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The role of e-purchasing in government procurement fraud reduction through expanding market access

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A B S T R A C T

This study aims to analyze the effect of e-purchasing implementation on the reduction of fraud in government procurements in Indonesia. This study also analyzes the role of market access in mediating the effect of e-purchasing implementation on government procurement fraud. The study was conducted in all Procurement Service Units (ULP) of cities and districts in Indonesia. The questionnaires were sent electronically to 520 ULPs, but only 120 respondents could be used in this study. In analyzing data, the Structural Equation Modelling (SEM) was used with the support of the program Partial Least Square (WarpPLS 7.0) to examine the relationship between variables studied. The results show that the implementation of e-purchasing directly reduces the level of fraud in government procurements in Indonesia. Other findings of the study also indicate that the implementation of e-purchasing expands market access. The rise of market access in implementing e-purchasing will affect the level of frauds relating to procurement practices in the Indonesian government.

1. Introduction

Under the Digital Economy environment, governments across the globe are driven to carry out their roles to utilize internet technology aimed to provide better and more effective services for both government organizations and their citizens. In the Indonesian context, the Procurement Service Unit (ULP) is a unit formed across Ministries/Institutions/Other Agencies to facilitate procurement in procuring goods and services electronically (Zahra et al., 2017). The government can be directly involved in the use of e-commerce related to government-related business transactions so that it can affect the business environment in which business-to-business (B2B) transactions take place. Government agencies should be able to operate flexibly to take advantage of the efficiency gains that may result from the evolution of new business models. In the procurement of public goods and services, the government sector uses e-purchasing as a new technology in the field of government procurement. Governments are adopting new technologies for public procurement to achieve realized benefits for private sector companies. A prerequisite for the integration of new technologies in Government purchases is the analysis and improvement of existing business processes, systems and organizational structures of entities carrying out public procurement. The government procurement provides significant business opportunities for businesses to collaborate with the government (Michaelis et al., 2003; Loader, 2005). However, this is a challenge especially for SMEs business to find resources to be involved with the bureaucratic process and be disproportionately affected compared to larger suppliers (Glover, 2008). The access of SMEs related government procurement needs to be viewed in a broader context given the contribution of SMEs to the regional economy. Various studies have examined the challenges for SMEs in competing in public procurement and solutions (Bovis,

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1996; Erridge & Fee, 1998; Zheng et al., 2006; Glover, 2008). Several other studies reveal the success of SMEs in public sector procurement (Loader, 2005; Preuss, 2011). However, several other studies reveal the ineffectiveness of SMEs in the public procurement system (Fee et al., 2002; Loader, 2005; McKevitt & Davis, 2013). There is a lot of evidence that shows the low level of representation of SMEs in public procurement in the international scope (Glover, 2008; Harland et al., 2013, Zahra et al, 2021). Several challenges in the public procurement process become challenges for SMEs to supply the government procurement, including slow payments, unclear specifications, long and expensive bidding processes (Cabras, 2010) and concerns that tender prices must be low (MacManus, 1991; Michaelis et al., 2003). Additional challenges for SMEs also come from their limited resources. Electronic procurement of goods and services through e-purchasing can improve market access. Increased market access can result in healthy competition and increase the efficiency of the procurement process (Panayiotou et al., 2004; Zahra et al., 2017; Ajzen, 1985). With the e-purchasing system, orders are made by selecting items in the system which can reduce the possibility of errors. All tenders for the selection of government goods and services are carried out online via the internet so that the process is effective, efficient and transparent (Panayiotou et al., 2004). This indicates that e-purchasing indirectly supports transparency and healthy competition between providers of goods and services and for government officials, thereby reducing the intensity of direct meetings between suppliers of goods and services to the procurement committee in supporting the government to be free from corruption.

2. Theoretical Framework and Hypotheses

2.1 Public Procurement

Market access in e-B2B can be seen as a space where buyers can find new products and services where sellers can identify new market opportunities and find new customers, thereby lowering transaction costs for both (Panayiotou et al., 2004). Purchasing's role is to match buyers and sellers. Building a sustainable competitive advantage will be able to increase e-purchasing participation. E-procurement is a procurement process that refers to the use of the internet as a means of information and communication (Teo et al., 2009; Brandon-Jones & Silvestro, 2010; Zahra et al., 2017). There are several advantages of e procurement implementation as described by Teo et al. (2009). They are the direct benefits (increasing data accuracy, increasing efficiency in the procurement process, faster procurement processes, reducing administrative costs and reduced operating costs) and indirect benefits (e-purchasing makes procurement more competitive, improves customer service, and improves supplier relationships). Procurement in the public sector is different from procurement in the private sector. Public sector procurement is relatively large and complex. The objective of public sector procurements including various social topics and political goals (Tether, 1977). The government procurement system is also aimed at service accountability and transparency by using a complex contract system designed to protect the public interest (Rasheed, 2004). We can conclude that public procurement is an important activity for the government because it is large in scale so that it provides a wider role for society.

2.2. Fraud Triangle Theory & Fraud Diamond Theory

The Fraud Triangle Theory was initiated by Cressey (1953) after interviewing 250 people convicted of corruption. The interview was conducted within 5 *months. Cressey's conclusion is that "trust violators, when they conceive themselves as having financial problem which is non-shareable and have knowledge or awareness that this problem can secretly resolved by violation of position of financial trust. Also, they are able to apply their own conduct in that situation verbalizations which enable them to adjust their conceptions of themselves as trusted persons with their conceptions of themselves as users of the entrusted funds or property."* There are three key words in the above conclusion. They are existence of non-shareable financial problems, the existence of opportunity to commit violation, and rationalization. These three things underlie the fraud triangle theory, namely stating that the three causes of corruption are perceived pressure/incentive/motive, perceived opportunity, and rationalization.

2.3 Hypotheses

The previous studies explain that the role of e-procurement has an impact on budget savings as well as a means of reducing space for perpetrators of fraud (Croom & Brandon-Jones, 2005; Panda et al., 2010; Pathak et al., 2009). In addition, the implementation of e-procurement has a significant effect on fraud prevention which has an impact on procurement that is effective, efficient and integrated (Panayiotou et al., 2004; Brandon-Jones & Silvestro, 2010; Zahra et al., 2021). Based on the description above, the following hypothesis regarding the effect of e-purchasing on fraud is formulated as follows:

H_1: *E-purchasing has a negative effect on fraud in government procurement of goods and services.*

Theory of planned behavior Ajzen (1985) states that if a negative behavior is made as difficult as possible to implement, the behavior will be less likely to be realized. One example of negative behavior is limiting market access only to groups. Control beliefs in the form of implementation of information technology can be used to control these negative behaviors. Humans are made difficult to limit market access with control beliefs in the form of information technology because they are monitored by many parties, so that they voluntarily or are forced to only have the option to open the widest possible market access. The

higher the level of difficulty in limiting market access, the greater the tendency for the behavior to open market access. Several studies have provided evidence that the implementation of information technology improves market access. The implementation of e-government technology in the United States increases accessibility (Tolbert & Mossberger, 2006). The implementation of e-tendering at the Ministry of Finance increases market access and fair business competition (Nasution, 2012). The implementation of e-tendering in the Pontianak City Government increases market access and fair business competition (NIM, 2015). Finally, market access and healthy business competition after the implementation of e-purchasing is better than market access and healthy business competition before e-purchasing according to provider perceptions (Rizkiani, 2017). Therefore, the hypothesis regarding market access is formulated as follows:

H_2: *E-Purchasing has a positive effect on market access for government procurement of goods/services.*

Fraud diamond theory explains several indicators that trigger people to commit fraud, including challenges to defeat the system (pressure), for the good of the organization (rationalization), then those related to opportunity are the weakness of the board of directors, inadequate internal control, the ability to obscure fraud, lack of controls to prevent fraudulent behavior, lack of access to information and lack of audit trail. In the process of procuring government goods/services through e-purchasing, increasing access to information can increase the transparency of the procurement process, thereby increasing internal control in the procurement process which in turn will prevent fraudulent behavior in the process of procuring goods and services. Access to information that encourages expansion of market access can also reduce the capability to commit fraud in procurement. In addition, the high control system in the procurement process that increases the efficiency of the procurement process is also a factor in preventing fraudulent acts in the procurement of government goods/services. The involvement of SMEs in the procurement of government, especially local SMEs in the local government, will have an impact on the growth of SMEs in that area and will also have impact on the transparency and efficiency of the government procurement process because the wider the market of government procurement will be more transparency of the process of government procurement (Zahra et al., 2021). The size of the market for government procurement will also increase efficiency because local governments can compare prices among suppliers based on existing bids (Zahra et al., 2021). Based on the description above, the following hypothesis regarding the effect of market access on fraud is formulated as follows:

H_3: *Market access has a negative effect on fraud in government procurement of goods/services.*

3. Research Method

This research was conducted in all Procurement Service Units (ULP) in cities and districts in Indonesia. The questionnaires were sent electronically to 520 ULPs, but only 120 respondents could be used in this study. There are several variables in this study, including E-Purchasing (EP), Procurement Fraud (F) and Market Access (MA). Every Construct in this study was measured using a 5-point Likert-type scale. Methods of data analysis used in this research is by using analysis of Structural Equation Modelling (SEM) by using the program Partial Least Square (PLS) to examine the relationship between variables. PLS evaluation model based on measurement predictions that have the nature of non- parametric. Then, under certain conditions, PLS works with a relatively small sample size (Ghozali & Latan, 2014).

4. Data Analysis and Discussion

Factor Loadings, Composite reliability coefficients and Average variances extracted are indicators of validity and reliability on latent variables. The composite reliability for all constructs in this study are above 0.70 and Cronbach's alpha is above 0.7. This result indicates that the instrument used to measure the variables has good reliability. There are two criteria to assess whether the outer model meets the convergent validity requirements for a reflective construct, firstly (1) the loading must be above 0.70 and secondly (2) the p value is significant (> 0.05) (Hair et al., 2021). However, the loading factor of 0.60-0.70 is still acceptable (Ghozali & Latan, 2014).

The results show that all the indicators of the fraud construct (F1, F2, F3, F4, F5, F6, F7, and F8), all the indicators of the e-purchasing construct (EP1, EP2, EP3, EP4 EP5, EP6, EP7, EP8, EP9 and EP10), and all market aspect construct indicators (MA1, MA2, MA3, and MA4) have loading values greater than 0.60. These results indicate that these indicators have good convergent validity with a significance of <0.01. Research instruments that have met the elements of convergent validity indicate that the instrument is able to collect data with the same pattern to measure the same construct. The discriminant validity in this study was obtained by the Average variances extracted (AVE) score. The results show that the AVE score of all constructs have scores above 0.5. These results indicate that each construct has good descriptive validity. Analysis of structural models was done with WarpPLS 7.0 shows the results of full Structural Equation Modelling as follows:

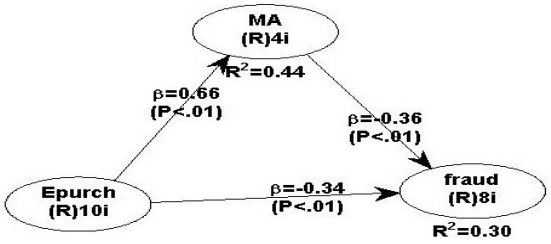

Fig. 1. Output of WarpPLS 7.0 - Full Model

Measurement of model fit shows output model fit with APC value = 0.457, p <0.001, ARS = 0.373, p<0.001, AARS = 0.365, p< 0.001, AVIF = 1.054, (acceptable if <= 5, ideal <= 3.3) and AFVIF = 1.165, (acceptable if <= 5, ideally <= 3.3). The WarpPLS provisions state that the value of ρ for APC and ARS must be less than 0.05 (significant). AVIF and AFVIF values as indicators of multicollinearity must be smaller than 5. Referring to these provisions, it can be concluded that the model of this study is fit.

Table 1
Path Coefficients, ρ-Value, Indirect Effect, Total Effect-Full Model

Path	Coefficients	ρ-value
EP → F	- 0.34	<0.001
EP → MA	0.66	<0.001
MA → F	-0.36	<0.001
Indirect Effect	Coefficients	ρ-value
EP → F	-0.241	<0.001
Total Effect	Coefficients	ρ-value
EP → F	-0.584	<0.001
EP → MA	0.665	<0.001
MA → F	-0.362	<0.001

Fig. 1 and Table 1 show the path coefficient and the ρ value of each direct relationship in the research model. Path of EP → F shows the coefficient value -0.34 and significant with the value ρ = <0.001. The result indicates that E-purchasing (EP) has a negative effect on Procurement Fraud (F) and the hypothesis is statistically supported with a p value <0.001. The result describes that implementation of e-purchasing reduces the level of fraud in government procurement. These results support the previous studies about e-procurement's impact on fraud (Croom & Brandon-Jones, 2005; Panda et al., 2010; Pathak et al., 2009; Vaidya et al., 2006).

Path of EP → MA shows the coefficient value 0.66 and significant with p value <0.001. The result indicates that E-purchasing (EP) has a positive effect on Market Access (MA) and the hypothesis is statistically supported with a p value <0.001. The results describe the implementation of e-purchasing to expand market access. E-purchasing implementation requires involving local suppliers to participate in local government procurement. The implementation of e-purchasing also opens a wide range of opportunities for suppliers to offer goods and services for government procurement. This result supports the previous studies about e-procurement's impact on market access expanding (Tolbert & Mossberger, 2006; Nasution, 2012).

Path of MA → F shows a coefficient value of -0.36 and is significant with the value of ρ <0.001. The result indicates that Market Access (MA) has a negative effect on procurement Fraud (F) and the hypothesis is statistically supported with a p value <0.001. The result describes that the market access expanding can reduce the level of fraud in government procurement. The market access expansion has consequences on fair competition among government procurement suppliers that will reduce the level of procurement fraud in the Indonesian Government.

According to table 1, there is an indirect effect between E-Purchasing (EP) and Procurement Fraud (F) that is mediated by Market Access (MA). This path coefficient value is -0.241 and significant with the value of ρ <0.001. This result is statistically supported with a p value <0.001. The results of this study indicate that market access can mediate the negative relationship between e-purchasing implementation and procurement fraud. This indicates that the implementation of e-purchasing can expand market access for government procurement in Indonesia. The market access expansion has consequences on fair competition among government procurement suppliers that helps to reduce the level of fraud in government procurement in Indonesia.

5. Conclusion, Implication, Suggestion and Limitation

This study has two main objectives. The first is to analyze the effect of e-purchasing implementation on reducing fraud in Indonesian government procurement. Secondly, it analyzes the role of market access in mediating the effect of e-purchasing implementation on government procurement fraud. The research was conducted in all Procurement Service Units (ULP) in cities and districts in Indonesia. The questionnaires were sent electronically to 520 ULPs, but only 120 respondents could be used in this study. The data analysis uses analysis of Structural Equation Modelling (SEM) by using the program Partial Least Square (WarpPLS 7.0). The implementation of e-purchasing directly in reducing the level of fraud in government procurement in Indonesia. The implementation of e-purchasing expands market access. E-purchasing implementation requires involving local suppliers to participate in local government procurement. The implementation of e-purchasing also opens a wide range of opportunities for suppliers to offer goods and services for government procurement.

The market access expansion reduces the level of fraud in government procurement in Indonesia. The market access expanding also mediates the negative relationship between e-purchasing implementation and procurement fraud. The market access expansion has consequences on fair competition among government procurement suppliers that helps to reduce the level of fraud in government procurement in Indonesia. This finding has implications for expanding market access for government procurements.

The suggestion that can be given to the government is the involvement of MSEs in the realization of government spending through the government procurement system of goods/services. This can encourage the progress of MSEs as the basis for main market access in the society.

One way for the government to assist MSMEs in reaching their full potential is through a public procurement system (Puddephatt & Kaspar, 2012). SMEs can become providers for the procurement of goods and services in the government sector so that they can help SMEs businesses as well as absorb the government goods/services spending budget. However, the entry of MSMEs to compete as providers of government procurement is often hampered by factors such as corruption, complicated bureaucracy and a lack of transparency in the procurement system. Lack of resources and capital to achieve the quality of goods/services that are standard government spending specifications is also an inhibiting factor for the involvement of MSMEs in the procurement of government.

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