Micro and Small Industries and the Use of Internet: Findings from Indonesian

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Abstract

This study aims to examine the development of Indonesian micro and small enterprises in the manufacturing industry (called micro and small industries/MSIs) in utilizing the internet for their businesses. By nature, this is a descriptive study, which analyses secondary data. It also reviews key literature on the use of ICT by micro, small, and medium enterprises (MSMEs) in developing countries. It shows that MSMEs, dominated by micro and small enterprises (MSEs), has been the leading player in Indonesian domestic economic activities as they accounted for more than 90 percent of all firms and contributed to more than 50 percent of gross domestic product (GDP). But, only a small fraction of these enterprises in Indonesia that utilize the internet for business, and the intensity of internet usage varies by province and type of business. This is the first macro-level study ever conducted in Indonesia on the use of the internet by MSEs across sectors based on national data from the 2016 Economic Census conducted and data on the 2016 survey on MSEs in the manufacturing industry (MSIs). Thus, the findings of this study may add new empirical evidence to the literature on the utilization of ICT by MSMEs in developing countries.

Keywords: MSMEs; MSEs; MSIs; information and communication technology (ICT); e-commerce
JEL Classification: D22; I25; M31

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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 also changed the way they promote and sell their products or purchase their raw materials. Digital Marketing has now become a 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. 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 MSEs, are pushed to adopt this technology. Sooner or later, MSEs, which not take this new technology and business practice will be displaced by their competitors and abandoned by their customers

Governments in many countries give considerable attention to the utilization of ICT, particularly the adoption of e-commerce, by MSMEs through issuing policies and regulations to assist them in adopting this technology. In Indonesia, in the past few years, the government has taken many measures to encourage or to support MSMEs, particularly MSEs, to use ICT in running their business. The measures include providing training for MSEs in utilizing platforms such as Facebook, Instagram, and other application systems, as well as to create their websites to promote and market their goods and services; creating a particular web portal (SMESCO Trade) by the Ministry of Cooperatives and SMEs that all MSMEs can use it for marketing their products; and issuing various regulations to provide a sense of security for business actors in utilizing ICT such as e-commerce for marketing and internet banking for financial transactions.

The purpose of this paper is to examine the recent development of MSEs in utilizing the internet in Indonesia. More specifically, it aims to address the following three research questions. First, how many MSEs in Indonesia that use the internet for their businesses? Second, is the intensity of internet usage by MSEs different between types of businesses and regions within Indonesia? Third, is the profit or income earned by MSEs that use the internet more significant than that earned by MSEs which do not use it?

Methodologically, this paper is based on a review of key literature on the internet usage by MSMEs mainly in developing countries and a descriptive analysis of secondary data from two sources: data on MSMEs in Indonesia for the period 1997–2017 from the Ministry of Cooperative and SME, and data on the internet usage by MSEs in Indonesia from the National Agency of Statistics (BPS, 2017a). The paper also reviews key literature on the utilization of ICT by MSMEs in developing countries.

2. Literature Review

2.1. Definitions of MSMEs

In Indonesia, the definition of MSMEs is set in Law Number 20, 2008, on MSMEs. In Article 1 in Chapter I (general provisions) of the Law, it is stated that microenterprises (MIE) are a productive business independently owned by an individual person or a business entity fulfilling the criteria of MIE as stipulated in the Law. Small enterprises (SE) is a stand-alone productive economic enterprise undertaken by an individual person or a business entity which is not a subsidiary or not a branch of a company owned, controlled, or becomes part, either directly or indirectly, of medium enterprises (ME) or large enterprise (LE) that meets the SE criteria as stated in the Act. While ME is a stand-alone productive economic enterprise undertaken by an individual person or a business entity that is not a subsidiary or not a branch of a company owned, controlled, or becomes part, directly or indirectly, of MIE, SE or LE that meets the criteria of ME as stipulated in the Act.

In this law, the criteria used to define MSMEs as outlined in Article 6 are net asset value or asset value excluding land and building of business premises, or annual sales. Under these criteria, MIE is a business unit with an asset value of at most Rp50 million, or with annual sales of maximum Rp300 million; SE is a business unit with an asset value of more than Rp50 million up to a maximum of Rp500 million, or having annual sales of more than Rp300 million up to a maximum of Rp2.5 billion; and ME is a company with a net worth value of more than Rp500 million up to a maximum of Rp10 billion, or have annual sales of over Rp2.5 billion to a maximum of Rp50 billion.

Alternatively, the Indonesian Central Bureau of Statistics (BPS) uses the number of workers as a measure to differentiate the scale of business between MIE, SE, ME, and LE. MIE is a business unit with permanent workers up to 4 people; SE between 5 to 19 workers; and ME from 20 to 99 people. Companies with a workforce of more than 99 people are categorized as LE.

2.2. Key Characteristics of MSMEs

MSMEs are not only different from LEs, but within the MSMEs group itself, there is a characteristic difference between MIEs, SEs, and MEs in some aspects that can be easily observed daily in Indonesia. These aspects include the sector in which they operate (formal versus informal), the organizational 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 degree of mechanism in the production process (Table 1). Understanding the differences in these aspects between MIEs, SEs, and MEs is indeed important to understand the differences between the three subgroups of MSMEs in performance, such as output growth rates, productivity or efficiency, quality of product, competitiveness, share in

gross domestic product (GDP) and exports, and also including the degree of internet usage.

Table 1: Key Characteristics of MIE, SE, and ME

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	Organization and management	Primitive/traditional	Many are non-primitive units with modern management systems	All have formal organizational 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 mechanized	Degree of mechanization is much higher
5	Market orientation	Most are very local-oriented; served local low income households	Domestic, national and/or export	National and/or export
6	Economic and 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 utilize ICT	Many use machines and utilize ICT	The degree of modern technology used is much higher, and all utilize ICT.

Source: Tambunan (2017) and BI & LPPI (2015)

2.3. Development of MSMEs

One characteristic of the Indonesian economy is that economic activities are dominated by MSMEs, although the ratio of MSMEs to LEs varies across economic sectors. For example in the mining sector, particularly in oil, gas, and coal, where there are many LEs, including foreign companies, the ratio is lower than in other sectors such as trade, manufacturing industry, and agriculture. According to official time series data issued by the State Ministry of Cooperatives and SMEs (Menegkop & UKM) for the period, 1997–2017 shows that the number of MSMEs in Indonesia increased every year from 39.765 million MSMEs (or about 99.8 percent of the total business units in Indonesia) in 1997 to more than 59 million units by 2017 (Figure 1). Except in 1998, when the Asian financial crisis occurred during the period 1997–98 hit Indonesia, the number of MSMEs grew negatively by more than 7 percent, and after that, in 1999 as the national economy started to recover MLSEs also recovered with a positive growth rate of almost 3 percent (Figure 2).

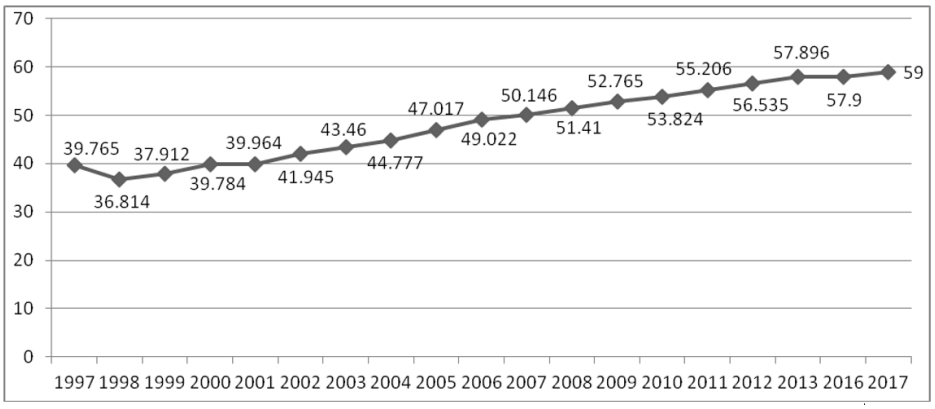

Figure 1: Total Number of MSMEs in All Sectors, 1997–2017 (million units)
Source: Menegkop & UKM/BPS for 1997–2013:
http://www.depkop.go.id/berita-informasi/data-informasi/data-umkm/; for 2016 and 2017:
http://www.lisubisnis.com/2016/12/perkembangan-jumlah-umkm-di-indonesia.html

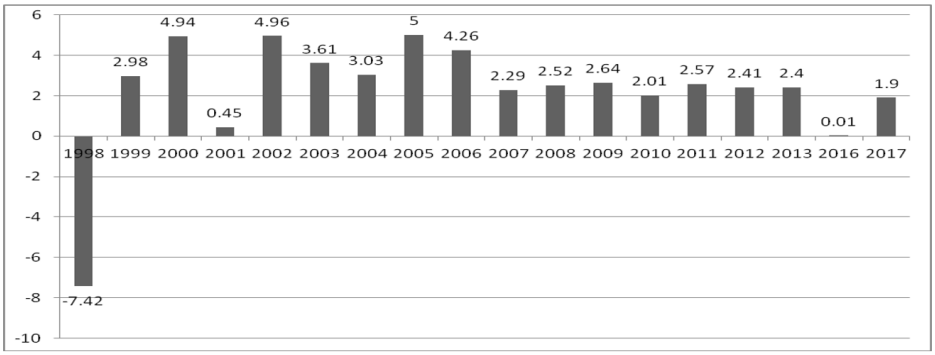

Figure 2: The Growth Rate of the Total Number of MSMEs in All Sectors, 1998–2017 (%)
Source: Menegkop & UKM/BPS for 1997–2013:
http://www.depkop.go.id/berita-informasi/data-informasi/data-umkm/; for 2016 and 2017:
http://www.lisubisnis.com/2016/12/perkembangan-jumlah-umkm-di-indonesia.html

Most MSMEs that were out of business during the crisis period were heavily dependent on imported raw materials, which became very expensive in rupiah due to the weakening of the rupiah against the US dollar by more than 500 percent in mid-1998, while domestic demand for their products declined due to rising inflation. Many also stopped operating because of the difficulty of getting credit due to the banking crisis as the direct result of the Asian financial crisis. In addition, there were also many MSMEs which had production linkages with LEs

through subcontracting arrangements forced to stop because there was no order anymore from the LEs.

One interesting thing from the Indonesian data of MSMEs is that the number of MIEs dominates the number of Indonesian MSMEs, which is about 99 percent. However, the distribution of MSMEs under this subgroup is not the hallmark of Indonesian MSMEs. For instance, based on data from the APEC Secretariat, as can be seen in Figure 3, in other both developing and developed economies in the Asia-Pacific region, the share of MIEs in total MSMEs is also large, above 50 percent. Nevertheless, MIE's share in total MSMEs in Indonesia is the highest, followed by Canada in second position (98 percent). However, there are differences between MIEs in Indonesia or in other developing economies in the region such as Thailand, Cambodia, Vietnam, and China with those in, for example, the US, Japan, Australia, and South Korea. In the first group of economies, MIEs are generally traditional business units with a very low degree of mechanization (see again Table 1), whereas, in the second group of economies, they are much more modern with a high degree of computerization and internet usage.

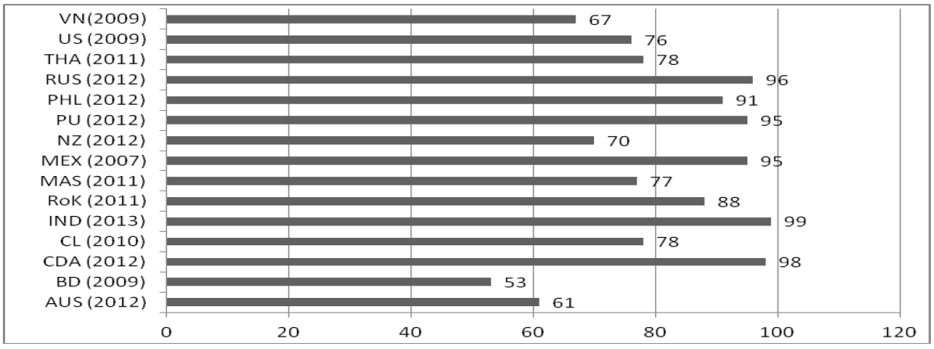

Figure 3: Share of MIEs in total MSMEs in APEC member economies (%)[1]
Source: Yuhua (2013)
Note: [1] APEC economies: Australia (AUS); Brunei Darussalam (BD); Canada (CDA); Chile (CL); People Republic of China (PRC); Hong Kong, China (HKC); Indonesia (IND), Japan (JPN), Republic of Korea (RoK); Malaysia (MAS), Mexico (MEX); New Zealand (NZ); Papua New Guinea (PNG); Peru (PU); Philippines (PHL); Russia (RUS); Singapore (SIN); Chinese-Taipei (CT); Thailand (THA); United States of America (AS); and Viet Nam (VN).

Data based on the National Economic Census 2016 show that the majority of MSMEs in Indonesia are located in Java, the most populated island where also the concentration of economic activities, particularly manufacturing industry, trade, finance, construction, agriculture, and services. Most of the existing firms in non-agricultural businesses in Indonesia are also found in Java, which reached 16.2 million units. They are dominated by MSEs that reached 15.9 million units or nearly 61 percent of all non-agricultural MSEs throughout the country (Table 2). The majority of MEs and LEs (or MLEs) in all non-agricultural sectors are also found in Java that reached 291.7 thousand units or 65.2 percent of total

non-agricultural MLEs in Indonesia. Meanwhile, in Papua and Maluku, the least developed region of the country, the number of non-agricultural businesses is very low, which consists of 451.9 thousand MSEs and 7.5 thousand MLEs, or only about, respectively, 1.8 percent and 1.7 percent of total non-agricultural business in the country.

Table 2: Distribution of MSEs and MLEs by island, 2016 (%)

Island	MSEs	MLEs
Java	60.7	65.2
Sumatera	18.6	16.6
Sulawesi	8.1	5.6
Kalimantan	5.1	6
Bali and Nusa Tenggara	5.7	4.9
Papua and Maluku	1.8	1.7
Total	100.0	100.0

Source: BPS (2017a)

Finally, concerning the formation of gross domestic product (GDP), the contribution of MSMEs is always smaller than their role in generating employment. For example, in the APEC economies, more than 90 percent of the current total employment opportunities are created by MSMEs, but their output contribution to GDP is below 90 percent, although the ratio varies by the economy (Yuhua, 2013). This is also evident in Indonesia, where MSMEs accounted for only around 60 percent of GDP in 2013 (Figure 4). The lower contribution of MSMEs to the formation of GDP compared to their role in job creation is caused by many things, including the limitations of advanced technology, capital, and human resource that made the level of productivity per unit of MSME much lower than that in LEs. Although the MSMEs' share of GDP is higher than that of the LEs, it is merely because their number of units is far more than the number of companies from the LE category.

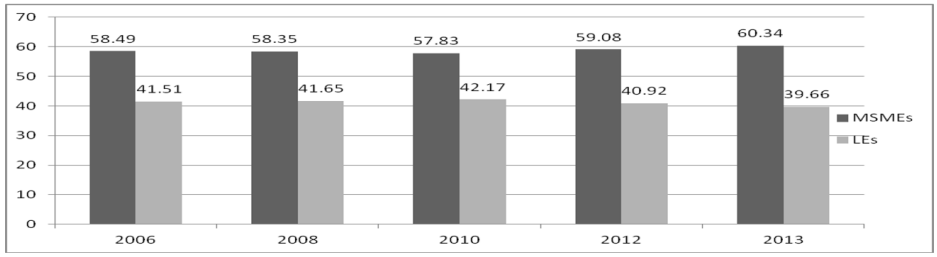

Figure 4: GDP shares of MSMEs and LEs, 2006–2013 (%)
Source: Menegkop & UKM/BPS
(http://www.depkop.go.id/berita-informasi/data-informasi/data-umkm/)

3. Method

Methodologically, this paper is based on a review of key literature on the internet usage by MSMEs mainly in developing countries and a descriptive analysis of secondary data from two sources: data on MSMEs in Indonesia for the period 1997–2017 from the Ministry of Cooperative and SME, and data on the internet usage by MSEs in Indonesia from the National Agency of Statistics (Indonesia's Economic Census, 2016). The paper also reviews key literature on the utilization of ICT by MSMEs in developing countries.

4. Result

4.1. Findings from the Literature

As the competition faced by MSMEs increasingly tight, these enterprises need 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 are utilizing ICT or adopting e-commerce, although still many more MSMEs, especially MIEs, which do not/have not (yet) utilized this technology in running their business activities for various reasons. In accordance with this development, internet use, primarily e-commerce, among these enterprises has recently become a popular topic for researchers not only in the fields of MSMEs but also in such as electronic business, information management, information systems, and entrepreneurship; though research investigating on the adoption of e-commerce by MSMEs is still small in number. Most studies, especially in the context of developing countries, adopted a descriptive survey research design in which random sampling techniques are used, and the data were analyzed using descriptive statistics. Some of these studies also made a good summary of the findings from previous studies. Three key issues have received considerable attention from these existing studies, namely (i) factors that influence the decision of MSMEs or their main constraints to utilize ICT, (ii) companies or entrepreneurs' motivation or reasons to use ICT or to adopt e-commerce, and (iii) the benefit of using ICT and applications to support their business activities. Table 3 summarizes the findings of selected essential studies in the past two decades.

4.2. Findings from Indonesian Secondary Data

In Indonesia, despite the rapidly growing internet media, the number and percentage of MSEs that have utilized the internet are still very low. According to the 2016 Economic Census, only as many as 563 thousand enterprises or about 2.14 percent of total MSEs in Indonesia which have utilized the internet media for their business activities. Until now, there are very few published papers or reports, either based on field surveys or observations, on the utilization of ICT by MSMEs in Indonesia that can explain why the use of the internet by MSEs in the

Table 3: Key Findings of the Literature on the Utilization of ICT by MSMEs

Study and period	Main Issue		
	Determinant Factor/Constraints	Reason	Expected Benefit
Blackburn and Athayde (2000), Fallon and Moran (2000), Matlay (2000), Riquelme (2002)	The business sector, size, and characteristics		
Poon and Swatman (1995), Akkeren and Cavaye (1999), Doherty et al. (2001), Daniel et al. (2002), Nejadirani et al. (2011), Savrul et al. (2014)			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 communications; gather information; identify potential business partners.
Crawford (1998), Bakos and Brynjolfsson (2000), Miller and Besser (2000), Tetteh and Burn (2001), Jon et al. (2001), Mehrtens et al. (2001), Sawhney and Zabin (2002), Doolin et al. (2003), Chen (2004), Grandon and Pearson (2004), Poon and Swatman (1997), Chong and Pervan (2007), Shih (2008), Poorangi and Khin (2013), Ahmada et al. (2015), Rahayu and Day (2015)	Perceived relative advantage; perceived compatibility; perceived benefits; MSME owner's/manager's strategic vision, innovativeness, ICT knowledge, expertise, and experience, and willingness to utilize ICT as well as to adjust his/her businesses to the requirements related to the utilization of ICT; other owners's/manager's characteristics; business planning; organizational complexity; observability; government policies; external change agents (skilled labor, software/hardware vendors); pressures from trading partners, customers and competitors.		
Raymond (2001), Barry and Milner (2002), Daniel and Grimshaw (2002), Seyal (2003), Street and Meister (2004), Kaynak et al. (2005), Migiro (2006), Jones et al. (2011), Zaied (2012)	Resources, e.g., capital to finance-related costs (e.g., training of employees, organizational change, investment in tools and others), human resources, especially technical know-how/expertise, legal and regulatory (especially concerning internet security or trust to use online transactions) factors		

continued...

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Study and period	Main Issue		
	Determinant Factor/Constraints	Reason	Expected Benefit
Migiro (2006), Lai (2007), Standing et al. (2010)			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. (2006), Poorangi et al. (2013)	Trialability, observability, company's culture, complexity, relative advantages		Provides gain strategic advantages, e.g., internal and external process integration; closes relationships with customers and other business owners; influences market growth in earning external resources; and increases the expertise for growth and development of business.
Karakaya and Shea (2008)		to create new options for their customers, instigate fast new product delivery and services, reduce costs, increase sales, provide better customer service, gather market information, improve productivity, discover and retain new customers.	
Azam and Quaddus (2009a)			Increases productivity
Saffu et al. (2008), Azam and Quaddus (2009b)	Perceived organizational compatibility		
Hunaiti et al. (2009)			Provides cost-effective tool to market and launch new products, improves client communications, enhance the collection of marketing knowledge and information

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 utilize ICT, which include their low understanding of this kind of technology, their mindset which is not in favor 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 somewhat isolated/rural areas, are generally still unfamiliar with the online marketing system. They prefer to do marketing with conventional methods, by utilizing 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 Rahayu and Day in 2015. Target respondents for their study were owners/managers of MSMEs. In this study, MSMEs refers to a business that has less than 100 employees, assets less than 10 billion rupiah, and total sales per year below 50 billion rupiahs. From various data sources, including from the Ministry of Cooperative and SME, a total of 3,267 MSMEs were chosen as a sampling frame for this study, and only 292 MSMEs participated in this study, a response rate of 8.9 percent. Based on their finding, they conclude 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 individual factors play a significant role in adopting e-commerce technology by MSMEs in Indonesia.

4.2.1. Distribution of MSEs using the internet by province

The distribution of MSEs using the internet by province, as shown by Figure 5, most MSEs in this country that utilizes the internet for businesses are located in Java island. Provinces in Java with the highest proportion of MSEs using the internet are East Java, with around 18.72 percent of all MSEs using the internet in Indonesia, followed by West Java and Central Java with, respectively, 18.11 percent and 15.41 percent. While outside Java island, especially in the eastern region, the percentage is much lower. Provinces that have the lowest rate in this region is Maluku with only 0.12 percent, North Maluku with 0.16 percent, and West Papua 0.19 percent.

4.2.2. Distributions of MSEs using Internet and GDP by province

The percentage distribution by the province as shown in Figure 5 is in line with the fact that the number of MSEs in the eastern region, as well as its share in national GDP, is much lower than that in the western region, especially Java where the majority of these enterprises are located, and it has the highest GDP share. So, there is a positive relationship between the magnitude of economic

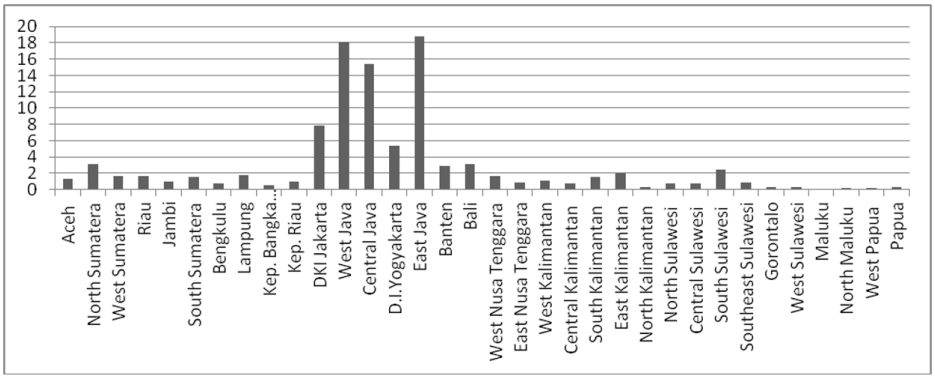

Figure 5: Percentage Distribution of Total MSEs Using the Internet by Province, Indonesia, 2016
Source: BPS (2017a)

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 utilizing the internet (Figure 6).

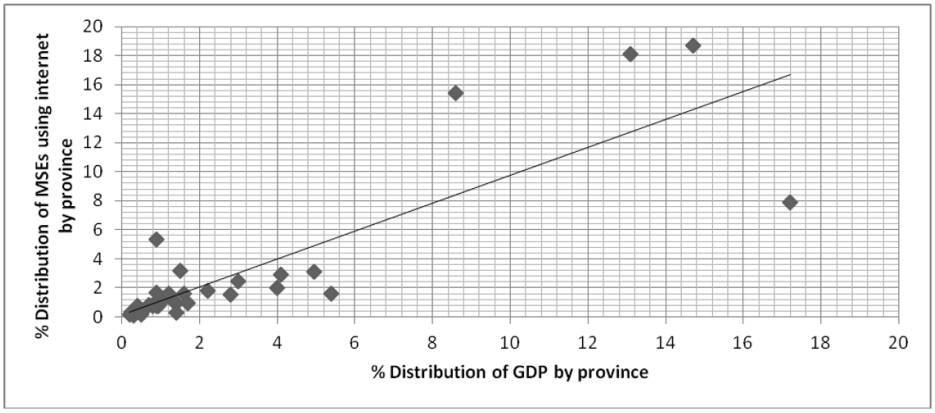

Figure 6: Percentage Distribution of MSEs Using Internet and GDP by Pprovince, Indonesia, 2016
Source: BPS (2017a)

4.2.3. MSEs using internet and income per capita per province

Figure 6 does not, however, show the difference between provinces in the intensity of internet usage by MSEs. For this, Figure 7 shows the percentage of total MSEs that use the internet per province. For instance, in Java, the province with the highest percentage of MSEs that use the internet is D.I Yogyakarta with near to 6 percent. In the second place is DKI Jakarta, the Capital city of Indonesia, with almost 4 percent. In some provinces outside Java, the internet usage rate of MSEs is also quite high, such as in Kep. Riau, Bali, and East Kalimantan, with almost 4 percent of total MSEs in these provinces, are using the internet. Here too, by combining the data in Figure 7 with data on total income and population per province, the intensity of the internet usage by MSEs is found to have a positive relationship with the level of income per capita (Figure 8).

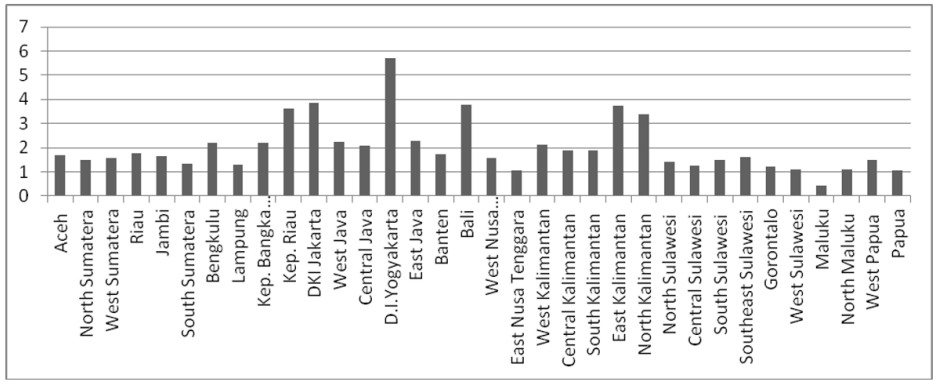

Figure 7: Percentage of MSEs Using Internet per Province, Indonesia, 2016
Source: BPS (2017a)

4.2.4. MSEs using internet and type of business

Of course, not only factors such as income per capita, level of economic development, technical skills of workers, ICT knowledge and experience of MSE owners/managers, security, and ICT infrastructure are very influential on the managers or business owners to use the internet in running their businesses, but the type of business is also critical. Or even it is more important than those factors because today there are many types of businesses that must use the internet or really require online transactions or the advantages of using the internet are felt directly by the company (e.g., very low-cost promotion activities). The types of businesses that fall into this category include travel agencies, hotels, rental services, bookstores, fashion, and online transport.

The 2016 Economic Census shows that the types of businesses that most MSEs utilize the internet are retail trade and car and motorcycle repair and care

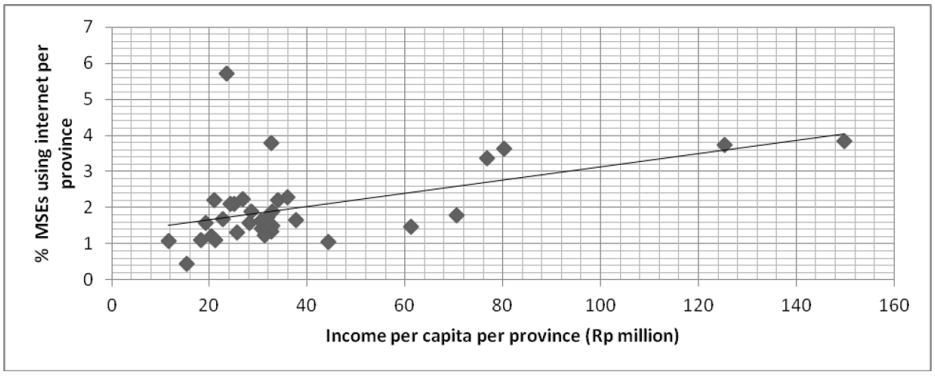

Figure 8: Percentage of MSEs Using Internet and Income per Capita per Province, Indonesia, 2016
Source: BPS (2017a)

services with around 39.64 percent (Figure 9). 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. This development is also encouraging or even forcing more and more MSEs in this sector to utilize the internet, both in the form of using existing marketing websites and creating their own websites. Other types of businesses that are also run by many MSEs by utilizing the internet are information and communication with 11.73 percent, manufacturing industry with 10.66 percent, and education with 8.09 percent. Meanwhile, the least types of businesses carried out by MSEs that utilize the internet are real estate business and human health and social activities. Only about 0.56 percent of total MSEs in the real estate sector that use the internet, and in human health and social activities, it is only 1.30 percent. The low percentages do not show low internet utilization rates of MSEs in these two sectors but mainly because of the small number of MSEs in these both categories of businesses, especially when compared to the number of MSEs in the trade sector.

4.2.5. MSEs using internet and turnover

Finally, Figure 10 gives an overview of turnover obtained by MSEs that utilize the internet for business and those which do not use the internet. As can be seen, in general, for both categories of MSEs, most have a turnover of fewer than 300 million rupiahs, namely a total of 79.41 percent for MSEs that utilizes the internet for business and 91.51 percent for those not using 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 Rp300 million. When viewed from the percentage of MSEs with turnover

more than 300 million rupiahs, more than 20 percent or about one in five

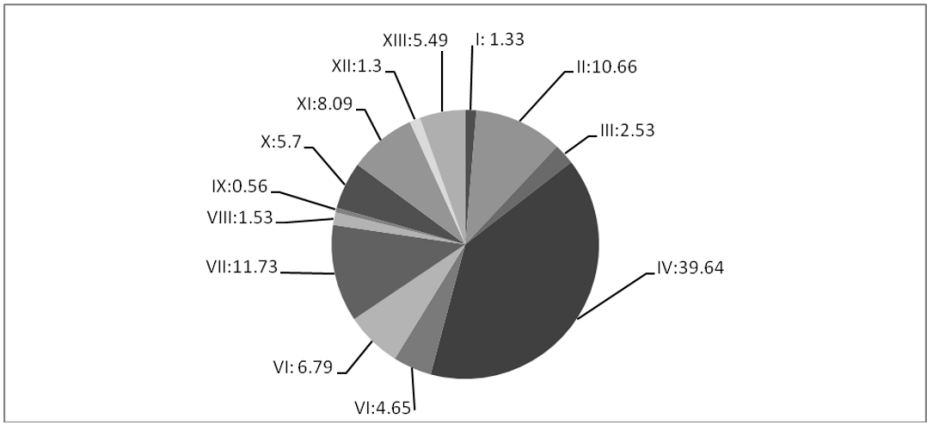

Figure 9: Distribution of MSEs Using the Internet by Type of Business, 2016
Source: BPS (2017a)
Notes: I: Mining and quarrying; procurement of electricity, gas and drinking water; water management, wastewater management, waste management, and recycling, and remediation activities; II: manufacturing industry; III: construction; IV: retail trade, and car and motorcycle reparation and maintenance; V: transportation and warehouse; VI: accommodation and food and beverages; VII: information and communication; VIII: finance and insurance; IX: real estate; X: business services; XII: education; healthcare and social activities; XIII: other services.

MSEs which utilizes the internet for business has a turnover above 300 million rupiahs. On the other hand, MSEs that do not use the internet for business, the percentage of MSE which has a turnover above 300 million the rupiah is not more than 10 percent. 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.

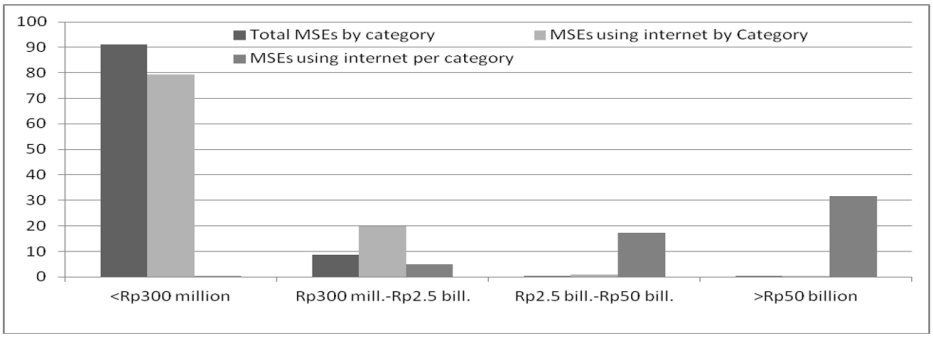

Figure 10: Total MSEs, MSEs Using Internet and Category of Revenues, Indonesia, 2016
Source: BPS (2017a)

This figure 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 computerization, 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. Alternatively, it could mean that MSEs that utilize the internet for businesses have a greater opportunity to generate higher turnover values compared to those that do not utilize 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 making online marketing gain far greater profits than ever before (Julianto, 2016).

Based on 2016 data from MSI in 23 industry groups, including food, tobacco, textile/garments, products from wood, and footwear, Figure 11 also suggests a positive relationship between internet usage and average income: groups of the industry with more MSI using the internet have higher average earnings per company (MSI) than industry groups with fewer MSI using internet users.

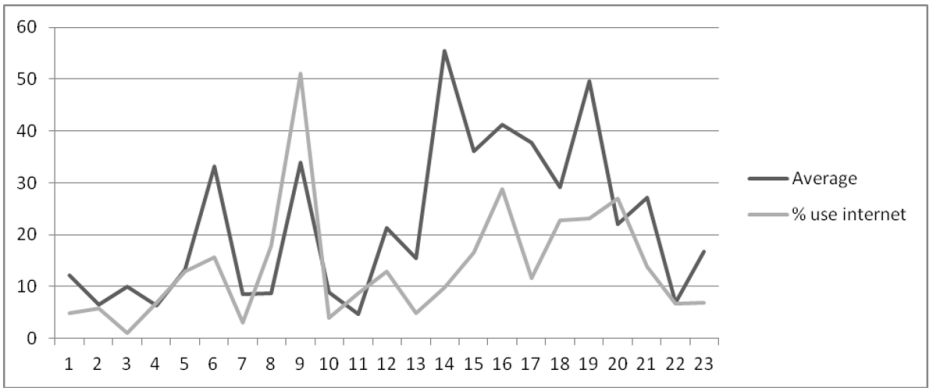

Figure 11: Internet Usage and Average Income of MSIs, Indonesia, 2016
Source: BPS (2017b)

4.2.6. MSEs using internet and level of education and age of the owners

Another interesting aspect to note is the relationship between internet usage and the education level of entrepreneurs (Figure 12). The hypothesis is that highly educated entrepreneurs tend to be more willing or able to use advanced technologies, including the internet, than vice versa, ceteris paribus. The following figure with MSI data in 23 groups of the industry seems to support this general view. Likewise, with the relationship between the age of the entrepreneur and the

use of the internet. The general view is that ceteris paribus, young entrepreneurs prefer or want or can utilize all kinds of advanced technologies that they can access, including the internet, compared to their older counterparts. Using the same data source, young entrepreneurs in this study were those between 20 and 44 years old, and as can be seen, Figure 13 seems to support this hypothesis.

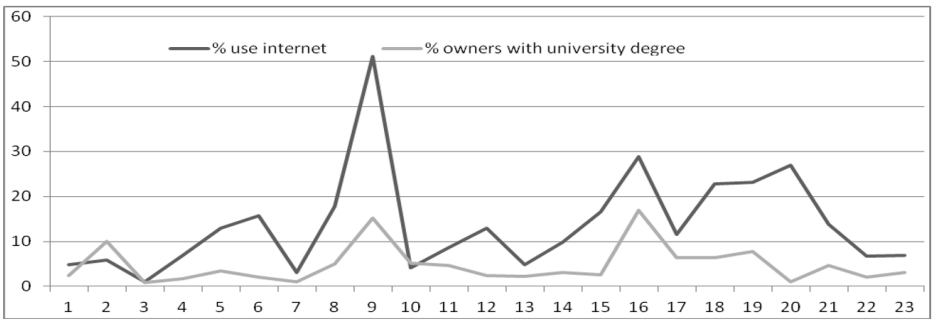

Figure 12: Internet Usage and Owners of MSIs with University Degree, Indonesia, 2016
Source: BPS (2017b)

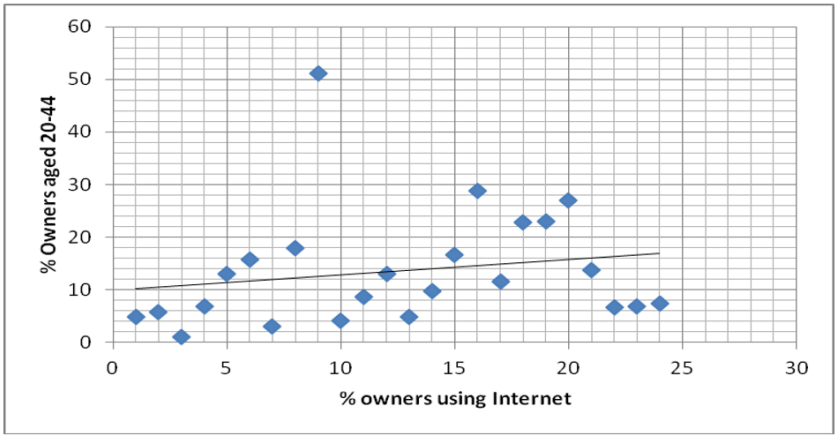

Figure 13: Internet Usage and Young Owners of MSIs, Indonesia, 2016
Source: BPS (2017b)

4.2.7. Use of internet and MSIs experiencing marketing problems

The MSIs data show that there are three main reasons for using the internet, namely for promotion and marketing activities, procurement of raw materials

and other required inputs, and searching for all kinds of information relevant to businesses such as market conditions and opportunities, new materials or production tools offered in the market, new technologies and methods of production, and government policies or regulations. From here, one hypothesis that can be formulated in this study is that the more complicated marketing (for example, because of increasingly fierce competition or marketing expansion), the more urgent it is to use the internet, ceteris paribus. In other words, the larger the number of MSIs in an industry group experiencing marketing problems, the larger the number of MSI in the industry that uses the internet. Figure 14 tends to support this hypothesis.

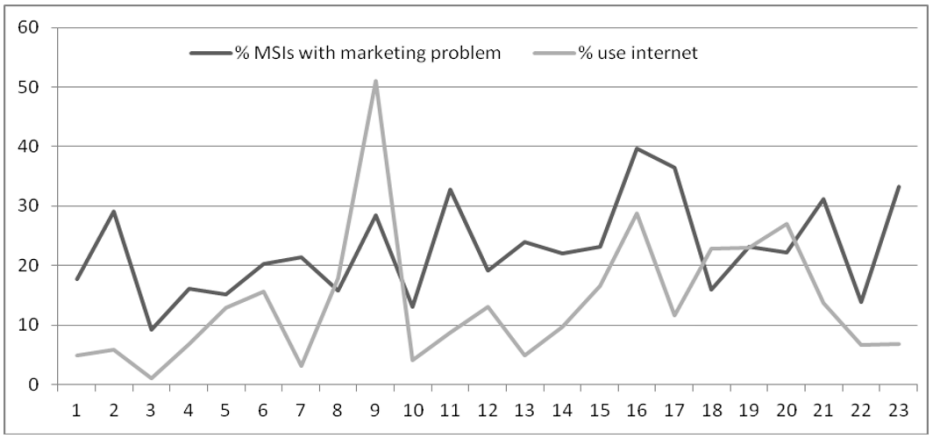

Figure 14: Internet Usage and MSIs with Marketing Problems, Indonesia, 2016
Source: BPS (2017b)

5. Conclusions

This study reveals several key facts. First, MSMEs are of overwhelming importance to Indonesia's local economy, accounting for more than 99 percent of all firms, and the majority of MSMEs are MSEs. Second, 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 favor 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. Third, 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. Fourth, the intensity of internet usage by MSEs is found to have a positive relationship

with the level of income per capita. Fifth, the type of business is also important in encouraging MSEs to utilize the internet. The types of businesses that most MSEs utilize the internet are retail trade and car and motorcycle repair and care services. Sixth, 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 utilize internet than those in types of businesses with less degree of computerization/automation and low investment risk but also small turnover value.

Finally, the information in this article is also important for policymakers not only in Indonesia but also in 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 the policymakers should give that capacity building, including their ability or readiness to utilize ICT, in these enterprises a high priority 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).

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