

Fleet Analysis for Route Jakarta - Jeddah for Umrah Flights Based on Total Operating Costs

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Abstract

Fleet planning is the strategy that should be applied by the airlines in order to compete with other industry by deciding the correct aircraft to make the operating costs more efficient and effective. Operating Costs itself are divided into two parts, Directs operating costs and Indirect operating costs in which direct operating costs are costs directly related to the operation of the aircraft while Indirect operating costs are costs unrelated to the operation of the aircraft, for example staff salary. In this journal, the writers compared how much Total operating costs per seat between Boeing 777-300ER and Airbus 330-300 for Jakarta-Jeddah route. The writer chose the aircraft because most of Airlines companies use that wide body Aircraft for Jakarta-Jeddah flights. For Jakarta-Jeddah route, Airbus 330-300 is more effective and efficient to use because it has less total operating costs than Boeing 777-300. It's even more profitable if the Airlines maximize the utilization from 350 hours/ month into 400 hours/ month. Based on the result, Airbus 330-300 is the correct suitable fleet to use in Jakarta-Jeddah route.

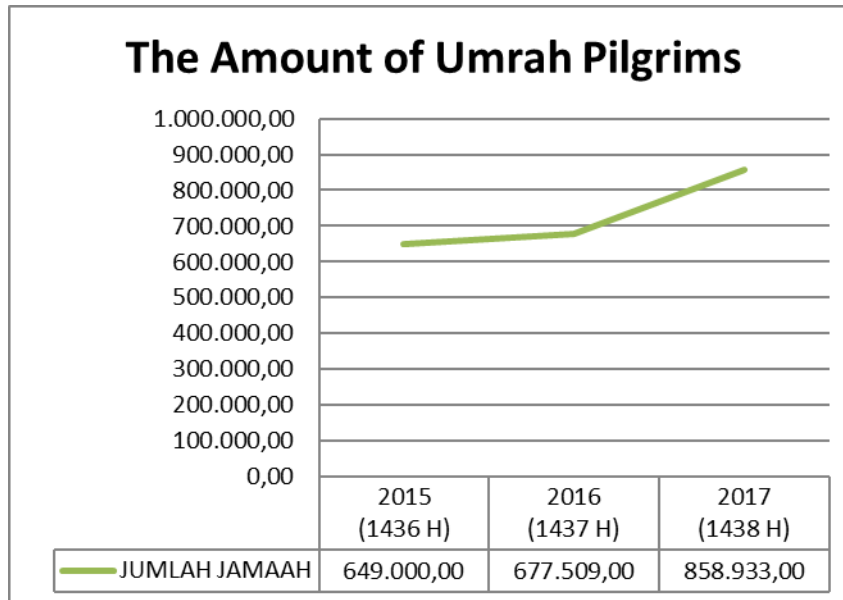
Keywords: Fleet Planning, Aircraft type, Effective and Efficient, Operating Costs, Utilization.

Introduction

Nowadays air transportation is one of the most used transportation modes because air transportation doesn't require much time, especially when travelling to international destinations. Compared to another type of transportation, it has more advantages, for example, less travelling time.

The Flight route from Jakarta to Jeddah is one of the international routes that has a high frequency of flight because this route is passed by Indonesians citizen for Umrah. It can be seen from the growth of Umrah Pilgrims from Indonesia, who have the flight from Soekarno-Hatta International Airport (CGK). Even though there are lots of issues about the disadvantages such as victimization from the most popular tour and travel agency, it doesn't change the amount of people interest any less. Otherwise, the number rises even it doesn't grow so fast. Umrah is different

from Hajj. Umrah is much easier to do than Hajj. It doesn't take much time and also doesn't have to wait for a couple years. This happens to everyone who wants to take Hajj because every year there's a limit for the quota. As mentioned, Umrah is much easier because people can direct depart at any time according to the schedule that has been made by the travel agent.



Source : Kementrian Agama Tahun 2015-2017

Within this route, the flight companies that handle this umrah service must decide which flight that suits with the requirement, because each aircraft has different capabilities and performance as well as the airport. Although using the smaller aircraft does not mean total operating costs are small or the profits are greater, the airline should pay attention to the size of the demand for a route (Merkert & Hensher, 2011). So that doesn't show up any issues and also optimizing the flight company's revenue. For choosing the right flight, the flight company has to consider the operating cost because it is one of the important things for the airline. There are 2 types of flight that have been used in Indonesia to depart Umrah worshiper, Airbus A330-300 and Boeing 777-300ER. Airbus A330-300 is an airplane with a big capacity and can carry almost 440 full economy passengers and

also can load until 233.000 kg. The other type of a plane used for Umrah is Boeing 777-300ER. This type is the next edition after Boeing 777-200. Boeing 777-300ER also was built for extended range (ER) and has double engine made by Boeing Commercial Airplanes. Boeing 777-300ER can carry almost 550 fully economy passengers and also can load up to 351.800 kg.

Method

The aim of this research is to analyze and find which aircraft is more efficient and effective for the company. The first step that the writer did in conducting the research is choosing types of the alternate aircraft. The aircraft that has been chosen is an aircraft that has a number of passenger seats, has a wide body and also can be used for the long haul flight. The aircraft that we chose are Boeing 777-330er and Airbus 330-300. The second step is calculating the operating cost, such as direct operating cost, indirect operating cost, total operating cost per seat and selling price per seat per hour based on each specification of the aircraft with assumption utilization for wide body aircraft which are 350 hours/ month and 400 hours/ month. The next step is comparing which aircraft that has a lower operating cost, the aircraft that has a lower operating cost is the most efficient and effective aircraft to be used.

There are three parts in calculating the total cost operation of the aircraft; the Direct Operating Costs (DOC), Indirect Operating Costs (IOC) and Total Operating Cost (TOC)(Juliater Simarmata, Charles, & Rizaldy, 2014). TOC is the operating cost that consists of:

1. Direct Operating Cost

DOC is all of the cost related to the operating flight. The cost components from Direct Operating Cost are

- Aircraft Cost
- Crew Cost

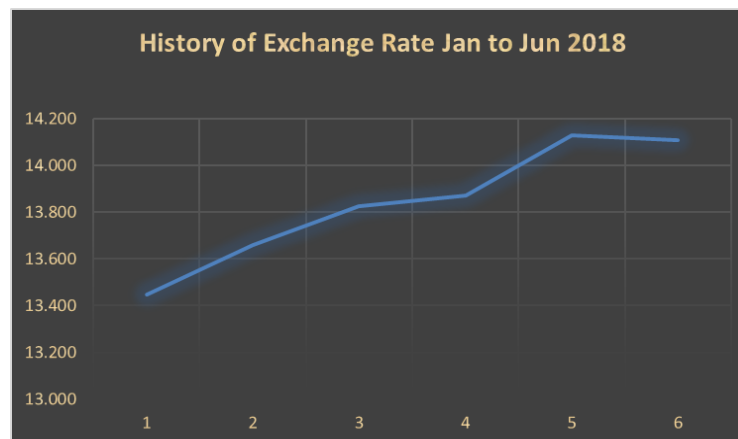
- Maintenance Cost
- Insurance
- Fuel
- Route Charges
- Ground Handling
- Crew Training Cost
- Catering (Airline's Services)

2. Indirect Operating Cost

IOC is a cost that doesn't have a connection with the operating flight. The cost component from Indirect Operating Cost are:

- Salary
- Communication Cost
- Marketing & Promotion Cost
- Printing
- Transportation
- Administration

Discussion and Result



Source Bank Indonesia

The graphic shows that dollar always fluctuates and that can give an impact to the fuel price. So, the writer used the average rate of exchange from January to June 2018 which is 1 US\$ = 13.840,- Rupiah and assumed that the cost of the Avtur fuel is consistent which is 9.838,- rupiah or 0,710 per gallon. The fluctuating rate of exchange Dollar (USD) to Rupiah (Rp) take a big part in calculating operating cost because almost 60% of operating cost uses US dollars so, if dollar value increases the cost will increases and when the exchange rate of US dollar decreases, so does the cost (Oum & Yu, 1998).

Table 1. Aircraft Characteristics B777-300ER & A330-300

no	Description	B777-300ER	A330-300
1	AIRCRAFT VALUE	\$361,500,000	\$264,200,000
2	DOW (in Kg)	168,700	123,100
3	MZFW (in Kg)	237,680	175,000
4	MTOW (in Kg)	351,800	233,000
5	MLW (in Kg)	251,290	187,000
6	FUEL CONSUMPTION (Kg / Hour)	8,100	6,150
7	Seat Capacity	550Y	440Y

Source (AIRBUS S.A.S, 2005; Boeing, 2011)

According to from the Aircraft Characteristic table, it shows that Aircraft B777-300ER has a lot of profits then Airbus A330-300 from greater MTOW (Maximum take-off weight) and the seating capacity can load around 100 seats, so the capacity at B777-300ER can load more than Airbus A330-300. However, B777-300ER's aircraft is more expensive than Airbus A330-300, around USD 97.300.000,-. Also, the aircraft A330-300 fuel consumption per hour is less, around 1.950 kg/hour.

Table 2. Cost Structure Comparasion Based on Aircraft B777-300ER & A330-300 with 350 hour Utilizaion

	350 hours	350 hours
DESCRIPTION	Boeing 777-300ER	Airbus A330-300
	Cost/hour	Cost/hour
Direct Operating Cost	USD	USD
AIRCRAFT LEASE	2.459,18	1.797,28
CREW	398,57	327,14
MAINTENANCE	5.000,00	1.500,00
AIRCRAFT INSURANCE	2.582,14	1.887,14
FUEL	7.197,79	5.464,99
ROUTE NAV FEE	462,01	374,01
LANDING FEE	113,08	84,15
PARKING FEE	158,31	104,85
GROUND HANDLING	385,00	308,00
CREW TRAINING	316,25	258,75
CATERING	825,00	660,00
SUBTOTAL	19.897,34	12.766,31
INDIRECT OPERATING COST (10% DOC)	1.989,73	1.276,63
TOTAL OPERATING COST	21.887,07	14.042,94
MARGIN 10%	2.188,71	1.404,29
TOC SEAT/ HOUR	39,79	31,92
SELLING PRICE / SEAT	24.075,78	15.447,24
SELLING PRICE / SEAT / HOUR	66,44	44,13
PERCENTAGE OF FUEL COST	32,89%	38,92%

Table 3. Cost Structure Comparasion Based on Aircraft B777-300ER & A330-300 with 400 hour Utilizaion

	400 hours	400 hours
DESCRIPTION	Boeing 777-300ER	Airbus A330-300
	Cost/hour	Cost/hour
Direct Operating Cost	USD	USD
AIRCRAFT LEASE	2.151,79	1.572,62
CREW	348,75	286,25
MAINTENANCE	5.000,00	1.500,00
AIRCRAFT INSURANCE	2.259,38	1.651,25
FUEL	7.197,79	5.464,99
ROUTE NAV FEE	462,01	374,01

LANDING FEE	113,08	84,15
PARKING FEE	158,31	104,85
GROUND HANDLING	385,00	308,00
CREW TRAINING	316,25	258,75
CATERING	825,00	660,00
SUBTOTAL	19.217,35	12.264,87
INDIRECT OPERATING COST (10% DOC)	1.921,74	1.226,49
TOTAL OPERATING COST	21.139,09	13.491,35
MARGIN 10%	2.113,91	1.349,14
TOC SEAT/ HOUR	38,43	30,66
SELLING PRICE / SEAT	23.253,00	14.840,49
SELLING PRICE / SEAT / HOUR	58,13	37,10
PERCENTAGE OF FUEL COST	34,05%	40,51%

Total operating cost is the summary of direct operating cost and indirect operating cost. Comparing the total operating cost for each aircraft, it is the best way to decide which aircraft is more effective and efficient for the airlines. According to the table (2 and 3), authors calculate from both of Aircraft's operating cost based on the Aircraft Utilization for the wide-body Aircraft within 350 hours/month and 400 hours/month. Table 2 and 3 show that both Aircrafts do not have same operating cost and selling price/hour. Boeing B777-300ER has bigger total operating cost than Airbus 330-300 around USD 7844.13 or IDR 108.562.759,2 within the utilization 350 hours/month. Meanwhile, when the utilization is increased to 400 hours/month total operating costs for Boeing 777-300ER have decreased very slightly from USD 21.887,07 to USD 21.139,09 but still bigger than Airbus 330-300 that have total operating cost around USD13.491,35 within 400 hours/month utilization.

Total operating cost of B777-300ER is more expensive than A330-300's because B777-300ER is a new aircraft so it has more expensive Maintenance Cost, which is around \$3.500. The MTOW (Maximum Take-Off Weight) and MLW (Maximum Landing Wight) from B777-300ER and A330-300 are different so it gives a significant impact on the Aircraft's operating cost because MTOW

(Maximum Take-Off Weight) and MLW (Maximum Landing Weight) is used for the calculation of Parking fee, Landing fee, and Route Navigation fee.

Based on the total operating cost, it can determine the selling price that will be given to the passenger. If the total operating cost B777-300ER spends more, so the selling price that will be given to the passenger will be much more than the selling price from aircraft A330-300 and caused the Umrah price rises. Although the capacity B777-300ER has more seats than A330-300, it does not give a lower price for the selling price per seats. A huge amount of seat capacity from B777-300ER should have more advantages because of the total operating cost is divided by seats. However, we cannot only refer from the seating capacity because the variable from the total operating cost that own by B777-300ER also has a large amount then A330-300, such as maintenance cost, catering costs, crew training cost, and aircraft insurance. According to the table (2 and 3) it can also refer that B777-300ER's fuel cost has more cost than A330-300 because B777-300ER's fuel consumption is bigger around 1.950 kg/hour and caused a percentage of 32,89% in 350 hours/month utilization and 34,05% in 400 hours/month from B777-300ER's total operating cost.

From all the data that has been discussed, won't be effective and efficient if Boeing 777-300ER used for Umrah flight because Total Operating Cost owned by Aircraft Boeing 777-300ER is more expensive than A330-300 and it will impact the revenue from the airline that used both of the aircraft. In this condition, Fleet Planning is important for every airline because every airline has to pay attention to the total operating cost for aircraft. The operating cost will have an effect on the selling price that will be given and charged to the customer that will give an impact on the company income.

Conclusion

The selection of the type of aircraft can be analyzed and considered based on the operating cost data for each type of aircraft because each aircraft has a different operating cost. On the Jakarta - Jeddah route for umrah flights, it can be seen that

the aircraft type Airbus A330-300 with the capacity of 440 passengers in full economy class has a lower total operating cost compared to aircraft type Boeing 777-300ER. Although aircraft type B777-300ER has seat capacity 110 is larger and the load capacity is greater than the A330-300 does not make the total operating cost B777-300ER lower because there are several factors that make the total operating cost of the B777-300ER such as maintenance costs that are quite large different with the A330-300 which is \$ 3,500 or around Rp.48,440,000, B777-300ER also has a larger MTOW (Maximum Take-off Weight) and MLW (Maximum Landing Weight) and causes the aircraft to be subjected to a charge for navigation, landing, parking, and greater ground handling fee compared to the A330-300. Another one is the fuel consumption of B777-300ER. It is greater than A330-300, so the fuel has a significant impact on the total operating cost.

From this analysis, an airline can see that the A330-300 Aircraft is more efficient and effective judging from the total operating cost which is lower than B777-300ER and will have an impact on the finances of the airline. Especially if the airlines increase the utilization of the aircraft, the total operating cost will be lower and the selling price given will also be lower.

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