

## **ANALYSIS OF THE AVIATION INDUSTRY IN INDONESIA PERIOD 2003-2015 BASED ON DOMESTIC PASSENGER GROWTH AND THE STRATEGIC IMPLICATION FOR AIRLINES AND GOVERNMENT**

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### **Abstract**

*The objective of the study was to analyze the growth of the number of domestic passengers in Indonesia based on empirical data of the last 12 years to forecast the number of domestic passenger for 2016-2021 by using panel data modeling with random effects model technique. The research using independent variable air traffic, ticket prices and per capita income has never been done in the Indonesia's aviation industry, but research with the same model ever done in the industry of electrical household. The results of the study are useful for strategic planning for companies in developing the market and government of Republic of Indonesia to determine the right public policies needed to support the aviation industry development which able to accelerate economic growth, ensure the safety and convenient of air transport passengers and the sustainability of aviation industry. The results of this study indicate that the variable number of air traffic can be explained by ninety one point eleven percent by variable number of air traffic, yield and per capita income and has a close relationship to the number of domestic passengers in Indonesia.*

**Keywords:** *air transportation; passenger projection; public policy; and strategic management*

### **INTRODUCTION**

The airline industry in the world has been plagued by several factors such as over capacity, commoditization of offerings, cutthroat rivalry exacerbated by the entry of low cost carriers, and intermittent periods of disastrous under-performance (Costa et al., 2002). It happened also in Indonesia, so before deregulation of aviation industry in this country was done in 1999, the number of passengers in Indonesia was below 7 millions passenger per year with low growth rate around 5% until the period of 2002. Compared with the number of Indonesian population which according to Worldbank in 2002 amounted to 217.5 million means that the ratio of passengers to the population is only 5.5%, very far from the potential passengers in developed countries such as the United States which has reached 200% which means every citizen use airplanes reaching an average of 2 times a year. The low number of passengers and passenger growth figures is due to only few airlines, limited number of aircraft, expensive ticket prices, and low per capita income.

The small number of passengers shows low economic activity because the economy is fragmented within small area. The movement of people only occurs for short distances around the city or region respectively, the exchange of goods and services is still very low and less smoothly which means the economy has not reached optimal efficiency. The market of airline industry in this country is still big compared to the nation wide population and national economic is going better. The growth of sector of tourism business needs airline transportation, so the players shall also concern toward competitiveness and service delivery as stated by Purba (2014) due to the economic situation and regulations in the ASEAN Community are contributes the development of businesses and also make hypercompetitiveness among the companies and business players, so almost organizations over this region and also the world are forced to be better than before in running their services. An open economy will provide wider access to more efficient alternatives so that people have better economic choices for products and services needed. An open economy will also provide great potential to have broader access to the market, not only in its territory and even throughout Indonesia and around the world. Air transport creates the regional development through influence to employment and higher transportation need the capacity to move people and cargo (Vijver, Derudder, & Witlox, 2015).

A real example in Indonesia, woven fabrics produced in Kupang, East Nusa Tenggara can be sold at a more expensive price because the demand that initially only meets the local needs becomes larger because it serves the entire market of Indonesia and even the whole world because of weaving origin Kupang already exhibited by the Indonesian fashion designers in New York Fashion Week. That is why the aviation industry contributes positively to the economy in addition to supporting economic activity as well as creating jobs, increasing tax contributions, increasing import duties (Button & Yuan, 2013). Increased air passenger traffic also contributes significantly to the economic development of the region (Vijver, Derudder, & Witlox, 2015). The problem of very small ratio of air transport passenger to the population provide a huge potential for aviation business growth in Indonesia, but the regulation create entry barrier to grow higher because it is not easy for investors to set up airlines in Indonesia in the era before 2000.

In the period before 1999 the aviation industry in Indonesian consisted only with 5 airlines, which are Merpati Airline, Garuda Indonesia, Sempati Air, Mandala Airline and Bouraq Airline. The limited number of airlines makes air fares too high that they can only be accessed by people of high rank and income, others should be satisfied with land and sea transportation only. Domestic flight ticket prices before flight deregulation varied between USD 11-20 cent per seat kilometer, while post-deregulation even can reached USD 3 cent, which resulted many airlines went bankrupt.

However, through the Minister of Transportation Regulation PP No. 40 on 1995 concerning Air Transport, deregulation in the air transportation sector began to have impact in 1999, where the Indonesian aviation industry entered a new era that tends to lead to free market competition. The growth of domestic passenger numbers post deregulation was increasing quite high every year with an average annual growth rate of 22% (Kompas, 13 of April 2010). This growth is due to the growing number of aircraft which is very fast along with the establishment of new domestic airlines such as Lion Air, Batavia Air, Sriwijaya Air, AW Air

(which later became Indonesia Air Asia), Star Air, Indonesian Air, Jatayu Air, and Express Air. The seat capacity growth due to the increasing number of airlines and the number of aircraft resulted the yield dropped significantly, so impacted the passenger numbers increase significantly by 44% from 2003 to 2004, the cause of the yield decline 5.89% mostly due to the new established of low cost carrier as the new concept in the aviation industry in Indonesia.

The new low cost carrier which use relatively old planes in the introduction phase made them possible to sell low airfare to compete with legacy airline. The new airline such as Lion Air and Wings Air was originally using the MD-82 aircraft which was produced in 1982; Sriwijaya Air and Express Air even use B737-200 made in 1976 (Ministry of Transportation).

Beside the low airfare which applied by the new entrant, the positive growth of the Indonesian economy -according to World Bank data reached an average of 5.29% during the period 2002-2016, was increasing the business activity and air passenger traffic due to higher purchasing power able to attract the passengers from other modes of transportation such as ships, buses and trains to airplane.

The perceived value of air travel is very high compare to other transportation modes because the airfare paid by the airline passenger sometimes similar, even can be lower compare to other transportation mode. Even when the airfare is slightly higher than other modes but considering the travel time with the same distance is much shorter, people prefer to use airline. For example, if people want to travel from Jakarta to Makassar using air transport it will take only 2 hours and 20 minutes, while it will take 3 days if you use sea transportation. Not to mention airline also provide in-flight services (meals and readings material).

The below figure showed the growth of airline passenger for the period 2003 to 2015, and expected continue to grow until the years ahead.

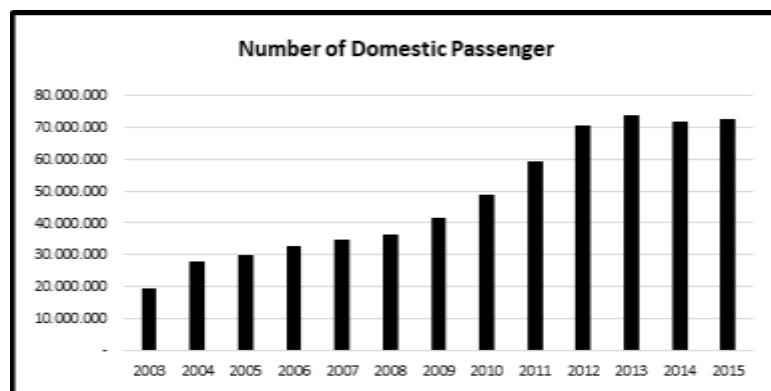


Figure 1

**Air Transport Passenger growth**

**Source: Air Transport Statistics Data 2017, Ministry of Transportation**

Four years since the deregulation of the airline industry rolled out, competition between airlines began to lead to unhealthy competition. It was visible in the price war that led to the stop operation of several airlines. Airlines which are closed not only the newly established airlines which have not reached 5 years, such as Bayu Air (2003), Seulawah Air (2004), Bali Air (2005), AW Air, Indonesian Air, Jatayu Gelang Sejahtera (2006), Star Air (2006),

Linus Air (2008), Adam Air (2008), but also also the legacy airline such as Bouraq Airline (2006) and the last is Mandala Air, which went bankrupt in January 2010 (Ministry of Transportation, 2011).

Although roller coaster situation in the aviation industry, the number of passengers is expected to continue to grow significantly in line with Indonesia's economic growth, so it is necessary for the government and stakeholders to forecast number of domestic passengers in the period 2016-2021 to anticipate and prepare the infrastructure and public policy needed to create an ideal air transport system, improving aviation safety standards and being prepared to face open sky policies implementation in the ASEAN region starting 2015. In concerning on ideal air transport systems the quality of service delivery toward the passengers shall be the priority too because the service delivery becomes the main key strategy in achieving the goals in this era of century development. Most of the organizations over the world always do review and redesign on their services delivery toward their customers for the sake of growing and sustainability of their businesses, companies, governments, non-governments organizations (Purba & Rorim, 2015).

To address the key challenges faced by the Government of Indonesia above, the objectives of this study are: to analyze the relationship between the number of air traffic, the yield and the per capita income to the number of air transport passenger from 2002 to 2015, and to forecast the number of air transport passenger 2016 to 2021 in Indonesia. Therefore, to estimate the number of passengers for the 2016-2021 period it is necessary to understand the significant factors which affect the growth of the number of air transport passengers.

## **LITERATURE REVIEW**

The model of the number of air transport passengers as a function of airfare yield, per capita income and the number of flight frequencies is a similar model performed to determine the demand model of passenger traffic on international flights by Srinidhi (2010) where airfare between two cities, per capita income, population between the two cities, the number of air traffic and the distance between the two cities have an effect on the number of passengers.

The similar model is also used in research of (Xiaowen, Oum, & Zhang, 2010) as presented in their research that the aviation liberalization reduces tariff barriers, barriers to open new routes, increase the service capacity to make airlines more efficient, airfare goes down, passenger traffic increase. This model shows a contradictory and significant relationship between the airfare and the number of passengers, where if airfare decreases then the number of passengers will increase. This research besides explain the influence of airfare variable to the growth of passenger number also explain the influence of variable frequency or air traffic used in this research.

Number of air traffic as an important factor in increasing the number of passengers is the similar variable used by (Leurent, 2011) which explains the frequency of services affecting the number of passengers transported in each station, indicating the number of frequencies indicating the carrying capacity in addition to the number of seats available in the mass transit system.

While the influence of income level per capita has a positive effect on the number of passengers, a significant income growth to the growth of the number of passengers due to bigger purchasing power to buy airline tickets. The linkage between per capita income to passenger numbers can be explained by the same research developed by (Kobos, Erickson, & Drennen, 2003) where the growth of income levels is in line with the growth in vehicle ownership which costs much higher than the price of airline tickets.

### **Overview of global air transportation**

Airline profitability is closely linked to world economic growth and trade. During the first half of the 1990s, the aviation industry faced challenges not only from the world recession but also from the Gulf War which have negative impact on air travel. In 1991 the number of international passengers fell for the first time. The financial difficulties were exacerbated by the airlines that booked the aircraft in the booming years in the late-1980s, leading to significant overcapacity in the market. Airlines from IATA member suffered cumulative net losses of \$ 20.4 billion in the period of 1990 to 1994.

Since then, airlines shall recognize the need for radical change to ensure their survival. Many airlines have tried to cut costs aggressively, and reduce capacity growth. The action has made the industry as a whole profitable, which according to IATA reached \$ 5 billion in 1996, less than 2% of total revenue. This figure is still below the target of IATA. But, air transport remains a huge industry that continues to grow because it accelerates economic growth, world trade, international investment, tourism and is the cause of globalization happening in many other industries.

In the last decade, air transport has grown by 7% per year. Traveling for business and leisure purposes is growing strongly around the world. Scheduled flights carry 1.5 billion passengers years ago. In the long haul market, the large aircraft such as the Boeing 747 is very convenient and affordable for people to travel long distances for new and exotic destinations.

The most dynamic growth centers is in the Asia Pacific region, where rapidly expanding trade and investment are coupled with increasing domestic prosperity. Air travel for the region has risen up to 9% per year and expected to grow continue rapidly, although the Asian financial crisis of 1997 and 1998 slowed the growth rate for the next year or two due to declining profit levels. Around the world, IATA, projecting international air travel will grow by an average of 6.6% a year for the end of the decade and over 5% in 2000-2010. In Europe and North America, where the air travel market has been highly mature, growth has begun to slow down around 4% -6%.

Worldwide passenger market growth is most prevalent in some countries such as Brazil, Russia, India, and China because of their high economy growth. The awareness of the potential of domestic market in some countries has inspire to develop their own aviation industry to produce aircraft needed. Brazil has succeed with their Embraer jet E-145, E-170, E-175, E-190, E-195 which already been using widely in South America, China and Indonesia.

China has succeed to develop ARJ-21 aircraft with seat capacity of 100 passengers which was just exhibited at the International Air Show in Zhuhai, China in November 2010. China has also started to build a 168-200 seater plane named COMAC 919 (Commercial Aircraft Corporation of China), but 90% of its components are American and European made

supported by General Electric or Honeywell (New York Time-May 5, 2017). The aircraft is expected to fly premiere at the end of 2014 and will start serving scheduled flights by 2016 and will certainly be a rival for Boeing production aircraft (B737-600 /700/800/900) and Airbus (A319 and A320). (Avbuyer, Editor: Eric)

Do not want to left behind, Russia was ready with the aircraft Sukhoi Super Jet 100 which will also supply the demand for new aircraft worldwide. Thus, the number of aircraft will not be constrained by the ability of Boeing and Airbus production lines alone, because it has been emerging from many other countries (Aviationweek-Juni 18, 2017).

A number of factors are forcing airlines to become more efficient. In Europe, the European Union (EU) has ruled that governments should not be allowed to subsidize their losers. On the other hand, government concerns over their own financial condition and the the benefits of privatization have led to the transfer of ownership of airlines from state to private sector. In order to attract prospective shareholders, airlines must become more efficient and competitive.

Nevertheless, the aviation industry has been continuing towards globalization and consolidation by riding the wave of the passenger growth, through the formation of partnerships and alliances, connecting their networks to expand access to their customers (interline).

### **Overview of air transportation in Indonesia**

Refer to the fact that the macroeconomy of Indonesia is still growing, while the other countries experienced negative growth in 2009, Indonesia along with China and India became the countries that still have positive economic growth. This achievement has impacted on the growth of the domestic aviation industry in terms of the number of passengers and the number of aircraft used. If air transportation is able to absorb all the market demand of passengers and goods in Indonesia, then it will accelerate the economic growth faster.

The geography of Indonesia which consists of 5 major islands (main land) and thousands of small islands that can reach 17,000 islands made Indonesia the largest archipelagic country in the world today. This condition create the opportunity for air transport mode to be very vital infrastructure for people (passenger) and goods (cargo) movement.

The regional autonomy that has been rolling since 2002 also increases the growth of regional transportation potential. Why? Because 497 sub provinces is racing to accelerate their economy growth by developing air transportation infrastructure through longer airport runway, bigger airport capacity, better air navigation and telecommunication.

The situation in Indonesia which are often experienced natural disasters with many casualties, both dead and injured, the quick access is really needed to conduct emergency response to minimize the casualties. The speed of logistic for food and clothing relief in times of disaster using air transport is really helpful the casualties in the midst of a very difficult situation.

### **The economic effect of air transport deregulation in Indonesia**

The growth of passenger numbers has developed rapidly since the deregulation of air transportation in Indonesia through PP no. 40 years 1995 was rolling in 1999 concerning Air

Transportation which opened the opportunity for the establishment of several domestic airlines. At that time, domestic passengers was only 7.04 millions people which then grew rapidly to 72.56 millions people in 2015 means that there has growth 10 time folds in 16 years -the growth has reached 82% of the installed capacity. (Statistics of Air Transport, Biro Pusat Statistik, 2017)

This growth is triggered by the increasing number of available seat capacity due to the emergence of low cost carrier in Indonesia which accelerates the growth of passenger of the air transportation sector from year to year. The potential of air transportation is also happened in the growing of air freight which in 2002 reached 804 thousands ton and in 2009 had reached 1.2 billion tons. Potential cargo of goods may still be optimized because it only use 44.3% of installed capacity (Statistics of Air Transport, Ministry of Transport, 2009). The potential of the growth shall be support by optimism and innovative strategy as recommended by Kamaludin & Purba, 2015, optimism and innovativeness function as mental enablers of the players to adapt the environment changed according to the potential business (Kamaludin & Purba, 2015). The changing world society that has been globalized become implication of the innovation in many forms of technologies, management systems that shall be considered by regulators and organization leaders (Purba, 2015) management innovation involves the introduction of novelty in an established organization, and as such it represents a particular form of organizational change. The economic, political, business, social and cultural dimensions that force the leaders of the organization must change to adjust to the demands of the times for survival, growth and development of organization / business he leads (Purba & Butarbutar, 2016).

### **Empirical study**

The similar study on the airlines industry has never been found by researcher, but was found on the electricity industry which analyzing the electricity needs of the residential sector. Wilson from Cornell University study the demand of electrical for residential to achieve Doctorate degree, Wilson analyzed the demand of electricity for residential in 6 different categories of homes.

The model uses household electricity consumption as dependent variable and independent variable of household electrical price, average number of rooms per house, degree of temperature per day. The estimation resulted that the price of household electricity, gas selling price, the average of household income is significant at level 1%, Wilson interprets that his model represents the long-run demand function.

Journal of Air Transport Management written by (Chen & Wu, 2009) study the air transport passenger preference. The results showed that passenger airfare negatively affect the ticket sales although passengers are offered other service attributes such as: meals, inflight entertainment, booking channel and booking flexibility. The preference for airfare is applicable to non-business passengers, which means that airfare greatly affect people's willingness to use air transport (Chen & Wu, 2009).

### **Strategy implication in the airline and government**

This further reinforces the fact why low cost carrier are able to develop rapidly in seizing the market from other modes of transportation, which in turn leads to significant passenger growth in the aviation industry. It happens due to the consequences of the presence of high technology in many areas such as information and communication technology, in various on hardware and devices, so the service industry is like; flights, banking, telecommunications, hotels, insurance, food, and so forth becomes growing fast. The use of information systems and information technology applications in the business companies and organizations giving impact toward them (Purba, 2016). The governance of the airline also support by Information communication technologies, because the advances in technology plays an important role in the various activities of airline operation, such as crew scheduling, aircraft rotation, aircraft flight log (AFL), airline maintenance activities such as: aircraft maintenance program, spare part management, record of Hot Item List (HIL) and also the customer journey such as reservation system, online booking, payment gateway, chek-in, baggage handling and frequent flyer program. Currently ICT, has been used in every activity of the organization, either partially or as a whole (Panday & Purba, 2015). Those are being implicated to strategic management of the organization itself, the companies and the government have to respons the dynamic change as proposed by Purba (2002) strategies must be flexible, requiring you to be sensitive and responsive to market changes. The first overriding imperative about markets is that they change. The second imperative is that must be tried to know what is going on out there all the time or you will not know what is changing Purba (2014). The fourth imperative is that if you cannot respond to changes your strategies will be unrealistic and will not work. Strategy can also be defined as an action plan to deal with the commercial environment. The example about this, as (Ohmae, 1982) that 'strategy is really no more than a plan of action for maximizing one's strength against the forces at work in the business environment's. He added that the strategic planning unit, then, is best established at a level where it canrather freely address: 1) all key segments of the customer group having similar objectives, 2) all key functions of the corporation, so that it can deploy whatever functional expertise is needed to establish positive differentiation from competition in the eyes of the customer, and 3) all key aspects of the competitor. A strategy of differentiation for example implies high quality offerings, and significant investments in innovation, staff development and branding, leading to higher costs than average. Strategic alignment can be represented as consisting of four key elements. First, environmental conditions (macro and microelements relating to the industry), secondly the strategy of the company that should be appropriate for the environmental conditions, thirdly the core competencies that should effectively support the strategy, and finally the organizational level (including elements such as processes, culture, and functional strategies that should deliver the necessary core competencies (Heracleous & Wirtz, 2009)



## RESEARCH METHOD

The hypothesis built in this study was based on the relationship between the dependent variable Passenger (PAX) and the independent variables Air Traffic (AT), Airfare Yield (YIELD), and per capita Income (INC) explained in Figure 4.

### The relationship between the dependent variable and the independent variable

First, there is a positive relationship between the number of aircraft with the number of air transport passengers, where the number of passengers increases in accordance with the increasing number of aircraft. The aircraft is one of the main factors of production in the aviation service industry, so the increasing number of aircraft will increase the available seat capacity, thus allegedly passengers will be transported more and more.

Second, there is a negative relationship between the yield and the number of passengers, if the air fare goes up the number of passengers decreases and vice versa. The law of demand states that the relationship between the selling price and the quantity of goods demanded inversely means that the consumer will buy more or have a greater desire if the selling price is lower, meaning the preference of passengers to use aviation services is mostly influenced by the selling price (Pindyck & Rubinfeld, 2005)

Third, there is a positive relationship between per capita income and the number of air transport passengers, if per capita income goes up the number of passengers will increase and vice versa. Per capita income is one of the factors that can shift the demand curve, meaning it can affect the amount of demand for a good or service, in this case the number of passengers. (Rahardja & Manurung, 2004).

The research method used multiple regression analysis to explain the airline industry condition during the period of 2003-2015. The selected variables which are number of air traffic (AT), Airfare Yield (YIELD) and income per capita (INC) as independent variables and the number of airtransport passengers (PAX) as dependent variable. Number of Passengers transported per year and number of air traffic per year in Indonesia during the period 2003-2015 obtained from the recorded data by the Ministry of Transportation. Afterward, researcher create the mathematic model using those significant variables, as follows:

$$\ln (PAX_{it}) = \alpha_0 + \alpha_1 \ln (AT_t) + \alpha_2 \ln (YIELD_t) + \alpha_3 \ln (INC_t) + \epsilon_t$$

PAX<sub>t</sub> = Number of passengers during the period 2003-2015

AT<sub>t</sub> = Number of air traffic during the period 2003-2015

YIELD<sub>t</sub> = Airfare Yield for domestic route per seat kilometer (SKM) during the period 2003- 2015

INC<sub>t</sub> = Income per capita of Indonesia population during the period 2003-2015

ε<sub>t</sub> = Error

α<sub>0</sub> = Intercept

α<sub>1</sub> α<sub>2</sub> α<sub>3</sub> = Constant variable

t = Number of time periods

The model above used to analyse the actual growth of the number of air transport passengers between the years 2003 to 2015 to find the model of passenger's growth. After the growth model of air transport passenger obtained by looking at the correlation between the significant variables, then the growth model based on the data from the period 2003-2015 will be used to forecast the growth of passengers in the period 2016-2021.

## RESULTS AND DISCUSSION

The actual data in the domestic airline industry in the period 2003-2015, can be summarized as follows: first, the number of air traffic (AT) is the number of air traffic which flown by domestic jet airline in Indonesia. The growth of traffic for domestic flights reached an average of 4.42% start from 352.028 flights in 2003 to 538.896 flights in 2015.

The airfare yield (YIELD) is the air transport ticket price for every seat kilo meter flown by airline. The yield was increasing in average 6.86% per year. Although, the yield was increasing but the passenger still grow, indicating the market potential still very high.

Income per capita of Indonesia's population for the period 2003-2015 grew an average of 11.23% each year which has higher growth with almost double than the yield growth, where in 2003 it was only USD 1,064.51, but in 2015 had reached USD 3,570.29 or increased by 235% which means almost 3 times in twelve years, made the purchasing power is getting higher and supporting the growth of air transport passenger in a row.

**Table 1**  
**Variable Data Number of Domestic Passengers, Number of Air traffic, Yield and per Capita Income**

Year	Number of Passenger	Flight Frequency	Yield (IDR)	Per capita Income (USD)
2003	19.286.788	352.028	534	1.064,51
2004	27.853.279	444.346	503	1.148,57
2005	29.817.403	453.177	505	1.260,93
2006	32.687.646	475.728	521	1.586,21
2007	34.865.468	454.041	560	1.855,09
2008	36.144.647	424.118	664	2.160,53
2009	41.691.639	509.305	762	2.254,45
2010	48.872.730	576.200	841	3.113,48
2011	59.276.728	531.676	907	3.634,28
2012	70.682.386	530.203	986	3.687,95
2013	73.595.938	569.820	1.054	3.491,06
2014	71.626.293	674.853	1.106	3.336,11
2015	72.564.939	538.896	1.162	3.570,29

Source: BPS and World Bank

### Passenger growth

In the period of 2003 to 2015, the number of air transport passengers has increased with the average growth of 12.27% per year, from 19.3 millions passenger in 2003 to 72.6 millions passenger in 2015 signaling prospects for the development of the aviation industry in Indonesia. Although the number of passengers continues to grow quite rapidly every year, however the ratio of passengers in Indonesia only reached 28.10% of the total population 258.2 millions in 2015 so it still has the potential to keep growing rapidly every year, compare to the US with a population of 309.3 million peoples (US Census Bureau, World Bank) already has 629.5 million domestic passengers (Bureau of Transportation Statistics, T-100 Market), the ratio of passengers is 203%, which means that each citizen using air transport an average of twice a year.

With relatively low passenger ratio in Indonesia, growth is expected to continue as additional aircraft continue to be delivered to all airlines. This opportunity should continue to be utilized and optimized by all domestic airlines before the implementation of open sky policy in ASEAN region in 2015, so that Indonesia ready to face the competition with the airlines in the region.

The highest passenger growth occurred in 2004 which reached 44.42% due to the addition of a huge seat capacity, there were an increase of 20 aircraft used by several domestic scheduled airlines at the time. While the lowest passenger growth occurred in 2014.

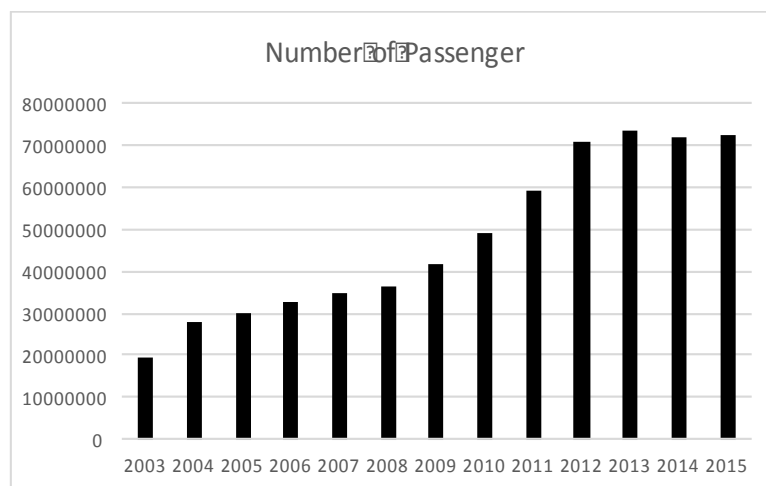


Figure 2  
The Growth of Domestic Passengers

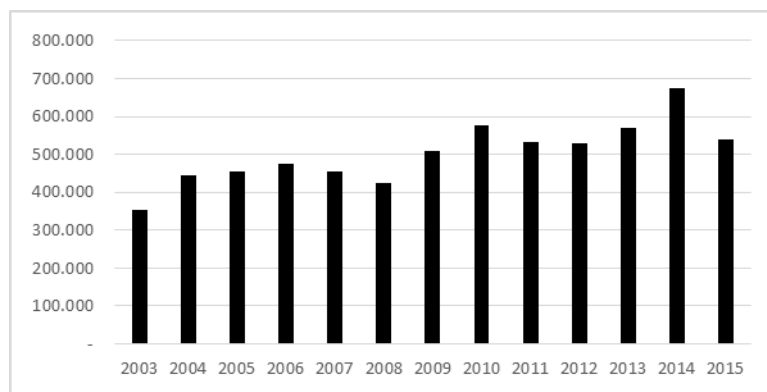
### Air traffic growth

Indonesia's domestic aviation industry expected still growing in the next 20 years, to grow at least 10% annually to reach until 100% passenger to population ratio, making it more attractive to new investors and airlines that are currently operating. Foreign investors have started to work on Indonesia's domestic market such as Air Asia which has expanded its brand penetration in Indonesia through acquisition of AW Air airline by controlling 49% of its shares. Tiger Airways' plan to acquire a 25% stake from Mandala Air will also enliven domestic airline competition before the open sky policy is take place.

The number of aircraft in Indonesia in 2003 which only 98 units, in 2015 has reached 586 units. This amount is slightly bigger than a single airline fleet in China that is China Southern Airlines which manages 452 units of jet aircraft.

In the period 2003-2015 the growth of the number of scheduled air traffic in Indonesia still growing with the average growth rate 4.42%. The highest growth of air traffic number was in 2004 which has reached 26.22%, Indonesia absorpt 20 aircraft which delivered to Lion Air with 7 aircraft, followed by Garuda with 4 aircraft, and Batavia Air with 3 units, while the other company only added 1-2 aircraft units. However, the decline of air traffic delivered also occurred in 2014 as the negative growth with -20.15%.

Based on the fleet plan already prepared by all domestik airline, the number of aircraft to be flown in Indonesia will require 659 units, which is expected to carry at least 80 millions passenger in 2016.



**Figure 3**  
**The Growth of Air Traffic in Indonesia**

### The Yield growth

According to Ministry of Transportation Decree no. 26 of 2010, there are two types of air fare which are the basic air fare and the distance air fare. The basic airfare is the airfare per kilometer passenger in rupiah, while the distance airfare is the fare per flight route, which is the result of the multiplication of the basic air fare with distance.

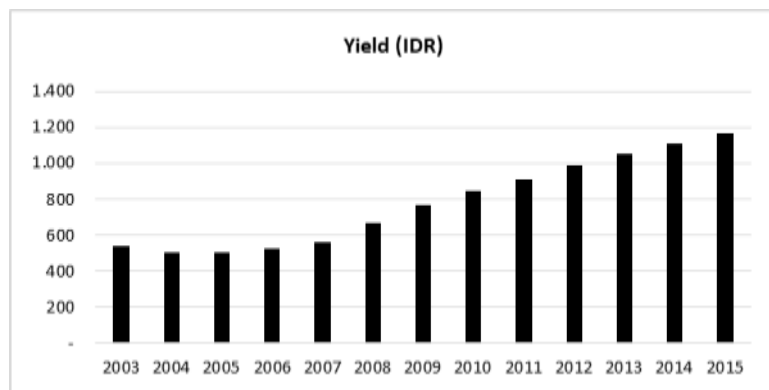
As one of the most important and effective tools, airlines pricing strategies and policies should refer to the Ministry of Transportation Decree no. 26 of 2010 Article 5, paragraph 2, which regulates the maximum air fare classification that can be used in accordance with service level that airline provide, divided into 3 category, which are: first category, Full Service airline can apply maximum air fare of 100% from the ceiling price of economy class. Second category, Medium Service airline can apply maximum air fare of 90% of the ceiling price of economy class. Third category, Low Cost Carrier Service or no frills airline can apply maximum air fare of 85% from the ceiling price of economy class.

In the period 2003-2015 the growth of domestic yield reached an average of 6.86% per year. The highest growth rate occurred in 2008 of 18.68%, while the lowest growth was in 2004 which has negative growth -5.89%. The actual passenger yield in 2003 was Rp 534 and moved up every year to reach Rp 1.162 in 2015.

During the 2003-2007 period, the yield applied tend to be flat in the range of Rp 500, - /km, as this period is still the introduction phase for some newly operating airlines. But since 2008, the average yield has begun to increase around Rp 100, - every year, one of the causes is the avtur world prices that reached its peak in 2008.

The fluctuations in avtur prices are worldwide difficult to be predicted and complicated the airline in Indonesia because in that period the airfare applied was still using on KM No.9 Year 2002 as the basic calculation. To bridge the gap between the higher avtur price and the applied airfare, all airlines began to impose fuel surcharge, which made the airfare began to move up.

Through new Decree of the Ministry of Transportation through KM. 26 in 2010 which set the maximum avtur price up to Rp. 10.000, - / liter as basic calculation of airfare, then the enforcement of fuel surcharge was eliminated as long as the avtur price is still under the applicable provisions.



**Figure 4**  
**Passenger Yield per Seat Kilometer in Indonesia**

**Data analysis**

Researcher assisted by SPSS version 23 to analyze the number of passengers (PAX), the number of air traffic (AT), the yield per seat kilometer (YIELD), and the per capita income (INC) with the result as follows:

**Table 2**  
**The Influence of Number of Air traffic, Air Ticket and Income per Capita to Number of Passengers**

Variable	Coefficient	Standard Error	T-Statistic	Probability
C	-17,130,102.917	9,883,368.095	-1.733	.117
AT	28.964	27.989	1.035	.328
YIELD	44,898.448	16,680.131	2.692	.025
INC	6,177.664	3,834.412	1.611	.142
R-square	0.958			
F-statistic	68.531			

Dependent variabel: PAX (passengers)

\* Dependent variable of the model is Number of Passengers.

\*\* The models is significant at level of 5%

The analysis is conducted by regression model and tested in accordance with the specific requirements to get the best model which is able to explain the problem in the research objectives. the result of the model to be as follows:

$$\ln(\text{PAXit}) = \alpha_0 + \alpha_1 \ln(\text{ATt}) + \alpha_2 \ln(\text{YIELDt}) + \alpha_3 (\text{INCt}) + \epsilon_t$$

$$\ln(\text{PAX}) = -17130103 + 28.964 * \ln(\text{AT}) + 44898.448 * \ln(\text{YIELD}) + 6177.664 * \ln(\text{INC})$$

The effect of the variables on the number of air traffic, the yield and the per capita income to the number of domestic passengers can be explained as follows: R-squared of 0,958, means the correlation between the variable number of air traffic (AT), Yield Airfare (YIELD) per capita Income (INC) with the variable number of passengers (PAX) is 95,8% or expressed a close relationship, Adjusted R-squared of 0.911137 means that 91.11% of the variable number of air transport passenger can be explained by the variable number of air traffic (AT), Yield (YIELD) and income per capita population (INC).

The constant value of the dependent variable contained in the regression equation is the passenger which is the constant value of the passenger when the independent variables in this study is 0 or neither increase nor decrease. The positive AT regression coefficient of 28.964 indicates that when AT rises 1 unit, then the number of passenger will also increase by 28.964. The positive value of YIELD coefficient 44898.448 shows that when YIELD rises 1 unit, the number of passengers still increase by 44898.448 means the market of air transport passenger is still growing significantly even when the yield is increasing reasonably the number of passenger is still increasing. The positive INCOME regression coefficient of 6177.664 indicates that when INCOME rises 1 unit, the number of passenger will also increase by 6177.664.

The next step is the Regression Model results of Domestic Passengers will be compared to the actual data of domestic scheduled passengers for the period 2003 to 2015.

**Table 3**  
**The Predicted Regression Model and the Actual Data Number of Domestic Passengers for 2003-2015**

YEAR	ACTUAL DATA	PREDICTED DATA	DISCREPANCY
2003	19.286.788	18.614.437	-3,61%
2004	27.853.279	26.202.687	-6,30%
2005	29.817.403	30.043.933	0,75%
2006	29.817.403	30.043.933	0,75%
2007	32.687.646	32.514.541	-0,53%
2008	36.144.647	37.211.600	2,87%
2009	41.691.639	42.100.164	0,97%
2010	48.872.730	49.678.457	1,62%
2011	59.276.728	59.527.143	0,42%
2012	70.682.386	68.559.360	-3,10%

<b>2013</b>	73.595.938	72.375.139	-1,69%
<b>2014</b>	71.626.293	72.353.366	1,00%
<b>2015</b>	72.564.939	69.463.914	-4,46%

Source: the results of processed

The smallest error rate in 2011 was 0.42% and the biggest error rate in 2004 was -6.30%. While the average error in the period 2003-2015 of 0.87%. The following graph of domestic passengers for the period 2003 to 2015 based on actual and forecast data.

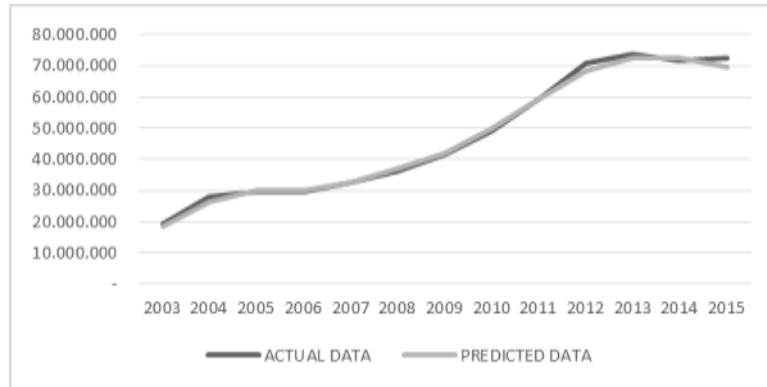


Figure 5

Number of Domestic Passengers (Actual versus Predicted Model)

Source: the results of processed

After the study obtaining a model for the growth of the domestic passengers from 2003 to 2015 period, the next stage is to forecast the number of passengers for the period 2016 to 2021.

Table 4

Projected Number of Domestic Passengers Period 2016-2016

Year	Passenger	Air Traffic	Yield Airfare (IDR)	Per capita Income (USD)
<b>2016</b>	81,812,104	626,149	1,210	4,232.17
<b>2017</b>	86,887,677	635,185	1,296	4,502.03
<b>2018</b>	92,767,546	654,212	1,377	4,749.26
<b>2019</b>	98,563,769	673,452	1,452	4,965.19
<b>2020</b>	104,274,255	695,216	1,521	5,175.95
<b>2021</b>	109,626,929	711,901	1,582	5,373.30

Source: the results of processed

The forecast shows the number of passengers until 2016 is still increasing along with the increasing number of air traffic flown by each airline over the next 5 years. With the support of economy growth, the number of domestic passenger is expected to continue to rise. The results of data processing shows the forecast is still moderate as the growth of the number of passengers in the period 2016-2021 is estimated in average of 7.99%, while calculation from 2003 to 2016 reached an average of 10.86%

Garuda Indonesia plans to bring in 90 Boeing 737-800 Next Generation (NG) aircraft to serve domestic, regional and international routes. Lion Air has ordered 178 Boeing 737-900 ER aircraft from the Boeing factory in Seattle, USA and has been strengthening its fleet since 2008 until it is completely fulfilled in 2017. While the Wings Air airline will be reinforced by a French-made ATR72-500 aircraft that has started operations since 2010 and still growing. Sriwijaya Air has started to renew its fleet with new generation aircraft which is Boeing 737-800 NG aircraft with 20 units. Merpati Nusantara Airline is more focused to serve domestic routes and pioneer flights divide fleet plannya into 3 categories, which are: jet aircraft with seat capacity of 100 seats for 40 units, MA-60 propeller aircraft with a capacity of 56 seats with 15 aircrafts and aircraft with 20 seats capacity. While Batavia Air was plan to strengthen its fleet with the addition of 18 French-made A320 aircraft that start to come in 2011.

The yield was still reasonable to increase, because the average growth remain in average 5.29% during the period 2016-2021. This small yield escalation was expected to create a conducive situation in spurring domestic passenger growth. Therefore, the high movement of passengers and goods, was expected to drive the economy faster and larger trading volume. Air transport infrastructure shall create multiplier effects to other development sectors.

The yield applied in the period 2016-2021 is not expected to be much different from the assumption of average growth per year reached 5.29%, compared with the period 2003-2015 which reached 6.86%. According to projections conducted by the Ministry of Transportation, the application of yield in 2016 will be around Rp. 1.162 / km, 2017 is around Rp. 1.198 / km, 2018 around Rp. 1.349 / km, 2019 is around Rp. 1.484 / km, 2020 around Rp. 1.629 / km, and 2021 around Rp. 1.768. Thus, the application of yield is still based on the tariff policy of the Ministry of Transportation through KM. 26 year 2010 where the highest rate is Rp. 2.070 / km.

The projected income per capita using the assumptions made by World Bank in 2010 was USD 2,600, in 2011 was USD 2,600, in 2012 was USD 2,800, in 2013 was USD 3,100, in 2014 was USD 3,300 and in 2015 was around USD 3,600.

## CONCLUSIONS

The airfare yield (YIELD) used is the most significant variable and positively affects the growth of domestic passenger. It means the hypothesis which stated the level of airfare yield affecting the number of domestic passengers is acceptable. This relationship means when the yield of air fare increases, the number of domestic passengers will also increases. This conclusion is different from the law of demand which states if the price rises then the number of requests will decrease because the variable airfare used is the average for the whole industry over a period of twelve years or is aggregate. Where the time dimension in the tariff changes runs gradually, so the impact in the long run still have a positive effect. So it is important to manage the air tariff increase periodically or gradually to avoid negative impact to the growth of the number of passengers domestic flights.

Air traffic (AT) as one of the variable studied has no significant effect on the increase in the number of domestic passenger because the air traffic are not the main factor to



increase domestic passengers, but as the supporting factors on the supply side. If the airfare applied is affordable for domestic passenger, it will create higher demand. The growth of demand will attract airlines as producer to provide more aircraft to absorb the demand. The rule of thumb in airline industry, if the Seat Load Factor has reached 80%, that is the signal for the airline to add more frequencies or more aircraft because the service level has decreased because there were some passengers who were rejected due to fully occupied seats in many flights.

Per capita income variable (INC) of Indonesian population is not significant to the growth of domestic passenger. It means the per capita income is not the main factor which is significant to increase the number of domestic passengers in Indonesia. This can be seen in the year of 2013 when growth per capita decreased by 5.34% but the number of passengers remained increased by 4.12%.

## **IMPLICATIONS**

The potential growth of domestic passengers will continue to increase according to the fleet plans which are still in the process of ordering and licensing from several major airlines such as Garuda Indonesia that has ordered 90 Boeing 737-800NG (30 aircraft already in operation), 10 Boeing 777, 10 Bombardier; Lion Air has ordered 178 Boeing 737-900ER (43 aircraft already in operation) and 30 ATR72-500 (8 aircraft already in operation); Batavia Air applying for an additional 18 jet aircraft; and Sriwijaya Air who have applied the license for 20 Boeing 737-800NG and 12 Embraer Ejets.

Domestic passenger growth in Indonesia is further reinforced by the level of airfare which attracts more business traveling which requires the fastest transportation services as long as it is supported by the growth of per capita income. In addition, an increase in per capita income will also increase the purchasing power of people who use air transportation services for personal traveling such as family visits (Visit Friends and Relatives), leisure, or education.

To anticipate the number of air traffic (AT) which continues to grow to reach 586 aircrafts in 2015, the government shall make strategic improvements from operational aspects, human capital aspect, commercial aspects and public policy. The operational aspect will require supporting infrastructure of air transportation, such as: investment in navigation and communication instruments, better technology. The human capital which takes an important role to support the growth of aviation industry requires comprehensive training and certification to create high qualified human capital which has a strong safety mindset but is still service oriented. In the commercial aspect, the application and supervision to the regulation of airfare shall secure the viability of the aviation industry, avoid price wars and does not create a high cost economy to the public.

### **Improvement on infrastructure and operational aspect**

Consumers who feel satisfaction are the consumers who already can feel through the product offerings made and then associated with expectations from consumers themselves. Satisfaction and consumer dissatisfaction can be measured through the overall feelings and behaviors that are owned by consumers of products that have been purchased (Radnan &

Purba, 2016). For the operational aspect, the airports in Indonesia are not good enough to support the current growth because it can not accommodate the existing capacity such as parking stand, waiting room, and quick boarding process.

Airplane parking space in big cities is not sufficient, such as Jakarta, Surabaya, Bali, Makassar and Medan made the aircraft shall remain over night (RON) in other small cities (spoke). This conditions creates high costs for airline due to scattered resources not only aircraft but also crew, equipment, lodging.

Passenger waiting room during peak hours was not sufficient, greatly reduces the comfort of the passengers. This problems shall overcome as soon as possible before it creates stressful situation like what happens at Heathrow London, where the density of operational and passenger activities leads to higher levels of stress than workplace, due to too long queues, ever-changing procedures, luggage left behind, difficult to reach boarding gate on time (Telegraph.co.uk, 2007)

The runway length in the sub province or district level also needs to be extended at least 1,400 meters and 30 meters wide so can be landed by propeller aircraft with a seating capacity of 50 seaters. If the runway in the district can be landed by this type of aircraft, then the next stage can be landed by jet planes means there will be direct flight from major cities to sub province. This development has succeed in some districts that have been landed by jets such as Berau in East Kalimantan and Wanci in South Sulawesi.

The other important thing is the navigation and communication facilities, navigation and radar becomes a mandatory requirement to be fulfilled as most airports in Indonesia are still in category 1 (Cat 1) because the airport did not equipped with the Instrument Landing System ILS), while airports in other country already in category 3 (Cat 3). Airports which is in Cat 3 already have the ability to land a plane automatically in bad weather conditions -the International Civil Aviation Organization standard (ICAO).

The time robber shall be removed to increase the speed of movement for passengers and goods within Indonesia, therefore, inter modes network of transport connected to railway, freeway and sea transport is necessary. Several countries has started to develop the Aerotropolis as the city we live next, the city as the center of fast economy growth in modern era (Kasarda & Lindsay, 2011)

### **Improvement on human capital aspect**

In the human capital aspect aspect, it is necessary to increase the number of pilot schools and training facilities twice that from the current condition to fill the human resource required. Development of human resources becomes the priority as stated by Purba (2015) In fulfilling the demands and the requirements of the companies and organizations both regionally and globally quality is priority. Due to that a number of pilots needed to fly the entire jet is 4,688 people because each jet plane requires at least 4 sets of crew (1 set crew consisting of 1 person Captain and 1 person Flight Officer / FO). This means that 630 new pilots are needed every year, while the existing Pilot school in Indonesia only produces 320 pilots each year, so there was gap 310 additional pilots needed each year, therefore, number of aviation school shall be double.

Flight engineers will require 4,668 people by 2015, aviation training for flight engineer mostly conducted by airlines to comply with the international aviation standar regulation that every airlnes shall have certified training facilities. The same problem with flight attendant (FA) will need 9,376 people because each below 200 seaters jet plane at least need 4 people FA. Training facilities to produce FA is not difficult and can be provide by the general training provider, but still need to be anticipated to keep the airline comply to safety standard.

Government as a regulator shall supervise tightly the implementation of safety procedures in every carrier periodically to prevent incident and accident not only to avoid life casualties but also to reduce operational costs and insurance premiums. For example, in the case of pilot flying hours, according to the regulation a pilot is only allowed to have 90 hours/month and 1.080 hours/year flight hours, but because the number of pilots was insufficient will resulted many pilots flying over the maximum limit.

The regulation concerning passenger airfare in Kepmen No. 26 of 2010 also needs to be refined as it is one of the important factors to ensure the viability of the aviation industry. Some alternatives can be made to regulate the air tariff system, namely: The first alternative is the ceiling airfare is not necessary to be capped, as the international passenger airfare was determined by market mechanism. The basic consideration is that not across the year airlines can make a profit. The time period when the airline can make a profit is very short, Peak Season period only at school holidays (June-July) and High Season only at year end holidays (December). While outside of this period, it is practically difficult for airlines to sell tickets using ceiling price and make a profit, especially as the aviation industry is entering a growth stage when new airlines attracted to entry cause the supply was starting greater than demand. If ceiling price was abolished, airlines will have courage to pioneer new routes with profitable airfare because they have to cover higher operating costs to develop market in introduction stage (Hooley, Piercy & Nicoulaud, 2012).

The second alternative is to set the supply-demand ratio on each route to maximum 80% seat load factor before regulator open additional slot for incumbent or new entrant. This option needs to be done so that there is no over-supply on the high density routes that cause the price fall down below the operational costs resulting great loss to the airline which can affect to end customer.

## **LIMITATIONS AND SUGGESTIONS**

This study using data released by the Ministry of Transportation, the Central Bureau of Statistics (BPS), the World Bank and the Indonesian Air Carrier Association (INACA) to analyze the growth of passengers on domestic scheduled flights, from 2002 to 2009. Factors which significant and tested on the number of passengers are limited only to the variable number of air traffic, yield and per capita income.

The study can be expanded to use additional variable such as tourism attraction or calendar of event (MICE) or infrastructure readiness, extended to understand how far the multiplier effect of passenger growth to the economy of Indonesia. The study can be done as well at provincial and district levels that have high density population or high economic growth because it has the potential to have direct flights to major cities such as Jakarta,

Surabaya, Makasar, Medan (major hub) to ensure profit for the airlines in determining effective marketing strategies and benefit to central and local governments in determining effective public policies in regional economic development.

## REFERENCES

- BPS RI (2016). *Statistik Kementerian Perhubungan Direktorat Jenderal Angkutan Udara dari berbagai tahun*. Penerbit Badan Pusat Statistik Republik Indonesia Tahun 2017.
- Button, K., & Yuan, J. (2013). Airfreight Transport and Economic Development: An Examination of Causality. *Urban Studies Journal Limited*. 50(2), pp.329–340, February 2013. DOI: 10.1177/0042098012446999.
- Chen, C. F., & Wu, T. F. (2009). Exploring passenger preferences in airline service attributes: A note. *Journal of Air Transport Management*, 15(1), 52-53.
- Costa, P., Harned, D., & Lundquist, J. (2002). Rethinking the aviation industry. *McKinsey Quarterly*, 89–100. Special edition: Risk and resilience.
- Florida, R., Mellander, C., & Holgersson, T. (2015): Up in the air: the role of airports for regional economic development, *Springer Journal*.
- Heracleous, L., & Wirtz, J. (2009). Strategy and organization at Singapore Airlines: Achieving sustainable advantage through dual strategy. *Journal of Air Transport Management* 15, pp. 274-279. Retrieved on 23<sup>rd</sup> of May 2015 from <http://bschool.nus.edu/departments/Marketing/Jochen%20papers/jatmheracleouswirtzstrategyorganizationsingaporeairlines2009.pdf>
- Hooley, G., Piercy, N. F., & Nicoulaud, B. (2012). *Marketing Strategy and Competitive Positioning*, Prentice Hall, pp. 71.
- Kamaludin & Purba, J. T. (2015). Strategic Management: Banking Technology Readiness Analysis in Facing Challenges and Opportunities. First International Conference on Economics and Banking, (January), 121–127. *Atlantis Press*. Retrieved on 12 December 2015 from: <https://doi.org/10.2991/iceb-15.2015.18>
- Kasarda, J. D., & Lindsay, G. (2011): *Aerotropolis: The Way We'll Live Next*
- Kementerian Perhubungan RI (2010), *Keputusan Menteri Perhubungan Nomor 26 tahun 2010 Tentang Mekanisme Formulasi Perhitungan Dan Penetapan Tarif Batas Atas Penumpang Pelayanan Kelas Ekonomi Angkutan Udara Niaga Berjadwal Dalam Negeri*
- Kobos, P. H., Erickson, J. D., & Drennen, T. E. (2003). Introduction, I., Hou, J., Economist, S. S., National, S. Scenario Analysis of Chinese Passengers. *Contemporary Economic Policy*, 21(2), 200–217.
- Leurent, L. (2011). *Transport capacity constraints on the mass transit system: a systemic analysis*, Springer
- Ohmae, K. (1982). The strategic triangle: A new perspective on business unit strategy. *European Management Journal*. 1(1), pp. 38-48
- Panday, R., & Purba, J. T. (2015). Lecturers and Students Technology Readiness in implementing Services Delivery of Academic Information System in Higher Education Institution: A Case Study. *International Conference on Soft Computing, Intelligence Systems, and Information Technology*. Retrieved on 21<sup>st</sup> October 2015, from: [https://link.springer.com/chapter/10.1007/978-3-662-46742-8\\_49](https://link.springer.com/chapter/10.1007/978-3-662-46742-8_49)

- Pindyck, R. S., & Rubinfeld, D. L. (2005): *Microeconomics*, Prentice Hall  
\_\_\_\_\_ Peraturan Pemerintah Nomor 40 Tahun 1995 tentang Angkutan Udara.
- Purba, J. T. (2002). *Proposed Strategic Plan for Faculty Development for Atmajaya Catholic University Jakarta*. The Doctoral Dissertation. De La Salle University, Taft Avane, Vitocruz Manila Phillipines. pp.11-12.
- Purba, J. T. (2014). Enhancing ICT Competencies Through Education as a Strategy in Facing the Regional Opportunities and Challenges. *Proceedings*. Presented in the International Conference on Business, International Relations and Diplomacy (ICOBIRD) 2014, as the 1st Joint International Conference on Humanities 2014, September, 1-2, 2014, at Bina Nusantara University, Jakarta, Indonesia.
- Purba, J. T. (2015). Strategic Innovation through Technology Readiness and Acceptance in Implementing ICT for Corporate Sustainability. *Proceedings*. Presented in 12th International annual symposium on management, in Makassar March, 2015 .
- Purba, J. T., & Butarbutar, F. (2016). Manajemen Strategi Menuju Kepemimpinan yang Handal untuk Menghadapi Persaingan Global : Suatu Studi Empiris (pp. 20–22). *Proceedings*. Presented in Konferensi Nasional Riset Manajemen X “Akselerasi Daya Saing Menuju Keunggulan Organisasi yang Berkelanjutan” Lombok, 20-22 September 2016.
- Purba, J.T (2016). Enhancing Competitiveness in Business Through Entrepreneurial Management Education as a Strategy in Facing Regional Opportunities and Challenges. *Proceedings*. Presented in 6<sup>th</sup> National Conference Forum Management Indonesia (FMI) Medan, North Sumatera.
- Purba, J.T, & Rorim, P. (2015). Innovation Strategy Services Delivery: An Empirical Case Study of Academic Information Systems in Higher Education Institution. *Springer Books*. Retrieved on 1<sup>st</sup> December 2015, from: [https://link.springer.com/chapter/10.1007/978-3-662-46742-8\\_47](https://link.springer.com/chapter/10.1007/978-3-662-46742-8_47).
- Purba, J. T. (2015). Building Higher Education Institution Capacity in Indonesia through Strategic Faculty Development. *Journal of Asian Scientific Research*, 2015, 5(6), 291-302. Retrieved on 21<sup>st</sup> July 2016 from: <https://pdfs.semanticscholar.org/c9b6/30d110d7d364fb7fc26d07147578c8553ff7.pdf>
- Radnan, P. Y., & Purba, J. T. (2016). The use of Information Communication Technology (ICT) as the Technology Acceptance Model (TAM) of Mobile Banking. *Jurnal Manajemen dan Pemasaran Jasa*, 9(2). Retrieved on 23<sup>rd</sup> November 2016 from: <http://dx.doi.org/10.25105/jmpj.v9i2.2057> pp. 284-298.
- Rahardja, P., & Manurung, M. (2004): *Pengantar Ilmu Ekonomi*, Lembaga Penerbit Fakultas Ekonomi Universitas Indonesia
- Srinidhi, S. (2010): Demand Model for Air Passenger Traffic on International Sectors, *South Asian Journal of Management*
- Vijver, E.V.D., Derudder, B., & Witlox, F. (2015). Air Passenger Transport and Regional Development: Cause and Effect in Europe. *Promet – Traffic&Transportation*, Vol. 28, 2016, No. 2, 143-154. Retrieved on 23<sup>rd</sup> October 2016 from: <https://repository.uantwerpen.be/docman/irua/.../135418.pdf>
- Xiaowen, F., Oum, T. H., & Zhang, A. (2010). Air Transport Liberalization and Its Impacts on Airline Competition and Air Passenger Traffic. *Transportation Journal™*. Retrieved on

23<sup>rd</sup> November 2016 from: [http://www.icms.polyu.edu.hk/Papers/IFSPA09.../9\\_A013.pdf](http://www.icms.polyu.edu.hk/Papers/IFSPA09.../9_A013.pdf)

\_\_\_\_\_ Undang-Undang Republik Indonesia, Nomor 1 Tahun 2009 tentang Penerbangan.