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ASSOCIATION OF INNOVATION AND ENTREPRENEURIAL ORIENTATION ON SME PERFORMANCE: THE CASE OF SOC TRANG PROVINCE VIETNAM

Tu Van Binh[1+]
Ngo Giang Thy[2]
Pham Minh Vu[3]
Huynh Dang Khoa[4]
Nguyen Dinh Thong[5]

[1,3]*University of Economics, Ho Chi Minh City and CFVG, Vietnam.*
[1]*Email: tuvanbinh@gmail.com Tel: +84938825815*
[3]*Email: vuminhpham@cfvg.org Tel: +84984926984*
[2]*Nguyen Tat Thanh University, Vietnam.*
[2]*Email: ngogiangthy@gmail.com Tel: +84937842825*
[4,5]*University of Economics, Ho Chi Minh City, Vietnam.*
[4]*Email: khoa.huynh.d@gmail.com Tel: +84904050256*
[5]*Email: dthongtg@gmail.com Tel: +84907150239*

(+ Corresponding author)

ABSTRACT

Quantitative results derived by Extended Ordered Probit Model on 91 SMEs in Soc Trang province show the influential role of innovation and entrepreneurial orientation on the sales growth of enterprises. These two factors confirm their association is indispensable in the development of enterprises. In addition, the results also provide information on the significant contribution of endogenous variables in the model. Of which the application of information technology (IT) in the organizational administration is endogenous and contributes significantly to innovation and entrepreneurial orientation on SMEs performance, which the older SMEs are, the more interested they are in applying IT in the organizational administration. The finding is an important message for local SMEs who need to rethink the application of IT systems to corporate governance. It is also very useful reference information for local policymakers to create an approach that supports SMEs in developing innovation strategies and entrepreneurial orientation toward market integration.

Contribution/Originality: Through the quantitative model, the finding confirms the role of IT application in corporate governance in SMEs, creating dominant influence of innovation and entrepreneurial orientation on SMEs' sales growth. The result is an important message for local policymakers to think of innovation and entrepreneurial orientation for SMEs in emerging markets.

1. INTRODUCTION

The innovativeness of enterprises becomes more concerning for emerging countries. It is the process of change, which can be incremental or radical, and must be driven by the company. There are three key components to innovation: technology development, defining new markets and growth and transforming how an organization works (Davis, Bell, Payne, & Kreiser, 2010). Innovation is also driven by the company's need to stay competitive. This means if a company does not innovate, it will eventually die out. However, innovation will not be completely successful in the absence of entrepreneurial orientation (EO) in the enterprise (Ferreras-Méndez, Olmos-Peñuela, Salas-Vallina, & Alegre, 2021). This shows that innovation and entrepreneurial orientation are not inseparable for the long-term competitive strategy of the enterprise. Innovation without entrepreneurial orientation can cause waste, and if entrepreneurial orientation is taken care of while innovativeness is slow and inactive, it can lead to confusion and disorientation (Dibrell, Davis, & Craig, 2008).

According to the arguments of Bouncken, Cesinger, and Tiberius (2020) and Covin et al. (2020) behind the EO results not only reflect the direction of the top management, but also the strategic posture of the management's multiple layers to promote individual initiative and distributed entrepreneurship within the company. A relationship between EO and the firm's performance is complicated (Covin et al., 2020). Although there is evidence of a positive relationship between EO and the firm's performance, the endogenous effects on this relationship have not been studied in depth (Ahmeti, Ahmeti, & Aliu, 2022; Martens, Lacerda, Belfort, & De Freitas, 2016). So, this study is to re-test whether the existing relationship between EO and the firm's performance is or not for SMEs in the emerging countries, e.g. Vietnam. In addition, this study is also concerned to investigate how its association with EO influences the firm's performance, in which the application of information technology in SMEs to administer their business is concerned.

Doubts about the contribution value of EO based on innovation toward an increase in the firm's performance are still argued. Some of the criticism is related to the lack of a theoretical foundation and empirical evidence on how EO is implemented in terms of the enterprise's innovation (Covin & Wales, 2019). Several studies have warned that EO may be necessary but may not be sufficient for successful innovation (Ferreras-Méndez et al., 2021). Accordingly, this study will provide a theoretical contribution to the association between EO and innovation to cause positive changes in a firm's performance, especially for SMEs in the emerging markets.

Battor and Battor (2010) have arguments and evidence of organizational capabilities for the success of product innovation, in which firms' capabilities are awareness of customer needs and preferences. So this paper is a detailed approach to the organizational capability of SMEs, in which the application of information technology (IT) systems into the administration scheme of SMEs is taken into account as the endogeneity. This is a new point of study.

Based on the arguments mentioned above, the novelty of the study is in examining how each innovation and EO component affects the sales growth of SMEs in an emerging market through a quantitative model. In addition, the association of these two components, i.e. innovation and EO, is also explored to see how they related to SMEs' sales growth when the information technology application in organizational administration is dominated as the endogenous variable. The novelty of the current paper also answers how once the information technology application is taken into account SMEs will catalyze the relationship between the association of innovation, EO and sales growth. Testing results of the role of information technology applied in SMEs' organizations bring a theoretical contribution to how SMEs in emerging markets think of the role of information technology in the era of rapid development of the information technology industry.

The structure of the paper is separated into five sections with an introduction included. The second section presents the theory and hypotheses. The next section describes data collection and methods. The fourth section presents empirical analysis and results. The fifth is a presentation of discussion and conclusion of the study, in which theoretical implication, limitation and future research are included.

2. THEORY AND HYPOTHESES

A firm's innovation is a broad concept, but it doesn't rule out activities like R&D (Novkovic, 2015). In the study of Wang and Chung (2020) measures of innovation are based on increased features of product or services, service innovation, new product introduction, and improvement of product or service quality. Successful innovation is supported by an appropriate combination of external and internal knowledge (Gao, Xu, & Yang, 2008). Innovation often is advantageous for large-size firms due to their financial capability, but more disadvantages to SMEs (Ndesaulwa & Kikula, 2016).

EO is defined as a firm's willingness to innovate to dominate the market, take risks and improve ineffective products or services. It is evident in the firm's interest in starting business ideas in the marketplace. Once EO is appropriate, it effectively helps a firm's business to be more proactive than competitors in exploiting market opportunities (Miller, 1983).

The firm's performance can be pointed in measures of financial performance (Yoon & Chung, 2018) and market performance (Binh, 2016; Premaratne, 2001). Following up arguments of Aw (2002); Binh (2016) and Binh and Tien (2019) the market performance is employed in this paper, in which the percentage of sales growth of the current year as compared to the previous years is taken into account. This measure is transformed into the ordinal measure, in which 1 being the growth rate is less than 100% (low growth rate), 2 being the growth rate is 100% as unchanged growth rate, and 3 being the growth rate is more significant than 100% as the high growth rate.

2.1. Innovation and Firm Performance

There are many different types of innovation. Incremental innovations happen when a company introduces a new product or service with minor improvements over current products or services, these usually come from within the organization itself. An excellent organizational capacity causes the success of a firm's innovation leading to competition in the enterprise (Battor & Battor, 2010). Radical innovations happen when a company introduces a new product or service with significant improvements over current products or services. Evidence of innovation impacting the firm's performance is found in some studies, e.g. Keskin (2006) and Thornhill (2006). However, more or less innovation that the enterprise concerns depends on how the organization is structured (Battor & Battor, 2010). As a result, the hypothesis is claimed as below.

H1: Innovation significantly impacts the firm's performance through the contribution of organisational administration based on information technology application of SMEs.

2.2. EO and the Firm's Performance

There is a growing demand for entrepreneurial orientation among businesses (Miller, 1983) and Lumpkin and Dess (1996). Once EO is confirmed, firms have a chance to discover and exploit opportunities in the market. Entrepreneurial companies are created by entrepreneurs who exploit opportunities that satisfy unmet needs or offer new ways to do things better than what was done before.

As found by Wiklund and Shepherd (2003) the higher the innovation level, the better the company's performance, in which the firm knows how to bundle knowledge-based resources. Additionally, Keh, Nguyen, and Ng (2007) had a study on SMEs in Singapore to exam how the relationship between EO, marketing information and the firm's performance; they confirm a positive contribution of EO on a firm's performance. According to Tang, Tang, Zhang, and Li (2007) the impact of entrepreneurial orientation on a firm's performance is distributed by the mediator of ownership type of Chinese enterprises. Unlikely, this current paper employed the IT application in SMEs' administration as the endogeneity to test how this endogenous variable contributes to the relationship between EO and firm performance. As a result, the hypothesis is concerned as below.

H2: EO significantly impacts a firm's performance through the contribution of organisational administration based on IT application of SMEs.

3. DATA AND METHODS

3.1. Data Collection

Data are collected based on a survey conducted in Soc Trang province. The survey questionnaire design is based on references from the author's previous studies, e.g. Ato Sarsah, Tian, Dogbe, Bamfo, and Pomegbe (2020); Evans (1987) and Manu and Sriram (1996). The initial list of SMEs in Soc Trang province to be considered is based on the list of enterprises provided by the Provincial Statistics Office. Due to the Covid-19 pandemic, time limitations and budget constraints, 100 SMEs were initially selected from the list of 1,776 enterprises in the province.

The survey was conducted by sending the hard copy of the questionnaire to the respondents who are in charge of the firm, e.g. owner, director, and manager. After one week, the questionnaire is collected, and then they were

qualified and cleaned. As a result, the final sample of 91 enterprises is sufficient and served to estimate the statistical model.

3.2. Variable and its measures

There are 21main questions in the questionnaire; each question has different items, in which at least one question has two items, and the most a question has is 16 items. However, the current paper extracts some measures to test the hypotheses. The variables employed in the quantitative model are presented in Table 1.

Table 1. Variables employed in the model.

Variable label	Reference	Definition	Measures
Dependent variable			
Sales growth	(Aw, 2002); (Binh, 2016); (Binh & Tien, 2019)	Sales of enterprises	Ordinal measure: 1 being low sales growth rate; 2 being unchanged sales growth rate; 3 being high growth sales rate
Independent variable			
Innovation (IN)	(Novkovic, 2015) and Wang and Chung (2020)	Innovation cost	Ordinal variable: 1 being the low innovation cost; 2 being the medium innovation cost; 3 being the high innovation cost
Entrepreneurial orientation (EO)	(Tang et al., 2015)	Measured by questions of: (i) Usage of customer information to improve service quality; (ii) New product development process based on customer's value; (iii) Fulfilling customer commitments; (iv) quick resolution on customer complains; (iv) Enhancement to gain competitive advantages through understanding customer needs	Mean of five point Likert scale of five questions
Endogenous variable			
Administration based on information technology (IT_Admin)	(Dibrell, Davis, & Craig, 2008)	Application of information technology on entire administration system	1 being strongly uncomplete application and 5 being strongly complete application of IT into corporate governance
Instrument variables			
Training	(De Clercq et al., 2013)	Training frequency per year	Continuous
Gender	(Covin et al., 2020)	Gender of respondent: Owner, director, manager	Nominal: 1 being male and 0 being female
Firm's age	(Tang et al., 2015); (De Clercq et al., 2013)	Length of firm's business	Continuous
Firm's type	(Tang et al., 2015)	Firm's style	Nominal: 1 being Private enterprise, 0 being otherwise

(a) The measure of the firm's performance is based on the question: "how many percentages of sales growth does the enterprise get in the current year compared to the previous year?" It is the so-called sales growth rate and transformed into the ordinal measure, in which 1 being the growth rate is less than 100% (low growth rate), 2 being the growth rate is 100% as unchanged growth rate, and 3 is the growth rate is more significant than 100% as the high growth rate (Binh & Tien, 2019).

(b) A measure of innovation is based on questions to ask the enterprises about the total cost of innovative activities, such as the introduction of a new product or service, current product or service improvement, application of new technology, data warehouse management restructure, and R&D (Novkovic, 2015) and Wang and Chung (2020). Because all enterprises do not apply the whole innovation activities just mentioned,

there is a big difference occurs in total innovation costs among firms. To solve this problem, the total cost of innovation is converted into the ordinal variables, in which 1 presents the enterprises with a low innovation cost, 2 presents the enterprise with a medium innovation cost, and 3 presents the enterprise with a high cost of innovation.

(c) The measure of entrepreneurial orientation is based on the arguments of Tang, Chen, and Jin (2015) and is a mean value of five observed variables with the rating of five-point Likert scales, one being unlikely/not at all and 5 being very likely/very much. Those five items are (i) Usage of customer information to improve service quality; (ii) New product development process based on customer value; (iii) Fulfilling customer commitments; (iv) Quick resolution of customer complaints; (iv) Enhancement to gain competitive advantages through understanding customer needs.

(d) The measure of information technology (IT) application in the entire administration system of SMEs is ordinal variables of a five-point Likert scale, in which 1 is an incomplete IT application, and 5 is a complete application of IT to SMEs' organisational administration. This variable is employed as the endogenous variable.

(e) Instrument variables: There are four instrument variables enclosed in the model, such as the training frequency (De Clercq, Dimov, & Thongpapanl, 2013) gender (Covin et al., 2020) of the owner/manager/director who is interviewed, age of the firm, and the firm's style (1 being limited company, 0 being otherwise) (Tang et al., 2015).

3.3. Statistical Model

Drukker (2017) developed the Extended Regression Model (ERM), in which Drukker also published the Extended Ordered Probit Regression Model (EOPR) to find out whether unobserved factors as endogenous variables have a potential impact on the regression. Dependent variables employed in ERM can be continuous (for linear) and ordinal values (ordered probit). Accordingly, the model of order profit is concerned in this study and its common model is mentioned in (1) and (2). In which the function (1) presents two exogenous variables in the function, e.g. *IN* and *EO*. The function (2) presents a relationship between SA (sales growth) and IT administration (Application of information technology on entire administration system).

$$x\beta = \beta_1 IN + \beta_2 EO \tag{1}$$

$$SA\beta = \beta_1 IT\_Admin + x\beta \tag{2}$$

The function of (3), (4) and (5) present three level of sales growth of continuous years (Low, Unchanged and High). While the function of (6), (7) and (8) depict sales growth of SMEs with three levels (Low, Unchanged and High) divided into cut 1 and cut 2.

$$
SA\_change = \begin{cases}
\text{"Low sales"} & \text{if } w\beta + \varepsilon \leq cut1 & (3)\\
\text{"Unchanged sales"} & \text{if } cut1 < w\beta + \varepsilon \leq cut2 & (4)\\
\text{"High sales"} & \text{if } cut2 < w\beta + \varepsilon & (5)
\end{cases}
$$

$$\varepsilon \sim N(0,1) \; yields$$

$$Pr(SAchange = \text{"Low sales"}) = \theta(cut1 - w\beta) \tag{6}$$

$$\Pr(SAchange = \text{"Unchange sales"}) = \theta(cut2 - w\beta) - \theta(cut1 - w\beta) \quad (7)$$

$$\Pr(SAchange = \text{"High sales"}) = 1 - \theta(cut2 - w\beta) \quad (8)$$

As mentioned in (1) and (2), the assumption that IT_administration is exogenous. If it is not independent of ε, IT_ administration is endogenous.

In turn, IT_ administration is endogenous; the model of (9) is concerned to test endogeneity of IT_ administration

$$IT\_ administration = \gamma_1 Training + \gamma_2 Gender + \gamma_3 FirmAge + \gamma_4 FirmStyle + \vartheta > 0 \quad (9)$$

ε and ϑ are joint nomal of (3), (4), (5), and (9)

The testing endogenous variable of IT_ administration is based on the comment in Stata as below.

eoprofit SA_change IO, EO, endogenous (IT_ administration = Training, Gender, Firm's age, Firm's style)

Once the correlation between e.Sachange and e.IT_ administration is non zero, and the variable of IT administration is confirmed as the endogenous one.

4. ANALYSIS AND RESULTS

Descriptive statistics of 91 enterprises in the study are presented in Table 2. The count value of dummy variables of gender (male accounting for 73%, female accounting for 27%) and the firm's style (private enterprises occupying 40% and otherwise occupying 60%) is a significant difference between the two groups of each dummy variable and is sufficient for the ERM.

The measure of information technology application in organizational administration is ordinal, 1 being a strongly incomplete application and 5 being the strongly complete application of information technology in corporate governance. The variable of training presents the frequency of SMEs' training organized in a year, its measures as a continuous variable.

As previously mentioned, the change in sales of SMEs is measured in ordinal, in which the low sales account for 36%, the unchanged sales are 16% and the high sales occupy 48%.

Table 2. Descriptive statistics.

Variable	Obs.	Mean	Std. Dev.	Min	Max
SA_change (1 = 36%; 2 = 16%; 3 =48%)	91	2.121	0.917	1	3
IN	91	1.989	0.823	1	3
EO	91	3.444	0.663	1.2	4.4
IT_ administration	91	3.242	1.099	1	5
Training	91	1.275	0.668	1	5
Gender (1 being male = 73%; 0 being female = 27%)	91	0.725	0.449	0	1
Firm's age	91	10.538	5.594	1	23
Firm's style (1 being private enterprise = 40%; 0 being otherwise = 60%)	91	0.396	0.492	0	1

Based on applying the Extended Ordered Probit Regression Model of Drukker (2017) the result of estimation is depicted in Table 3. Although the table presents three models, variables of IT_ administration, Training, Gender, the firm's age, and the firm's style are always employed in the three models. Accordingly, model 1 presents an exogenous variable of innovation (IN) employed in the function (1), other variables are IT_ administration, Training, Gender, the firm's age, and the firm style (they are kept the same in all three models).

As results in the table, model 1 brings a message that there is enough evidence to confirm a significantly positive relationship between Sales change (SA change) and innovation. It means that an increase in innovation causes a rise in sales by SMEs.

The correlations of error IT_ administration and error sales change (corr(e.IT_ administration, e.SA_change) are significant at any level, this confirms that IT_ administration is endogenous (Drukker, 2017) in which the existence of IT_ administration is significantly influenced by the firm's age. This means that the older the firm is has a significant contribution to its organizational administration structure based on IT.

Similarly, model 2 also confirms a significant impact of EO on SMEs' sales change. An increase in EO of SMEs causes an increase in its sales growth. The result of model 2 also proves that IT_ administration is endogenous, due to its p-value of the significant correlation between the error IT_ administration and the error sales change, in which the firm's age plays the main effect. Again, it is confirmed that the older firms, the more interested they are in considering the application of IT into their corporate governance.

Model 3 presents the association of innovation (IN) and entrepreneurial orientation (EO) enclosed in the model. Both of the two exogenous variables of IN and EO are significant at a 5% significant level. Similarly, IT_administration is also endogenous, because its error correlation with the error of sales change (corr(e.IT_administration, e.SA_change)) is significant at any level (Drukker, 2017), in which the firm's age is the main contribution to IT_administration.

As a result, all three models confirm that the association of innovation and entrepreneurial orientation of SEMs have significantly positive influences on the sales growth of SMEs, in which the role of endogeneity of IT_administration is well presented. This gives a message once the SMEs have an appropriate approach of applying IT system into administration scheme it causes a significant contribution to innovation and entrepreneurial orientation. The older SMEs have more interest in consideration the application of information technology to corporate governance.

Table 3. Estimated result of probit extension regression model.

Variable	Model 1		Model 2		Model 3	
	Coefficient	P>|z|	Coefficient	P>|z|	Coefficient	P>|z|
SA_change						
IN	0.839	0.008			0.510	0.028
EO			0.909	0.011	0.575	0.035
IT_ application	0.710	0.000	0.727	0.000	0.736	0.000
IT_ application						
Training	-0.174	0.179	-0.136	0.257	-0.186	0.130
Gender	0.264	0.222	0.323	0.109	0.269	0.190
Firm's age	0.036	0.034	0.037	0.024	0.035	0.036
Firm's style	-0.141	0.424	-0.075	0.637	-0.137	0.412
_cons	2.946	0.000	2.817	0.000	2.967	0.000
/SA_change						
Cut1	3.551		5.207		5.007	
Cut2	3.968		5.560		5.429	
var(e.IT_ application)	1.111		1.109		1.111	
corr(e.IT_application, e.SA_change)	-0.759	0.000	-0.824	0.000	-0.816	0.000
Number of obs.	91		91		91	
Wald chi2(1)	89.080		106.230		106.32	
Prob > chi2	0.000		0.000		0.000	
Log likelihood	-198.013		-199.704		-192.337	

As a result, the endogeneity of IT_ application has a significant contribution to the model. Additionally, three models result that the coefficients for IT_ application clarify both the unchanged sales (cut1) and high sales (cut2) are a positive effect, in which the value of cut1 is larger than cut2. This means once the SMEs employ information

technology system into organizational administration it causes significant impacts on innovation and entrepreneurial orientation on the sales change. This is a new point of the current study to think of comments to SMEs' interaction with the application of information technology in management.

5. DISCUSSION

5.1. Theoretical implications

The study found that innovation and entrepreneurial orientation have an impact on a firm's performance and were the subject of many previous studies, most of which were conducted in developed countries. Unlike previous studies, this study has an approach to SMEs in emerging markets like Vietnam, in which Soc Trang province is one of the provinces in the Mekong Delta region, so the study for the situation reality is even more refreshing.

Influences of innovation and entrepreneurial orientation on SMEs' sales growth through the significant contribution of applying IT systems to organizational administration is an academic contribution because this study is based on SMEs in an emerging market, e.g. Vietnam. This study is a different idea from some previous studies, e.g. Tang et al. (2007) they were concerned with the role of the mediator of ownership type to find changes in a significant relationship between EO and the firm's performance. Accordingly, the finding reflects the reality of the application of IT in the governance of SMEs with positive results, which is consistent with the current technological development.

In addition, the study also shows that innovation and entrepreneurial orientation have an impact on SMEs' sales growth in emerging markets, while Keskin (2006); Thornhill (2006) and Keh et al. (2007) found that evidence in the developed countries. In addition the finding also affirms the role of IT application in the corporate governance of SMEs is very important, because this application brings a rule of endogenous effects of IT application in SMEs, and makes a significant contribution to the effects of innovation and entrepreneurial orientation on SMEs' performance.

Finding the role of innovation and entrepreneurial orientation in contributing to a firm's performance is an important message to local policymakers to devise an appropriate approach to make a more supportive direction for SMEs. Specifically, by the creation of favourable conditions for SMEs in the region that enables them to access and transfer science and technology toward innovation. Also, support services should be promoted so that SMEs have the opportunity to improve their capacity for competition. In which the ability to apply IT in corporate governance contributes to increasing innovation efficiency and entrepreneurial orientation.

5.2. Policy Implication

As defined, innovation in the current study is investments in new products or services, current product or service improvement, the application of new technology, data warehouse management restructure, and R&D. However, in general, due to limited funding and financial capacity, many enterprises only carry out one or two innovation activities. Therefore, the local authority needs to create connections between SMEs and public credit institutions, or the provincial policy can facilitate institutions to support R&D capital. This will facilitate SMEs to promote innovation and market orientation.

The implementation of digital transformation in the current period of the information technology industry's development is very necessary. This implementation cannot be without support from the local government through the need to expand cooperation with universities and innovation research institutes so that SMEs can get a chance to improve their capacity in information technology.

Although there are not many SMEs interested in modern trade, their entrepreneurial orientation did not neglect activities of service quality, customer commitments and resolution of customer complaints. What is done seems to be spontaneous, lacking in method and skills. To fill these limitations, the local authority needs to organize

training courses to improve the knowledge capacity of SME owners, directors and managers. These training programs should have support from professors from universities and colleges.

Research results have shown that the role of information technology in corporate governance has a great influence on SMEs implementing innovation and entrepreneurial orientation, giving a positive impact on the firm's performance. However, the reality is that many SMEs are still slow to apply information technology to management; this is partly due to traditional business habits. Of course, the problems of financial capacity and competence level of employees in the business are also taken into account. To solve these problems, the local authority needs to organize a local government informatics centre and make a link with this organization with enterprises. Based on that, the centre will lead new information technology applications and transform this technology to SMEs.

5.3. Limitations and Future Research

The study was conducted during the Covid-19 pandemic in the Mekong Delta, Vietnam, so the survey sample only had 91 observations. The study's limitation is that the survey process is based on sending questionnaires to SMEs, not directly to interview. As a result, the answers given by owners, directors, and managers of SMEs are sure are likely to include some misunderstanding. Although the study has limitations in the survey, the quantitative method used is rigorously tested, and the results are guaranteed to meet the requirements of the quantitative approach.

6. CONCLUSION

Quantitative results of the Extended Ordered Probit Model on 91 SMEs in Soc Trang province show the influential role of innovation and entrepreneurial orientation on the sales growth of enterprises. These two factors confirm it is indispensable in the development of enterprises. The results also show the significant influence of the variable IT_ administration. The application of IT in organizational administration has an endogenous contribution to SMEs' innovation and entrepreneurial orientation. It must also be noted that the older SMEs are, the more interested they are in applying IT in the organizational administration. The result is an important message for local SMEs who need to rethink the application of technology systems to corporate governance. The results are also very useful reference information for local policymakers to have an orientation to support SMEs in the province.

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