Profit Optimization Strategy in Airline Operations: An Integrated Fleet Assignment Model for Indonesian Domestic Flights

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HOW TO CITE:
Inof Seno Acton, Sutanto Soehodho, Nahry Nahry (2026). Profit Optimization Strategy in Airline Operations: An Integrated Fleet Assignment Model for Indonesian Domestic Flights. International Journal of Special Education, 41(9s), 710-717

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ABSTRACT:
Because of its speed, air travel is becoming more popular. Airlines operate a large fleet due to increased air travel demand. Airlines must operate wisely due to the high cost of operating aircraft. Competition among airlines has intensified with the liberalization of the aviation sector. The competition led to a decline in aircraft service quality and operational efficiency. This adversely affects the airline's financial status. Several airlines have ceased operations, potentially leaving some flight routes unserved. Another consequence is the tendency of airlines to form monopolies or oligopolies by charging higher fares. To address these issues, the author shifted the focus from unrestricted competition to airline collaboration in aircraft operations. This research aims to maximize profits by optimizing aircraft assignments using the Integrated Fleet Assignment (IFA) strategy. The strategy consolidated aircraft assignment under a singular managerial structure at the IFA, as though the IFA functioned as a merged operations management unit. An integer programming model is employed to optimize fleet assignment models. The objective of this model is to identify the optimal fleet composition to maximize profit. The study's findings indicate that the IFA strategy yields a better combination of fleet assignments and optimal profits than under previous conditions. The approach not only optimizes aircraft operations but also introduces innovations in flight service management. This study can also serve as a basis for policymaking, especially for the government, as the regulator of air transport services.

Keywords: Optimization; Profit Maximization; Integrated Fleet Assignment; Fleet Assignment Model; Airline Operations.

1. Introduction

Indonesia has many islands and relies on air travel for inter-island transportation and equitable development. Indonesia's aviation market is the second-fastest growing after China (Statista, 2022). Domestic flights dominate Indonesia's aviation sector and therefore need to be managed effectively.

Operational optimization for airlines, as providers of public transportation services, must remain focused on both passengers and the airlines themselves. Due to limited resources, many public transportation service providers are

willing to sacrifice their performance or service levels to avoid financial difficulties or even bankruptcy (Nahry, 2000). This trend is also evident in Indonesia's aviation sector.

Operating aircraft is costly, so when assigning the fleet, efficiency must be considered. Operational optimization, including fleet deployment and scheduling, can significantly enhance efficiency, particularly in reducing fuel consumption and carbon emissions (L. Chen & Han, 2025; Y. Chen et al., 2023; Justin et al., 2022; Unal et al., 2022).

Ciftci & Özkır(2024), Anzoom & Hasin (2018), Kenan, Jebali, et al. (2018), Barnhart et al.(2009), Bélanger et al.(2006), Özener et al.(2017), Sherali et al.(2013) have conducted a study on fleet assignment to maximize profits. Meanwhile, studies conducted by Tofigh et al. (2015), Haouari et al.(2009), Abouzeid et al. (2021), Unal et al. (2022), Ahuja et al. (2007), and Sriram & Haghani(2003) have examined how to minimize costs. Other studies have examined integrated fleet assignment and aircraft routing(Özkır & Özgür, 2021), integrated fleet assignment with crew pairing and routing (Shao et al., 2017), integrated bank structure and fleet assignment (Ciftci & Özkır, 2024), and competitive schedule design with fleet assignment under market competition. These studies indicate a growing interest in utilizing fleet assignments to improve airline profitability and efficiency.

To enhance fleet utilization and efficiency, airlines are concentrating on partnerships, including codesharing and strategic alliances (Adler & Hanany, 2016; Hu et al., 2013; Kenan, Diabat, et al., 2018). Traditional airline alliances like Star Alliance, SkyTeam, and Oneworld focus on network expansion, frequent-flyer program integration, lounge access, and coordinated scheduling, but organizational boundaries and airline objectives limit operational integration. Codeshare agreements allow one airline to sell seats on another's aircraft without merging operational resources or decision-making.

In contrast, the suggested Integrated Fleet Assignment (IFA) framework integrates operational, technological, and strategic factors into a single alliance structure to deepen collaboration. IFA enables real-time resource sharing, coordinated operational planning, integrated data interchange, and network performance improvement across member airlines, not only commercial cooperation. The goal is to improve system-wide efficiency, robustness, and sustainability beyond alliance and codeshare models.

Therefore, the research gap addressed in this paper is not the integration of fleet assignment with other airline planning functions, but rather the integration of multiple airlines into a single cooperative fleet assignment model. In our study, all domestic airlines are combined into a single operating company serving the aggregate market demand. The model determines fleet assignments from a system-wide perspective to optimize the cooperative network's total profit, rather than the profitability of individual airlines. This merger marks a key departure from the usual fleet-assignment studies, in which aircraft resources are allocated within a single carrier's borders rather than across the entire domestic network.

To the best of our knowledge, only a few studies have addressed fleet assignment under a truly cooperative multi-airline framework, where all participating airlines optimize fleet utilization and demand fulfillment at the network level. Therefore, this research contributes to the literature by presenting an integrated fleet assignment model to evaluate the potential benefits of industry-wide collaboration in domestic air transport operations.

2. Methods

This investigation was quantitative. A rigorous, reproducible literature review provided a clear, concise, plain understanding. Solutions for positive transformation will be developed after examining the aviation system and domestic aviation services. This study uses IFA and compares results to previous circumstances. The objective of this study is to consolidate all airlines, including their respective fleets, into a single entity and then reorganize fleet assignments without regard to ownership or flight routes, thereby maximizing system profitability.

This study develops a model that accounts for all factors affecting an airline's profitability in providing flight services. The problem

formulation will be presented, but several assumptions will also be made, as follows: this study proposes a new strategy at the strategic level to consolidate all airlines operating scheduled domestic flights, the network used in this model is assumed to be the existing network, it is also assumed that the flight network and schedule used are the optimal network and schedule that have been established, and that only economy-class aircraft are used.

In this section, we also present the notation needed to provide a mathematical explanation of the model outlined below.

a. Set

P	=	Set of aircraft types
F	=	Set of flight numbers
N	=	City set (Number of nodes served by flight)

b. Index

p	=	Index for aircraft type p ∈ P
f	=	Index for flight numbers f ∈ F

c. Inputs and Parameters

Pax_{pf}	=	Number of passengers transported by aircraft p serving flight f
TP_p	=	Ticket price to serve the flight using the aircraft p
D_f	=	Passenger Demand on a flight f
FC_p	=	Fuel consumption of aircraft type p
J_f	=	Distance traveled on a flight f
FP_p	=	Fuel prices for p-type aircraft
PSC_f	=	Passenger Service Charge (PSC) for flight f
$DCar_{pf}$	=	Cargo Demand on a flight f
Car_{pf}	=	Number of cargos transported by aircraft p serving flight f
TC_p	=	Cargo rate per kg on flights using aircraft p
L_f	=	Cargo loading and unloading rates for flight f
N_p	=	Number of p-type aircraft available
B_p	=	Seating capacity of type p aircraft
CC_p	=	Cargo capacity that can be loaded for p-type aircraft

d. Decision Variables

$$Y_{pf} = \begin{cases} 1 \\ 0 \end{cases}$$

1 $if\ the\ aircraft\ p\ serves\ the\ flight\ f$ $and\ vice\ versa$

The following integer programming model is based on the basic Fleet Assignment model used by Abara (1989), which was subsequently modified to calculate profits.

$$Max\ Z = (Revenue\ Parameters) - (Cost\ Parameters)$$

$$
\begin{aligned}
&Max\ Z \\
&= \sum_{p\in P}\sum_{f\in F} Pax_{pf}.TP_p.Y_{pf} \\
&+ \sum_{p\in P}\sum_{f\in F} Car_{pf}.TC_p.Y_{pf} \\
&- \sum_{p\in P}\sum_{f\in F} FC_p.J_f.FP_p.Y_{pf} \\
&- \sum_{p\in P}\sum_{f\in F} PSC_f.Pax_{pf}.Y_{pf} \\
&- \sum_{p\in P}\sum_{f\in F} Car_{pf}.L_f.Y_{pf}
\end{aligned} \quad (1)
$$

Subject to

$$\sum_{p\in P} Y_{pf} = 1 \quad , \qquad \forall f \in F \quad (2)$$

$$\sum_{f\in F} Y_{pf} = 1 \quad , \qquad \forall p \in P \quad (3)$$

$$Pax_{pf} = \begin{cases} B_p & \rightarrow if\ D_f \geq B_p \\ D_f & \rightarrow if\ D_f < B_p \end{cases} \quad (4)$$

$$Car_{pf} = \begin{cases} CC_p & \rightarrow if\ DCar_f \geq CC_p \\ DCar_f & \rightarrow if\ DCar_f < CC_p \end{cases} \quad (5)$$

$$Y_{pf} \in \{0,1\} \quad , \qquad \forall f \in F\ ;\ \forall p \in P \quad (6)$$

The model above has the objective (1) of maximizing profit by assigning various aircraft to all scheduled flights. Constraint (2) is a flight-cover constraint to ensure that each flight is served by only one aircraft. Similarly, the next constraint ensures that each aircraft serves only one flight, as indicated by constraint (3). Constraints (4) and (5) ensure that the number of passengers and cargo on a flight does not exceed the aircraft's capacity. Constraint (6) represents the binary values of the decision variables.

To conduct a comprehensive and precise assessment of the proposed framework, this investigation uses a hybrid dataset comprising both synthetic and real data. The airport operator furnished operating data. Flight operations and aircraft performance data were unavailable due to airlines' strict confidentiality requirements. A synthetic dataset was developed to circumvent these constraints, drawing from aircraft manufacturer specifications, public technical datasheets, and well-regarded aviation literature. Synthetic data were generated with realistic operational connections and parameter distributions to simulate airline operations. This hybrid technique is implemented by methodological and system-based investigations when proprietary data is scarce and controlled testing is required without sacrificing practical relevance. The dataset is a dependable source for assessing the proposed framework, strategy, and analytical methods in real-world operational contexts. Access to the dataset is available upon request by contacting the corresponding author and via the link listed in the references section (Acton et al., 2026).

A limitation of the present study is that several indirect operating cost components, such as maintenance, personnel, leasing, insurance, airport, and navigation charges, were not considered. Future studies may incorporate these elements to provide a more comprehensive assessment of total operating costs.

OpenSolver 2.9.3 is a free, open-source optimization add-in for Microsoft Excel that extends the capabilities of the built-in Excel Solver. It supports sophisticated optimization engines, such as COIN-OR CBC (Computational Infrastructure for Operations Research – Branch and Cut), as well as commercial solvers such as CPLEX (C Programming Language for Extended Mathematical Programming) and Gurobi.

3. Results And Discussion

Using OpenSolver 2.9.3, the optimization model yielded a maximal profit of $609,996.35, surpassing the previous result of $390,289.40. Figure 1 shows a detailed comparison of each airline's profits. The simulation results indicate that the proposed framework yields higher profitability with the same number of aircraft, demonstrating enhanced operational efficiency. Table 1 presents the fleet assignments generated by the optimization procedure. Fleet utilization becomes more flexible, allowing aircraft to be assigned randomly across routes and schedules to achieve the demand-optimization objective,

without the constraints imposed by fixed route ownership within the airline.

To verify the mathematical model and the solution employed, a comprehensive examination is conducted to determine whether the constraint's function has been implemented in OpenSolver during the solution.

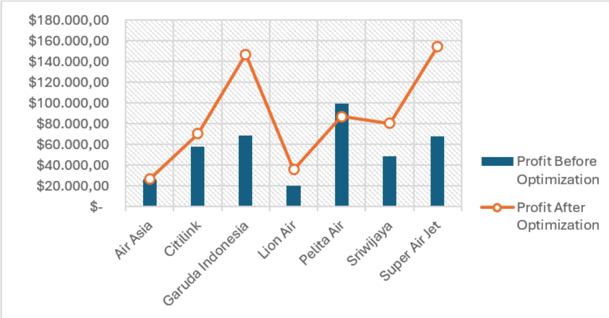

Figure 1. Profit Comparison

Table 1. Optimized Fleet Assignment

	Flight Index																																														
Fleet Index	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
27	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
36	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
41	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

A sensitivity analysis was conducted to evaluate the resilience of the developed model by assessing the robustness of the proposed optimization model to variations in critical factors, including cost and revenue variables, as shown in Table 2. Despite variations in parameter values affecting the profits generated, this model consistently produces feasible solutions and maintains its overall efficacy as demonstrated in Table 3. The findings indicate that the proposed model is adequately robust to handle reasonable variations in input parameters.

In terms of service quality, the optimal scheduling structure decreases the risk for aircraft delays, as flight assignments are pre-planned based on observable demand patterns. Although the scheduling structure is believed to be preset in this study, the results demonstrate its potential to improve punctuality and service reliability under coordinated operations.

Table 2. Sensitivity Spectrum of Variables

Variables	Sensitivity Value	Characteristics
Ticket Price per Km	±20	Very volatile (influenced by economic and seasons)
Cargo Rates per Kg	±15	Cargo fares are usually not as volatile as aviation fuel prices and are generally more stable than passenger ticket fares on the same route.
Passenger Demand	±20	Highly volatile (affected by economy, season and ticket prices)
Cargo Demand	±20	More volatile than passenger demand, but its volume contributes less to revenue.
Fuel Price	±30	Very volatile (affected by oil prices and exchange rates)
PSC	±10	Relatively stable, these rates do not change every month and usually undergo periodic adjustments.
Loading Cargo	±20	Relatively stable, depending on the contract and handling rates
Unloading Cargo	±20	Relatively stable, depending on the contract and handling rates

From a sustainability standpoint, reduced inter-airline competition for exclusive routes leads to better route coverage and minimizes the risk of underserved routes. This more efficient allocation of capacity also enhances resource use, indirectly improving environmental and operational sustainability by reducing redundancy and better matching supply with demand.

Table 3. Sensitivity Analysis Scenarios

Variables	Low	Baseline	High
Revenue Variables			
Ticket Price per Km	-20	0	+ 20
Passenger Demand	-20	0	+ 20
Cargo Rates per Kg	-15	0	+ 15
Cargo Demand	-20	0	+ 20
Cost Variables			
Fuel Price	-30	0	+ 30
PSC	-10	0	+ 10
Loading Cargo	-15	0	+ 15
Unloading Cargo	-15	0	+ 15
Profit	**$ 415.487,22**	**$ 609.996,35**	**$ 793.939,45**

Implementing the proposed framework may encounter several challenges. From a regulatory perspective, compliance with aviation safety regulations, airport operational standards, and environmental requirements may influence implementation feasibility. Operational challenges include data availability, stakeholder coordination, infrastructure readiness, and uncertainties in traffic demand and aircraft scheduling.

Ownership-related challenges arise from the involvement of multiple stakeholders, including airport operators, airlines, regulators, and service providers, whose objectives and priorities may not always be aligned. In addition, competition-related challenges may arise when airlines perceive operational or commercial disadvantages stemming from resource-allocation decisions or from the implementation of framework strategies.

Aircraft turnaround time, gate utilization rate, passenger throughput, on-time performance, operational cost savings, resource utilization efficiency, and emission reduction can be used for practical assessment. Due to limited access to private airline data, these indicators cannot be used to support this study at present. Future studies should include more stakeholder-related data to evaluate the framework in practical scenarios. The government can bridge the barrier to enhance trust and cooperation among airlines. OpenSolver 2.9.3 can solve optimization problems in this study, but it has limitations. The more datasets used, the more time and precision are required. This is because it will need larger matrices. OpenSolver 2.9.3 is the right solution for small- to medium-sized datasets; however, for larger datasets, more powerful, scalable software is required.

4. Conclusion

This study proposes IFA as a new perspective for fleet allocation. It has been demonstrated that leveraging this innovation can enhance system efficiency. Furthermore, this could also be a consideration for the government when formulating policies to sustain the aviation ecosystem. Nevertheless, the government's role is urgently needed, particularly to facilitate this collaboration and gather the most comprehensive data from airlines for analysis. With more controlled airline competition, negative effects on aviation services can be mitigated. Under this strategy, airline collaboration becomes more extensive, even though it typically involves only a few airlines.

Domestic air travel still has significant room for improvement, as demonstrated by this IFA. Of course, given this tremendous potential, further research is needed to support the IFA by studying new flight network designs and flight planning to serve domestic air travel.

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