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EAST JAVA ONLINE TRANSACTIONS: ANALYSIS FROM CONSUMER SIDE FACTORS

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ABSTRACT

Despite the study of rapid growth of online-based transactions in East Java over the past few years, little is focused on the analysis from consumer side factors s. This study aims to analyze the relationship of consumer characteristics on the expansion of online-based transactions in East Java. Panel data consisting of 38 districts/cities in East Java province in the period 2015- 2017 is analyzed using the random effects method. The results show that the increase of tertiary education participation has a significant positive effect on the digital transactions both for goods/service transaction and the use of banking facilities. In addition, mobile phones ownership also has a significant positive role on improving online transactions for the sale and purchase of goods services through the internet. Share of non-food expenditure has a positive effect on online transactions, especially for financial transactions. On the other hand, the productive age population has a negative significant effect on online buying and selling activities. Health variable insignificantly affect online transactions since the activities of transactions through internet can be done both in healthy and unhealthy conditions. Likewise with computer ownership that does not significantly affect online transactions because people tend to use mobile phones as the transaction device. Level of expenditure does not affect online transactions because online transactions have become the lifestyle in this digital era. Thus, internet-based transaction is no longer influenced by the economic conditions.

Keywords: *Transactions, Online, Random Effects, Consumers*

JEL Classification: G230, G400, O330

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Introduction

The rapid development of information and communication technologies (ICT) in the past few decades, in particular the massive adoption of the internet, has increased the number of internet users in Indonesia. The Indonesian Internet Service Providers Association (2018) records the number of internet users in Indonesia amount to 143.26 million people in 2017. This number is increase by around 10.6 million compared to the previous year.

The increasing number of internet users has led to changes in traditional financing methodsand business practices. Evidenced by the emergence of digital financial services that make accessto finance easier, such as e-banking that support the use of electronic money. The Central Bank ofIndonesia reported that the volume of electronic money transaction increased

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76.13 percent in theperiod 2015-2017 while its value raised by 134.25 percent at that period. Furthermore, many newcomers of business actors have been continuously emerging since it is easy to sell goods through the internet (DBS, 2016). In addition, based on McKinsey's 2018 research, Indonesia is the largeste-commerce market in Southeast Asia with revenues is $ 2.5 billion and will be increase until $ 20billion in 2020. Therefore, it can be concluded that Indonesia has a great opportunity to improve the economy through the use of the internet to transact since e-commerce and e-banking in Indonesia that are identical to online transactions have experienced significant growth.

Adoption of online transactions is expected to improve business performance through reducing transaction costs (Olatukun & Bankole, 2011). The real effect of online transactions in the economy is that it can reduce costs and prices and make businesses more efficient. Increased productivity arises as result of reduced production costs, reduced inventory storage costs, and reduced input costs for businesses (Suryani & Subagyo, 2011). Abou-Shouk (2011) summarizes the benefits of online transactions in the economy such as; market expansion, reducing the cost ofmaking, storing, processing and distributing information, minimizing shipping delays, and its ability to enable producers to interact more closely with consumers. Not only that, the results of the 2016 Moody's Analytics research concluded that every 1 percent increase in online-based transactions, on average, would increase the consumption of goods and services by around $ 104 billion and increase GDP by 0.04 percent.

East Java as one of the provinces in Indonesia will also benefit from online-basedtransactions. According to Deloitte (2015), the provinces most affected by digital financial services are provinces with high GDP and densely populated provinces. Data from the Central Statistics Agency show that East Java is the second most densely populated province in Indonesia after West Java. In terms of buying and selling services, based on Katadata (2018) research, East Java is the province with the second largest e-commerce penetration in Indonesia, which is 17.31 percent after West Java at 21.21 percent.

Evidence-based strategies are needed so that the existing potential can be managed properly. Before entering into the strategy, the driving factors for online-based transactions need to be studied and analyzed first, so in their implementation, things that support or hinder can be managed properly. Analysis of the development of online-based transactions can be viewed fromthe demand side and supply side. This study focus on analyzing the development of online-based transactions in East Java in terms of consumer side factors. The results of the analysis are expectedto serve as consideration in making decisions for consumers, producers and the government. The literature review in this paper will be discussed in part two. Part three contains the methods used and chapter four explains the results and discussion. Finally, section five concludes.

Literature Review

Although online-based payment systems are growing rapidly, there are still people who arereluctant to get used to digital payments so there are most transactions still use cash. Several studieshave been conducted to analyze the factors that influence someone to transact using the internet.

Vinitha & Vasantha (2017) in their study presented a conceptual model of decision factorsthat influence digital payment systems. The model formulated the Perceived Ease of Use (PEOU),Perceived Usefulness (PU) and Perceived Risk (PR) as elements of trust in the receipt of the digitalpayment system. Consumer awareness, convenience, security and availability of electronic payment instruments were elements that influence someone to adopt digital payments to conduct online transactions. Conversely, consumer attitudes were found to have the least significant influence on the adoption of digital payments.

The same argument was stated by Oney, Guven & Rizvi (2017). In their research investigating security determinants and perceived trust and the effects of both variables on the adoption of digital payments, it was mentioned that security and trust have a significant influencein online transactions. In addition, from 299 respondents and analyzed using structural equation modeling (SEM), it was also mentioned that technical protection and past experience were common determinants of consumer safety and trust. Research conducted by Haque, Tarofder, Rahman & Raquib (2009) using structural equation model (SEM) to analyze Malaysian banking consumers' perceptions of online transactions, it was found that only protected transactions, service quality and frame work regulations had a significant impact on perceptions consumers to make transactions online. The framework regulation variable was the most significant variable in influencing consumer satisfaction and has a positive impact on consumer perceptions.

Singh in 2017 argued that there were a number of facilitators that led to the growth of digital payments. These facilitators included penetration of internet connectivity on smart phones,non-banking financial institutions that facilitate digital payments, one touch payment, improvement in the financial technology sector and encouragement by the government either by providing incentives or tax breaks. All of these factors created a positive atmosphere for the growthof digital payments in India. Demographic factors such as gender, age, profession and incomedid not significantly influence the community to adopt payments using the internet, but education wasfound to have a significant effect on the adoption of online payments.

Furthermore, according to Bounie & Francois (2006), the greater the transaction, the lowerthe probability of payment using cash or in other words the higher the probability of using a checkor bank card. Then also found strong evidence that there was an effect of specialization from the use of payment instruments related to the type of goods, places of shopping and contacts.

Data and Research Methods

Data

All data in this study is obtained from the publication of the center of statistics bureau (BPS) of East Java province, namely East Java provincial welfare statistics for 2015, East Java provincial welfare statistics for 2016, and East Java provincial welfare statistics for 2017. It provides information on population, health, education, per capita expenditure, information and technology, and others. Especially for the information technology chapter includes information starting from the ownership and control of mobile phones and computers, internet usage, facilitiesand locations in internet access until the purpose of internet access. The analysis is carried out onpanel data of 38 districts and cities in East Java in the period 2015-2017 (114 observations).

Method

This study uses the percentage of residents who use the internet for the purpose of buying /selling goods/services and financial facilities. Furthermore, to analyze these variables, the demandside involved in the analysis included higher education participation, the percentage of people whoown/control mobile phones, the percentage of people who use computers, percentage of productiveage population, percentage of people who has an illness, share expenditure rather than food and per capita expenditure. Data is analyzed using panel data regression with the random effects method. The choice of method is based on the assumption that unobserved factors that influence outcomes are independent of all explanatory variables. In addition, the results of the Hausman testas a statistical calculation used to determine the selection of methods also strengthen the selectionof this method. The following model is built to analyze the main problems in this study:

$$trx\_ol_{i,t} = \beta_0 + \beta_1 education_{i,t} + \beta_2 phone_{i,t} + \beta_3 comp_{i,t} + \beta_4 productive\_age_{i,t} + \beta_5 health_{i,t} + \beta_6 share\_non\_food\ \exp enditure_{i,t} + \varepsilon_{i,t} \quad (1)$$

The model above uses two proxies to measure online transactions (trx_ol), namely selling/buying goods/services online and utilizing financial facilities online. To further deepen theanalysis, explanatory variables for welfare in the form of per capita expenditure are included in the new model where this model modifies the above model by replacing the non-food expenditureshare variable with the per capita expenditure variable.

$$trx\_ol_{i,t} = \beta_0 + \beta_1 education_{i,t} + \beta_2 phone_{i,t} + \beta_3 comp_{i,t} + \beta_4 productive\_age_{i,t} + \beta_5 health_{i,t} + \beta_6 percapita\_\exp enditure_{i,t} + \varepsilon_{i,t} \quad (2)$$

Trx_ol	:	online transactions (goods/services, financial facilities)sale/purchase transactions
education	:	higher education participation
phone	:	the percentage of residents who own mobile phones
comp	:	percentage of population using computers
productive_age	:	percentage of productive age population
health	:	percentage of the population who has an illness
share_non_food_expenditure	:	average share of non-food expenditure
per_capita_expenditure	:	average per capita expenditure

Finding and Discussion

The Distribution of Online Transaction

Access to the internet is carried out by the community with various purposes such as obtaining information or news, doing school assignments and lectures, sending and receiving e- mail (e-mail), communicating through social media, seeking entertainment up to trading both for selling/buying and for utilizing financial facilities.

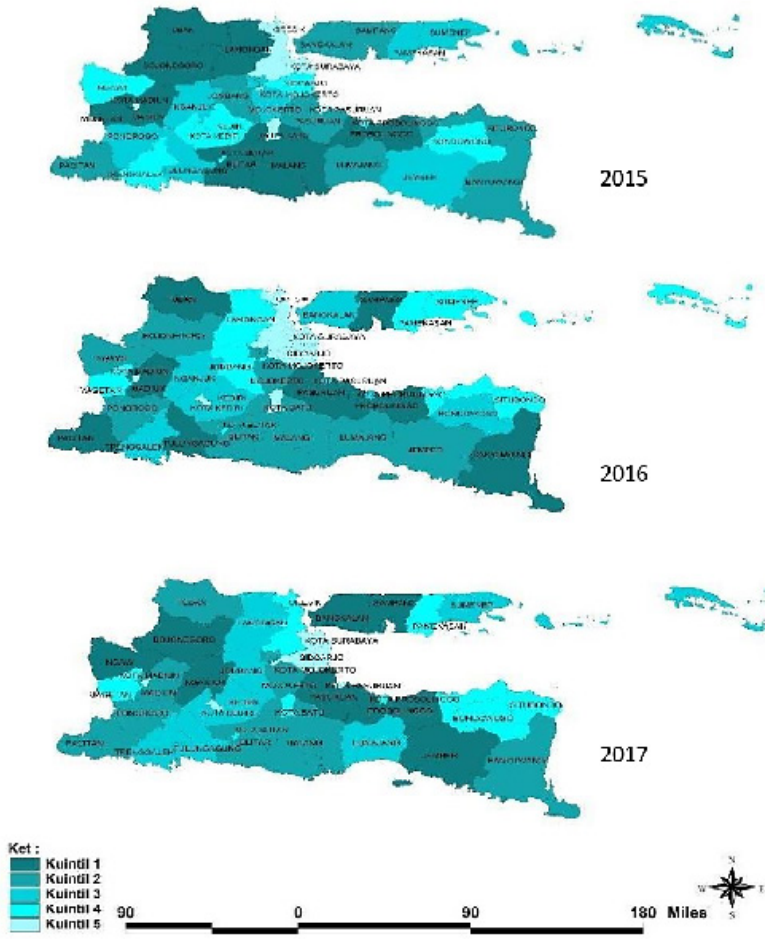
Figure 1 below explains the percentage of internet users who use internet access for the purpose of selling/buying transactions and using financial facilities online. To facilitate analysis, researchers classified the distribution of data variations in quintiles. This visualization makes the trend of distribution over time is easier to be observed. Briefly overview of this three-year distribution shows that there was a dynamic transaction through internet in almost all the districts/cities in East Java.

Generally, the figure above suggests the maps of districts that have potencies to obtain thedevelopment of online payment. It can be seen that there was a shift from quintile 1 (the lowest 20% transaction) which initially tended to cluster in the western region and slightly to the middlein 2015, and in 2016, it began to spread to the districts on the border. After entering 2017, the distribution pattern changed again for districts in the southern area and did not change much for the northern region. The quintile 5 status (the highest 20%) is consistently carried by the city of Surabaya. This is very reasonable considering Surabaya as the capital of East Java. In addition, Gresik, Sidoarjo, Batu City and Malang City are also upper class which are ranked several timesin the same class as Surabaya.

Districts/cities that are in the middle area such as Jombang, Kediri, Mojokerto City, Bondowoso Ponorogo, Blitar and others from time to time tend to be constant in the range of 2-4 quintiles. In addition, if we see developments throughout 2015-2017, Tuban, Lamongan, Magetanand Lumajang are regions that have experienced an increase in the percentage of online transactionusers. Even though it did not reach quintile 5 (highest), this positive trend gave

optimism to the development of internet-based transactions in the district/city. Conversely, there are some regions where the trend tends to be negative, for example Ngawi. The internet user for online transaction dropped by 4.34 percent from 2015 to 2017. Decreasing quintile does not mean a decrease in volume. Decreasing quintile means that the percentage of internet usage for online transactions isrelatively lower compared to other districts in East Java. In addition, Jember also experienced almost the same trend where in 2015 it was in quintile 3 then dropped 1 quintile each year with the drop of percentage was 4.65 from 2015 to 2017.

Figure 1: Online Transaction by District



Online Transaction from the Demand Side

Table 1 presents the estimate results by using online transactions for the sale and purchaseof goods and the use of banking facilities as dependent variables and the share of non-food expenditures and per capita expenditures as welfare variables that function as independent variables. Of the four models presented in table 1, the first model uses the online transaction variable for selling and buying transaction as the dependent variable and uses per capita expenditure as a proxy for welfare. Model 2 uses the same proxy as model 1 to measure welfare, but the dependent variable used is the use of internet for financial transaction through banking facilities. The next two models use the non-food expenditure share variable as a measure of welfarelevel. People with higher welfare tend to have higher non-food expenditures compared to the community with lower economic classes. The difference between models 3 and 4 is the dependentvariable used. Additionally, model 3 uses the same dependent variable with model 1 while model4 uses the same dependent variable with model 2.

Based on the estimation results in table 1, it can be seen that higher education participationhas a significant positive effect on online transactions in East Java province both for goods / services transactions and financial facility use. Referring to the output of models 1 and 3, a 1% increase in population participation in education will increase online transactions by 0.9-1%. While the influence of higher education on the use of financial facilities online is 0.8%. The trendof higher education participation that continues to rise from time to time implies that the potentialof online transactions both for selling / buying and the use of financial product facilities will increase in the future. This is very reasonable because more educated residents are more likely to be more open minded about changes due to technological advances and more aware of the choiceof products to provide services effectively and efficiently.

Table 1: Output Regression Analysis

	(1)	(2)	(3)	(4)
	Selling and Buying	**Banking Facilities**	**Selling and Buying**	**Banking Facilities**
education	1.012***	0.814***	0.931***	0.830***
	(0.282)	(0.226)	(0.289)	(0.241)
phone	0.277***	0.0511	0.208**	0.129
	(0.0705)	(0.0620)	(0.0906)	(0.0801)
comp	-0.0282	-0.0152	-0.0350	0.0354
	(0.0481)	(0.0482)	(0.0460)	(0.0483)
productive_age	-0.00000189**	0.000000403	-0.00000213***	0.000000258
	(0.000000807)	(0.0000006)	(0.000000817)	(0.00000066)
health	0.0162	-0.000707	0.0129	-0.0160
	(0.0252)	(0.0250)	(0.0248)	(0.0263)
share_non_food	0.00525	0.268***		
expenditure	(0.0893)	(0.0848)		
per_capita			0.00000291	0.000000833
expenditure			(0.00000274)	(0.00000247)
_cons	-5.961	-12.01***	-3.635	-4.301
	(3.785)	(3.195)	(3.446)	(3.038)
N	114	114	114	114

Standard errors in parentheses $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Statistically, the percentage of residents who own mobile phones has a significant positiveeffect on the percentage of residents who buy and sell by online. The increase of percentage of residents who have a mobile phone by 1% will increase online sale/purchase transactions by 0.2- 0.3%. The thing that needs to be underlined is that the purpose of cellphone ownership is not always intended to transact online. Secondly, ownership of computers/laptops is not significant ininfluencing online transactions both for selling/buying and using financial transactions. This provides an insight that people tend to transact online using cellphones, not computers/laptops. The rise of computer/laptop sales may not enhance the activity of online transaction at that area.

The percentage of productive age population has a significant negative effect on the percentage of people who use the internet for online sale purchase transactions. Even so, the magnitude of the effect is very small. This is most likely because offline shopping is still an entertainment place for some productive people so shopping online is less able to meet the needs in terms of entertaining consumers with product treats directly. While higher education

variable has a significant positive effect on online transactions, it might need further analysis that the reduction in online transactions due to the addition of productive age is likely to be done by the productive age group whose education is still relatively low. Moreover, in the long run, the ongoingincrease in higher education participation has the potential to influence the sign of the coefficientof the productive age population variable in its effect on online transactions. Health variables measured by the percentage of people who experience ill health are not significant in influencing online transactions both for selling/buying goods/services and utilizing internet banking facilities.In the practice of transacting online, an individual's health status does not directly affect the individual's decision to transact online or offline. This is most likely due to the ease of online transactions that can be carried out by healthy and unhealthy individual condition.

Share of non-food expenditure has a positive significant effect on the percentage of internetuse to utilize financial facilities online. The increase of the percentage of non-food expenditure by1%, on average, it will increase internet usage for the utilization of financial services by 0.3%. Nevertheless, this variable is not significant in influencing online sale/purchase transactions. Theseresults indicate that the increase in share of non-food expenditure does not necessarily lead to thepurchase of goods services online. Most likely, there are still many community behaviors that increase non-food purchases offline. On the other hand, the service of utilizing online financial facilities is likely to be used by the community with a medium to high economic level where the group usually has a relatively high share of non-food expenditure. This is an explanation of the results of the estimation of this study why the share of non-food expenditure only affects online transactions for the utilization of financial facilities and has no effect on online transactions for selling/buying goods/services.

Conclusion

The important effect of online transactions to the economy is that it can reduce costs and prices and make businesses more efficient. East Java as a province with the second largest penetration of e-commerce in Indonesia requires a strategy so that its potential can be managed properly. Before entering into the strategy, important things that must be analyzed first are the factors that influence the online transaction. Viewed from the demand side, analysis using panel data of all districts/cities in East Java in the period 2015-2017 with the random-effects method shows that higher education participation is one of the important things that influence thedevelopment of online transactions in East Java. On the other hand, an increase in productive agesignificantly decreases online transactions to sell/buy goods/services even though it is very small.If it is associated with the higher education variable which has a statistically significant positive effect, this decline is likely to be carried out by the productive age group whose education is still relatively low. Over time, the ongoing increase in higher education participation has the potentialto influence the sign of the coefficient of the productive age population variable in its effect on online transactions.

Ownership and mastery of cell phones have a significant positive effect on online buy or sell transactions but the effect is relatively small while ownership of computers/laptops is not significant in influencing online transactions both for selling/buying and using financial transactions. This provides an insight that people tend to transact online using cellphones, not computers/laptops. The level of community welfare as measured by the share of non-foodexpenditure has a positive significant effect on the percentage of internet use to utilize financial facilities online. Nevertheless, this variable is not significant in influencing online sale or purchase transactions. On the other hand, the service of utilizing online financial facilities is likely to be used by people with middle to upper economic levels where the group usually has a relatively highshare of non-food expenditure. This is an explanation of the results of the estimation of this studywhy the share of non-food expenditure only affects online transactions for the utilization of financial facilities and has no effect on online transactions for selling and buying for the goods orservices.

In taking advantage of the opportunities of the real potential of internet-based transactionsin East Java, there are several things that need to be taken into consideration. The quality of consumers, especially in terms of education, is an important point in developing online transactions. The opportunity and short-term potential implications are that districts/cities that have large higher education enrollment rates should be able to further develop or intensify online-based transactions. Product innovations both goods/services and financial products that can be marketed online are likely to be ready to be accepted by the market. The second important point from the results of this study is that online transactions in the use of internet banking facilities aremore likely to be used by relatively high-income groups. So that, in the short term, for financial products or services that can be accessed online can be targeted for those who are categorized in the upper middle class people. Otherwise of this economy class may still use the offline facilities due to the small-medium amount of transaction.

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