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Factors Affecting the Travel Tourism Competitiveness Index

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Abstract. In an effort to improve the image of tourism that will have an impact on increasing the number of tourists, the Indonesian government wants to increase the travel tourism competitiveness index. On the other hand, the risk of natural damage due to human actions and also fluctuations in the number of visitors due to the tight competition between countries is a threat to the tourism industry. In an effort to achieve sustainable tourism, the application of the latest information and communication technology is a solution to keep attracting visitors and will simultaneously maintain environmental sustainability. So far Indonesia excels in the assessment of price competitiveness, while for the assessment of information and communication technology readiness Indonesia has not been considered superior. This research was conducted with a descriptive-explanatory study approach. Using simple random sampling, samples in the form of secondary data from seven ASEAN countries from 2007 to 2019 were processed using multivariable regression to assess the magnitude of influence and significance levels of the various variables studied. The results showed that price competitiveness didn't have a significant effect on the travel tourism competitiveness index in the ASEAN countries but there were two other factors that had a significant effect.

Keywords: *tourism, sustainability, telecommunications, prices, risk management*

INTRODUCTION

The tourism industry is an industry that receives special attention in various countries because it is a large source of income for the tourism industry. One of Indonesia's tourist destinations that are a favorite of local and foreign tourists is the ancient tourist destinations of Borobudur Temple and Prambanan Temple in Central Java. Borobudur Temple and Prambanan Temple which are located relatively close together in the Province of Central Java Indonesia is proof that in ancient times the ancestors of the Indonesian nation were very tolerant in carrying out their respective religious rituals. There has never been a record of destruction of temples or places of worship either in inscriptions or historical records during the period of the establishment of the two temples. In addition to being historical evidence, this can certainly be a learning for younger generations in behaving towards the religion and beliefs of others. For this reason, it is not surprising that almost every school located on the island of Java has a study tour agenda to these temples as part of extra-curricular learning. In addition to tourist attractions, Borobudur Temple and Prambanan Temple will also be designated as places of worship for Buddhists and Hindus. Borobudur Temple and Prambanan Temple are world heritage sites that have been authorized by UNESCO and must be protected and preserved for the benefit of world history. Borobudur is the only ancient Buddhist temple in the form of a pyramid and has a very beautiful

relief, while Prambanan temple has the main temple, namely Shiva temple which has a height of 47 meters and rises high among a number of smaller temples (Rif'an, 2016).

Due to the Covid-19 pandemic that has lasted more than a year, various industries have contracted. The tourism industry is the industry most affected by the Covid-19 pandemic (Gössling et al., 2020) and the results of research show that during the Covid-19 pandemic, people are actually afraid to travel (Rather, 2021). Indeed, on the one hand, the large number of visitors becomes income for the cost of temple conservation, but on the other hand it will increase the risk of damage to the temple, especially if the temple visitors are not disciplined. In addition to being the target of bombings by terrorists, Borobudur temple also experienced vandalism from a number of visitors who climbed the statues of the temple, for that it takes the firmness of the managers and supervisors around the temple rather than relying solely on the prohibition board (Hitchcock & Putra, 2015).

Because the quality of service has a positive effect on tourist satisfaction and on the interest in returning visits in the future (Canny & Hidayat, 2012), the temple manager needs to think of a form of service that can maintain the preservation of the temple while increasing visitor satisfaction. The occurrence of the Covid-19 pandemic provides an opportunity for the tourism industry to redefine the more desirable direction. This opportunity is seen and utilized by the Indonesian government by establishing the use of augmented reality at Borobudur Temple to maintain the preservation of the temple, with the existence of augmented reality, tourists are prohibited from entering the temple area and only enjoy the beauty of the temple from the outside through the technology (Khairunnisa, 2021).

The fundamental need for humans to socialize and communicate continues to drive the development of telecommunication technology that can reach various parts of the world at affordable and reliable prices. Currently, the use of the internet has reached all major cities in the world and with faster data transmission, remote control of tools can be done in real-time. Furthermore, technological innovation has also improved the way of learning, playing, and traveling in new directions and has the potential to continue to be developed. The development of wireless communication technology both in terms of speed and image display has resulted in technology that encourages new uses in various fields. Online classes, online games, e-sports, online medicine, and also online tourism are some of the uses of communication technology. This technological development is changing the way tourism destinations are perceived and consumed (Huang et al., 2016). In the future attention to quality to improve the tourist experience will make tourists more memorable, for example the application of sensory perception (Stankov et al., 2020).

In tourism terms known as Information and Communication Technology Readiness (ICTR). ICTR rankings indicate the level of availability and utilization of internet communication technology in a country. The use of augmented reality and virtual reality is included in the ICTR level determination factor. Currently, the use of augmented reality and virtual reality has been increasingly used in various countries.

Ministry of Tourism and Creative Economy seeks to increase the Travel Tourism Competitiveness Index (TTCI) so that Indonesia still has an advantage in the tourism industry between countries, especially in the ASEAN region. The increase in TCCI will improve the image of tourism and further impact the increase in the number of tourists. There are various pillars of tourism competitiveness assessment and among them Indonesia excels in the Price Competitiveness (PC) pillar, while the Tourist Service Infrastructure (TSI) pillar, and Information and Communication Technology Readiness (ICTR) is not yet the flagship pillar of Indonesia (Febrinastri, 2020). The lag of the Indonesian tourism industry in the pillars of Tourist Service Infrastructure (TSI), and Information and Communication Technology Readiness (ICTR) is a phenomenon because there is a gap between what should happen (das sollen) and what is actually happening (das sein). It becomes a question: are these two factors significant in the travel

tourism competitiveness index? Then it is also necessary to study whether Price Competitiveness (PC) is still an important and significant pillar in the tourism competitiveness index?

Based on the above, it is necessary to further research whether Information and Communication Technology Readiness (ICTR), Tourist Service Infrastructure (TSI), and Price Competitiveness (PC), have a positive and significant effect on the Travel Tourism Competitiveness Index (TTCI) in the ASEAN countries.

Literature Studies

Information and Communication Technology Readiness

The use of augmented reality in a tourism object is a reflection of the readiness of communication and information technology (Information and Communication Technology Readiness).

The Use of Augmented Reality Is Related to the Preservation of Culture and Heritage Sites

Augmented reality will transform the traditional way of traveling into a virtual way of traveling through a new type of interface that can provide various benefits such as a controlled, safe, economical and unlimited tourism environment (Hu et al, 2012).

The uses of augmented reality are:

- improve the visitor experience and provide a learning experience and this supports cultural tourism (Han et.al, 2019).
- affects visitor behavior towards tourist destinations (Shin & Jeong, 2021).
- affecting visitors' behavior towards cultural heritage (Chung et.al, 2018).
- provide new opportunities for interesting ways of teaching (Kysela & Štorková, 2015).
- provide an experience interacting with art results (Tussyadiah et.al, 2018)
- provide a thorough literature review relating to tourist destinations (Kečkeš & Tomičić, 2017).

The Use of Augmented Reality in Tourism Marketing

Social media is widely used in marketing tourist destinations (Leung et al., 2021) . Marketing aims to connect an organization with its consumers with a relationship that benefits both parties, therefore how marketing can be perceived by consumers and suppliers becomes very important (Dolnicar & Ring, 2014). Augmented reality is currently developing in marketing for the travel industry (Cranmer, 2020) and is important in competing (Jung & Han, 2014). Sensory perception perceived by consumers can give rise to sensory pleasure and focus attention on new perspectives (Stankov et.al, 2020). In addition, the use of augmented reality can also increase interest in visiting tourist destinations (Chung et.al, 2015).

The Use of Augmented Reality in Increasing Tourist Attraction Revenue

The purpose of using augmented reality also supports the creation of tourist destination attractions, namely: some can be reviewed, some can be done, and some can be purchased (Rif'an, 2016).

The use of augmented reality has an impact on increasing the income of tourist attractions in various ways, namely:

- consumers' willingness to pay more (He et.al, 2018) ; (Huang, 2021).
- triggering the desire to visit again (Jung et.al, 2016).
- triggered impulsive purchases (Do et.al, 2020).

Tourist Service Infrastructure

Infrastructure readiness in a tourism object is a reflection of the readiness of Tourist Service Infrastructure (TSI). Here are a number of research results concluding that infrastructure has a positive and significant effect on tourist satisfaction, namely on the results of research (Bagri &

Kala, 2015); (Ghaderi et al., 2018); (Virkar & Mallya, 2018). While the results of research (Araslı & Baradarani, 2014) and (Puh, 2014) concluded that infrastructure has no effect on tourist satisfaction.

Price Competitiveness

Here are some research results related to Price Competitiveness (PC): a number of research results concluded that price competitiveness has a positive and significant effect on tourist satisfaction, namely in the results of research (Frangos et al., 2015); (Gnanapala, 2015); (Rajesh, 2013); (Vetitnev et al., 2013). While the results of the study (Chen et al., 2016) concluded that price competitiveness has no effect on tourist satisfaction.

Hypothesis

From the gap between das sollen with das sein and various studies of a number of studies, research hypotheses can be formed:

1. Whether the improvement of Information and Communication Technology Readiness will have a positive effect on the Travel Tourism Competitiveness Index in the ASEAN countries.
2. Whether the increase in Tourist Service Infrastructure will have a positive effect on the Travel Tourism Competitiveness Index in the ASEAN countries.
3. Whether the increase in Price Competitiveness will have a positive effect on the Travel Tourism Competitiveness Index in the ASEAN countries.
4. Whether the improvement of Information and Communication Technology Readiness, Tourist Service Infrastructure, and Price Competitiveness together will have a positive effect on the Travel Tourism Competitiveness Index in the ASEAN countries.

The statistic hypotheses that can be formed are:

Ha1 : There is a positive influence on the increase in Information and Communication Technology Readiness on the Travel Tourism Competitiveness Index in ASEAN countries.

Ha2 : There is a positive influence on the increase in Tourist Service Infrastructure on the Travel Tourism Competitiveness Index in the ASEAN countries.

Ha3 : There is a positive influence on the increase in Price Competitiveness on the Travel Tourism Competitiveness Index in the ASEAN countries.

Ha4 : There is a positive influence on improving Information and Communication Technology Readiness, Tourist Service Infrastructure, and Price Competitiveness together on the Travel Tourism Competitiveness Index in ASEAN countries.

Research Framework

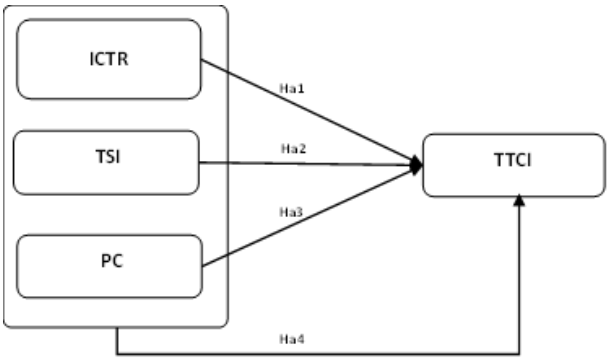

Figure 1. Research Framework

Research Model:

$$TTCI = \beta_0 + \beta_1.ICTR_{it} + \beta_2.TSI_{it} + \beta_3.PC_{it} + \mu_{it}$$

Notes:

β_0	: Intercept
$\beta_1, \beta_2, \beta_3$	: Coefficients
t	: Time Period
i	: Country
TTCI	: Travel Tourism Competitiveness Index
ICTR	: Information and Communication Technology Readiness
TSI	: Tourist Service Infrastructure
PC	: Price Competitiveness
μ	: Term of Error

RESEARCH METHODS

Types of Research

The purpose of this study is to analyze whether the readiness of communication and information technology, infrastructure for tourists, as well as competitive price advantages have a significant effect and can increase the competitive index of state tourism in the ASEAN region. Based on the purpose of the research, the type of research used in this study is descriptive and explanatory.

Population, Sample and Sampling Techniques

The population in this study is all tourism competitive index data, the value of communication and information technology readiness, infrastructure for tourists, as well as the competitive price advantage of countries in the ASEAN region. Using simple random sampling, the sample used is data from seven countries in the ASEAN region from 2007 to 2019 because the latest data available on the site is until 2019. The travel & tourism competitiveness report obtained from the World Economic Forum is published biannually and can be accessed through https://www.weforum.org/. In order to maximize the usage of available data, we use the earliest data available (from 2007) up to the most recent data available (until 2019).

Variable Operational Definition

In this study, the research variables used are independent variables consisting of ICTR values, TSI values and PC values as independent variables and TTCI values as dependent variables. The operational definition of variables in this study is:

Table 1. Variable Operational Definition

No	Variable Name	Variable Type	Scale
1	TTCI	Dependent Variables	Ratio
2	ICTR	Independent Variables	Ratio
3	TSI	Independent Variables	Ratio
4	PC	Independent Variables	Ratio

Source: https://www.weforum.org/

Data, Data Types and Data Retrieval Techniques

The data used in this study is secondary data. The type of data processed is panel data because it is a combination of time series data and cross section data. The data collection technique used to obtain secondary data is the search and processing of data from the world economic forum website.

Data Processing and Analysis Techniques

The panel data processing techniques used in this study used multivariable regression by first determining whether using a more suitable use using the Common Effect Model, Fixed Effect Model, or Random Effect Model.

RESULTS AND DISCUSSIONS

Because the data to be processed is panel data, it is necessary to test whether the best estimation method is to use the Common Effect, Fixed Effect, or Random Effect models. Here are the testing stages:

Chow Test

Hypothesis:
H0 = Common Effect
H1 = Fixed Effect
H0 is accepted if the p-value > 0.05, and H0 is rejected if, the value ≤ 0.05

Table 2. Chow Test Result

Test cross-section fixed effects				
Effects Test		Statistics	d.f.	Prob.
Cross-section F		40.96331	(6,39)	0
Cross-section Chi-square		97.41958	6	0
Cross-section fixed effects test equation:				
Dependent Variable: TTCI				
Method: Panel Least Squares				
Periods included: 7				
Cross-sections included: 7				
Total panel (balanced) observations: 49				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.067672	0.723303	4.241196	0.0001
ICTR	0.132226	0.073031	1.810531	0.0769
TSI	0.180231	0.067621	2.665309	0.0106
PC	0.005108	0.12546	0.04071	0.9677
F-statistic	15.30732			0.000001
Adjusted R-squared	0.472075			

Source: Processed secondary data, 2022

The Chi-square cross-section probability value ≤ 0.05 on the Chow Test provides a clue that the fixed effect model is more suitable for processing this panel's data. However, it needs to be tested further with the next test, namely the Langrangian Multiplier Effect test.

Langrangian Multiplier Effect

Hypothesis:
H0 = Common Effect
H1 = Random Effect
H0 is accepted if the p-value > 0.05, and H0 is rejected if the p-value ≤ 0.05

Table 3. Langrangian Multiplier Effect Test

Lagrange Multiplier Tests for Random Effects			
Null hypotheses: No effects			
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided			
(all others) alternatives			
	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	28.71091	12.93763	41.64854
	(0.0000)	(0.0003)	(0.0000)
Honda	5.358257	3.596891	6.332246
	(0.0000)	(0.0002)	(0.0000)
King-Wu	5.358257	3.596891	6.332246
	(0.0000)	(0.0002)	(0.0000)
Standardized Honda	6.394454	5.606323	5.187434
	(0.0000)	(0.0000)	(0.0000)
Standardized King-Wu	6.394454	5.606323	5.187434
	(0.0000)	(0.0000)	(0.0000)
Gourierioux, et al.*	--	--	41.64854
			(< 0.01)
*Mixed chi-square asymptotic critical values:			
1%	7.289		
5%	4.321		
10%	2.952		

Source: Processed secondary data, 2022

Langrangian Multiplier Effect results show a p-value of < 0.05 meaning H0 is rejected, and shows that the best estimation method is random effect.

Hausman Test

Hypothesis:
H0 = Random Effect
H1 = Fixed Effect
H0 is accepted if the p-value > 0.05, and H0 is rejected if the p-value ≤ 0.05

Table 4. Hausman Test

Correlated Random Effects - Hausman Test			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistics	Chi-Sq. d.f.	Prob.
Random cross-section	0	3	1

Source: Processed secondary data, 2022

The Hausman Test results showed a p-value of > 0.05 meaning H0 was accepted, and showed that the best estimation method was random effect\

Result from Random Effect Model

The results of the multivariate regression test using the Random Effect Model are:

Table 5. Random Effect Model Test

Swamy and Arora estimator of component variances				
Dependent Variable: TTCI				
Method: EGLS panel (Cross-section random effects)				
Periods included: 7				
Cross-sections included: 7				
Total panel (balanced) observations: 49				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.964247	0.340895	5.762034	0.0000
ICTR	0.289963	0.033255	8.719412	0.0000
TSI	0.171081	0.027434	6.236051	0.0000
PC	0.108544	0.056578	1.918468	0.0614
F-statistic	49.7358			0.0000
Adjusted R-squared	0.752842			

Source: Processed secondary data, 2022

A Prob (F-statistic) value of 0.00 smaller than 0.01 indicates that simultaneously the ICTR (Information and Communication Technology Readiness), TSI (Tourist Service Infrastructure) and PC (Price Competitiveness) variables have a positive and significant effect on the TTCI (Travel Tourism Competitiveness Index) variable. This means that the improvement (decrease) in the quality of Information and Communication Technology Readiness, the quality of Tourist Service Infrastructure, and the level of Price Competitiveness will significantly affect the increase (decrease) of the Travel Tourism Competitiveness Index. These results support alternative hypothesis 4 which states that there is a positive influence on improving Information and Communication Technology Readiness, Tourist Service Infrastructure, and Price Competitiveness together on the Travel Tourism Competitiveness Index in the ASEAN countries.

With a confidence level of 97.5%, or with an alpha value of 0.025, the following variables proved to have a significant positive effect on the TTCI (Travel Tourism Competitiveness Index) variable, namely:

- The influence of ICTR (Information and Communication Technology Readiness) on TTCI (Travel Tourism Competitiveness Index). These results support alternative hypothesis 1 which states that there is a positive influence on improving Information and Communication Technology Readiness on the Travel Tourism Competitiveness Index in the ASEAN countries.
- The influence of TSI (Tourist Service Infrastructure) on TTCI (Travel Tourism Competitiveness Index). These results support alternative hypothesis 2 which states that there is a positive influence on the increase in Tourist Service Infrastructure on the Travel Tourism Competitiveness Index in the ASEAN countries.
- The positive influence of improving Information and Communication Technology Readiness (ICTR) on the Travel Tourism Competitiveness Index (TTCI) is in line with the results of previous research from (He et.al, 2018); (Huang, 2021); (Jung et.al, 2016). The positive influence of increasing Tourist Service Infrastructure (TSI) on the Travel Tourism Competitiveness Index (TTCI) is in line with the results of previous research from (Bagri & Kala, 2015); (Ghaderi et al., 2018); (Virkar & Mallya, 2018). Price Competitiveness (PC)

has no significant effect on the Travel Tourism Competitiveness Index (TTCI) in line with the results of previous research from (Chen et al., 2016).

The model of equations that can be formed is as follows:

$$TTCI = 1.964247 + 0.289963.\ ICTR^{**}_{it} + 0.171081.\ TSI^{**}_{it} + 0.108544.\ PC_{it}$$

Note:
)**: significant at value of α ≤ 0.025

CONCLUSIONS

The data processing results showed a number of alternative hypotheses proved to have a significant effect:

- Alternative hypothesis 1 states that there is a positive influence on improving Information and Communication Technology Readiness on the Travel Tourism Competitiveness Index in ASEAN countries.
- Alternative hypothesis 2 states that there is a positive influence on the increase in Tourist Service Infrastructure on the Travel Tourism Competitiveness Index in the ASEAN countries.
- Alternative hypothesis 4 states that there is a positive influence on improving Information and Communication Technology Readiness, Tourist Service Infrastructure, and Price Competitiveness together on the Travel Tourism Competitiveness Index in ASEAN countries.

While the alternative hypothesis 3 which states there is a positive influence on increasing Price Competitiveness on the Travel Tourism Competitiveness Index in the ASEAN countries is not proven.

From a number of variables examined its influence on the Travel Tourism Competitiveness Index in the ASEAN countries, there are two factors that have a significant positive effect, the first is Information and Communication Technology Readiness and the second is Tourist Service Infrastructure. The results of this study show that the government and business people in the field of tourism must continue to pay attention to and improve these two factors in order to win competition in the ASEAN countries, in addition to increasing tourism infrastructure and communication technology will support environmental preservation and sustainable tourism.

Prices are an insignificant factor in the ASEAN region because there seems to have been a shift in travelers from price sensitive economy travelers to less sensitive upper market travelers. In addition to providing valuable information and input for business people, this finding also provides theoretical contributions in the field of microeconomics and business management by indicating that there are other factors besides price that affect the elasticity of demand, namely infrastructure and internet services.

The limitation of this study is that the last data available is until 2019 and there is no data available in the weekly or monthly period, but this study is trying to get data as long as possible starting from the oldest available year. Subsequent research could attempt to include other variables that are thought to affect the Travel Tourism Competitiveness Index either in the ASEAN region or in other regions.

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