

Air Transport Service Efficiency and Airport Connectivity of ASEAN Countries

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Article's history:

Received 17th December, 2020; Revised in revised form 25th January, 2020; Accepted 26th February, 2020;
Published 30th March, 2020. All rights reserved to the Publishing House.

Suggested citation:

Jangkrajang, V., Patsopa, Y., Waidee, T., Chaiwan, C., Ramingwong, S. 2020. Air transport service efficiency and airport connectivity of ASEAN countries. *Journal of Applied Economic Sciences*, Volume XV, Spring, 1(67): 76-82. DOI: [https://doi.org/10.14505/jaes.v15.1\(67\).06](https://doi.org/10.14505/jaes.v15.1(67).06)

Abstract:

Southeast Asia countries have integrated their socio-economic development together as the ASEAN Community. The paper focuses on air transportation as one of the key drivers of the connectivity. The indicators, *i.e.*, air transport service efficiency and airport connectivity, reported by World Bank, are investigated. Each country's GDP per capita was mapped these indicators to reduce economic advantage gap. The results are suggestive that Malaysia, Indonesia, Thailand, and Singapore possess outstanding potential. The Philippines and VietNam are satisfiable in airport connectivity yet need improvement in air transport service. Cambodia, Lao PDR, and Brunei are lack behind in both areas.

Keywords: ASEAN community; air transport service efficiency; airport connectivity.

JEL Classification: F42; L93; N75.

Introduction

The ASEAN Community is the initiative of 10 Southeast Asian nations, *i.e.*, Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam, aiming at integrating economic, social and cultural development of the member countries. Toward 2025, ASEAN has visions to become a highly integrated and cohesive economy, a competitive, innovative, and dynamic ASEAN while enhancing connectivity and sectoral cooperation with a resilient, inclusive, people-oriented, and people-centered (ASEAN Secretariat 2015, Han and Soesastro 2003, Santiteerakul *et al.* 2018).

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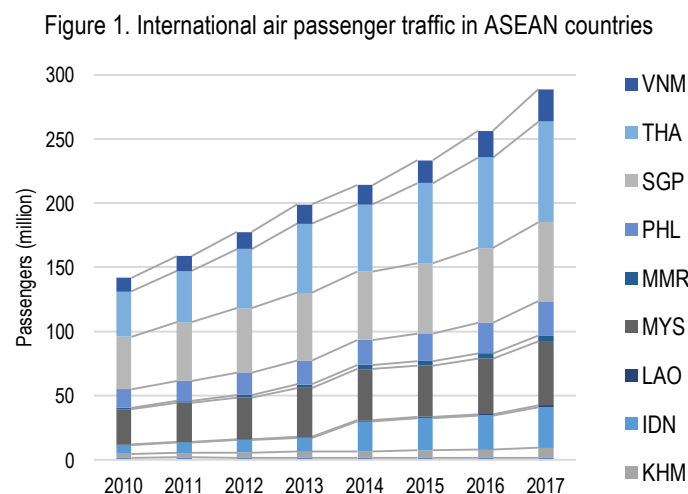
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Within the collaboration, transport cooperation is among key strategies where goods and people are allowed to flow freely within ASEAN. ASEAN can thus become competitive to the global economy (ASEAN Secretariat 2008, Forsyth *et al.* 2006, Tan 2014). For people movement, air transportation is the most famous one thanks to the entrance of low-cost airlines, technological advancement, and globalization. More and more passengers are able to fly with relatively low cost and high frequency. Statista.com estimated the number of flights performed globally expectedly to reach 39.4 million in 2019. Global air traffic passenger demand also increases by the rate of 5-7% yearly. The International Air Transport Association (IATA) forecasts number of passengers traveling in 2036 at 7.8 billion people; by which 45% are from the Asia Pacific region.

Focusing on people movement, intra-ASEAN and the rest of the world, ASEAN has developed ASEAN Single Aviation Market (ASAM) initiatives, aiming at becoming a seamless ASEAN sky connecting to the world. In 2018, the ASEAN Secretariat Statistics Division has reported that there are more than 288 million passengers traveling in and out ASEAN. 27% are from/to Thailand, 21% are from/to Singapore and 17% are from/to Malaysia. The growth rate is at 11% every year since 2010 (see Figure 1).



Source: ASEAN secretariat

Recently, ASEAN also extends its collaboration into the global economy through FTAs and Comprehensive Economic Partnership agreements (CEPs) with China, Japan, the Republic of Korea, India, Australia, and New Zealand. These external economic relations will strengthen ASEAN economy.

This paper aims at investigating air transport service efficiency and airport connectivity of 10 ASEAN countries if they are aligned. Using published and reliable source of data, the comparison can be done and thus potential of each country can then be identified.

1. ASEAN community

1.1. Basic information of ASEAN

According to the ASEAN Secretariat statistics, the population of ASEAN is at 649.1 million. Reported visitors is 125.5 million. ASEAN GDP is at 2.99 US\$ billion, ranked as the world's 5th largest. The figure grows steadily with the annual average rate at 5.3%. The highest growth rates during the period of 2000-2017 are Myanmar (at 10.0%), followed by Cambodia (7.7%), Lao PDR (7.1%), and Viet Nam (6.5%). The services sector contributed more than 50% of the region's total GDP. Total trade 2.8 US\$ trillion. 23.5% is intra-ASEAN. Foreign direct investments inflow are 154,713 US\$ million (ASEAN Secretariat, 2018).

Table 1. Basic data of ASEAN countries

Country	Total land area (sq.km.)	Total population (thousand)	GDP at current prices (US\$ million)
BRN	5,765	442.40	13,557
KHM	181,035	15,981.80	24,634
IDN	1,916,862	265,015.30	1,041,562
LAO	236,800	6,887.10	18,096
MYS	331,388	32,385.00	358,412
MMR	676,576	53,625.00	77,264

Country	Total land area (sq.km.)	Total population (thousand)	GDP at current prices (US\$ million)
PHL	300,000	106,598.60	342,693
SGP	720	5,638.70	364,076
THA	513,140	67,831.60	505,060
VNM	331,230	94,666.00	241,039
ASEAN	4,493,516	649,071.50	2,986,391

Source: ASEAN Secretariat

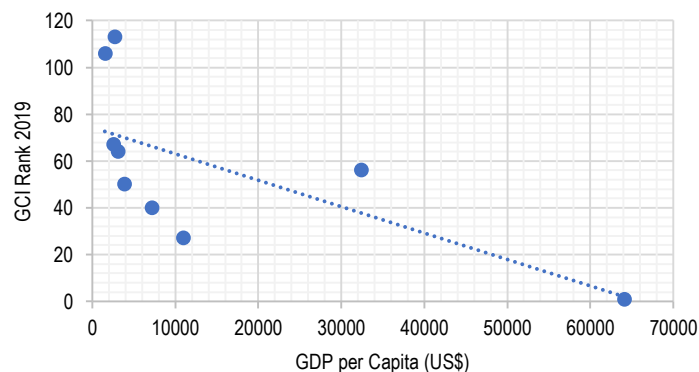
From Table 1, it can be seen that ASEAN countries are diverse in geography, population size, and economy. The country area ranges from 1,916,862 sq.km. of Indonesia to a small 720-sq.km. island of Singapore. Population ranges from 265.0 million of Indonesia (World's 4th populated country) to 0.4 million Brunei. GDP also ranges from 13.5 US\$ billion to 1.0 US\$ trillion.

1.2. Competitiveness of ASEAN countries

Based on World Bank's The Global Competitiveness Report 2019, the Global Competitiveness Index 4.0 (GCI 4.0) evaluates 103 individual indicators from 12 competitiveness pillars reflecting globalization and the 4th industrial revolution, *i.e.*, institutions, infrastructure, ICT adoption, macroeconomic stability, health, skills, product market, labour market, financial system, market size, business dynamism, and innovation capability of 141 economies (Klaus 2019).

Among ASEAN, in fact, the world, Singapore is the 1st rank. With great potential on institutions, infrastructure, ICT adoption, health, product market, labour market, and financial system. The GDP per capita of Singapore is also as high as 64,041.4 US\$, outlying all ASEAN countries with the regional average of 14,259.8US\$. The second best of ASEAN is Malaysia with GCI rank of 27th. Then, Thailand is at 40th and Indonesia is at 50th. Cambodia and Lao PDR both lie on the 100 rank band. It shall be noted that Myanmar data is not available in The Global Competitiveness Report 2019.

Figure 2. GCI rank 2019 vs GDP per capita of ASEAN countries



At first, a preliminary investigation is conducted to observe if the competitiveness of ASEAN country is aligned. Here, the GCI rank of each country is mapped with its GDP per capita to reflect the country's advantage based on economic potential.

The investigation is based on Figure 2 which maps GCI rank 2019 with GDP per capita. The linear trend line indicates the expectation of GCI rank per GDP per capita. If countries lie below the line, this is desirable. It means the country's competitiveness is over expectation based on ASEAN average. If the points lie above the line, it is otherwise.

Therefore, Figure 2 is suggestive that Malaysia has possessed very strong competitiveness. Malaysia lies far away below from the trend line. With Malaysia's GDP, the expectation can be as far as the 60th+ rank. But Malaysia is at 27th rank. Thailand and Indonesia are also in good location under the trend line. Philippines and Viet Nam are close to the trend line yet in the preferable position. On the other hand, Lao, Cambodia, and Brunei lie much above the trend line, indicating the undesirable ranks.

2. Airline and airport business in ASEAN countries

2.1. Airline business in ASEAN

There are 169 airlines in ASEAN. The total fleet is close to 2000 aircraft with a year-on-year growth of 6%. Top 10 largest airlines (by fleet size) are only from 6 countries, *i.e.*, Indonesia, Singapore, Malaysia, Thailand, Vietnam, and Philippines (see Table 2). Currently, ASEAN airlines currently have more than 1600 aircraft on order. Low-Cost Carriers (LCC) account for more than 70% of these aircraft on order.

Table 2. Top 10 largest airlines in ASEAN by fleet size

Rank	Airline Group	Number of Airline	Country	Number of Aircraft
1	Lion Air	5	IDN	294
2	Garuda Indonesia	2	IDN	192
3	Singapore Airlines	3	SGP	191
4	Air Asia	4	MYS	186
5	Thai Airways	3	THA	129
6	Vietnam Airlines	3	VNM	115
7	Malaysia Airlines	3	MYS	102
8	Philippine Airlines	2	PHL	88
9	Cebu Pacific	2	PHL	61
10	Sriwijaya Air	2	IDN	56

Source: Centre for Asia Pacific Aviation

The ASEAN Secretariat has reported that there are 108.9 million tourists flew into ASEAN countries and 42% of these tourists travelled within ASEAN. Intra-ASEAN passengers are 39.1%. Passenger traffic in ASEAN grew by approximately 10% each year (Center of Aviation, 2018). It is predicted that intra-ASEAN air travel will contribute to a third of world air traffic by 2036 (Gnanasagaran 2018).

2.2. Airport business in ASEAN

According to the Centre for Asia Pacific Aviation (CAPA), there are 383 airports in ASEAN and 73 are international. However, the busiest airports in 2017 are only belonged to 5 countries, *i.e.*, Indonesia, Singapore, Thailand, Malaysia, and Vietnam (see Table 3).

Table 3. Top 10 busiest airports in ASEAN

Rank	Airport	City	Country	Total passenger	% Change (in 2017)
1	Soekarno–Hatta International Airport	Jakarta	IDN	63,015,620	+8.0%
2	Singapore Changi Airport	Singapore	SGP	62,219,573	+6.0%
3	Suvarnabhumi Airport	Bangkok	THA	60,860,704	+8.9%
4	Kuala Lumpur International Airport	Kuala Lumpur	MYS	58,618,680	+11.2%
5	Ninoy Aquino International Airport	Manila	PHL	42,022,484	+6.1%
6	Don Mueang International Airport	Bangkok	THA	38,299,757	+8.8%
7	Tan Son Nhat International Airport	Ho Chi Minh City	VNM	35,900,000	+10.5%
8	Noi Bai International Airport	Hanoi	VNM	23,068,227	+12.0%
9	Ngurah Rai International Airport	Denpasar	IDN	22,863,647	+12.5%
10	Juanda International Airport	Surabaya	IDN	21,882,335	+10.9%

3. Air Transport and airport potential of ASEAN countries

Of interest in this paper are the efficiency of air transport service and the airport potential of ASEAN countries. These issues have been addressed with several models yet the data collection can be complicated (Boonekamp and Burghouwt 2017, Chaiwan and Tippayawong 2018, Pandey *et al.* 2018, Suwanwong *et al.* 2018). To simplify the assessment, these issues are reflected by “efficiency of air transport service” and “airport connectivity”, as the reported GCI indicators in World Bank’s The Global Competitiveness Report 2019. The definitions, computations, and data sources are noted in Table 4.

Table 4. Efficiency of air transport service and airport connectivity indicators

Indicators	Definitions	Computations	Data Sources
Efficiency of air transport services	Reflection of the efficiency (<i>i.e.</i> frequency, punctuality, speed, price) of air transport services	Response to the survey question "In your country, how efficient are air transport services?" (weighted average or most recent period available)	World Economic Forum, Executive Opinion Survey
Airport connectivity	Measurement of the degree of integration of a country within the global air transport network	For each airport, the number of available seats to each destination is weighted by the size of the destination airport (in terms of number of passengers handled). The weighted totals are then summed for all destinations, then for all airports in the country to produce a score. A log transformation is applied to the raw value before converting it to the 0 to 100 score.	International Air Transport Association (IATA)

Source: Klaus (2019)

In this investigation, the methodology of mapping GDP per capita with score indicators are used. Where score 100 represents the best potential. Thus, the position of the dot above the trend line is now preferable.

Figure 3. Efficiency of air transport service of ASEAN countries

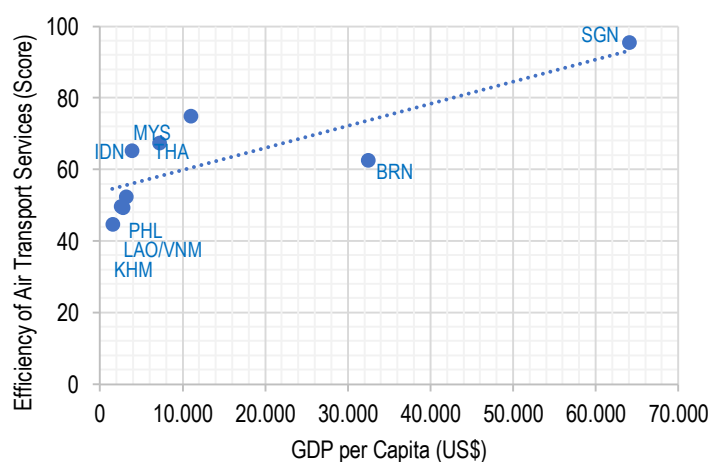
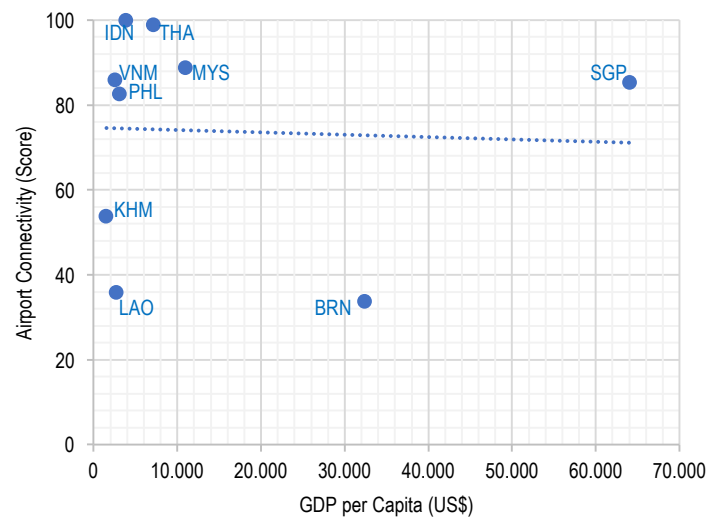


Figure 3 illustrates the mapping of country's efficiency of air transport service score with GDP per capita of 9 ASEAN countries. (Myanmar data is not available). The progressive trend line indicates that the efficiency of air transport service should be higher if the GDP per capita is higher. Singapore, again, possesses the best air transport service efficiency with a score of 95.5, ranked world's 1st. Malaysia, despite ranked world's 25th, is outstanding in ASEAN. In this case, Malaysia is positioned high above trend line. Thailand and Indonesia are also positioned in the desired positions. This means that these countries can provide satisfactory frequency, punctuality, speed and price in their air transport services. On the other hand, Philippines, Lao PDR, Viet Nam, Cambodia, and Brunei are in the subpar positions. This indicates room for improvement for these countries.

Figure 4 illustrates the mapping of country's airport connectivity score with GDP per capita of 9 ASEAN countries. There is no trend relationship between two axes. (If consider Singapore and Brunei outliers, the progressive trend will appear).

The average score of ASEAN in this indicator is as high as 73.9 out of 100. Indonesia scores 100 out of 100, ranked world's 5th. Thailand also scores 98.9, ranked world's 9th. This indicates the high connectivity of airports that can integrate into the global air transport network. Singapore, Malaysia, Viet Nam, and Philippines also possess satisfactory potential. However, Cambodia, Lao PDR, and Brunei are again in subpar positions.

Figure 4. Airport connectivity of ASEAN countries



Conclusion

Air transportation is among the key drivers of ASEAN development. Despite a large diversity in socio-economic development, ASEAN is trying to bridge the ASEAN sky to the world. Leading by Singapore, the world's 1st rank in GCI 2019, Indonesia, the world's 4th populated country, Malaysia, an outstanding country in terms of overall competitiveness, ASEAN are connecting to the world with airline and airport industries.

The air transport and airport potential investigation uses the methodology of mapping GDP per capita with the efficiency of air transport service and airport connectivity. The result is suggestive that Malaysia, Indonesia, Thailand, and Singapore are outstanding in terms of both air transport service and airport connectivity. Philippines and Viet Nam are good at airport connectivity yet need to improve their air transport service. Finally, Cambodia, Lao PDR, and Brunei need improvement in both air transport service and airport connectivity.

Acknowledgement

This research work was partially supported by Chiang Mai University – Thailand.

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