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Is It Worth Replacing B 737-800 NG with B 737 Max 8?

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Abstract

The currency exchange rate, fuel cost, regulation, etc. have an impact upon the aircraft operating cost since every aircraft has different performances and capabilities. The aircraft operating cost determines the price quotations that will offered to the customers. Thus, the right airfcraft selection is a fundamental aspect, because it leads to airline's profit and loss and will determine the sustainability of the airline. If the Total Operating Cost (TOC) of the aircraft is high, then the price offered to the passengers will be higher compared to the competitors, and it leads the company to be not competitive. This study concerned to the aircraft cost structure, implemented analysis method which compare the TOC of the B737 MAX 8 and B737-800 NG based on the calculation of aircraft characteristics and aircraft utilization.

Keywords: Aircraft Planning, Aircraft Utilization, Aircraft Selection, Total Operating Cost, Competitiveness, Sustainability

Introduction

The airline industry these days is such a complex business with high competition, thus to select the right type of aircraft is important for every airlines along the economic growth, exchange rate, fuel cost, regulation, and so on, because these are substantial aspects that could give impact on flight costs. (Juliater Simarmata, Charles, & Rizaldy, 2014; Pitfield, Caves, & Quddus, 2010). Other than that, the aircraft will continue to develop and enhance the technology. The needs of efficient, eco-friendly, and effective aircraft will always come in the future. Therefore, the aircraft manufacturing company will keep on the innovating to meet the needs and demands of the world airline.

The Boeing 737 Max 8 is the latest development jet aircraft from previous aircraft, B737-800 NG which is designed with double winglet features to break turbulances and improve aerodynamics using an engine that capable to diminish the noise pollution by 40%. The B737 MAX 8 is expected to conserve fuel consumption by

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16% than the A320 and 14% than the B737-800 NG. (Boeing, 2011). Fuel consumption can affect the DOC (Direct Operating Cost) which leads to selling price decision (Park & O'Kelly, 2018). The B737 MAX 8 was first launched in 2011 then produced four years later in 2015, and gain enthusiastic response from the airlines in the world. According to Boeing data in June 2018, the B737 MAX 8 have been ordered as much as 4,649 from 98 airlines, and the 3 most common buyers are Southwest Airlines with 310 orders, Flydubai 251 orders, and Lion Air 251 orders. The first ordered B737 MAX 8 was given to Malindo Air which operated in 2017, and Norwegian Air was the second airline that operate the B737 MAX 8. After operated for 1 year, FlyDubai observed that B737 MAX 8 is 15% more efficient than B737-800 NG, which means 1% more efficient that expected 14%.

In Indonesia, most commonly aircraft used is B 737-800 NG and currently competing against A320. This type of aircraft is the most aircraft sold within the Next Generation 737 family. Recently, Lion Air planned to replace all of their aircrafts with B737 MAX 8 and Lion Air is the first airline in Indonesia that operate Max 8.

The questions arisen based on these conditions are; will both type of aircrafts be competitive to be used, or there is only one type that is more advantageous for the company? 7 Furthermore, is it the best decison to chose Boeing 737 MAX 8 compare to Boeing 737-800 NG.

Method

This study aims to compare the selection of aircraft types between the B737 MAX 8 with B737-800 NG using the same aircraft utilization, and to determine which one is more competitive to compete with other competitors in the airline industry. The study was done by using analyses, interpretation, and comparation of the existing data obtained from previous studies and researchThe data were processed based on applicable and relevant theories that can support theopinions or conclussions made..

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According to (Zuidberg, 2014) it can be seen that the average of operating cost per aircraft movement is higher than a newer aircraft. In order to study the competitiveness among B737-800 NG and B737 MAX 8, the analysis using aircraft characteristics was conducted to compare the TOC (Total Operating Cost) of both aircrafts.

Discussion and Result

Table 1. Cost structure comparison between B 737-800 NG and B 737 MAX 8 based on aircraft utilization

Description	200 hours cost/hour USD	200 hours cost/hour USD
DIRECT OPERATING COST	B 737 MAX 8	B 737-800 NG
AIRCRAFT	1,400.00	1,225.00
CREW	260.00	260.00
MAINTENANCE	1,325.00	920.00
AIRCRAFT INSURANCE	1,463.75	1,402.50
FUEL	1,592.92	1,850.68
ROUTE CHARGES	231.90	231.90
GROUND HANDLING	115.00	115.00
CREW TRAINING	15.00	15.00
CATERING	283.5	276
SUB TOTAL	6,687.07	6,296.08
INDIRECT OPERATING COST		
DOC x 10%	668.71	629.61
TOTAL OPERATING COST		
IN USD	7,355.78	6,925.69
IN IDR	106,658,805.00	100,422,465.00
TOC/SEAT HOUR	38.92	37.64
MARGIN 10%	735.58	692.57
SELLING PRICE/HOUR	8,091.36	7,618.26
SELLING PRICE/SEAT HOUR	42.81	41.40
PERCENTAGES OF FUEL COST	22%	27%

Source: Is It Worth Replacing B 737-800 NG With B 737 Max 8?

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Table 2. Cost structure comparison between B 737-800 NG and B 737 MAX 8 based on aircraft utilization

Description	250 hours cost/hour USD	250 hours cost/hour USD
DIRECT OPERATING COST	B 737 MAX 8	B 737-800 NG
AIRCRAFT	1,120.00	980.00
CREW	208.00	208.00
MAINTENANCE	1,325.00	920.00
AIRCRAFT INSURANCE	1,171.00	1,122.00
FUEL	1,592.92	1,850.68
ROUTE CHARGES	231.90	231.90
GROUND HANDLING	115.00	115.00
CREW TRAINING	15.00	15.00
CATERING	283.5	276
SUB TOTAL	6,062.32	5,718.58
INDIRECT OPERATING COST		
DOC x 10%	606.23	571.86
TOTAL OPERATING COST		
IN USD	6,668.55	6,290.44
IN IDR	96,694,042.50	91,211,340.00
TOC/SEAT HOUR	35.28	34.19
MARGIN 10%	666.86	629.04
SELLING PRICE/HOUR	7,335.41	6,919.48
SELLING PRICE/SEAT HOUR	38.81	37.61
PERCENTAGES OF FUEL COST	24%	29%

Source: Is It Worth Replacing B 737-800 NG With B 737 Max 8?

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Table 3. Cost structure comparison between B 737-800 NG and B 737 MAX 8 based on aircraft utilization

Description	300 hours cost/hour USD	300 hours cost/hour USD
DIRECT OPERATING COST	B 737 MAX 8	B 737-800 NG
AIRCRAFT	933.33	816.67
CREW	173.33	173.33
MAINTENANCE	1,325.00	920.00
AIRCRAFT INSURANCE	975.83	935.00
FUEL	1,592.92	1,850.68
ROUTE CHARGES	231.90	231.90
GROUND HANDLING	115.00	115.00
CREW TRAINING	15.00	15.00
CATERING	283.5	276
SUB TOTAL	5,645.82	5,333.58
INDIRECT OPERATING COST		
DOC x 10%	564.58	533.36
TOTAL OPERATING COST		
IN USD	6,210.40	5,866.94
IN IDR	90,050,867.50	85,070,590.00
TOC/SEAT HOUR	32.86	31.89
MARGIN 10%	621.04	586.69
SELLING PRICE/HOUR	6,831.45	6,453.63
SELLING PRICE/SEAT HOUR	36.15	35.07
PERCENTAGES OF FUEL COST	26%	32%

Source: Is It Worth Replacing B 737-800 NG With B 737 Max 8?

According to tables obtained above, the table 1, 2 and 3 divide the calculation of aircraft utilization classified to 200 hours, 250 hours, and 300 hours. These calculations show that the assumptions for costs of crews, route charges, ground handling, and crew training are as much as B 737 MAX 8 and B737-800 NG. Yet, it does not make the B737 MAX 8 has less TOC, which can be caused by the difference of maintenance cost compared to the B737-800NG. The maintenance cost for B737 MAX 8 is USD 1,325 whereas B737-800 NG cost USD 920, it means the maintenance of B737 MAX 8 is USD 405 more exprensive bacause of new aircraft type.

Total Operating Cost (TOC) of B737 MAX 8 which is bigger compared to B737-800 NG will take effect upon the selling price for the passenger. Indeed, the fare of

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B737 MAX 8 will be more expensive than B737-800 NG that can lead the B737 MAX 8 to become less efficient and less competitive. B737 MAX 8 is supposed to be more affordable since they have more seat capacity that can load as much 189 passengers rather than B737-800 NG which seat capacity is for 184 passenger. The more seat capacity that the aircraft has, the more profitable it would be.. Since the TOC is devided into per seat capacity as of the cost per seat will be lesser, therefore, the selling price will be more affordable.

From table 1, 2, and 3 obtained, it also shows the difference of fuel cost between both aircrafts.B737 MAX 8 always has a lesser fuel cost rather than B737-800 NG. It can be caused by the fuel consumption of B737 MAX 8 that is 14% more efficient (2.095 kg) compared to the B737-800 NG with 2.434 kg fuel consumption. Yet, it does not affect the TOC of B737 MAX 8 that hasismore costly than B737-800 NG.

Accordingly, B737 MAX 8 is not competitive if they have the same utilization as B737-800 NG. The utilization of B737 MAX 8 must be added in order to make the aircraft more competitive. As an example, the utilization of B737 MAX 8 added by 300hours than B737-800 NG with only 250hours, thus the B737 MAX 8 can possibly more competitive. In the other hand, B737 MAX 8 have a predominance that they use 5-6% more efficient fuel cost rather than B737-800 NG.

The right aircraft selection is one of the fundamental aspect, because it will lead the different TOC for every aircraft type and the utilization that airline used. This will affect the airline's profit and loss, and indirectly determine the airline competitiveness, whether they will survive in the airline industry or not. The aircraft TOC will determine the selling price that will be offered to the passsenger. Selling price decision is one of the important factors to gain the market passenger. If the airline offers higher selling price than the competitor, thus the airline is likely not competitive, as an example even though B737 MAX 8 is a new aircraft type that has more efficient fuel cost, that does not make the TOC lesser than B737-800 NG. Also, the selling price offerred by B737 MAX 8 is more expensive

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than B737-800 NG. If assumed that both of the aircrafts use the same utilization hour, thenthe B737-800 NG type would be more competitive.

Not only considering the selling price and TOC that can affect the revenue directly, but airlines also have to examine the market demands for the aircraft type selection. It is better not to use aircraft with big seat capacity for market that only can gain 60-70% load factor. Besides, airport has also become a consideration of airline in selecting the right type of aircraft to be used. Furthermore, in order to keep up the competitive selling price, the airlines must examine the capability of the airport's facilities such as runway strength, runway length, navigation facility, GSE availability, etc. For the reason that sing certain types of aircraft like B737-800 NG or B737 MAX 8 to meet the high demand but the aircraft is not suitable for the airport, would only make the airlines at loss.

Conlcusion

Several factors such as currency exchange rate, aircraft type selection, fuel cost, regulations, *etc*. are very impactful upon the airline, particularly in Indonesia. Most Indonesian airlines are struggling with the currency exchange rate from dollar to rupiah since generally cost of fuel, maintenance, are in dollar while revenue earned by the airline is rupiah (Rp) which caused lot of airlines sustain bankruptcy due to these factors.

Airline planning and strategy is a crucial aspect in terms of company's sustainability to compete in the airline industry. The right aircraft selection is one of the factors that the airline must consider about. Most airlines choose the aircraft regarding to the market demand to load more passenger, but circumtances such as runway performances, capabilities, and availability of supporting facility have to be considered for what the airline need as well. Furthermore, airline must surely know the cost, revenue, and profit from the aircraft so that airline can minimize the operating cost, such as fuel. Fuel is one of the largest cost that can reach almost 50% from the aircraft total operating cost.

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In addition, airline can choose the B737 MAX 8 which is the latest Boeing aircraft that has more efficient fuel consumption, comparing to the other boeing aircraft such as B737-800 NG. Furthermore, by choosing the B737 MAX 8 aircraft type the airline can use the optimum utilization as for 300 hours or more to get the lower cost. Thus, the airline can be more competitive than the competitors to be sustainable and survive in the airline industry.

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