Card Based Payment in Digital Civilization:

A Study in Indonesia Hospitality Industry

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Abstract—Nowdays, our modern society is dominated by information and digital media that change our civilization come to term digital civilization. Digital Civilization that represented by society culture or lifestyle, has change one way of life, including the way to pay in purchase something digitally. Within this digital civilization, non-cash payment is one of popular method used within a transaction in digital civilization. The purpose of this research is to examine the correlation of the growing of non-cash payments that involve card-based payment instruments, which is issued by banks, the development of the tourism and or hospitality industry, as the focus of the current development, and the Indonesian economy. This study uses data from the period of 2003-2015, i.e.: number of ATM card and debit card, the number of hotel guests, and GDP, which is processed using the 3 SLS analysis technique, which is different from previous research technique analysis, in addition to differences in the variables used. The findings of this study indicate a significant positive relationship between cards based payment and the number of star hotel guests on economic growth. Furthermore, specifically the findings of this study indicate that the method of payment using ATM and debit cards positively and significantly influence the number of star hotel guests, but has no effect on the number of non-star hotel guests. This finding can be considered for banking and hospitality industry 4.0 strategic initiatives for competitiveness and sustainability in order to support economic development.

Keywords—card based payment, bank, hotel guest, digital civilization

I. INTRODUCTION

The development of civilization is seen as a positive step in improving human welfare, which leads to improve quality of life, including better social and economic conditions, which affect lifestyle changes [1]. Where as, lifestyle is a pattern that describes how a person lives to spend time and money [2], or the resources they have, including them. Civilization is also a term for social nature as a whole and also shows human control over nature including in encountering the globalization and or the development of scientific technology [3]. Civilizations are also marked off by symbolic boundaries and consist of elements including money, commerce, techniques and tools [4]. Civilization is also refer to the culture of society. Nowdays, digital commodities are accessible and available by society, and the society interact with the digital space, it can be named as the digital civilization.

Digital civilization, whereas information and technological advances is creating opportunities for education, entertainment, commerce, have become industry, including banking, opportunity in providing services that can increase purchasing power, for instance, in increasing online sales that utilize payments through transfers or using non-cash payment instruments, one of which is a card-based payment instrument. The availability of non-cash payment instruments is expected to spur the development of activities in the real sector which ultimately encourage economic growth and improve the welfare of the community. As an example is the use of cash payments using cards that have largely replaced cash payments using money in the tourism industry transactions. the ease of transactions in the industry is possible to trigger the development of the tourism industry.

Indonesia is a country with many tourism destinations, which is a potential in increasing economic growth, hence requires special attention. There are many phenomenas that show improvement in the tourism industry. The Association of Indonesian Tours and Travel (ASITA) data, estimated that there were approximately 60 million domestic tourists and a velocity of money reaching 50 billion rupiahs, in the area of West Sumatra during long vacation period in May, 5-8 2016. Those amount was obtained by calculated the total occupancy of hotel rooms which reached 5,000 rooms, not including 10 percent of hotels yet that are not members of the Indonesian Hotels and Restaurants Association in that province. In average, tourist who use a hotel stay for 4 days and three nights, which is spent approximately IDR 1.5 million per person, then shopping for at least IDR 1 million. The increasing number of tourists, not only occurs in West Sumatra, but also in other areas, such as in Yogyakarta, whereas home stay services were full, in Bali there was an increase in hotel room occupancy by 20 percent, and in Batu Tourism City, Malang, 90 percent of hotel rooms fully charged [5].

Another interesting phenomenon is an increase in the number of domestic tourist trips, average travel, per-trip expenses and total expenditure during the period 2009 to 2013 [6]. For instance, for domestic tourist trips in 2009 were 229731 travel, then increased to 234377 in 2010, then successively in 2011, 2012 and 2013 there were 236752, 245290 and 250036 domestic tourist trips. Based on the thoughts and phenomena described, the purpose of this study

was to determine empirically analyzing the relationship between non-cash payments, the tourism industry, and the economy in Indonesia during the period 2003-2015.

Various previous studies have been carried out, one of it as reviewed by Pramono, et al. [7], which was examines the impact of non-cash payments on the economy and monetary policy. Other studies examine comparatively the trends of non-cash payments from several countries, using payment data per capita, the research was conducted by Markose and Loke [8]. This study is different from previous studies, since in this study used 3 SLS analysis techniques that analyze the models simultaneously as a system, and use differ variables. This study examined the variables of payment instruments using cards and the tourism industry, and using time series data.

Several theories that discuss the concept of using non-cash payment instruments use cards in relation to the tourism industry and economic growth. One that allows payment using non-cash medium is the development of information technology in the business world. The use of information technology is one of several efforts to excel in business competition by building businesses that focus on services that facilitate customers, including using information technology to fundamentally reduce business process costs, reduce customer costs, develop new markets, shorten market time, managing business expansion [9].

One form of the use of information technology that can summarize all the efforts that have been described is the sale of services included in the tourism industry such as transportation facilities, lodging, or tour packages, including the ease of payment using non-cash payments. Thus, the development of information technology not only helps the market in real terms, in the form of business competition, but also in the development of payment systems, including non-cash payment systems, especially payment instruments using cards.

Referring to Republic of Indonesia Legislation No. 10 of 1998 concerning banking [10], the purpose of bank financial institutions is to improve the standard of living of the people. For example, the issuance of credit cards by banks can increase the purchasing power of the people, as well as payment instruments using other cards, Debit Cards and ATM Cards, making it easier for people to make payment transactions.

According to the Terms of Payment System for Rupiah-Money Management Central Bank of Indonesia [11], non-cash payment instruments using cards are payment instruments in the form of credit cards, Automated Teller Machine (ATM) cards and / or debit cards. Credit Cards are card based payment that can be used to make payments for obligations arising from an economic activity, including spending transactions and / or to make cash withdrawals, where the obligation to pay the cardholder is fulfilled in advance by the acquirer or issuer, and the card holder is obliged to make payments at the agreed time either by a full payment (charge card) or by payment in installments.

An ATM card is a card based payment that can be used to make cash withdrawals and / or transfer of funds where the obligation of the cardholder is fulfilled immediately by reducing the deposit of the cardholder directly at the Bank or

Non-Bank Institution authorized to collect funds in accordance with the applicable legislation.

Debit Card is a card based payment that can be used to make payments for obligations arising from an economic activity, including shopping transactions where the obligation of the cardholder is fulfilled immediately by reducing directly the deposit of the cardholder at the Bank or Non-Bank Institution authorized to collect funds in accordance with the statutory provisions valid invitation.

II. RESEARCH METHODS

This research is an empirical study, using a qualitative and quantitative analysis approach. Quantitative approach is carried out using 3 SLS analysis techniques. The data used are (1) In order to measure the variable of Card Based Payment (account-based cards): number of ATM and debit cards is used, (2) In order to measure the tourism industry variables: the number of tourists (guests) in star and non-stars hotels is used, and (3) To measure Indonesia's economy, GDP per capita data is used. Data on the number of tourist visits is obtained from the Hotel Guest Visit Statistics published by Statistic Center Beureu, the same as the GDP per capita data, and the data on the number of ATM and debit cards obtained from card based payment statistics published by Bank Indonesia, for the period 2003 to 2015. Data was processed using a simultaneous equation model analysis technique, 3 SLS (Stage Least Squares).

A. Variables and Measurement

In this study the measurements made on the variables tested. In order to obtain data and information in this study, a number of variables, and indicators were disclosed.

TABLE I.   LIST OF VARIABLES

Name of Variable	Measurement	Description / Indicator	Source
Card Based Payment	Number of ATM + Debit Cards	Number of ATM cards that also function as Debit cards circulating in the community at certain periods	Central Bank of Indonesia
Hospitality Industry	Number of Guest Star Hotels	Number of Indonesian guests at star hotels	Statistic Center Beureu
	Number of non-star hotel guests	Number of Indonesian guests in non-star hotels	Statistic Center Beureu
Economy	GDP	the amount of the average income of residents in Indonesia	Statistic Center Beureu

Source: processed for research use, 2018

As measured by the number of payment instruments using a card, in the form of a facility-based card (account-based card), namely the number of ATM cards and outstanding debits, an indicator of non-cash payments [7].

Exogenous variables are: economic variables measured by GDP per capita and that is the tourism industry variable as measured by the number of tourist visits (guests) in star hotels

and non-star hotels. In detail about the operationalization of this variable can be seen in Table 1.

B. Instrument Test

Considering the data collection was done using secondary data, the validity and realibilty of a social research result is largely determined by the measuring instrument used. If the measuring instrument used is not valid and or cannot be trusted, then the results of the research conducted will not describe the real reality. First, the model identification in the simultaneous equation is carried out, which is an initial indication related to the model coefficient / parameter to be estimated. Furthermore, in accordance with the instrument establishment standard, which before the instrument is used as a research test tool, it must first test the classic assumption. For the validation process, a Goodness-od-fit measure is used namely the coefficient of determination (R^2) and Mean Square Error (MSE).

C. Simultaneous Equation Model

The following is the simultaneous equation description which will be estimated using Three Stage Least Square (3SLS) using the EVIEWS software:

$$\text{GDP}_t = c_{10} + c_{11}\,\text{Non-star}_t + c_{12}\,\text{Star}\,t + c_{13}\,\text{CBP}_t + c_{14}\,\text{GDP}_{t-1} + e_{1,t} \qquad (1)$$

$$\text{Non-star}_t = c_{20} + c_{21}\,\text{CBP}_t + e_{2,t} \qquad (2)$$

$$\text{Star}_t = c_{30} + c_{31}\,\text{CBP}_t + e_{3,t} \qquad (3)$$

with
t = 2003, 2004, ..., 2015; where t is the time index in years.

GDP = GDP per capita

Non-star = Number of guests in non-star hotels

Star = Number of Guests in a star hotel

CBP = Card Based Payment, represented by number of ATM + Debit cards

Based on the order conditions, the simultaneous equation model was identified, so that the next stage is the estimation of the model with 3SLS can be done. Since the data used are time series data in the form of annual data observed in 2003 - 2015, there will be autocorrelation in the model so that it needs to be anticipated by the addition of the autoregressive model p or AR (p) with p = 1, 2, 3 to model residuals model. Mathematically, the simultaneous equation model with the addition of the AR (p) model will be appropriate to model the observational data with the following formulation provisions:

$$\text{GDP}_t = c_{10} + c_{11}\,\text{Non-star}_t + c_{12}\,\text{Star}_t + c_{13}\,\text{CBP}_t + c_{14}\,\text{GDP}_{t-1} + e_{1,t} \qquad (1)$$

$$\text{AR}_{(1)} \to e_{1,t} = c_{41}\,e_{1,t-1} + v_{1,t}$$

$$\text{Non-star}_t = c_{20} + c_{21}\,\text{CBP}_t + e_{2,t} \qquad (2)$$

$$\text{AR}_{(3)} \to e_{2,t} = c_{42}\,e_{2,t-1} + c_{43}\,e_{2,t-2} + c_{44}\,e_{2,t-3} + v_{2,t}$$

$$\text{Star}_t = c_{30} + c_{31}\,\text{CBP}_t + e_{3,t} \qquad (3)$$

with t = 2003, 2004, ..., 2015; where t is the time index in years.

III. RESULTS AND DISCUSSION

A. Results

Based on the results of the classical assumption test, it was concluded that the Univariate / Multivariate Normality of the simultaneous equation model was fulfilled, the residuals were not univariate autocorrelation, and the residual equation model was not multivariate autocorrelation. The goodness-of-fit measure, namely R-Square and MSE produced good value for the equation in the simultaneous equation model because R-Square above 0.50 (equation (1) GDP R-Square 0.985, equation (2) Non-star R-square 0.447 and equation (3) Star R-Square 0.961).

TABLE II.   T TEST RESULTS FOR THE SIGNIFICANCE OF THE SIMULTANEOUS EQUATION COEFFICIENT

Equation	Variable	Symbol	Coeffisien	P-value (Prob.)
GDP $_t$	Constanta1	c(10)	-2,930013	0,0135*
	NonStar $_t$	c(11)	0,353745	0,0000*
	Star $_t$	c(12)	-9,807806	0,0000*
	BCP $_t$	c(13)	1,055907	0,0000*
	GDP $_{t-1}$	c(14)	-0,875842	0,0003*
	AR(1)	c(41)	-0,805766	0,0007*
NonStar $_t$	Constanta2	c(20)	-3,790919	0,8439
	BCP $_t$	c(21)	0,800454	0,2979
	AR(1)	c(42)	1,168554	0,4110
	AR(2)	c(43)	1,069488	0,2250
	AR(3)	c(44)	-0,271705	0,7163
Star $_t$	Constanta3	c(30)	-0,006145	0,9647
	CBP $_t$	c(31)	0,040642	0,0000*

* Significant for a significant level (α) of 5%.

Source: Processing Research Data, 2018

Simultaneous testing / coefficient of the model with the F test in EViews software on the 3SLS estimation was not carried out because of the condition if in the regression model there was a significant regression coefficient, and then the F test would produce a significant conclusion. In testing the partial / individual model coefficients with the t test, a significant effect is given when the P-value ≤ α with α is determined at 5%. The results of the t test for the significance of the simultaneous equation coefficients are listed in Table 2.

B. Discussion

Based on the output in Table 2, this test provides information that:

- There is a significant influence of Non-star variables on GDP on the GDP equation of 0.353745 (positive influence) meaning that if there is an increase of 1 million from Non-Stars hotelguest, then an increase in GDP value of 0.353745 million or equivalent to 353,745; and vice versa if there is a decrease of 1 million from Non-Stars hotel guest, it will be obtained a decrease in GDP value of 0.353745 million or equivalent to 353,745.

- There is a significant influence of the Star variable on GDP in the GDP equation of -9.807806 (negative influence) meaning that if there is an increase of 1 million from Star hotel guest, then a decrease in GDP value of 9,807806 million or equal to 9,807,806; and vice versa if there is a decrease of 1 million from Star hotel guest, then an increase in GDP value of 9,807806 million will be obtained, equivalent to 9,807,806.

- There is a significant effect of the ABC variable on GDP in the GDP equation of 1.055907 (positive influence) meaning that if there is an increase of 1 million from Card based Payment (CBP), then an increase in GDP value of 1.055907 million or equal to 1,055,907; and vice versa if there is a decrease of 1 million from CBP, then a decrease in GDP value will be obtained at 1.055907 million, equivalent to 1,055,907.

- There is a significant CBP variable effect on the Star in the Star equation of 0.040642 (positive influence) meaning that if there is an increase of 1 million from CBP, then an increase in the Star hotel guest value of 0.040642 million or equivalent to 40,642; and vice versa if there is a decrease of 1 million from CBP, it will obtain a decrease in the Star hotel guest value of 0.040642 million, equivalent to 40,642.

- There is no significant effect of CBP variables on Non-stars on the Non-star equation;

There is a significant positive influence on the number of guests in non-star hotels against GDP per capita; this shows that the tourism industry can meet the expectations of the government as a leading sector in development, with the understanding that the tourism industry is capable of driving the economy in Indonesia.

Likewise, an increase in the number of account-based cards contributes positively to an increase in GDP per capita. Since the increase in the number of cards circulating in the public is directly proportional to the increase in the volume and number of transactions using ATM cards and debit (card based payment). Bank Indonesia data shows an increase Based on the results of an interview with the Deputy Governor of Indonesia Central Bank, Ronald Waas, in 2014, the amount of ATM + Debit card transactions was almost 12 trillion / day in 2013, which in 2010 was 5.4 trillion (nominal) with volume of 4.9 million, an extraordinary increase occurred over a period of three years [12,13]. Furthermore, the explanation why there is no significant effect of CBP variables on Non-stars, since most of Indonesian tourists hunt for three-Star Hotels, specially the three-star one [13]. Hence banking and hospitality industri need to considering, in order to enlarge the market share, to more focus on the non star hotel guest, try to promote the benefit for instance user friendly of the card based payment system.

IV. CONCLUSION

The conclusion of the results and discussion of the findings of this study is that there is a relationship in the form of a significant positive influence between payment cards using cards (as measured by the number of ATM + debit cards) and the tourism industry (as measured by the number of hotel guests) to economic growth. Specifically, the findings of this study indicate that payment instruments using ATM and debit cards have a positive and significant effect on the number of star hotel guests, but have no effect on the number of non-star hotel guests.

Based on these conclusions it is recommended to implement policies that support the development of the use of transactions with card-based payment instruments including maximizing the security of these payment transactions. It can be considered for banking and hospitality industry 4.0 strategic initiatives for competitiveness and sustainability in order to support economic development, in order to improve the growth of the tourism industry and the economy in Indonesia. Furthermore, for development in the field of research, it can be explored by involving different variables or measuring instrument and analysis techniques.

V. ACKNOWLEDGMENTS

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