LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING

Judul Jurnal Ilmiah (Artikel)	:	Cost-benefit Analysis of Flight Extended Operations (ETOPS) for Garuda Indonesia Airways	
Jumlah Penulis	:	3 orang	
Status Pengusul	:	Penulis Pertama	
Identitas Makalah	:	a. Judul Prosiding	: International Cooperation for Education About Standardization 2018 (ICES 2018)
		b. Nomor ISSN	: 2261-2424
		c. Tahun Terbit, Tempat	: 3-5 July 2018, Yogyakarta
		d. Penerbit/Organizer	: Universitas Islam Indonesia
		e. DOI artikel (jika ada)	: 10.1051/shsconf/20184902015
		f. Alamat web	: https://www.shs-conference.org
Kategori Publikasi	:	√ Prosiding Forum Ilmiah Internasional	
		□ Prosiding Forum Ilmiah Nasional	

(beri √ pada kategori yang tepat)

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Yang Diperoleh
	Reviewer 1	Reviewer2	
a. Kelengkapan unsur isi prosiding(10%)	2,5	2,5	2,5
b. Ruang lingkup dan kedalaman pembahasan (30%)	8	8	8
c. Kecukupan dan kemutahiran data/informasi dan metodologi	8	8	8
d. Kelengkapan unsur dan kualitas penerbit (30%)	8	8,5	8,25
Total = (100%)	26,5	27	26,75
Nilai Pengusul = (60%)* 26,75 = 16,05			

Semarang, 20 Agustus 2019

Reviewer 1

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Jabatan Fungsional: Lektor Kepala

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g. Terindeks di Scopus/Scimagojr/SJR = Web of conference, EDP Science

Kategori Publikasi :
√ Prosiding Forum Ilmiah Internasional
☐ Prosiding Forum Ilmiah Nasional

(beri √ pada kategori yang tepat)

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akbir Yang Diperoleh
	Internasional	Nasional	
a. Kelengkapan unsur isi prosiding (10%)	3		2,5
b. Ruang lingkup dan kedalaman pembahasan (30%)	9		8
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9		8
d. Kelengkapan unsur dan kualitas terbitan prosiding(30%)	9		8
Total = (100%)	30		26,5
Nilai Pengusul = (60%)* 26,5 = 15,9			

Catatan Penilaian artikel oleh Reviewer :
1. **Kesesuaian dan kelengkapan unsur isi jurnal:** Isi paper sesuai dengan topik conference dan sistematika artikel sudah sesuai dengan panduan yang ditetapkan oleh jurnal Pendahuluan, Metode, Hasil dan Pembahasan, Kesimpulan
2. **Ruang lingkup dan kedalaman pembahasan:** Pembahasan atas metode penilaian cukup baik begitu juga pembahasan hasil pengolahan data disajikan dengan representative dan jelas
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:** Metode yang digunakan sudah sesuai untuk melakukan analisa keuangan pada unit bisnis baru
4. **Kelengkapan unsur dan kualitas terbitan:** tulisan diterbitkan pada prosiding terindex EDP Science dan diterbitkan oleh web of conference sebagai penerbit dengan unsur yang lengkap

Semarang, 19 Agustus 2019

Reviewer 1

Dr. rer. oec. Arfan Bakhtiar, ST, MT
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Jabatan Fungsional: Lektor Kepala

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(beri √ pada kategori yang tepat)

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b. Ruang lingkup dan kedalaman pembahasan (30%)	9		8
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9		8
d. Kelengkapan unsur dan kualitas terbitan prosiding(30%)	9		8,5
Total = (100%)	30		27
Nilai Pengusul = (60%)* 27 = 16,2			

Catatan Penilaian artikel oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi jurnal:** Isi paper sesuai dengan topik conference dan sistematika artikel sudah sesuai dengan panduan yang ditetapkan oleh jurnal Pendahuluan, Metode, Hasil dan Pembahasan, Kesimpulan
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3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:** Metode yang digunakan sudah sesuai dan data diberikan dengan cukup jelas
4. **Kelengkapan unsur dan kualitas terbitan:** tulisan diterbitkan pada prosiding terindex EDP Science dan diterbitkan oleh web of conference

Semarang, 19 Agustus 2019
Reviewer 2

Dr. Purnawan Adi Wicaksono, ST, MT
NIP. 197710032000121001
Unit Kerja : Dept T. Industri FT Undip
Bidang Ilmu: Teknik Industri
Jabatan Fungsional: Lektor Kepala

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The International Cooperation for Education about Standardization (ICES) 2018 Conference

Strengthening Industry and Engineering, Science, and Management Education through Standardization Learning

Joint International Conference with
5th ACISE (Annual Conference on Industrial and System Engineering)
and
World Standards Cooperation (WSC) Academic Day

Eastparc Hotel Yogyakarta
3-5 July 2018

Jointly hosted by

Universitas Islam Indonesia, Badan Standardisasi Nasional, and Universitas Diponegoro

Indonesia

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Welcome Message from Conference Chair

Assalamu'alaikum wr. wb.

Distinguished guests and participants,

First and foremost let us be grateful and thankful to Allah Almighty for His blessings poured upon us that we are able to make time and trip to this awaited event.

It is my privilege to welcome you to ICES 2018 Conference, a Joint International Conference with 5th ACISE and World Standard Cooperation Academic Day from 3rd of July until the 5th of July in Yogyakarta cultural city of Indonesia. It is truly a collaborative Conference organized together by International Cooperation on Education about Standardization, Islam University of Indonesia, National Standardization Agency of Indonesia (BSN), Diponegoro University, and Indonesia Forum of Standardization Education (FORSTAN). This is a unique kind of yearly ICES Meeting that this year the Conference is calling for papers to be presented. Parallel classes are scheduled for paper presentation and discussion.

The International Cooperation on Education about Standardization 2018 Conference (ICES 2018 Conference) is an international forum for the exchange of ideas, knowledge, and experience on the latest development in the field of standardization and standardization education among researchers and practitioners. The conference is also expected to enhance opportunities for collaboration among the participants to share and to advance the theory and practice in the fields. Panel discussions are also organized to share latest topics both in the policy making and implementation of standard and standard education.

The third day of this Conference which is jointly addresses organized with World Standard Cooperation to hold Academic Day that will specifically the MOOCs issues advancing in many countries. I thank ISO, IEC, and ITU for the Academic Day arrangement and support.

This Conference will not be possible without dedication of my fellow Committee members working continuously in the past several months. I thank and owe you all very much. My appreciation also goes to all Speakers and Sponsors that your participation and support have meant very significantly to this event.

My hope is that this Conference will raise more awareness on the importance of standard and standard education in the search of a better quality of life of ours and the next generation.

I wish you all enjoyable time and valuable knowledge from the Conference.

Wassalamu'alaikum wr. wb.

Dr. Bambang Purwanggono

Opening Speech

Standard as Social Construction: Rethinking Values and Playing Fields

Fathul Wahid, Ph.D. Rector of Universitas Islam Indonesia

An Address to The International Cooperation for Education about Standardization (ICES) 2018 Conference – Yogyakarta, 3 July 2018

Distinguished guests and participants,

On behalf of Universitas Islam Indonesia, I would like to welcome you to Indonesia and to Yogyakarta in this special occasion.

Starting from today until three days to come, we will have conference on the education of standardization, a significant field in our borderless but diverse world. It is indeed a great honour to host this important conference.

I do believe, none of artefacts, including standards that are value-free. They are indeed value-laden. There are certain values inscribed when developing standards.

Standards may be seen as common communication protocols. Good communication among parties is a necessary part to strengthen network and to extend collaboration.

Standards may also be considered as shared references to move forward together. An old African proverb says: If you want to go fast, go one, but if you want to go far, go together. Standard plays a pivotal role to provide us a common platform to go hand-in-hand in an orchestrated fashion.

Standards may also serve as an evaluation yardstick. It will be beneficial to make regular self-assessment to see our position and to leverage us to certain level of achievement.

Overall, however, if the development of standard is not departing from or in line with those underlying values, I am afraid that standard can be a hegemonic tool used by certain actors, to a certain level of achievement, to take control over or even to defeat others.

This is critical given the current development of standard has created unnecessary distributional implications, according to the extant literature. The result is that the rule-makers are more benefited than the rule-supporting partners, throughout much of time.

In many cases, rule-makers are better in gaining relative power, as they have more sources than their partners. Their technical knowledge creates information asymmetries, making it difficult for rule-supporting partners to immediately adopt the rules.

Previous wars on standard have provided us lessons to consider. We can learn how a number of rule-makers not only aim at enforcing standard as normative rules, but also intentionally at gaining more global financial power.

This can be seen from the stories of standard wars, such as in the case of digital wireless telephone (Code Division Multiple Access [CDMA] versus the Global System for Mobile Communication [GSM]), modem technologies, and mobile operating systems (Google versus Apple versus Microsoft). For its time, each of them has been evolved, superseded, and more likely to simply fade away. In some cases, several standards may co-exist, but in other cases, the winner takes all. These have raised questions to consider. What went wrong? Why the war on standard is inevitable?

The problem will be on its application within different readiness on the ground. Positive feedback is quite often to happen, when the strong get stronger and the weak get weaker, which in turn, this situation leads to extreme outcome; as information asymmetries do. Here, rule-makers or first-movers advantages manifest as they have better installed-base.

Hence, we may think to include this aspect in this context of education of standardization, the aspect of how to consider diverse playing fields and how to level them.

I would like to bring another viewpoint into the table.

Standard in some cases is not always about the better option, as a social artefact, it is socially constructed. For instance, without further discussion, we can easily concur that the layout of QWERTY keyboard has no longer rational base, as it was designed to avoid jams in the traditional typewriter. But until today, we witness that the QWERTY keyboard still exists and widely adopted, even when the inspired problem has vanished. The Dvorak keyboard layout did not gain ground, even though it was technically a better alternative.

In this regard, I would like to invite you to consider the existing practices cannot be totally neglected, but they can be used as inspirations to set-up standards.

In some cases, we may end up with flexible standards. It may seem as an oxymoron, but it works in many cases. For example, our colleagues from University of Oslo, propose this principle of flexible standards when developing health information system infrastructure in various developing countries. A set of core standards is set, but a room for flexibility is provided.

Distinguished guests,

Please note, that this viewpoint comes from a rookie in this field of education of standardization.

I do understand that pouring a pack of salt into the sea will be a meaningless effort, but at least, I do hope that this viewpoint may provide alternate or complement perspective that invites further discussions.

To conclude, I wish you all a fruitful conference and a memorable visit to Yogyakarta.

The role of MOOCs in democratising quality education: Indonesia case

Lucy Pandjaitan
Founder and CEO of IndonesiaX.co.id

This presentation will discuss how IndonesiaX, since launched on August 17, 2015, strives to bring high quality education through massive open online courses (MOOCs) to learners spread out in 17,000 islands and 34 provinces in the Republic of Indonesia, for free.

There is a big disparity of quality education amongst provinces of the Republic. Teacher quality and distribution make education in rural areas generally inferior to urban areas.

The challenge is to provide the necessary educational infrastructure and facilities as well as teachers in remote islands and locations and this is a huge task.

Rapid technological innovation, young Indonesians' active use of internet and the passion and willingness of competent instructors to share their knowledge for free are the most important keys to the success of MOOCs as the new way of learning in Indonesia.

In the presentation, I cover how IndonesiaX evolved, the selection of instructors, the positive results but also the challenges and how MOOCs can be more effective in the future in democratising education, helping to improve education standards throughout the nation, facilitating lifelong learning and thus enriching lives of Indonesians.

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Yogyakarta, Indonesia, July 3-5, 2018

B. Purwanggono and D. Hatta Fudholi (Eds.)

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Cost-benefit analysis of flight extended operations (ETOPS) for Garuda Indonesia airways

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Abstract

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Abstract - Garuda Indonesia reducing the flight cost used flight extended operations (ETOPS). ETOPS can reduce travel time and fuel consumption. The cost-benefit analysis was conducted to compare the flight between NON ETOPS flight and ETOPS flight Cengkareng - Perth - Cengkareng route. Net benefit of ETOPS flight is USD 1.212.863 and NON ETOPS is USD 1.154.894. Cost structure analysis was conducted to identify the percentage of flight cost component. The biggest percentage of cost was direct flight cost. It is equal to 49,53% for route Cengkareng - Perth NON-ETOPS and 47,70% for ETOPS. While for the route Perth - Cengkareng NON-ETOPS and ETOPS have the same amount of 46.03%. Based on the results of the cost-benefit analysis, it is evident that the ETOPS flight can reduce the fuel cost, although the flight requires trained pilots. Contribution of the paper is brief describe on the structure of revenue and expenditure items in airways business. The structure is specific, different from other transportation business.
Keywords: ETOPS, fuel, cost-benefit analysis, cost structure

1. Introduction

Determination of public transport fares require the right policy to bridge the interests of passengers as consumers and employers as providers of public transport services. Many factors affect the transport tariffs, such as public purchasing power, the cost of maintenance, spare parts price, fuel prices, facilities and infrastructure [1]. Air transportation has specific structure on revenue and expenditure items which not much discuss on scientific publication. Technical knowledge is needed to obtain the data of revenue and expenditures of airways business.

Garuda Indonesia is the largest airline in Indonesia. Garuda Indonesia airlines carry more than 25 million passengers annually, serve flights to more than 40 domestic destinations and 26 international destinations. Garuda Indonesia has prepared various aircraft to meet the needs of consumers for international flights, such as Airbus Industries A330-300, Boeing 737-800, and others. Boeing 737-800 is one type of aircraft with seat load factor of 162 seats, this type of aircraft can be used to travel internationally to countries such as Perth, Australia.

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ETOPS or Extended Operations or formerly known as Extended Range-Twin Engine Operations is a technology carried out by a two-engine aircraft which has the ability to fly only with one machine for a certain period on the scope of an adequate airport (adequate airport). ETOPS can reduce the gasoline consumption due to shorter routes and leads to cost savings. Now, Garuda Indonesia is conducting a feasibility analysis of ETOPS technology for Boeing 737-800 on the Cengkareng - Perth flight route using New Generation aircraft fleet.

ETOPS flights require trained pilots, it is the investment cost. Management needs to know whether ETOPS flight is still feasible or not by calculating all cost involved. The calculation of feasibility analysis of ETOPS and NON ETOPS be reviewed by cost-benefit analysis. Cost-benefit analysis can be used to make decisions from several existing investment alternatives by reviewing the costs associated with the object under investigation. This study does a review NON ETOPS and ETOPS flights for Cengkareng - Perth - Cengkareng route based on flight cost plan. The study aims to compare the resources uses for flight on structure analysis and calculating the cost-benefit analysis. The ETOPS flight used in this study was ETOPS 90 minutes.

2. Literature review

ETOPS or Extended Operations is an operation performed by twin-engine aircraft that have the ability to fly for 60 minutes or more with one machine in dead from the nearest airport in certain routes [2]. An adequate airport is a decent airport to serve as the launching point of the ETOPS aircraft [3]. The operating area of ETOPS is the area that the relevant aircraft can fly under the ETOPS regulation. This area is characterized by a circle centered on the adequate airports. ETOPS flights alone can save the fuel consumption and reduce the flight cost. In the USA, more than 5.5 million ETOPS twinjet flights have been logged worldwide since 1985, and every day some 143 operators perform 1,750 more these operations set the highest standard for safe, reliable long-range flying or RLRF [4].

The cost structure is good to describe all the costs required to run a business model [5]. Identification the percentage of flight cost will help to describe the impact of saving fuel consumption on ETOPS and NONETOPS flight. Some cost component occurred while preparing the ETOPS flight. Costs are accounted for major activities, key resources, and partnerships determined. Aviation cost of differs slightly from the operational cost of manufacture companies. The cost consists of direct cost and indirect cost. Direct cost or operational costs is a cost associated with the aircraft and flight cost. The cost incurred by airlines that dependent in the intended destination, aircraft technology used, flight duration and other related aspects. Indirect cost is the cost for daily aircraft operations, aircraft and flight administration, and overhead cost (costs incurred excluding operational costs).

All these costs will be processed to get the value of the total cost. Total cost is the accumulation of all the costs required for the associated route. Total cost consists of the incremental cost of flight interrupted and HO administration. Flight interrupted is the cost incurred when an unavoidable delay occurs. While the administration of HO or administration head office is the cost of administration in the main office to handle the administration of the related routes. Morlok (1988) stated that the management of transport businesses face a very wide choice in terms of pricing and operating plans [6].

Cost-benefit analysis or CBA is a practical tool for assessing the feasibility of a project. It is important to consider the project over the long term such as reciprocity to consider the impact of a project on stakeholders [7]. CBAs on business units or those used within a company consider the commercial aspect of a project and regardless of the social effect [8]. The advantages of CBA is more efficient on using of economic resources, and the use of

funds monitored appropriately. The disadvantages of CBA is that the impact of the project cannot be analyzed precisely and many factors influence lead to increase cost [9].

3. Research Methods

There are five stages to perform cost-benefit analysis calculation [10]. First, define a problem and identify possible options/alternatives. Identify problems that occur by getting information from relevant parties and start looking for solutions to solve the problems at hand. The solution offered consists of several alternatives, the best alternative will be selected based on cost-benefit analysis calculation. Second steps are determined inputs and outputs (impacts) of each option. All aspects that affect the calculation of cost-benefit analysis should be detail reviewed accordance to each available alternative.

Third steps is the valuation of the benefits and costs of each option ('net benefits'). The calculation of income and expenditure is calculated on the basis of alternatives previously reviewed, after which the profit of each alternative is calculated. Step four is to identify the 'best' option based on the calculation of each of the advantages that have been done. The last step is selected the best alternative that provides problem-solving and the benefits to be desired.

4. Result and Discussion

The first stage of cost-benefit analysis is defined problem and identify possible options or alternatives. Based on experienced, the demand for Cengkareng - Perth - Cengkareng route is quite attractive to consumers, indicated by high seat load factor of 75.96% for the Cengkareng - Perth route and 77.80% for the Perth - Cengkareng route. But economic conditions in 2016 are in a critical position, where the revenue of this airline has decreased compared to previous years. All program for savings already made by Airlines to increase the profit. Extended Operations or ETOPS flights on Cengkareng - Perth - Cengkareng route using Boeing 737-800 New Generation aircraft can be one of the saving programs. This stage described data of flight plan for Non-Etops and Etops based on the flight plan described in Table 1.

4.1. Cost-benefit analysis

The second stage of cost-benefit analysis is determining inputs and outputs of each option, means identify the revenue and expenditure structure of airways business. Based on financial statements, the revenue earned from NON-ETOPS Cengkareng - Perth flight in 2016 was USD 5,910,056 and Perth - Cengkareng was USD 6,836,053. The financial statements are recorded for each flight made by Garuda Indonesia, which consists of net-income (revenue and expenditures). The nett revenue was obtained with load factor 66.02% for Cengkareng - Perth flight and 66.40% for Perth - Cengkareng flight. Load factor is total of passengers, cargo, mail, and baggage loaded divided by the available capacity. The revenue resulted from 191 times total flights for Cengkareng - Perth and 191 for Perth – Cengkareng. The calculation for ETOPS flight revenue for the same route made use the same load factor and flight frequency. A detail description of the revenue for the Non-ETOPS flight is listed in Table 2.

Table 2 explain the structure of revenue on airways business. The revenue of ETOPS and NON ETOPS flight give the same result. The factor give highest influence on revenue estimation is the load factor assumption. That’s why the revenue of ETOPS and NON

ETOPS should not compared. The data of revenue only needed to calculate the benefit as difference between revenue and cost.

Table 1. Comparison of Etops and Non-etops Flight information 2016

	CENGKARENG - PERTH				PERTH – CENGKARENG				
	Non-etops	Etops	Gap (flight)	Gap (year)	Non-etops	Etops	Gap (flight)	Gap (year)	unit
Payload	15.144	15.578	434	83.328	17.179	17.510	331	63.552	kg
Duration	269	262	7	1.344	279	275	4	768	minute
Trip fuel	10.701	10.326	375	72.000	11.522	11.267	255	48.960	kg
	13.590	13.114	476	91.440	14.633	14.309	324	62.179	liter
Block fuel	16.920	16.488	432	82.944	15.706	15.376	330	63.360	kg
	21.488	20.939	548	105.34	19.947	19.528	419	80.467	liter
Distance	1.825	1.730	95	18.240	1.830	1.800	30	5.760	Nm
	3.379	3.203	176	33.780	3.380	3.204	176	33.780	Km

Table 2. Revenue of Non-ETOPS Flight 2016

Revenue	**CGK – PERTH (US $)**	**PERTH – CGK (US $)**
Passenger Revenue Gross	5.625.247	6.628.417
Excess baggage revenue	18.191	18.501
Passenger Revenue discount	3.460	69.195
Passenger Revenue net	5.639.979	6.577.723
Freight revenue gross	140.953	7.162
Freight revenue discount	97.382	4.596
Freight revenue net	43.571	2.566
Mail revenue	1.673	0
Other revenue	224.833	255.765
Net Revenue	5.910.056	6.836.053

The flight cost or expenditure consist of many kinds of cost describe on Table 3. Direct traffic cost consist of passenger commission, freight commission, credit card commission, catering, on board service, and reservation cost paid by customers. Direct flight cost is the highest one.

The third stage is the valuation of the benefits and costs of ETOPS flight and Non-ETOPS flight. Cost planning required for Non-Etops and Etops for Cengkareng - Perth - Cengkareng route was planned and revenue obtained in 2017 estimated. Several assumptions are 192 times flights in a year and 80% load factor. Calculation of Etops and Non-ETOPS flight cost for Cengkareng - Perth - Cengkareng route only different on direct flight cost, fleet cost and pilot training cost. Direct flight costs on Non-Etops for Cengkareng - Perth route is USD 2.429.000 and ETOPS flight cost USD 2.391.000

resulting a gap of USD 37.600. Direct flight cost for Perth - Cengkareng route Non-Etops was USD 2.834.000 and the Etops cost was USD 2.813.000 resulting gap of USD 20.000. Fleet cost only changed at the depreciation cost and lease cost of aircraft, while for the cost of insurance does not change. Fleet cost flight Non-ETOPS route Cengkareng - Perth was USD 1.266.000 and ETOPS flights cost USD 1.246.000 thus spending a gap of USD 20.000. Perth - Cengkareng flight route the Non-ETOPS fleet cost was USD 1.295.000 and Etops was USD 1.283.000 resulting in a gap of USD 11.600.

Table 3. Comparison of Etops and Non-Etops Flight cost 2016

Cost	CGK – Perth		Pert - CGK	
	NON ETOPS (USD)	ETOPS (USD)	NON ETOPS (USD)	ETOPS (USD)
Direct Traffic Cost	774.963	774.963	954.956	954.956
Direct Flight Cost	2.428.913	2.391.251	2.833.703	2.833.703
Fuel Aircraft	1.203.150	1.140.5	1.203.6	1.203.648
Cockpit Crew	152.466	149.978	153.772	153.772
Cabin Crew	182.990	180.004	178.236	178.236
Landing	174.496	174.496	126.835	126.835
Handling	196.978	196.978	610.744	610.744
Air Traffic	86.570	73.786	105.300	105.300
variable	432.259	475.485	455.164	455.164
Indirect Cost	205.855	205.855	213.809	213.809
Fleet Cost	1.266.213	1.245.8	1.295.3	1.283.720
Depreciation	93.559	92.033	95.653	94.781
Lease Aircraft	1.152.300	1.133.4	1.179.2	1.168.539
Insurance	20.354	20.354	20.399	20.399
Overhead Cost	396.218	396.218	437.631	437.631
Flight Interrupted	4.376	4.376	4.549	4.549
Administration HO	358.697	358.697	415.996	415.996
Training Cost	-	5.819	0	5.819
TOTAL COST	5.435.235	5.383.0	6.155.9	6.150.183

Training cost is used for 1 pilot of Boeing 737 - 800 New Generation. The Cengkareng - Perth route requires 25% of the total training cost. The pilot training cost for ETOPS flight is IDR 5 million for each person. Cengkareng - Perth - Cengkareng flight route alone requires 5% of the total 310 crew of Boeing 737 - 800 New Generation or 31 crew. Total training cost for Cengkareng flight - Perth - Cengkareng for 31 crew is IDR 155 million or if converted into dollars is USD 11,638.

The fourth stage compares the net benefits of each option. Cengkareng - Perth route revenue is USD 7.217.054 per year, then net benefit Non-ETOPS flight is USD 1.782.000 and ETOPS flights is USD 1.834.000. Perth - Cengkareng route gain potential revenue USD 8.291.000 per year and obtained a net benefit for Non-ETOPS flight USD 2.135.000 and Etops USD 2.141.000. The fifth stage is to identify the 'best' option. The choice of best

option can be seen based on the largest net benefit from each route. Based on the largest net benefit for the Cengkareng - Perth - Cengkareng route, Etops is chosen as the best option compared to Non-ETOPS flights. Fuel that can be saved if using ETOPS is 185,806 liters per year or 192 times flight. Total cost saved is USD 57.969 per year. Table 5 outlines the overall flight costs of Non-Etops and ETOPS routes Cengkareng - Perth - Cengkareng.

Based on financial statements, the revenue earned from NON-ETOPS Cengkareng - Perth flight in 2016 was USD 5,910,056 and Perth - Cengkareng was USD 6,836,053. Total revenue was USD 12.746.109. Table 5 give the total flight cost for NON ETOPS and for ETOPS. From the data we can make a calculation of benefit of flight and compare the benefit between ETOPS and NON ETOPS. Cost-benefit analysis shows that ETOPS flights are more profitable, although requires training costs for pilots. The benefit for 2016 NON ETOPS flight was 1.154.894 USD and for ETOPS was 1.212.863 USD. Although the used of ETOPS flight on 2016 not increase the benefit significantly, the flight for the route was increase in 2017. The estimation of load factor was 80 % compare to 2016 60 %. In this case, the effect of use ETOPS flight will give profit increase significantly.

4.2. Cost Structure Analysis

The most influential cost of transportation business is fuel cost, it also happens on bus operational costs [1]. The result of cost structure analysis for Cengkareng-Perth route shows that direct flight cost is the biggest expenditure components for Non-ETOPS flight (44.69%) and fleet cost are the biggest expenditure components for ETOPS flight (44.42%). Etops flight decreased the direct flight cost 0.27%, fleet cost 0.16%, and need additional training cost 0.11% of all cost. The result for Perth - Cengkareng route also shows that direct flight cost and fleet cost as the largest cost components for Non-Etops and Etops. Etops flight result on a decrease of direct flight cost 0%, fleet cost 0.17%, and need additional training cost by 0.09%. The most influential resource on Non-Etops and ETOPS flights is the fuel cost, describe Table 4.

Table 4. Comparison of Etops and Non-Etops Cost Structure

	CGK - PER		PER – CGK	
	Non etops	Etops	Non etops	Etops
Direct Traffic Cost	14,26%	14,40%	15,51%	15,53%
Direct Flight Cost	44,69%	44,42%	46,03%	46,03%
Indirect Cost	3,79%	3,82%	3,47%	3,48%
Fleet Cost	23,30%	23,14%	21,04%	20,87%
Overhead Cost	7,29%	7,36%	7,11%	7,12%
Flight Interrupted	0,08%	0,08%	0,07%	0,07%
Administration HO	6,60%	6,66%	6,76%	6,76%
Training Cost	0%	0,11%	0%	0,09%
TOTAL COST	100%	100%	100%	100%

Cockpit crew travel and cabin crew travel are also one of the most cost-affecting aspects of cost. These costs are part of the direct flight cost group. Non-Etops and ETOPS flights also associated with fleet costs, and training costs. The efficiency or savings made by ETOPS flight can be seen from the percentage of direct flight cost, fleet cost, and overhead cost.

Based on the details of cost structure analysis, it is proven that fuel is the most influential component of direct flight cost. Fuel consumption difference between Non-Etops and

ETOPS flight for Cengkareng - Perth route is 105 liters per year, and for Perth - Cengkareng route is 80 liters per year. Thus, it can be concluded that by using Etops result on cost reduction from fuel savings caused by flight duration. Cost saving can be used for route-related marketing costs in order to increase load factor, improved quality of passenger care and increased service for passengers.

5. Conclusions

Cost-benefit analysis shows that ETOPS flights are more profitable than NON ETOPS. Compare to NON ETOPS, ETOPS flight requires training costs for pilots but saving the fuel consumption cost. Based on cost structure analysis, the greatest expenditure is direct flight cost component due to fuel cost. Fuel consumption difference between Non-Etops and ETOPS flight according to amount of distance reduction or time flight.

Analysis on ETOPS and NON ETOPS flight can be done more sensitive if we concern only on cost reduction result of fuel consumption decreasing. The revenue calculation significantly influence by load factor assumption and the calculation of revenue will give the same value for ETOPS and NON ETOPS flight model.

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