

Better Performance Prospect of Large-Medium Enterprises: The Role of Innovation

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ABSTRACT

Based on the Business Characteristics Survey 2019 conducted by Statistics Indonesia, enterprises developed innovation are only 11.65%. Although innovation provides the benefit of a significant increase in revenue, there are 63.44% of companies that do not innovate. Therefore, it is necessary to study the effect of innovation on the prospects of large and medium-sized businesses in Indonesia. This study also observed the innovation types and business characteristics of large-medium enterprises. The data processed in this study came from the micro-data of 312,080 large-medium enterprises resulting from the 2016 Census of Economic-Advanced Data Collection for Large-Medium Enterprises and Micro-Small Enterprises. It was carried out by Statistics Indonesia in 2017 in 34 provinces in Indonesia. The method used to analyze the data was Logistic Regression. The result of the study showed that marketing innovations and product innovations were the most innovative types widely carried out by large-medium enterprises. The effect of innovation variable was seen in categories of manufacturing; water supply, sewerage, waste management & remediation; construction, transportation & storage; financial & insurance; and human health & social work. These categories will have better business prospects when there are more types of business innovations implemented. These suggest that leaders of large-medium enterprises and related stakeholders engaged in these sectors to pay more attention to innovation factors and their indicators in the operation of enterprises.

ABSTRAK

Berdasarkan Survei Karakteristik Bisnis 2019 yang dilakukan oleh BPS, perusahaan yang mengembangkan inovasi hanya 11,65%. Meskipun inovasi memberikan manfaat dari peningkatan pendapatan yang signifikan, ada 63,44% perusahaan yang tidak berinovasi. Oleh karena itu, perlu dikaji pengaruh inovasi terhadap prospek bisnis besar dan menengah di Indonesia. Penelitian ini juga mengamati karakteristik tipe inovasi dan karakteristik usaha UMB di Indonesia. Data dalam penelitian ini berasal dari mikrodada dari 312.080 perusahaan menengah-besar yang dihasilkan dari Sensus Ekonomi 2016- Lanjutan Pendataan Usaha Menengah Besar (UMB) dan Usaha Mikro Kecil (UMK). Pengumpulan data populasi UMB ini dilakukan oleh Badan Pusat Statistik tahun 2017 pada 34 provinsi di Indonesia. Metode yang digunakan untuk menganalisis data adalah Regresi Logistik. Hasil penelitian menunjukkan bahwa inovasi pemasaran dan inovasi produk adalah jenis inovasi yang paling banyak dilakukan oleh usaha menengah besar. Pengaruh variabel inovasi terlihat pada kategori manufaktur; pengelolaan air, pengelolaan air limbah; pengelolaan dan daur ulang sampah, dan aktivitas remediasi; konstruksi, transportasi & pergudangan; keuangan & asuransi; dan kesehatan manusia dan aktivitas sosial. Kategori-kategori ini akan memiliki prospek bisnis yang baik atau lebih baik ketika ada lebih banyak jenis inovasi bisnis yang diterapkan. Hal ini menunjukkan bahwa para pemimpin perusahaan besar-menengah dan pemangku kepentingan yang dengan sektor-sektor tersebut untuk lebih memperhatikan faktor inovasi dan indikatornya dalam operasi perusahaan.

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1. INTRODUCTION

Enterprises of developing countries perceive the importance of innovation in the current era of globalization. All of the aspects, such as marketing, software, workforce training, R&D, machinery, design, and management, increasingly require innovation. Also, international trade and global value chains are dominated by the development of international standards. Thus, the ability of enterprises depends on the competitiveness of companies and countries to innovate and orient them towards technology and information. At present, the urgency of innovation has become a necessity in economic achievement (Cornell University, INSEAD, & WIPO, 2015). Accordingly, benchmarking the performance of innovation is becoming a significant need.

National innovative capacity, as explained in the research of Sohn, Kim, & Jeon (2015), is an innovative system that becomes the economic and political potential of a nation in the form of innovation development activities, dissemination, and use of innovation. In the context of increasing economic growth and development performance, many countries enhance national innovation capacity.

The Global Innovation Index (GII) released by Cornell University, INSEAD and the World Intellectual Property Organization (WIPO) (2019) shows the position of Indonesia's innovative ranking, which ranked 85th out of 129 countries in 2018 and 2019. The Global Innovation Index (GII) of Indonesia ranks far below ASEAN countries, such as Malaysia, which is ranked 35th (2018-2019). While Thailand is ranked 44th (2018) and 43rd (2019), while the Philippines ranks 73rd (2018) and 54th (2019), also still above Indonesia. Cambodia is the only ASEAN country that it ranked below Indonesia. The data of the State of Laos and Timor Leste are not available. This data shows that Indonesia must pay more attention to efforts to increase national innovation.

According to Iqbal (2014), currently, the condition of the global economy has a lot of pressure, which business experts predict that creativity and innovation will be the essential factor in developing and maintaining superior competitiveness.

In terms of Indonesia's microeconomic conditions, the condition of the business sectors, which are micro, small, medium, and large enterprises, generally have not implemented much business innovation. Based on the Business Characteristics Survey conducted by Statistics Indonesia (BPS), enterprises developed innovation

were only 11.65%. While the enterprises introduced innovation were 21.78%. Conversely, the enterprises that stopped innovation was 3.13% (Statistics Indonesia, 2019).

The rest, enterprises that do not innovate, are 63.44%. It needs to be observed. The majority of businesses in Indonesia did not innovate to improve business performance. In fact of that survey, according to the business unit that is doing ongoing innovation, the most perceived benefit of innovation is an increase in business revenue. It also can save costs and other competitive advantages. So, it is necessary to study the condition of innovation from the business side in Indonesia, especially from large-medium enterprises.

Efforts to update and modify inter-company competition designs and strategies are imperative for companies to face global markets, increase economic competition, and interdependence among economic actors. Today's business is facing the challenge of competing for higher quality products at lower prices and more responsive to changes in market demand. Rapid socio-political changes will increase the number and strength of new competitors from foreign companies. New competing enterprises have more knowledgeable human resources and also technical experts. They are more innovative and even more productive. Enterprises compete by quickly accessing the latest methods and equipment. The complexity and challenges require enterprises to have the right innovation strategy. So, they can compete both nationally and multinational.

Many European countries conducted surveys on innovation using the Oslo Manual guidelines and under the coordination of Eurostat in 1992. The Oslo Manual and the Community Innovation Surveys (CIS) began because of the urgency of research on business innovation. This urgency was capturing the output of innovations other than patents, such as new product introductions, percentage of sales arising from new products, processes and organizational changes, percentage of sales of new products used in industry, and product distribution in the product cycle (Kleinknecht *et al.*, 2002).

It is necessary to study related innovations on the prospects of large-medium enterprises in Indonesia. This study will find out the strengths and weaknesses of each economic sector in terms of innovation toward the prospects of enterprises. Besides, it is also essential to look at the characteristics of innovation types and business characteristics of large-medium enterprises in Indonesia.

Literature studies on corporate innovation in Indonesia, especially for large, medium-sized companies, are limited. Although research on organizational innovation is very numerous and varied, it is necessary to study more specifically about the characteristics and their effects on large-medium enterprises. Therefore this study is expected to expand new scientific insights for academics, business people, and government.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

Innovation is a concept that discusses the application of new ideas, products, or processes which are discussed more fully and broadly. Innovation is also an application containing creative ideas to improve the progress of a company. Thus, activities to form new concepts related to competitors, customers, and markets are prioritized by enterprises (Amabile, 2013).

Research and articles about innovations are very much, from various perspectives, broad, and diverse. One of the first economists studied was Joseph Schumpeter. Schumpeter discussed the capitalization of new products, new consumers, production methods, modern transportation, new markets, new forms of industrial organization (Bayarcelik, Tasel, & Apak, 2014).

Schumpeter makes initiatives supporting social and economic change. In development economics, Schumpeter showed a process of qualitative change as the impact of innovation. Schumpeter stated innovation as a combination of new resources that are named "entrepreneurial functions" (Fagerberg, Mowery, & Nelson, 2006). Schumpeter's theory emphasizes the primary innovation clusters described in the Business Cycles theory (Silverberg & Verspagen, 2003).

Innovation

Innovation is the activity of producing new better outputs (goods or services), implementing new operational techniques, implementing new marketing strategies, or management of the organization/ managerial in business practices, organizations in the workplace, or external relations (Statistics Indonesia, 2017). Innovation has an impact on many things. Research by Tidd, Bessant, and Pavitt (2005) proves the effect of innovation on marketing and new products. The market was successfully upgraded and maintained by new products, and thus resulted in additional profits in these markets. Products that are in high demand by the market have competitive sales. They are not only

due to low prices but also from various designs, product value, and quality innovation. Innovation strategy has become the most crucial factor due to increasing productivity and operating capacity of the company. So innovation is expected to be a reason for entrepreneurs to have better business prospects.

H1: Innovation significantly has a positive effect on the prospect of enterprises.

Internet Usage

Many mature companies implement the internet, social networking, and so on in the company's business processes. Innovation causes changes in the evolution of the company, which is realized by open innovation. Open innovation is identified as global innovation, digitalization, and the internet, and partnerships. Most companies have to adapt to the radical changes introduced through digital technology and the internet to develop, expand their scope, and grow (Deschamps & Nelson, 2014). Therefore, the enterprise's prospects will be better with the use of the internet in the company's operations.

H2: Internet usage significantly has a positive effect on the prospect of enterprises.

Patent, Copyright, and Intellectual Property Rights

Patents, Copyright, and Intellectual Property Rights (IPR) are legal remarks of innovation. The Ministers responsible for the science and technology policy of all OECD countries made statements at the 2004 meeting. At the meeting, OECD Committee for Scientific and Technological Policy at Ministerial level claims that patents have a role in driving innovation, spreading increasingly complex scientific knowledge and technical insights, and also increasing market acceptance and corporate creation. The growth in the number of patents reflects an increase in the progress of innovation. The effect of patented inventions is increasingly present throughout the economy, especially on innovation. Patented inventions make better economic performance and pervasive (Organization for Economic Co-operation and Development (OECD), 2004). The OECD statement shows the role of Patent, Copyright, and Intellectual Property Rights in giving excellent prospects to enterprises.

H3: Patent/Copyright/Intellectual Property Rights significantly have a positive effect on the prospect of enterprises.

Business Collaboration/Partnership

Many studies show that international collaboration has increased massively, especially in the manufacturing industry (Golich, 1992; Rosenfeld, 1996; Shi & Gregory, 1998; Yang, Lin, Chan, & Sheu, 2010; Vachon & Klassen, 2008). Although the long-term prospects vary, which looks brighter in some industries than in others, the collaboration that makes the company look quite tame for its competitiveness is a response to this collaboration strategy. In other industries, collaboration has helped USA companies strengthen their technology and production skills (Nelson, 1993). This shows the effect of collaboration or partnership on good prospects for enterprises.

H4: Collaboration/Partnership significantly has a positive effect on the prospect of enterprises.

Business Expansion & Development

The expansion and elaboration of company activities is an effort to change the company's managerial. The expansion and diversification of the company's products and activities as part of this enterprise development is essential to gain market interest and maintain the market (Nelson, 1993). Expanding market size, increasing high-production, and developing technological knowledge is necessary to improve financial prospects (Grossman & Helpman, 2015).

H5: Expansion & Development Business Plan significantly has a positive effect on the prospect of enterprises.

Research and Development

Research and Development (R&D) is an influenced factor in innovation. So, R&D is a proxy for innovation (Peters, 2006). Over the years, the paradigm of innovation has changed slowly. In the past, views on innovation, especially in large companies, placed the implementation of innovation in the research and development (R&D) department (Chandler, 1990). Now, the scope of innovation is increasingly expanded by companies, where all areas of the company conduct research. The impact of expansion research implies that different business functions, such as marketing, purchasing, and manufacturing, must work together in research and development (Wheelwright and Clark, 1992). Most companies drive all renovation/innovation activities within their businesses with the support of R&D (Deschamps & Nelson, 2014).

H6: Research & Development significantly have a positive effect on the prospect of enterprises.

Workforce Training

Innovations sometimes cause skills to need rapid updating. Therefore, companies need training for the workforce. Accordingly, it shows the reason for the urgency of lifelong learning. Countries in the case have many companies that provide education and training to their employees are leaders countries are in the innovation Organization for Economic Co-operation and Development (OECD) (2010).

One of the strategies that enterprises can choose to be innovative is the developing of internal knowledge and effective practices. It will influence prospective enterprise growth (Rejeb *et al.*, 2008).

Ma *et al.* (2018) examine how to implement human resources for corporate innovation in various countries and regions. The results of an analysis of survey research data from 304 manufacturing industry companies in 13 countries, found that training for employees increased company innovation in terms of successful new product development and the percentage of company revenue from newly developed innovative products. It is why it is essential to look at the level of learning/ education of an organization/ company. Then the innovative company aspects are those ongoing improvements in learning individually or organizationally. It will bring good prospects for the progress of enterprises.

H7: Workforce Training significantly has a positive effect on the prospect of enterprises.

3. RESEARCH METHOD

Data and Scope of Analysis

This study is quantitative analysis research, which analyses of 312,080 large-medium enterprises from the micro-data of Statistics Indonesia (BPS-RI). The data of large medium enterprises for this study was the result of the 2016 Census of Economic-Advanced Data Collection for Large-Medium Enterprises and Micro-Small Enterprises, which were conducted by Statistics Indonesia (BPS-RI). This census was held in 2017 and carried out in 34 provinces in Indonesia.

This study covers 15 economic sector categories from a total of 17 economic sector categories based on the International Standard Industrial Classification (ISIC). The observation unit of each economic sector category in this study is the population of the large-medium enterprise's census results.

The data of large medium enterprises is classified based on the International Standard

Industrial Classification (ISIC) that consist of: (1) 1,778 enterprises of Mining & Quarrying sectors (category of B); (2) 35,163 enterprises of Manufacturing sectors (category of C); (3) 1,292 enterprises of Electricity, Gas, Steam, and Air Conditioning Supply sectors (category of D); (4) 1,317 enterprises of Water supply, Sewerage, Waste Management & Remediation Activities sectors (category of E); (5) 27,868 enterprises of Construction sectors (category of F); (6) 128,196 enterprises of Wholesale & Retail Trade, Repair of Motor Vehicles & Motorcycles sectors (category of G); (7) 21,205 enterprises of Transportation & Storage sectors (category of H); (8) 16,093 enterprises of Accommodation & Food Service sectors (category of I); (9) 8,133 enterprises of Information & Communication sectors (category of J); (10) 28,379 enterprises of Financial & Insurance sectors (category of K); (11) 6,509 enterprises of Real Estate sectors (category of L); (12) 8,775 enterprises of sectors of Professional, Scientific and Technical Activities (category of M); (13) 15,229 enterprises of sectors of Rental and Leasing Activities, Travel Agency and Other Supporting Service Activities (category of N); (14) 8,362 enterprises of Education sectors (category of P); (15) 3,781 enterprises of Human Health and Social Work sectors (category of Q).

Scopes of enterprises classifications based on firms size for this study are (1) medium enterprise (turnover/year is more than 2.5 billion to 50 billion rupiahs); (2) large enterprise, turnover/year above medium business (turnover/ year is more than 50 billion rupiahs). Specific classification for industry sectors of this study based on firm size is (1) medium enterprises (total workers are 20-99 people); (2) large enterprises (total workers ≥ 100 people).

According to the "Schumpeter hypothesis," this study selects the large and medium qualified firm size because large firms are more willing to innovate than small firms. According to Schumpeter, large firms will innovate to get better financing advantages (Feng *et al.*, 2019).

Further, firm size qualifications for construction sectors of this study are (1) medium enterprise (M1 qualification which value of one construction work ≤10 billion and M2 qualification which value of one construction work ≤50 billion rupiahs); (2) large enterprises (B1 or B2 qualifications which value of one construction work ≤250 billion and M2 which value of one construction work to unlimited). Moreover, particular criteria for the hotel (accommodation) subsectors consist of (1) medium enterprises (one to a five-star hotel with a turnover

of 2.5 billion-50 billion rupiahs); (2) large enterprises (one to five-star with a turnover of more than 50 billion rupiahs).

The purpose of this study was to determine the effect of enterprise innovation and other business support activities (internet usage, research, and development, intellectual property right, collaboration/partnership, expansion/development business, workforce training) on the dependent variable (the prospect of enterprise performance). Data processing use the Stata 13.0 software.

Logistic Regression Analysis

The method used to analyze the data in this study is logistic regression. This method aims to conduct the probability of the occurrence of the dependent variable with a logistic transformation, which is predicted by the independent variable. In this study, the binary logistic regression model is used to analyze the relationship between one dependent/response variable and six independent variables (covariates), with the response variable in the form of a qualitative dichotomous data which is value "1" to define the enterprise's future performance which good/better prospect and value "0" to define the enterprise's future performance which bad/worse prospect.

Odds of an event Y, expressed as *odds Y*, are the ratio of the probability between the two outcomes of a binary variable, that is the ratio between the probability of an event Y occurring (success) with the probability that the Y event does not occur (failure) (Liu, 2016):

$$\text{odds } Y = \frac{P(Y)}{1-P(Y)} \quad (1)$$

Harlan (2018) explained the multiple logistic regression model:

$$\text{logit } Y = \ln \frac{P(Y=1)}{1-P(Y=1)} \quad (2)$$

$$\ln \frac{P(Y=1)}{1-P(Y=1)} = \beta_0 + \beta_1 X_1 + \dots + \beta_p X_p \quad (3)$$

which $Y = \{0, 1\}$

The regression coefficient output of STATA contains the estimated maximum likelihood value of the logistic regression coefficient for each predictor including its constant, along with its standard error, the statistical value of the Wald test examiner with the distribution of Z and its p-value, as well as the estimated interval for the regression coefficient (Long and Freese, 2001).

The partial test (Wald test) for each independent variable (for each logistic regression coefficient β_j) has the hypothesis (partial test)

$H_0: \beta_j = 0$ (independent variable of i-th is statistically not significantly affect the dependent variable)

with test statistic: $Z_{test} = \frac{\hat{\beta}_j}{SE(\hat{\beta}_j)}$ and the decision is to reject H_0 if $p\text{-value} < \alpha$ (Hilbe, 2015).

This study used the Hosmer and Lemeshow Test (Goodness-of-fit-test) to test the adequacy and accuracy of the data in this regression model. The initial hypothesis is that the logistics model shows data sufficiency (model is fit). In contrast, the

alternative hypothesis is that the logistics model does not indicate data sufficiency (model is not fit). If the probability value is less than 0.05 ($\alpha=5\%$), then this indicates insufficient data.

It can be seen in the value of the likelihood-chi-square ratio (LR χ^2), which is used to test the null hypothesis that all the coefficients associated with the independent variable except the intercept are simultaneously equal to zero. $Prob > \chi^2$ shows the *p-value*, where the numbers in parentheses are the number of coefficients tested. The decision is to reject H_0 if the *chi-square probability* $< \alpha$ (Long and Freese, 2001).

Research Model and Variable Definition

$$\text{Logit PROSP}_i = \beta_0 + \beta_1 \text{ INOV}_i + \beta_2 \text{ INT}_i + \beta_3 \text{ HKI}_i + \beta_4 \text{ MIT}_i + \beta_5 \text{ PUS}_i + \beta_6 \text{ RND}_i + \beta_7 \text{ LAT}_i \quad (4)$$

INOV (Innovation): Amount of types of innovations undertaken by the enterprise, including product innovation, process innovation, organizational/managerial innovation, and marketing innovation. It is a count variable with the answer choices from values zero up to four (0-4).

INT (Internet Usage): The enterprise uses the internet in its operational/production business processes. It is a binary variable with the answer choices: (0) if No or (1) if Yes.

HKI (Intellectual Property Right): The company has a Patent/Copyright/Intellectual Property Right. It is a binary variable with the answer choices: (0) if No or (1) if Yes.

MIT (Business Collaboration/Partnership): The enterprise does business partnership/collaboration. It is a binary variable with the answer choices: (0) if No or (1) if Yes.

PUS (Business Expansion & Development): The enterprise prepare for business development and expansion. It is a binary variable with the answer choices: (0) if No or (1) if Yes.

RND (Research and Development): The enterprise carries out business research and development (R&D) activities. It is a binary variable with the answer choices: (0) if No or (1) if Yes.

LAT (Workforce Training): The enterprise does business partnership/collaboration, including the provision of money/capital goods, procurement of raw materials/product, marketing, training/counselling, or other. It is a binary variable with the answer choices: (0) if No or (1) if Yes.

PROSP (Business Prospect): Enterprise envisages the level of expectation related to business conditions or business tendencies going forward both in terms of profitability. It is a binary variable with the answer choices: (0) if it is as bad or worse; or (1) if it is as good or better.

Based on the research of Tidd, Bessant, and Pavitt (2005), types of innovation consists of: (1) product innovation; (2) process innovation; (3) position innovation; (4) paradigm innovation. Similarly, innovation types according to Statistics Indonesia/ BPS (2017) are classified as follows: (i) product innovation; (ii) process innovation; (iii) marketing innovation; (iv) organizational or managerial innovation. This research will present descriptive statistics in the form of classification of Large-Medium Enterprises innovation types based on microdata of Statistics Indonesia. Besides, this type of innovation data will be an independent variable as count data. The data count is the number of types of innovations carried out by each enterprise as the observation unit. Of the four types

of enterprise innovation based on the concept of Statistics Indonesia, the range of data count for each observation unit is zero (0) until four (4). If the value of the innovation variable of an enterprise is 0, it means that no innovation is carried out. Conversely, if the value is 4, it means the enterprise is doing four types of innovation (product innovation, process innovation, marketing innovation, and organizational/managerial innovation).

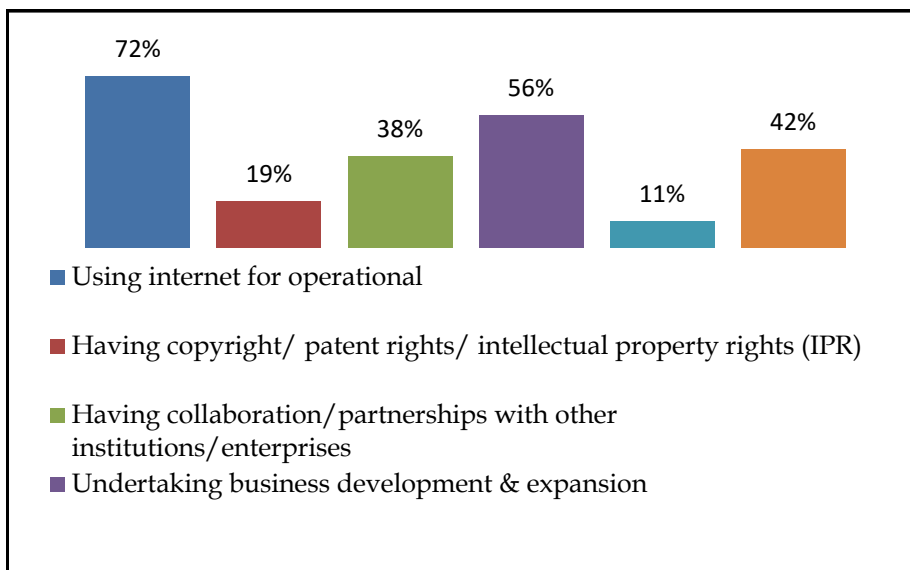
4. DATA ANALYSIS AND DISCUSSION

As seen in figure 1, the percentage of internet usage is 72%, the highest than other independent variables. While research and development (R&D) activities are the lowest business variables, which is 11% of the total large medium enterprises. The large medium

enterprises that prepare for business development and expansion are 56%. Besides, there is 42% of the large medium enterprises which provide workforce training.

As seen in Figure 1, we can obtain that only 19% of large medium enterprises do not have

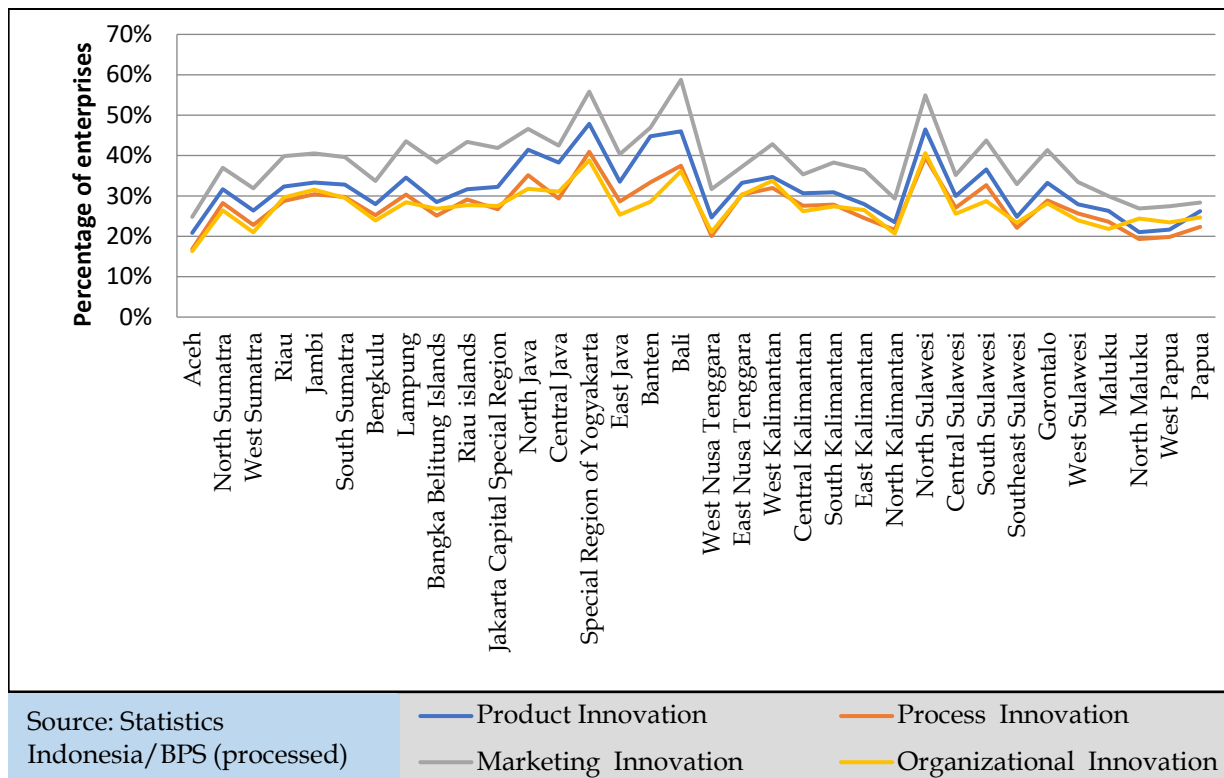
copyright/patent/intellectual property rights. It shows that very few large medium enterprises have discovered the invention of the product. There is 38% of large medium enterprises that collaborate with other institutions or enterprises.



Source: Statistics Indonesia/BPS (processed)

Figure 1

Business characteristics of large medium enterprises in Indonesia, 2017



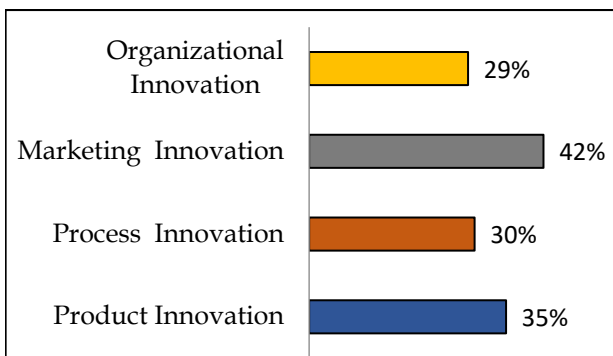
Source: Statistics Indonesia/BPS (processed)

Figure 2

Types of Innovation on large medium enterprises based on province in Indonesia, 2017

The types of innovation in Indonesia can be seen in Figure 2. In general, large-medium enterprises in the provinces of Bali, DI Yogyakarta, and North Sulawesi are the most innovative in terms of product, marketing, process, and organizational innovation. From this graph, it can be concluded that marketing innovation is the most common innovation done by large medium enterprises in all provinces in Indonesia. Nationally, marketing innovation was carried out by 42% of large-medium enterprises in Indonesia (Figure 3).

The type of innovations that at least carried out large-medium enterprises in almost all provinces in Indonesia were organizational/managerial innovations. Nationally, organizational innovation is carried out by 29% of large-medium enterprises in Indonesia. The results of this study are consistent with Chen (2006). Enterprises compete directly, and marketing innovations cause significantly more expansion and diversion of output. That is why many enterprises prefer marketing innovation. The process innovation (production process) is carried out by 30% of large medium enterprises as a whole in Indonesia. Meanwhile, product in-novation is carried out by 35% of large medium enterprises.



Source: Statistics Indonesia/ BPS (processed)

Figure 3
Percentage of large medium enterprises based on types of Innovation was conducted in Indonesia, 2017

Peters (2006) described that the performance measure seen from product innovation is determined by the ability of sales, which refers to the proportion of turnover in a particular year that comes from new products. Measuring the success of a new process is far more complicated and impossible for all types of process innovation. Based on the description, marketing innovations and product innovations are the most widely carried out by enterprises because these innovations have the most direct impact on financial turnover.

The data used in this study were 312,080 observations of large-medium enterprises, without agriculture sectors and another service sector. The sector categories with the most observations were 128,196 large-medium enterprises (G/Wholesale & Retail Trade sectors, Repair of Motor Vehicles & Motorcycles). The second-largest large-medium enterprises are 35,163 observations (C/Manufacturing sector). While the least is 1,292 observations (sector D/Electricity, Gas, Steam, and Air Conditioning Supply).

The chi-squared statistic on the significant likelihood-chi-square ratio (LR chi² (7)) (below $\alpha = 5\%$) shows that we reject the null hypothesis that these seven coefficients are simultaneously equal to zero. Almost all models have a p-value below 5%, except category sector B. So it can be concluded, the logistic model for category sector B does not have an independent variable that has a statistically significant effect on the dependent variable. Whereas the logistic model for other category sectors statistically has at least one independent variable that influences the dependent variable.

The pseudo R² value indicates the value of the diversity of the independent variable that can explain the diversity of the dependent variable. In contrast, the rest is explained by variables outside the model. The pseudo R² value of these 15 logistic models is no more than 8%. The smallest of 1.37% in the category of B (Mining & Quarrying), showing a minimal diversity of innovation variables and other independent variables that can explain the diversity of business prospects in the enterprises of Mining & Quarrying category. The highest pseudo R² among the 15 models is 5.43% (Q/Human Health and Social Work category), 6.5% (K/Financial & Insurance category), and 7.83% (F/Construction category).

The results of the Hosmer and Lemeshow test (Goodness-of-fit-test), which show that p-value > 0.05 are fit models. These fit model are models for the category of D (Electricity, Gas, Steam, and Air Conditioning Supply), E (Water supply, Sewerage, Waste Management & Remediation), H (Transportation & Storage), I (Accommodation & Food Service), J (Information & Communication), K (Financial & Insurance), L (Real Estate), M (Professional, Scientific and Technical Activities), N (Rental and Leasing Activities, Travel Agency, and Other Supporting Service Activities), P (Education), and Q (Human Health and Social Work). On the other hand, the models that do not have sufficient data are not fit models (p-value < 0.05). These not fit models are the category of B (Mining & Quarrying), C (Manufacturing), F (Construction), and G

(Wholesale & Retail Trade, Repair of Motor Vehicles & Motorcycles; Transportation & Storage).

The correlation between prospects (future performance) and innovation is positive, based on economic recovery. Enterprise expectations for innovation have a positive impact on enterprise performance. Innovation activities will be carried out by the enterprise to obtain valuable, expensive, scarce, and unmatched new resources (Bowen, Rostami, & Steel, 2010). The effect of this innovation is seen in categories of C (Manufacturing), E (Water supply, Sewerage, Waste Management & Remediation), F (Construction), H (Transportation & Storage), K (Financial & Insurance), and Q (Human Health and Social Work). These categories will have good/better business prospects when there are more types of business innovations implemented. This result shows that enterprises must innovate in various aspects of the business to succeed in today's fierce business competition. Opportunities for a better enterprise future can be illustrated by innovation (Rajapathirana & Hui, 2018).

As shown in table 1, in the large medium enterprises of C category's model, all independent variables partially significantly affect the business prospect variable at $\alpha=1\%$, except for the labor training variable, which is significant at $\alpha=10\%$. This result deserves the attention of stakeholders and leaders of the C category because it shows that this sector will have good prospects if it applies innovation and other variables of business (internet usage, R&D, intellectual property right, collaboration/partnership, expansion/development business, workforce training), in the operations of the manufacturing industry.

The significant independent variable in all models is the Business Development/Expansion (PUS) variable. Business Development/Expansion (PUS) variables are significant, with $\alpha=1\%$, $\alpha=5\%$, and $\alpha=10\%$. The Business Development/Expansion (PUS) variable is significant at one% for the categories of B, C, F, G, H, I, J, K, L, M, N, P, and Q. It shows the sectors will have good or better business prospects when preparing business expansion.

Table 1
Result of logistic regression based on economic activities of B (Mining & Quarrying) to H (Transportation & Storage) categories in Indonesia, 2017

PROSP	The odds ratio of enterprises classification form economic activities categories						
	B	C	D	E	F	G	H
INOV	1.0610 (0.0810)	1.0790*** (0.0160)	1.0770 (0.1090)	1.3850** (0.1820)	0.8860*** (0.0240)	1.0110 (0.0090)	1.0380* (0.0230)
INT	0.9520 (0.1670)	1.1530*** (0.0480)	1.3480 (0.4260)	0.9310 (0.2820)	3.0450*** (0.2490)	1.1080*** (0.0270)	1.1030* (0.0660)
HKI	0.8670 (0.2710)	0.7430*** (0.0350)	0.8220 (0.2900)	0.5600 (0.2400)	0.8060** (0.0870)	1.0770** (0.0330)	1.2930*** (0.1010)
MIT	1.1580 (0.2120)	0.8790*** (0.0370)	0.77200 (0.2400)	0.8810 (0.2700)	1.0170 (0.0700)	0.9190*** (0.0220)	0.9210 (0.0530)
PUS	1.6660*** (0.3150)	2.2560*** (0.1000)	1.8360* (0.5770)	1.9070** (0.5580)	3.7950*** (0.2450)	2.7640*** (0.0650)	2.9430*** (0.1690)
RND	0.9510 (0.3340)	0.8070*** (0.0490)	0.5140 (0.215)	0.7560 (0.31)	0.7690** (0.095)	0.9050** (0.036)	0.7390*** (0.068)
LAT	1.2470 (0.2210)	0.9200* (0.0390)	1.287 (0.38)	0.955 (0.281)	0.56*** (0.037)	1.026 (0.028)	0.842*** (0.054)
_cons	6.1470*** (0.8060)	7.2220*** (0.2530)	11.23*** (2.855)	13.378*** (3.243)	5.092*** (0.389)	7.171*** (0.133)	6.939*** (0.329)

Numb of obs	1,7780	35,1630	1,292	1,317	27,868	128,196	21,205
Log likelihood	-598.1490	-10525.7070	-258.1170	-244.3670	-5108.7390	-33716.0900	-5597.2200
Pseudo R2	0.0137	0.02210	0.0204	0.0341	0.0783	0.0335	0.0390
Prob>chi2 (LR test)	0.0199	0.0000	0.1490	0.0159	0.000	0.0000	0.0000
Prob>chi2 (Hosmer Lemeshow test)	0.0106	0.0000	0.0693	0.3558	0.0000	0.0000	0.1338

Noted: i. * Significantly at $\alpha = 10\%$; ** $\alpha = 5\%$; *** $\alpha = 1\%$

- ii. (B) Mining & Quarrying; (C) Manufacturing; (D) Electricity, Gas, Steam, and Air Conditioning Supply; (E) Water supply, Sewerage, Waste Management & Remediation; (F) Construction; (G) Wholesale & Retail Trade, Repair of Motor Vehicles & Motorcycles; (H) Transportation & Storage.

Table 2
Result of logistic regression based on economic activities of I (Accommodation & Food Service) to Q (Human Health and Social Work) categories in Indonesia, 2017

PROSP	The odds ratio of enterprises classification form economic activities categories							
	I	J	K	L	M	N	P	Q
INOV	1.0120 (0.0260)	0.9610 (0.0350)	1.1700*** (0.0290)	1.0470 (0.0440)	1.0620 (0.0400)	1.0140 (0.0270)	1.0150 (0.0390)	1.1060* (0.0650)
INT	1.0930 (0.0750)	1.1030 (0.1070)	0.7200*** (0.0800)	1.0300 (0.1140)	0.8850 (0.0930)	1.0490 (0.0750)	0.8710 (0.0880)	1.0950 (0.1590)
HKI	1.1490 (0.1030)	1.0790 (0.1320)	1.3900*** (0.1260)	0.9680 (0.1290)	0.8520 (0.1020)	1.1180 (0.1030)	1.2270 (0.1620)	0.8580 (0.1550)
MIT	0.9450 (0.0620)	0.800** (0.0740)	0.9120 (0.070)	1.0000 (0.1060)	0.9490 (0.0930)	1.0160 (0.0700)	0.8460* (0.0820)	0.8950 (0.1250)
PUS	2.8680*** (0.1910)	3.5720*** (0.3450)	3.4670*** (0.2720)	3.1590*** (0.3370)	3.8440*** (0.3760)	2.8330*** (0.1930)	3.1200*** (0.3040)	3.6370*** (0.5400)
RND	1.0620 (0.1230)	0.9520 (0.1510)	0.6710*** (0.0640)	0.6600** (0.1090)	0.7380** (0.1090)	0.7770** (0.0860)	0.6240*** (0.0950)	0.9650 (0.2430)
LAT	0.9790 (0.0720)	1.0840 (0.1140)	1.2810*** (0.1090)	0.9390 (0.1110)	0.8730 (0.0930)	1.0130 (0.0790)	1.2960** (0.1440)	0.9020 (0.1440)
_cons	6.8630*** (0.3820)	7.0380*** (0.5470)	12.9230*** (1.4420)	7.1930*** (0.6390)	8.8130*** (0.7840)	7.1810*** (0.4080)	8.4220*** (0.6640)	6.9560*** (0.7980)
Numb of obs	16,0930	8,1330	28,3790	6,5090	8,7750	15,2290	8,3620	3,7810
Log-likelihood	-4192.1700	-2093.7400	-3544.3800	-1672.8500	-2003.1100	-3937.1700	-2050.4400	-934.4540
Pseudo R2	0.0373	0.0479	0.0650	0.0419	0.054	0.035	0.0422	0.0543

Prob>chi2 (LR test)	0.0000	0.0000	0.0000	0.000	0.000	0.000	0.000	0.000
Prob>chi2 (Hosmer Lemeshow test)	0.3732	0.6020	0.5240	0.8605	0.494	0.355	0.7901	0.9847

Noted: i. * Significantly at $\alpha = 10\%$; ** $\alpha = 5\%$; *** $\alpha = 1\%$

- ii. (I) Accommodation & Food Service; (J) Information & Communication; (K) Financial & Insurance; (L) Real Estate; (M) Professional, Scientific and Technical Activities; (N) Rental and Leasing Activities, Travel Agency and Other Supporting Service Activities; (P) Education; (Q) Human Health and Social Work.

Batterink (2009) revealed that research and development (R&D) has a significant influence on innovation because it is the primary locus of innovation. In line with this study, Research and Development (RND) variable is significant at $\alpha = 1\%$ for the categories of C, H, K, and P. This variable is significant at $\alpha = 5\%$ for the models for categories of F, G, L, M, and N. For other models, Research and Development (RND) variable does not significantly affect the model. This result means that enterprises in categories of C, H, K, P, F, G, L, M, and category of N will experience good or better prospects when intensely conducting research and development (R&D).

While the Labor Training (LAT) variable is significant at $\alpha = 1\%$ for the category of F, category of H, and category of K. The variable is significant at $\alpha = 5\%$ for the category of P model and significant at $\alpha = 10\%$ for the category of C model. Meanwhile, the Workforce Training (LAT) variable does not significantly affect the rest model. It means that enterprises in the category of F, category of H, category of K, and category of P will experience good/better prospects when providing training/education to their workers. Furthermore, this is following the study of Becker and Gerhart (1996) that Management of Human Resources (HR), like training, can have an economically significant effect on firm performance and firm expectation.

The Internet Usage (INT) variable is significant at $\alpha = 1\%$ for the category of C, F, G, and K. This variable is significant at $\alpha = 10\%$ for the category of H. This shows that these five sectors will have good or better prospect when using the internet as operations.

The variable Patent/Copyright/ Intellectual Property Rights (HKI) is significant at $\alpha = 1\%$ for the category of C, H, and category of K. This variable is significant at $\alpha = 5\%$ for the category of F and category of G. This result means that enterprises in these five sectors will experience good/better prospects when they have Patent/Copyright/Intellectual Property Rights (IPR). The value of patent protection implicitly

builds in the expectation of future choices made by the applicant, and any additional fees resulting from these choices (Organization for Economic Co-operation and Development (OECD), 2004).

While the Business Partnership (MIT) variable is significant at $\alpha = 1\%$ for the category of C and category of G. This variable is significant at $\alpha = 5\%$ for the category of J model and significant at $\alpha = 10\%$ for the category of P model. In the remaining models, this variable does not significantly influence the model. It is following the study of Deschamps and Nelson (2014) where many manufacturing companies began implementing open innovation policies since the 2000s in the form of implementing innovation partnerships between companies.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

Based on this study's results and discussion above, we may conclude that marketing innovations and product innovations are the most innovative types widely carried out by large-medium enterprises. Nonetheless, innovation activities, whether the product, process, marketing, or managerial/organizational innovation need to be improved in large-medium enterprises in Indonesia

The effect of innovation variable is seen in categories of C (Manufacturing), E (Water supply, Sewerage, Waste Management & Remediation), F (Construction), H (Transportation & Storage), K (Financial & Insurance), and Q (Human Health and Social Work). These categories will have good or better business prospects when there are more types of business innovations implemented. Innovation and other independent variables are varying in combination while influencing business prospects in all economic sectors. Variables that affect the entire economic sector are the variables of business development/ expansion preparation. Meanwhile, the sector that is influenced by all variables in this study is the manufacturing industry sector.

Each different category/sector will require

different innovations. Category of (Manufacturing), category of F (Construction), category of G (Wholesale & Retail Trade, Repair of Motor Vehicles & Motorcycles), category of H (Transportation & Storage), category of K (Financial & Insurance), and category of P (Education) have many significant independent variables. It is crucial for stakeholders engaged in these sectors to pay more attention to innovation and other business variables in the operation of enterprises.

This study has certain limitations. First, the ISIC-based economic sector used in this study is only 15 categories, excluding R (Arts, entertainment and recreation sectors) and S (Other service activities sectors) sectors. Further research will be better if it covers 17 economic sectors, according to the International Standard Industrial Classification of All Economic Activities (ISIC). Second, the scope of research can be added by analyzing micro-small enterprise data. Third, the authors have difficulty adding quantitative variables, in the form of profits, revenues, and enterprise expenditures, to the model. These quantitative variables are necessary for enterprise performance variables. It is due to limited data access.

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