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Business Vulnerability and Credit Access for Agriculture-Based Micro and Small Women Entrepreneurs*

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Abstract

Micro and Small Industries (MSIs) constitute the largest share of Indonesia's manufacturing sector and play an important role in providing employment opportunities and value-added creation. However, their business sustainability and scaling up are often hindered by various factors, one of which is access to credit. The subsidized loan scheme provided by the government, namely People's Business Credit (KUR), appears to be insufficiently attractive to entrepreneurs, especially to Micro and Small Women Entrepreneurs (MSWEs). Employing a logit regression method and utilizing the BPS-Statistics Indonesia's 2015 MSI survey data, this study aims to investigate factors affecting MSWEs' decision to apply for bank loans and factors contributing to the approval of their credit applications by banks. The results show that MSWEs have low participation in credit borrowing, partially due to business vulnerability and self-rationing attitude, while credit application rejection is caused mainly by banks' conservative approach to MSWEs. Practical implications of the findings are discussed.

Keywords: credit access; micro and small women entrepreneurs; self-rationing; business vulnerability

JEL classifications: G21; G18; H81

1. Introduction

Previous research, especially in developing countries such as India, Bangladesh, Malaysia, and Indonesia, has shown that microcredit has a positive effect on poverty reduction (Morduch 1998; Santoso et al. 2020; Revindo & Gan 2017b). The Microcredit Summit 2015 reports that microfinance community reached 211 million customers at the end of 2013, 144 million of whom live in the worst poverty (Reed et al. 2015). In most developing countries, Micro and Small Industries (MSIs) are typically identical to entrepreneurs from poor families. Thus,

developing and upscaling MSIs has become one of the government's main programs to reduce poverty worldwide.

Despite the positive effect, several previous studies have also revealed that women entrepreneurs have a lower credit application rate and a higher rejection rate than their male counterparts. Mijid & Bernasek (2013) argue that women seem to ration themselves in the credit market rather than being discriminated by banks. Studies on factors affecting this trend are important as female and male entrepreneurs perform very similarly and have a similar rate of borrowing when the business environment is conducive (IFC 2011). In addition, when Micro and Small Women Entrepreneurs (MSWEs) are empowered, the larger-scale impact of empowerment has proven beneficial for overall societal development as female entrepreneurs tend to re-invest their money in their children's health, educa-

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tion, and nutrition. This, along with the increased bargaining power of women, will benefit the society and the economy as a whole through better provision of children's health and education. Ultimately, this will contribute to improving human capital of the next generation and enhancing the potential for economic growth.

IFC (2011) also found that the provision of a supporting and enabling environment leads to better development of small firms. Easier access to finance is an important part of the enabling mechanism (Klapper, Laeven & Rajan 2006). Rajan & Zingales (2003) argue that existing firms are aided by financial access to exploit new growth and investment opportunities. Furthermore, access to finance contributes to growth through the entry of new firms (Klapper, Laeven & Rajan 2004) and, on a macro scale, to the creation of a thriving private sector with an efficient distribution of resources (Rajan & Zingales 2003). Indeed, access to capital can be the most critical factor for firm growth (Banerjee & Duflo 2008; De Mel, McKenzie & Woodruff 2008).

Availability of business loans is an important aspect of access to finance. This is especially relevant for women's new ventures since women generally own little to no property and have smaller initial capital due to lack of access to proper employment prior to initiating the ventures (Fay & Williams 1993). Empirical evidence suggests that providing financial access to non-poor small entrepreneurs can have a strong positive indirect effect on the poor (Demirgüç-Kunt, Beck & Honohan 2007). Gender differences in access to financial services can thus lead to negative repercussions not only for women entrepreneurs but also for the economy (Aterido, Beck & Iacovone 2011).

The contribution of Micro, Small, and Medium-sized Enterprises (MSMEs) is notably important to the economy of Indonesia, as MSMEs constitute 99 percent of business establishments, providing more than 90 percent of employment to the entire workforce and contributing 57 percent to Indonesia's GDP (IFC 2016). Nearly 10 percent of business units of MSMEs engage in the man-

ufacturing sector. To support the development of MSMEs, the government has introduced a capital assistance scheme in the form of KUR (People's Business Credit) loans. The model is adapted from MSME loans of BRI (People's Bank of Indonesia) and distinguished in the form of Micro KUR and Retail KUR. The maximum loans that can be accessed in the Micro KUR and Retail KUR schemes are IDR25 million and up to IDR500 million, respectively.

Until 2014, both loan models were offered to MSMEs with an annual interest rate of 22 percent, which was similar to that outside the banking system. To further assist the progress of MSMEs, in the mid 2015 the government issued a policy reducing the Micro KUR interest rate to 12 percent and subsidizing banks. In the early 2016, the government re-lowered the KUR Micro interest rate to 9 percent and eliminated the collateral requirement¹.

However, interest in Micro KUR remained low, especially among Micro and Small Industries (MSIs) (Table 1). Furthermore, within the MSIs, credit participation by those enterprises owned by female entrepreneurs was even lower. This fact shows that government solution to MSMEs' lack of capital still faces some constraints at the implementation level, and the constraints are more evident in the case of MSWEs.

This paper aims to investigate factors affecting MSWEs' participation in formal credit borrowing from banks and factors contributing to the success of their credit applications. The findings from this study contribute to our understanding of the ways to improve financial access to MSMEs in general and MSWEs in particular. The remainder of the paper is organized as follows. Section 2 provides a review of the relevant literature, while Section 3 describes

¹The Government of Indonesia through the Coordinating Minister for Economic Affairs decided to lower the KUR interest rate to 7% per annum effective January 1, 2018. The target of KUR distribution in the production sector (i.e., agriculture, fishery, processing industry, construction, and production services) in 2018 at minimum amounted to 50% of the total disbursement target of IDR120 trillion (Permenko No. 11 of 2017).

Table 1. MSIs' Credit Applications in Indonesia

Credit Status	2014				2015			
	Male	%	Female	%	Male	%	Female	%
Not Applying	1,759,128	89.22%	1,482,967	96.71%	1,870,609	87.87%	1,477,672	95.92%
Applying	212,461	10.78%	50,508	3.29%	257,835	12.11%	62,757	4.07%
Participating	194,900	91.73%	40,207	79.61%	237,899	92.27%	54,861	87.42%
Application Denied	17,561	8.27%	10,301	20.39%	19,936	7.73%	7,896	12.58%

Source: MSI Survey (BPS-Statistics Indonesia 2015,2016)

the employed data and methodology. Section 4 discusses the results and Section 5 presents the conclusion.

2. Literature Review

Stiglitz & Weiss (1981) claim that interest rates in credit market are not a proper signal to indicate the balance between demand and supply of credit. The incomplete information that lenders have about their potential borrowers often results in adverse selection, in which not all customers can obtain loans. Lowering the interest rate is expected to attract more loan applications. This is in line with the results of the studies conducted by Robinson (2001), Blas (2011), and Kausar (2013). However, credit programs often do not reach the poor. As noted by Robinson (2001), common rural credit programs tend to be in the form of subsidized agricultural credit that is frequently given to better-off households, pushing the poor to rely on informal credit markets. This trend tends to happen in developing countries, such as Bangladesh, India, Mexico, Nigeria, Philippines, Thailand, Zambia, and Zimbabwe. Theoretically, the limited accessibility to credit originates from the asymmetric information that occurs in the credit market, especially in formal financing sources (Jaffee & Modigliani 1969).

In the case of KUR in Indonesia, the reduction in the interest rate and its effect are justified in the form of a government subsidy on the KUR rate, allowing banks to provide loans at a lower interest rate (Prawiranata 2013). Accordingly, Rachmawati (2015) and Santoso & Gan (2019) report that the demand for microcredit in Indonesia is affected by the interest rate. However, as in the case of other

developing countries, subsidized credit programs often do not reach the poor who need them the most. Interest rate is not the main reason for the lack of MSMEs' participation in borrowing from formal sources, but rather the onerous procedures and stringent requirements that become the inhibiting factors (Azriani 2014). This niche is then served by informal commercial loans (loan sharks) that are relatively easy to find and access in rural areas.

KUR as a microcredit is intended to serve the poor and the unbanked people. Low level of income and expenditure are indicators of poverty. Poverty is often accompanied by vulnerability, but they are not always in the same dimension. Vulnerability by definition is explicitly expecting a future loss of household welfare (Chaudhuri, Jalan & Suryahadi 2002). Vulnerability to poverty indicates the possibility of an entity (household) to fall into poverty one day. Vulnerability is more predictive, describing the outcomes of the household decision-making process when facing various risks and the potential outcomes that will occur (Abraham & Kumar 2008). According to Pearlman (2012), vulnerability indicates circumstances where a person or a household cannot maintain their consumption when there is a shock in their income. MSMEs act like a household; thus, their vulnerability is similar.

Furthermore, vulnerability has been found to cause women entrepreneurs to be reluctant to borrow money from banks. Women often do not have other sources of income, such as savings that can be withdrawn or assets that can be sold when the shock occurs, hindering loan repayments (Pearlman 2012). Another characteristic that accompanies vulnerability is low level of education (Wedelia, Hutagaol & Daryanto 2017; Fitriana et al. 2018).

Moreover, several other studies have shown that accessibility for the poor is more decisive than interest rates. The low interest rate of KUR on micro banking credit does not significantly increase the number of first-time borrowers. Meanwhile, bank loans are considered inflexible and require more paperwork (IFC 2016). Thus, lowering the KUR interest rate might not be the appropriate policy to assist MSMEs in accessing funding. Accessibility is said to be influenced by the educational background of the entrepreneurs (Chinonso & Zhen 2016). A better educational background indicates a better ability to provide proper business plans and positive financial information. In addition, most of the better educated entrepreneurs possess abilities related to business functions that help them achieve favorable assessment from financial institutions. Other factors that might increase accessibility are the amount of cash holdings (Bose, MacDonald & Tsoukas 2019; Bougheas, Mizen & Yalcin 2006; Quartey et al. 2017; Ferrando & Mulier 2013), asset ownership (Carreira & Silva 2010), and formal status of the business (IFC 2011,2016).

As for MSWEs in Indonesia, collateral requirements from banks often prevent them from participating in credit borrowing. Table 2 shows that 12 to 13 percent of the MSWEs stated that 'not having collateral' was their reason for not accessing bank loans. To address this issue, in addition to lowering the KUR interest rate to 9 percent in 2016, the government has also eliminated collateral liabilities. However, this has not significantly increased the number of first-time borrowers from the target group².

With regard to its impact on women's credit participation, microcredit has a positive and significant impact on various dimensions of women's empowerment in rural China, consisting of a greater control over their own financial resources and assets, strengthening their position in the family by having a greater role in the family's decision-making process, increased mobility, and

increased autonomy in making purchases (Revindo & Gan 2017a). However, it is also noted that there is a threshold of the amount of borrowing made by women in order for those impacts to be significant.

Questions remain as to what factors affecting women's decision to apply for bank credit and whether vulnerability is the factor responsible for dissuading MSWEs from applying for microcredit from the banking system (legal lenders). Question also remains as to what factors influencing banks' decision to approve the MSWEs' credit applications.

3. Method

This study used cross-sectional data from 2014 and 2015 Micro and Small Industry (MSI) Survey published by BPS-Statistics Indonesia. We investigated the behavior of MSWEs in the banking market nationally, when the KUR Micro interest rates were reduced from 22 percent per year in 2014 to 12 percent per year in 2015. The unit of analysis in this study is micro and small women entrepreneurs (MSWEs) engaging in agriculture-based sectors, including food and non-food producers.

The indicators of vulnerability are defined as income, fixed assets, and paid wage and profits, while the indicators of company demography are defined as age and business experience. Comparing the averages of those variables of vulnerability and demography using univariate analysis, we could examine differences in characteristics between MSWEs whose loan applications were accepted (not-rationed) and those whose applications were rationed. The latter includes MSWEs who did not apply for credit because of other reasons than being denied by the banks (i.e., self-rationed or discouraged) (Mijid & Bernasek 2013).

Due to many similarities in vulnerability and demography between the rationed and discouraged MSWEs, the first step of the analysis was to divide the data into two groups, namely

²From 2014 to 2017, only about 75 percent of the targeted KUR fund provided by the Government was disbursed by banks.

Table 2. Indonesian MSWEs' Reasons for Not Borrowing from Banks

Reasons for Not Borrowing from the Banks	2014		2015	
	Total	%	Total	%
Not knowing the procedure	159,366.00	10.67	144,555.00	9.73
Difficult procedure	60,485.00	4.05	71,814.00	4.83
Not having collateral	200,931.00	13.46	182,077.00	12.26
High interest rate	108,532.00	7.27	116,139.00	7.82
Application denied	10,301.00	0.69	7,896.00	0.53
Not interested	953,653.00	63.86	963,087.00	64.83
Total	1,493,268.00	100	1,485,568.00	100

Source: MSI Survey (BPS-Statistics Indonesia 2015,2016)

applying (rationed and not-rationed) and not applying (discouraged). The hypothesis is that vulnerability is one of the factors that affect the probability of MSWEs applying or not applying for bank loans (see equation 1). In addition to the indicators of vulnerability, we also included the demographic data of MSWEs, namely years of education and enterprise characteristics, such as business scale and business entity.

Hence, the binary logit-regression model was then used to observe the effects of the vulnerability characteristics of MSWEs on their participation in applying for bank credit, as follows:

$$\begin{aligned} \text{Pr(Apply)} = & \alpha_{1i} + \alpha_{2i}\text{Vulnerability} \\ & + \alpha_{3i}\text{Entrepreneur} \\ & + \alpha_{4i}\text{Enterprise}_i \\ & + \varepsilon_i \end{aligned} \quad (1)$$

The values of the estimated coefficients from the logistic regression have no direct economic interpretation because they were obtained using maximum likelihood estimation techniques (Greene 2008). To address this limitation, we also calculated the marginal effects (ME) for continuous random variables and odds ratio (OR) for dummy variables.

Vulnerability is predicted to have an opposite relationship with credit applications, where higher operating revenues, fixed assets, wage, and business costs will encourage MSWEs to apply for bank credit. In contrast, vulnerable MSWEs will be increasingly reluctant to apply for bank credit or do self-rationing. Entrepreneur variables such as education, age, and work experience are

predicted to have a positive effect on the probability of applying for banks loans. The third category is enterprise indicators, namely business scale and business entity. The hypothesis is that small enterprises will have a higher probability of applying for bank credit than micro enterprises. Furthermore, legal entities are expected to have higher likelihood to apply than informal ones.

The next step of the analysis was to divide the first group (applying) into MSWEs whose credit was granted (accepted) and those whose applications was not accepted (see equation 2). The hypothesis is that the rationed group is more vulnerable compared to the not-rationed group. Hence, the second model estimates the effects of the three categorized independent variables on the probability of a bank accepting MSWEs' credit applications, formulated as follows:

$$\begin{aligned} \text{Pr(Accept)} = & \beta_{1i} + \beta_{2i}\text{Vulnerability} \\ & + \beta_{3i}\text{Entrepreneur}_i \\ & + \beta_{4i}\text{Enterprise}_i \\ & + \varepsilon \end{aligned} \quad (2)$$

Banks generally assess the ability of prospective customers to repay loans, among others, through the characteristics of vulnerability. Therefore, a negative relationship between bank rejection and vulnerability is expected to be observed. In this case, banks may still treat micro and small loans as risky loans, thus rejecting MSWEs' loan applications considered vulnerable. Meanwhile, entrepreneur characteristics will have a positive effect on loan application acceptance by banks.

Table 3. Variable Definition

Variables	Description	Measurement	Expected sign (Probability of applying for loan)	Expected sign (Probability of being granted loan)
Vulnerability indicators				
Operating revenues (000 IDR)	Operating revenues from primary business activities	The production value of all final and intermediate goods produced plus the income earned from industrial services in June or the last month of production	+	+
Ownership of fixed assets (000 IDR)	The value of fixed assets owned by the enterprise	Market value on June 30th of all assets used as factors of production with a utilization period of more than one year. This includes land, building, tools and machinery, vehicles, and other fixed assets.	+	+
Ability to pay workers' wages (000 IDR)	Remuneration for workers	Pre-tax remuneration in June for workers in the form of money or goods. Remuneration includes allowances, bonuses, and overtime pay as well as non-monetary compensation such as commuting facilities.	+	+
Business costs/problems	Problems/ challenges in business activities	Dummy variables indicating whether MSWEs encountered problems or needed cash to deal with one of the following costs: - Raw materials - Marketing - Capital - Fuel/energy - Transportation - Workers' skills - Wage	+	+ / -
Participation in non-bank loans	MSWEs' participation to obtain loans from non-bank institutions	Measured as whether MSWEs had their source of capital raised from following institutions: - Cooperatives - Non-bank financial institutions - Venture capitals - Individuals/colleagues - Family/relatives	+	+
Entrepreneur variables				
Age	Age of entrepreneur	Age is rounded down based on last birthday	+	+
Years of schooling	Years of schooling undergone by entrepreneur	Inferred from highest educational attainment of the entrepreneur. Divided into three dummy variables: - Primary - Secondary - Tertiary	+	+
Business experience	Years since starting commercial production	Length of time since the year of the commencement of commercial production, not including trial production	+	+
Enterprise variables				
Business scale	Scale of business, consisting of micro and small industry	- Micro industry: manufacturing industry that has 1–4 workers - Small industry: manufacturing industry that has 5–19 workers	+	+
Business entity	Legal entity of business	Categorized into: - PT (limited liability company) - CV (limited partnership) - Local government permits - Cooperatives - Individual	+ / -	+ / -

4. Result

4.1. Descriptive Statistics

Table 4 shows the descriptive statistics of MSWEs by their vulnerability indicators and loan applications. The differences in the characteristics of MSWEs obtaining bank credit (not-rationed firms), MSWEs not applying for credits (discouraged firms), and MSWEs rejected by banks (rationed firms) are stark in terms of operating revenues. On average, MSWEs that received loans from banks generated operating revenue of nearly IDR20 million, while rationed and discouraged MSWEs only generated around IDR4.12 and IDR4.25 million, respectively.

In terms of the value of fixed assets owned, surprisingly there was a little difference between not-rationed and discouraged MSWEs and their asset value was on average almost three times larger than those of rationed MSWEs. In terms of workers' wage, not-rationed MSWEs had a better financial muscle to pay their workers. On average, not-rationed MSWEs spent IDR3.67 million on one worker, around 1.5 times higher than the amount rationed and discouraged MSWEs paid for each of their workers. It appears that the vulnerable MSWEs tended to do self-rationing.

Interestingly, rationed MSWEs on average had been in the business for almost 14 years, slightly longer than not-rationed (12.45 years) and discouraged MSWEs (11.48 years). Furthermore, rationed MSWEs also on average had the oldest owners (45.25 years) as compared to not-rationed MSWEs (43.99 years) and discouraged MSWEs (44.79 years).

4.2. Estimation Results

Table 5 shows the binary logit regression estimating the probability of MSWEs applying for bank loans. All vulnerability characteristics showed significant relationships with the probability of applying for bank loans, both for MSWEs operating in food and

non-food sectors.

Operating revenue had a positive and significant estimated coefficient, which implies that MSWEs with higher revenue had a higher probability to apply for bank loans. Likewise, cash holding had a positive and significant estimated coefficient, which suggests that MSWEs with a higher cash holding had a higher probability to apply for bank loans. These results are in line with the findings by Bose, MacDonald & Tsoukas (2019), Bougheas, Mizen & Yalcin (2006), Quartey et al. (2017), and Ferrando & Mulier (2013), who argued that higher revenue and cash holdings lower the likelihood that the loans will not be repaid. This finding is strengthened by the estimated result of business scale variable, where small-sized enterprises were more likely to participate in credit borrowing than micro-scale enterprises, most likely due to their stronger financial muscle.

Fixed asset ownership had a positive and significant estimated coefficient, which implies that MSWEs with higher asset values had a higher probability to apply for bank loans. Our finding is in line with Carreira & Silva (2010), who reported that a higher amount of fixed assets can be used as collateral, thus increasing both the probability of applying for a loan and getting it accepted by banks. However, the marginal effect of the assets was significantly lower than that of operating revenue and cash holdings in affecting MSWEs to participate in credit borrowing.

With regard to business problems, all but wage had odds ratio values larger than one, indicating positive relationships to MSWEs' likelihood of applying for bank credit. Capital problems, in particular, were the main impetus for increasing the probability of applying for loans. According to IFC (2016), this is a common sight as MSMEs regularly utilize overdraft line facility (*Pinjaman/Kredit Rekening Koran*) to address short-term liquidity and working capital problems. Working capital loans, in fact, are the biggest contributor to banks' loan portfolios. The needs for working capital significantly increased the probability of MSWEs applying for bank loans. The estimated odds ratios for fuel/energy and

Table 4. MSWEs' Vulnerability and Credit Application

Variables	Not-rationed firm			Rationed firm			Discouraged firm			t-test		
	Mean	Median	SE	Mean	Median	SE	Mean	Median	SE		Not-rationed and rationed	Not-rationed and discouraged
Operating revenues (000 IDR)	19,085	6,782	45,051	4,124	1,480	15,110	4,254	1,787	6,045	24.39***	4.32***	0
Ownership of fixed assets (000 IDR)	86,022	23,050	184,900	33,310	5,150	111,000	89,008	5,000	739,800	12.46***	0	-5.66***
Ability to pay workers' wages (000 IDR)	3.673	2,000	4,710	2,032	1,000	3,863	2,058	1,520	2,297	7.40***	1.79**	0
Age (years)	43.99	43	10.14	45.25	45	11.64	44.79	44	10.63	-2.97***	-0.92	0.52
Business experience (years)	12.45	10	9.84	13.87	11	11.47	11.48	9	9.27	-3.42***	1.19	2.74***
Number of observations	780			24,283			173					

Note: (*), (**), (***) represent 10%, 5% and 1% significance levels, respectively; Source: Processed from 2015 MSI Survey (BPS-Statistics Indonesia 2016).

transportation problems, however, were not found to be statistically significant for non-food MSWEs. It appears that for female-owned micro-businesses operating in non-food sector, energy and transportation problems were not pressing issues forcing them to apply for bank credit as compared to those in food sector.

Regarding the participation in non-bank loans, the results showed that MSWEs that had borrowed from cooperatives and individuals (colleagues) were less likely to participate in credit borrowing from banks than those that had never borrowed. This is possible as MSWEs that encountered complex procedures and high interest rates charged by banks are encouraged to turn their heads to other sources of funding (IFC 2016). Interestingly, the results showed that borrowing from family had an opposite effect. MSWEs that had borrowed from family/relatives were still more likely to participate in credit borrowing from banks than those who had never borrowed. This is possible as loans from family/relatives are usually of very limited amount and very short-term, and therefore are not viable substitutes to bank loans. Furthermore, borrowing from non-bank institutions significantly increased the likelihood of MSWEs in non-food sector to apply for bank loans, but the effect to MSWEs in food sector was insignificant. By contrast, borrowing from venture capitals significantly increased the likelihood of MSWEs in food sector to apply for bank loans, but the effect to MSWEs in non-food sector was insignificant.

In terms of entrepreneur characteristics, the higher the educational attainment of the entrepreneur, the higher the odds that she would apply for bank loans. This finding lends supports to the study by Chinonso & Zhen (2016), discovering that the educational background of small-scale entrepreneurs in general influences their financial literacy and thereby access to finance. Furthermore, entrepreneurs' age and business experience showed a significant effect on their likelihood to apply for bank loans but their estimated marginal effects were extremely low in magnitude. With a rapidly increas-

ing access to information regarding financial access, entrepreneurs' lack of experience appears to become a less significant barrier for them to apply for bank loans.

In terms of business entity, MSWEs that had legal forms of CV had a lower probability of applying for bank loans when compared to PT, irrespective of the products the firms produced. This finding is in line with IFC's (2016) assertion that small enterprises have to present their business registration and licenses in order to apply for bank loans, and therefore less formal enterprises are less inclined to participate in credit borrowing. Interestingly, other MSWEs with less formal business forms including cooperatives, those operating with only local government permits and individual businesses had a higher probability applying for bank loans when compared to PT. This result contradicts the findings from Brazil by Marques et al. (2018) as well as Babbitt, Brown & Mazaheri (2015) findings on Indonesia, showing that women prefer legalized individual entrepreneurship to facilitate their access to the benefits of formalized businesses. However, this is possible with the increasing outreach and accessibility of KUR in recent years. KUR is the policy credit program aimed to cater the credit needs of small scale and less formal enterprises.

When comparing the odds of food and non-food producers of applying for bank credit, the results showed that the direction of the effect and the magnitude varied across independent and control variables. This is despite the fact that the food-producing MSWEs are generally smaller in size than their non-food counterparts and rarely need advanced technologies and high formal skills, as they engage in simple-income generating industries such as food production, food stalls, and basic goods, and exist not to seek profit, but to survive (Tambunan 2019), and therefore tend to be more credit-constrained than the larger ones (Brown et al. 2011; Chakravarty & Xiang 2013; Mac an Bhaired, Vidal & Lucey 2016).

Table 6 provides the binary logit estimation on the factors affecting the probability of MSWEs' loan

Table 5. Probability of MSWEs Applying for Bank Loans

Variable	Marginal effect / Odds ratio	
	Non-food	Food
Vulnerability characteristics		
Operating revenue	0.041***	0.022***
Ownership of fixed assets	0.006***	0.010***
Cash	0.013***	0.026***
Business problems		
No obstacle (Base)		
Raw materials	1.377***	1.514***
Marketing	1.225***	1.563***
Capital	2.206***	1.958***
Fuel/energy	1.104	1.395***
Transportation	1.102	1.373***
Workers' skills	2.443***	1.745***
Others	0.741***	0.969
Wage	0.008***	0.009***
Participation in non-bank loans		
Cooperative	0.841***	0.887***
Non-bank	1.929***	0.962
Venture capital	1.000	2.822**
Individual	0.832***	0.238***
Family	2.778***	1.953***
Others	0.977	1.639***
Entrepreneur characteristics		
Education		
Primary (base)		
Secondary	1.200***	1.377***
Tertiary	1.286***	1.209***
Age of entrepreneur	-0.002***	0.001
Squares of the entrepreneur's age	0.000***	-0.000***
Business experience	0.003***	0.000
Squares of business experience	-0.000***	-0.000***
Enterprise characteristics		
Business scale		
Micro industry (Base)		
Small industry	1.513***	1.259***
Business entity		
PT (Base)		
CV	0.458***	0.227***
Cooperative	2.526***	1.818***
Local government permits	2.624***	3.719***
Individual	1.229*	1.793***
Others	1.748***	4.290***
_cons	0.000***	0.000***
Pseudo R-sqr	0.1689	0.0968
BIC	143028.4	304551.6

Note: Note: (*), (**), and (***) represent 10%, 5% and 1% significance levels, respectively;

Source: Authors' calculation.

applications to be granted by banks. All vulnerability characteristics showed significant relationships with the probability of MSWEs operating in food and non-food sectors obtaining bank loans, despite different directions of the effect.

The result showed that having higher operating revenue significantly increased the probability of

MSWEs obtaining loans. Likewise, higher cash holding also significantly increased MSWEs' probability of obtaining loans. Our findings are in line with that of Pearlman (2012), suggesting that the less vulnerable the small enterprises are, the more likely their credit application will be granted by banks. This finding is strengthened by the estimated result of business scale variable, where small-sized en-

terprises were more likely to be granted credit by banks than micro-scale enterprises.

However, an indicator of invulnerability, the fixed asset ownership, had significant and negative relationships with credit application approval, both for food and non-food MSWEs. This implies that a higher fixed asset ownership significantly decreased the probability of MSWEs' loans being granted by banks. This result should be interpreted with caution. The reasoning behind this can be explained by the fact that in 2015 collateral was no longer required for KUR application. However, the KUR limit is very low, urging MSWEs with higher fixed asset possession to apply for commercial credit (non-policy credit program), with a higher credit limit but more stringent requirements.

Moving to the second factor, Table 6 also shows a significant and positive relationship between participation in cooperatives loans and the probability of MSWEs obtaining bank loans. This may be due to the collective nature of cooperatives; being a member of a cooperative is an indication of a stronger social capital. Likewise, obtaining venture capital increased the likelihood of non-food MSWEs to be granted credit by banks. Having venture capital implies that MSWEs had been assisted by investors in their business planning and operation, thereby suggesting more sustainable business from the banks' perspective.

By contrast, obtaining loans from non-bank financial institutions, individual sources and family/relatives decreased MSWEs' likelihood of being granted loans by banks. This may happen as many small and individual enterprises in Indonesia tend to rely on informal sources of funding due to high opportunity cost of accessing formal sources (Machmud & Huda 2011). Hence, MSWEs obtaining loans from informal sources are mostly those who encounter difficulties in complying with the requirements demanded by banks.

When it comes to entrepreneur characteristics, our finding indicated an interesting result. The higher the educational attainment of the entrepreneurs

was, the less likely they would be granted credit by banks. This finding conflicts the assertion made by Chinonso & Zhen (2016) that higher education leads to a better financial access. This is possible because more educated owners may have lower demand for credits or they are more likely to use internal financing (Vos et al. 2007; Rand 2007).

However, it is possible that entrepreneurs with different levels of education apply for different credit schemes. More educated entrepreneurs are more inclined to commercial credits with a higher limit but also more stringent requirements, while the less educated entrepreneurs opt to apply for KUR (policy credit programs) with a lower limit but less stringent requirements. Further, entrepreneurs' age and business experience had a significant effect on their likelihood of obtaining bank loans but their estimated marginal effects were extremely low in magnitude.

As for the types of business entity, it is hard to establish any relationship with the probability of credit application approval for non-food WMSEs due to the insignificant result. However, for MSWEs engaging in food industry, those with individual business form or only with local government permits had a significantly higher probability of obtaining bank credit compared to PT. Again, the better odds of less formal MSWEs obtaining bank loans can be attributed to the government's effort to encourage banks to lower barriers for MSMEs to access finance, strengthen the loan guarantee system, and increase its attractiveness (IFC 2016; Machmud & Huda 2011; Tambunan 2019).

5. Conclusion

The findings from this study indicate that MSWEs, due to their small size and informality, are prone to business vulnerability because of their small operating income and limited cash and asset holdings. Consequently, most MSWEs do not apply for bank loans as compared to male entrepreneurs. Hence, the lower access to credit for MSWEs to

Table 6. Probability of MSWEs Obtaining Bank Loans

Variables	Marginal effect / Odds ratio	
	Non-food	Food
Vulnerability characteristics		
Operating revenue	0.048***	0.024***
Ownership of fixed assets	-0.014***	-0.007***
Cash	0.039***	0.023***
Participation in non-bank loans		
Cooperative	1.216*	1.807***
Non-bank	0.151***	0.072***
Venture capital	2.449***	1.000
Individual	0.150***	0.095***
Family	0.342***	1.054
Others	2.130***	9.691***
Entrepreneur characteristics		
Education		
Primary (base)		
Secondary	0.743***	1.112***
Tertiary	0.393***	0.767***
Age of entrepreneur	-0.010***	-0.014***
Squares of the entrepreneur's age	0.000***	0.000***
Business experience	0.002***	-0.001***
Enterprise characteristics		
Business scale		
Micro industry (Base)		
Small industry	1.208***	1.423***
Business entity		
PT (Base)		
Local government permits	0.860	46.543***
Individual	1.000	71.928***
_cons	0.001***	0.004***
Pseudo R-sqr	0.4521	0.2153
BIC	27860.4	42146.3

Note: Note: (*), (**) and (***) represent 10%, 5% and 1% significance levels, respectively;

Source: Authors' calculation

a large extent can be explained by women entrepreneurs' internal barriers and self-rationing.

MSWEs feel encouraged to submit loan applications to banks if they have sufficiently large income and assets. This appears to be due to MSWEs' perception that banks will consider their business vulnerability, especially with the significant reduction of the interest rate on microcredit in 2015. Other factors driving MSWEs to submit credit applications to banks are the needs for capital and fund to overcome their business problems. For MSWEs applying for credit to banks, the probability of their application to be accepted is determined amongst others by their operating income and cash holdings. Again, this may indicate banks' conservative approach towards MSWEs' business vulnerability.

The findings from this study have several policy and managerial implications. First, stakeholders (especially related government agencies) should increase their effort to improve the financial literacy of female entrepreneurs. Financial literacy can improve female entrepreneurs' money management skills and make their attitude more positive towards credit, which in turn can reduce credit self-rationing. For example, the government can provide assistance for MSWEs to legalize and formalize their business and provide basic financial management training.

Second, an expansion of the current financial infrastructure can increase MSWEs' existing access to finance. The removal of assets from the primary requirements of bank loans has increased the likelihood of MSWEs to obtain loans. However, the

removal of collateral may make banks more selective in approving loan applications, worsened by the lower interest rate. Therefore, the government and banks need to find ways to make KUR more attractive to MSWEs. IFC (2011) recommends the strengthening of an integrated credit record with both positive and negative credit histories. The collective information held can reduce the cost of information and in turn the cost of borrowing. In addition, collateral registries and secured transaction systems can also expand the types of assets that can be used as collateral. The lack of fixed assets owned by MSWEs can be offset by recognizing the legality of movable assets as collateral.

Third, financial institutions may consider reassessing their standard policy with regard to credit access for MSWEs. Women's World Banking Report (2016) recommends a gender-disaggregated information on clients. Understanding the differences between the characteristics of male and female owning MSEs can help financial institutions develop specific and tailored products for MSWEs, including more flexible terms and requirements. In addition, financial institutions may also develop alternative mechanisms of creditworthiness assessment. Women's World Banking research and experience argue that the proactive approach of financial institutions by visiting the applicants' business locations firsthand can reduce administrative barriers frequently faced by MSWEs.

This study has several limitations which future research in this topic can address. Futures studies can extend this study by delving more deeply into the comparison of credit access for male and female entrepreneurs as well as for food and non-food industries. Longer data series can also be employed to assess the impact of government regulations such as collateral removal and interest rate reduction. Finally, future studies can specify the types of credit applied and obtained by MSWEs to distinguish the performance of commercial credit to policy credit programs in providing financial access to MSWEs.

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