



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



Small Business Use of the Internet: Findings from Indonesia

Tulus Tambunan^{1*} and Ida Busnetti¹

¹*Center for Industry, SME & Business Competition Studies, University of Trisakti, Jakarta, 11440, Indonesia.*

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2018/44545

Editor(s):

(1) Dr. Shakeel-Ul-Rehman, Assistant Professor, Department of Business Studies, Islamic University of Science and Technology, Jammu & Kashmir, India.

Reviewers:

(1) Hussin Jose Hejase, Al Maaref University, Lebanon.

(2) Tutunea Mihaela, Babes-Bolyai University from Cluj-Napoca, Romania.

Complete Peer review History: <http://www.sciencedomain.org/review-history/27084>

Original Research Article

Received 04 August 2018
Accepted 09 October 2018
Published 06 November 2018

ABSTRACT

In the current era of globalisation, small businesses are required to be able to compete in the market. Utilising information technology in the form of Internet media is the way out for them. This study aims to explore the use of the Internet by micro and small enterprises (MSEs) in Indonesia. For this purpose, this study analysed secondary data on Internet use by MSEs and primary data were collected from face-to-face interviews with randomly selected 482 owners of MSEs in various cities and types of business. The secondary data analysis shows that only a small fraction of MSEs in the country utilise the Internet for their businesses, although it varies by province and type of business. From the primary data analysis, three interesting findings revealed, namely: (i) manufacturing industry is the type of business with the most Internet usage; (ii) young respondents use the Internet more than older respondents; and (iii) higher educated respondents are more likely to use the Internet in running their businesses than low educated respondents.

Keywords: *Micro; small and medium enterprises (MSMEs); micro and small enterprises (MSEs) Internet; information and communication technology (ICT); e-commerce.*

*Corresponding author: E-mail: ttambunan56@yahoo.com;

1. INTRODUCTION

It is undeniable that information and communication technology (ICT) has changed many things in the business. It not only has changed the way businesses communicate to each other or deal with their customers, distributors and suppliers but also through digital marketing or e-commerce it has changed the way they promote and sell their products or purchase their raw materials. Digital Marketing has now become the trend in targeting both current and prospective customers. Most people now have daily access to the Internet; via computers, laptops or smartphones. Social media is one of the best channels of online marketing, and Instagram is one of the fastest growing platforms available today [1]. More and more businesses are eager to establish a strong presence on this network and encourage their prospects' engagement. To be able to survive in this new business environment all companies including micro, small and medium enterprises (MSMEs) are pushed to adopt this technology. Sooner or later, MSMEs which do not adopt this new technology and business practice will be displaced by their competitors and abandoned by their customers [2,3,4,5].

The objective of this paper is to explore the use of the Internet by small businesses, represented by micro and small enterprises (MSEs), in Indonesia. More specifically, it aims to address the following three research questions. First, how many MSEs in Indonesia use the Internet for their businesses? Second, does the intensity of Internet usage by MSEs vary by business,

region, age and education of the owners? Third, is the profit or income earned by MSEs that use the Internet greater than that earned by MSEs which do not use it?

2. REVIEW OF LITERATURE

As the competition faced by MSMEs become increasingly tight, it is vital for these enterprises to use modern technologies, including ICT as among their sources of competitive advantages. There are many indications from various sources that in the past decade more and more MSMEs utilised ICT or adopting e-commerce; although still many more MSMEs, especially MIEs, which do not/have not (yet) utilised this technology in running their business activities for various reasons. In accordance with this development, Internet use, especially e-commerce, among these enterprises has recently become a popular topic for researchers not only in the fields of MSMEs but also in electronic business, information management, information systems and entrepreneurship; though research investigating the adoption of e-commerce by MSMEs is still small in number (see references in Table 1). Some of these studies also made a good summary of the findings from previous studies. There are two key issues that have received a great attention from these existing studies, namely (i) factors that influence the decision of MSMEs or their main constraints to utilise ICT; and (ii) the benefit of utilising ICT and applications to support their business activities. Table 1 summarises the findings of selected important studies in the past two decades.

Table 1. Important findings from key literature on the Utilisation of ICT by MSMEs

Study and period	Two key issues	
	Determinant Factor/Constraints	Expected Benefit
Blackburn and Athayde [6], Fallon and Moran [7], Matlay [8], Riquelme [9]	Business sector, size and characteristics	
Poon & Swatman [10], Akkeren and Cavaye [11], Doherty et al. [12], Daniel et al. [13], Farhad et al. [14], Savrula [15]		Improves productivity and competitiveness; increase ability to operate in international markets; provides a tool for providing cost-effective ways to market their products and launch new products; creates value added, new services and new business models; improves or speeds

Study and period	Two key issues	
	Determinant Factor/Constraints	Expected Benefit
		communications; gather information; identify potential business partners.
Crawford [16], Bakos and Brynjolfsson [4], Miller & Besser [17], Tetteh & Burn [18], Jon et al. [19], Mehrrens et al. [20], Sawhney and Zabin [21], Doolin et al. [22], Chen [23], Grandon & Pearson [24], Poon & Swatman [25], Chong & Pervan [26], Shih [27], Poorangi & Khin [28], Ahmada et al. [2], Rahayua and Daya [29]	Perceived relative advantage; perceived compatibility; perceived benefits; MSME owner's/manager's strategic vision, innovativeness, ICT knowledge, expertise, and experience, and willingness to utilise ICT as well as to adjust his/her businesses to the requirements related to the utilisation of ICT; other owner's/manager's characteristics; business planning; organisational complexity; observability; government policies; external change agents (skilled labor, software/hardware vendors); pressures from trading partners, customers and competitors.	
Raymond [30], Barry & Milner [5], Daniel & Grimshaw [31], Seyal [32], Street & Meister [33], Erdener, et al. [34], Migiro [35], Jones et al. [36], Zaied [37]	Resources, e.g. capital to finance related costs (e.g. training of employees, organisational change, investment in tools and others), human resources, especially technical know-how/expertise, legal and regulatory (especially with respect to internet security or trust to use online transactions) factors	
Migiro [35], Lai [38], Standing et al. [39]		Improves competitiveness and efficiency; closes the relationship gap between customers, suppliers and trading partners; streamlining of business processes; market expansion; improved operational efficiencies; access to new customers, supplier and trading partners; creation of new ways of selling existing products
Neale et al. [40], Poorangi et al. [41]	Triability, observability, company's culture, complexity, relative	Provides gain strategic advantages, e.g. internal and external process

Study and period	Two key issues	
	Determinant Factor/Constraints	Expected Benefit
	advantages	integration; closes relationships with customers and other business owners; influences market growth to earn external resources; and increases the expertise for growth and development of business.
Azam & Quaddus [42]		Increases productivity
Saffu et al [43], Azam & Quaddus [3]	Perceived organisational compatibility	
Hunaiti et al. [44]		Provides cost-effective tool to market and launch new products, improves client communications, enhance the collection of marketing knowledge and information

3. METHODOLOGY

This study is an exploratory investigation and adopted descriptive analysis, using a mix research approach: quantitative and qualitative analyses. With the first approach, it analysed secondary data. The data was obtained from two sources, namely (i) national data on development of MSMEs in Indonesia for the period 1997-2017 from the Ministry of Cooperative and SME (online data), and (ii) data on the internet usage by MSEs in Indonesia from the National Agency of Statistics (Indonesia's Economic Census 2016). The second approach analysed primary data which was collected from interviews with randomly selected 482 owners of MSEs in various cities, including Jakarta (the Capital), and types of businesses, such as trade, manufacturing, and services. The interviews took place during the first quarter of 2018.

4. FINDINGS AND DISCUSSION

In Indonesia, the classification of enterprises is set in Law No. 20, 2008. In this law, the criteria used are net asset value excluding land and building of business premises, and annual revenues (Table 2). Alternatively, the Indonesian Agency of Statistics (BPS) adopts the number of workers as the criteria: microenterprise (MIE): 0-4 persons; small enterprise (SE): 5-19 persons; medium enterprise (ME): 20-99 persons; and large enterprise (LE): > 99 persons.

Table 2. Definon of enterprises by size category in Indonesia (in rupiah)

Size category	Net Asset Value	Annual Revenue
MIE	≤50m	≤300m
SE	>50m-500m	>300m-2.5b.
ME	>500m-10b	>2.5b-50b
LE	>10b	>50b

Source: Law No.20, 2008 (State Ministry of Cooperative and SME)

Besides net asset value and annual revenues, there are also differences between MIEs, SEs, and MEs in other aspects that can be easily observed in Indonesia. These aspects include the sector in which they operate (formal *versus* informal), the organisational and management systems applied in the business, the nature of employment within the enterprise, the market orientation, the economic and social profile of the owner, and the technology used including information technology, and degree of automation in the production process (Table 3).

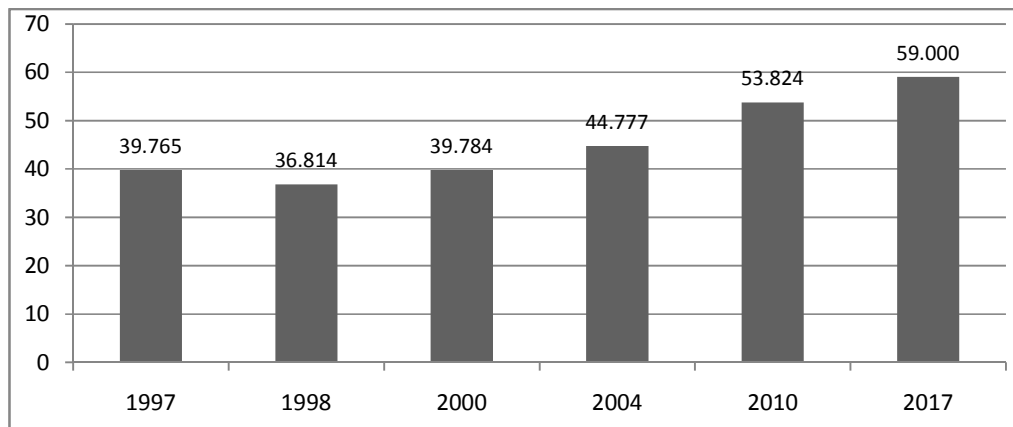
4.1 Results from Secondary Data Analysis

One characteristic of the Indonesian economy is that economic activities are dominated by MSMEs; although the ratio of MSMEs to LEs varies across different economic sectors. For example, in the mining sector, particularly in oil, gas and coal, where there are many LEs,

Table 3. Key features of MSMEs

No	Aspect	MIE	SE	ME
1	Formality	Degree of informality is high	Degree of informality is lower	All are operated formally (i.e. registered and paid taxes)
2	Organisation & management	Primitive/traditional	Many are non-primitive units with modern management systems	All have formal organisational structure with modern management systems
3	Workers used	In general, they use unpaid family members	In general they use wage-paid employees	All use wage-paid employees
4	Production process	Traditional/manually	Many are highly mechanised	Degree of automation is much higher
5	Market orientation	Most are very local oriented; served local low income households	Local, national and/or export	National and/or export
6	Economic & social profile of the owner	Non-/low educated and poor	Many are well educated and from non-poor families	Most are well-educated and from medium to high-income families.
7	Technology used	In general, they use 'out of date' machines or manually and do not utilise ICT	Many use machines and utilise ICT	Degree of modern technology used is much higher and all utilise ICT.

Source: Tambunan [45], dan BI dan LPPI (2015).

**Fig. 1. Number of MSMEs in Selected Years for the Period 1997-2017 (million units)**

Source: Menegkop & UKM [46], [47]

including foreign companies, the ratio is lower than in other sectors such as trade, manufacturing industry and agriculture [48,49]. According to the official time series data issued by the State Ministry of Cooperatives and SMEs for the period of 1997-2017, the total number of MSMEs in all sectors in Indonesia increased every year from 39.765 million units (or about 99.8 % of the total business units in Indonesia) in 1997 to more than 59 million units by 2017 (Fig.

1) (Menegkop & UKM, [46,47]), except in 1998, when the Asian financial crisis occurred during the period 1997-98 hit Indonesia.

Concerning their contribution to the formation of gross domestic product (GDP), MSMEs always play a smaller role compared to their contribution to employment generation. Although their GDP share tended to increase lately, MSMEs in Indonesia still accounted for much less than 90%

of GDP (Fig. 2). The lower contribution of MSMEs to the formation of GDP compared to their role in job creation is caused due to many factors including their limited access to advanced technology, capital and human resource that resulted in their much lower productivity than that in LEs [45].

In Indonesia, despite the rapidly growing Internet media, the number and percentage of MSEs that have utilised the Internet are still very low. According to the 2016 Economic Census, only as many as 563 thousand enterprises or about 2.14% of total MSEs in Indonesia have utilised the Internet media for their business activities (BPS, 2017). Until now there are very few published papers or reports, either based on field surveys or observations, on the utilisation of ICT by MSMEs in Indonesia that can explain why the use of the Internet by MSEs in the country is still very low. According to Julianto (2016), there are various obstacles faced by the Indonesian government (the State Ministry of Cooperative and Small Medium Enterprise) in encouraging MSEs owners to utilise ICT, which include their low understanding of this kind of technology, their mindset which is not in favour of using Internet in doing their businesses, and their lack of knowledge on how to operate this technology. Meanwhile, according to a report issued by the Indonesian Ministry of Industry, MSMEs, especially MSEs and located in rather isolated/rural areas, are still unfamiliar with the online marketing system. They prefer to do marketing with conventional methods, by utilising the distribution networks that they have been using for a long time or involving many distributors who have long been their customers (Kompas, 2018).

So far, there is only one study in Indonesia which was based on a survey conducted by Rahayua and Daya [29] in 2015. Target respondents for their study were owner/managers of MSMEs. In this study, MSMEs refers to a business which has less than 100 employees, assets less than 10 billion rupiah and total sales per year below 50 billion rupiah. From various data sources, including from the Ministry of Cooperative and SME, a total of 3,267 MSMEs were chosen as the sampling frame for this study, and only 292 MSMEs participated in this study, a response rate of 8.9 %. Based on their finding, they concluded that the adoption of e-commerce by MSMEs in Indonesia is affected by several factors which are perceived benefits, technology readiness, owners' innovativeness, owners' ICT experience and owners' ICT ability. Their findings also show that the individual factors play a significant role in adopting e-commerce technology by MSMEs in Indonesia.

The distribution of MSEs using the Internet by province, as depicted in Fig. 3, shows that Internet use for businesses are done mainly from Java island. Provinces in Java with the highest proportion of MSEs using the Internet are East Java with around 18.72 % of all MSEs using the Internet in Indonesia, followed by West Java and Central Java with, 18.11 % and 15.41 %, respectively. While, outside the Java Island, especially in the eastern region, the percentage is much lower. Provinces that have the lowest percentage in this region are Maluku with only 0.12 %, North Maluku with 0.16 %, and West Papua 0.19 %.

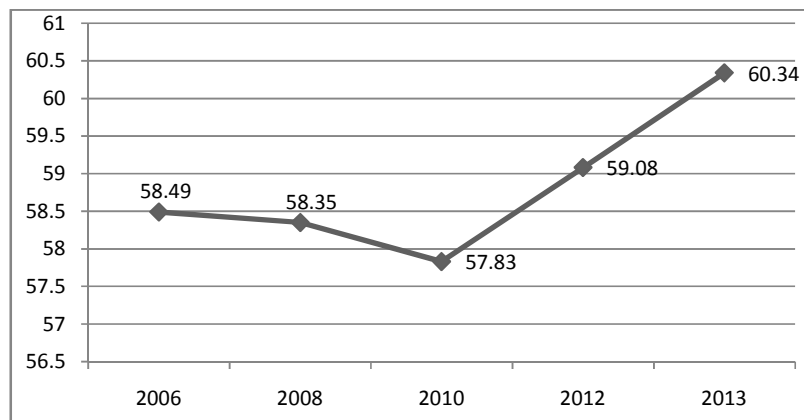


Fig. 2. GDP shares of MSMEs and LEs, 2006-2013 (%)

Source: Menegkop & UKM [46]

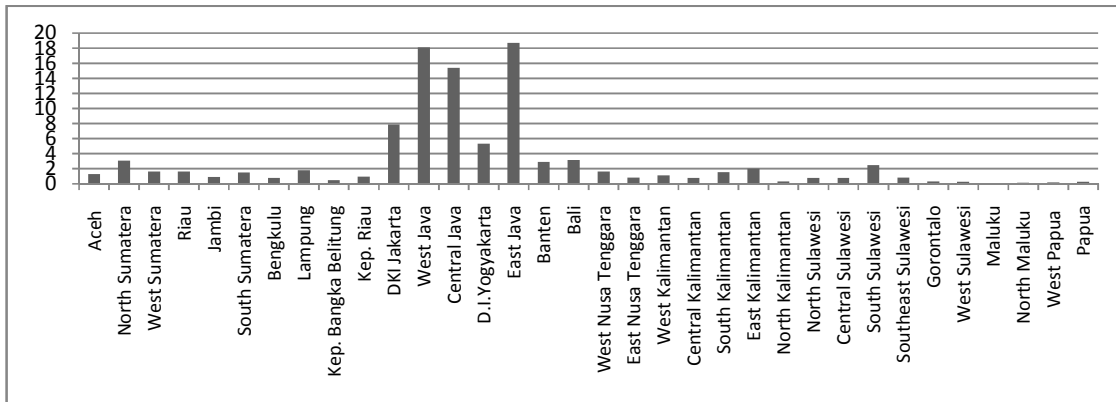


Fig. 3. Percentage distribution of total MSEs using Internet by province, Indonesia, 2016

Source: BPS [50].

The percentage distribution by province (Fig. 3) is in line with the fact that the number of MSEs in the eastern region, as well as the region's share in the national GDP, is much lower than that in the western region, especially in Java Island, where the majority of these enterprises are located, and it has the highest national GDP share. So, this fact may suggest a positive relationship between the magnitude of economic activities in a province relative to other provinces, reflected by its share of national GDP, and the number of MSEs in the province using the Internet compared to other provinces, indicated by its share of Indonesia's total MSEs in utilising the Internet.

Fig. 3 does not, however, show the difference between provinces in the intensity of Internet usage by MSEs. For this, Fig. 4 shows the percentage of total MSEs that use the Internet per province. For instance, in Java Island, D.I. Yogyakarta province uses the Internet with the

highest usage (near to 6 %). In the second place is DKI Jakarta, the Capital city of Indonesia, with almost 4 % usage. In some provinces outside Java Island, the Internet usage rate of MSEs is also quite high, such as in Kep. Riau, Bali, and East Kalimantan, with almost 4 % of total MSEs of the Internet usage in these provinces.

Next, based on the 2016 Economic Census, Table 4 shows that the types of businesses whereby most MSEs utilise the Internet are retail trade, car, motorcycle repair and care services with around 39.64 % usage. Especially in the retail trade, the use of online transactions by both consumers (buying) and producers (selling) in Indonesia has grown tremendously in recent years. Other types of businesses that are also run by many MSEs by utilising the Internet are information and communication with 11.73 %, manufacturing industry with 10.66 %, and education with 8.09 %.

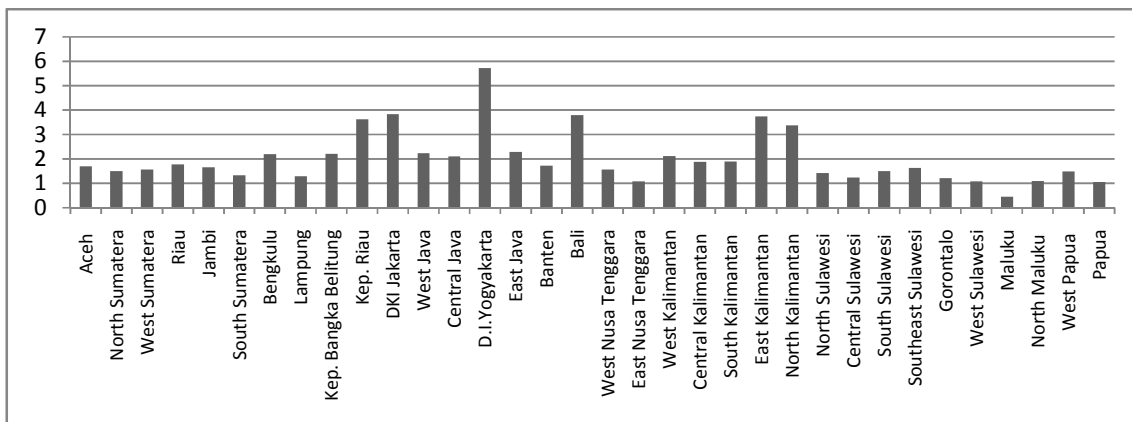


Fig. 4. Percentage of MSEs using Internet per province, Indonesia, 2016

Source: BPS [50].

Table 4. Distribution of MSEs using Internet by type of business, 2016

No	Sector	Percentage distribution
1	Mining and quarrying; procurement of electricity, gas and drinking water; water management, wastewater management, waste management and recycling, and remediation activities	1.33
2	Manufacturing industry	10.66
3	Construction	2.53
4	Retail trade, and car and motorcycle reparation and maintenance	39.64
5	Transportation and warehouse	4.65
6	Accommodation and food and beverages	6.79
7	Information and communication	11.73
8	Finance and insurance	1.53
9	Real estate	0.56
10	Business services	5.7
11	Education	8.09
12	Healthcare and social activities	1.3
13	Other services	5.49

Source: BPS [50].

Finally, Table 5 gives an overview of turnover obtained by MSEs that utilise Internet for business and those which do not use Internet. In general, for both categories of MSEs, most have a turnover of less than 300 million rupiah, namely a total of 79.41 % for MSEs that utilises the Internet for business and 91.51 % for those not utilising the Internet. This is also in line with the fact that due to their small size, most MSEs in Indonesia have turnover per year below Rp 300 million. When viewed from the percentage of MSEs with turnover more than 300 million rupiah, more than 20 % or about one in five MSEs which utilises the Internet for business has a turnover above 300 million rupiah. On the other hand, MSEs that do not utilise the Internet for business, the percentage of MSE which has a turnover above 300 million the rupiah is not more than 10 %. The ratio of MSEs that use the Internet for business to those which do not use it in businesses with high turnover is greater than that in businesses with lower turnover.

Data in Table 5 may give two different impressions. First, it could mean that businesses with a high turnover value usually have more complicated processes with a higher degree of

computerisation, and a greater financial/investment risk than businesses with smaller turnover value. Therefore, naturally, companies including MSEs in the first category of businesses are more in need of modern technologies, including ICT, than their counterparts do in the second category of businesses. Or, alternatively, it could mean that MSEs that utilise the Internet for businesses have a greater opportunity to generate higher turnover values compared to those that do not utilise the internet, which is in accordance with what has been said in the literature on the benefits of using the Internet for MSMEs. Findings from a survey conducted by the Indonesian Ministry of Industry indicate that successful MSMEs doing online marketing gain far greater profits than ever before [51].

4.2 Results from Primary Data Analysis

The primary data to be analysed in this section were obtained from a survey questionnaire and face-to-face interviews with randomly selected 482 owners of MSEs in various cities and types of businesses in Indonesia during the first quarter

Table 5. Total MSEs and those using internet by category of Turnover, Indonesia, 2016 (%)

Category of turnover	Total MSEs by category	MSEs using internet by category	MSEs using per category
<Rp300 million	91.25	79.41	0.002
Rp300 mill.-Rp2.5 bill.	8.65	19.78	4.9
Rp2.5 bill.-Rp50 bill.	0.1	0.78	17.2
>Rp50 billion	0.002	0.03	31.74

Source: BPS [50].

of 2018. The majority of the sample, however, is from the MIE category. As shown in Table 6, the majority of the respondents are located in Jakarta (the Capital) and operated in the trade sector (shops). This is in accordance with one of the characteristics of MIEs in Indonesia (as also evident in other developing countries) that trade is the main sector of this category of enterprises. Concerning the level of education of the respondents, also according to one characteristic of these enterprises, most of them only have a high school education.

During the survey, the respondents were asked with the key question: wheather they use the Internet or not. It reveals from the survey that as many as 178 respondents (about 36.9 % of the sample) do not use the Internet, for various reasons, given in percentage distribution as follows:

- i. No need: 60.8 %. The assumption that the Internet does not really need has something to do with the type of business and its market coverage. Types of business like e.g. food stalls, small shops or small motorcycle repair workshops that only serve the surrounding community do not need internet;
- ii. lack of knowledge: 25.13 %. For example, many of them said that they do not know how to do online purchases, or how to implement e-commerce in marketing their goods; and
- iii. lack of capital: 14.07 %. Many of them claimed to have no money to buy computers or to install the Internet. There were even a number of respondents who said that they actually want to create their own websites to promote their businesses but have not yet been realised due to funding problems.

Table 6. Profile of the respondents

Description	Persons
Total respondents:	482
-Jakarta	303
-Tangerang	73
-Bekasi	37
-Depok	19
-Bogor	13
-Indramayu	7
-Bandung	3
-Nias, Cibubur, Kerawang, Serang, Cikarang, Cibinong, Serui	each 2
Age group:	
- ≤30	139
- 31-50	257
- 51-65	77
- ≥66	9
Gender:	
-Male	323
-Female	159
Education	
-High school or lower	257
-Academy	38
-University	187
Type of business:	
-shop	208
-restaurant	141
-manufacturing	33
-rental services	29
-workshop	28
-beauty salon	18
-entertainment services	4
-others	21

Source: Field survey, 2018

The second interesting finding from the interviews is about the number of respondents using the Internet by type of businesses. The following two figures show, respectively, the 'gross intensity' and 'net intensity' of Internet usage. As can be seen in Fig. 5, the 'gross intensity' of Internet usage among the respondents is highest in the manufacturing industry; followed by those in rental services, and restaurants, catering and cafes. Fig. 6 shows that the 'net intensity' of Internet usage of those who run repair workshops is negative as in that type of business the number of respondents who use the Internet is less than those who do not. Whereas, in other types of businesses more respondents who utilise the Internet than those who do not. Respondents, who were the manufacturers of food products, furniture, handicrafts, and car spare parts, said that the Internet helped them much in seeking alternative sources of raw materials, product design, or information about prices and competitors.

Owners of rental services also claimed that the internet is important to find new potential tenants.

However, not only the type of business that determines the intensity of ICT/Internet usage in running a business; age and level of education also revealed to be important determinants. The theory behind this is that young entrepreneurs who were born in the 80s or 90s, which means that as teenagers they lived in the era of ICT, tend to use ICT more than their counterparts who were born before the 80s; although they are in the same businesses. As shown in Fig. 7, it is very obvious that much younger respondents with age less than 50 years old are more eager to utilise ICT compared to those aged above 50. The same is true in education. As can be seen in Fig. 8, obviously that higher educated businessmen or owners of MSEs are more likely to use the Internet in running their businesses than their less educated counterparts.

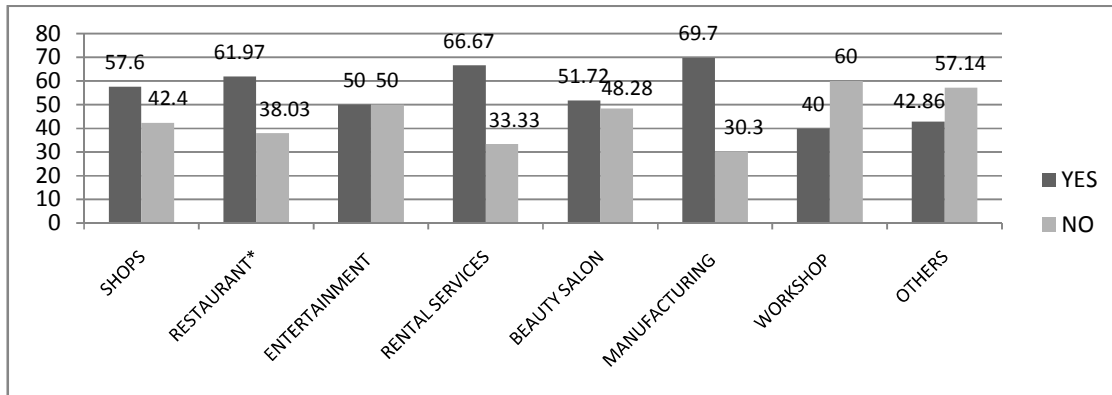


Fig. 5. Gross intensity of internet usage of the respondents by type of business (%)

Note: * including catering and cafes.

Source: field survey, 2018

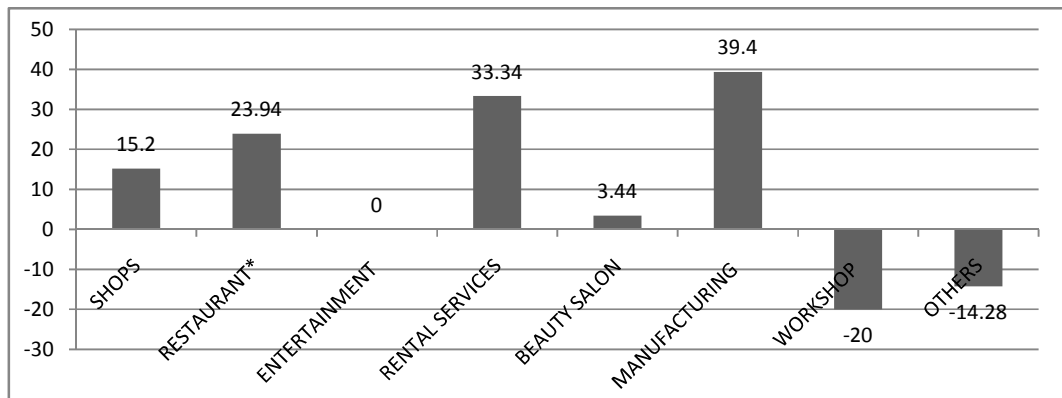


Fig. 6. Net intensity of internet usage of the respondents by type of business, (%)

Note: * including catering and cafes, Source: field survey, 2018

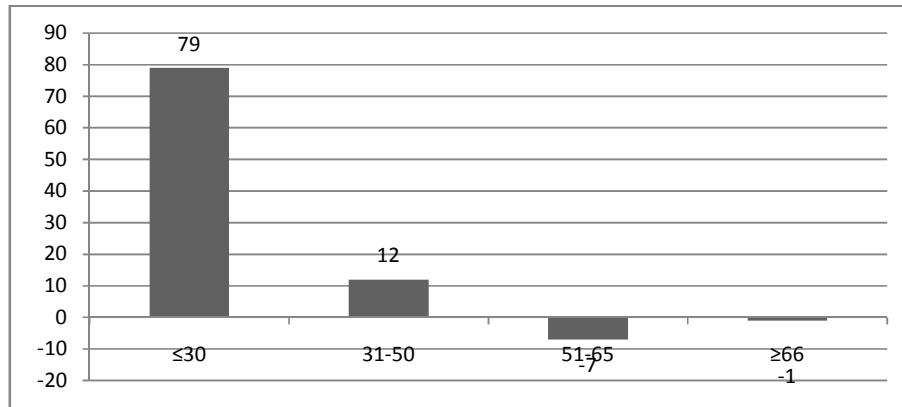


Fig. 7. Net intensity of internet usage of the respondents by age (no. of respondents)
Source: Field survey, 2018

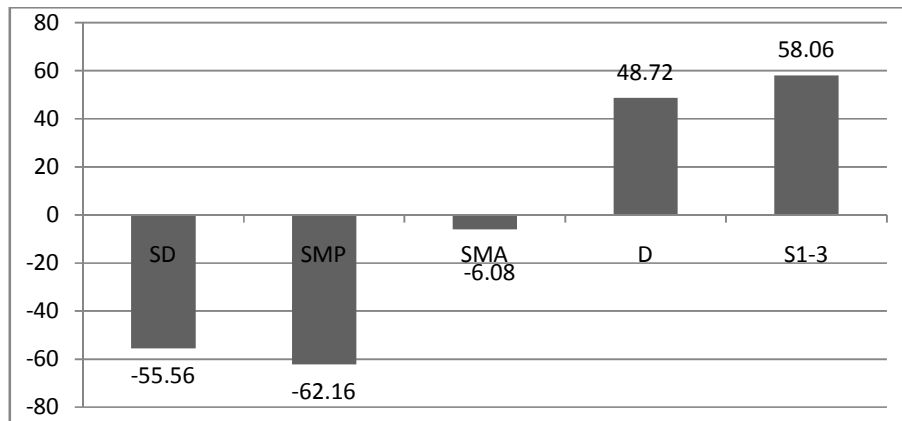


Fig. 8. Net intensity of internet usage of the respondents by level of education (%)
Source: Field survey, 2018

Concerning those who use the Internet, as shown in Fig. 9, the main purpose of using it varies between individuals. Some of them said that they use it more often to search for market opportunities or marketing (A). Some others use the Internet more often to search for sources of funds, especially alternative sources outside conventional banks (B). There are also a number of respondents who admitted that they use the Internet only when they need to find alternative suppliers of raw materials or other needed inputs with better quality or prices (C), or simply to seek information on the latest government regulations that may affect their business (D), or to follow closely market changes in e.g. new emerged product design or newcomers/competitors in the market (E); or for other purposes (F). Interestingly, among those different purposes, to find sources of funding and to follow closely market changes revealed as the most important ones for the majority of them. Only a very few of

them adopted e-commerce to market their products. Lack of trust or no confidence in security in using e-commerce was revealed as the major obstacle for many respondents to utilise e-commerce technology.

Finally, as Fig. 10 shows, the majority of the respondents who use the Internet (including e-mail) in running their businesses said that its most perceived positive impact is smooth marketing (A). They acknowledged that by utilising the Internet, their turnovers have increased. There are also some respondents who claimed that the benefit is more in the form of raw material procurement that becomes easier, faster and cheaper (B). There are also who claimed positive effect was felt in both smooth marketing and easier and more efficient procurement of raw materials (AB). The rest claimed other forms of benefit (C) such as getting a lot of current information about

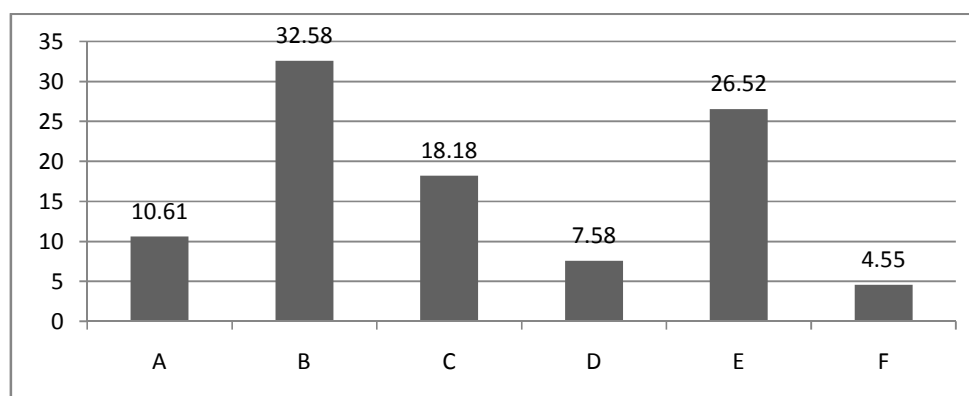


Fig. 9. Use of internet by different purposes, (%)

Source: Field survey, 2018

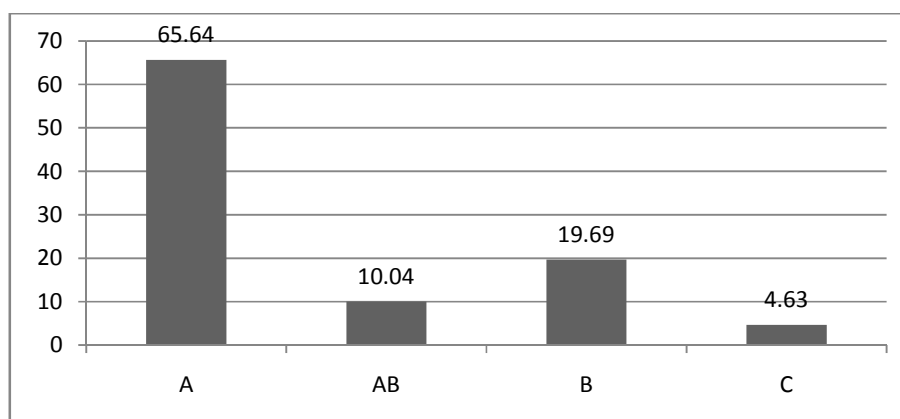


Fig. 10. Use of internet by different forms of benefit (%)

Source: Field survey, 2018

things that are imported directly or indirectly with their businesses, consumer complaints, more easily communication with the government or with headquarters or branches.

5. CONCLUSION

This study reveals several key facts. First, the use of the Internet by MSEs in the country is still very low. Very few existing studies reveal several explanations, which include their low understanding of the importance of ICT for their businesses, their mindset which is not in the favour of using ICT in doing their businesses (e.g. they prefer to do marketing with conventional methods), their lack of knowledge on how to operate this technology, and lack of owners' innovativeness.

Second, there is a positive relationship between the magnitude of economic activities in a province relative to other provinces and the

number of MSEs in the province using the Internet compared to other provinces. One explanation is that in regions where economic activity is large, usually there are also many economic factors which make competition among themselves tight. This also forces them to be more aggressive and smarter in marketing, and for that, they must utilise the Internet/ICT.

Third, the intensity of Internet usage by MSEs is found to have a positive relationship with the level of income per capita. Per capita income in a region reflects the level of welfare of the people in the region, which also reflects the level of ability and needs of the community to utilise ICT.

Fourth, the type of business is also important in encouraging MSEs to utilise the Internet. This finding is in line with findings from other previous studies that business sector is among important determinant factor of the use of Internet of ICT (e.g. Blackburn and Athayde [6]; Fallon and

Moran [7]; and Riquelme [9]. The retail trade and car and motorcycle repair and care services are the MSEs which uses Internet the most.

Fifth, MSEs in types of businesses with more complicated processes and have a greater financial risk but on the other hand have a high turnover value are more likely to utilise Internet than those in types of businesses with less degree of computerisation/automation and low investment risk but also small turnover value. This finding may support many other previous studies that found a positive relationship between the use of ICT in running business and revenues of turnovers (e.g. Akkeren and Cavaye, [11]; Daniel et al., [13]; Farhad et al. [14]; Savrula [15]).

Finally, the information in this article is also important for policymakers not only in Indonesia but also other developing countries, for two main reasons. First, with their huge number (which is significantly larger than the number of large enterprises), MSMEs are indeed very important not only as a source of employment but, potentially, as a growth engine for the economy. This means that that capacity building, including their ability or readiness to utilise ICT, in these enterprises should be given a high priority by the policymakers in their economic development policies. Second, MSMEs are a good starting place for the development of women entrepreneurs. This means that these enterprises do have an important role to play in promoting women empowerment in developing countries, which in these days is among important targets of the sustainable development goals (SDGs).

Direct supports that governments in developing countries can give are, to provide training on the use of ICT, and to socialise the importance of ICT for business development/growth through seminars, workshops or via other media. Or, indirectly, to build infrastructure and to provide other needed facilities so that MSMEs everywhere, including in rural areas, can have full access to ICT. And, probably, more importantly, to provide protection for internet users through regulations or laws that provide certainty and a sense of security for consumers and producers in conducting online transactions.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Balakrishnan, Anita and Julia Boorstin. Instagram says it now has 800 million users, up 100 million since April". 25 September, 2017 CNBC.Com. Available:<https://www.cnbc.com/2017/09/25/how-many-users-does-instagram-have-now-800-million.html>.
2. Ahmada, Syed Zambari, Abdul Rahim Abu Bakar, Tengku Mohamed Faziharudean and Khairul Anwar Mohamad Zakic. An Empirical Study of Factors Affecting e-Commerce Adoption among Small- and Medium-Sized Enterprises in a Developing Country: Evidence from Malaysia. *Information Technology for Development*. 2015;21(4):555–572.
3. Azam MS, Quaddus. Adoption of e-commerce by the SMEs in Bangladesh: The effects of innovation characteristics and perceived risk. Paper presented at the Australian and New Zealand Marketing Academy Conference. Melbourne, Victoria, 30 November - 2 December 2009b.
4. Bakos Y, Brynjolfsson E. Bundling and competition on the internet. *Marketing Science*. 2000;19(1):63–82.
5. Barry H, Milner B. SME's and electronic commerce: A departure from the traditional prioritisation of training? *Journal of European Industrial Training*. 2002;25(7): 316–326.
6. Blackburn R, Athayde R. Making the connection: The effectiveness of internet training in small businesses. *Education and Training*. 2000;42(4/5):289-299.
7. Fallon M, Moran P. Information Communications Technology (ICT) and manufacturing SMEs. Paper presented at the 2000 Small Business and Enterprise Development Conference. University of Manchester. Manchester. 10-11 April 2000.
8. Matlay H. Training in the Small Business Sector of the British Economy. In Carter S. and Jones D. (eds.), *Enterprise and Small Business: Principles, Policy and Practice*. Addison Wesley Longman. London; 2000.
9. Riquelme H. Commercial Internet Adoption in China: Comparing the Experience of Small, Medium and Large Business Internet Research. *Electronic Networking Applications and Policy*. 2002;12(3):276–286.
10. Poon, Simpson, Paula Swatman. The Internet for small businesses: An enabling

- infrastructure for competitiveness. In Kilnam Chon (ed.), *Proceeding of the Fifth Internet Society Conference*. Hawaii; 1995.
11. Akkeren J, Cavaye A. Factors affecting the adoption of e-commerce technologies by small business in Australia – an empirical study. Paper presented at the 10th Australasian Conference on Information Systems. Wellington. 1-3 December 1999.
12. Doherty N, Hughes F, Ellis-Chadwick F. An investigation into the factors affecting the level of e-commerce uptake amongst SMEs. In Roberts, M., Moulton, M., Hand, S. and Adams, C. (eds.). *Sixth Annual Conference of UKAIS*. School Press. Cambridge, MA; 2001.
13. Daniel E, Wilson H, Myers A. Adoption of e-commerce by SME's in the UK: towards a stage model. *International Small Business Journal*. 2002;20(3):253-268.
14. Farhad, Nejadirani, Masoud Behraves, Reza Rasouli. *Developing Countries and Electronic Commerce the Case of SMEs*. *World Applied Sciences Journal*. 2011; 15(5):756-764.
15. Savrula, Mesut, Ahmet Incekarab, Sefer Senerb. The potential of e-commerce for SMEs in a globalizing business environment. *Procedia - Social and Behavioral Sciences*. 2014;150:35-45.
16. Crawford J. *NEWS –A Project to get smaller enterprises online*. The National Office for the Information Economy (NOIE). Canberra; 1998.
Available:<https://www.finance.gov.au/agim/o-archive/publications/noie/1998.html>
17. Miller NL, Besser TL. The importance of community values in small business strategy formation: Evidence from rural Iowa. *Journal of Small Business Management*. 2000;38(1):68-85.
18. Tetteh E, Burn J. Global strategies for SME-business: Applying the SMALL framework logistics. *Information Management*. 2001;14:171-180.
19. Jon K, Lai TL, Hui CK, Dennis NCH, Meng TS. Electronic commerce adoption by SMEs in Singapore. Paper presented at the the 34th Annual Hawaii International Conference on System Sciences. Maui, Hawaii. 3-6 January; 2001.
20. Mehrtens J, Cragg PB, Mills AM. A model of internet adoption by SMEs. *Information and Management*. 2001;39:165-176.
21. Sawhney M, Zabib J. Managing and measuring relational equity in the network economy. *Journal of the Academy of Marketing Science*. 2002;30(4):313-332.
22. Doolin B, McLeod L, McQueen B, Watton M. Internet strategies for establishing retailers: Four New Zealand case studies. *Journal of Information Technology Cases and Applications*. 2003;5(4):3-19.
23. Chen S. Adoption of electronic commerce by SMEs of Taiwan. *Electronic Commerce Studies*. 2004;2(1):19-34.
24. Grandon EE, Pearson JM. Electronic commerce adoption: An empirical study of small and medium US Business. *Information and Management*. 2004;42: 197-216.
25. Poon, Simpson, Paula Swatman. Small business use of the Internet: Findings from Australian case studies. *International Marketing Review*. 2005;14(5):1-15.
26. Chong S, Pervan G. Factors influencing the extent of deployment of journal of electronic electronic commerce for small and medium sized enterprises. *Commerce in Organizations*. 2007;5(1):1-29.
27. Shih H. Contagion effects of electronic commerce diffusion: Perspective from network analysis of industrial structure. *Technological Forecasting & Social Change*. 2008;75(1):78-90.
28. Poorangi, Mehdi M, Edward WS. Khin. Strategic alliance on Malaysia SMEs to compete globally. Endogenous and exogenous prospective. *Actual Problem of Economics*. 2013;3(141):407-415.
29. Rahayua, Rita, John Daya. Determinant factors of e-commerce adoption by SMEs in developing country: Evidence from Indonesia. *Procedia - Social and Behavioral Sciences*. 2015;195:142-150.
30. Raymond L. Determinants of web site implementation in small business internet research. *Electronic Network Applications and Policy*. 2001;11(5):411-422.
31. Daniel EM, Grimshaw DJ. An exploratory comparison of electronic commerce adoption in large and small enterprises. *Journal of Information Technology*. 2002;17(3):133-147.
32. Seyal AH. An investigation of e-commerce adoption in micro business enterprises: Bruneian evidence. Paper presented at the 4th International Conference on Working with e-Business (We-B 03), Perth. 24-25 November 2003.
33. Street CT, Meister DB. Small business growth and internal transparency: The role

- of information systems. MIS Quarterly. 2004;28(3):473-506.
34. Erdener, Kaynak, Ekrem Tatoglu, Veysel Kula. An analysis of the factors affecting the adoption of electronic commerce by SMEs. Evidence from an emerging market. International Marketing Review. 2005; 22(6):623-640.
 35. Migiro SO. Diffusion of ICTs and E-commerce adoption in manufacturing SMEs in Kenya. South African Journal of Library and Information Science. 2006;72(1):35-44.
 36. Jones P, Packham G, Beynon-Davies P, Pickernell D. False promises: E-business deployment in Wales' SME community. Journal of Systems and Information Technology. 2011;13(2):163-178.
 37. Zaied, Abdel Nasser H. Barriers to e-commerce adoption in Egyptian SMEs. Information Engineering and Electronic Business. 2012;3:9-18.
 38. Lai IKW. The strategic changes by adopting internet-based interorganizational systems. Management Research News. 2007;30(7):495-509.
 39. Standing S, Standing C, Love P. A review of research on e-marketplaces 1997-2008. Decision Support Systems. 2010;49(1):41-51.
 40. Neale J, Murphy J, Scharl A. Comparing the diffusion of online service recovery in small and large organizations. Journal of Marketing Communications. 2006;12(3): 165-181.
 41. Poorangi, Mehdi M, Edward WS. Khin, Shohreh Nikoonejad, Arash Kardevani. E-commerce adoption in Malaysian Small and Medium Enterprises Practitioner Firms: A revisit on Rogers' model. Anais da Academia Brasileira de Ciências. 2013;85(4):1593-1604.
 42. Azam MS, Quaddus M. Adoption of b2b e-commerce by the SMEs in Bangladesh: an empirical analysis. Paper presented at the Asian Business Research Conference. Dhaka, 11-12 April 2009a.
 43. Saffu K, Walker JH, Hinson R. Strategic value and electronic commerce adoption among small and medium-sized enterprises in a transitional economy. Journal of Business & Industrial Marketing. 2008;23(6):395-404.
 44. Hunaiti Z, Masa'deh R, Mansour M, Al-Nawafleh A. Electronic commerce adoption barriers in small and medium-sized enterprises (SMEs) in developing countries: The case of Libya. IBIMA Business Review. 2009;2:37-45.
 45. Tambunan, Tulus. Usaha Mikro, Kecil dan Menengah. 2017. Jakarta: Ghalia Indonesia.
 46. Menekop, UKM. Data UKM 1997-2013. Jakarta. State Ministry of Cooperative and SME. Available:<http://www.depkop.go.id/berita-informasi/data-informasi/data-umkm/>
 47. Menekop, UKM. Data UKM 2016-2017. Jakarta. State Ministry of Cooperative and SME. Available:<http://www.lisubisnis.com/2016/12/perkembangan-jumlah-umkm-di-indonesia.html>
 48. BPS, Indikator Industri Manufaktur Indonesia 2014. Jakarta. Badan Pusat Statistik Nasional. 2016.
 49. BPS. Jumlah Perusahaan Industri Besar Sedang Menurut SubSektor (2 digit KBLI), 2000-2015. Jakarta. Badan Pusat Statistik Nasional. 2015. Available:<https://www.bps.go.id/dynamictable/2015/09/14/896/jumlah-perusahaan-industri-besar-sedang-menurut-subsektor-2-digit-kbli-2000-2015.html>
 50. BPS. Analisa Ketenagakerjaan Usaha Mikro Kecil. Sensus Ekonomi 2016. Analisa Hasil Listing. Jakarta. Badan Pusat Statistik Nasional. November 2017.
 51. Julianto, P.A. Pemerintah Targetkan 44 Juta UMKM Pasarkan Produk Lewat Internet. Kompas Newspaper. 18 June 2016. Available:<http://ekonomi.kompas.com/read/2016/06/18/111218426/pemerintah.targetkan.44.juta.umkm.pasarkan.produk.lewat.internet>

© 2018 Tambunan and Busnetti; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sciencedomain.org/review-history/27084>