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Determinant Factors of E-commerce Adoption by SMEs in Developing Country: Evidence from Indonesia

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Abstract

The aim of this study is to investigate those factors that influence SMEs in developing countries in adopting e-commerce. This study is motivated by the fact that the adoption of e-commerce by SMEs, especially in developing countries, is still very far behind the adoption by large companies. Yet to be able to survive in the new economic era, which is the information era; businesses, including SMEs, are forced to adopt e-commerce. Non-adopters will be left behind by the adopters. In addition, studies regarding e-commerce adoption by SMEs are rarely found. Therefore, the results of this study provide a timely understanding of e-commerce adoption by SMEs in developing countries.

The model developed in this study is based on the TOE framework. Eleven variables are proposed as the factors that influence SMEs in adopting e-commerce. These are organized into four groups, namely: technological factors, organizational factors, environmental factors and individual factors. Based on a survey of 292 Indonesian SMEs, it was found that perceived benefits, technology readiness, owners' innovativeness, owners' IT ability and owners' IT experience are the determinant factors that influence Indonesian SMEs in their adopting e-commerce.

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Keywords: E-commerce, SMEs, developing countries

1. Introduction

It is undeniable that e-commerce has changed many things in the business; it not only has changed the way they sell, purchase or deal with their customers and suppliers but it has also changed the business perspective from “production excellence” to “customer intimacy” (Macgregor & Vrazalic (2005) and from being “agent of seller” to being “agent of buyer” (Achrol & Kotler, 1999), and the business focus from physical goods alone to a service, information and intelligence focus (Rayport & Jaworski, 2001). As a result, the new economy era - the information era - has been created.

To be able to survive in the new economy businesses, including SMEs, are pushed to adopt this technology. Those businesses who do not adopt this philosophy and practice will be left behind by adopters. Furthermore, it was mentioned by Jerry Jasinowski, President of the US National Association of Manufacturers, in the Wall Street Journal that “small firms need to get in the e-commerce game or they are going to be shut out of a critical part of the marketplace” (Shah Alam, Ali, & Mohd. Jani, 2011). Therefore, it is not surprising that many parties, including governments, pay great attention to encouraging SMEs to

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adopt this technology.

Governments in many countries give considerable attention to the adoption of e-commerce by SMEs through issuing policies and regulations to assist them to adopt information technology; for example, in Australia, several programs and ICT policies, such as *The Building on IT Strengths (BITS) Incubator program*; *the National Technology Online program (ITOL)*; *the Business Entry Point* (www.business.gov.au); and *the online Business Resources Facility*, have been undertaken in order to widen e-commerce use in SMEs (OECD, 2002). In the United Kingdom, *The UK Online for Business and Wales Information Society (WIS) initiatives* were introduced in order to assist SMEs in e-commerce adoption (OECD, 2002). Similar programs are also found in countries such as Austria with the “*Let’s e Biz*” program; Finland with the “*eASKEL*” program; the Netherlands with “*Netherland go Digital*” program; Sweden with the “*SVEA*” program; Luxembourg with the “*APSI/CRP-HT Guide*” program; and Ireland with “*PRISM initiative*” program (OECD, 2002).

Despite this great attention by the government, the adoption of e-commerce by SMEs is still far behind the adoption of e-commerce by large companies (Chiliya, Chikandiwa, & Afolabi, 2011; Chong, 2008; Grandon & Pearson, 2004; Kartiwi & MacGregor, 2008; Long, Lan, & Duong, 2011; Shah Alam et al., 2011). This raises the question as to what are the precise factors that influence SMEs in their adoption of e-commerce. The answer is important as it is widely known that the SMEs in any country in the world play an important role in economic development. They make a significant contribution not only in terms of their number but also in terms of employment provision (Kotelnikov, 2007). They are recognized as a driver of economic growth and innovation (Kotelnikov, 2007) whilst they also contribute to household income and welfare; self-confidence and empowerment of the individual; social change, political stability, and democracy; and distributional or developmental objectives (Liedholm & Mead, 1999). In developing countries, the roles of SMEs become more meaningful especially in respect of reducing poverty and unemployment (Kotelnikov, 2007). As a result, the appropriate and effective development of SMEs will yield a significant impact on the economic development of a country.

It cannot be denied that there have been studies conducted regarding e-commerce adoption by businesses, however most of these focus on large companies and in developed countries (Williams, Dwivedi, Lal, & Schwarz, 2009; Daniel & Grimshaw, 2002). Studies that focus on SMEs in developing countries are rarely found. As commonly known, there is a difference between developing countries and developed countries. These differences are not only from an economic standpoint, but they also concern political, environmental and social as well as cultural factors. Therefore, research findings obtained from developed countries cannot be applied directly to developing countries. Similarly, large companies are also different to small companies. SMEs are not just ‘a little big business’ (Walsh & White, 1981), and so, because of their size, they exhibit unique features and behaviours such as centralized management control and decision making, being more likely to be risk averse, lacking resources and only having a limited share of the market (MacGregor & Vrazalic, 2007), all of which make it difficult for the SME to apply ‘large company’ strategy and especially an e-commerce strategy developed initially to fulfil the need of large businesses in developed countries.

The situation outlined above is the reason for this study to investigate those factors that influence *SMEs in developing countries* in adopting e-commerce. In this regard, Indonesia was chosen as the place in which the research was conducted. Firstly, Indonesia is one of the developing countries in Asia, and recognized as having the 4th largest population in the world. It also has the largest geographical area in Southeast Asia. Therefore, Indonesia might reflect other developing countries in Asia, particularly in Southeast Asia. Secondly, Indonesia is also recognized as the biggest archipelago country in the world, consisting of more than 13 million islands. Like any other country in the world, SMEs form over 95% of all businesses in Indonesia. The sheer size of the population and vast territory being good reasons for businesses in Indonesia to adopt e-commerce, especially SMEs. However, as commonly found in most developing countries, the adoption of e-commerce by Indonesian SMEs is still lagging behind when compared to SMEs in developed countries (Kartiwi & MacGregor, 2008).

2. Literature Review and Hypotheses

2.1 Theoretical Foundation in E-commerce Adoption Research

The extant e-commerce literature offers several theories to investigate the determinant factors of e-commerce adoption by SMEs. The five most commonly used are the Theory Reasoned Action (TRA); the Theory of Planned Behavior (TPB); the Technology Acceptance Model (TAM); The Diffusion of Innovation Theory (IDT); and the Technological, Organizational and Environmental Framework (TOE).

TRA was initially developed by Fishbein and Ajzen (1975). According to this theory, an individual’s behavior is highly determined by the intention of the individual to perform the behavior, and this intention is jointly affected by two factors, which are attitude toward behavior and subjective norm (Davis, Bagozzi, & Warshaw, 1989). This theory was criticized by Ajzen (1991) due to the model being unable to compromise in a situation in which the individual is not under volitional control. In addition, the predictive power of this model is also limited when applied to a situation in which actual behavior and intention are highly correlated (Yousafzai, Foxall, & Pallister, 2010). Based on these criticisms, Ajzen (1991) repaired the limitation of TRA by developing the Theory of Planned Behavior (TPB). In TPB, Ajzen (1991) added new constructs called perceived behavioral control (PBC). Hence, there are three factors that influence the intention to perform a certain behavior, which are attitude toward behavior, subjective norm and perceived behavioral control. However, according to Yousafzai et al. (2010) both TRA and TPB

still assume that there is closeness between intention and behavior, so the predictive power of this model is still weak if it applied in a situation in which intention and behavior are highly correlated. Moreover, Yousafzai et al. (2010) also criticize this model for ignoring, or not including, several factors that can increase predictive power, such as personal norms and affective evaluation of behavior.

The TAM model developed by Davis (1989) provides a model that is pointedly intended to explain an individual behavior regarding computer use. This model was formulated based on the TRA framework. In this theory, the actual behavior is highly determined by behavioral intention, and the behavioral intention is jointly determined by 'attitude toward' and perceived usefulness. Besides determining the behavioral intention, perceived usefulness together with ease of use also affect attitude (toward). This extension of the model is not without its critics, El-Gohary, (2012) argues that it ignores the effect of several important factors that come from both within and outside of the organization.

Different to the previous theories above which focus more on the individual perspective, is the innovation diffusion model with a greater focus on a 'process-oriented' perspective in order to describe how an innovation can be received and dispersed between people (Yu & Tao, 2009). Originally, the Innovation Diffusion (ID) model was developed by Rogers (1983) based on broad psychological and sociological theory. In this theory, relative advantages, compatibility, complexity, trialability and observability are factors that determine the rate of adoption of innovation.

The Technology-Organization-Environment (TOE) framework was developed initially by Tornatzky, Fleischer, and Chakrabarti (1990) in order to describe the influence of contextual factors in adoption of an innovation. In this framework, there are three aspects of a firm's context that influence adoption of the technology innovation; these are technological context, organizational context, and external task environmental (industry) or as it more commonly called -environmental context. Technological context relates to both the internal and external technologies that are relevant to the firm, while organizational context pertains to the nature and the resources of the firm, which is proxied by firm size and the decentralization, formalization, and complexity of their managerial structure. Then, the environmental context refers to other parties surrounding the firm such as competitors, suppliers and government (Zhu et al., 2002).

From the theories above, the TOE framework is chosen as the theoretical basis for the development of our research model. This choice is based on several considerations. Firstly, the TOE framework has been widely recognized by previous studies as a well-established framework through which to study e-commerce adoption (Morteza, Daniel, & Jose, 2011; Ramdani, Chevers, & Williams, 2013; Salwani, Marthandan, Norzaidi, & Chong, 2009; Sila & Dobni, 2012; Zhu, 2004). Secondly, the TOE framework considers various contexts, not only focusing on technological contexts (such as IDT), but also considering organizational and environmental contexts. It is recognized that a model that covers many dimensions can provide better explanatory power than a model that only covers one dimension (Li & Xie, 2012; Molla & Licker, 2005). Thirdly, the TOE framework is recognized as a model that employs an interactive perspective that assumes that the changes in an organization are determined not only by individuals in organization but also by the characteristics of the organization in which they operate (Hameed, Counsell, & Swift, 2012). The interactive perspective allows the researcher to treat all of the factors and their interaction in one dynamic framework (Molla & Licker, 2005) and it is believed that this can explain IT innovation adoption comprehensively.

In spite of many positive opinions about the TOE, however, there are still criticisms addressed to this theory. One of these revealed by Ghobakhloo and Tang (2013) is that this model ignores factors related to individual attributes concerning employees and managers.

Therefore, in this study in addition to taking into account technological, organizational, and environmental contexts, we also consider those relevant factors related to the individual that affect SMEs adoption of e-commerce.

2.2 Factors that Influence SMEs in Adopting of E-commerce

Based on the discussion above, in this study those factors that influence SMEs in their adoption of e-commerce are categorized into four main categories: technological context, organizational context, environmental context and individual context.

a. Technological Context

The technological context refers to those aspects such as perceived benefit, compatibility, and cost, that influence the adoption of e-commerce technology. The perceived benefit refers to the degree of acceptance of the possible advantages that e-commerce technology can provide for the organization (Tiago & Maria, 2010; Iacovou, Benbasat, & Dexter, 1995). Greater managerial understanding of the relative advantages of e-commerce adoption raises the probability of that company allocating some resources, such as managerial resources, financial resources and technological resources, to adopting e-commerce technology. Then, compatibility refers to what extent e-commerce is appropriate with technology infrastructure, culture, value, and work practices that already exist in the firm (Morteza, Daniel, & Jose, 2011). An innovation will be easily accepted in an organization if it is tune in with the prevailing values of that organization, can meet the needs of organization and accords with

organization culture. Compatibility between organization policies and technology innovation will make the innovation easier to be pictured in a more familiar context (Rogers, 2003). In this study, cost is also considered as a factor that influences Indonesian SMEs in their adopting e-commerce. Usually, the less expensive the cost of a certain technology, the more likely it will be quickly adopted and implemented in an organization (Premkumar & Roberts, 1999; Tornatzky & Klein, 1982). Therefore, these explanations lead to the following hypotheses:

H1: *Perceived benefits positively influence the adoption of e-commerce by the SME*

H2: *Perceived compatibility positively influences the adoption of e-commerce by the SME*

H3: *Cost negatively influences the adoption of e-commerce by the SME*

b. *Organizational Context*

The organizational context refers to the characteristics of the firm that might influence the adoption of e-commerce technology. Technology readiness is one of the organizational contexts proposed in this study as a determinant factor that influences SMEs in adopting e-commerce. Technology readiness refers to what extent the technology infrastructure, relevant systems and technical skills in business can support e-commerce adoption (Zhu et al, 2006). Technology readiness consists of both technology infrastructure and IT human resources (Zhu & Kraemer, 2005) and both are really needed if the company wants to make e-business an integral part of the value chain (Tiago & Maria, 2010). Hence, the greater the technology readiness of an organization the more likely the organization adopts IT technology, and vice versa. Another factor in organizational context that is identified as a determinant factor of e-commerce adoption by SMEs is firm size. This is because firm size is related to the ability of business to provide certain resources, both financial and human resources. The larger the size of business means the greater its ability to provide certain resources, and the more likely the adoption of e-commerce technology. Thus, in this study it is hypothesized that:

H4: *Technology readiness positively influences the adoption of e-commerce by the SME*

H5: *Firm size positively influences the adoption of e-commerce by the SME*

c. *Environmental Context*

The environmental factor refers to external influences such as pressure from customers/suppliers, pressure from a competitor(s) and external support that influence e-commerce adoption. In this study, the customer/supplier pressure relates to the degree of pressure from customers/suppliers perceived by SMEs. In many cases, the customer/supplier has the power to pressure an SME to adopt a particular kind of technology. For example, multinational corporations often pushed their branches and suppliers to adopt e-commerce technology to link into their global production network. Wal-Mart has required and pushed its suppliers to use wireless tracking(RFID) technology (Li, Wang, Zhang, & Chu, 2010) as well as car manufactures in the US that required their suppliers to use EDI in their dealings with them (Iacovou et al., 1995). Therefore, the greater the pressure from trading partners perceived by the SME, the more likely they are to adopt certain technology innovation(s) in order to maintain their own competitive position (Duan, Deng, & Corbitt, 2012).

The competitor pressure refers to the extent of pressure from competitors within the industry as felt by the firm (Zhu & Kraemer, 2005). When competitors start to use e-commerce technology, firms will be shoved into adopting e-commerce technology more widely to obtain competitive advantages. Thus, the higher the level of competition within the industry, the more likely it is that greater e-commerce use will be achieved (Zhu & Kraemer, 2005).

Besides pressures from customer/suppliers and competitors, support from external parties such as government and IT vendors is also considered in this study as one of determinant factors of e-commerce adoption by SMEs. As commonly known, SMEs have limited resources; financial resources; and IT skills resources, and so support from the government through policies or rules that can protect the parties involved in the business transaction; regulation of the use of the internet to make it as a secure medium for transactions; provision of incentives for companies to use e-procurement (Zhu & Kraemer, 2005); or a support from IT vendor are all believed to drive business, especially SMEs, to adopt IT technology. Hence, these explanations lead to the following hypotheses:

H6: *Customers/suppliers pressure positively influences the adoption of e-commerce by the SME*

H7: *Competitor pressure positively influences the adoption of e-commerce by the SME*

H8: *External support positively influences the adoption of e-commerce by the SME*

d. *Individual Context*

In addition to the three contexts explained above, in this study individual contexts are also considered as determinant factors of e-commerce adoption by SMEs in developing countries. This is because mostly in SMEs a strategic decision is highly dependent on the manager/owner. Cloete, Courtney, and Fintz (2002) revealed that the e-commerce adoption by SMEs extensively depends on the acceptance of e-commerce technology by the owner of business. This is reasonable, because structurally SMEs tend to centralize, hence the owner/manager have an important role in any business decision making (Nguyen & Waring, 2013).

In this study, three individual contexts: owner innovativeness, owner IT experience and owner IT ability are identified as determinant factors that influence SMEs in adopting e-commerce. In this study, innovativeness refers to the degree to which a

person adopts innovation more quickly than others in the same social context (Marcati, Guido, & Peluso, 2008). A manager who tends to seek a solution by changing the structure where the problem is located is usually considered an innovative manager (Thong & Yap, 1995). It implies that the innovative manager prefers to search for a solution that has never been tried before and therefore is more risky. As a technology innovation, e-commerce also has risk, especially if it is applied in small business and even more in developing countries. Hence, the more innovative the SMEs owner, the more likely they have an intention to adopt an e-commerce application (Ghobakhloo & Tang, 2013).

In this study, owners' IT ability and experience are also identified as determinant factors of e-commerce adoption by SMEs in developing countries. As commonly known, insufficient IT skills is one common SME problem. If the SME owner has greater ability and greater experience with IT, they will be confident in adopting IT and it will reduce the uncertainty and risk in that technology adoption. In addition to this, it is also believed that user skill and knowledge can assist and increase the speed of technology adoption (Morteza et al., 2011). More importantly, it assumes that if manager/owner comprehends the function and advantages of e-commerce adoption, they may be more pleased to adopt such technology. Therefore, it is reasonable to hypothesize that:

H9: *Owners innovativeness positively influences the adoption of e-commerce by the SME*

H10: *Owners IT ability positively influences the adoption of e-commerce by the SME*

H11: *Owners IT experience positively influences the adoption of e-commerce by the SME*

3. Methodology

A survey method using an on-line questionnaire was employed. This was chosen in due to its advantages, namely: cheaper, better, faster, and easier than other methods (Ronald, 2002). The questionnaire was developed by reference to previous studies.

3.1. Sampling Method

Target respondents for this study were owner/managers of Indonesian SMEs. In this study, SMEs refers to a business which has less than 100 employees, assets less than IDR 10 billion and total sales per year below IDR 50 billion. In Indonesia, there is no centralized database that stores information about all SMEs in Indonesia. Most of data sources available in Indonesia come from the data which collected and stored by several parties, for example the Indonesian government via the Indonesian Ministry of Cooperative and Empowerment of Small Medium Enterprises (*Kementrian Koperasi dan Usaha Kecil Menengah Republik Indonesia*) or research institutes or private organization, who are interested in SMEs. Based on various data sources, 3,267 SMEs were chosen as sampling frame for this study and 292 SMEs participated in this study, a response rate of 8.9%.

3.2. Measurement

Independent Variables:

Perceived benefits were measured by using ten indicators, and most of the indicators are adapted from Morteza et al. (2011), Al-Qirim (2007) and Grandon and Pearson (2004). While seven indicators, adapted from Morteza et al. (2011), Al-Qirim (2007), Grandon and Pearson (2004), and Premkumar (2003) were used to measure perceived compatibility. Cost was measured by using four indicators adapted from Al-Qirim (2007) and Morteza et al. (2011). Technology readiness was measured using six indicators adapted from Molla and Licker (2005). Firm size in this study was measured by using three indicators, which were the number of employees, total sales and total assets. Customers/suppliers pressure and competitor pressure were measured by using, respectively, four and three indicators and these indicators were also used by Sila (2013), Morteza et al. (2011) and Al-Qirim (2007). External support was measured by using five indicators adapted from Morteza et al. (2011). Next, owner innovativeness, owners IT ability and owner IT experience were measured by using, respectively, four, five and four indicators, and these indicators were also used by Morteza et al. (2011), Al-Qirim (2007) and Thong and Yap (1995). All of the measures in this study employed 5 point Likert Scales, and all of these passed a reliability test requirement, with *Cronbach's Coefficient Alpha* value greater than 0.80.

Dependent Variable:

The dependent variable is e-commerce adoption which is proxied by the scope of e-commerce use by SMEs. According to Gibbs and Kraemer (2004:132), the scope of e-commerce use refers to "the extent of e-commerce use for a number of different activities in the value chain, from advertising and marketing to sales, procurement, service and support, data exchange with customers and suppliers, and integration of business process". In this case, respondents are asked about whether they used or did not use e-commerce technology in such activities. The scores (yes =1, no =0) were accumulated and this measure is adopted from the Gibbs and Kraemer (2004) study.

3.3. Results

To investigate the relationship between the independent variables with dependent variables, multiple regression analysis is used. Before conducting this analysis, tests concerning data outliers, multicollinearity, normality, linearity and homoscedasticity

were carried out to ensure the data used in this study met requirements of multiple regression analysis. The tables below present the multiple regression results.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.567 ^a	.321	.295	1.60914

Table 2: Anova

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	343.030	11	31.185	12.044	.000 ^b
Residual	725.011	280	2.589		
Total	1068.041	291			

Table 3: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1.925	.994		-1.936	.054
perceived benefits	.060	.023	.154	2.673	.008
compatibility	.025	.043	.031	.574	.567
cost	.043	.028	.092	1.554	.121
technology readiness	.114	.026	.294	4.476	.000
Firm size	.179	.140	.064	1.280	.201
Customers/suppliers pressure	.001	.034	.002	.026	.979
competitor pressure	-.023	.043	-.033	-.531	.596
external support	.030	.026	.069	1.171	.243
Innovativeness	.095	.038	.142	2.468	.014
IT ability	.169	.029	.349	5.928	.000
IT experience	.108	.053	.125	2.020	.044

From the table above, it can be seen that the adjusted R square value for the regression model is .295 (see Table One), which means that in this model 29.5% of variances on e-commerce adoption are explained by the independent variable collectively, and the significance value of the regression model is .00 (see Table Two) which means that independent variables involved in this model collectively have a significant correlation with the dependent variable, which is e-commerce adoption. From Table Three it can be seen that all independent variables, except competitor pressure, have a positive correlation with e-commerce adoption. However, among these variables, only five of them have a significance value below 0.05, which are perceived benefits, technology readiness, owners innovativeness, owners IT ability and owners IT experience, while the others have a significance value greater than 0.05. These reflect that among eleven variables proposed as determinant factors of e-commerce adoption by SMEs in this study, only five variables: perceived benefits, technology readiness, owners innovativeness, owners IT ability and owners IT experience, positively and significantly influence SMEs in Indonesia in their adoption of e-commerce. So in this study, H1, H4, H9, H10 and H11 are fully supported.

3.4. Analysis and Discussion

In this study the eleven variables grouped into four groups: technological contexts, organizational context, environmental contexts and individual contexts, are identified as determinant factors that influence Indonesian SMEs in adopting e-commerce technology.

a. Technological contexts

There are three variables identified in technological contexts in this study that influence Indonesian SMEs in adopting e-commerce, these are perceived benefits, perceived compatibility and cost. It was found in this study that the perceived benefit has a positive and significant correlation with e-commerce adoption, which means that the perceived benefit is one of determinant factors of e-commerce adoption by SMEs in Indonesia. Therefore, H1 in this study is fully supported. This finding is consistent with previous studies (Al-Qirim, 2007; Chong, 2008; Chwelos, Benbasat, & Dexter, 2001; Gibbs & Kraemer, 2004; Poon & Swatman, 1999; Raymond, 2001; Shah Alam et al., 2011).

Perceived compatibility also has a positive correlation with e-commerce adoption; however this correlation is not statistically significant. Therefore, H2 is not supported. This finding is not consistent with the findings of the El-Gohary (2012), Tan, Chong, Lin, and Eze (2009), and Grandon and Pearson (2004) studies, in which the perceived compatibility was a determinant factor of e-commerce adoption. One explanation for this result might be that SMEs, especially in Indonesia, do not have so many applications in their business, and so they do not worry about integrating their applications with the new one (Ramdani, Kawalek, & Lorenzo, 2009). Similarly, cost is also found not to have a significant correlation with e-commerce adoption. A possible explanation for this finding is because the price of hardware and software related to e-commerce technology is not really expensive for SMEs. As mentioned by Palvia, Means Jr. and Jackson (1994), the price of hardware and software has decreased rapidly (and continues to do so) due to the emergence of powerful personal computers (and now tablets etc.) alongside the availability of user friendly and ready to use software packages.

b. *Organizational Context*

Technology readiness and firm size which are classified as organizational context are identified in this study as determinant factors of e-commerce adoption by SMEs in Indonesia. However, based on the regression analysis, it is found that it is only technology readiness that has a positive and significant correlation with the e-commerce adoption, while firm size does not. Hence in this study, H4 is fully supported, while H5 is not supported.

This result indicates that the technology readiness is one of the determinant factors that influence SMEs in Indonesia in adopting e-commerce technology. This result is consistent with previous studies, such as Ramdani, Chevers, and Williams (2013); Tiago and Maria (2010); and, Iacovou et al. (1995). Even more so Zhu, Kraemer, and Xu (2006) found that technology readiness was the most critical factor in e-business adoption by business in developing countries.

On the other hand, it is indicated that the Indonesian SMEs do not recognize the firm size as a factor that influences them in adoption of e-commerce. A similar result was found also in Al-Qirim (2007), Al-Qirim (2005), Gibbs and Kraemer (2004). A possible explanation for this condition is because Indonesian SMEs are mostly still at a lower level in the adoption of e-commerce (Rahayu & Day, 2013), where most have just a static or interactive website or even just e-mail. This technology is certainly less expensive than other technologies such as EDI.

c. *Environmental contexts*

Three variables which are customers/suppliers pressure, competitor pressure and external support are classified as environmental contexts in this study, and these variables are identified as the factors that influence SMEs in Indonesia in adopting of e-commerce technology. However, based on the multiple regression analysis, none of the variables have a positive and significant correlation with e-commerce adoption. This result indicates that customers/suppliers pressure, competitor pressure and external support are not recognized by Indonesian SMEs as factors that influence them in adopting of e-commerce technology. Hence in this study, H6, H7 and H8 are not supported. A possible explanation for this condition is that majority of customers in Indonesia are recognized as an “online shopper with a conventional manner” (Panji, 2014), in which the customer visits online sites only to see product offered, and if they are interested, they place the order conventionally through telephone, fax or even face to face. As a result, business in general, SMEs in particular, are not compelled to apply a sophisticated technology or extended e-commerce technology.

d. *Individual contexts*

Owners' innovativeness, owners' IT experience and owners' IT knowledge, which are classified as individual contexts, are identified in this study as determinant factors that influence SMEs in Indonesia in adopting of e-commerce. The multiple regression analysis shows that all of these variables have a positive and significant correlation with the e-commerce adoption. Therefore, H9, H10 and H11 are fully supported. This is consistent with previous studies, such as Ghobakhloo and Tang (2013), Thi and Lim (2011), Ramdani et al. (2009), Al-Qirim (2007), Wymer and Regan (2005), Thong (1999), and Thong and Yap (1995).

4. Conclusion

Based on the explanations above, it can be seen that the adoption of e-commerce by SMEs in Indonesia is affected by several factors which are perceived benefits, technology readiness, owners' innovativeness, owners' IT experience and owners' IT ability. The result also shows that the individual factors play a significant role in adopting of e-commerce technology by SMEs in Indonesia. Particular lessons can be drawn for both SMEs as distinct from large business and for SMEs in developing as opposed to developed countries.

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