Ida Busnetty and Tulus Tambunan
Center for Industry, SME and Business Competition Studies, USAKTI, Indonesia

Abstracts

The availability of information and communication technology (ICT) has assisted companies to effectively produce and market their products and services in the global market. However, many micro and small enterprises (MSEs) in Indonesia have not adopted such technology or e-commerce to support their business activities. Based on province data (cross-section data), this study aims to examine the adoption of e-commerce by Indonesian MSEs. It addresses two research questions. First, how many MSEs have adopted such technology? Second, what factors that influence e-commerce adoption by MSEs? The study used a multiple regression to estimate empirically the impact of selected factors as independent variables on the number of MSEs that use e-commerce. It shows at least three important facts; (i) the degree of e-commerce adoption by MSEs in Indonesia is still very low; (ii) there is a positive relationship between market size in a province and the number of MSEs in the province adopting e-commerce; and (iii) in a region where all residents or households have a computer or access to the internet, it is not always that all business actors, especially MSEs, in that region adopt e-commerce.

Keywords: MSE; e-commerce; Internet; ICT; internal factors; external factors; Indonesia

INTRODUCTION

It is undeniable that information and communication technology (ICT) has changed many things in the business. It not only has changed the way businesses communicate to each other or deal with their customers, distributors and suppliers but also through digital marketing or e-commerce it has changed the way they promote and sell their products or purchase their raw materials. Digital marketing has now become the trend in targeting both current and prospective customers. Most people now have daily access to the Internet via personal computers, laptops or smartphones. Social media is one of the best channels of online marketing, and Instagram is one of the fastest growing platforms available today (Balakrishnan and Boorstin, 2017). More businesses are now eager to establish a strong presence on this network and encourage their prospects' engagement. To be able to survive in this new business environment all companies including micro and small enterprises (MSEs) are pushed to adopt this technology. Sooner or later, MSEs which do not adopt this technology and business practice will be displaced by their competitors and abandoned by their customers (Ahmada et al., 2015; Azam and Quaddus, 2009a,b; Bakos and Brynjolfsson, 2000; Barry and Milner, 2002).

Governments in many countries have given considerable attention to the utilization of ICT, particularly the adoption of e-commerce, by MSEs by issuing special policies and regulations to assist them. In Indonesia, despite the rapidly growing Internet media, the number and percentage of MSEs that have utilised the Internet or adopted e-commerce are still low. According to the 2016 Economic Census, only 563 thousand enterprises or about 2.14 % of total MSEs in all sectors have utilised such technology (BPS, 2017). Therefore, in the past few years the Indonesian government has taken many measures to encourage or

support them to adopt such technology in order to expand their marketing. The measures include providing trainings for MSEs owners in utilizing such as Internet, facebook, Instagram and other application systems, and to create their own websites; creating a special web portal (SMESCO Trade) by the Ministry of Cooperatives and Small Medium Enterprise (SME) that all micro, small and medium enterprises (MSMEs) can use it for marketing their products; and issuing various regulations to provide a sense of security for business actors in adopting e-commerce and internet banking.

Given this background, this study aims to examine the adoption of e-commerce by MSEs in Indonesia. More specifically, it addresses the following two research questions. First, how many MSEs in Indonesia have adopted e-commerce? Second, what factors that influence e-commerce adoption by MSEs? This research only focuses on MSEs, not including medium enterprises (MEs), because there is no province data regarding the adoption of e-commerce by MEs

LITERATURE REVIEW

As the market competition becomes increasingly tight, it is vital for business actors to use modern technologies, including ICT as among their key sources of competitive advantages. In many developing countries, although the need of having ICT is also apparent, there are still many companies, especially MSEs, that do not adopt this technology. For larger enterprises with ample human and financial resources, the adoption of ICT may not be a significant problem. But, for MSEs which face resources limitations, including lack of fund and skill, the ICT adoption becomes a problem. Most MSEs do not consider IT as a strategic issue but rather use it more as an opportunistic (Triandini et al, 2013). Therefore, the adoption among MSEs in many developing countries, including Indonesia is still very low.

Literature on e-commerce can be grouped into two categories, namely studies that focus on factors influencing e-commerce adoption and studies that give more attention on the benefit of utilizing this technology. According to the title and purpose of this study, the focus of this review literature is on that first category.

The literature on factors influencing the decision of company owners /managers to adopt e-commerce continues to grow. Most recent articles are including from Blackburn and Athayde (2000), Fallon and Moran (2000), Matlay (2000), and Riquelme (2002) who argued that type of business or sector, and size and characteristics of company are the most decisive factors for a company to use ICT/e-commerce. Others such as Poon and Swatman (2005),Chong and Pervan (2007), Shih (2008), Poorangi and Khin (2013), Ahmada et al. (2015), and Rahayu and Daya (2015) concluded that many factors that have strong influences on a company's decision to use ICT or to adopt e-commerce are including: (i) perceived relative advantage, organisational compatibility, and benefits; (ii) strategic vision and business planning of owner or manager of a company; (iii) company's level of innovativeness and organisational complexity; (iv) ICT knowledge, expertise, experience, and willingness of company leaders or managers to utilize ICT as well as to adjust or change their way or method of doing businesses with the requirements related to the utilisation of ICT; (v) government policies or regulations related to the use of ICT or e-commerce adoption; (vi) availability of

skilled labor in ICT and software/hardware vendors; and (vii) pressures from trading partners, customers and competitors.

Neale et al. (2006), Saffu et al.(2008), Azam and Quaddus (2009b) and Poorangi et al. (2013) found that besides perceived organisational compatibility, relative advantages and organisational complexity, trialability, observability, and company's culture are also important determinant factors of e-commerce adoption by small businesses. Whereas, from studies by such as Migiro (2006), Jones et al. (2011), Zaied (2012), it was revealed that resources, i.e. capital to finance the related costs (e.g. training of employees, organizational change, investment in tools and others), and human resources, especially technical know-how/expertise, and internet security or trust to use online transactions were the main decisive factors for a company to use e-commerce in marketing its products and purchasing raw materials.

In Indonesia, the most recent research was from Suhartanto and Leo (2018), who examined small business entrepreneur resistances to adopting online store and website technology. Their qualitative study used the technology adoption model (TAM) as a theoretical basis. From their sample of 131 small entrepreneurs, they found that perceived lack of usefulness, perceived lack of ease to use, resources, and social influences are resistance factors for entrepreneurs to adopt online stores and websites. Among these factors, the perceived lack of usefulness and resources is considered the most substantial resistance factor for the entrepreneur to adopt the technology.

According to Julianto (2016), there were various obstacles faced by the Indonesian government (i.e. the State Ministry of Cooperative and Small Medium Enterprise) in encouraging or supporting MSEs owners to utilise ICT or to adopt e-commerce, namely their low understanding this kind of technology and its usefulness, their mindset which is not in favour of adopting e-commerce, and their lack of knowledge on how to operate this technology. Especially MSEs located in isolated/rural areas, many of them were unfamiliar with the online marketing system. Therefore, they prefer to do marketing with conventional methods, by utilising the distribution networks that they have been using for a long time or involving many traders or collectors who have long been their key customers.

Rahayua and Daya (2015) did a survey of more than 200 MSME owners/managers in 2015. In their study, MSME refers to a business which has less than 100 employees, assets less than 10 billion rupiah and total sales per year below 50 billion rupiah. They concluded that the adoption of e-commerce by MSMEs in Indonesia was affected by several factors which are perceived benefits, technology readiness, owners' innovativeness, and owners' ICT experience and ability.

Triandini et al. (2013) investigated the opportunities provided by e-commerce adoption for MSMEs in Indonesia and potential factors that could influence their e-commerce adoption. Their study however was not empirical but rather a discussion of conceptual model. It proposed six potential factors influenced the adoption of e-commerce, i.e. perceived usefulness, perceived ease of use, relative advantage, perceived risk, perceived trust, and compatibility.

Eva (2007) conducted a study on the application of e-commerce services for marketing MSMEs products. Five e-commerce services were communication interaction, access to information and data,

transaction, remote control and decision-making, and application and other services. In general, she found that the adoption of this online-based business processes by MSMEs was still relatively low. Many MSMEs owners/managers faced a number of constraints, such as internet access take a long time, difficult to switch to transaction-based technology, and companies have traditionally preferred to transact. Generally, MSMEs owners/managers were difficult to change their traditional way in marketing their products or purchasing their materials from physically into technology-based transactions.

Earlier work by Govindaraju and Chandra (2011) found that many MSMEs in Indonesia did have strategic plans to adopt higher level of e-commerce, though majority of them currently still adopt e-commerce at the lower level. They found eight essential variables which have no significant influences as the barriers of e-commerce adoption by MSMEs. Accordingly, these variables can be predicted as the factors that can support e-commerce adoption that need to further analysis, namely financial, supply chain management, internet services, market, source of information, enterprises association, e-commerce popularity, security and political.

Hafied (2007) found that many MSMEs in Indonesia have already starting to apply e-commerce adoption to increase or at least to maintain their revenues or profits, although the degree of adoption is different from one company to another. It was also revealed from his research that financing and customer service were the major driving factors in adopting e-commerce.

Finally, Vidi (2006) also used TAM to create an e-commerce adoption model in examining factors affecting the adoption of e-commerce by MSMEs in Indonesia for her thesis. She inferred that compatibility, top management support, organizational readiness, external pressure, and perceived benefits have significant positive effect to e-commerce adoption, and the adoption have significant positive effect to company's performance. Data was collected from nine big cities in Indonesia, i.e. Padang, Jakarta, Cirebon, Yogyakarta, Jepara, Sidoarjo, Denpasar, Makassar, and Balikpapan.
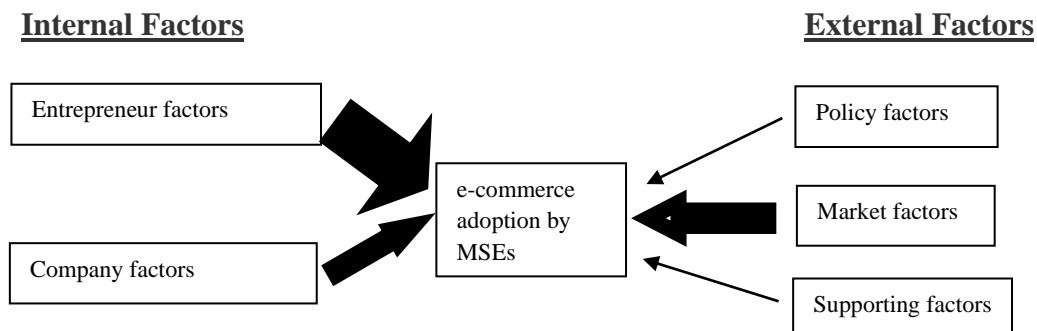
THEORETICAL FRAMEWORK

From the literature review it reveals that the decision of a business owner to adopt e-commerce is influenced by many factors, directly or indirectly. These factors can be grouped into two categories of factors: internal factors and external factors. Internal factors are related to: (i) individual characteristics of the entrepreneur/business owner, which include education, age, strategic vision, business planning, ICT knowledge, expertise, and experience, confidence that the use of e-commerce can improve business (perceived usefulness), confidence that this new marketing system would deliver its functionality in expected quality and reliability (perceived trust), and willingness to adopt e-commerce as well as to adjust the way he/she does business with the related requirements; and (ii) characteristics of a company including size, organizational complexity, technology readiness, resources (i.e. availability of skilled labor in ICT and capital), company's culture and level of innovativeness, and type of business. The first and second groups of factors can be said as, respectively, the "entrepreneur" factors, and the "company" factors

Whereas external factors are related to the external environment uncontrolled by the company which can be categorized into three sub-factors: (i) market factors (e.g. market size, location, degree of complexity and level of competition, and pressures from trading partners and customers to adopt e-commerce); (ii) policy factors (e.g. government regulation, laws, and incentive measures or facilities in the forms of e.g. tax relief, special designed ICT training programs for MSEs owners and employees, and other facilities to ease the use of ICT for beginners); and (iii) supporting factors such as the availability of ICT, infrastructure (e.g. electricity, software/hardware vendors, have a computer or smartphone. access to the Internet, universities and other training institutes providing ICT/e-commerce training, funding supports by the bank, and active supports by business associations and chamber of commerce).

Thus, as illustrated in Figure 1, generally, e-commerce adoption by MSEs is influenced by five main factors. From the literature there is no conclusion which of these five factors most influences the adoption of e-commerce by MSEs. But, because business decisions are in the hands of entrepreneurs or company leaders, especially things that have a serious consequence to the company, it can be hypothesized that the characteristics of entrepreneurs/business owners have the most influence, shown by the broadest black colored arrow. The second and third factors which also have big influences are, respectively, market and characteristics of company.

Figure 1 Theoretical Framework

So, based on the theoretical framework, the general hypothesis is that all these five groups of factors have positive and significant influences on e-commerce adoption by MSEs, and the entrepreneur factors have the largest effect, followed by the market factors and company factors.

ECONOMETRIC MODEL, HYPOTHESES, AND DATA

Economic Method

In accordance with the research objective, it used the following functional form, i.e. a multiple regression at 0.05 level of significance, to estimate empirically the impact of determinant factors as independent variables on the number of MSEs in all sectors that use e-commerce. The definitions of operational independent variables are given in Table 1. Unfortunately, there is no province data for many determinant factors included in these two categories of factors illustrated in Figure 1. So, in this model the number of independent variables is very limited. For instance, local governments in many provinces organized ICT

trainings for MSMEs, which can actually be adopted as an independent variable that represents a policy factor.

$$\text{MSEs-e} = \alpha_0 + \alpha_1 HH_1 + \alpha_2 HH_2 + \alpha_3 GW + \alpha_4 GRDP + \alpha_5 EDU$$

where MSEs-e = number of MSEs in all sectors that use e-commerce as a percentage of total MSEs per province.

Table 1 Definitions of Operational Independent Variables

	Factor	Variable used	Definitions and Variable Units
1	Entrepreneur Factor	EDU	The number of MSEs whose owners have a college or university diploma as a percentage of the total MSEs per province
2	Company Factor	GW	Electricity flow from the electricity transmission system to the consumer (giga watts per hour) per province
3	Market Factor	GRDP	Percentage distribution of Indonesia's gross domestic product by province
5	Supporting Factor	HH_1	The number of households that have computers as a percentage of total households per province
		HH_2	The number of households that have access to the internet as a percentage of total households per province

Hypotheses

Based on the model and the number of independent variables, this study has five hypotheses:

H_1: household that has computer (HH_1) has a positive and significant influence on MSEs adopting e-commerce;

H_2: household that has access to the internet (HH_2) has a positive and significant influence on MSEs adopting e-commerce

H_3: access to electricity (GW) has a positive and significant influence on MSEs adopting e-commerce

H_4: market size/volume of economic activities (GRDP) has a positive and significant influence on MSEs adopting e-commerce

H_5: education of the owner/entrepreneur (EDU) has a positive and significant influence on MSEs adopting e-commerce

Data

This study used 2017 cross section data of 34 provinces from the National Statistics Agency (BPS).

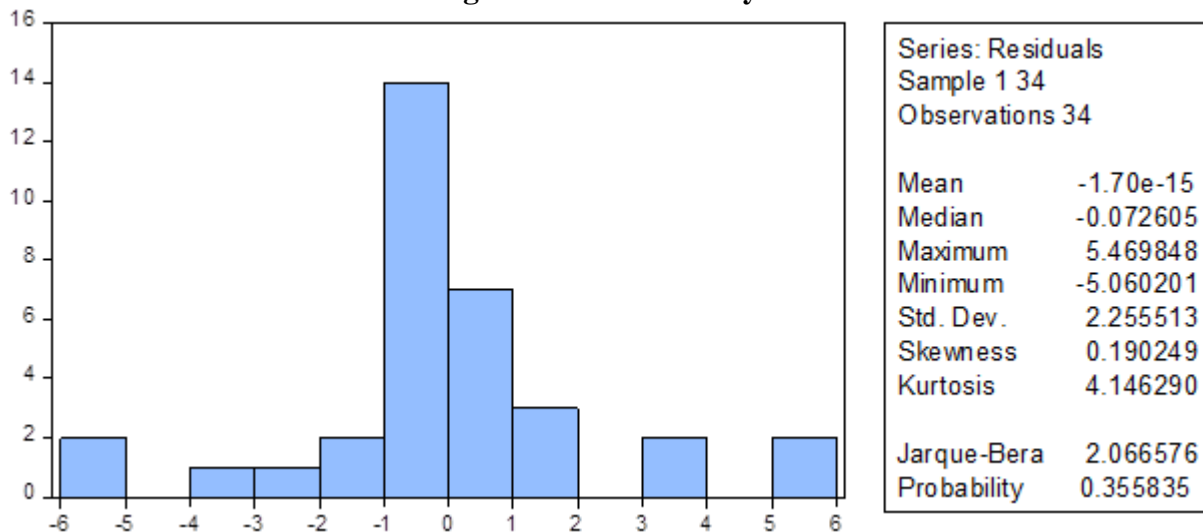**STATISTICAL TESTS AND REGRESSION RESULTS**

Table 2 presents the outcomes of the descriptive statistics for main variables involved in the regression model. Key figures, including mean, median, standard deviation, minimum and maximum value were reported. This was generated to give overall description about data used in the model and served as data screening tool to spot unreasonable figure.

Table 2 Descriptive Statistics of the Data

	MSEs-e	HH1	HH2	GW	GRDP	EDU
Mean	2.941.765	2.043.824	5.311.029	1.805.882	2.941.415	4.634.118
Median	1.195.000	1.920.000	5.372.000	0.370000	1.215.000	4.200.000
Maximum	1.872.000	3.340.000	8.570.000	9.900.000	1.744.000	1.050.000
Minimum	0.120000	1.224.000	1.976.000	0.010000	0.230000	2.500.000
Std. Dev.	4.847.908	5.864.383	1.282.131	2.997.217	4.240.576	1.778.536
Skewness	2.494.433	0.883105	-0.102764	1.837.923	2.258.847	1.228.576
Kurtosis	7.935.737	3.146.425	3.914.581	4.962.716	7.167.788	4.635.913
Probability	0.000000	0.108085	0.536648	0.000005	0.000000	0.002086
Observations	34	34	34	34	34	34

Source: computed from SPSS

Various statistical tests were performed first to determine the stability of the model, normality, multicollinearity and heteroscedasticity. The stability test (CUSUM and CUSUM SQ) shows the CUSUM and CUSUM of Squares lines do not cross the 5% significance line. So, it can be concluded that the model used is stable. The normality test results show that the prob. Jarque-Bera is more than 0.05 (i.e. 0.3558), which means that the data used are normally distributed (Figure 4). Based on the multicollinearity test results that the variable which has the value of the Variance Inflation Factor (VIF) less than 10 (Table 3), then the variable does not have multicollinearity, it can be concluded that all independent variables in this model do not have multicollinearity. Finally, based on the heteroscedasticity test results that prob. Chi-Square is more than 0.05 (0.0532) (Table 4), it can be concluded that there is no heteroscedasticity.

Figure 4 The Normality Test Results

Series: Residuals	
Sample 1 34	
Observations 34	
Mean	-1.70e-15
Median	-0.072605
Maximum	5.469848
Minimum	-5.060201
Std. Dev.	2.255513
Skewness	0.190249
Kurtosis	4.146290
Jarque-Bera	2.066576
Probability	0.355835

Table 3 Variance Inflation Factors (N=34)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
$\alpha 0$	5.412694	30.69347	NA
HH_1	0.018718	47.88099	3.542982
HH_2	0.003982	67.29282	3.602590
GW	0.061185	4.156698	3.025185
GRDP	0.031128	4.608015	3.080821
EDU	0.092416	12.86317	1.608946

Table 4 Heteroskedasticity Test: Glejser

F-statistic	28.83459	Prob. F(21,11)	0.0000
Obs*R-squared	32.41122	Prob. Chi-Square(21)	0.0532
Scaled explained SS	42.34480	Prob. Chi-Square(21)	0.0038

For the purpose of determining the extent to which the explanatory variables explain the variance in the explained variable, regression analysis was employed. The results of such analysis are narrated below (Table 5).

Table 5 Regression Results.

Dependent Variable: MSEs-e						
Variable	**Coefficient**	**Prob.**	Std. Error	**Hypothesis**	t-Statistic	**Conclusion**
α_0	2.667900	0.2612	2.326520		1.146734	
HH_1	0.052804	0.7024	0.136813	H_1 rejected	0.385956	Not significant
HH_2	-0.044544	0.4861	0.063102	H_2 rejected	-0.705903	Not significant
GW	0.564949	0.0302	0.247357	H_3 accepted	2.283943	Positive significant
GRDP	0.697563	0.0005	0.176431	H_4 accepted	3.953748	Positive significant
EDU	-0.326206	0.2924	0.304001	H_5 rejected	-1.073046	Not significant
R-squared						0.783538
Adjusted R-squared						0.744884
S.E. of regression						2.448630
Sum squared residual						167.8821
Log likelihood						-75.39124
F-statistic						20.27058
Prob(F-statistic)						0.000000
Durbin-Watson stat						2.081481

T test was used to determine the significance of the effect of each independent variable on the dependent variable. Based on the hypothesis, it is expected that partially a significant influence on the dependent variable on the real transform 0.05. The variable partially has a significant effect if the probability of each variable shows a number <0.05, which means that all independent variables (households with computers, households with internet access, electricity flow, GDP distribution and education), have significant influence on the dependent variable

DISCUSSION

The regression results show that not all independent variables have an impact on the use of e-commerce by MSEs as theoretically expected. Households that have computers (HH_1), the result is 0.7024> 0.05, which means that it is insignificant; so H_1 is rejected. This can be explained by the fact that e-commerce can also be done by a smartphone. In fact, smartphone is more flexible and can be taken anywhere, and it can be assumed that all MSE owners have smartphone as this has now become a necessity, no longer a luxury item. While in Indonesia, not all MSE owners especially peddlers, roadside food stall owners, small grocery store owners, small motorbike repair shop owners, and craftsmen do not have personal computers or laptops.

Likewise with the percentage of households that have access to the internet (HH_2), the result is 0.4861> 0.05, not significant, and therefore, H_2 is rejected. It is very likely that this variable does not have a positive and significant effect on the use of e-commerce by MSEs because the number of households in a region that have access to the internet or have wi-fi at home is not always directly proportional to the number of MSEs that use e-commerce. An MSE owner may have wi-fi at home but does not use e-commerce in marketing his/her products. On the other hand, a shop owner does not subscribe to wi-fi at home, but has wi-fi in his/her shop or utilizes wi-fi for free in public places, or for he/she buys a daily, weekly or monthly wi-fi package. So, actually the required variable in this particular case should not the number of households that have access to the internet but the number of MSEs owners who have internet access or wi-fi subscription, in which there is no data available at provincial level. An earlier study by Govindaraju and Chandra (2011) reveals a number of essential variables which have no significant influences as the barriers of e-commerce adoption by MSMEs. Therefore, they argued that these variables can be predicted as the factors that can support e-commerce adoption that need to further analysis. The variables are including internet services, e-commerce popularity among MSMEs, and security in using e-commerce. In other words, it is still an open question regarding the significant influence of the internet on the use of e-commerce by MSMEs, especially MSEs.

The effect of electricity flow to the consumer (GW) on the use of e-commerce by MSEs is positive and significant (0.0302 <0.05) as generally expected; so H_3 is accepted. During the Covid-19 pandemic (March-May/June) the Indonesian government required all schools and universities and companies in non-strategic sectors to close and school children and students learn and employees work from home. However, this 'anti-Covid impact' policy is not easy to carried out in remote and rather isolated regions where most households are poor, especially in the eastern part of the country, because besides the difficulty of accessing the internet there is also no electricity.

The effect of GRDP on the use of e-commerce by MSEs is positive and significant (0.005 < 0.05); so H_4 is accepted. Not only is the direction in accordance with the theory and the relationship is significant but it also has the largest coefficient value among the independent variables. This independent variable represents the market size, and the result may confirm that the market size is an important (if not the most important) factor in influencing an entrepreneur or business owner to use e-commerce. Market size is not only determined by the number of buyers but also by the number of traders or suppliers that automatically increase the level of market competition. And one way to stay in the market is besides improving the quality of goods or services but also improving marketing efficiency and effectiveness by using e-commerce system.

The importance of the market size is also supported by the following figures. Based on the 2016 Economic Census, the distribution of MSEs in all sectors in Indonesia that adopt e-commerce by province depicted in Figure 5 shows that MSEs using e-commerce are found mainly in Java island which consists of DKI Jakarta (the Capital City of Indonesia), the Province of Banten, the Province of West Java, the Province of Central Jawa, D.I. Yogyakarta, and the Province of East Java. Parts of Java with the highest proportion of

MSEs that use e-commerce are the Province of East Java with around 18.72 % of all MSEs adopting this technology in Indonesia, followed by the Province of West Java and the Province of Central Java with, 18.11 % and 15.41 %, respectively.

Figure 5 Percentage Distribution of Total MSEs Adopting e-commerce by Province, Indonesia, 2016
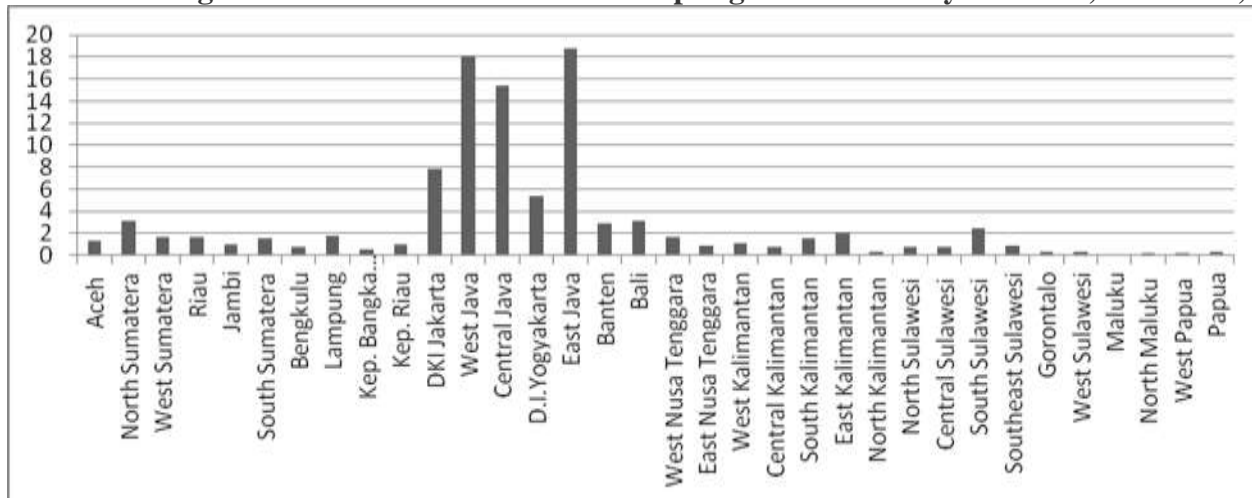
Java is the center of economic and financial activities in Indonesia with DKI Jakarta, the Province of Banten and the Province of West Java together as the largest region in Indonesian GDP, followed by the province of East Java and the province of Central Java. Also about 70 percent of the Indonesia population are found in this island. While, outside the Java Island, especially in the eastern region where many poor provinces are found, the percentage of MSEs using e-commerce is much lower. Provinces that have the lowest percentage in this region are Maluku with only 0.12 %, North Maluku with 0.16 %, and West Papua 0.19 %.

Further, Figure 6 shows the percentage of total MSEs that use e-commerce per province. For instance, in Java, the province with the highest percentage of MSEs using e-commerce is D.I Yogyakarta with near to 6 percent. In the second place is DKI Jakarta, the Capital city of Indonesia, with almost 4 percent. In some provinces outside Java, e-commerce usage rate of MSEs is also quite high, such as in Kep. Riau, Bali, and East Kalimantan, with almost 4 percent of total MSEs in these provinces.
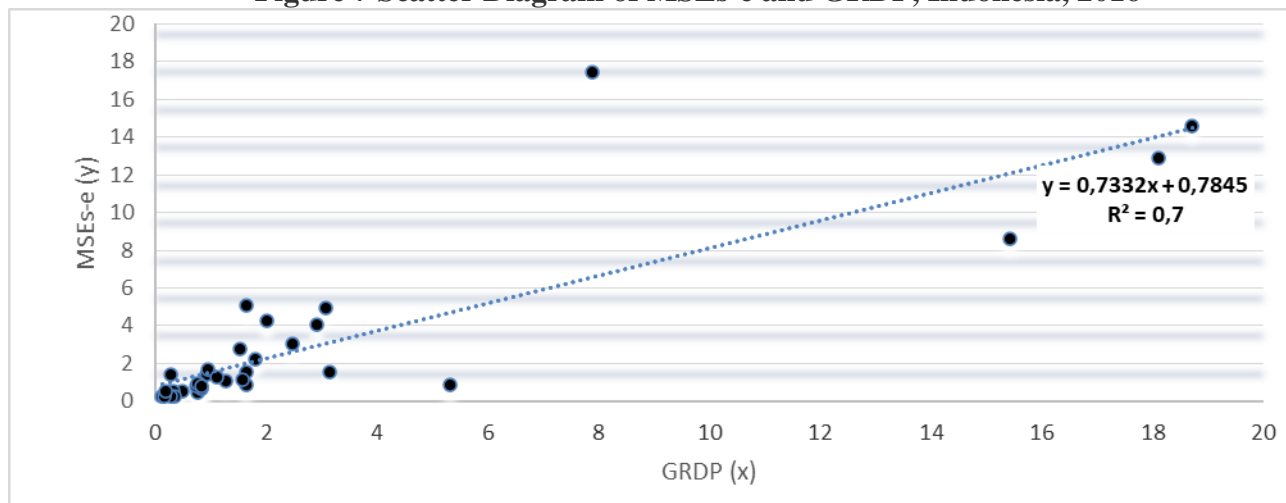
Figure 6 Percentage of MSEs adopting e-commerce per Province, Indonesia, 2016
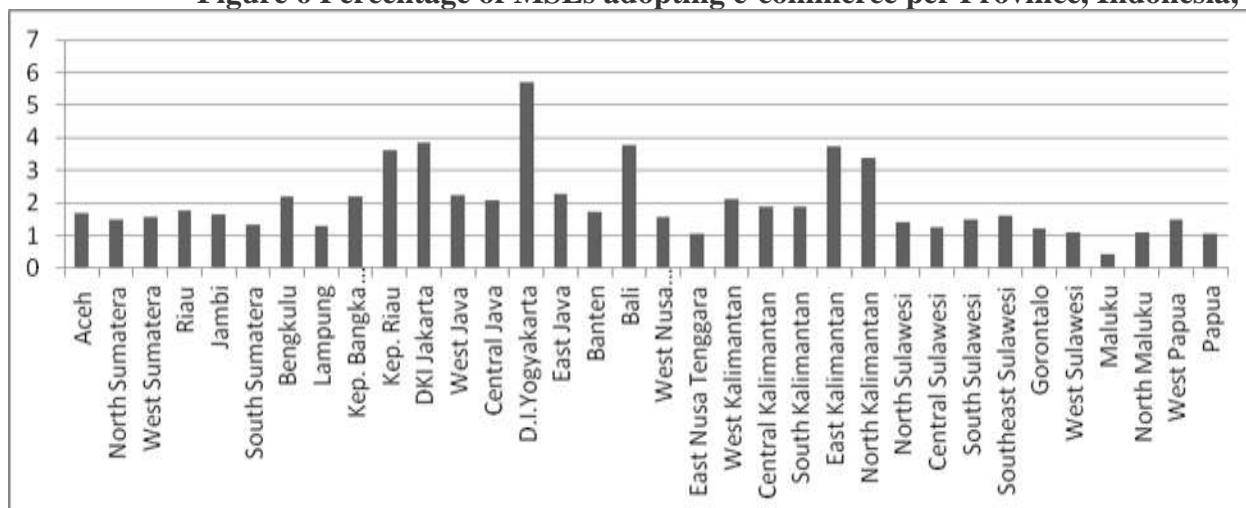
The scatter diagram of MSEs-e and GRDP shown in Figure 7 may provide a clearer picture of the relationship between MSEs-e and the market size, represented by provincial GDP

Figure 7 Scatter Diagram of MSEs-e and GRDP, Indonesia, 2016

$y = 0{,}7332x + 0{,}7845$
$R^2 = 0{,}7$

Source: BPS (2017).

Finally, the relationship between EDU and the use of e-commerce by MSE is not significant (0.2924> 0.05) and the coefficient is negative; so H_5 is rejected These results give the impression that conducting e-commerce does not affected by the level of formal education of the MSEs owners. In Indonesia, MSEs owners are generally poorly educated; in fact, most of them who are above 40 years old have only elementary school or those who are still in their 20s only have a high school diploma. With low education, it is difficult for them to find jobs in the formal sector, for example, as employees in a big company. Therefore, they are forced to open their own businesses. So, there is a kind of negative relationship between the level of education of MSE owners and the existence of MSEs.

CONCLUSION

This study outlines some significant findings on the e-commerce adoption by MSE owners /entrepreneurs in Indonesia. It shows at least three important facts. First, the degree of e-commerce adoption by MSEs in Indonesia is still very low. From the review of literature above, it reveals several explanations, which include their low understanding of the importance of ICT or e-commerce for their businesses, their mindset which is not in the favor of using ICT or adopting e-commerce, i.e. they prefer to do marketing with conventional methods, lack of human resource capacity, and lack of owners' innovativeness.

Second, there is a positive relationship between the size of economic activities or market in a province and the number of MSEs in the province using the Internet or e-commerce. One explanation is that in regions where market size is large represented by many buyers and producers, usually the market competition among MSEs themselves as well as between MSEs and larger companies and imported goods among is tight. Such market condition forces MSEs to be more aggressive and smarter in promoting as well as marketing their products, and for that, they must utilise the Internet/ICT or adopt e-commerce.

Third, in a region where all residents or households have a computer or access to the internet, it is not always that all business actors, especially MSEs, in that region utilize e-commerce technology. This suggests that there are other many other factors, as already discussed in the literature review or described in the theoretical framework, which are far more important in influencing the decision of an MSE owner or entrepreneur to change his/her marketing system from conventional to e-commerce usage.

LIMITATION AND FUTURE RESEARCH

However, this study which tried to impact of internal and external factors as explained in the conceptual framework of this study on the use of e-commerce by MSEs in Indonesia based on secondary data is not entirely successful. Lots of factors, especially from the category of entrepreneur, company, policy and supporting factors for which there are no province data.

Therefore, this research should be combined with primary data-based studies, that is data collected from interviews with MSEs owners/entrepreneurs. And to get an idea of the differences (if any) between provinces and between sectors, the field survey must cover MSEs in various sectors and provinces. In the sample selection procedure, the priority sectors should be trade, agriculture and manufacturing industries, because usually the majority of MSEs are in these three sectors. Whereas the priority provinces are one or two provinces with the highest percentage of MSEs using e-commerce (e.g. East Java and West Java provinces) and one or two provinces with the least number of MSEs using e-commerce (e.g. provinces Papua and West Papua provinces).

References

Ahmada, Syed Zamberi, Abdul Rahim Abu Bakarb, Tengku Mohamed Faziharudeanc and Khairul Anwar Mohamad Zakic (2015) 'An Empirical Study of Factors Affecting e-Commerce Adoption among Small- and Medium-Sized Enterprises in a Developing Country: Evidence from Malaysia', *Information Technology for Development*, Vol. 21, No. 4, pp. 555–572.

Azam, M.S. and Quadddus, M. (2009a) 'Adoption of b2b e-commerce by the SMEs in Bangladesh: an empirical analysis', paper presented at the Asian Business Research Conference, 11-12 April, Dhaka.

Azam, M.S. and Quaddus, M. (2009b) 'Adoption of e-commerce by the SMEs in Bangladesh: the effects of innovation characteristics and perceived risk', paper presented at the Australian and New Zealand Marketing Academy Conference, 30 November - 2 December 2009, Melbourne, Victoria.

Bakos,Y. and Brynjolfsson, E. (2000) 'Bundling and Competition on the internet', *Marketing Science*, Vol. 19, No. 1, pp. 63– 82.

Balakrishnan, Anita and Julia Boorstin (2017) 'Instagram says it now has 800 million users, up 100 million since April', 25 September, CNBC.Com [online] https://www.cnbc.com/2017/09/2 5/how-many-users-does-instagram-havenow-800-million.html (accessed 3 October 2018).

Barry, H. and Milner, B. (2002) 'SME's and Electronic Commerce: A Departure from the Traditional Prioritisation of Training?', *Journal of European Industrial Training*, Vol. 25, No. 7, pp. 316–326.

Blackburn, R. and Athayde, R. (2000) 'Making the connection: the effectiveness of internet training in small businesses', *Education and Training*, Vol. 42, No. 4/5, pp. 289-299.

BPS (2017) *Analisa Ketenagakerjaan Usaha Mikro Kecil*, Sensus Ekonomi 2016. Analisa Hasil Listing, November, Jakarta: Badan Pusat Statistik Nasional.

Chong, S. and Pervan, G. (2007) 'Factors Influencing the Extent of Deployment of Journal of Electronic Electronic Commerce for Small and Medium Sized Enterprises', *Commerce in Organizations*, Vol.5, No. 1, pp. 1-29.

Eva, A.M.S. (2007) 'Persepsi Penggunaan Aplikasi Internet untuk pemasaran produk usaha kecil menengah', paper presented at The National Seminar on Information Technology Application, 16 June, Yogyakarta [online] https://journal.uii.ac.id/Snati/article/view/1719 (accessed 11 May 2020).

Fallon, M. and Moran, P. (2000) 'Information Communications Technology (ICT) and manufacturing SMEs', paper presented at the 2000 Small Business and Enterprise Development Conference, 10-11 April, University of Manchester, Manchester.

Govindaraju, R. and Chandra, D.R. (2011) 'E-commerce adoption by Indonesian Small, Medium, and Micro Enterprises (SMMEs): analysis of Goals and Barriers', paper presented at the IEEE 3rd International Conference on Communication Software and Networks, 27-29 May, Xi'an [online] https://www.semanticscholar.org/paper/E-commerce-adoption-by-Indonesian-small%2C-medium%2C-of-Govindaraju-Chandra/bff63933e9281fd4cb2feb6047aa7bb25ff63b80 (accessed 10 May 2020).

Hafied, N. (2007) 'Adoption of E-commerce for small and medium enterprises: A case study of rural banks in the Depok city, Thesis Program Magister Teknologi Informasi, Universitas Indonesia, Depok [online] http://lib.ui.ac.id/detail?id=126301&lokasi=lokal (accessed 11 May 2020).

Jones, P., Packham, G., Beynon-Davies, P., and Pickernell, D. (2011) 'False promises: E-business deployment in Wales' SME community', *Journal of Systems and Information Technology*, Vol. 13, No. 2, pp.163–178.

Julianto, P.A. (2016) 'Pemerintah Targetkan 44 Juta UMKM Pasarkan Produk Lewat Internet', *Kompas Newspaper*, 18 June [online] http://ekonomi.kompas.com/read/2016/06/18/ 111218426/pemerintah. targetkan. 44.juta. umkm.pasarkan.produk.lewat.internet (accessed 24 November 2017).

Matlay, H. (2000) 'Training in the Small Business Sector of the British Economy', in Carter S. and Jones D. (eds.), *Enterprise and Small Business: Principles, Policy and Practice*, Addison Wesley Longman, London.

Migiro, S.O. (2006) 'Diffusion of ICTs and E-commerce adoption in manufacturing SMEs in Kenya', *South African Journal of Library and Information Science*, Vol.72, No. 1, pp. 35-44.

Neale, J., Murphy, J. and Scharl, A. (2006) 'Comparing the Diffusion of Online Service Recovery in Small and Large Organizations', *Journal of Marketing Communications*, Vol.12, No.3, pp, 165-181.

Poon, Simpson and Paula Swatman (2005) 'Small business use of the Internet: Findings from Australian case studies', *International Marketing Review*, Vol.14, No.5, pp. 1-15.

Poorangi, Mehdi M and Edward W.S. Khin (2013) 'Strategic Alliance on Malaysia SMEs to compete globally. Endogenous and exogenous prospective', *Actual Problem of Economics*, Vol.3, No.141, pp. 407-415.

Poorangi, Mehdi M., Edward W.S. Khin, Shohreh Nikoonejad and Arash Kardevani (2913) 'E-commerce adoption in Malaysian Small and Medium Enterprises Practitioner Firms: A revisit on Rogers' model', *Anais da Academia Brasileira de Ciências*, Vol.85, No.4, pp. 1593-1604.

Rahayua, Rita and John Daya (2015) 'Determinant Factors of E-commerce Adoption by SMEs in Developing Country: Evidence from Indonesia', *Procedia - Social and Behavioral Sciences*, No.195, pp.142 – 150.

Riquelme, H. (2002) 'Commercial Internet Adoption in China: Comparing the Experience of Small, Medium and Large Business Internet Research', *Electronic Networking Applications and Policy*, Vol.12, No.3, pp. 276–286.

Saffu, K., Walker, J. H., and Hinson, R. (2008) 'Strategic value and electronic commerce adoption among small and medium-sized enterprises in a transitional economy', *Journal of Business & Industrial Marketing*, Vol.23, No.6, pp, 395–404.

Shih, H. (2008) 'Contagion effects of electronic commerce diffusion: Perspective from network analysis of industrial structure', *Technological Forecasting & Social Change*, Vol.75, No,1, pp.78–90. DOI 10.1016/j.techfore.2006.10.002.

Suhartanto, Dwi and Gundur Leo (2018) 'Small business entrepreneur resistance of ICT adoption: a lesson from Indonesia', *International Journal of Business and Globalisation*, Vol. 21, No. 1, pp.5-18 DOI: 10.1504/IJBG.2018.10015253.

Triandini, Evi, Arif Djunaidy, and Daniel Siahaan (2013), 'Factors Influencing E-Commerce Adoption by SMES Indonesia: A Conceptual Model', *Lontar Komputer*, Vol.4, No.3, pp. 301-311 [online] https://ojs.unud.ac.id/index.php/lontar/article/view/16727 (accessed 10 May 2020),

Vidi, V. (2006), 'Analysis of factors affecting the adoption of electronic commerce and company (Study on small and medium company in Indonesia)', Thesis of Management Magister Program, Universitas

Diponegoro, Semarang [online] file:///C:/Users/USER/Downloads/Documents/Vidi_Arini _Yulimar.pdf (accessed 11 May 2020).

Zaied, Abdel Nasser H. (2012) 'Barriers to E-Commerce Adoption in Egyptian SMEs', *Information Engineering and Electronic Business*, No.3, pp.9-18 [online] https://www.researchgate.net/publication/272854426_Barriers_to_E-Commerce_Adoption_in_Egyptian_SMEs (accessed 10 April 2020).