Factors influencing the resilience of MSEs to the COVID-19 pandemic crisis in Indonesia

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Abstract

The purpose of this empirical study is to investigate two things: a) the impact of domestic economic activities falling sharply due to the COVID-19 pandemic on micro and small industries (MSIs) throughout 2020, and (b) the forms of crisis mitigation measures (CMMs) adopted by crisis-affected MSIs. The study evaluates the importance of four components, namely capital, collaboration, cooperation, and digital technology (DT), using data from the Quarterly MSI Survey (QMSIS) 2020, which included 24,000 respondents (owners of MSIs) from around the country. It provides two key findings: (1) The most popular form of CMMs adopted by crisis-affected MSIs was those that produce other goods whose demand remains high during the pandemic, and (2) The most popular form of CMMs adopted by crisis-affected MSIs was those that produce other goods whose demand remains high during the pandemic with a positive regression coefficient according to theory and significant, suggesting that it was an important determinant of MSIs' resilience. Combined with online sales, this form of CMM has greatly helped many MSIs survive the crisis. The findings have practical implications, including that government stimulus policy during a crisis must complement and correspond with the CMMs adopted by the target MSMEs, therefore, different forms of CMMs in response to different business risks need different policy approaches and stimulus packages. At least in Indonesia, this is the first attempt to empirically examine the impact of the economic crisis due to the COVID-19 on MSIs and explore their CMM by analyzing data from a national survey. In its originality, the findings of this study add to the small business literature, especially studies on the impact of the economic crisis on business.

1. Introduction

The Indonesian government recognizes that micro, small, and medium companies (MSMEs) play an important role in economic development because they have been shown to be the primary driver of job creation and GDP growth. They are critical for poverty reduction, improving income distribution, industrial growth and diversification, rural development, and export growth because they make up the bulk of businesses in the country and they also provide business opportunities to women, unemployed and less educated youths, and secondary incomes to low-income households such as small farm households.

The importance of MSMEs is based on their distinct qualities, which include the following: For starters, they are numerous, particularly micro, and small businesses (MSEs) that are dispersed throughout rural areas. Second, because they are largely populated by firms with significant employment growth potential, their development or growth can be incorporated as a key component of employment creation and poverty alleviation policies, both of which are important components of the country's national inclusive economic policy. Third, not only do the bulk of MSMEs, particularly MSEs, operate in rural areas, but they also mostly engage in agricultural operations. Therefore, government efforts to support MSMEs could also be considered as efforts, indirectly, to support the agricultural sector. Fourth, many MSMEs, especially small and medium enterprises (SMEs) are proven to grow significantly, therefore, they are regarded as enterprises having the "seedbed large enterprises (LEs)" function. Finally, most MSMEs, especially MSEs, manufacture consumer goods and means of production at low prices for low-income consumers.

In addition to these characteristics, MSMEs, especially MSEs have also proven to be very important during economic crises. During the 1997/98 Asian financial crisis or the COVID-19 pandemic crisis in 2020, these MSEs acted as the only alternative

source of income for many laid-off employees from the crisis-affected medium and large companies. These unemployed either become microenterprise owners or self-employment (i.e. sole proprietors). In Indonesia as in other developing countries, both microenterprises and self-employment are found in the informal sector.

Of course, the fact that many MSEs acted as the "last resort" for workers who were laid off from the formal sector during the crisis is very important for the Indonesian government to always support their development, mainly because the country's economy experienced a growth contraction of 2.07 percent. As in other affected countries, the anti-Covid-19 impact policy (i.e. social/physical distancing, learning and working from home, and the temporary suspension of business activities in non-strategic sectors) has brought business activities to a standstill in many sectors or drastically reduced their activities.

Although data sets in many developing countries, including Indonesia are scarce, there is some evidence to suggest that the COVID-19 pandemic has had a severe impact on MSMEs. To mention some, in Asian developing countries, Kahveci [1] found that around 30% of MSMEs were expected to lay off 50% of their staff, 50% of MSMEs were found to have a month of cash reserves or less, and in China 1/3 out of business in 1 month, another 1/3 in two months. In Africa, the COVID-19 pandemic has had a disparate impact on MSME-dominant sectors, specifically in tourism, trade, and services. The pandemic is also likely to increase the previously estimated USD 421 billion financing gap for MSMEs in Africa given the intensified demand for liquidity support due to limited cash reserves. [2]

Based on this background, the study underlying this article aimed to examine the impact of the COVID-19 crisis on MSEs in the manufacturing industry in Indonesia called micro and small industries (MSIs), and how those affected by the crisis were coping with the crisis. More specifically, it has three research questions:

1) Through what transmission channels does the crisis affect MSMEs?

2) How crucial is it for MSIs to have access to money, cooperate with LEs and/or others, be a member of a cooperative, and use DT or the internet during the crisis?

3) What is the most popular form of CMMs adopted by crisis-affected MSIs?

2. MSMEs in Indonesia
Definition

In terms of the number of workers, microenterprises (MIEs) employ less than five (5) full-time equivalent employees; small enterprises (SEs) are enterprises with 5 to 19 workers, and medium enterprises (MEs) are those with 20 to 50 employees more. In terms of monetary, MIEs are those with assets less than 50 million or sales of less than 300 million Indonesian rupiahs (IDR) (or with an average exchange rate in 2020, approximately 3.571 and 21.438 US$,

respectively); SEs with assets of 50-500 million or sales 300 million – 2.5 billion IDR (3.571-35.714 and 21.438-178.571 US$ respectively); and MEs with assets 500 million – 10 billion or sales 2.5 – 50 billion IDR (35.714-714.286, and 178.571-3.57 million US$, respectively).

2.1 Number of Enterprise and Labor

The data from the State Ministry of Cooperatives and SMEs (Menegkop & UKM) as well as the Central Statistics Agency (BPS) show that there were approximately 39.765 million MSMEs representing 99.8 percent of the total business establishments in Indonesia in 1997. The number was observed to be growing every year except in 1998 when the Asian financial crisis hit Indonesia. This crisis forced many domestic companies out of business while some others reduced their production volume due to various reasons such as the high cost of foreign debt (loan repayment plus interest) in rupiah, high domestic inflation, high-interest rates on the domestic money market which, along with many domestic banks experiencing financial difficulties due to bad debts and losses in USD trading, made it difficult for domestic businesses to obtain credit at the time, and high import prices for raw materials and other production inputs in rupiah.

The crisis also caused the national economy to experience the biggest recession in Indonesian history since the 1945 independence and even the Dutch colonial period as indicated by a negative GDP rate of 13 percent. The number of MSMEs at the time reduced to approximately 36.8 million units which is a 7.42 percent reduction. Moreover, Menegkop & UKM estimated that nearly 3 million MSEs stopped doing business during the crisis while the MEs and LEs that closed down were estimated to be 4.2 percent and 12.7 percent, respectively, of the total enterprises. However, when the national economy began to recover in 1999, the number of MSMEs started growing again to 37.9 million units which is an increase of 2.98 percent and the growth continued afterward. [3]

Table 1 shows the number of MSMEs was nearly 61.7 million companies which are approximately 99 percent of the total business units in Indonesia in 2016 and the number increased to slightly more than 65 million in 2019. The MIEs are dominant in the MSME sector with approximately 98 percent while the SE portion is only about 1 percent and MEs are even less than that. This means the discussion of Indonesian MSMEs is usually concerning MIEs.

3. Indonesia's experience with the COVID-19 crisis

As a direct consequence of the "anti-COVID 19 impacts" policy, i.e. social/physical distancing, learning and working from home, and the temporary suspension of business activities in non-strategic sectors resulting in a drastic drop in domestic economic activities, the Indonesian economy in 2020 experienced a growth contraction of 2.07 percent (Chart 1). As in other

affected countries, the anti-COVID-19 impact policy has brought business activities to a standstill in many sectors or drastically reduced their activities. Business fields that experienced the deepest growth contraction were transportation and warehousing with 15.04 percent, and provision of accommodation and food and drink amounted to 10.22 percent. The anti-COVID-19 impact policy also caused community, including tourists to stop, so the use of transportation such as trains, airplanes, and buses between cities; hotel reservations; and visits to restaurants was drastically dropped. Other sectors with negative growth were company services by 5.44 percent; other services by 4.10 percent; and large trade and retail; car and motorcycle repair by 3.72 percent. According to the Ministry of Manpower, approximately 96 percent of companies in all affected sectors in Indonesia were affected directly or indirectly by this policy. [4]

However, not all sectors were negatively affected by the policy, which included health services and social activities which grew by 11.60 percent; information and communication by on 10.58 percent; procuring water, waste management, waste, and recycling by 4.94 percent; real estate of 2.32 percent; and agriculture, forestry, and fisheries of 1.75 percent.

Of course, sectors experiencing negative growth had serious consequences for employment opportunities and subsequently poverty in Indonesia. Historically, high and sustained economic growth during the New Order era (1966-1998) made a major contribution to poverty reduction in the country. In 1998 the poverty rate went up again when the country was hit by the Asian financial crisis, and in 1999 started to decline again as the Indonesian economy has begun to recover. Unfortunately, in 2020, because many workers lost their jobs and many business actors experienced a decrease in their incomes due to the anti-COVID-18 impact policy, the percentage of poor people increased again (Chart 2).

4. Literature Review and Theoretical Framework
4.1 Literature Review: Impact of the Pandemic Crisis on MSMEs, and CMMs

It is often stated in the literature that one comparative advantage of MSMEs relative to LEs is their flexibility and capacity to move from one product to another when market demand changes, expand easily when the economy grows, and contract easily in case of economic crises. Berry et al. [5] for example, added that MSMEs are very important in industries or economies that face rapid market or economic condition changes, such as a sharp macro-economic downturn because they work as a shock absorber in the business cycle. In Sandee et al. [6], it is stated that MSMEs can be expected to perform better under volatile macro-economic conditions than LEs that produce more standardized products where the reorganization of the assembly line takes time.

However, some authors argued that MSMEs, as with their larger counterparts, can also be severely affected by the economic crisis. It depends, among other factors, on the type of the crisis and thus its main transmission channels through which the crisis affects the MSMEs. Experiences in many countries in Southeast Asia showed that credit, import, and domestic demand were the most important transmission channels through which the 1997/98 Asian financial crisis affected local MSMEs. [7,8]

During the COVID-19 crisis, there was also a lot of evidence showing that many MSMEs were affected not because of high-interest rates and a weakening exchange rate like during the 1998 Asian financial crisis, but because of the "anti-COVID 19 impacts" policy. In Asian developing countries, Kahveci [1] found that many MSMEs were expected to lay off almost half of their employees and faced a a shortage of cash. In Africa, the COVID-19 pandemic has had a disparate impact on MSME-dominant sectors, specifically in tourism, trade, and services. [2]

In its recent report on SME Competitiveness Outlook 2020, International Trade Centre shows that small companies tend to be vulnerable during an economic crisis, in part because they have fewer resources with which to adapt to a changing context. Its COVID-19 Business Impact Survey gathered evidence on how the pandemic affected 4,467 companies in 132 countries. It shows that the pandemic has strongly affected 55% of respondents. Nearly two-thirds of MSEs reported that the crisis strongly affected their business operations, compared with about 40% of larger companies. One-fifth of MSEs said they risked shutting down permanently within three months. In Africa, two out of three businesses said they had been strongly affected by COVID-19, mostly involving reduced sales (75%) and/or difficulty accessing inputs. [9]

In its updated report on SME policy response to the crisis, OECD [10],[11] explains that the COVID-19 crisis-affected MSMEs through both the supply and demand sides. On the supply side, MSMEs faced a shortage of labor as workers were unwell or needed to look after their children while schools were closed, and movements of people were restricted. Measures to contain the disease by lockdowns and quarantines led to further and more severe drops in capacity utilization. As supply chains were also interrupted by the crisis, many MSMEs also experienced shortages of parts, intermediate goods, or processed raw materials. On the demand side, MSMEs also suffered from a cash shortage due to a dramatic decline in demand and revenue. All these effects were compounded because workers were laid off and firms were not able to pay salaries.

Results of the ILO SCORE Program Survey showed that enterprises in many affected countries were struggling to survive the effects of COVID-19 . [12,13,14,15] Of the 1,000 MSMEs surveyed from eight countries across four continents, 70 percent have had to shut down operations. Half (50%) have temporarily closed their business by following direct instructions from the authorities, while the other 50 percent have closed

temporarily due to a reduction in orders, cases of staff COVID-19 infection, or more sadly, permanently. More than 75 percent of MSMEs were experiencing or expecting a reduction in revenues through 2020. In some cases, the reductions in revenues were very high. One-third (33%) of businesses anticipated losing more than half of their revenues. About 75 percent of companies suffered from reduced demand and one-third (33% experienced more than 50 percent in customer orders. Nearly 9 out of 10 businesses were experiencing a shortage in cash flow.

Shafi et al. [16] collected data from 184 Pakistani MSMEs by administering an online questionnaire, and the data were analyzed through descriptive statistics, which results indicated that most of the participating enterprises have been severely affected by the significant drop in demand and they were facing several issues such as financial problems, supply chain disruptions, decrease in demand, reduction in sales and profit, among others. Further, more than two-thirds of participating enterprises reported that they could not survive if the lockdown lasts more than two months.

It is said that when a company is facing an unexpected fall in market demand for its products, especially if the decline is not expected to be a short-term phenomenon, it will take some adjustment measures to reduce the pressure on its profit, or if the prices of raw materials have increased significantly due to interference in their supply or distribution, or because of depreciation of the national currency, companies highly dependent on that raw material will take several adjustment steps to maintain production. CMMs can in various forms such as fewer production volumes, fewer working days or hours per day, laid-off workers, the substitution of raw materials, and change the way of marketing. The choice of forms taken will depend largely on the type of crisis and hence the type of business risks, the apparent impact of the crisis, and, perhaps more importantly, the owner's own expectation about the prospect of the current condition his or her business is facing.

The ILO Survey showed that MSMEs were responding to the economic fall-out from COVID-19 in several ways [15] Half of the MSMEs surveyed have reduced their production of goods and services to match demand reductions and constraints on their production. Over one-third (38%) of MSMEs were negotiating wage modifications with workers or revised payment terms with banks and suppliers. Less frequently, some MSMEs were trying to diversify their sales channels or products to try to reduce the effects of the crisis on their business.

From their research in Pakistan, Shafi et al. [16] also provided evidence on CMMs adopted by affected MSMEs. The enterprises surveyed have chosen a different variety of strategies to curb the crisis. Particularly, 31 percent of the sampled enterprises have shut down their businesses completely, while 19 percent have partially closed their businesses, 18 percent of enterprises were planning to apply for a loan, and 12 percent of

enterprises were continuing to operate their business. Only 4 percent of participating enterprises expressed that they were planning to change the business line to address the COVID-19 challenge. Additionally, 2 percent were struggling to work remotely. Working remotely as much as possible is one of the best ways to stay safe and minimize the exposure to get infected. Nevertheless, not all MSMEs, especially MSEs in the rural or backward regions have the required resources to adopt such a strategy.

5. Theoretical Framework

The ability of a company to cope with a crisis is highly dependent on many factors that determine its resilience. Among these factors are access to capital, access to digital technology (e.g. online marketing/e-commerce), having partnerships with LEs in the form of e.g. subcontracting arrangements, and being a member of a related business cooperative (e.g. a shoe producer joins a shoe producer cooperative). By having all these four factors, it is easier for firms to cope with a crisis. If a firm has partnerships with banks or other financial institutions, it may get temporary delay or rescheduling of debt installment payments or reduction of debt interest. If the firm has partnerships with LEs, business associations, chamber of commerce, or government departments, it may get supporting facilities including finance for retaining all its workers (while still paying their wages; full or half) even though production is reduced or stopped, changing production to other goods that are still in high demand, changing the type or composition of raw materials, conducting special training for employees, or moving the factory or shop location to a more strategic or cheaper place.

Furthermore, the level of resilience of a company plus the appropriate form of CMMs according to the type of crisis it faces (e.g. market demand crisis or banking crisis, or exchange rate crisis) and carried out on time will determine its survival rate (Chart 3).

6. Research method and source of ddata

The method used in this study is a quantitative research method. As for the empirical analysis, this study uses a multiple linear regression analysis with the following model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + et.$$

where:

Y = Resilience (dependent variable)

β_0 = Constant

$\beta_1, \beta_2, \beta_3, \beta_4$ = Regression coefficients of dependent variables

X_1 = Capital

X_2 = Partnership

X_3 = Cooperative

X_4 = Digital technology

et = error term

Next, Table 2 shows the operationalization of the variables

This study used data on MSEs in the manufacturing industry (called micro and small industries or MSIs) from the Quarterly MSI Survey 2020 by the Central Bureau of Statistics (BPS). For the survey, as many as 24,000 MSIs across the country each quarter were randomly selected through stratified two-stage sampling. Phase 1, from the sample frame of the census block from the 2016 National Economic Census (SE2016), several census blocks were selected with a probability proportional to size basis with the size of the number of MSIs registered because of listing (SE2016). In phase 2, from the sample frame of MSIs, a number of enterprises were selected systematically. The composition of the selected number of MSIs is determined based on the proportion of the population in the province in the sample frame of SE2016 results. [17]

7. Results and discussion
7.1 Transmission channels
From our observations, news in the mass media, reports from the government, and talking to several clothing store owners, many MSMEs have been affected by the COVID-19 pandemic crisis. However, the actual impact did not come from the crisis but as a result of the implementation of the "anti-COVID 19 impacts" policy, which consisted of three main elements: (i) social/physical distancing' (ii) learning and working from home; and (iii) the temporary suspension of business activities in non-strategic sectors. The second element obviously has caused the number of buyers in the local market to decrease dramatically (↓). Thus, this policy element has affected MSME activities on the demand-side ('demand effect'). Whereas the third element of the policy has affected MSMEs on the supply-side ('supply effect'). These demand-side and supply-side effects did not happen only in MSMEs manufacturing finished products but also in those that supply processed raw materials, components, spare parts, auxiliary goods, semi-finished goods, and other inputs. This is the first channel of the impact.

The second channel was the decrease in world demand, especially from China, for Indonesian products which caused Indonesia's exports to decrease. [18] The third channel was the decline in imports of processed raw materials and auxiliary materials, especially from China, which forced many companies, including MSMEs, in Indonesia, which were highly dependent on imports from China to reduce/stop their productions. The fourth channel was the increase in the number of poor people as many employees have been laid off, or their wages were cut, which further led local market demand to decline that hit the MSME business which can be considered as an indirect effect of the crisis (Chart 4).

7.2 Impact on MSIs' production
The manufacturing industry, which has the largest contribution to the Indonesian economy, experienced a very severe impact during the COVID-19 pandemic crisis. Its growth contracted to - 2.93 percent, and the absorption of labour by this sector was drastically reduced and many MSIs had been severely affected. In 2020 the production of these industries contracted by -17.63 percent compared to 2019's growth of 5.80 percent. Chart 5 shows quarterly growth of MSIs' production for the period 2018-2019 to clearly see how big the impact of the crisis on MSIs is.

Many MSIs had to close their businesses due to the crisis, some must change their current type of production to other types, and many others stopped their production temporarily. By the end of 2020 (quarter IV), 7.06 percent of MSIs were closed and 11.25 percent were temporarily closed. The beverage industry was the industry with the percentage of IMK that did not produce during the last quarter of 2020. Only a small number of MSMEs were actually able to seize opportunities during this pandemic. They were in businesses playing a role in handling the COVID-19 pandemic, such as the pharmaceutical industry, industries that make traditional medicines, and industries that produce chemicals and chemical-based goods.

Changes in the number of MSIs that remained in production during 2020 fluctuated between quarters. This pattern indicates that MSI's activities were highly dependent on the current conditions of the pandemic.

When the number of deaths due to the COVID-19 continued to increase at an increasingly rapid rate, the government then took stronger measures to prevent the pandemic from getting worse, which in the end resulted in a sharp decline in economic activities, and, consequently, an increasing number of MSIs have stopped producing, especially for items that are not essential for the prevention of the COVID-19 pandemic, such as apparel, footwear, food and beverages, handicrafts, and furniture.

The average percentage of MSIs that were still actively producing also varied by province during that particular period as shown in Chart 6. The difference in growth rates between provinces is caused by many factors that are also different between provinces such as the resilience of individual MSIs, how big the impact of the pandemic crisis on the dominant industrial groups in the province, infrastructure, and logistics. Apart from these factors, another very important factor that often differs between provinces is the local government's policies toward the development of MSMEs in their administrative areas. Not all local governments, both at the provincial and district levels actively support MSMEs with various program initiatives do not.

7.3 Resilience of MSIs
What is interesting from Figure 6 is that in all provinces, the majority of MSIs remained active in production during the pandemic period. It means that in general MSEs in Indonesia were quite resilient to the economic crisis caused by Covid-19. The question now is what made their resistance level to the crisis good

enough; did the four independent variables play an important role?

Ideally, to analyze the factors affecting the resilience of MSIs, the dependent variable should be the number of MSIs that were still producing, not those that were not, and the explanatory variables should be MSIs who have access to capital and digital technology and those who have partnerships and who are members of a cooperative. However, findings from the Quarterly MSI Survey 2020 show that the number of MSIs who received loans from banks, who used the internet, especially for marketing and procurement of raw materials, and who did partnership with e.g. LIs (e.g. subcontracting), business associations, government departments government, and who were members of the cooperative are very few (Table 3).

This gives the impression that most of the MSIs that remained actively producing, as shown in Figure 6, were not solely due to these four factors (capital, partnership, cooperatives, and digital technology); there must have been many other factors, including crisis mitigating measures (CMMs) adopted by many MSIs to minimize the negative impact of the crisis (will be discussed next). As seen in Table 4, R^2 is only around 23 per cent, meaning that there were many other factors not included in the analyses but have important influences on the resilience of MSIs. It is also indicated by the goodness of fit test that the ability of the four independent variables in explaining the difference in the number of MSIs that stopped production per province is only 12.32% and the remaining 87.68% was explained by other variables not included in the model.

Based on T-test, the bank's probability value of 0.546 is higher than 0.05, meaning that the MSIs that did not borrow from the bank has no significant effect on their resilience. The partner probability value of 0.53 is also higher than 0.05 and this means that non-partnered MSIs have no significant effect on their ability to stay in business during the crisis. Whereas, the cooperative probability value of 0.01 is lower than 0.05, meaning that being a member or forming a cooperative was important for the survival of MSIs during the pandemic crisis. Unfortunately, the sign is negative, there is no logical explanation for this, it could be a data problem. As shown in Table 3, the average number of MSIs as members of cooperatives is very small per province, not commensurate with the number of MSIs that survive on average per province with the majority. But, basically cooperatives can be very helpful for their members during a crisis, for example, cooperatives lend funds to members whose businesses are facing financial difficulties due to a sluggish market.

Likewise, the Internet probability value of 0.02 (< 0.05) means that not using the internet was also one of the causes of many MSEs that did not survive. There is no doubt that the use of digital technology, especially for marketing, was very helpful during the COVID-19 crisis. Even in Indonesia, the use of e-commerce by many business actors made them able to continue their business even though their stores were empty of visitors because they could still get buyers through market platforms or directly via email or WhatsApp.

Probe F-statistic is 0.09 higher than 0.05 meaning that simultaneously not having access to banks (capital), no collaborations with others (partnership), not being a member of cooperatives (cooperative), and not using the Internet (digital technology) have no effect (if using 0.5) was not responsible for MSIs which then collapsed during the crisis. But if $\alpha = 0.1$, higher than 0.09, then it means that the four independent variables did have influences.

8. CMMs

During the COVID-19 pandemic crisis in 2020, the owners of MSIs had two choices, those who were unable to adapt to the crisis, many of them temporarily stopped their production activities (business was not officially closed) and others that were really losing money or were no longer financially feasible closed officially. The highest percentage of MSIs temporarily not producing occurred in the second quarter of 2020 which amounted to 15.35 per cent, but then tends to decrease in the following quarters. In the third quarter of 2020, the number of MSIs temporarily not producing was around 11.55 percent and in the fourth quarter of 2020 around 11.25 per cent.

MSIs that were still in production can be distinguished between those that continued to make the same types of products before the crisis, and those made other types of products whose market demand remained high despite the crisis. Data from the Quarterly MSI Survey 202 indicates that changes in the types of goods made did not always produce the goods that remained in great demand, such as food ingredients and items that were really needed during the crisis, such as masks, soap and other simple medical equipments. Many MSIs have changed to goods that have technological proximity. Around 21.38 percent of MSI's business that changes were wood industry, industries producing wood and cork goods (excluding furniture), and industries producing woven goods made of bamboo, rattan, and the like (ISIC Code 16). Changes in business in these industries were dominated by the furniture industry (ISIC Code31) and the YTDL machinery and equipment industry (which does not include others) (ISIC Code28).

Meanwhile, the furniture industry (ISIC Code31) was the business that experienced the second largest change in ISIC Code, namely 17.59 percent. The changes in MSI ISIC Code 31's business were mostly wood, wood and cork products (excluding furniture), rattan, bamboo and woven goods and the like (ISIC Code16). From the two types of industries that have experienced changes in the type of business mentioned above, MSI entrepreneurs only made changes in the types of activities that are relatively the same with technology. MSI ISIC Code 16's business and those in ISIC Code 31 seemed to be just each other exchange activities.

The textile industry (ISIC Code 13) was the third business with the most changes in, which is 12.41 percent. Changes in business in ISIC Code 13 were dominated by changes to other processing industries (ISIC Code 32) and apparel industry (ISIC Code 14). A total of 36.36 percent of changes in the textile industry (ISIC Code 13) were two other processing industries (ISIC Code 32). One of the changes in the products of other processing industries (ISIC Code 32) was the manufacture of masks.

Table 5 shows the percentage of the number of MSI businesses by the change in the type of activity according to the 2-digit ISIC Code throughout 2020. The most frequent changes in the 2-digit ISIC Code were the shift in the wood industry, wood, and cork products (excluding furniture), wicker goods from rattan, bamboo, and the like (ISIC Code 16), as much as 18.28 percent, the furniture industry (ISIC Code 31) as much as 15.52 percent, and other processing industries (ISIC Code 32) as much as 13.79 percent. Meanwhile, the types of MSI businesses that are not transitional are the tobacco processing industry (ISIC Code 12), the paper and paper goods industry (ISIC Code 17), and the computer, electronic and optical goods industry (ISIC Code 26).

Table 1: Number of MSMEs and their workers by sub-category in Indonesia, 2016-2019

Description	unit of measure	2016		2018		2019	
		Total	Share (%)	Total	Share (%)	Total	Share (%)
MSMEs Les	Unit	61,651,177 5,370	99.99 0.01	64,194,057 5,550	99.99 0.01	65.465.497 5.637	99.99 0.01
Total companies		61,656,547	100.00	64,199,607	100,00	65.471.134	100.00
MSMEs Les	People	112,828,610 3,444,746	97.04 2.96	116,978,631 3,619,507	97.00 3.00	119.562.843 3.805.829	96,92 3,08
Total workers		116,273,356	100.00	120,598.138	100.00	123.368.672	100.00

Source: Menegkop & UKM (http://www.depkop.go.id/)
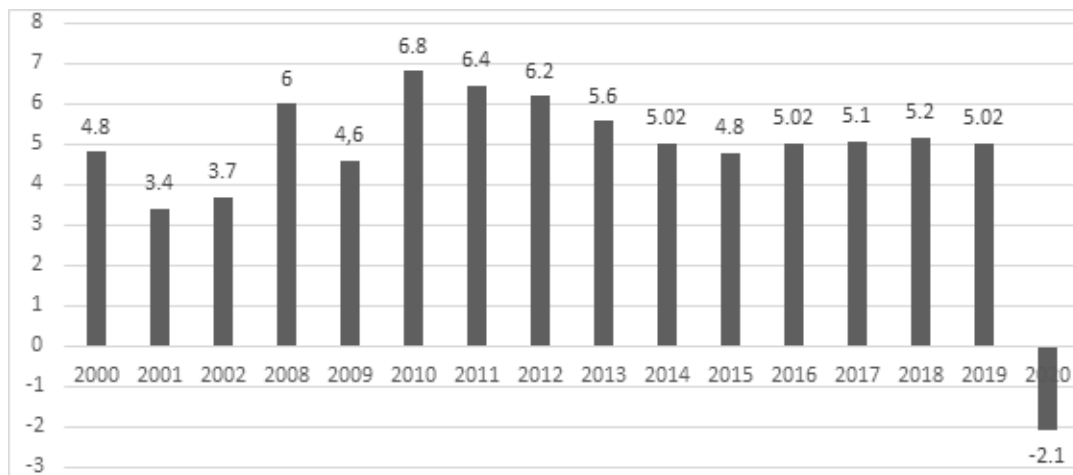
Source: BPS (https://www.bps.go.id/)communication
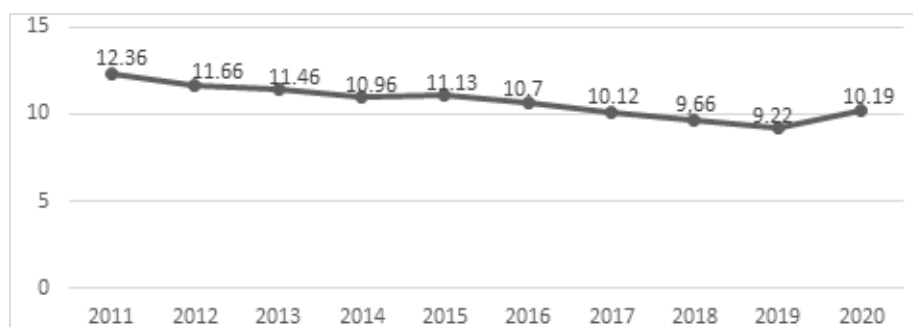
Chart 2: Poverty rate in Indonesia, 2011-2020 (%)*

Note: * September
Source: BPS (http://www.bps.go.id)

Chart 3: Theoretical Framework
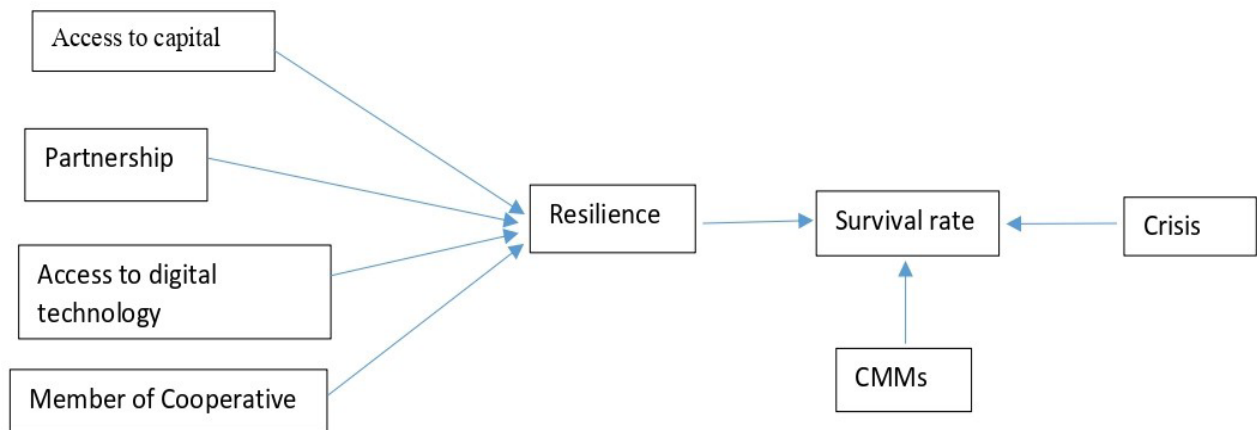
Chart 3: Theoretical Framework

Table 2: Operational variables

Factor	Category of variable	Operational Independent Variables
Resilience	Dependence	Number of MSEs that stopped production/closed per province
Capital	Independence	Number of MSEs who do not have access to bank per province
Digital technology	Independence	Number of MSIs who do not use digital technology or the internet per province
Partnership	Independence	Number of MSI who do not have partnerships with others
Cooperative	Independence	Number of MSIs who are not members of a production or marketing cooperative
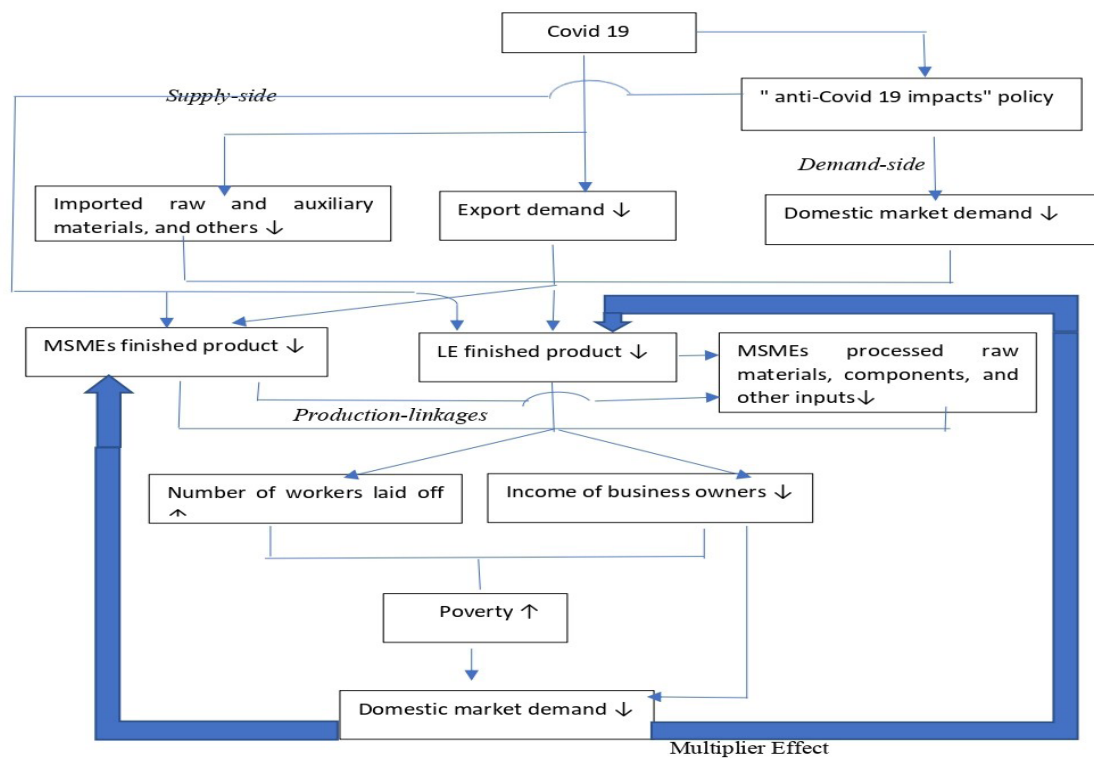
Chart 4: Impact of the COVID-19 Pandemic on MSMEs in Indonesia
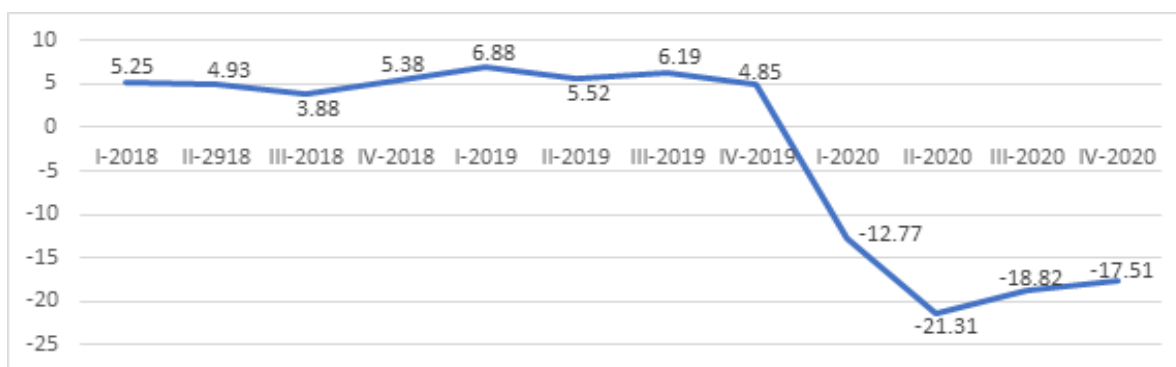
Chart 5: MSIs' Production growth (y-on-y), QI-2018-QIV-2020
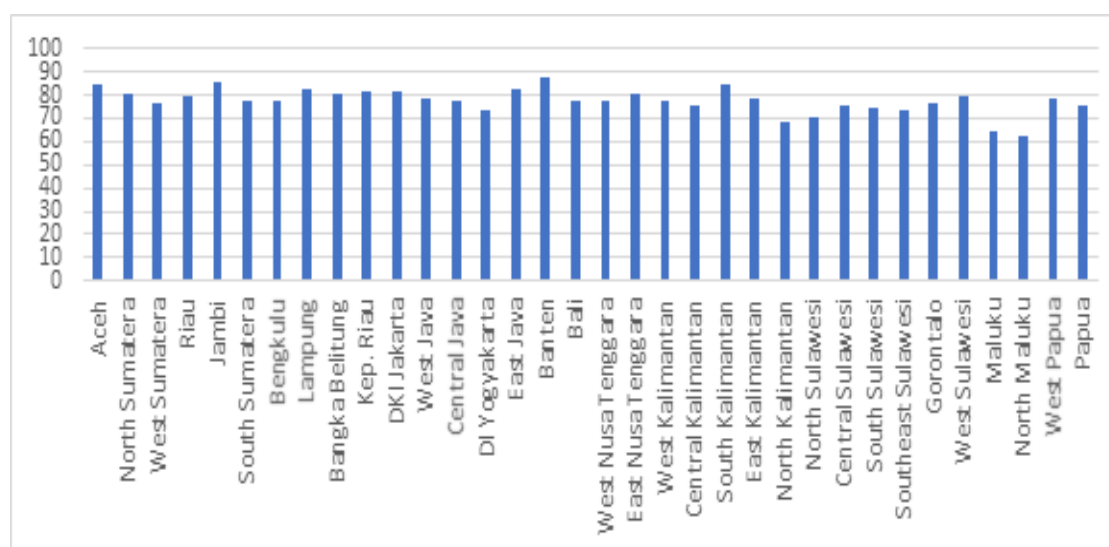
Chart 6: Average percentage of MSIs in the manufacturing industry that were still produced in 2020 by province

Table 3: Percentage of MSIs who have access to capital and digital technology, partnership and who are members of the cooperative by province in 2020

Province	Access to banks	Partnership	Member of Cooperative	Used Internet
Aceh	1.99	4.71	1.00	6.98
North Sumatera	6.91	7.40	1.91	10.23
West Sumatera	6.52	5.97	3.86	9.81
Riau	5.08	9.42	1.78	16/01
Jambi	4.53	4/87	0.84	8.26
South Sumatera	4.99	5.64	0.87	6.97
Bengkulu	10.12	7.68	4.09	11.46
Lampung	6.73	2.64	2.21	9.69
Kep. Bangka Belitung	3.75	3.79	0.26	10.26
Kep. Riau	2.56	4.46	2.26	16.24
DKI Jakarta	2.80	18.53	2.16	36.89
West Java	6.77	12.96	1.15	14.05
Central Java	6.79	9.80	3.26	12.74

D.I. Yogyakarta	8.26	8.89	3.41	21.80
East Java	6.31	6.98	1.67	12.56
Banten	4.19	14.36	1.41	11.34
Bali	7.52	5.49	3.62	9.86
West Nusa Tenggara	5.27	5.93	0.98	6.25
East Nusa Tenggara	2.10	4.30	8.19	4.23
West Kalimantan	4.65	9.47	2.16	8.60
Central Kalimantan	3.59	6,10	1.27	15.58
South Kalimantan	2.24	2.50	0.36	8.08
East Kalimantan	7.23	8.42	2.01	19.96
North Kalimantan	9.93	7.02	3.25	16.40
North Sulawesi	5.02	5.02	2.07	8.67
Central Sulawesi	3.67	7.56	1.12	2.79
South Sulawesi	10.66	5.91	0.52	9.87
Southeast Sulawesi	6.46	0.58	1.67	6.87
Gorontalo	5.59	6.08	3.49	9.30
West Sulawesi	4.89	2.70	0.67	2.51
Maluku	1.33	1.32	0.26	4.93
North Maluku	3.24	8.30	4.26	5.93
Papua	7.88	4.98	0.85	14.55
West Papua	4.44	2/56	0.62	3.84

Table 4: Regression results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	140.4845	53.13876	2.643730	0.0131
Banks	0.033356	0.054601	0.610901	0.5460
Partnerships	0.136952	0.218362	0.627179	0.5354
Member of cooperatives	-1.562611	0.568249	-2.749871	0.0102
Internet	0.195649	0.084879	2.305030	0.0285
R-squared	0.229505	Mean dependent var		19.13059
Adjusted R-squared	0.123230	S.D. dependent var		5.080004
S.E. of regression	4.756712	Akaike info criterion		6.092043
Sum squared resid	656.1628	Schwarz criterion		6.316508
Log likelihood	-98.56473	Hannan-Quinn criter.		6.168592
F-statistic	2.159541	Durbin-Watson stat		0.990080
Prob(F-statistic)	0.098725			

Table 5: Percentage of total MSIs by 2-digit ISIC code change, 2020

ISIC Code	Produce the same goods				Producing other types of goods			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
10	76.78	76.26	77.43	77.71	0.07	0.12	0.15	0.03
11	82.6	87.42	88.34	87.10	0.17	0.09	–	–
12	19.07	22.72	87.82	49.40	–	–	–	–
13	81.53	78.32	79.82	79.52	0.61	0.21	0.26	0.21

14	78.72	76.40	79.25	79.83	0.34	0.19	0.11	0.26
15	76.59	69.51	71.08	69.42	1.46	0.24	–	0.25
16	79.59	81.04	81.66	82.85	0.43	0.55	0.37	0.27
17	77.08	66.32	67.01	71.58	–	–	–	–
18	82.38	75.47	83.57	83.33	0.86	0.17	–	0.35
19	--	-	-	-	-	-	-	-
20	65.65	76.80	74.73	72.88	0.28	–	0.27	0.27
21	74.6	71.88	72.22	73.02	0.79	0.78	–	–
22	70.45	75.59	82.26	82.03	–	0.79	–	–
23	79.99	83.09	85.04	84.56	0.05	0.05	–	0.05
24	81.29	82.01	82.73	82.73	0.72	–	–	–
25	79.19	82.20	83.72	84.46	0.57	0.21	0.07	0.28
26	100.00	85.71	100.00	100.00	–	–	–	–
27	70,59	68.75	64.71	58.82	5.88	–	5.88	–
28	47.56	74.70	78.57	78.82	25.61	1.20	2.38	1.18
29	78.33	83.33	86.36	85.71	1.67	1.52	–	–
30	69.96	69.60	71.53	71.38	0.73	0.73	–	-
31	73.42	77.26	79.93	80.07	1.19	1.18	0.77	0.69
32	75.14	68.69	74.11	74.66	1.51	0.58	0.64	0.14
33	76.70	78.64	77.23	79.25	2.91	–	–	–

Note: ISIC Code: 10: food, 11: beverages, 12: tobacco processing, 13: textiles, 14: apparel, 15: leather, leather goods and footwear, 16: wood, wood products and cork (excluding furniture), woven articles from rattan, bamboo and the like, 17: paper and paper articles, 18: printing and reproduction of recorded media, 20: chemicals and articles of chemical substances, 21: pharmaceuticals, chemical medicinal products and traditional medicine, 22: rubber, articles of rubber and plastics, 23: non-metal minerals, 24: base metals, 25: non-machined metal goods and their equipment, 26: computers, electronic and optical goods, 27: electrical equipment, 28 : YTDL machinery and equipment (excluding others), 29: motor vehicles, trailers and semi-trailers, 30: other means of transportation, 31: furniture; 32: other processing; 33: repair and installation of machinery and equipment; "lainnya" means others.

9. Conclusions and further research

Like almost all other countries, Indonesia has been hit by the COVID-19 pandemic. Hence, this article tried to assess the impact of the outbreak on MSIs and the adopted CMMs by crisis-affected MSIs. Although there must be many other resilience determinant factors, this study focuses on four factors, i.e. capital, partnership, cooperation and DT or the internet. It reveals that among these factors only the use of the internet with a positive regression coefficient according to theory and significant which may suggest that DT was an important determinant of the resilience of MSIs. Another important finding from this study is that the most popular form of CMMs adopted by crisis-affected MSIs was to produce other goods whose demand remains high during the pandemic.

This study has two important contributions, namely the theoretical and practical aspects. Concerning the theoretical contribution, different types of crises have varying transmission channels through which MSMEs were affected. Hence, the effect on businesses depends on the type of crisis and the transmission channels, meaning that not all MSMEs in every sector may be impacted. The COVID-19 crisis could be considered a combination of market demand and supply or production crises. From the market demand side, only MSMEs that make finished products, goods, and services and are completely dependent on the offline market were hit hard, as people had to stay at home. Conversely, only larger companies with high numbers of workers were generally affected, according to the market supply side. These include textile, apparel, and electronics industries, alongside businesses, which are gathering places for people, such as cafes and restaurants, entertainment venues, cinemas, hotels, and malls that had to close during the pandemic. Meanwhile, micro-businesses that utilize below five (5) workers, for example, small car repair shops, car washes, and shops, or business units without workers, such as craftsmen, small traders, and food stalls remained open.

Consequently, this study has two policy implications as practical contributions in case the government wishes to assist crisis-affected MSMEs. First, the stimulus package programs should be made effective, and the most affected MSMEs should be identified at the start. For this, the type of crisis, the main transmission channel, and the type of business risks should be known in advance. Second, the form of stimulus must complement and correspond with the CMMs adopted by the target MSMEs. Therefore,

different CMMs in response to different business risks need different policy approaches and stimulus packages.

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