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DOES INNOVATION MATTER? EVIDENCE FROM ENTERPRISE SURVEY OF ASEAN COUNTRIES

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Abstract

This study embarks on an investigation to unearth evidence that innovation may, in certain contexts, fail to foster enterprise development. Innovation has been identified as a key driver of firms' growth. However, to have successful innovation requires some minimum capabilities and resources. Based on this notion, we tried to find evidence that innovation may fail to help enterprises develop. The study use the World Bank's enterprise survey. The survey collected samples from ASEAN firms. Respondents were chosen by using stratified random sampling technique based on the type of business for all small, medium and large non-agricultural companies in all geographical areas. We used instrumental variable regression to avoid simultaneous causality. The findings show that while innovation has a considerable impact on the growth of non-SMEs, it has little or no impact on SMEs. This confirms our prediction that innovation dampen firms' development, particularly those with limited abilities to innovate successfully. The research emphasizing the importance of tailored approaches to accommodate the diverse landscape of businesses, particularly in the dynamic ASEAN market.

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INTRODUCTION

Small and medium enterprises (SMEs) have long been recognized as a factor of economic development in most countries due to their contribution to real GDP growth, job creation, and poverty reduction. Formal SMEs produce up to 45% of total employment and 33% of GDP in developing countries (OECD, 2017), but up to 50% of GDP in developed countries (Ayyagari et al., 2007). Most developing countries rely heavily on the development of the SMEs sector by intervening in the business environment through policies and regulations (Du et al., 2017; Olayemi et al., 2022; Tambunan, 2008; Ye et al., 2022).

However, different studies also found that SMEs provide inadequate evidence for promoting a country's economic growth (Beck et al., 2004; Cravo, 2010; Cravo et al., 2012). This raises an issue of whether government intervention has optimally supported the development of SMEs. The lack of effectiveness could be intepreted that despite the fact that much effort in recent literature has been paid to identifying the determinants of SMEs' development, the results still leave room for further investigation. Thus, this study contributes to the field by investigating the determinants of SMEs' growth using firm-level data from the World Bank. This study specifically examines the impact of innovation on the growth of individual SMEs.

The contribution of SMEs could be characterized by its size. The large sector of SMEs does not necessarily exert power to help countries flourishing their economies. This sector should comprise of a large number of SMEs with the diverse distribution of firms' size. For example, Beck et al. (2004) found that large sector of SMEs characterizes fast-growing economies but has no causal effect on economic growth. This finding

suggests that large number of small firms potentially give benefit to economies by intensifying competitive business environment.

The level of competitiveness in the market is believed to have a positive effect on the economic growth (Klapper, 2006). The role of competitive business environment plays a key role in the development of economies that may answer the question of why SMEs show no convincing evidence on the growth. This also suggests another interpretation such that the competition in the market requires firms to continuously evaluate its strategy to satisfy its customer. Thus, it encourages the firms to increase their propensity to innovate, especially in the dynamic environment where customers' demand and preference change frequently (Popa et al., 2017).

SMEs are expected to perform better in innovation because they have relatively less bureaucratic and are more flexible in operating their business, thereby increasing their openness to innovation, especially in the developing countries such as Southeast Asia Countries. However, promoting innovation in SMEs sector is not an easy task. Despite the growing number of literatures shows a profoundly positive impact of innovation on growth, large number of SMEs are still reluctant to innovate their business. One factor might derive from obstacles they face in the business environment. Some studies present different results about the impact of obstacles on innovation. A study done by Amara et al. (2016) showed that certain obstacles might have specific impacts only on certain characteristics of SMEs. For example, SMEs which operates in service industry considers knowledge-based obstacles as the impactful factors. Another study found that financial obstacle has severe impact mostly on manufacturing firms (Pissarides, 1999).

Countries in the Southeast Asia have entered in the new system of doing business and trade agreement, called ASEAN Economic Community (AEC). This new system of business exchange enables countries in ASEAN to do business with more supportive regulation. This certainly make the environment more competitive. In addition, the economies of most countries in ASEAN comprise largely of SMEs sector. It accounted for at least 50% of their GDP. Thus, the result of this study should earn much attention of the countries because of the relative importance of SMEs sectors.

Literature Review

This study was built upon two fundamental issues. The first, considering that innovation of the firms is partially driven by the competitiveness of the market, we are interested in looking out the effect of innovative firms in the situation where the level of competitiveness is poor. This becomes the reason why our sample is SMEs sector in ASEAN countries as implied by Intal et al. (2008). We argue that our sample properly represents the environment that could possibly help answering the question why innovation does not necessarily contribute to countries' growth. The second background of the study comes from the notion that examining the relationship between innovation and growth is subject to endogenous problem. Due to the reason above, we modeled our empirical test using instrumental variables.

Relationship between innovation and performance

One interesting study was done by Beck et al. (2004). Using cross-country evidence, they conducted a test to examine the impact of SMEs sector on growth and poverty. The result showed that there was no strong evidence which support the notion that SMEs could contribute to nations' growth and help alleviating poverty problems. A possible explanation of the result is that large sectors of SMEs which mostly characterizes successful economies comprise of many large firms but lack of growth (Beck & Demirguc-Kunt, 2006).

Another explanation comes from the role of legal and financial institutions taking part in the development of business environment (Beck et al., 2006). SMEs sectors benefit from well-developed legal and financial institution through the protections of investors and easy access to finance. It increases firm-entry level, thereby enhancing the level of competitiveness in the market. Unfortunately, countries in ASEAN have relatively less developed legal and financial institution (evidence). As mentioned before that the level of competition could drive innovation, it is worth to further examine whether innovation in this context could enhance growth.

Literature from dynamic environment study also suggests the feature of fast-changing customers' demands and preferences (Popa et al., 2017). A good firm is one which can optimally satisfy its customers. In addition, if any firms could continuously identify what markets need and want, they could both survive from the competition and gain sustainable growth. This condition stimulates any firms to have high propensity to innovate in order to satisfy customers' demand and preferences.

However, the outcome might be different in situation where the demand and preferences are quite stagnant. Porter (2008) suggest that organizations should be able to adapt to the environment in order to survive in the market. This notion could be interpreted that any firms which operate in less competitive market might be reluctant to innovate their business (find evidence). As a result, innovative firms might not benefit from innovation as much as when they operate their business in more competitive market (find evidence). If this condition is satisfied, we

argue that innovations have no impact on the growth of SMEs. It supports the result that SMEs have no contribution to growth due to lack of competition and less dispersed size of SMEs (Beck et al., 2004; Beck & Demirguc-Kunt, 2006).

To measure competitiveness of the market, we used the distribution of firms' size in the SME's sector. If it is fairly (poorly) distributed, the market could be classified as more competitive (less competitive).

Simultaneous relationship between innovation and growth

In this case, we predict that growth and innovation are jointly distributed. Many literatures in economics explains that innovation is one of the most important ways to be able to compete and grow, especially in the current era of the knowledge economy (Mason et al., 2009). Innovations made by the company will result in an increasing production capacity because it can increase efficiency and reduce costs. In addition, any firms with high growth can be more able to finance their research and developments to generate innovation. This simultaneous relationship between innovation and economic growth of the company can lead to endogeneity problem. The interpretation can potentially become incorrect because the parameters produced by OLS are biased and inconsistent. To overcome the problem of endogeneity, we used the least squares two-step method using instrumental variables (Woolridge, 2016)

We introduce two instrumental variables. The first, we use firms' perceptions on obstacles they meet. This includes obstacles in electricity, telecommunication, transportation, customs and trade regulations, and competitor's informal practices. The second we use specific obstacles on financial, proxied by the percentage of assets funded by external parties. These two instrumentals were based on firms' perceptions as determinants of company intentions to do innovation. The high perception of firms' obstacles will create the motivation of the firms to innovate and either directly or indirectly affect the company's financial performance, and vice versa.

First we estimate the effects of instrumental variables to innovation through linear model. Then, we used log-linear model to smoothen the distribution of growth. So our model will be:

$$\log\_sg_i = \beta_0 + \beta_1 sum\_innov_i + u_i$$

METHOD

Data used in this study were obtained from the Enterprise Survey in ASEAN countries: Indonesia (2015), Malaysia (2015), Vietnam (2015), Philippine (2015), Cambodia (2016), Thailand (2016), Laos (2016) that conducted by the World Bank. Respondents were chosen by using stratified random sampling technique based on the type of business for all small, medium and large non-agricultural companies in all geographical areas. Data collection techniques were using direct interviews with firms so that firms were expected to provide feedback on the state of the private sector that allowed researchers to track changes in the business environment over time and the growth of the private sector so as to create a comprehensive business environment indicator.

This study takes place in the manufacturing and service industries to provide broader generalizations. Some researchers focus more on manufacturing companies because they assume that their innovation is more radical and has a stronger impact on performance than the service sector (Prajogo, 2006), spesifically in financial performance (Hassan et al., 2013).

Table 1. The definitions of the variables used in this study are as follows

Variable	Operationalization
Sales growth logarithm [log_sg]	Measured by using the logarithm of the difference in sales value in the last financial year before the survey and the last sales value in the previous three years. Logarithms are used to create normal data distributions
Innovation [sum_innov]	Measured by using the aggregate value of the innovations through five kind activites in: products, manufacturing methods, logistic, delivery and distribution, managerial practices or organizational structure, and marketing. Each innovation given by the company will be given a value of 1.
Financial access [acc_fin]	Measured by using the percentage of fixed assets financing by external parties, banks, non-bank financial institutions, credit purchases, loans from suppliers or consumers and financing of other parties.
Obstacles [obs_sum]	Measured by using the aggregation value of perceived barriers encountered by companies on electricity, telecommunications, transportation, customs and trade regulations, as well as informal

	practices carried out by competitors using a Likert scale with a value range of 0 = no obstacles up to 5 = very large obstacles
Age [log_age]	Measured by using the survey year minus the year of establishment of the company and transform to logarithm function
Num_employee	Measured by using the number of permanent employees in the company
Country dummy	Measured by using several dummy variables for ASEAN countries which include: and with based is the country of Indonesia

Testing hypotheses on models with instrumental variables can be estimated using two-stage least square (2SLS). It consists of two stages. The first stage is done by regressing instrumental variables on endogenous variables, innovation. The second stage is done by regressing the fitted value from the first equation on the firms' sales growth. These stages can be done mechanically / manually or using special commands embedded to statistical processing program. Moreover, Duflo (2000) recommended to use manual commands because mechanical testing does not accommodate additional errors that appear in the first equation.

To ensure that the variable is truly endogenous, we use Durbin test and Durbin-Wu-Hausman test which compared OLS and IV estimates. Next, we measure that the instrumental variables used are strong enough to be able to describe the variable instrumented. Testing instrumental variables on endogenous variables with more than one instrumental variable can be seen from the F-test value on the regression between innovations and instrumental variables. An endogenous variable that is instrumented with more than one instrumental variable requires testing overidentification using Sargan test.

Table 2. Pre-tests rule of thumb

	Test	Description
Endogeneity	Durbin test;	Ho: exogen
	Durbin-Wu-Hausman test	
Weak instruments	F test	F test > 10
Overidentifaction	Sargan test	Ho: not overidentify

RESULTS

Table 3 shows the descriptive statistic of the overall sample that consists of large firms and SMEs with fewer than 250 employees. The basis of categorization is referred to as regulation of the EU economic region. By using this basis, it can facilitate comparison between countries or between economic circles. Table 3 show that there is a gap between that two categories, however it can be considered representative because this is in accordance with a study conducted by Banking & Capital Markets, UOB, & Bradstreet (2013) that most companies in the ASEAN region are companies in the SMEs sector with a contribution range of 70% to 99% for each country.

Table 3. Descriptive Statistics

Variable	Mean	Std. Dev	Min	Max
Panel A. Full Sample (N=2482)				
log_sg	18.295	4.045	7.377	30.284
sum_innov	1.160	1.648	0	5
num_emp	165.774	683.396	2	17000
firm_age	18.242	12.963	2	128
fin_acc	16.759	26.496	0	100
sum_obst	5.195	4.629	0	20
Panel B. SMEs sample (N=2189)				
log_sg	17.829	3.816	7.377	29.936
sum_innov	1.057	1.583	0	5

num_emp	51.728	57.245	2	250
firm_age	17.442	12.303	2	128
fin_acc	16.758	26.622	0	100
sum_obst	5.0584	4.577	0	20
Panel C. Non-SMEs sample (N=293)				
log_sg	21.773	4.016	11.849	30.284
sum_innov	1.935	1.901	0	5
num_emp	1,017.812	1,765.688	253	17,000
firm_age	24.219	15.915	2	112
fin_acc	16.767	23.578	0	100
sum_obst	6.023	4.936	0	20

The average log sales growth in all samples (SMEs; Non-SMEs) amounted to 18.295 with SD = 4.045 (x bar = 17.829, SD = 3.816 ; x bar = 21.773, SD = 4.016). This positive logarithmic value shows that between all sample, SMEs and non-SMEs increase their sales growth. There are also relatively large differences in growth between SMEs and Non-SMEs. On average, companies only do one type of innovations out of five.

Compared to Non-SMEs, SMEs tend to be relatively new with average 17 years of operation than 24 years of operation. A very significant difference between the two groups of samples is about the average number of employees. Even though the Non-SMEs are only 11.80% of the overall samples, they have 1,018 employee on average compared to 50 people for the sector of SME's. Both SMEs and non-SMEs experience obstacles. Of the total 20 types of obstacles, non-SMEs actually have a perception that the barriers are far greater than those of the SMEs sector company both in finance and overall aspects.

Table 4. Pairwise Correlation

	log_sg	sum_innov	num_emp	log_age	fin_acc	sum_obst
Panel A. Full Sample (N= 2482)						
log_sg	1.000					
sum_innov	0.0760***	1.000				
num_emp	0.2350***	0.0608***	1.000			
log_age	-0.0346*	0.0662***	0.0959***	1.000		
fin_acc	0.0055	0.0873***	-0.0096	-0.0053	1.000	
sum_obst	0.0190	0.1704***	0.0173	0.0042	-0.0098	1.000

Table 4 shows the correlation between variables in the whole sample. Growth strongly correlated with the company's innovation. In addition, innovation is also strongly correlated with the financial access and perceived of constraints that submitted as instrumental variables. This gives an early sign regarding the main hypothesis in this study: there is a strong relationship between growth and innovation so we need to clarify the causal relationship. To clarify that, we will look for the effect of financial access and perceived barriers because we expect that greater chance of the company to get funding from external parties will lead company to innovate, and higher perceptions of obstacles it has reversely will motivated the company to innovate overcoming these obstacles.

Table 5. Pre-tests result

	(1) All Sample	(2) SME	(3) NonSME
Endogenous variable	Endogenous	Exogeneous	Endogenous
Weak instrumentals	Strong	Strong	Strong
Overidentifying model	Not overidentify	Overidentify	Overidentify

Before testing the hypotheses, we conduct initial testing: the suitability of the model and the strength of instrumental variables. Table 5 explains that growth and innovation are jointly distributed by the overall sample, but when they are divided by the category, there is no simultaneity in SME sector. For that reason of simultaneity, it was carried out using the 2SLS instrumental variable method for the whole sample and Non-SMEs, others will use the ordinary least square (OLS). The results of the hypotheses testing are presented in Table 6

Table 6. Hypotheses testing

	(1) All Sample (2SLS)	(2) SMEs (OLS)	(3) Non-SMEs (2SLS)
sum_innov	0.4916***	0.052*	1.346*
	(.1738)	(0.0298)	(0.750)
num_emp	0.0008***	0.0178***	0.001***
	(.0001)	(.0008)	(0.001)
log_age	0.4284***	.1414**	-0.844
	(0.0869)	(.0696)	(0.631)
Constant	20.6940***	20.9754***	23.712***
	(0.2704)	(.1811)	(0.930)
r-squared	0.6378	0.7157	0.1213
N	2,482	2,189	293

Notes: the dependent variable is sales growth; the independent variables are number of innovation, number of employees, log of the companies age, and dummies for country. The significance levels are ***, **, * for 1%, 5%, 10%

Innovation has a positive influence on sales growth for the three samples. A unit of innovation impact to 49% increasing of sales growth, the impact is become smaller to SMEs and tripled for the Non-SMEs. OECD (2017) states that SMEs are disproportionately affected by inefficiencies in the business environment. This reflects that Non-SME is much more efficient to commercialize their innovation than SMEs.

Innovation has a positive relationship with sales growth in all three models. One unit increase in innovation will increase growth by 0.499 for entire sample, 0.053 for SMEs, and 0.509 for non-SMEs. The benefit of innovation on growth is larger for non-SMEs, compared to SMEs. this indicates that innovation undertaken by non-SMEs is more effective in increasing growth compared to SMEs.

The number of employees is also the significant determinant to gain the sales growth. More number of employees impact has a positive effect on growth for all sample groups. In particular, the effect of the number of employees is higher for SMEs than for Non-SMEs. While firm age only has a positive effect on full sample and SMEs. Spesific to SMEs, this reverse to OECD (2017) that argue new SMEs benefited by work outside of dominant paradigm, exploiting technological opportunities that have been neglected by more established companies or enable the commercialization of uncommercialized knowledge in universities and research organizations. Non-SMEs will actually reduce the growth owned by the company even though it is not statistically significant, this may be due to the company already approaching the optimum level of growth opportunities.

Furthermore, the researchers tried to focus on the SMEs sector, namely the manufacturing industry. Innovation in the manufacturing industry is considered more influential on growth than in non-manufacturing industries (Prajogo, 2006). Table 7 shows the results of regression testing using OLS in the SMEs sector in the manufacturing industry.

Tabel 7. Regression Test Results

	Manufacture SMEs
sum_innov	0.04
	(0.035)
num_emp	0.019***
	(16.61)
log_age	0.15*
	(0.08)
Constant	18.666***
	(0.264)
r-squared	0.702
N	1,511

Table 7 explains that innovation in SMEs in manufacture sector does not affect growth. Conversely, the number of employees and the age of the company actually has a significant positive effect. This in fact disputes the argument that growth obtained by SMEs in manufacture sector is influenced by innovation, in other words innovation is not a way for SMEs in manufacture sector to achieve growth.

DISCUSSION

We highlighted that innovation has a positive effect on growth but show different results for the two sample groups. By the Hausman and DWH tests, innovation and growth are jointly distributed for the whole sample and subsample of Non-SMEs. This means that the benefits derived from growth are used by companies to create innovation. By relating it to the instrumental variables that we propose, it can be seen that Non-SMEs have greater financial access to get project funding that develops new innovation, then these companies tend to have a higher perception of constraints so they are more motivated to innovate to overcome these obstacles. On the other hand, innovations by SMEs are not funded by the benefits of the company's growth. In addition, these companies also have low financial access.

Our second finding is that innovations carried out by SMEs are not effective and efficient for increasing growth compared to Non-SMEs. This might be due to differences in the characteristics of innovation. Innovation in Non-SMEs is generally an innovation that is radical and high-cost so that it can reduce costs to provide goods / services that are cheaper or an innovation that gives birth to a customer base for these products / services. Whereas SMEs are very limited in choosing innovation because of the existence of budget constraints. SMEs tend to be more loose in terms of regulations and have limited guarantees and liquidity so that the opportunities for external parties to provide financing are lower (López-Gracia & Sogorb-Mira, 2008). And if SMEs get external funding, companies tend to be subject to transaction costs that are relatively higher than the actual value received.

By comparing SMEs and non-SMEs, it can be seen that the role of financial access and obstacle reduction tends to have a low impact on SMEs. This means that there are other factors that influence innovation. SMEs have high flexibility in making innovation decisions, for example through shorter hierarchies and less stringent regulations, so we suspect that innovation decision making is very likely influenced by market sophistication and decision maker characteristics such as the level of courage in risk taking, skill, experience, and tenure (Brockmann & Simmonds, 1997; Cruz & Justo, 2017). Entrepreneurs tend to use the combination of experience and tacit knowledge to make a decision (Brockmann & Simmonds, 1997)

Previous research shows that gender decision makers will influence their courage in making innovation decisions (Ferreras-Garcia et al., 2021; Hoang et al., 2019). A male manager tends to have low risk aversion so that he is more willing to take risks in making innovation decisions, while his counterpart seems to have more prepared in making innovation decision (Ferreras-Garcia et al., 2021). Innovation decisions are also largely determined by the expertise and experience of the decision maker (Custódio et al., 2017; Jiao et al., 2022; Pérez-Luño et al., 2011). Individuals with expertise and more in-depth experience about the organization, market and specific innovations carried out will make better innovation decisions (Custódio et al., 2017).

Furthermore, innovation does not affect the growth of SME companies in manufacture sector. This is contrary to previous literature studies stating that innovation is the determinant

of firms' growth. We suspect that the firms' growth is achieved through existing economies of scale. Manufacturing companies in the SMEs sector tend to optimize their production functions, reduce production costs and increase sales to achieve growth. This result confirms our prediction that innovation does not necessarily provide a source of growth for SMEs.

CONCLUSION

Innovation has deemed as a strong factor of firms' growth. However, not any single firm could guarantee a success for its initiative to innovate their business. This paper tried to find evidence that some innovation may fail to develop firms. We use enterprise survey conducted by World Bank. We took sample from ASEAN firms.

To avoid simultaneous causality, we employed instrumental variable regression. The pretest satisfied our presumption of this causality relationship. The results shows that innovation have a significant effect on non-SMEs, while this effect disappear for SMEs. This confirms our prediction that innovation does not necessarily help firms to grow, especially for those which have less capability in making innovation successful.

This study makes several contributions. The first, innovation could be a source of growth if initiated by large and mature firms. It implies that such firms tend to have resource to make innovation, such as experience, expertise, and finance. The second, innovation could dampen the development of SMEs if it is too soon to be taken. So, encouraging SMEs to take innovation without proper resources could lead to failure. The third, SMEs are better to focus on expanding their operation to take the benefit of economies of scale.

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