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Business Centre Development Model of Airport Area in Supporting Airport Sustainability in Indonesia

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Abstract. Airport is expected to play the role in enhancing the economic level of the region, especially the local people around the airport. The Aero City concept in developing an airport might also develop a city centreed in the airport that combining airport oriented business development, business actors and local people around the airport area. This study aims to generate development model of business centre at the airports in Indonesia. This is a mixed method based study. The population includes 296 airports under government management, government subsidiary and military. By using stratified random sampling, there were 151 sample airports. The results show that business centre development in the airport area will be related with the airport management and the commercial property (business centre) growth at the airport. Aero City in Indonesia can be developed by partnership system between government and private sector that consists of construction, development, and implementation of commercial property such as hotel, apartment, retail, office, etc. Based on the result of T-Value test, Airport Performance variable predicted to have significant influence on Gross Regional Domestic Product Central Business District performance.
Keywords: aero city, airport business model, airport commercial property, airport business area

1. Introduction

Airport holds strategic role as the transportation network point, as the gate of economic activities to actualize development equity, growth, economic stability also national development congruity, activities centre for interconnection of transportation mode, transportation to meet the demand to improve integrated and sustainable service quality depicted as the centre for air transportation mode shifting to another transportation mode or otherwise, to support industrial activities, trade and/or tourism activities as the effort to promote national development dynamics, also integrate with other development sectors, open the access to isolate areas, develop Indonesia border areas in the islands and/or lands, disaster handling, and infrastructure to strengthen national insights and nation sovereignty [1].

Airport development in Indonesia is quite fast, even some airports successfully ranked in the global best flight ranking. For instance, in 2017 Soekarno-Hatta airport has been ranked 10th in the Top 20 Fastest Growing World Airports Hub Connectivity 2017 [2]. Meanwhile, in 2016 Juanda Airport ranked first category big airport in The Top 20 Airports [3]. However, airports development for now and in the future is not necessarily to build a luxurious airport but also play the key role in the society economic development. The Aero City concept in developing an airport might also develop a city centreed in the airport that combining airport oriented business development, business actors and local people around the airport area [4]. Therefore, airport does not only serve as the flight destination but also connecting the industry and the market, the product and the consumer from various countries.

There are many successful examples of Aero City concept, for instance Changi airport in Singapore that achieved 7,2% growth in 2016 reached S$ 1,1. This income growth generated from the concession supported by strong retail sells that grows up to 9,9% and reached highest record with S$ 2,2 billion. Changi airport is one of three top airports in the world with highest concession sells. Changi airport keeps launch innovative retail throughout the year, for instance the opening of Zara and The Shilla Beauty Loft outlet. The big profit of Changi airport's non-aeronutic business enables Changi to substitute and maintain the competitive flying costs [5]. Other example is Malaysia airport that recorded the income escalation on duty free and non-dutiable goods (contribute by 17,7%), agriculture and horticulture income (contribute by 0,8%) and hotel income (contribute by 2,2%). Those non-aeronutic incomes generally generated from business commercial on airport operational and non-airport operational business. Commercial business on airport operational includes income from commercial room leasing, duty free and non-duty free shop, food and drinks outlet, airport parking facility, ads business, hotel and free commercial zone in KLIA. In 2016, non-aeronutic reached RM 1.110 million, duty free and non-dutiable good income reached RM 740 million, airport operational income reached RM 259 million, hotel income reached RM 92 million, agriculture and horticulture income reached RM 34 million, also improvement and maintenance project income reached RM 132 million [6].

In Indonesia to date, the Aero City concept developed in the form of strategic development master plan of International Airport Kualanamu. By employing this concept the airport might have the strategic function to produce and accelerate the region economic activities. It is important to analyze the space structure, land function, and city design in accordance with the development vision of the region in order to prepare the airport as an Aero City [7].

This study aims to generate development model of business centre at the airports in Indonesia. Problems identification includes airport management, commercial properties growth (business centre) and Aero City development model in Indonesia. The study results might contribute to the Aero City development in Indonesia.

2. Research Method

This is a mixed method based study. Mixed method requires researcher to collect, analyze and combine both qualitative and quantitative data in order to gain comprehensive understanding on the research problems [8]. The population includes 296 airports under government management, government subsidiary and military. By using stratified random sampling, there were 151 sample airports then we chose 7 airports of 7 big cities that have the most complete data on commercial property development, that is Jabodetabek, Banten, Bandung, Makasar, Medan, Semarang, and

Surabaya. Primary data derived from observation activities of 7 airports area in 7 different cities, while quantitative data derived from the research data released by 151 sample airports.

Research variable includes X Variable (airport performance) and Y Variable (Gross regional domestic product Central Business District (GRDP CBD) performance), and the hypothesis as below:

H_0 :   Airport Performance has no significant influence on the GRDP CBD performance
H_1 :   Airport Performance has significant influence on GRDP CBD performance

Data analysis technique includes two stages, that is descriptive analysis and influence test of Airport Performance variable (X) and GRDP CBD Performance (Y) using Partial Least Square Path Modelling Structural Equation Modelling (PLS-SEM) analysis, which including convergence validity test, discriminant test (Cross Loading value), discriminant test result (AVE root value), construct reliability test, R Square test, and T-Value test.

3. Results and Discussion
3.1. Airport Management
Indonesia have 296 official airports under government management include 13 airports managed by PT Angkasa Pura I, 13 airports managed by PT Angkasa Pura II, 53 airports under Indonesian National Army (TNI) management, 178 airports managed by Transportation Ministry technical operation unit and 39 airports managed by local government technical operation unit [9]. Airport management by government differs from the private sector management. To build an Aero City requires cooperation of all parties include the government, private sector, and also the society. There are several collaborations done by state and local government with Angkasa Pura – as the government subsidiary – and private sector. The collaborations include (1) direct buy and sell agreement of goods asset such as buildings and lands complete with the facilities within; (2) collaboration agreement to establish and to utilize half of the air field physic facility such as Apron, Taxiway, GSE yard, Inspection Road, and Helipad that also include the basic design preparation and submission, technical specification, and design detail, budgeting and result submission; (3) annual contribution submission from PT Angkasa Pura I (Persero) to the local government for maintaining and operating the half air field physic facility; (4) exchanging plan of PT Angkasa Pura (Persero) land and local government's land; (5) investment inclusion cooperation on the entity association and inclusion on the private sector enterprises also other government's subsidiaries; (6) concession collaboration with private sector enterprises, government's subsidiaries, and Directorate General of Air Transportation Hub to provide airport services including aircraft service, passengers, goods, and post consists of providing and/or developing landing facility service, take off, maneuver, parking, and aircraft retention, terminal facility to serve the passengers, cargo, post, electronic facility, electricity, water, and waste disposal unit, lands for buildings, fields, and industries, also buildings to support the air transportation smoothness.

Transportation Ministry of Indonesia Regulation Number PM.129 year 2015 arranges provision that an airport requires to provide minimum 70% of operational service facility and maximum 30% of commercial service facility from the total of passengers terminal space minus 20% of the circulation room and utility building [10]. This regulation affects the financial income of Angkasa Pura airports as one of the airport managerial in Indonesia where there is income decreasing of tenant leasing in 13 airports managed by Angkasa Pura.

3.2. Commercial Property (Business Centre) Growth
Based on the result of Central Bank of Indonesia (Bank Indonesia) data analysis, commercial property growth consists of 5 commercial property types, that is offices, retails, apartments, hotel, and industrial land [11]. Demand property growth in Jabodetabek and Surabaya shows positive trend and pretty promising, while commercial property demand in other areas is quite low such as in Banten the retail is quite low, offices is low in Makasar, in Bandung office and hotel is low, apartment and hotel is low in Semarang while in Medan offices, retail, and hotel is quite low. Commercial property supply growth in Jabodetabek (specifically apartment and hotel) and Surabaya (specifically offices) are both pretty positive, while hotel growth in Makasar has positive trend, apartment in Medan is pretty good, both in Semarang and in Bandung apartment is quite low while in Banten both retail an hotel are quite

low. Commercial property price growth shows a very promising commercial property price growth. Only few indicate price decreasing tendency such as in Jabodetabek only apartment's price is decreasing, in Banten retail's price is decreasing, in Bandung, Makasar and Semarang only hotel's price is decreasing, in Surabaya only offices is decreasing, and in Medan only apartment and hotel price are decreasing [11, 12].

The data of 151 airports in Indonesia from Statistics Indonesia (*Badan Pusat Statistik*) shows that the highest growth of real estate at airport area is in Tangerang and the lowest is in Halmahera Tengah (in the middle of Halmahera) [13]. Reliability test used in this research was Cronbach alpha and composite reliability or known as "Dillon Goldstein". Composite Reliability to measure internal consistency uses Formula 1 as follow [14]:

$$\rho c = \frac{\left(\sum \lambda_i\right)^2}{\left(\sum \lambda_i\right)^2 + \sum_i \mathrm{var}\left(\varepsilon_i\right)} \tag{1}$$

λ_i : factor loading
ε_i : error variance

While to calculate Cronbach's Alpha uses Formula 2 as follow [14]:

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum \sigma_b^2}{\sum \sigma_t^2}\right) \tag{2}$$

α : alpha reliability coefficient
k : amount of question items
σ_b^2 : score variant of each question item
σ_t^2 : score variant of question items total

The result of convergence validity test can be seen in Table 1 as follow:

Table 1. Convergence Validity Test upon GRDP CBD

Variable	Indicator	Outer Loading	AVE	Communality	Status
Airport Performance (X1)	Aircraft Arrival (x1.1)	0.995			VALID
	Aircraft Departure (x1.2)	0.994			VALID
	Passenger Departure (x1.3)	0.989			VALID
	Passenger Arrival (x1.4)	0.989	0.881	0.881	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
APBD Performance (Y1)	Revenue (Y1.1)	0.997			VALID
	District Own Source Revenue (PAD, Y1.2)	0.996			VALID
	The result of separated regional wealth management (Y1.3)	0.979	0.982	0.982	VALID
	Budget (Y1.4)	0.996			VALID
	Capital Expenditure (Y1.5)	0.986			VALID
	Regional Investment participation (Y1.6)	0.991			VALID

As can be seen on Table 1, the result of convergence validity test shows that outer loading value > 0,50 and Average Variance Extracted (AVE) value > 0,50 thus can be concluded that indicator of GRDP Real Estate Activities and variable of GRDP CBD meet the convergence validity test.

Further, the result of discriminant test upon GRDP CBD can be seen in Table 2 as follow:

Table 2. Discriminant Test Result (Cross Loading Value) upon GRDP CBD

Indicator	Variable / Airport Performance (X1)	Regional Gov Budget Performance (Y1)	GRDP Non CBD Performance (Y2)	GRDP CBD Performance (Y3)
Aircraft Arrival (x1.1)	0.995	0.127	0.411	0.412
Aircraft Departure (x1.2)	0.994	0.131	0.416	0.418
Passenger Departure (x1.3)	0.989	0.124	0.398	0.400
Passenger Arrival (x1.4)	0.989	0.117	0.392	0.393
Baggage Unloaded (x1.5)	0.988	0.115	0.396	0.401
Baggage Loaded (x1.6)	0.990	0.108	0.380	0.381
Cargo Unloaded (x1.7)	0.685	0.028	0.225	0.237
Cargo Loaded (x1.8)	0.828	0.037	0.214	0.219
GRDP Construction (Y1)	0.332	0.612	0.857	0.927
GRDP Transportation and warehousing (Y2)	0.329	0.666	0.921	0.958
GRDP Real Estate/Real Estate Activities (Y3)	0.425	0.881	0.922	0.896
GRDP Information and Communication (Y4)	0.376	0.561	0.893	0.938

The result above indicates that the biggest cross loading value is on the formed construct. Thus, it can be concluded that research indicators meet the discriminant validity.

Meanwhile, the result of discriminant test with AVE root value can be seen on Table 3 as follow:

Table 3. Discriminant Test Result (AVE root value)

Variable	Airport	GRDP CBD
Airport	1	
GRDP CBD	0.392408	1

Table 4 shows Discriminant Test Result (AVE root value) where each AVE root for each construct is bigger than the correlation among constructs within the model thus it is valid in the discriminant validity test. The result of discriminant validity test indicates that both cross loading and AVE root meet rule of thumb thus it is valid.

Further, the result of R Square test and T Value test can be seen in Table 4 and Table 5 as follow.

Table 4. Result Test of R Square

Dependent Variable	R-Square Value	
GRDP CBD Performance (Y)	0.948	Substantial

Based on the output result with the help of SmartPLS 2.0 software, it shows that R-Square value is 0,948 for GRDP CBD performance (Y).

Table 5. T-Value Test Result

Relationship between Variables	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (|O/STERR|)
Airport Performance (X) -> GRDP CBD Performance (Y)	-0.039	-0.050	0.016	0.016	2.408

Based on the result of T-Value test, T-Value value for Airport Performance variable is 2,408. The result compared to T-Table is 1,976 (the significant level is 0,05), that means T-Value > T-Table thus Airport Performance variable predicted to have significant influence on GRDP CBD Performance.

3.3. Aero City Development Model in Indonesia

Comprehensive analysis upon various aspects required in generating a model of Aero City development. Airport Development that consists of Instituto Superior Tecnico, Universidade do Porto Faculdade de Engenharia, Universidade de Beira Interior Portugal, Universiteit Anwerpen and TPR Department of Transport and Regional Economics generated airport business development using Osterwalder approach. The basic questions of Osterwalder approach are who is our consumer, how do we make money, types of fee should be spent, and how we generate value that can be utilized by other resources [15]. This Osterwalder approach then formulated in the Canvas Business Model. When this Canvas Business Model used to develop airport business in Indonesia, then it can be elaborated as follow:

Table 6. Aero City Development in Indonesia using Canvas Business Model

Key Partners		Key Activities	Key Proposition	Customer Relationship	Customer Segments
1. Passengers 2. Airline 3. Aircraft manufacture 4. Cargo 5. Fuel enterprises 6. Government 7. International regulations 8. Catering 9. Industries/ service provider related flight and airport services: safety, security, satisfaction, etc. 10. ATC, SAR, etc.		1. Flight Services. 2. Aircraft Maintenance 3. Airport Maintenance 4. Management Services 5. Cargo services 6. Safety and security Services 7. Commercial property: hotel, retail, apartment, office	1. Interconnection, Indonesian and many countries coverage. 2. Accessibility 3. Reliability 4. On time 5. Tour packages/ destination 6. Additional services: pick up from airport to hotel, from hotel to airport, retail, public transportation, etc. 7. Visa on arrival 8. Taxes policy	1. Excellent service 2. Handling customer complaints	a. Purpose: 1. Business 2. Leisure 3. Study b. Budget: 1. Premium Class 2. Low-cost
		Key Resources 1. Infrastructure 2. Human resources 3. Financial Resources 4. Management 5. Supplier 6. Software Management		**Channel** 1. Mediated Communication: internet, apps, phone. 2. Face to face 3. Commercial advertising	

Cost Structure	Revenue Streams
1. Infrastructure 2. Services 3. Human resources 4. Supplier 5. Software	1. Airlines services 2. Commercial properties 3. Subsidies 4. Travel Agents 5. Additional Services

Based on the components in this canvas business model, then Aero City in Indonesia can be developed through partnership system between the government and private sector that including commercial property construction, development, and implementation that include hotel, apartment, retail, offices, ect.

There is increasing opportunity of airport infrastructure and business centre at airport area investment, which shown on the realization of both domestic and international investment in 2016, especially construction sector reached Rp 14,2 trillions, restaurant and hotel sector reached Rp 2,4 trillions, transportation, storage and communication reached Rp 27,5 trillions, also real estate and service enterprise reached Rp 11,5 trillions [16].

The development of business centre at the airport area by government-private collaboration eventually will support tourism competitiveness by infrastructure quality enhancement, among others public facility, information technology, tourism promotion, the conducive business climate, connectivity and accessibility integrity. This collaborative work of government-private sector in developing business centre will also escalate the economic construction sector, the increasing trend in the latest 5 years; it will be also followed by increasing employment, supported by subsector of civil building development for public includes road, bridge, train, irrigation, and port with 60% portion, followed by subsector buildings include house, office, shopping centre, health, education, accommodation, and recreation place with 28% portion. The high involvement of private sector especially housing building construction and commercial, there is still up to 22% households has not own a house by themselves yet and in needs of 3 million houses of house supply.

4. Conclusion

Business centre development in the airport area will be related with the airport management and the commercial property (business centre) growth at the airport. Aero City in Indonesia can be developed by partnership system between government and private sector that consists of construction, development, and implementation of commercial property such as hotel, apartment, retail, office, etc. Airport is expected to play the role in enhancing the economic level of the region, especially the local people around the airport, by developing Aero City.

5. Acknowledgment

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