The Correlations between Airport Sustainability and Indonesian Economic Growth

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Abstract. This study aims to analyze the correlation between airport performances with Gross domestic product-regional (GDP-regional) performance. This research uses quantitative research method with correlation study approach. Based on the T-Value Test Result, the T-value for the Airport Performance variable is 14,264. T-Value Test Results and compared with T-table equal to 1,976 (significant level 0,05) hence T-count> T-table so variable of Airport Perform predicted have significant correlation to GDP-regional. This means that good airport performance will either improve the performance of Water supply, Sewerage, Waste Management and Remediation Activities; Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles; Accommodation and Food Service Activities; Financial and Insurance Activities; Business Activities; Public Administration and Defence; Compulsory Social Security; Education; Human Health and Social Work Activities; Other Services Activities; Manufacturing; and Electricity and Gas, better.

1. Introduction

The airport becomes an important asset for a country should have a competitive advantage. For example Changi Airport (Singapore) and Suvarnabhumi Airport (Thailand) as the Aero City Model and the Efficient Gate have different characteristics, which brings its own impression for the customers. Changi Airport is surrounded by highly developed areas, has a great potential to become the center of Aero City, while Suvarnabhumi Airport is surrounded by lowland and agricultural land in the area around Bangkok but the main airport could run well into the Efficient Gate rather than the Aero City concept. Airport stakeholders benefit from efficient airport management. In Europe, the transport system is used to improve the competitiveness of Europe. The correlation between investment in transport infrastructure and broader economic impacts, namely competitiveness and economic growth. There are at least three things that make an airport developed, namely passenger, service sectors and goods shippers are increasing thus it will support the economic growth of a country.

Flight connectivity is an important element in the choice of airport. Japanese airlines for example, they attract passengers who come from local cities using Haneda international airport because the airport provides convenience to the domestic aviation network, especially for passenger with business destination. The increasing demand for air transport passengers has a direct impact on airlines and airports. Market expansion allows airports to flourish by opening new routes. Currently, the airport has been able to reduce airline costs to increase pax demand, revenue is gained from new routes opening and non-aeronautical revenue that is increased. On the other hand, competition among airlines is also escalating. Beautiful tourism and high accessibility of air transport, attracting more tourists, industry and tourism practitioners. Meanwhile, facilities and tourism capital, forming the economy of tourism. The results show there is a positive correlation between civil aviation, the development of Yunnan tourism and urban development. The arrival of international airport passengers is vulnerable to exogenous and endogenous factors (such as economic conditions, aviation services, price fluctuations).

Accurate and reliable airport passenger demand estimation are essential for policy making and planning by airport management, aviation authorities and tourism operators. In terms of cargo operations at major airports in the Asia-Pacific region, there are three efficiency groups that need to be considered: high efficiency but inefficient in carrying out transport operations, efficiency that shows the intercorrelation between profitability and cost and facility growth but low frequency efficiency and groups that exhibit stagnant growth, but have a steady streak in international freight transport by running efficiencies on aviation facilities and frequencies. Hong Kong and Incheon airports are a great example of efficiency. Despite similar advantages and growth between the two airports, the cost and facilities efficiency is higher. The international airport of Hong Kong, has more than 100 links with 160 cities and 40 cities in China which makes it more profitable. The international airport of Hong Kong is in the second group which shows a high growth of international cargo handling as well as efficient in cost and facilities compared to other airports. The flight frequency, landing and processing performance of Hong Kong airport is also better. In terms of number of runways, gates, goods terminal area, and Incheon Airport facilities have competitive facilities, although not profitable in terms of operational efficiency compared to Hong Kong Airport. Hong Kong operates 5 (five) logistics airport terminals. Their new cargo terminal will be the most important aviation hub for Mainland China, providing an efficient and reliable air cargo service with the highest safety and security standards. Taipei airport shows high efficiency compared to Narita, improving the performance of air cargo facilities can create competitive advantage, potentially improving the efficiency of airport operations and cargo terminals[1]–[15].

In Indonesia, PT Angkasa Pura I (Persero) manages the airport in a strategic location, located in the business center (Surabaya, Makassar, Balikpapan, Banjarmasin, and Semarang) and also the leading tourism areas of Indonesia (Bali, Biak, Manado, Yogyakarta, Surakarta, Lombok, Ambon and Kupang). The market share of PT Angkasa Pura I (Persero) in 2016 based on total air transport

passengers reached 43.6%, based on air traffic, market share reached 42.6%. The Government of the Republic of Indonesia through the Ministry of Tourism and Creative Industries promotes 10 tourism destinations as the "New Bali" to become a driver of the tourism sector. 10 tourism destinations are expected to bring foreign tourists as much as 8.5 million people in 2019 to obtain foreign exchange of 8.5 billion USD. PT Angkasa Pura II currently manages 13 airports: Soekarno-Hatta, Halim Perdanakusuma, Kuala Namu, Supadio, Minangkabau, Sultan Mahmud Badaruddin II, Sultan Syarif Kasim II, Husein Sastranegara, Sultan Iskandarmuda, Raja Haji Fisabilillah, Sultan Thaha, Depati Amir and Silangit. The movement of the aircraft in 2016 reached 723,799 routes, an increase of 14.45%, airport passengers reached 95,175,021 pax, an increase of 12.91%, cargo in 2016 recorded 743,336,817 kg, escalated by 0.49%. Aircraft movement in 2012-2016 (route unit), the highest is Soekarno-Hatta airport (Tangerang), Kuala Namu (Deli Serdang) and Halim Perdanakusuma (East Jakarta). The movement of domestic and international passengers in 2016 at PT Angkasa Pura II airport, the highest for domestic are Soekarno-Hatta airport (Tangerang), Kualanamu (Deli Serdang) and Halim Perdanakusuma (East Jakarta), while the highest for international is Soekarno-Hatta airport (Tangerang), Kualanamu (Deli Serdang) and Husein Sastranegara. Cargo at PT Angkasa Pura II airport during 2012 until 2016, the highest is Soekarno-Hatta airport (Tangerang) although in 2016 it was slightly decreased, then Kuala Namu (Deli Serdang) and Supadio (Pontianak) [10] .

This study aims to analyze the correlation between airport performance towards Gross Domestic Product Regional (GDP-regional)[16]–[21].

2. Research Method

The method used in this research is quantitative research with correlational analysis. Correlational study aims to determine the correlation between variables. The correlation between two or more variables is determined by using the regression equation to make predictions on the population. The aims in performing regression and correlational analysis is to create a data table, create a scatter diagram. All these works could explain clear correlation or trend, calculate the correlation coefficient r or Pearson correlation coefficient factor and determine whether r value is statistically significant. If r value is significant, then regression analysis can be used to determine the correlation between variables [22]–[25].

The total population used in this study are 296 airports which all managed by the government. However, by using stratified random sampling, only 151 airports were used as research sample. There are several research variables were applied include the Gross domestic product-regional (GDP-regional) as well as sub-variable such as Water supply, Sewerage, Waste Management and Remediation Activities (Y2.1); Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles (Y2.2); Accommodation and Food Service Activities (Y2.3); Financial and Insurance Activities (Y2.4); Business Activities (Y2.5); Public Administration and Defence; Compulsory Social Security (Y2.6); Education (Y2.7); Human Health and Social Work Activities (Y2.8); Other Services Activities (Y2.9); Gross domestic product-regional (Y2.10); Manufacturing (Y2.11); Electricity and Gas (Y2.12). The Airport Performance (X1) variables including sub-variable: Aircraft Arrival (X1.1), Aircraft Departure (X1.2), Passenger Departure (X1.3), Passenger Arrival (X1.4), Baggage Unloaded (X1.5), Baggage Loaded (X1.6), Cargo Unloaded (X1.7), Cargo Loaded (X1.8). Table 1 and Table 2 were referred to determine the validity and reliability of the results [26-33].

2.1 Hypothesis

Hypothesis testing was conducted by comparing the value of t-count with t-table. The t-count value is obtained with the help of the SmartPLS 2.0 software, while the t-table value corresponds to the alpha and degree of freedom [26]–[29]. The hypothesis set as follows;

H_1 : Airport has a significant influence on GDP-regional
H_0 : Airport does not have a significant influence on GDP-regional

Table 1. Indicators Validity and Reliability Test [26]–[33]

Validity and Reliability	Parameter	Indicators
Convergen Validity	Loading Factor	≥ 0,7
	Average Variance Extracted (AVE)	≥ 0,5
	Communality	≥ 0,5
Discriminant Validity	Cross Loading	> 0,7 for every variabels
	AVE root of quadratic and correlation of latent construct	AVE root of quadratic > correlation of latent construct

Table 2. Reliability Test Rule of Thumb [26]–[33]

Reliabilities	Parameter	Rule of Thumb
Reliability	Cronbach Alpha	• > 0,70 for confirmatory research • > 0,60 for exploratory research
	Composite Reliability	• > 0,70 for confirmatory research • 0,60 – 0,70 for exploratory research

3. Results & Discussion

To test the influence of the variable of Airport Performance (X1) with, GDP-regional (Y2), Partial Least Square Path Modeling Structural Equation Modeling (PLS-SEM) analysis.

Table 3. Convergent Validity Test Results

Variable	Indicator	Outer Loading	AVE	Communality	Status
Airport Perform (X1)	Aircraft Arrival (x1.1)	0.995	0.881	0.881	VALID
	Aircraft Departure (x1.2)	0.994			VALID
	Passenger Departure (x1.3)	0.989			VALID
	Passenger Arrival (x1.4)	0.989			VALID
	Baggage Unloaded (x1.5)	0.988			VALID
	Baggage Loaded (x1.6)	0.990			VALID
	Cargo Unloaded (x1.7)	0.685			VALID
	Cargo Loaded (x1.8)	0.828			VALID
GDP-REGIONAL (Y2)	Water supply, Sewerage, Waste Management and Remediation Activities (Y2.1)	0.779	0.736	0.736	VALID
	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles (Y2.2)	0.688			VALID
	Accommodation & Food Service (Y2.3)	0.892			VALID
	Financial and Insurance Activities (Y2.4)	0.806			VALID
	Business Activities (Y2.5)	0.832			VALID
	Public Admin. and Defence; Compulsory Social Security (Y2.6)	0.931			VALID
	Education (Y2.7)	0.928			VALID
	Human Health and Social Work Activities (Y2.8)	0.943			VALID
	Other Services Activities (Y2.9)	0.941			VALID
	Gross domestic product-regional (Y2.10)	0.959			VALID
	Manufacturing (Y2.11)	0.829			VALID
	Electricity and Gas (Y2.12)	0.707			VALID

Based on Table 3, the obtained value of outer loading all items are larger than > 0.50 and the Average Variance Extracted (AVE) value of all variables are > 0.50. Thus, it can be concluded that all indicators and variables passed the convergence validity test. Discriminant validity tests are assessed on the basis of cross-loading indicator measurements with their constructs. Another method used to assess discriminant validity is to compare AVE roots for each construct with the correlation between constructs with other constructs in the model. The model has sufficient discriminant validity if the AVE root for each construct is greater than the correlation between the construct with the other constructs in the model and the largest cross loading is in the construct it constructs. The value of cross loading test results is shown in Table 4.

Table 4. Discriminant Test Results (Cross Loading Value)

Variable / Indicator	Airport Performance (X1)	GDP-regional (Y2)
Aircraft Arrival (x1.1)	0.995	0.411
Aircraft Departure (x1.2)	0.994	0.416
Passenger Departure (x1.3)	0.989	0.398
Passenger Arrival (x1.4)	0.989	0.392
Baggage Unloaded (x1.5)	0.988	0.396
Baggage Loaded (x1.6)	0.990	0.380
Cargo Unloaded (x1.7)	0.685	0.225
Cargo Loaded (x1.8)	0.828	0.214
Water supply, Sewerage, Waste Management and Remediation Activities (Y2.1)	0.336	0.779
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles (Y2.2)	0.651	0.688
Accommodation and Food Service Activities (Y2.3)	0.304	0.892
Financial and Insurance Activities (Y2.4)	0.374	0.806
Business Activities (Y2.5)	0.133	0.832
Public Administration and Defence; Compulsory Social Security (Y2.6)	0.228	0.931
Education (Y2.7)	0.223	0.928
Human Health and Social Work Activities (Y2.8)	0.304	0.943
Other Services Activities (Y2.9)	0.244	0.941
Gross domestic product-regional (Y2.10)	0.437	0.959
Manufacturing (Y2.11)	0.424	0.829
Electricity and Gas (Y2.12)	0.299	0.707

Based on Table 4,) it clearly shows that the largest cross loading is in the construct that it formed. Therefore it can be concluded that the research indicators has met the discriminant validity. In addition to use cross loading, discriminant validity is also viewed through the AVE root in table 5.

Table 5. Discriminant Test Result (AVE root value)

Variable	Airport Performance (X1)	GDP-REGIONAL Non CBD Performance (Y2)
Airport Performance (X1)	1	
GDP-regional (Y2)	0.389338	1

Based on Table 5, it shows that the AVE root for each construct is greater than the correlation between the construct and the other constructs in the model. Based on this result, it can classified as a valid result in the discriminant validity test. Discriminant validity test results indicates that both cross loading and AVE roots meet the rule of thumb thus it is valid.

In addition to the validity test, model measurement is also done to test the reliability of a construct. The reliability test is performed to prove the accuracy, consistency, and accuracy of the instrument in measuring the constructs. In PLS-SEM, SmartPLS 2.0.3 software is used to measure reliability that is able to be conducted in two ways namely Cronbach's Alpha and Composite Reliability. Reliability test results can be seen in Table 6.

Table 6. Constructive Reliability Test Results

Variable	Composite Reliability	Cronbachs Alpha	Status
Airport Performance (X1)	0.983132	0.978889	RELIABLE
GDP-regional (Y2)	0.9706	0.966097	RELIABLE

Based on the reliability test results in Table 6, it exhibit the value of composite reliability for Value Added is >0.7 and this result can be considered as acceptable and reliable. Therefore it can be concluded that Value Added satisfy the reliability test. Composite reliability is considered better in estimating the internal consistency of a construct than Cronbach Alpha. Thus it can be regarded that all constructor indicators are reliable or meet the reliability test. The result of the structural model is seen from the significance of all the estimation path. Prediction of the strength of the structural model can be seen from R-Square value of endogenous variable, Quality indexes or Goodness of Fit (GoF) Index. Evaluation of measurement model (Inner Model) can be seen from R-Square value for each endogenous variable as model prediction power. R-Square value of 0.75 is called a strong model, whereas 0,50 concluded as a moderate model and 0,25 concluded that the model is weak. The results of R-Square testing in this study as shown in Table 7 below.

Table 7. R Square Test Results

Dependent Variable	R-Square Value	
GDP-regional (Y2)	0.770	Substantial

Based on the results of output with the help of SmartPLS 2.0 software that has been done, it can be seen that the value of R-Square is 0.770 for GDP-regional(Y). After a statistical test using a two-step approach was conducted, hypothesis testing can be performed. This research model applied second order confirmatory factor analysis model. The second order construct test was done with a tiered system. First the analysis was done from the latent-dimensional construct to the indicators. Second, the analysis was done from the latent construct to the dimensional construct. Approach in analyzing second order construct is by using repeated indicator approach or also called hierarchical component model.

Testing of this variable is done in 2 stages. The first stage was conducted to determine the significant influence between Airport Performance with GDP-regional. Hypothesis testing by looking

at the significance between variables performed with bootstrapping procedure in SmartPLS 2.0 software. To verify the significance of the prediction model in testing the structural model, the T-value between independent variables to the dependent variable in the Path Coefficient table was used. The value of T-value as shown in Table 8.

Table 8. T-Value Test Results

Relation between variables	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (|O/STERR|)
Airport Performance (X1) -> GDP-regional (Y2)	0.301	0.333	0.021	0.021	14.264

Based on the value of the coefficient path and the T-value in Table 8, the test result can be concluded as follows:

Airport Performance (X1) -> GDP-regional (Y2)

Based on the T-Value result, the T-value for the Airport Perform variable is 14,264. The result of T-Value Test and compared with T-table is equal to 1,976 (significant level 0,05) hence T-count> T-table thus variable of Airport Performance is predicted to have a significant correlation to GDP-regional.

Based on statistical analysis, there is a significant correlation between airport performance and GDP-regional. This means that good airport performance will either improve the performance of the Water supply, Sewerage, Waste Management and Remediation Activities; Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles; Accommodation and Food Service Activities; Financial and Insurance Activities; Business Activities; Public Administration and Defence; Compulsory Social Security; Education; Human Health and Social Work Activities; Other Services Activities; Manufacturing; and Electricity and Gas, better.

4. Conclusion

The airport becomes an important asset, for a country should have a competitive advantage. The performance of the airport is predicted to have a significant effect on the GDP-regional in Indonesia. This means that good airport performance will either improve the performance of the accommodation industry or the food beverage industry better.

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