

---

**COST INDEX AND FUEL TANKERING POLICY OF THE AIRLINES  
IN INDONESIA**

**SUHARTO ABDUL MAJID<sup>1</sup> and CHARLES AN<sup>2</sup>**

Trisakti Institute of Transportation and Logistics

**ABSTRACT**

Facing the highly competitive situation among airlines in Indonesia today, and at the same time the price of aviation fuel (avtur) and the exchange rate of USD against IDR are very high, airline companies need to make efficiency in sustainable ways so as to maintain their airline business. The aim of this study is to analyze the extent of efficiency or cost saving the airline companies in Indonesia can do now by using the concept of fuel tankering due to the difference of fuel price at the origin airport and the destination airport as well as the use of cost index. The research method used here is the descriptive explorative method with time series data. The result of research which is based on fuel tankers approach and cost index calculation shows that airline companies can make very significant cost savings every month and every year.

**Keywords:** Cost index, fuel tankers, cost saving, airline business.

**1.0 INTRODUCTION**

The competition in the airline industry in Indonesia nowadays is very tight where every company faces big threats in term of economic growth which tends to decline (Abdul Majid, Kaltum, and Sucherly 2016). According to the report from Bank Indonesia, the economic growth of Indonesia in 2013 was 5.78% on average, whereas in 2016 it reached 5.03% on average. Such a phenomenon of Indonesia's economic growth will surely impact on people purchasing power; either basic daily needs, secondary needs, or tertiary needs like recreation, family visit and business travel especially using air transportation mode (airline), will be reduced or will not become a priority anymore. Similarly, the growth of passengers in 2017 declines compared with the growth of passengers in 2016. Of course, this phenomenon becomes one of the indicators that illustrate the economic condition and declining people purchase power compared to 2016. This phenomenon, accompanied with other phenomena such as the declined exchange rate of IDR against USD, will surely influence company's cash flow, where the company's cost of production is dominated by USD while its revenue will be in IDR.

Likewise, the very competitive condition of the airline business in Indonesia is not favourable, where every airline implements various kinds of strategy which incline to price competition so that people can afford it and the company can survive. It is very necessary that every airline company makes efficiency in order not to go bankrupt but still exists in Indonesia's airline industry.

With the economic growth which tends to decline now, the competition among airline companies in Indonesia becomes increasingly tight and causes a mutually deadly price war. Of course, airline companies need to make some policies or implement the recommendations from factories, such as effective cost index policy and fuel tankering policy, since the difference of aviation fuel price among airports is very significant. In such a condition of the airline business, human resources with skills, knowledge, and a good attitude are needed to manage the company, either in its operation, maintenance, commerce, or finance to make policies, to carry out implementation and supervision, especially to implement cost index and fuel tankering policy. The difference in aviation fuel price in recent time among airports is between IDR1,000 and IDR1,600 per litre. In order to stay exist, and become one factor stimulating the growth of Indonesian business and economy, airline companies much need to make an efficient, effective, and economical corporate business strategy so that the price is affordable.

The theoretical basis for this article is operation management, especially operation management for airline companies from Massoud Bazargan (2010) who writes among others about fuel management system. To him, in the airline, fuel and crew are two major components and operational cost drivers. Therefore, to him, airline companies need to implement aircraft fuel management system which can reduce the cost of fuel through a fuel ferrying or fuel tinkering approach. This is due to the difference in fuel price among airports. The other writers on fuel tankers and cost index are Stroup and Wollmer (1992), Ma, Song, and Zhu (2017), Zouein et al (2002) as well as Edwards, Dixon-Hardy, and Wadud (2016).

## 2.0 RESEARCH METHOD

The research method used in this analysis is descriptive explorative with time series data, secondary database supported by observation and interview. The technique for data analysis uses the formulas and factors existing in the flight planning and performance manual and flight crew operation manual of each aircraft. The types of aircraft being analyzed are Boeing 737-800NG, Boeing 737-900ER and Airbus 320, where all the aircraft population are used as samples in this analysis.

## 3.0 RESULT AND DISCUSSION

In the midst of Indonesian domestic flight passenger growth nowadays, there is a very tight business competition as well as a threat that cannot be neglected, i.e. economic growth and people purchase power which tend to decline. Of course, company management cannot accept this condition for granted, but every company develops a strategy to be the winner in the competition to be able to survive and gain profit. The strategy implemented by Indonesian domestic airlines tends to be price war so that it can be absorbed by the market and reached by people. Selling cheap (low price) ticket is not a wrong policy of corporate strategy because the company has calculated it thoroughly. The wrong policy is when the company implement the same ticket price with the competitors without taking into account its own cost.

With the economic growth and people purchase power which tends to decline and the weakened exchange rate of IDR against USD now, in order to keep going the strategy of the low ticket price, the company should make efficiency by issuing effective policies, for

example, fuel conservation policy. This policy is much recommended by the aircraft manufacturers so that the company can hold energy-saving and economical flights.

Fuel conservation is a concept of airline efficiency in using fuel by, among others, implementing cost index policy and fuel tankering policy.

## 4.0 COST INDEX

Cost index is a comparison of flight time cost and aircraft fuel cost (Airbus Manufacture, 2008). Cost index of every airline company is not necessarily same in a country, because each airline's cost structures can be different in order to save the use of fuel, where the aircraft speed tends to Long Range Cruise (LRC) speed (Edwards, Dixon-Hardy, and Wadud, 2016).

Cost index policy is very important for every airline company because this concept is not only fuel efficiency but also flight time efficiency. The way to calculate the cost index correctly and accurately is by calculating the fuel price and the valid or current exchange rate of the local currency against USD. Correct and accurate implementation of cost index will contribute highly to the airline both from the fuel cost saving aspect and flight time-saving aspect. The formula of cost index is as follows:

Formula:

$$\text{Cost Index (C.I)} = \frac{\text{Cost of Time}}{\text{Cost of Fuel}}$$

**Table 1. Saving from Cost Index of Airlines in Indonesia  
Period: 2014 – 2016**

NO	YEAR	TOTAL AIRCRAFT	TOTAL FLIGHT	C.I (COMPANY)	C.I (CURRENT)	SAVING ( 000 )		SAVING COST / YEAR ( USD )
						FUEL (KG)	TIME (HR)	
1	2014	259	512,820	30	36	51,282	8.547	<b>85.35 Million</b>
2	2015	296	586,080	30	52	117,216	19.536	<b>145.21 Million</b>
3	2016	309	611,820	30	56	122,364	20.394	<b>143.53 Million</b>
		<b>Total</b>				<b>290,862</b>	<b>48.477</b>	<b>374.09 Million</b>

From the calculation in Table 1, it is seen that from 2014 to 2016 airline companies in Indonesia use the average cost index of 30. From the calculation following the fluctuating fuel price and the exchange rate of USD from 2014 to 2016, the airlines operating aircraft with the type B 737-800NG, B 737-900ER and A-320 should have great cost saving.

In 2014, 2015 and 2016 with the average cost index of 36, 52 and 56, the total cost saving for 3 (three) years is predicted to be USD 374.09 million. If it is divided with the six airline companies using those three types of aircraft, then the average cost saving per year of each airline company in 2014 is USD 14.23 million, USD 24.20 million in 2015, and USD 23.92 million in 2016. So, cost index implementation is very important for facing the competition and for staying in the recent condition so as to reduce the company's risk of loss.

### 5.0 FUEL TANKERING

Fuel tankering is purchasing fuel at the origin airport because the price at the origin airport and destination airport is significantly different, where the fuel price at the origin airport is much cheaper than the fuel price at the destination airport (FPPM, Boeing Manufacture 2011).

Fuel tankering can be done with some criteria, such as:

1. Significant difference of fuel price at the origin airport and at the destination airport.
2. If the rest of payload is available for tankering fuel that refers to the aircraft structures and aircraft performance at an airport.
3. Tank capacity availability permit

Efficiency in fuel consumption using the concept of cost index and the effective implementation of fuel tankering will surely save fuel cost, flight time cost (aircraft charter, cost of crew, maintenance, aircraft insurance, etc.). Almost in all airline companies in Indonesia, the top management do not care about the change of fuel price because they lack knowledge about operational cost, especially the way to save the fuel cost and flight time cost (Ma, Song, & Zhu, 2017).

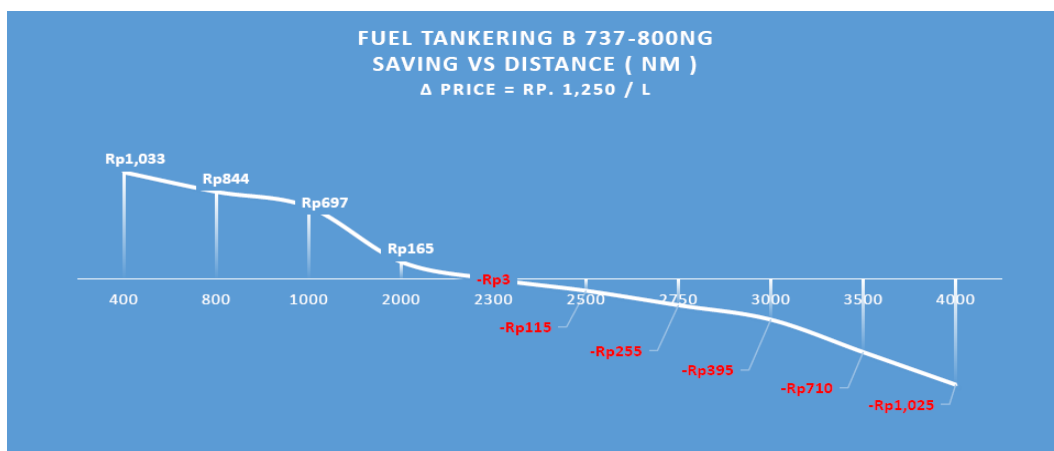


Figure 1. Saving from Fuel Tankering for B 737-800NG

As illustrated in Figure 1 above, with the difference of fuel price IDR1,250 per litre between origin airport and destination airport and the total distance of 400 NM, then the cost saving from tankering is IDR1,033 per litre or IDR1,291 per kilogram.

**Table 2. Saving from Indonesia’s Airline Fuel Tankering  
Period: 2014 – 2016**

NO	YEAR	TOTAL FLIGHT	AVERAGE LEG DIST (NM)	AVERAGE BEFPR	AVERAGE FUEL PRICE ( IDR ) / KG			TANKERING ( KGS )	SAVING ( in Million )	
					ORIGIN	DEST	BEP		IDR	USD
1	2014	636,462	445	1.036	13,500	14,800	13,986	1,000	518,080	<b>43.43</b>
2	2015	659,091	410	1.033	9,400	11,000	9,710	1,000	850,227	<b>63.18</b>
3	2016	764,156	402	1.033	7,900	9,900	8,161	1,000	1,328,867	<b>99.35</b>
<b>Total</b>									<b>2,697,174</b>	<b>205.96</b>

If the calculation of fuel tankers by conservative assumption and weighted average seat availability of domestic flight in 2014 as many as 193 passengers, in 2015 as many as 193 passengers and in 2016 as many as 192 passengers per flight, whereas domestic SLF in 2014 = 82%, in 2015 = 79%, and in 2016 = 78.5%, then the available tankering per flight in 2014 = 3,150 kg, in 2015 = 3,690 kg and in 2016 = 3,690 kg. From the calculation in Table 2, from 2014 to 2016 when airline companies in Indonesia implemented fuel tankering averagely 1,000 kg per flight and following the fluctuating fuel price and the exchange rate of USD from 2014 to 2016, then those airline companies operating aircraft B 737-800NG, B 737-900ER and A-320 should have great cost saving.

Assuming that the fuel price is on average in 2014, 2015 and 2016, the total cost saving for three years is predicted to be USD 205.96 million. If there are six airlines using those three types of aircraft, then the average cost saving per year of each airline in 2014 is USD7.24 million, in 2015 is USD10.53 million and in 2016 is USD16.56 million. The fuel tanker strategy can also overcome the risk of loss and it is very possible to implement it in Indonesia now because the difference of fuel price is significant, where the price at the origin airport is cheaper than at the destination airport. From the recent route structure of airline companies in Indonesia, the fuel price at the origin airport is IDR500 to IDR1,500 per litre cheaper than the price at the destination airport. Cost saving from fuel tanker is less than the saving from cost index but the nominal value contributed by fuel cost saving is fairly big.

**Table 3. Summary of Savings from Cost Index and Fuel Tankering of Airlines in Indonesia  
Period: 2014 – 2016**

NO	YEAR	TOTAL AIRCRAFT	SAVING COST ( USD - Million )		TOTAL SAVING COST C.I + T			
			COST INDEX ( C.I )	TANKERING ( T )	25 % T	50 % T	75 % T	100 % T
1	2014	259	<b>85.35</b>	43.43	96.21	<b>107.07</b>	117.92	<b>128.78</b>
2	2015	296	<b>145.21</b>	63.18	161.01	<b>176.80</b>	192.60	<b>208.39</b>
3	2016	309	<b>143.53</b>	99.35	168.37	<b>193.21</b>	218.04	<b>242.88</b>
<b>Total</b>						<b>477.08</b>		<b>580.05</b>

Based on the summary of cost saving in Table 3, if the airlines in Indonesia implement cost index and fuel tankering from 2014 to 2016, then they will get much cost saving and profitable.

Conservatively, the total cost saving for three years in the period of 2014-2016 is predicted to be USD 477.08 million if the cost index is used with the current condition and 50% of fuel tankering implementation. If the use of cost index and the implementation of fuel tankering are 100 percents, then the cost saving will be much more, around USD 580.05 million, if this cost saving is divided by six (because there are six airlines), then the average cost saving of each airline from 2014 to 2016 is USD32.23 million per year or USD 2.69 million per month. Of course, this cost saving is not a little amount and it can reduce the risk of loss as well as stay to compete if it is calculated accurately and implemented properly.

## 6.0 CONCLUSION

In the era of tight competition among airline companies, it is necessary to find a strategy to improve operational efficiency so as to maintain the sustainability of a company in the future. One way to improve operational efficiency is by implementing fuel tankering and cost index accurately and properly. The calculation of fuel tankers and cost index in an accurate and proper way will result in significant cost saving.

The implementation of fuel tankers and cost index in Indonesia has not been seriously paid attention by policymakers from national airline companies. It is due to their minimum knowledge of aircraft fuel management system.

## 7.0 REFERENCES

- Abdul Majid, Suharto, Kaltum, Umi, and Sucherly. 2016. Analysis on The Factors Causing Airlines Bankruptcy: Cases in Indonesia. *International Journal of Management Sciences and Business Research* Vol 5 Issue 2 Feb 2016.
- Airbus Manufacture. 2014. *Flight Crew Operating Manual* – Issue date February 04, 2014.
- Airbus Manufacture. 2008. *Airbus 320 Family Performance Retention and Fuel Savings Flight Operations Support & Services*– Issue date January 02, 2008.
- Bank Sentral Republik Indonesia. 2017. Informasi Kurs 2017. <http://www.bi.go.id/id/moneter/informasi-kurs/transaksi-bi/Default.aspx>.
- Bazargan, Massoud. 2010. *Airline Operations and Scheduling 2<sup>nd</sup> Edition*. England: Ashgate Publishing Limited.
- Boeing Manufacture. 2011. *Flight Planning and Performance Manual* – Revision Number: 8 Revision Date: June 18, 2011.

- Edwards, H. A., Dixon-Hardy, D., & Wadud, Z. 2015. Aircraft Cost Index and the Future of Carbon Emissions from Air Travel. *Journal of Applied Energy* 164, 553–562.
- International Civil Aviation Organization (ICAO). 2012. Flight Planning and Fuel Management Manual (FPFMM).
- Ma, Qiuzhuo, Song, Haiqing, & Zhu, Wenbin. 2017. Low-Carbon Airline Fleet Assignment: A Compromise Approach. *Journal of Air Transport Management* xxx (2017) 1–17.
- Pertamina Aviation. Daftar Harga Jual Avtur Seluruh Indonesia Tahun 2014-2016.
- Statistik Perhubungan Republik Indonesia. 2016. Buku 1 Statistik Perhubungan – 2016 <http://dephub.go.id/ppid/informasi/index?id=117>.
- Stroup, John S and Wollmer, Richard D. 1992. A Fuel Management Model for the Airline Industry. *Journal of Operation Research* Volume 40 Issue 2 April 1992 Page 229-237.
- Zouein, P. P., Abillama, W.R., Tohme, E. 2002. A Multiple Period Capacitated Inventory Model for Airline Fuel Management: A Case Study. *Journal of the Operational Research Society* Volume 53 Number 4, 1 April 2002 Page 379-386.