241 1,02131 0,05724 5,28322 4,57753 0,13299 0,73224 Max 2,011741 1,102131 0,05724 0,033185 0,11741 0,06270 0,13265 0,73284 ACAN 0,31828 0,11741 <th>EVA</th> <th>0,93642</th> <th>0,02677</th> <th>0,06209</th> <th>0,01362</th> <th>2,34813</th> <th>4,55903</th> <th>0,21670</th> <th>99082'0</th> <th>0,23141</th>	EVA	0,93642	0,02677	0,06209	0,01362	2,34813	4,55903	0,21670	99082'0	0,23141
THEAIR 2,09171 0,42268 0,15018 0,07778 0,53185 1,93085 0,43599 0,48209 TAP 1,06892 -0,02931 -0,71086 -0,04882 1,75901 38,30027 0,53599 0,97389 THAIR 0,58713 -0,040865 -1,02131 -0,04082 2,63390 3,63002 0,19599 0,97389 UNAIR 0,58013 0,060638 0,11094 0,03088 2,65002 3,60022 0,19299 0,92416 Min 0,58017 0,060638 0,11094 0,03088 2,68322 4,57753 0,19299 0,73244 Min 0,31828 0,11741 -1,02131 -0,06217 0,53182 0,73252 0,73252 0,73262 ACAN 0,31828 AT ASAIR ACAN 0,00000 0,3330 0,88510 0,17622 0,02637 0,4772 ACAN 0,00000 0,31330 0,89591 0,22042 0,02642 0,02642 0,02642 0,17620 0,03652 ACAN	LUF	0,70593	0,03418	0,12139	0,02918	3,22765	4,15942	0,26454	0,75958	0,37474
TAP 1,06892 -0,02931 -0,1086 -0,01856 1,75901 38,30027 0,35997 0,97389 TUAIR 0,58713 -0,06655 -1,02131 -0,04682 3,63950 21,81468 0,19299 0,92416 UNAIR 0,58713 0,06658 -1,02131 -0,04882 3,63950 0,19299 0,92516 NAIR 0,54795 0,06038 0,07784 2,65069 3,60027 0,07324 3,63027 0,15365 0,78154 Min 0,31828 -0,11741 -1,02131 -0,06217 0,53185 1,93085 0,08435 0,78159 Min 0,31828 -0,11741 -1,02131 -0,06217 0,53185 1,93085 0,084209 0,78200 ACAN Min ACAN	SHEAIR	2,09171	0,42268	0,15018	8///0′0	0,53185	1,93085	0,34598	0,48209	0,16541
THAIR 0,58713 -0,06665 -1,02131 -0,04682 3,63950 21,81468 0,19299 0,95416 TUAIR 0,80015 0,06638 0,11094 0,03388 2,65669 3,60022 0,19295 0,72244 Max 0,054795 0,06660 0,24201 0,05774 2,53822 4,57753 0,13565 0,78154 Min 0,31828 -0,1741 -1,02131 -0,06217 0,58824 3,50027 0,13565 0,78154 Min 0,31828 -0,1741 -1,02131 -0,06217 0,58824 1,93085 0,08435 0,78835 0,78835 0,78835 0,78836 0,78836 0,78836 0,78836 0,78836 0,78836 0,78836 0,78837 0,78836 0,78837 0,78836 0,78836 0,78836 0,78836 0,78837 0,78837 0,78836 0,78836 0,78837 0,78837 0,78837 0,78837 0,78837 0,78837 0,78837 0,78837 0,78837 0,78837 0,78837 0,78837 0,78837 0,7	TAP	1,06892	-0,02931	-0,71086	-0,01856	1,75901	38,30027	0,35997	68826'0	0,33678
TUAIR 0,80015 0,06038 0,11094 0,03088 2,65069 3,60022 0,19295 0,72224 UNAIR 0,54795 0,06960 0,26201 0,05724 5,28322 4,57753 0,15565 0,78154 Min 0,54795 0,06960 0,26201 0,07778 7,88247 38,30027 0,53652 0,78154 Min 0,31828 -0,11741 -1,02131 -0,06217 0,53185 1,93085 0,08435 0,78269 ACHA Cotean PR1 PR2 PR3 AT CA FSR1 FSR2 ACHN 0,38563 0,36025 1,00000 0,82418 0,27392 0,12038 0,41225 0,26921 ACHN 0,00000 0,31330 0,86559 0,62065 0,69642 0,00000 0,44772 ACHN 0,01360 0,12861 0,2281 0,28651 0,17652 0,026528 0,026942 0,00000 0,44772 ACAN 0,01360 0,12861 0,28651 0,28652 <	THAIR	0,58713	-0,06665	-1,02131	-0,04682	3,63950	21,81468	0,19299	0,95416	0,32870
UNAIR 0,54795 0,06960 0,26201 0,05724 5,28322 4,57753 0,15565 0,78154 Max 2,09171 0,42268 0,33545 0,07778 7,88247 38,30027 0,53652 0,97389 Min 0,31828 -0,11741 -1,02131 -0,06217 0,53185 1,93085 0,08435 0,97389 Alima 0,31828 -0,11741 -1,02131 -0,06217 0,53185 1,93085 0,08435	TUAIR	0,80015	0,06038	0,11094	0,03088	2,65069	3,60022	0,19295	0,72224	0,24114
Min 2,09171 0,42268 0,33545 0,07778 7,88247 38,30027 0,53652 0,97389 Min 0,31828 -0,11741 -1,02131 -0,06217 0,53185 1,93085 0,68435 0,97389 criteria Normalization of Criteria criteria Criteria ACAN RR PR1 PR2 PR3 AT CA FSR1 FSR2 ACAN 0,36563 0,36025 1,00000 0,82418 0,27392 0,12038 0,41225 0,26921 ACAN 0,0180 0,38551 0,02201 0,02401 0,02422 0,02642 0,02674 0,00000 0,44772 ACAN 0,0180 0,38851 0,28069 0,02807 0,01144 0,23482 0,02800 0,64723 COPAIR 0,0180 0,03800 0,08464 0,84299 0,24709 0,02800 0,43999 0,448772 COPAIR 0,03885 0,28069 0,79862 0,54709 0,00083 0,43897 <th>UNAIR</th> <th>0,54795</th> <th>09690'0</th> <th>0,26201</th> <th>0,05724</th> <th>5,28322</th> <th>4,57753</th> <th>0,15565</th> <th>0,78154</th> <th>0,28406</th>	UNAIR	0,54795	09690'0	0,26201	0,05724	5,28322	4,57753	0,15565	0,78154	0,28406
Min 0,31828 -0,11741 -1,02131 -0,06217 0,531855 1,93085 0,08435 0,48209 criteria CR PR1 PR2 PR3 AT CA FSR1 FSR2 ACAN 0,36563 0,36025 1,00000 0,82418 0,27392 0,12038 0,41225 0,26921 ACAN 0,00000 0,31330 0,80559 0,62065 0,62642 0,02674 0,0000 0,44772 ACAN 0,01360 0,31330 0,80559 0,62065 0,62642 0,02674 0,00000 0,44772 ACHN 0,01360 0,32851 0,92901 0,82418 0,72562 0,02674 0,00000 0,44772 ACAN 0,01360 0,00000 0,8259 0,62065 0,62642 0,02674 0,00000 0,44772 ASAIR 0,01360 0,00000 0,82491 0,24462 0,22602 0,06895 0,43999 0,44772 EVA 0,021850 0,12806 0,79852 0,54155	Max	2,09171	0,42268	0,33545	8///0′0	7,88247	38,30027	0,53652	68£26′0	05668'0
criteria CR PR1 PR2 PR3 AT CA FSR1 FSR2 ACAN 0,36563 0,36025 1,00000 0,82418 0,27392 0,12038 0,41225 0,26921 ACAN 0,00000 0,31330 0,80559 0,62065 0,69642 0,02674 0,00000 0,647723 ACHIN 0,01360 0,32851 0,92201 0,86510 0,17622 0,02674 0,00000 0,44772 ACHIN 0,01360 0,00000 0,38059 0,62065 0,69642 0,02674 0,00000 0,44772 ACHIN 0,01360 0,00000 0,8807 0,1144 0,53482 0,26942 0,0697 0,00000 ASAIR 0,01360 0,00000 0,8807 0,01144 0,53482 0,43999 0,84983 COPAIR 0,51826 0,28069 0,50013 0,00000 1,00000 0,73950 0,73950 0,73502 EVA 0,21859 0,28069 0,28069 0,78052 0,72726	Min	0,31828	-0,11741	-1,02131	-0,06217	0,53185	1,93085	0,08435	0,48209	0,16541
CRN PR1 PR2 PR3 AT CA FSR1 FSR2 ACAN 0,36563 0,36025 1,00000 0,82418 0,27392 0,12038 0,41225 0,26921 ACHN 0,00000 0,31330 0,80559 0,62065 0,69642 0,02674 0,00000 0,64723 ACHN 0,01360 0,32851 0,89559 0,62065 0,69642 0,02674 0,00000 0,64772 ASAIR 0,01360 0,32851 0,29901 0,86510 0,17652 0,05855 1,00000 0,44772 ASAIR 0,01360 0,00000 0,08907 0,01144 0,53482 0,3568 0,66907 0,68348 COPAIR 0,51826 0,28634 0,50013 0,00000 1,00000 0,78852 0,24709 0,73850 0,43577 EVA 0,21859 0,28696 0,58674 0,00000 0,00000 0,00000 0,73850 0,43577 LUF 0,04337 0,16313 0,02282 0,31161 0				Nor	malization of C	riteria				
ACAN 0,36563 0,36025 1,00000 0,82418 0,27392 0,12038 0,41225 0,26921 ACHN 0,36563 0,36025 1,00000 0,82418 0,27392 0,12038 0,41225 0,26921 ACHN 0,00000 0,31330 0,80559 0,62065 0,69642 0,02674 0,00000 0,64772 ACHN 0,01360 0,00000 0,32851 0,92901 0,86510 0,17652 0,02674 0,00000 0,44772 ASAIR 0,01360 0,00000 0,08907 0,01144 0,53482 0,35568 0,06907 0,44772 COPAIR 0,51826 0,38632 0,84684 0,84929 0,24709 0,07850 0,17502 0,38483 EVA 0,21886 0,26696 0,79852 0,24709 0,07226 0,29270 0,39292 EVA 0,21859 0,28069 0,79852 0,65278 0,24709 0,07226 0,29270 0,39292 EVA 0,42327 0,16313 0,22882 <t< th=""><th>Criteria</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>	Criteria									
ACAN 0,36563 0,36025 1,00000 0,82418 0,27392 0,12038 0,41225 0,26921 ACHN 0,00000 0,31330 0,80559 0,62065 0,69642 0,02674 0,00000 0,44772 AEA 0,61607 0,32851 0,92901 0,86510 0,17652 0,05855 1,00000 0,44772 ASAIR 0,01360 0,00000 0,08907 0,01144 0,53482 0,65855 1,00000 0,44772 COPAIR 0,51826 0,38632 0,84684 0,84929 0,22602 0,06883 0,43999 0,84983 CROAIR 0,51826 0,12808 0,5013 0,00000 1,00000 1,00000 0,09850 0,17502 0,31573 EVA 0,21859 0,28696 0,79852 0,54155 0,24709 0,017502 0,29270 0,39292 SHEAIR 1,00000 1,00000 0,86344 1,00000 0,00000 0,00000 0,69054 0,00000 TAP 0,42327 0,16338		೪	PR1	PR2	PR3	AT	5	FSR1	FSR2	FSR3
0,36563 0,36025 1,00000 0,82418 0,27392 0,12038 0,41225 0,26921 0,00000 0,31330 0,80559 0,62065 0,69642 0,02674 0,00000 0,64772 0,01607 0,31380 0,80559 0,62065 0,69642 0,02674 0,00000 0,64772 0,61607 0,32861 0,92901 0,86510 0,17652 0,05855 1,00000 0,44772 0,01360 0,00000 0,08907 0,01144 0,53482 0,35568 0,06907 0,08368 0,05129 0,12808 0,84684 0,84929 0,22502 0,00883 0,43599 0,84983 0,05129 0,12808 0,5013 0,00000 1,00000 0,17502 0,17502 0,31573 0,21859 0,28069 0,784223 0,65278 0,06128 0,039850 0,43577 1,00000 1,00000 0,88344 1,00000 0,00000 0,00000 0,00000 0,69054 0,000000 0,42327 0,16313	Alternative									
0,00000 0,31330 0,80559 0,62065 0,69642 0,02674 0,00000 0,64772 0,61607 0,32851 0,92901 0,86510 0,17652 0,05855 1,00000 0,44772 0,01360 0,00000 0,08907 0,01144 0,53482 0,06907 0,08368 0,01360 0,00000 0,84684 0,84929 0,22602 0,06833 0,43999 0,84988 0,05129 0,12808 0,5013 0,00000 1,00000 0,08450 0,17502 0,31573 0,34856 0,26696 0,79852 0,54155 0,24709 0,07226 0,2970 0,39520 0,21859 0,28069 0,84223 0,65278 0,36618 0,39850 0,43577 1,00000 1,00000 0,86344 1,00000 0,00000 0,00000 0,60954 0,00000 0,41327 0,15160 0,09398 0,00000 0,10695 0,24026 0,24026 0,24012	ACAN	0,36563	0,36025	1,00000	0,82418	768270	0,12038	0,41225	0,26921	0,51011
0,61607 0,32851 0,92901 0,86510 0,17652 0,05855 1,00000 0,44772 0,01360 0,00000 0,08907 0,01144 0,53482 0,35568 0,06907 0,08368 0,51826 0,28632 0,84684 0,84929 0,22602 0,00883 0,43999 0,84983 0,05129 0,12808 0,5013 0,00000 1,00000 0,03850 0,17502 0,31573 0,34856 0,2696 0,79852 0,54155 0,24709 0,07226 0,29270 0,339292 0,21859 0,28069 0,84223 0,65278 0,36674 0,06128 0,39850 0,43577 1,00000 1,00000 0,86344 1,00000 0,00000 0,57862 1,00000 0,42327 0,16313 0,22882 0,316695 0,24026 0,24026 0,24026 0,15160 0,019398 0,00000 0,10970 0,42277 0,54672 0,24026 0,04012	ACHN	000000'0	0,31330	0,80559	0,62065	0,69642	0,02674	0,00000	0,64723	0,57445
0,01360 0,00000 0,08907 0,01144 0,53482 0,35568 0,06907 0,08368 0,51826 0,38632 0,84684 0,84929 0,22602 0,00883 0,43999 0,84983 0,05129 0,12808 0,50013 0,00000 1,00000 0,07256 0,17502 0,31573 0,34856 0,26696 0,79852 0,54155 0,24709 0,07226 0,29270 0,33292 0,21859 0,28069 0,84223 0,65278 0,36674 0,06128 0,39850 0,43577 1,00000 1,00000 0,86344 1,00000 0,00000 0,57862 1,00000 0,42327 0,16313 0,22882 0,31161 0,16695 0,24026 0,04012 0,15160 0,01516 0,09398 0,00000 0,10970 0,42277 0,54672 0,24026 0,04012	AEA	0,61607	0,32851	0,92901	0,86510	0,17652	55850'0	1,00000	0,44772	0,08210
0,51826 0,38632 0,84684 0,84929 0,22602 0,00883 0,43999 0,84983 0,05129 0,12808 0,50013 0,00000 1,00000 0,09850 0,17502 0,31573 0,34856 0,26696 0,79852 0,54155 0,24709 0,07226 0,29270 0,32292 0,21859 0,28069 0,84223 0,65278 0,36674 0,06128 0,39850 0,43577 1,00000 1,00000 0,86344 1,00000 0,00000 0,57862 1,00000 0,42327 0,16313 0,22882 0,31161 0,16695 1,00000 0,60954 0,00000 0,15160 0,015160 0,042277 0,54672 0,24026 0,04012	ASAIR	0,01360	000000′0	20680′0	0,01144	0,53482	89556'0	20690'0	89£80′0	0,26454
0,05129 0,12808 0,50013 0,00000 1,00000 0,09850 0,17502 0,31573 0,34856 0,26696 0,79852 0,54155 0,24709 0,07226 0,29270 0,39292 0,21859 0,28069 0,84223 0,65278 0,36674 0,06128 0,39850 0,43577 1,00000 1,00000 0,86344 1,00000 0,00000 0,57862 1,00000 0,42327 0,16313 0,22882 0,31161 0,16695 1,00000 0,60954 0,00000 0,15160 0,09398 0,00000 0,10970 0,42277 0,54672 0,24026 0,04012	COPAIR	0,51826	0,38632	0,84684	0,84929	0,22602	£8800′0	0,43999	0,84983	0,72855
0,34856 0,26696 0,79852 0,54155 0,24709 0,07226 0,29270 0,39292 0,21859 0,28069 0,84223 0,65278 0,36674 0,06128 0,39850 0,43577 1,00000 1,00000 0,86344 1,00000 0,00000 0,57862 1,00000 0,42327 0,16313 0,22882 0,31161 0,16695 1,0000 0,60954 0,00000 0,15160 0,09398 0,00000 0,10970 0,42277 0,54672 0,24026 0,04012	CROAIR	0,05129	0,12808	0,50013	00000′0	1,00000	05860'0	0,17502	0,31573	00000′0
0,21859 0,28069 0,84223 0,65278 0,36674 0,06128 0,39850 0,43577 1,00000 1,00000 0,86344 1,00000 0,00000 0,57862 1,00000 0,42327 0,16313 0,22882 0,31161 0,16695 1,0000 0,60954 0,00000 0,15160 0,09398 0,00000 0,10970 0,42277 0,54672 0,24026 0,04012	EVA	0,34856	0,26696	0,79852	0,54155	0,24709	0,07226	0,29270	0,39292	0,71803
1,00000 1,00000 0,86344 1,00000 0,00000 0,57862 1,00000 0,42327 0,16313 0,22882 0,31161 0,16695 1,0000 0,60954 0,00000 0,15160 0,09398 0,00000 0,10970 0,42277 0,54672 0,24026 0,04012	LUF	0,21859	0,28069	0,84223	0,65278	0,36674	0,06128	0,39850	0,43577	0,10578
0,42327 0,16313 0,22882 0,31161 0,16695 1,00000 0,60954 0,00000 0,15160 0,09398 0,00000 0,10970 0,42277 0,54672 0,24026 0,04012	SHEAIR	1,00000	1,00000	0,86344	1,00000	00000′0	00000′0	0,57862	1,00000	1,00000
0,15160 0,09398 0,00000 0,10970 0,42277 0,54672 0,24026 0,04012	TAP	0,42327	0,16313	0,22882	0,31161	0,16695	1,00000	0,60954	00000'0	0,26796
	THAIR	0,15160	0,09398	0,00000	0,10970	0,42277	0,54672	0,24026	0,04012	0,30243

TUAIR	0,27172	0,32920	0,83453	0,66492	0,28825	0,04590	0,24018	0,51170	0,67647	
UNAIR	0,12951	0,34627	0,94587	0,85323	0,64639	0,07277	0,15768	0,39111	0,49314	
				Square Matrix	×					
Criteria										
Alternative	క	PR1	PR2	PR3	АТ	5	FSR1	FSR2	FSR3	
ACAN	0,13368	0,12978	1,00000	0,67927	0,07503	0,01449	0,16995	0,07247	0,26021	
ACHN	00000′0	0,09816	0,64897	0,38521	0,48501	0,00072	00000′0	0,41891	0,32999	
AEA	0,37954	0,10792	0,86305	0,74839	0,03116	0,00343	1,00000	0,20045	0,00674	
ASAIR	0,00018	0,00000	0,00793	0,00013	0,28603	0,12651	0,00477	00/00/0	86690'0	
COPAIR	0,26859	0,14924	0,71714	0,72129	0,05108	80000′0	0,19359	0,72221	0,53078	
CROAIR	0,00263	0,01640	0,25013	0,00000	1,00000	0/600'0	69080'0	69660′0	00000'0	
EVA	0,12149	0,07127	0,63763	0,29328	0,06105	0,00522	29580'0	0,15438	0,51557	
LUF	0,04778	0,07878	0,70935	0,42612	0,13450	0,00375	0,15880	68681′0	0,01119	
SHEAIR	1,00000	1,00000	0,74553	1,00000	00000′0	00000'0	0,33480	1,00000	1,00000	
TAP	0,17916	0,02661	0,05236	0,09710	0,02787	1,00000	0,37154	00000′0	0,07180	
THAIR	0,02298	0,00883	000000'0	0,01203	0,17874	0,29890	0,05773	0,00161	0,09147	
TUAIR	0,07383	0,10838	0,69643	0,44212	0,08309	0,00211	0,05768	0,26183	0,45761	
UNAIR	0,01677	0,11991	0,89466	0,72801	0,41782	0,00530	0,02486	0,15297	0,24319	
Total	2,24665	1,91527	7,22320	5,53295	2,83139	1,47021	2,49003	3,28142	3,58853	
٤	13	13	13	13	13	13	13	13	13	
total/m	0,17282	0,14733	0,55563	0,42561	0,21780	0,11309	0,19154	0,25242	0,27604	
Square Root(total/m)	0,41572	0,38383	0,74541	0,65239	0,46669	0,33629	0,43765	0,50241	0,52540	
Standard Deviation (Standardization of	0,28114	0,23919	0,34427	0,34505	0,26970	0,28894	0,26654	0,29591	0,29841	
Criteria)										
Square Root(total/m)/Standard										
Deviation (Standardization of	1,47868	1,60472	2,16520	1,89070	1,73042	1,16390	1,64195	1,69783	1,76064	
Criteria)										
pwij	39,11530	47,29499	77,25107	63,69463	54,83645	15,17741	49,58867	52,93529	56,56764	456,46144
wj	0,08569	0,10361	0,16924	0,13954	0,12013	0,03325	0,10864	0,11597	0,12393	1,00000
Rank	∞	7	1	2	4	6	9	5	n	

APPENDIX 4: 2019 TOPSIS Analysis Results

Target Criteria	Max	Max	Max	Max	Max	Max	Max	Min	Min
Weight Values	0,08569	0,10361	0,16924	0,13954	0,12013	0,03325	0,10864	0,11597	0,12393
Criteria	CR	PR1	PR2	PR3	AT	CA	FSR1	FSR2	FSR3
Alternative									
ACAN	69996′0	0,07715	0,33545	0,05317	2,54537	9880£′9	0,27076	0,84149	0,28009
ACHN	0,31828	0,05180	0,07168	0,02469	66059'5	2,90346	0,08435	0,65558	0,26503
AEA	1,41084	10090′0	0,23913	06850'0	1,82939	4,06025	0,53652	0,75370	0,38028
ASAIR	0,34239	-0,11741	-0,90047	-0'06057	4,46308	14,86689	0,11558	0,93274	0,33757
COPAIR	1,23737	0,09123	0,12766	69950'0	2,19322	2,25198	0,28330	0,55595	0,22895
CROAIR	0,40924	-0,04824	-0,34275	-0,06217	7,88247	5,51313	0,16349	0,81861	0,39950
EVA	0,93642	0,02677	0,06209	0,01362	2,34813	4,55903	0,21670	99082′0	0,23141
LUF	0,70593	0,03418	0,12139	0,02918	3,22765	4,15942	0,26454	0,75958	0,37474
SHEAIR	2,09171	0,42268	0,15018	0,07778	0,53185	1,93085	0,34598	0,48209	0,16541
TAP	1,06892	-0,02931	-0,71086	-0,01856	1,75901	38,30027	0,35997	0,97389	0,33678
THAIR	0,58713	59990'0-	-1,02131	-0,04682	05689′8	21,81468	0,19299	0,95416	0,32870
TUAIR	0,80015	8£090′0	0,11094	880£0′0	5,65069	3'60022	0,19295	0,72224	0,24114
UNAIR	0,54795	09690′0	0,26201	0,05724	5,28322	4,57753	0,15565	0,78154	0,28406
				Normalization of Criteria	on of Criteria				
Criteria									
Alternative	æ	PR1	PR2	PR3	АТ	ď	FSR1	FSR2	FSR3
ACAN	0,26790	0,16052	0,20083	0,29956	0,18176	0,13043	0,27728	0,29816	0,25559
ACHN	0,08820	0,10777	0,04292	0,13910	0,40352	0090′0	0,08638	0,23229	0,24184
AEA	6606£′0	0,12485	0,14317	0,33182	0,13063	0,08394	0,54943	0,26705	0,34702
ASAIR	0,09489	-0,24429	-0,53910	-0,34124	0/31870	0,30735	0,11836	0,33049	0,30804
COPAIR	0,34292	0,18982	0,07643	0,31936	0,15661	0,04656	0,29012	0,19698	0,20892
CROAIR	0,11341	-0,10037	-0,20520	-0,35025	0,56287	0,11398	0,16743	0,29005	0,36455
EVA	0,25951	69550'0	0,03717	0,07673	0,16767	0,09425	0,22192	0,27660	0,21117
LUF	0,19564	0,07112	0,07268	0,16442	0,23048	0,08599	0,27091	0,26914	0,34196
SHEAIR	0,57968	0,87942	0,08991	0,43819	0,03798	0,03992	0,35431	0,17082	0,15094
TAP	0,29623	66090'0-	-0,42558	-0,10457	0,12561	0,79181	0,36863	0,34507	0,30731
THAIR	0,16271	-0,13868	-0,61145	-0,26376	0,25989	0,45099	0,19764	0,33808	0,29995
TUAIR	0,22175	0,12564	0,06642	0,17400	0,18928	0,07443	0,19760	0,25591	0,22005
UNAIR	0,15186	0,14482	0,15686	0,32247	0,37726	0,09463	0,15940	0,27692	0,25921

			Multiplica	tion of Normalize	Dication of Normalized Matrices by Weight Values	aht Values			
Criteria			•		•)			
Alternative	£	PR1	PR2	PR3	АТ	5	FSR1	FSR2	FSR3
ACAN	0,02296	0,01663	0,03399	0,04180	0,02184	0,00434	0,03012	0,03458	0,03167
ACHN	0,00756	0,01117	0,00726	0,01941	0,04848	0,00200	0,00938	0,02694	0,02997
AEA	0,03350	0,01294	0,02423	0,04630	0,01569	0,00279	69650'0	26080'0	0,04300
ASAIR	0,00813	-0,02531	-0,09124	-0,04762	0,03829	0,01022	0,01286	0,03833	0,03817
COPAIR	0,02939	0,01967	0,01293	0,04456	0,01881	0,00155	0,03152	0,02284	68570′0
CROAIR	0,00972	-0,01040	-0,03473	-0,04887	0,06762	6/200'0	0,01819	0,03364	0,04518
EVA	0,02224	0,00577	0,00629	0,01071	0,02014	0,00313	0,02411	0,03208	0,02617
JNT	0,01676	0,00737	0,01230	0,02294	0,02769	0,00286	0,02943	0,03121	0,04238
SHEAIR	0,04967	0,09112	0,01522	0,06114	0,00456	0,00133	0,03849	0,01981	0,01871
TAP	0,02539	-0,00632	-0,07203	-0,01459	0,01509	0,02633	0,04005	0,04002	0,03808
THAIR	0,01394	-0,01437	-0,10348	-0,03681	0,03122	0,01500	0,02147	0,03921	21280'0
TUAIR	0,01900	0,01302	0,01124	0,02428	0,02274	0,00247	0,02147	0,02968	0,02727
UNAIR	0,01301	0,01500	0,02655	0,04500	0,04532	0,00315	0,01732	0,03211	0,03212
			Positive	ideal solutions an	Positive ideal solutions and negative ideal solutions	olutions			
+Y	0,04967	0,09112	0,03399	0,06114	0,06762	0,02633	69650′0	0,01981	0,01871
A-	0,00756	-0,02531	-0,10348	-0,04887	0,00456	0,00133	0,00938	0,04002	0,04518
	The q	The distance of each alternative to t	ternative to the p	ositive ideal and r	he positive ideal and negative ideal solution points and its performance ranking	ıtion points and it	s performance ra	nking	
Alternative	+iO	Ė	ט	Rank					
ACAN	0,10235	0,17339	0,62881	7					
ACHN	0,11954	0,14349	0,54553	8					
AEA	0,10322	0,17392	0,62755	3					
ASAIR	0,21640	0,03784	0,14885	13					
COPAIR	0,10043	0,16169	0,61686	2					
CROAIR	0,17847	0,09516	0,34776	10					
EVA	0,12495	0,13292	0,51546	6					
JNT	0,11738	0,14401	0,55095	7					
SHEAIR	0,07350	0,20852	0,73936	1					
TAP	0,17603	0,06760	0,27746	11					
THAIR	0,21102	0,03761	0,15127	12					
TUAIR	0,11459	0,14498	0,55852	9					
UNAIR	0,10303	0,17127	0,62440	4					

APPENDIX 5: 2020 LOPCOW Analysis Results

				Decision Matrix	хi				
Target Criteria	Мах	Max	Мах	Max	Мах	Мах	Max	Min	Min
Criteria Altemative	క	PR1	PR2	PR3	AT	క	FSR1	FSR2	FSR3
ACAN	1,21460	-0,79667	-2,70962	-0,16072	0,67270	16,85889	0,29990	0,94068	0,24691
ACHN	0,24487	-0,21413	-0,18880	-0,05568	3,74245	3,39047	0,06949	90502'0	0,28377
AEA	1,01032	-0,54904	<i>1</i> 926'7-	-0,15816	0,68928	18,57412	0,41792	0,94616	0,41365
ASAIR	0,45476	-0,12912	-0,46172	-0,03631	1,63241	12,71550	0,17227	0,92136	0,37882
COPAIR	1,49913	-0,75788	-0,47295	-0,15754	06959′0	3,00211	0,31644	06999′0	0,21108
CROAIR	1,67119	-0,65844	-1,65333	-0,48640	0,73871	7,66023	0,44374	0,86946	0,26552
EVA	1,23109	089£0′0-	-0,04274	-0,00994	1,59208	4,29910	0,16972	68.492'0	0,13786
LUF	0,68490	-0,49489	-4,84859	-0,17032	1,35349	28,46720	0,25428	0,96487	0,37126
SHEAIR	1,14728	0,31043	0,10326	0,05335	0,49904	1,93552	0,34438	0,48333	0,30017
TAP	0629300	-1,18073	1,06585	-0,24818	95865'0	-4,29464	0,35116	1,23285	0,62273
THAIR	0,06547	-2,95873	1,09727	-0,67618	2,41662	-1,62275	0,09457	1,61624	1,44446
TUAIR	0,64710	-0,12677	-0,14902	-0,03142	1,51499	4,74303	0,16360	0,78916	0,25282
UNAIR	1,16270	-0,46024	-1,19214	-0,11873	1,03750	10,04049	0,24866	0,90040	0,21386
Max	1,67119	0,31043	1,09727	0,05335	3,74245	28,46720	0,44374	1,61624	1,44446
Min	0,06547	-2,95873	-4,84859	-0,67618	0,49904	-4,29464	0,06949	0,48333	0,13786
			Noi	Normalization of Criteria	:riteria				
Criteria	(744	644	å		•		6431	
Alternative	ž	Ž.	PK2	Z Z	¥	5	FSKI	FSK2	FSK3
ACAN	0,71565	0,66135	0,35974	0,70656	0,05354	0,64568	0,61566	0,59630	0,91653
ACHN	0,11172	0,83954	0/283/0	0,85054	1,00000	0,23458	0,00000	0,80429	0,88833
AEA	0,58843	0,73710	0,32139	0,71007	0,05865	0,69803	0,93102	0,59147	0,78892
ASAIR	0,24244	0,86555	0,73780	0,87710	0,34944	0,51921	0,27465	0,61336	0,81558
COPAIR	0,89284	0,67322	0,73591	0,71092	0,04867	0,22272	0,65986	0,83797	0,94396
CROAIR	1,00000	6)20363	68283'0	0,26014	06820'0	0,36490	1,00000	0,65918	0,90229
EVA	0,72592	0,89379	0,80827	0,91324	0,33700	0,26231	0,26781	0,74926	1,00000
LUF	0,38577	0,75366	00000′0	0,69340	0,26344	1,00000	0,49377	0,57495	0,82136
SHEAIR	0,67372	1,00000	0,83282	1,00000	0,00000	0,19017	0,73452	1,00000	0,87577
TAP	0,31041	0,54387	0,99472	0,58668	0,03068	0,00000	0,75263	0,33841	0,62890
THAIR	0,00000	0,00000	1,00000	0,00000	0,59122	0,08156	0,06702	00000'0	0,00000
TUAIR	0,36223	0,86627	0,79039	0,88380	0,31323	0,27586	0,25147	0,73005	0,91201

Corpus CRA PR1 PR2 PR3 AT CA FSR1 FSR2 FSR3	UNAIR	0,68333	0,76426	0,61496	0,76412	0,16602	0,43756	0,47874	0,63186	0,94183	
ACAN GS 1215 O,43738 O,12941 O,49922 O,00287 O,41690 O,27904 O,33558 O,84004 ACAN O,51215 O,70438 O,12941 O,49922 O,00587 O,41690 O,27904 O,33558 O,84009 ACAN O,01248 O,70433 O,10249 O,70431 O,10249 O,70432 O,00587 O,46800 O,35503 O,84013 ASAIR O,03403 O,7917 O,54437 O,16349 O,78437 O,84323 O,78437 O,84332 O,78437 O,84332 O,78437 O,84332 O,78437 O,84332 O,78437 O,84332 O,78437 O,84332 O,78437 O,84332 O,78437 O,84337 O,84343 O,84337 O,84343 O,84343 O,84343 O,84343 O,84343 O,84343 O,84343 O,84343 O,84343 O,84343 O,84343 O,84343 O,84443 O,84443 O,84443 O,84443 O,84443 O,84443 O,84443 O,844441 O,844441 O,844441 O,844441 <th< th=""><th></th><th></th><th></th><th></th><th>Square Matri</th><th>×</th><th></th><th></th><th></th><th></th><th></th></th<>					Square Matri	×					
ACAN 0,51215 0,43738 0,12941 0,49922 0,00287 0,41690 0,37904 0,35558 0,84004 ACHN 0,01248 0,70483 0,61419 0,72342 1,00000 0,65603 0,00000 0,64688 0,78913 ASAR 0,02487 0,74317 0,74317 0,74317 0,74317 0,74317 0,74317 0,74317 0,74317 0,74310 0,74441 0,74411 0,74411		R	PR1	PR2	PR3	AT	CA	FSR1	FSR2	FSR3	
0,01248 0,70483 0,6149 0,72342 1,00000 0,055633 0,00000 0,64688 0,78913 0,01248 0,74431 0,17242 1,00000 0,00344 0,48725 0,66680 0,34983 0,6239 0,05878 0,74417 0,10329 0,50420 0,00344 0,48725 0,86680 0,34983 0,6239 0,079717 0,44312 0,76431 0,78441 0,00460 0,12211 0,03660 0,34983 0,62517 0,079717 0,454510 0,28879 0,666767 0,00466 0,13315 1,00000 0,44451 0,81413 0,52666 0,79887 0,67870 0,00466 0,13315 1,00000 0,44451 0,67444 0,48390 0,68380 0,34419 0,00466 0,13456 0,0044 0,00466 0,44451 0,5444 0,00000 0,00000 0,00000 0,00000 0,00000 0,00466 0,3445 0,0044 0,00000 0,0044 0,00446 0,0044 0,0044 0,0044		0.51215	0.43738	0 12941	0.49922	0.00287	0.41690	0 37904	0 35558	0.84004	
0,34625 0,5431 0,10329 0,50420 0,00344 0,48725 0,66500 0,34639 0,6239 0,05878 0,74917 0,54435 0,76930 0,12111 0,26957 0,07543 0,37621 0,66517 0,05878 0,74917 0,54435 0,76930 0,12111 0,26957 0,07433 0,7219 0,6517 1,00000 0,49510 0,288401 0,66740 0,00024 1,00000 0,43451 0,814113 0,52666 0,79885 0,65330 0,88401 0,11357 0,06881 0,07172 0,56140 1,00000 0,14882 0,56801 0,00000 0,48080 0,06940 1,00000 0,24381 0,07149 0,00000 0,44640 0,1481 0,00005 0,00000 0,28994 0,00000 0,34955 0,00449 0,00000 0,34658 0,47512 0,5648 0,14668 0,00000 0,00000 0,28094 0,00000 0,28084 0,00000 0,14668 0,17668 0,00000	ACHN	0,01248	0,70483	0,61419	0,72342	1,00000	0,05503	0,00000	0,64688	0,78913	
0,05878 0,74917 0,54435 0,76930 0,12211 0,26957 0,07543 0,37621 0,66517 0,79717 0,45322 0,54157 0,50541 0,00337 0,04960 0,43542 0,70219 0,89105 1,00000 0,49510 0,28879 0,60767 0,00356 0,10000 0,43541 0,0081 0,00712 0,5019 0,89105 0,52666 0,28887 0,66330 0,83401 0,10800 0,00000 0,43560 0,60000 0,67464 1,00000 0,67464 0,67128 0,56440 1,00000 0,67464 0,67464 0,67464 0,67464 0,67464 0,67464 0,67464 0,67464 0,67464 0,67464 0,67460 0,67464	AEA	0,34625	0,54331	0,10329	0,50420	0,00344	0,48725	0,86680	0,34983	0,62239	
0,79717 0,45322 0,54157 0,50541 0,00246 0,43542 0,70219 0,89105 1,00000 0,49510 0,28879 0,605767 0,00546 0,13315 1,00000 0,43451 0,81413 0,52696 0,79887 0,605767 0,00546 0,13315 1,00000 0,43451 0,8144 0,14882 0,65801 0,00000 0,48080 0,06900 0,04381 0,5644 0,45390 1,00000 0,69360 1,00000 0,00000 0,24381 0,5644 0,11452 0,5648 0,00635 0,29579 0,98946 0,00000 0,00000 0,56645 0,11452 0,6044 0,00000 0,00000 0,00000 0,00000 0,00000 0,60645 0,11452 0,39524 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 <td< th=""><th>ASAIR</th><th>0,05878</th><th>0,74917</th><th>0,54435</th><th>0,76930</th><th>0,12211</th><th>0,26957</th><th>0,07543</th><th>0,37621</th><th>0,66517</th><th></th></td<>	ASAIR	0,05878	0,74917	0,54435	0,76930	0,12211	0,26957	0,07543	0,37621	0,66517	
1,00000 0,49510 0,28879 0,06767 0,00546 0,1315 1,00000 0,43451 0,81413 0,81413 0,6140 0,43451 0,81413 0,81413 0,005840 0,1317 0,056140 0,6140 1,00000 0,65140 1,00000 0,67440 1,00000 0,65140 1,00000 0,67640 1,00000 0,67640 1,00000 0,67640 1,00000 0,67640 1,00000 0,67640 0,00000 0,67640 0,00000 0,67640 0,00000 0,67640 0,00000 0,67640 0,00000 0,67640 0,00000 0,67640 0,00000 0,67640 0,00000 0,67640 0,00000	COPAIR	0,79717	0,45322	0,54157	0,50541	0,00237	0,04960	0,43542	0,70219	0,89105	
0,52696 0,79885 0,65330 0,83401 0,11357 0,06881 0,07172 0,56140 1,00000 0,14882 0,56801 0,00000 0,48080 0,06940 1,00000 0,24381 0,33057 0,67464 0,04330 1,00000 0,69360 1,00000 0,03616 0,53352 1,00000 0,75645 0,76645 0,76648 0,76648 0,76649 0,766449 0,76649 0,76649 0,76649 0,76649 0,76649 0,76649 0,766449 0,76649 0,766449 0,76649 0,766449 0,76649 0,766449 0,76649 0,766449 0,766449 0,76649 0,766449 0,76649 0,766449 0,76649 0,766449 0,76649 0,766449 0,76649 0,766449 0,76649 <t< th=""><th>CROAIR</th><th>1,00000</th><th>0,49510</th><th>0,28879</th><th>0,06767</th><th>0,00546</th><th>0,13315</th><th>1,00000</th><th>0,43451</th><th>0,81413</th><th></th></t<>	CROAIR	1,00000	0,49510	0,28879	0,06767	0,00546	0,13315	1,00000	0,43451	0,81413	
0,14862 0,56801 0,00000 0,48080 0,06940 1,00000 0,24381 0,33957 0,67464 0,45390 1,00000 0,69360 1,00000 0,00000 0,053952 1,00000 0,76698 0,00635 0,29579 0,88946 0,34419 0,00000 0,56645 0,11422 0,76698 0,000000 0,00000 0,00000	EVA	0,52696	0,79885	0,65330	0,83401	0,11357	0,06881	0,07172	0,56140	1,00000	
0,45390 1,00000 0,09806 0,03616 0,53952 1,00000 0,76698 0,09635 0,29579 0,98846 0,34419 0,00004 0,00000 0,56645 0,11452 0,39552 0,00000 0,00000 0,00800 0,34419 0,00000 0,00000 0,1452 0,1452 0,39552 0,000000 0,00000	LUF	0,14882	0,56801	000000	0,48080	0,06940	1,00000	0,24381	0,33057	0,67464	
0,09635 0,09645 0,28449 0,00004 0,00000 0,56645 0,11452 0,39522 0,00000 0,00000 1,00000 0,00000 0,00049 0,00049 0,00000 0,00	SHEAIR	0,45390	1,00000	09869'0	1,00000	000000'0	0,03616	0,53952	1,00000	0,76698	
0,00000 0,00000 0,00000 0,34955 0,00065 0,00449 0,00000 0,00000 0,13121 0,75042 0,62472 0,78111 0,09812 0,07610 0,06324 0,53297 0,83177 0,46694 0,58409 0,37817 0,58387 0,02756 0,19145 0,22919 0,53924 0,88705 4,55101 7,38018 6,56085 7,09321 1,79538 2,79068 4,47512 5,80391 9,17786 0,35008 0,56771 0,50468 0,54563 0,13811 0,21467 0,34424 0,44645 0,70599 0,53108 0,75346 0,71041 0,73867 0,21467 0,44645 0,70599 0,30355 0,24561 0,28589 0,27725 0,28356 0,27676 0,31595 0,24549 0,25836 1,94919 3,06767 2,48493 2,66424 1,31057 1,67412 1,85700 2,72184 3,25223 6 2 5 4 9 8 7 3	TAP	0,09635	0,29579	0,98946	0,34419	0,00094	00000′0	0,56645	0,11452	0,39552	
0,13121 0,75042 0,62472 0,78111 0,09812 0,07610 0,06324 0,53297 0,83177 0,46694 0,58409 0,37817 0,58387 0,02756 0,19145 0,22919 0,39924 0,88705 4,55101 7,38018 6,56085 7,09321 1,79538 2,79068 4,47512 5,80391 9,17786 13 13 13 13 13 13 13 13 13 0,35008 0,56771 0,50468 0,54563 0,13811 0,21467 0,34424 0,44645 0,70599 0,59167 0,75346 0,71041 0,73867 0,137163 0,46332 0,58672 0,66817 0,84023 0,30355 0,24561 0,28589 0,27725 0,28356 0,27676 0,31595 0,24549 0,25836 1,94919 3,06767 2,48493 2,66424 1,31057 1,67412 1,85700 2,72184 3,25223 6 2 5 4 9 8 7	THAIR	00000'0	00000′0	1,00000	00000′0	0,34955	59900'0	0,00449	00000'0	00000'0	
0,46694 0,58409 0,37817 0,58387 0,02756 0,19145 0,22919 0,39924 0,88705 4,55101 7,38018 6,56085 7,09321 1,79538 2,79068 4,47512 5,80391 9,17786 13 13 13 13 13 13 13 13 0,35008 0,56771 0,50468 0,54563 0,13811 0,21467 0,34424 0,44645 0,70599 0,59167 0,775346 0,71041 0,73867 0,21467 0,24424 0,74645 0,70599 0,30355 0,24561 0,28589 0,27725 0,28356 0,27676 0,31595 0,24549 0,25836 1,94919 3,06767 2,48493 2,66424 1,31057 1,67412 1,85700 2,72184 3,25223 66,74143 0,12431 0,12331 0,07094 0,08521 0,13385 0,16236 6 2 4 9 8 7 3 1	TUAIR	0,13121	0,75042	0,62472	0,78111	0,09812	0,07610	0,06324	0,53297	0,83177	
4,55101 7,38018 6,56085 7,09321 1,79538 2,79068 4,47512 5,80391 9,17786 13 <td< th=""><th>UNAIR</th><th>0,46694</th><th>0,58409</th><th>0,37817</th><th>0,58387</th><th>0,02756</th><th>0,19145</th><th>0,22919</th><th>0,39924</th><th>0,88705</th><th></th></td<>	UNAIR	0,46694	0,58409	0,37817	0,58387	0,02756	0,19145	0,22919	0,39924	0,88705	
13 14 14<	Total	4,55101	7,38018	6,56085	7,09321	1,79538	2,79068	4,47512	5,80391	9,17786	
0,35008 0,56771 0,50468 0,54563 0,13811 0,21467 0,34424 0,44645 0,70599 0,59167 0,75346 0,71041 0,73867 0,37163 0,46332 0,58672 0,66817 0,84023 0,30355 0,24561 0,28589 0,27725 0,28356 0,27676 0,31595 0,24549 0,25836 1,94919 3,06767 2,48493 2,66424 1,31057 1,67412 1,85700 2,72184 3,25223 66,74143 112,09178 91,02439 97,99189 27,04630 51,52848 61,89604 100,13065 117,93398 0,09188 0,15431 0,12531 0,13490 0,03723 0,07094 0,08521 0,13785 0,16236 6 2 4 9 8 7 3 1	w	13	13	13	13	13	13	13	13	13	
0,59167 0,75346 0,71041 0,73867 0,28589 0,27725 0,28356 0,27676 0,31595 0,24549 0,25836 0,30355 0,24561 0,28589 0,27725 0,28356 0,27676 0,31595 0,24549 0,25836 1,94919 3,06767 2,48493 2,66424 1,31057 1,67412 1,85700 2,72184 3,25223 66,74143 112,09178 91,02439 97,99189 27,04630 51,52848 61,89604 100,13065 117,93398 0,09188 0,15431 0,12531 0,13490 0,03723 0,07094 0,08521 0,13785 0,16236 6 2 5 4 9 8 7 3 1	total/m	0,35008	0,56771	0,50468	0,54563	0,13811	0,21467	0,34424	0,44645	0,70599	
0,30355 0,24561 0,28589 0,27725 0,28356 0,27676 0,31595 0,24549 0,25836 1,94919 3,06767 2,48493 2,66424 1,31057 1,67412 1,85700 2,72184 3,25223 66,74143 112,09178 91,02439 97,99189 27,04630 51,52848 61,89604 100,13065 117,93398 6 2 5 4 9 8 7 3 1	Square Root(total/m)	0,59167	0,75346	0,71041	0,73867	0,37163	0,46332	0,58672	0,66817	0,84023	
1,94919 3,06767 2,48493 2,66424 1,31057 1,67412 1,85700 2,72184 3,25223 66,74143 112,09178 91,02439 97,99189 27,04630 51,52848 61,89604 100,13065 117,93398 0,09188 0,15431 0,12531 0,13490 0,03723 0,07094 0,08521 0,13785 0,16236 6 2 5 4 9 8 7 3 1	Standard Deviation (Standardization of Criteria)	0,30355	0,24561	0,28589	0,27725	0,28356	0,27676	0,31595	0,24549	0,25836	
1,94919 3,00/0/ 2,48493 2,00424 1,5103/ 1,0/412 1,83/00 2,72184 3,2323 66,74143 112,09178 91,02439 97,99189 27,04630 51,52848 61,89604 100,13065 117,93398 0,09188 0,15431 0,12531 0,13490 0,03723 0,07094 0,08521 0,13785 0,16236 6 2 5 4 9 8 7 3 1	Square Root(total/m)/Standard	6	L)L))		7 ()	71010	C 8 8 E J 8	00000	707010		
66,74143 112,09178 91,02439 97,99189 27,04630 51,52848 61,89604 100,13065 117,93398 0,09188 0,15431 0,12531 0,13490 0,03723 0,07094 0,08521 0,13785 0,16236 6 2 5 4 9 8 7 3 1	Deviation (Standardization of Criteria)	94919	3,06/6/	2,48493	2,66424	1,3105/	1,6/412	00/58/1	7,72184	3,25223	
0,09188 0,15431 0,12531 0,13490 0,03723 0,07094 0,08521 0,13785 6 2 5 4 9 8 7 3	pwij	66,74143	112,09178	91,02439	97,99189	27,04630	51,52848	61,89604	100,13065	117,93398	726,3849
6 2 5 4 9 8 7	wj	0,09188	0,15431	0,12531	0,13490	0,03723	0,07094	0,08521	0,13785	0,16236	1
	Rank	9	2	5	4	6	8	7	3	1	

APPENDIX 6: 2020 TOPSIS Analysis Results

Target Criteria	Мах	Max	Max	Max	Max	Max	Max	Min	Min
Weight Values	0,09188	0,15431	0,12531	0,13490	0,03723	0,07094	0,08521	0,13785	0,16236
Criteria						•			
Alternative	Ť	P. P. P. P. P. P. P. P. P. P. P. P. P. P	PR2	PR3	AT	5	FSR1	FSR2	FSR3
ACAN	1,21460	79967'0-	-2,70962	-0,16072	0,67270	16,85889	0,29990	0,94068	0,24691
ACHN	0,24487	-0,21413	-0,18880	-0,05568	3,74245	3,39047	0,06949	0,70506	0,28377
AEA	1,01032	-0,54904	-2,93767	-0,15816	87689′0	18,57412	0,41792	0,94616	0,41365
ASAIR	0,45476	-0,12912	-0,46172	-0,03631	1,63241	12,71550	0,17227	0,92136	0,37882
COPAIR	1,49913	88/5/'0-	-0,47295	-0,15754	06959′0	3,00211	0,31644	06999'0	0,21108
CROAIR	1,67119	-0,65844	-1,65333	-0,48640	0,73871	2'96053	0,44374	0,86946	0,26552
EVA	1,23109	089£0′0-	-0,04274	-0,00994	1,59208	4,29910	0,16972	0,76739	0,13786
LUF	0,68490	-0,49489	-4,84859	-0,17032	1,35349	28,46720	0,25428	0,96487	0,37126
SHEAIR	1,14728	0,31043	0,10326	0,05335	0,49904	1,93552	0,34438	0,48333	21008'0
TAP	0,56390	-1,18073	1,06585	-0,24818	95865′0	-4,29464	0,35116	1,23285	0,62273
THAIR	0,06547	-2,95873	1,09727	-0,67618	2,41662	-1,62275	0,09457	1,61624	1,44446
TUAIR	0,64710	-0,12677	-0,14902	-0,03142	1,51499	4,74303	0,16360	0,78916	0,25282
UNAIR	1,16270	-0,46024	-1,19214	-0,11873	1,03750	10,04049	0,24866	0,90040	0,21386
-		-		Normalizatic	Normalization of Criteria		-	-	
Criteria	క	PR1	PR2	PR3	AT	5	FSR1	FSR2	FSR3
Alternative									
ACAN	0,33435	-0,22333	-0,39743	-0,17109	0,11753	0,39227	0,29564	0,27565	0,13387
ACHN	0,06741	-0,06003	-0,02769	-0,05928	0,65385	0,07889	0,06850	0,20660	0,15385
AEA	0,27811	-0,15391	-0,43088	-0,16836	0,12043	0,43218	0,41198	0,27725	0,22427
ASAIR	0,12518	-0,03620	-0,06772	-0,03865	0,28520	0,29586	0,16982	0,26999	0,20538
COPAIR	0,41267	-0,21245	-0,06937	-0,16770	0,11477	0,06985	0,31194	0,19542	0,11444
CROAIR	0,46003	-0,18458	-0,24250	-0,51776	0,12906	0,17824	0,43743	0,25478	0,14396
EVA	0,33889	-0,01032	-0,00627	-0,01058	0,27815	0,10003	0,16730	0,22487	0,07474
LUF	0,18854	-0,13873	-0,71116	-0,18131	0,23647	0,66237	0,25066	0,28274	0,20129
SHEAIR	0,31582	0,08702	0,01515	0,05679	0,08719	0,04504	0,33949	0,14163	0,16274
TAP	0,15523	-0,33099	0,15633	-0,26418	0,10458	-0,09993	0,34617	0,36126	0,33762
THAIR	0,01802	-0,82941	0,16094	-0,71978	0,42221	-0,03776	0,09322	0,47361	0,78314
TUAIR	0,17813	-0,03554	-0,02186	-0,03345	0,26468	0,11036	0,16127	0,23125	0,13707
UNAIR	0,32006	-0,12902	-0,17486	-0,12639	0,18126	0,23362	0,24512	0,26385	0,11595

			Multiplica	tion of Normalize	Multiplication of Normalized Matrices by Weight Values	ght Values			
Criteria									
Alternative	క	PR1	PR2	PR3	AT	క	FSR1	FSR2	FSR3
ACAN	0,03072	-0,03446	-0,04980	-0,02308	0,00438	0,02783	0,02519	0,03800	0,02173
ACHN	0,00619	-0,00926	-0,00347	-0,00800	0,02435	09500'0	0,00584	0,02848	0,02498
AEA	0,02555	-0,02375	-0,05399	-0,02271	0,00448	0,03066	0,03511	0,03822	0,03641
ASAIR	0,01150	-0,00559	-0,00849	-0,00521	0,01062	0,02099	0,01447	0,03722	0,03335
COPAIR	0,03792	-0,03278	-0,00869	-0,02262	0,00427	0,00496	0,02658	0,02694	0,01858
CROAIR	0,04227	-0,02848	-0,03039	-0,06985	0,00481	0,01264	0,03727	0,03512	0,02337
EVA	0,03114	-0,00159	6/000'0-	-0,00143	0,01036	0,00710	0,01426	0,03100	0,01213
LUF	0,01732	-0,02141	-0,08912	-0,02446	0,00880	0,04699	0,02136	26880'0	0,03268
SHEAIR	0,02902	0,01343	0,00190	99/00′0	0,00325	0,00319	0,02893	0,01952	0,02642
TAP	0,01426	-0,05108	0,01959	-0,03564	68E00′0	60/00′0-	0'02950	0,04980	0,05482
THAIR	0,00166	-0,12799	0,02017	-0,09710	0,01572	-0,00268	0,00794	0,06529	0,12715
TUAIR	0,01637	-0,00548	-0,00274	-0,00451	98600′0	0,00783	0,01374	0,03188	0,02225
UNAIR	0,02941	-0,01991	-0,02191	-0,01705	0,00675	0,01657	0,02089	0,03637	0,01882
			Positive	ideal solutions an	Positive ideal solutions and negative ideal solutions	olutions			
A +	0,04227	0,01343	0,02017	0,00766	0,02435	0,04699	0,03727	0,01952	0,01213
A-	0,00166	-0,12799	-0,08912	-0,09710	0,00325	-0,00709	0,00584	0,06529	0,12715
	Тh	The distance of each alternative to the positive ideal and negative ideal solution points and its success ranking	alternative to the	e positive ideal an	d negative ideal s	olution points an	d its success ranki	ng	
Alternative	Di+	Di-	Ci	Rank					
ACAN	0,09805	0,17340	0,63880	8					
ACHN	0,07461	0,20443	0,73261	5					
AEA	0,09843	0,17162	0,63550	9					
ASAIR	0,06665	0,20132	0,75127	4					
COPAIR	0,07928	0,19034	0,70595	7					
CROAIR	0,11068	0,16971	0,60526	10					
EVA	0,05762	0,22029	0,79268	2					
LUF	0,12691	0,17232	0,57588	12					
SHEAIR	0,05609	0,22997	0,80392	1					
TAP	0,11385	0,16644	0,59381	11					
THAIR	0,22660	0,11010	0,32700	13	•				
TUAIR	0,06522	0,20906	0,76221	3	•				
UNAIR	0,07409	0,19169	0,72122	9					

APPENDIX 7: 2021 LOPCOW Analysis Results

				Decision Matrix	. <u>×</u>				
Target Criteria	Мах	Max	Max	Max	Max	Max	Мах	Min	Min
Criteria Altemative	£	PR1	PR2	PR3	AT	5	FSR1	FSR2	FSR3
ACAN	1,45191	-0,56281	-400,22222	-0,11766	0,63663	3401,55556	0,32838	0,99971	0,22617
ACHN	0,33177	-0,23946	-0,28592	-0,06308	2,58588	4,53253	0,10187	0,77937	0,30706
AEA	1,24380	0,00751	0,02373	0,00329	0,95504	7,21041	0,45871	0,86131	0,36880
ASAIR	0,48963	60611'0-	-0,99177	-0,03950	1,69170	25,10603	0,19608	0,96017	0,41709
COPAIR	1,17632	0,02904	0,03374	0,01032	1,21888	3,26941	0,29160	0,69413	0,24789
CROAIR	1,24940	-0,40397	4,16266	-0,20347	1,36031	-20,45855	0,37026	1,04888	0,29635
EVA	1,39764	0,06431	0,07206	0,02053	1,59356	3,50904	0,20037	0,71502	0,14336
LUF	0,91779	-0,13033	-0,48797	-0,05151	1,24757	9,47394	0,31678	0,89445	0,34515
SHEAIR	0,93254	0,32845	0,09659	0,04923	0,68632	1,96198	0,21841	0,49031	0,23419
TAP	9/60/0	68//1'1-	3,41636	-0,33893	1,09596	-10,07974	0,26255	1,09921	0,37013
THAIR	0,52368	2,55483	-0,77351	0,34185	0,87000	-2,26271	0,15380	1,44195	0,29369
TUAIR	0,72750	0,08435	0,09280	0,02322	1,47998	3,90191	0,18602	0,74372	0,25570
UNAIR	1,19266	59620'0-	-0,39256	-0,02879	1,12824	13,63485	0,32040	0,92666	0,26864
Mak	1,45191	2,55483	4,16266	0,34185	2,58588	3401,55556	0,45871	1,44195	0,41709
Min	0,33177	68//1'1-	-400,22222	-0,33893	0,63663	-20,45855	0,10187	0,49031	0,14336
			Nor	Normalization of Criteria	riteria				
Criteria						ļ			
Alternative	క	PR1	PR2	PR3	AT	క	FSR1	FSR2	FSR3
ACAN	1,00000	0,16478	0,00000	0,32503	0,00000	1,00000	0,63477	0,46472	0,69747
ACHN	0,00000	0,25141	0,98900	0,40520	1,00000	0,00730	0,00000	0,69625	0,40197
AEA	0,81421	0,31757	0,98976	0,50269	0,16335	60800′0	1,00000	0,61015	0,17642
ASAIR	0,14093	0,28365	0,98725	0,43983	0,54127	0,01332	0,26402	0,50626	0,00000
COPAIR	0,75397	0,32334	0,98979	0,51302	0,29870	6900'0	0,53169	0,78582	0,61813
CROAIR	0,81922	0,20733	1,00000	0,19898	0,37126	0,00000	0,75214	0,41305	0,44108
EVA	0,95155	0,33279	0,98988	0,52802	0,49092	00/00/0	0,27603	0,76387	1,00000
LUF	0,52317	0,28064	0,98850	0,42220	0,31342	0,00875	0,60225	0,57533	0,26280
SHEAIR	0,53633	0,40355	0,98995	0,57017	0,02550	0,00655	0,32659	1,00000	0,66818
TAP	0,33745	0,00000	0,99815	0,00000	0,23565	0,00303	0,45029	0,36016	0,17156
THAIR	0,17133	1,00000	0,98779	1,00000	0,11973	0,00532	0,14552	0,00000	0,45081
TUAIR	0,35328	0,33816	0,98994	0,53197	0,43265	0,00712	0,23582	0,73372	0,58959

UNAIR	0,76856	0,29422	0,98874	0,45557	0,25221	96600'0	0,61239	0,54148	0,54232	
				Square Matrix						
Kriter Alternative	æ	PR1	PR2	PR3	AT	CA	FSR1	FSR2	FSR3	
ACAN	1,00000	0,02715	0,00000	0,10564	0,00000	1,00000	0,40293	0,21596	0,48647	
ACHN	000000	0,06320	0,97812	0,16418	1,00000	0,00005	0,00000	0,48476	0,16158	
AEA	0,66294	0,10085	0,97963	0,25270	0,02668	0,00007	1,00000	0,37228	0,03112	
ASAIR	0,01986	0,08046	0,97467	0,19345	0,29297	0,00018	0,06971	0,25630	0,00000	
COPAIR	0,56848	0,10455	0,97968	0,26318	0,08922	0,00005	0,28270	0,61751	0,38208	
CROAIR	0,67112	0,04299	1,00000	0,03959	0,13783	0,00000	0,56571	0,17061	0,19455	
EVA	0,90545	0,11075	0,97987	0,27880	0,24101	0,00005	0,07619	0,58350	1,00000	
LUF	0,27371	0,07876	0,97713	0,17825	0,09823	0,00008	0,36270	0,33100	0,06907	
SHEAIR	0,28765	0,16285	66626'0	0,32509	90000'0	0,00004	0,10666	1,00000	0,44647	
TAP	0,11387	00000′0	0,99631	00000′0	0,05553	0,00001	0,20276	0,12971	0,02943	
THAIR	0,02935	1,00000	0,97574	1,00000	0,01433	0,00003	0,02118	0,00000	0,20323	
TUAIR	0,12481	0,11435	76676'0	0,28299	0,18719	0,00005	0,05561	0,53834	0,34762	
UNAIR	0,59068	0,08657	0)22/60	0,20754	0,06361	0,00010	0,37503	0,29320	0,29411	
Total	5,24791	1,97248	11,77872	3,29143	2,20726	1,00070	3,52118	4,99317	3,64573	
u	13	13	13	13	13	13	13	13	13	
total/m	0,40369	0,15173	90906′0	0,25319	0,16979	0,07698	0,27086	0,38409	0,28044	
Square Root(total/m)	0,63536	0,38952	0,95187	0,50318	0,41205	0,27745	0,52044	0,61975	0,52957	
Standard Deviation (Standardization of Criteria)	0,32830	0,22679	0,27481	0,22738	0,26162	0,27544	0,27466	0,24543	0,26735	
Square Root(total/m)/Standard										
Deviation (Standardization of	1,93531	1,71755	3,46379	2,21298	1,57502	1,00728	1,89483	2,52513	1,98081	
Criteria)										
pwij	66,02652	54,08967	124,23629	79,43395	45,42691	0,72555	63,91265	92,62935	68,35079	594,83167
wj	0,11100	0,09093	0,20886	0,13354	0,07637	0,00122	0,10745	0,15572	0,11491	-
Rank	5	7	1	3	8	6	9	2	4	

APPENDIX 8: 2021 TOPSIS Analysis Results

				Decision Matrix	n Matrix				
Target Criteria	Max	Max	Max	Max	Max	Max	Max	Min	Min
Weight Value	0,11100	0,09093	0,20886	0,13354	0,07637	0,00122	0,10745	0,15572	0,11491
Criteria Alternative	æ	PR1	PR2	PR3	AT	ď	FSR1	FSR2	FSR3
ACAN	1,45191	-0,56281	-400,22222	-0,11766	0,63663	3401,55556	0,32838	0,99971	0,22617
ACHN	0,33177	-0,23946	-0,28592	-0,06308	2,58588	4,53253	0,10187	0,77937	0,30706
AEA	1,24380	15/00′0	0,02373	0,00329	0,95504	7,21041	0,45871	0,86131	0,36880
ASAIR	0,48963	60611′0-	-0,99177	-0,03950	1,69170	25,10603	0,19608	0,96017	0,41709
COPAIR	1,17632	0,02904	0,03374	0,01032	1,21888	3,26941	0,29160	0,69413	0,24789
CROAIR	1,24940	-0,40397	4,16266	-0,20347	1,36031	-20,45855	0,37026	1,04888	0,29635
EVA	1,39764	0,06431	0,07206	0,02053	1,59356	3,50904	0,20037	0,71502	0,14336
LUF	0,91779	-0,13033	-0,48797	-0,05151	1,24757	9,47394	0,31678	0,89445	0,34515
SHEAIR	0,93254	0,32845	65960'0	0,04923	0,68632	1,96198	0,21841	0,49031	0,23419
TAP	0,70976	-1,17789	3,41636	-0,33893	1,09596	-10,07974	0,26255	1,09921	0,37013
THAIR	0,52368	2,55483	-0,77351	0,34185	0,87000	-2,26271	0,15380	1,44195	0,29369
TUAIR	0,72750	0,08435	0,09280	0,02322	1,47998	3,90191	0,18602	0,74372	0,25570
UNAIR	1,19266	59620′0-	-0,39256	-0,02879	1,12824	13,63485	0,32040	0,92666	0,26864
				Normalization of Criteria	on of Criteria				
Criteria Alternative	£	PR1	PR2	PR3	AT	8	FSR1	FSR2	FSR3
ACAN	0,39745	-0,19181	06666'0-	-0,21499	0,12944	0,99993	0,32720	0,30001	0,20999
ACHN	0,09082	-0,08161	-0,00071	-0,11526	0,52576	0,00133	0,10151	0,23389	0,28509
AEA	0,34048	0,00256	90000′0	0,00601	0,19418	0,00212	0,45706	0,25848	0,34242
ASAIR	0,13403	-0,04059	-0,00248	-0,07218	0,34395	0,00738	0,19538	0,28815	0,38725
COPAIR	0,32201	0,01008	0,00605	0,01931	0,24992	0,08315	0,30747	0,21837	0,23541
CROAIR	0,34202	-0,13768	0,01040	-0,37179	0,27658	-0,00601	0,36893	0,31477	0,27515
EVA	0,38260	0,02192	0,00018	0,03752	0,32400	0,00103	0,19965	0,21458	0,13311
LUF	0,25124	-0,04442	-0,00122	-0,09412	0,25366	0,00278	0,31564	0,26843	0,32046
SHEAIR	0,25528	0,11194	0,00024	0,08995	0,13954	0,00058	0,21763	0,14714	0,21744
TAP	0,19429	-0,40144	0,00854	-0,61932	0,22283	-0,00296	0,26161	0,32987	0,34365
THAIR	0,14336	0,87071	-0,00193	0,62465	0,17689	-0,00067	0,15325	0,43273	0,27268
TUAIR	0,19915	0,02875	0,00023	0,04243	0,30091	0,00115	0,18535	0,22319	0,23741
UNAIR	0,32648	-0,02714	86000'0-	-0,05261	0,22939	0,00401	0,31924	0,27809	0,24943

			Multiplica	Multiplication of Normalized Matrices by Weight Values	d Matrices by Wei	ght Values			
Criteria	ę	200	caa	caa	H	Š	1932	6051	6655
Alternative	5	2	rk.	Š	Ē	5	ואני	13K2	FSRS
ACAN	0,04412	-0,01744	-0,20884	-0,02871	68600'0	0,00122	0,03516	0,04672	0,02413
ACHN	0,01008	-0,00742	-0,00015	-0,01539	0,04015	00000′0	16010′0	0,03642	0,03276
AEA	0,03779	0,00023	0,00001	08000′0	0,01483	00000′0	0,04911	0,04025	0,03935
ASAIR	0,01488	69800'0-	-0,00052	-0,00964	0,02627	0,00001	66070′0	0,04487	0,04450
COPAIR	0,03574	0,00092	0,00126	0,00258	0,01909	0,00010	0,03304	0,03401	0,02705
CROAIR	96/20'0	-0,01252	0,00217	-0,04965	0,02112	-0,00001	0,03964	0,04902	0,03162
EVA	0,04247	0,00199	0,00004	0,00501	0,02474	00000′0	0,02145	0,03342	0,01530
LUF	0,02789	-0,00404	-0,00025	-0,01257	0,01937	00000′0	0,03391	0,04180	0,03682
SHEAIR	0,02834	0,01018	50000′0	0,01201	0,01066	00000′0	0,02338	0,02291	0,02499
TAP	0,02157	05980'0-	0,00178	-0,08270	0,01702	00000′0	0,02811	0,05137	0,03949
THAIR	0,01591	0,07918	-0,00040	0,08342	0,01351	00000′0	0,01647	0,06739	0,03133
TUAIR	0,02211	0,00261	50000′0	0,00567	0,02298	00000′0	0,01992	0,03476	0,02728
UNAIR	0,03624	-0,00247	-0,00020	-0,00703	0,01752	00000′0	0,03430	0,04331	0,02866
			Positive	Positive ideal solutions and negative ideal solutions	nd negative ideal s	olutions			
A +	0,04412	0,07918	0,00217	0,08342	0,04015	0,00122	0,04911	0,02291	0,01530
Α-	0,01008	-0,03650	-0,20884	-0,08270	0,00989	-0,00001	0,01091	0,06739	0,04450
	the dis	tance of each alte	rnative from the _l	the distance of each alternative from the positive ideal and negative ideal solution points and its performance ranking	negative ideal so	lution points and	its performance r	anking	
Alternative	Di+	Di-	Ci	Rank					
ACAN	0,26113	0,07661	0,22683	13					
ACHN	0,14274	0,22570	0,61258	10					
AEA	0,12093	0,23443	0/659/0	6					
ASAIR	0,13678	0,22520	0,62213	6					
COPAIR	0,11702	0,23552	90899′0	4					
CROAIR	0,16599	0,22006	0,57003	11					
EVA	0,11500	0,23705	0,67333	3					
LUF	0,13376	0,22612	0,62832	8					
SHEAIR	0,10835	0,24007	0,68902	2					
TAP	0,20943	0,21242	0,50355	12					
THAIR	0,06938	0,29099	0,80747	1					
TUAIR	0,11759	0,23395	0,66549	5					
UNAIR	0,12744	0,22920	0,64267	7					

APPENDIX 9: 2022 LOPCOW Analysis Results

				Decision Matrix	×				
Target Criteria	Мах	Max	Max	Max	Max	Max	Мах	Min	Min
Criteria Alternative	æ	PR1	PR2	PR3	AT	CA	FSR1	FSR2	FSR3
ACAN	1,03336	-0,10268	1,09325	-0,05761	1,71298	-18,97556	0,32755	1,05270	0,31698
ACHN	0,24053	-0,80277	-2,09836	-0,15314	2,52965	13,70198	0,07541	0,92702	0,31352
AEA	1,15495	0,07987	0,30675	0,05285	1,65812	5,80397	0,39905	0,82770	0,34551
ASAIR	0,47592	0,00427	0,03707	0,00197	2,18213	18,80168	0,21139	0,94681	0,44417
COPAIR	1,03540	0,11739	0,23326	0,07421	2,39923	3,14344	0,26348	0,68188	0,25447
CROAIR	1,61850	66/60′0-	-1,46159	-0,08128	1,69333	17,98265	0,48986	0,94194	0,30022
EVA	1,09151	99950′0	0,08129	0,02448	1,62957	3,32015	0,26516	0,69881	0,24293
LUF	0,86148	0,02414	0,09334	0,01825	2,14815	5,11388	0,35202	0,80445	0,40863
SHEAIR	0,62730	0,12468	0,03508	0,01450	0,50954	2,41842	0,22830	0,58651	0,36394
TAP	0,86557	0,01894	0,15707	0,01109	1,81939	14,16070	0,32183	0,92938	0,37181
THAIR	0,93947	-0,00242	0,00354	-0,00127	1,73680	-2,79027	0,30177	1,35839	0,32121
TUAIR	0,87701	0,15243	0,26144	0,08198	2,30333	3,18900	0,23350	0,68642	0,26624
UNAIR	1,00320	0,01644	0,10765	0,01098	2,24125	6,80757	0,29791	0,89804	0,29696
Mak	1,61850	0,15243	1,09325	0,08198	2,52965	18,80168	0,48986	1,35839	0,44417
Min	0,24053	-0,80277	-2,09836	-0,15314	0,50954	-18,97556	0,07541	0,58651	0,24293
			Nor	Normalization of Criteria	riteria				
Criteria									
Alternative	ន	PR1	PR2	PR3	ΑT	ď	FSR1	FSR2	FSR3
NACA	0.57536	0.73797	1 00000	0.406.20	0.50573	00000	0,60837	0.30603	0.63004
ACHN	0,00000	0,00000	0,00000	0,00000	1,00000	0,86501	0,00000	0,55886	0,64920
AEA	0,66360	0,92404	0,75357	0,87611	0,56857	0,65594	0,78089	0,68752	0,49024
ASAIR	0,17082	0,84489	20699'0	0,65971	0,82797	1,00000	0,32809	0,53321	0,00000
COPAIR	0,57684	18896'0	0,73055	£6996′0	0,93544	0,58551	0,45378	0,87644	0,94263
CROAIR	1,00000	0,73784	0,19951	99508'0	0)58600	0,97832	1,00000	0,53952	0,71532
EVA	0,61756	0,89974	0,68293	0,75546	0,55444	0,59019	0,45783	0,85451	1,00000
LUF	0,45062	69598'0	0,68671	0,72896	0,81115	29/29'0	0,66742	0,71764	0,17659
SHEAIR	0,28068	0,97094	0,66845	0,71301	000000'0	0,56632	0,36890	1,00000	0,39866
TAP	0,45359	0,86025	0,70668	0,69850	0,64841	0,87715	0,59457	0,55579	0,35954
THAIR	0,50723	0,83788	0,65857	0,64593	0,60752	0,42844	0,54616	0,00000	0,61100
TUAIR	0,46190	1,00000	0,73938	1,00000	0,88797	0,58672	0,38144	0,87056	0,88415

Square Matrix AT CA FSR1 0,16507 0,35490 0,00000 0,37011 0,000000 1,00000 0,74824 0,00000 0,76756 0,232328 0,43025 0,60979 0,033496 0,87505 0,43028 0,00000 0,093496 0,87505 0,34282 0,20592 0,093496 0,87505 0,34482 0,20592 0,093496 0,87505 0,34482 0,20592 0,093496 0,87701 1,00000 0,10764 0,093496 0,34340 0,95711 1,00000 0,57072 0,30741 0,34832 0,20592 0,65706 0,40662 0,44545 0,44545 0,65708 0,00000 0,32072 0,14549 0,48721 0,42043 0,76939 0,35351 0,48722 0,73849 0,76805 0,44545 0,48722 0,73485 0,58052 0,28821 0,49224 0,52772 0,49475 0,282078 <t< th=""><th>UNAIR</th><th>0,55347</th><th>0,85763</th><th>0,69119</th><th>0,69801</th><th>0,85724</th><th>0,76192</th><th>0,53685</th><th>0,59640</th><th>0,73151</th><th></th></t<>	UNAIR	0,55347	0,85763	0,69119	0,69801	0,85724	0,76192	0,53685	0,59640	0,73151	
ACAN O.33104 0.53718 1,00000 0,16507 0,33490 0,00000 0,37011 ACAN O.33104 0,53718 1,00000 0,16507 0,33490 0,00000 0,37011 ACHN O.00000 0,00000					Square Matri						
0,33104 0,53718 1,00000 0,16507 0,33490 0,00000 0,37011 0,00000 0,00000 0,00000 0,00000 0,00000 0,74824 0,00000 0,04037 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,04037 0,02078 0,55787 0,7576 0,3328 0,43025 0,69979 0,03918 0,771385 0,44766 0,43322 0,68553 1,00000 0,10764 0,338139 0,62797 0,53370 0,93496 0,88536 0,20592 1,00000 0,5441 0,03946 0,69349 0,34340 0,20592 0,2036 0,74942 0,44683 0,57072 0,30741 0,34832 0,20961 0,2036 0,7403 0,44683 0,5339 0,6704 0,44549 0,74568 0,2037 0,7403 0,44683 0,50343 0,76939 0,7454 0,74444 0,14568 0,2057 0,7403 0,4337 0,41722 0,73485		CR	PR1	PR2	PR3	AT	CA	FSR1	FSR2	FSR3	
0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,44037 0,85885 0,56787 0,76756 0,3238 0,43025 0,60979 0,02918 0,71385 0,44766 0,48753 1,00000 0,10764 0,0000 0,02918 0,71385 0,44766 0,87507 0,87320 0,20592 0,0000 1,00000 0,54441 0,03980 0,09342 0,34780 0,20592 0,20502 1,00000 0,54441 0,03980 0,09342 0,34741 0,34832 0,20691 0,20306 0,74942 0,446640 0,57072 0,30741 0,34832 0,20691 0,07878 0,74033 0,4483 0,56399 0,40662 0,4456 0,13583 0,07878 0,74033 0,44833 0,56339 0,0000 0,13689 0,13583 0,27578 0,70057 0,74868 1,00000 0,78849 0,13689 0,13689 0,2133 0,73553 0,7774 0,48722 0,73485	ACAN	0,33104	0,53718	1,00000	0,16507	0,35490	0000000	0,37011	0,15684	0,39948	
0,44037 0,85385 0,56787 0,76756 0,32328 0,43025 0,60979 0,02918 0,71385 0,44766 0,43522 0,68553 1,00000 0,10764 1,032175 0,923797 0,53370 0,09346 0,887505 0,34282 0,00592 1,00000 0,54441 0,03980 0,09342 0,34382 0,20571 1,00000 0,28139 0,809424 0,609342 0,34813 0,60652 0,40662 0,20504 0,07878 0,94273 0,46640 0,57072 0,53741 0,10060 0,44565 0,07878 0,94273 0,44683 0,58399 0,60000 0,34655 0,48791 0,42043 0,76939 0,34856 0,20572 0,70205 0,44774 0,48791 0,42043 0,76939 0,38817 0,18506 0,23063 1,00000 0,54668 1,00000 0,78493 0,48791 0,78849 0,18506 0,18493 0,22072 0,22072 0,230438 0,47744 0,48722	ACHN	0000000	00000′0	00000′0	000000'0	1,00000	0,74824	000000'0	0,31232	0,42147	
0,02918 0,71385 0,44766 0,43522 0,68553 1,00000 0,10764 0,33275 0,92797 0,53370 0,93496 0,87505 0,34282 0,20592 1,00000 0,54441 0,03980 0,09342 0,34340 0,55711 1,00000 0,20306 0,54441 0,03980 0,09342 0,34340 0,55711 1,00000 0,02036 0,74942 0,46403 0,50318 0,65796 0,44545 0,2061 0,07878 0,74942 0,48731 0,65796 0,40662 0,44545 0,44545 0,07878 0,74939 0,50839 0,60808 0,13662 0,44545 0,02675 0,74000 0,54668 1,00000 0,78849 0,78376 0,14549 0,25728 0,70205 0,47774 0,48722 0,73485 0,28022 0,28821 0,23073 0,71204 0,4556 0,49224 0,72346 0,14549 0,28022 0,23071 0,72407 0,72548 0,25724 0,26475 <th>AEA</th> <th>0,44037</th> <th>0,85385</th> <th>0,56787</th> <th>0,76756</th> <th>0,32328</th> <th>0,43025</th> <th>6/609′0</th> <th>0,47269</th> <th>0,24033</th> <th></th>	AEA	0,44037	0,85385	0,56787	0,76756	0,32328	0,43025	6/609′0	0,47269	0,24033	
0,33275 0,92797 0,53370 0,93496 0,87505 0,34282 0,20592 1,00000 0,54441 0,03980 0,09342 0,34340 0,95711 1,00000 0,38139 0,80954 0,46640 0,57072 0,33431 0,20661 1,00000 0,28139 0,80954 0,46640 0,57072 0,33041 0,34682 0,20661 0,020306 0,74942 0,44683 0,5839 0,00000 0,43072 0,13668 0,02572 0,74003 0,44683 0,58899 0,40000 0,14599 0,13689 0,25728 0,74003 0,448791 0,42043 0,76939 0,13689 0,25728 0,74003 0,448791 0,78849 0,14449 0,25728 0,73553 0,47774 0,48722 0,73693 0,58821 0,23063 0,73553 0,47774 0,48722 0,58638 0,41702 0,24071 0,71204 0,45246 0,70494 0,70494 0,53918 0,84383 0,67547	ASAIR	0,02918	0,71385	0,44766	0,43522	0,68553	1,00000	0,10764	0,28431	0000000	
1,00000 0,5441 0,03980 0,03942 0,34340 0,95711 1,00000 0,38139 0,80954 0,46640 0,57072 0,30741 0,34832 0,20961 0,020306 0,74942 0,44683 0,55795 0,40662 0,44545 0,020308 0,74942 0,44683 0,50839 0,00000 0,32072 0,13608 0,020375 0,74003 0,48731 0,50839 0,00000 0,32072 0,13608 0,205728 0,74003 0,48939 0,48791 0,42043 0,76839 0,13581 0,21335 1,00000 0,54668 1,00000 0,78849 0,18356 0,28821 0,23043 0,7724 0,44774 0,48722 0,73442 0,14549 0,23071 1,3 13 13 13 13 1,2007 0,75555 5,93136 6,89038 6,4375 0,73208 0,53918 0,84383 0,67547 0,70244 0,70339 0,5637 0,53918 0,84383	COPAIR	0,33275	0,92797	0,53370	0,93496	0,87505	0,34282	0,20592	0,76816	0,88855	
0,38139 0,80954 0,46640 0,57072 0,30741 0,34832 0,20961 0,20306 0,74942 0,47157 0,53138 0,65796 0,40662 0,44545 0,007878 0,94273 0,44683 0,50839 0,00000 0,32072 0,13608 0,00575 0,74003 0,49939 0,48791 0,42043 0,76939 0,13608 0,25728 0,70205 0,43372 0,41772 0,36908 0,78356 0,28829 0,21335 1,00000 0,54668 1,00000 0,78499 0,34424 0,14549 0,30633 0,73553 0,47774 0,48722 0,73485 0,58821 0,14549 0,30637 0,73663 0,45565 5,93136 6,39907 6,86038 6,43179 4,17012 13 13 13 13 13 13 13 0,29071 0,71204 0,49524 0,70160 0,72644 0,70339 0,56637 0,24407 0,2554 0,25548 0,25548	CROAIR	1,00000	0,54441	086£0′0	0,09342	0,34340	0,95711	1,00000	0,29108	0,51168	
0,02306 0,74942 0,47157 0,53138 0,65796 0,40662 0,44545 0,07878 0,94273 0,44683 0,50839 0,00000 0,32072 0,13608 0,20575 0,74003 0,49939 0,48791 0,42043 0,76939 0,35351 0,25728 0,70205 0,43372 0,41722 0,36908 0,18356 0,29829 0,23728 0,70205 0,43372 0,41722 0,36908 0,18356 0,29829 0,23063 0,73553 0,47774 0,48722 0,73485 0,58052 0,28821 0,30633 0,73553 0,47774 0,48722 0,73485 0,58052 0,28821 1,3 13 13 13 13 13 13 13 1,29071 0,71204 0,45626 0,49224 0,72644 0,70339 0,56637 0,24407 0,25554 0,25428 0,27396 2,67351 2,67351 2,5861 2,20909 3,30212 2,65635 2,56096 <t< th=""><th>EVA</th><th>0,38139</th><th>0,80954</th><th>0,46640</th><th>0,57072</th><th>0,30741</th><th>0,34832</th><th>0,20961</th><th>61082′0</th><th>1,00000</th><th></th></t<>	EVA	0,38139	0,80954	0,46640	0,57072	0,30741	0,34832	0,20961	61082′0	1,00000	
0,07878 0,94273 0,4683 0,50839 0,00000 0,32072 0,13608 0,20575 0,74003 0,49939 0,48791 0,42043 0,76939 0,35351 0,25728 0,70205 0,43372 0,41722 0,36908 0,18356 0,29829 0,21335 1,00000 0,54668 1,00000 0,78849 0,14549 0,14549 0,230633 0,73553 0,47774 0,48722 0,73485 0,58052 0,28821 13 13 13 13 13 13 13 13 13 13 13 13 13 0,29071 0,71204 0,49224 0,52772 0,49475 0,53078 0,53918 0,84383 0,67547 0,70160 0,72544 0,70339 0,56637 0,24407 0,2554 0,25428 0,27396 2,82402 2,67351 2,35861 2,20909 3,30212 2,65635 2,56096 2,82402 2,67351 0,10488 0,092	TUF	0,20306	0,74942	0,47157	0,53138	96259′0	0,40662	0,44545	0,51501	0,03119	
0,25728 0,74003 0,49939 0,48791 0,42043 0,76939 0,35351 0,25728 0,70205 0,43372 0,41722 0,36908 0,18356 0,29829 0,21335 1,00000 0,54668 1,00000 0,78849 0,14549 0,14549 0,20633 0,73553 0,47774 0,48722 0,73485 0,58052 0,28821 3,77927 9,25655 5,93136 6,39907 6,86038 6,43179 4,17012 13 13 13 13 13 13 13 0,29071 0,71204 0,45626 0,49224 0,52772 0,49475 0,32078 0,53918 0,84383 0,67547 0,70160 0,72644 0,70339 0,56637 0,24407 0,25554 0,25728 0,25724 0,26310 0,24013 2,20909 3,30212 2,65635 2,56096 2,82402 2,67351 2,35861 0,09281 0,13988 0,11440 0,11012 0,11557 0,11515	SHEAIR	0,07878	0,94273	0,44683	6805'0	00000′0	0,32072	0,13608	1,00000	0,15893	
0,25728 0,70205 0,43372 0,41722 0,36908 0,18356 0,29829 0,21335 1,00000 0,54668 1,00000 0,78849 0,34424 0,14549 0,30633 0,73553 0,47774 0,48722 0,73485 0,58052 0,28821 3,77927 9,25655 5,93136 6,39907 6,86038 6,43179 4,17012 13 13 13 13 13 13 13 0,29071 0,71204 0,49224 0,52772 0,49475 0,32078 0,53918 0,84383 0,67547 0,70160 0,72644 0,70339 0,56637 0,24407 0,25428 0,27396 0,25724 0,26310 0,24013 2,20909 3,30212 2,65635 2,56096 2,82402 2,67351 2,35861 7 8 1 4 6 2 3 7	TAP	0,20575	0,74003	0,49939	0,48791	0,42043	68692'0	138381	1680£′0	0,12927	
0,21335 1,00000 0,54668 1,00000 0,78849 0,34424 0,14549 0,30633 0,73553 0,47774 0,48722 0,73485 0,58052 0,28821 3,77927 9,25655 5,93136 6,39907 6,86038 6,43179 4,17012 13 13 13 13 13 13 13 0,29071 0,71204 0,45626 0,49224 0,52772 0,49475 0,32078 0,53918 0,84383 0,67547 0,70160 0,72644 0,70339 0,56637 0,24407 0,25554 0,25428 0,27396 0,25724 0,26310 0,24013 2,20909 3,30212 2,65635 2,56096 2,82402 2,67351 2,35861 7,9,25811 119,45654 97,69548 94,03812 103,81631 98,33905 85,80732 8 1 4 6 2 3 7	THAIR	0,25728	0,70205	0,43372	0,41722	8069£′0	0,18356	67867'0	00000′0	0,37333	
0,30633 0,73553 0,47774 0,48722 0,73485 0,58052 0,28821 3,77927 9,25655 5,93136 6,39907 6,86038 6,43179 4,17012 13 13 13 13 13 13 13 0,29071 0,71204 0,45626 0,49224 0,52772 0,49475 0,32078 0,53918 0,84383 0,67547 0,70160 0,72644 0,70339 0,56637 0,24407 0,25554 0,25428 0,27396 0,25724 0,26310 0,24013 2,20909 3,30212 2,65635 2,56096 2,82402 2,67351 2,35861 7,9,25811 119,45654 97,69548 94,03812 103,81631 98,33905 85,80732 8 1 4 6 2 3 7	TUAIR	0,21335	1,00000	0,54668	1,00000	0,78849	0,34424	0,14549	28252'0	0,78172	
3,77927 9,25655 5,93136 6,39907 6,86038 6,43179 4,17012 13 14	UNAIR	0,30633	0,73553	0,47774	0,48722	0,73485	0,58052	0,28821	6955£′0	0,53510	
13 14 13 14<	Total	3,77927	9,25655	5,93136	6,39907	6,86038	6,43179	4,17012	5,95306	5,47104	
0,29071 0,71204 0,45626 0,49224 0,52772 0,49475 0,32078 0,53918 0,84383 0,67547 0,70160 0,72644 0,70339 0,56637 0,24407 0,25554 0,25428 0,27396 0,25724 0,26310 0,24013 2,20909 3,30212 2,65635 2,56096 2,82402 2,67351 2,35861 79,25811 119,45654 97,69548 94,03812 103,81631 98,33905 85,80732 0,09281 0,13988 0,11440 0,11012 0,12157 0,11515 0,11048 8 1 4 6 2 3 7	m	13	13	13	13	13	13	13	13	13	
0,53918 0,84383 0,67547 0,70160 0,72644 0,70339 0,56637 0,24407 0,25554 0,25428 0,27396 0,25724 0,26310 0,24013 2,20909 3,30212 2,65635 2,56096 2,82402 2,67351 2,35861 79,25811 119,45654 97,69548 94,03812 103,81631 98,33905 85,80732 0,09281 0,13988 0,11440 0,11012 0,12157 0,11515 0,10048 8 1 4 6 2 3 7	total/m	0,29071	0,71204	0,45626	0,49224	0,52772	0,49475	0,32078	0,45793	0,42085	
0,24407 0,25554 0,25428 0,27396 0,25724 0,26310 0,24013 2,20909 3,30212 2,65635 2,56096 2,82402 2,67351 2,35861 79,25811 119,45654 97,69548 94,03812 103,81631 98,33905 85,80732 0,09281 0,13988 0,11440 0,11012 0,12157 0,11515 0,10048 8 1 4 6 2 3 7	Square Root(total/m)	0,53918	0,84383	0,67547	0,70160	0,72644	68802'0	28995'0	0/9/9′0	0,64873	
2,20909 3,30212 2,65635 2,56096 2,82402 2,67351 2,35861 79,25811 119,45654 97,69548 94,03812 103,81631 98,33905 85,80732 0,09281 0,13988 0,11440 0,11012 0,11515 0,11515 0,11048 8 1 4 6 2 3 7	Standard Deviation (Standardization of Criteria)	0,24407	0,25554	0,25428	0,27396	0,25724	0,26310	0,24013	0,25784	0,29420	
2,20909 3,30212 2,65635 2,56096 2,82402 2,67351 2,35861 79,25811 119,45654 97,69548 94,03812 103,81631 98,33905 85,80732 0,09281 0,13988 0,11440 0,11012 0,12157 0,11515 0,10048 8 1 4 6 2 3 7	Square Root(total/m)/Standard										
79,25811 119,45654 97,69548 94,03812 103,81631 98,33905 85,80732 0,09281 0,13988 0,11440 0,11012 0,12157 0,11515 0,10048 8 1 4 6 2 3 7	Deviation (Standardization of Criteria)	2,20909	3,30212	2,65635	2,56096	2,82402	2,67351	2,35861	2,62449	2,20510	
0,09281 0,13988 0,11440 0,11012 0,12157 0,11515 0,10048 8 1 4 6 2 3 7	pwij	79,25811	119,45654	97,69548	94,03812	103,81631	98,33905	85,80732	96,48869	79,07711	853,97673
8 1 4 6 2 3 7	ĺM	0,09281	0,13988	0,11440	0,11012	0,12157	0,11515	0,10048	0,11299	0,09260	1
	Rank	8	1	4	9	2	3	7	5	6	

APPENDIX 10: 2022 TOPSIS Performance Results

				Decision Matrix	ו Matrix				
Target Criteria	Max	Max	Max	Max	Max	Мах	Max	Min	Min
Weight Values	0,09281	0,13988	0,11440	0,11012	0,12157	0,11515	0,10048	0,11299	0,09260
Criteria Alternative	8	PR1	PR2	PR3	AT	8	FSR1	FSR2	FSR3
ACAN	1,03336	-0,10268	1,09325	-0,05761	1,71298	-18,97556	0,32755	1,05270	0,31698
ACHN	0,24053	-0,80277	-2,09836	-0,15314	2,52965	13,70198	0,07541	0,92702	0,31352
AEA	1,15495	0,07987	0,30675	0,05285	1,65812	2680362	0,39905	0,82770	0,34551
ASAIR	0,47592	0,00427	0,03707	0,00197	2,18213	18,80168	0,21139	0,94681	0,44417
COPAIR	1,03540	0,11739	0,23326	0,07421	2,39923	3,14344	0,26348	0,68188	0,25447
CROAIR	1,61850	66/60′0-	-1,46159	-0,08128	1,69333	17,98265	0,48986	0,94194	0,30022
EVA	1,09151	99950′0	0,08129	0,02448	1,62957	3,32015	0,26516	0,69881	0,24293
LUF	0,86148	0,02414	0,09334	0,01825	2,14815	5,11388	0,35202	0,80445	0,40863
SHEAIR	0,62730	0,12468	0,03508	0,01450	0,50954	2,41842	0,22830	0,58651	0,36394
TAP	0,86557	0,01894	0,15707	0,01109	1,81939	14,16070	0,32183	0,92938	0,37181
THAIR	0,93947	-0,00242	0,00354	-0,00127	1,73680	-2,79027	0,30177	1,35839	0,32121
TUAIR	0,87701	0,15243	0,26144	0,08198	2,30333	3,18900	0,23350	0,68642	0,26624
UNAIR	1,00320	0,01644	0,10765	0,01098	2,24125	6,80757	0,29791	0,89804	0,29696
•				Normalization of Criteria	on of Criteria				
Criteria Alternative	8	PR1	PR2	PR3	AT	5	FSR1	FSR2	FSR3
ACAN	0,29692	-0,12035	0,38639	-0,25820	0,24310	-0,47059	0,29770	0,32694	0,26514
ACHN	0,06911	-0,94088	-0,74162	-0,68631	66858'0	08688'0	0,06854	0,28791	0,26225
AEA	0,33186	0,09362	0,10841	0,23685	0,23531	0,14394	0,36269	0,25706	0,28901
ASAIR	0,13675	0,00501	0,01310	0,00883	8960£′0	0,46628	0,19213	0,29406	0,37153
COPAIR	0,29751	0,13758	0,08244	0,33256	0,34049	0,07796	0,23947	0,21177	0,21286
CROAIR	0,46505	-0,11484	-0,51657	-0,36425	0,24031	0,44596	0,44523	0,29254	0,25112
EVA	0,31363	0,06641	0,02873	0,10973	0,23126	0,08234	0,24100	0,21703	0,20320
LUF	0,24753	0,02829	0,03299	0,08180	0,30485	0,12682	0,31995	0,24984	0,34180
SHEAIR	0,18025	0,14613	0,01240	0,06500	0,07231	0,05998	0,20750	0,18215	0,30442
TAP	0,24871	0,02220	0,05551	0,04971	0,25820	0,35118	0,29251	0,28864	0,31101
THAIR	0,26994	-0,00284	0,00125	-0,00569	0,24648	-0,06920	0,27427	0,42188	0,26868
TUAIR	0,25200	0,17866	0,09240	0,36740	0,32688	0,07909	0,21222	0,21318	0,22270
UNAIR	0,28826	0,01927	0,03805	0,04919	0,31807	0,24322	0,27077	0,27891	0,24839

ria					piication of Normalized Matrices by Weight Values	giit values			
	CR	PR1	PR2	PR3	AT	5	FSR1	FSR2	FSR3
Alternative									
ACAN 0,0	0,02756	-0,01683	0,04420	-0,02843	0,02955	-0,05419	0,02991	0,03694	0,02455
ACHN 0,0	0,00641	-0,13161	-0,08484	-0'07558	0,04364	0,03913	68900′0	0,03253	0,02428
AEA 0,0	08080'0	0,01310	0,01240	0,02608	0,02861	0,01657	0,03644	0,02904	0'03676
ASAIR 0,0	0,01269	0,00070	0,00150	26000'0	0,03765	0,05369	0,01931	0,03322	0,03440
COPAIR 0,0	0,02761	0,01925	0,00943	79980'0	0,04139	86800′0	0,02406	0,02393	1/610′0
CROAIR 0,0	0,04316	-0,01606	-0,05910	-0,04011	0,02921	0,05135	0,04474	0,03305	0,02325
EVA 0,0	0,02911	0,00929	0,00329	0,01208	0,02811	0,00948	0,02422	0,02452	0,01882
LUF 0,0	0,02297	96800'0	0,00377	10600′0	90/80/0	0,01460	0,03215	0,02823	0,03165
SHEAIR 0,0	0,01673	0,02044	0,00142	91/00′0	6/800′0	0,00691	0,02085	0,02058	0,02819
TAP 0,0	0,02308	0,00311	0,00635	0,00547	0,03139	0,04044	0,02939	0,03261	08870′0
THAIR 0,0	0,02505	-0,00040	0,00014	-0,00063	0,02996	-0,00797	0,02756	0,04767	0,02488
TUAIR 0,0	0,02339	0,02499	0,01057	0,04046	0,03974	0,00911	0,02132	0,02409	79070'0
UNAIR 0,0	0,02675	0,00270	0,00435	0,00542	0,03867	0,02801	0,02721	0,03151	0,02300
			Positive i	ideal solutions an	tive ideal solutions and negative ideal solutions	olutions			
A+ 0,0	0,04316	0,02499	0,04420	0,04046	0,04364	0,05369	0,04474	0,02058	0,01882
A- 0,0	0,00641	-0,13161	-0,08484	-0,07558	0,00879	-0,05419	68900'0	0,04767	0,03440
	the dist	the distance of each alternative from	native from the p	ositive ideal and	negative ideal so	the positive ideal and negative ideal solution points and its performance ranking	its performance r	anking	
Alternative	Di+	-iO	Ü	Rank					
ACAN 0,1	0,13819	0,18349	0,57042	11					
ACHN 0,2.	0,24043	0,10127	0,29636	13					
AEA 0,0	0,05762	0,21910	0,79179	1					
ASAIR 0,0	0,07737	0,20903	0,72985	8					
COPAIR 0,0	0,06279	0,22541	0,78213	3					
CROAIR 0,1	0,13869	0,17306	0,55512	12					
EVA 0,0	0,07454	0,20329	0,73171	9					
LUF 0,0	0,07366	0,20054	0,73135	2					
SHEAIR 0,0	0,08787	0,20546	0,70044	9					
TAP 0,0	0,06591	0,20867	0,75995	4					
	0,09827	0,18305	0,65069	10					
TUAIR 0,0	0,06395	0,23086	0,78310	2					
UNAIR 0,0	0,06864	0,20352	0,74780	5					