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Research article

Women Access and Awareness of Financial Inclusion in Indonesia

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Abstract: The financial system plays a role in creating a community economic development, especially overcoming gender disparities. This paper analyzes the effect of mobile phone on the financial inclusion of women's in Indonesia involving data from household surveys provided by the 2014 Family Life Survey. We use the probit model with Ordinary Least Square (OLS) methods and the variable procedure to examine how the role of mobile phone on women's awareness in accessing financial institutions, as well as increasing savings and loan ownership. Our estimation results found that mobile phone penetration significantly increased awareness of women to access formal financial institutions, improve saving behavior, higher credit amount and access mobile banking. Therefore, mobile phone brings great benefits in increasing financial inclusion, especially women in Indonesia.

Keywords: mobile phone, women financial inclusion, Indonesia

JEL Classification: J16; P34

Abstrak: Sistem keuangan berperan dalam menciptakan pembangunan ekonomi masyarakat, khususnya mengatasi disparitas gender. Makalah ini menganalisis pengaruh telepon seluler terhadap inklusi keuangan perempuan di Indonesia yang melibatkan data dari survei rumah tangga yang disediakan oleh Family Life Survey 2014. Kami menggunakan model probit dengan metode *Ordinary Least Square* (OLS) dan prosedur variabel untuk mengkaji bagaimana peran ponsel terhadap kesadaran perempuan dalam mengakses lembaga keuangan, serta meningkatkan kepemilikan simpan pinjam. Hasil estimasi kami menemukan bahwa penetrasi ponsel secara signifikan meningkatkan kesadaran perempuan untuk mengakses lembaga keuangan formal, meningkatkan perilaku menabung, jumlah kredit yang lebih tinggi dan mengakses mobile banking. Oleh karena itu, ponsel membawa manfaat yang besar dalam meningkatkan inklusi keuangan, khususnya perempuan di Indonesia.

Kata kunci: ponsel, inklusi keuangan perempuan, Indonesia

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1. INTRODUCTION

Financial inclusion plays in enhancing growth and alleviating poverty. This goal must be an essential agenda in international policy. Meanwhile, the notion of financial inclusion is related to ownership of adult access to be able to use various financial services effectively In the initial stage, financial inclusion begins with ownership of deposits or transactions in banks or other financial

institutions that can be used as a tool for making payment transactions and managing money (Setyari, Widanta, & Purbadharmaja, 2018). Besides, financial inclusion also provides easy access to finance from formal financial institutions that can be used as a vehicle for adults to invest in education and business opportunities that would enable people to better manage commercial risks (Demirguc-Kunt, Klapper, Singer, Ansar, & Hess, 2018). Stimulating financial inclusion also encompasses to reduce income inequality, increase growth, and upgrade living standard (Kim, 2016). Giving access and opportunity to payments and savings can protect the economy from crises and boost investment and consumption (World Economic Forum, 2018). Account bank ownership has a capacity to increase growth by fiscal revenues and provides employment opportunities empowers women and health status (Setyari et al., 2018), start and expand business, invest in education, manage risk, and absorb financial shocks (Aker, Boumnijel, McClelland, & Tierney, 2016).

There is extensive attention on financial inclusion and its benefits, recently strategy to stimulate financial inclusion has been the focus on innovation and technology penetration. Products and financial services especially mobile phones are able to create cost-effective to reach low-income consumers, World Economic Forum (2018) helps households to maximize their utilities by increasing per capita expenditure, and reduce asymmetric information in financial service (Abor, Amidu, & Issahaku, 2018).The turning point in the history of telecommunications began in 2002, when the number of mobile phone users surpassed the number of fixed telephone customers on a global scale. According to Global Findex in 2017, mobile phone user in Indonesia reached 77 percent. Meanwhile, only 49 percent of the total sample had a bank account (Demirguc-Kunt et al., 2018). This development creates a gap in cellular money services in providing financial services and payments that can be accessed and reached to the unbanked group (Munyegera & Matsumoto, 2016). The unbanked group is known as poor people who are vulnerable and present a too high lending risk.

Gitaharie, Soelistianingsih, and Djutaharta (2017) mentioned three main groups that categorized as an unbanked group because of discriminated of financial services access. They are the poor, women, and rural population group. Meanwhile, access equality for women toward economic and financial resources are deemed extremely important to accomplish sustainable economic growth and development (United Nations, 2009). Differences in regulations cause women to limit their access to bank accounts (World Bank, 2012). This affects women's public access and freedom to manage their income, and even limits social mobility and interaction in society, especially between genders (Demirgüç-Kunt, Klapper, & Singer, 2013). Meanwhile, gaps in the use of financial services in each region show different things, namely that women are closer to informal financial institutions. However, in terms of access to credit to finance entrepreneurial activities, formal financial institutions tend to provide less financing to women entrepreneurs. They will place a higher burden on women than men (Muravyev, Talavera, & Schäfer, 2009).

Technology through mobile phone equipped with groups that do not have bank accounts, specifically for women. One of them is cellular money designed to offer access to financial services for individuals who do not have bank accounts, especially people in developing countries and lack of infrastructure and banking accessibility (Maurer, 2012 and Yunisvita, 2020). Abor et al. (2018) provided that mobile phone can upgrade access to the female-headed household in financial services. Some evidence presented that women who have a mobile phone will get a positive impact, especially for increasing her income and consumption (Fanta & Kingstone Mutsonziwa, 2016; Suri & Jack, 2016). Women have a vital role in approaching the impacts of owning mobile phone to the household's welfare. Based on intra-household resources allocation concept, women significantly better in household asset management than men (Setyari et al., 2018). Addressing women as a subject in management asset can enhance household expenditure significantly (Pangaribowo, Tsegai, & Sukamdi, 2019).

The financial system contributes for creating economic development in the community. Based on its function, the financial system plays important role in overcoming income inequality and encouraging broad economic growth, especially reducing the gender gap in the poor (Demirgüç-Kunt et al., 2013). This condition will subsequently cause the emergence of barriers that limit

financial access between men and women. Provisions on financial services, such as banking, credit unions, and alternative financial services, are also expected to benefit financial performance results (Demirguc-Kunt et al., 2018). Therefore, the emergence of an inclusive financial system allows access to broader financial services without providing obstacles to users. Without an inclusive financial system, poor people must rely on their savings, which are limited to investment in education. Meanwhile, there are concerns that the use of financial services can be an economic burden on households, given that commercial service products often have other higher interest rates. The Pew Charitable Trusts (2017) also mentions the number of borrowers delaying their loans when high-interest rates hinder the ability to pay.

The difference in regulatory treatment causes women to limit themselves to ownership of bank accounts (World Bank, 2012). This regulation affects women's access to public access and freedom in managing their income, even the emergence of restrictions on social mobility and interaction in society, especially between genders (Demirgüç-Kunt et al., 2013). Research on the Paraguayan side of the island is one of the evidence that shows that women understand more about financial institutions when they control more substantial family assets (Fletschner & Mesbah, 2011). While there are still limitations to the literature which states that women have the opportunity to save and make loans in the household. One study in nine Sub-Saharan African countries examining gender disparities in financial services found that the low use of formal financial services for women were caused by differences in gender, education level, income, type of work, and status of head of household (Aterido, Beck, & Iacovone, 2011). Gender disparities in the use of financial services do vary, but this evidence shows that women are indeed closer to informal financial institutions. Even on credit access in financing entrepreneurial activities, formal financial institutions are less likely to provide financing to female entrepreneurs. They will give a higher burden to women than men (Muravyev et al., 2009).

In developing countries, such as Bangladesh, Malawi, India, Pakistan, Ethiopia, Kenya, Tanzania, Uganda, and Zambia report women entrepreneurs face higher and systemic barriers to accessing formal financial services (Demirgüç-Kunt et al., 2013). Although this study found no clear evidence of legal discrimination, there is evidence that banks discriminate against women in the practice of lending money. In Pakistan, almost all female borrowers must have permission from their husbands to access loans, even in some other loan schemes that mention unmarried women are not allowed to obtain credit (Safavian & Haq, 2013). Women may face more significant challenges in accessing formal financial services compared to men. Women entrepreneurs are more likely to choose to enter a less capital intensively industry because of the difficulty of obtaining bank financing (Demirgüç-Kunt et al., 2013). In Indonesia, men are less likely to have loans. The dominance of married women increases the opportunity to borrow money because marriage may share the risk of borrowing between married couples (Sambodo, Sekaringsih, Azzani, & Asyahid, 2017).

Recently, the high commercial needs and access to demand for financial services that have occurred for women encouraging ownership of mobile phone opens up new channels of technology to access formal financial services (Aterido et al., 2011). The use of mobile phone as financial inclusion can facilitate communication and essential business services for the public, mainly formal commercial service providers that provide services in the form of financial transactions. However, according to Demirguc-kunt, A., and Klapper (2012) other factors impede a person to financial services, namely lack of ownership of money, high financial services, physical distance to financial institutions, and lack of confidence in financial institutions. For example, mobile money is designed to offer access to financial services for individuals who do not have a bank account, especially people in developing countries and lack banking infrastructure and accessibility (Maurer, 2012). Thus, through mobile phone women can increase access to financial services (Abor et al., 2018). Some evidence suggests that women who have mobile phone have a positive impact, especially to increase their income, savings and consumption (Fanta & Kingstone Mutsonziwa, 2016). This is due to the concept of household resource allocation, women are significantly better at managing household assets than men (Setyari et al., 2018).

Given that the development of digital financial transactions in Indonesia has made rapid progress, especially in East Asia and Pacific Region. Recorded 49 percent of adults in Indonesia

already have an account at the Bank. This proportion marks an increase in financial inclusion from 2014, which amounted to 36 percent (World Bank, 2018). This shows an increase in the use of digital technology as a transaction tool, even though there are 60 million adults in Indonesia own mobile phone, they do not have an account with a bank. Meanwhile, Global Findex states that women have a higher tendency to access banking, which is 51 percent than men by 46 percent. Fintechnews Singapore (2018) found that the lack of access and use of financial products is common in low-income households. The ease of access to digital transactions in economic activities can provide excellent opportunities for payment penetration and other commercial activities. Apart from the various cases, there is increasing evidence that financial services in the community can help create better financial inclusion conditions. Individuals who live in urban area with several banking branches and high economic conditions will tend to use various combinations of banking services provided (Friedline & Kepple, 2017), have bank accounts (Goodstein & Rhine, 2017), and have higher bank loan values (Brown, Cookson, & Heimer, 2019). In contrast, households with low-income levels will allocate their income only for family consumption.

This study attempts to analyze the role of mobile phone usage to women's financial inclusion in Indonesia. We divide financial inclusion into four aspects: savings, credit, awareness of formal and informal institution, and using mobile banking. The first and second aspect reflects that women have access to financial services. The third is to analyze the rate of women's awareness of formal and informal institution, while the last element to attempts whether women more effectively use financial services by using mobile banking. The study further distinguishes women in rural and urban in Indonesia. This approach as a fundamental analysis of the impacts of mobile phone to solve geography issues and its role to lower transaction cost. Second, we explore mobile technology by its functions: as communication and financial activities (mobile banking). Moreover, we also analyze the impact of internet access on women's financial inclusion.

The rest of the paper proceeds as follows. Section II presents literature reviews. Part III offers our data and empirical method. Finally, section IV of this paper sets data, results, and the last section is concluding remarks. This paper employed data from Indonesian Family Life Survey (IFLS) in the last wave (2014). From our preferred specification, result indicate that using mobile phone is associated with a higher amount of women's credit and saving. Women awareness to formal financial institution is associated with internet access. Single women and working women can effectively use financial services by using mobile banking than married and unworking women.

2. RESEARCH METHODS

2.1. Data

This study uses a set of data from Indonesian Family Life Survey (IFLS) wave 5 in survey period 2014. IFLS is an on-going longitudinal survey since 1993. IFLS provides rich set information on individuals, households, and community. Demographic, social economy and characteristics of each level are included in IFLS data. IFLS represents 83 percent of Indonesia's population living in 13 provinces and 262 districts.

In this study, we focus on women's financial inclusion data. The reason we select women as our sample are due to women have limited access to get information than men, particularly women in developing countries (Fletschner & Mesbah, 2011). Because of limited data of mobile phone and internet access in the previous wave, this study uses the last wave of IFLS data set. Regarding various characteristics and information, we get 16,718 women as our sample in this study.

Table 1. Variable Descriptions

Variable	Definition
Dependent Variables	
Saving	Logarithm amount of saving
Borrowing	Logarithm amount of borrowing
Financial institutions	Dummy that takes the value of 1 if the respondent answered formal institution where she can borrow money and 0 is otherwise
Mobile Banking	Dummy that takes the value of 1 access to financial services by mobile banking and 0 otherwise
Individual characteristics	
Age	Age of the respondent in years
Age^2	Age in years of the respondent squared
Year of Schooling	Years of schooling of the respondent
Marital status	Dummy that takes 1 if respondent is married and 0 otherwise
Health status	Dummy takes 1 if respondent has a poor health and 0 otherwise
Employment status	Dummy that takes the value of 1 if respondent is working and 0 otherwise
Internet access	Dummy that takes 1 if respondent access internet and 0 otherwise
Internet source	Dummy that takes 1 if internet source from mobile phone and 0 otherwise
Ownership of mobile phone	Dummy that takes 1 if respondent has mobile phone and 0 otherwise
Household characteristics	
Household size	The number of household members
PCE quintile	Per capita expenditure quintiles of the respondent: Poorest (20%), Second (20%), Third (20%), Fourth (20%) and Richest (20%).
Women Participation in Community Meeting	Dummy that takes 1 if respondent is joining the community meeting and 0 otherwise
Ln Asset	Logarithm total asset of household
Community characteristics	
Distance of bank	Distance to nearest *Bank Rakyat Indonesia* (BRI) (km)
Residence area	Dummy that takes the value of 1 if the respondent lives in urban area and 0 otherwise.

Source: IFLS (2014)

Probit represents the factors that may drive an individual to use informal financial intermediaries despite owning an account in a formal financial. Formal financial intermediaries use the ownership of a bank account as a proxy for formal financial institution access, that included the individual needs an account (transaction account) for which other financial services can be offered. In this case, we test the number of individual samples for formal financial intermediation using a formal account (account ownership). The proxies allow us to determine whether informal financial intermediaries are complements or substitutes to formal financial intermediation by regressing the dependent informal proxies against the formal financial proxies (Alhassan, Li, Reddy, & Duppati, 2019). The common phenomenon, private lender, such us moneylenders and pawnbroker have been dominated financial public activity in the most community in Indonesia. Meanwhile, financial inclusion can promote by mobile banking that have been documented to empower woman, mitigate income-inequality, and enhance business opportunities (Asongu, 2018a).

2.2. The Model Specification

To determine how Indonesian women's financial inclusion, we consider four models based on these dependent variables i.e. (1) women's amount of saving, deposit and stocks; (2) women's amount of credit; (3) women's awareness of formal and informal financial institution; and (4) using mobile banking. The first and second result reflect that women have access to financial services. The next result is to analyze the rate of women's awareness of formal and informal institution, while the last model to attempt whether women can effectively use financial services by using mobile banking. To estimate the first and second model, we use Ordinary Least Square (OLS). Meanwhile, the last

two models we employed Probit procedure. For that reason, we conduct the main equation below:

$$Y_{ij} = \beta_0 + \beta_1 F_{ij} + \beta_2 D_{ij} + \beta_3 H_{ij} + \beta_3 C_{ij} + \varepsilon_{ij} \quad (1)$$

$$P(Y = 1|X)_{ij} = G(\beta_0 + \beta_1 F_{ij} + \beta_2 D_{ij} + \beta_3 H_{ij} + \beta_3 C_{ij} + \varepsilon_{ij} \quad (2)$$

Where: Y_{ij} is dependent variables that we have declared before. We proxied awareness of formal and informal credit institution with dummy of women mentioning types of places where they can borrow money. Labeled 1 if women mention formal institution, and 0 if women mention informal institution. For the last model, mobile penetration is proxy by using mobile banking. Labeled 1 if women using mobile banking and 0 if women do not use mobile banking.

To estimate dependent variables, we controlled data from individuals, households, and community characteristics. F_{ij} is the technology variable penetration vector. In this study we consider owning of mobile phone and internet access. D_{ij} is a vector of demographic characteristics (age, education level, marital status, employment status, health status, and women's participation in community meetings). H_{ij} is a vector of household characteristics (per capita expenditure, household size, and total household assets). Meanwhile, C_{ij} is a vector of community level characteristics that proxied by resident area, and distance between community and financial institution. We involve Bank Rakyat Indonesia (BRI) as a formal financial institution by considering a wider market location and can reach most areas in Indonesia.

4. RESULTS AND DISCUSSION

4.1. Descriptive Analysis

Reports summary statistics for 16,718 individuals in the survey present in Table 2, compared to all of Indonesia population. Due to this study analyzes only women in Indonesia, more than half attrition occurred. The average age of women are 39 years old. Most of them are saving with the average is IDR.15,600,000. Meanwhile, the average amount of credit by women are IDR.7,622,495.

Table 2. Descriptive Statistics

Variable	Observation	mean	Std. dev	Min	Max
Amount of saving (ln)	4,397	14.870	1.886	8.517	20.723
Amount of Credit (ln)	4,579	15.327	1.564	9.903	20.723
Answering Formal Institution	16,718	0.625	0.483	0	1
Using Mobile Banking	16,718	0.251	0.434	0	1
Marital status	16,718	0.707	0.454	0	1
Age	16,718	38	16.343	14	103
Year of Schooling	16,718	8.261	4.550	0	22
Poor Health	16,718	0.247	0.431	0	1
Employment status	16,718	0.401	0.490	0	1
Residence area	16,718	0.586	0.492	0	1
Ownership of mobile phone	16,717	0.641	0.479	0	1
Internet Access	16,718	0.294	0.455	0	1
Source of Internet Access	16,718	0.261	0.439	0	1
Household size	16,718	4.212	1.885	1	16
PCE Quintile	16,717	1.976	1.429	0	4
Total Asset (ln)	16,634	17.883	1.697	9.210	21.950
Women Participation in Community Meeting	16,718	0.117	0.322	0	1

Source: Authors' calculations based on IFLS data (2014)

This study is also regarding the ownership of the mobile phone, average of the sample has mobile phone, whether to use communication or financial activities, particularly mobile banking. Another characteristic of the sample that we want to emphasize is employment status. Average

women are not working. IFLS wave five classified unemployment into six categories; job searching, attending school, housekeeping, retired, sick, and other. The majority of the sample is housekeeping. The average years of schooling are 8.2 years. Moreover, the average of the sample is completed elementary school and stop education in the second grade of junior high school. This section may be divided by subheadings. It should provide a concise and precise description of the experimental results, their interpretation as well as the experimental conclusions that can be drawn.

Based on marital status, the distribution respondents with an informal credit informed are concentrated with separated marriage. Respondents with right information about formal credit are focused on the working age group (25–55 years old): it represents 65.2 percent. Otherwise, respondents with answer informal credit institutions are concentrated in the elderly group. Mobile phone ownership is concentrated to mention formal credit institutions than respondents without a mobile phone. Respondents without mobile phone answer informal institution are 43.3 percent. The percentage of respondents with a formal credit answer living in an urban area is not significantly different from the answers of respondents who live in the rural area. In this study, respondents dominated living in 20 percent poorest group. The group dominates respondents who answered informal financial institutions. From the above descriptive analysis, the respondent's age, education level, residence area, income groups, employment status, and mobile phone ownership seem to be important determinants of financial inclusion among women in Indonesia. We will conduct further analysis later by way of econometric regressions.

4.2. Empirical Analysis

Table 3 presents the results of this study. Column (1) shows the estimation results of the independent variable on the total savings of women. At the expected signs, mobile phone is increasing the chances of access to savings. Owning a mobile phone helps women to access information on saving. Age and saving amount are linearly related, implying that increasing age increases saving. This is similar to the study of Abor et al., (2018) stated that mobile phone can increase women's access to financial services. Where, women who mobile phone can increase their income, saving and consumption (Fanta & Kingstone Mutsonziwa, 2016; Suri & Jack, 2016). Meanwhile, a mature age will provide greater opportunities to access financial services, especially saving, deposit or stocks. On the other hand, the age squared has a negative impact on saving. At a certain age, women will reduce their saving, although the impact is not significant. Per capita expenditure and assets are important predictors of women's saving. This occurs because women are significantly better at managing household assets than men (Setyari et al., 2018).

Women have significantly more opportunities to increase their saving as their well-being increases. Women have a major influence in increasing income, saving and household consumption, especially those who have access to technology (Fanta & Kingstone Mutsonziwa, 2016). This is addressing women as a subject in management asset can enhance household expenditure significantly (Pangaribowo et al., 2019). The difference in regulatory treatment causes women to limit public access and freedom in managing their income, even the emergence of restrictions on social interaction and limit the opportunity to save and make loans in the household (Aterido et al., 2011; Demirgüç-Kunt et al., 2013). Meanwhile, women understand more about financial institutions when they control more substantial family assets (Fletschner & Mesbah, 2011).

Education has proven to be an important predictor of women's saving. Saving increase with increasing years of schooling. Educated women are better to manage their assets and finances than women who are less educated. This is similar to (Pangaribowo et al., 2019). In terms of household size, the level of saving for women increases with the increase in the number of household members. This finding differs from previous research which states that women have high barriers to accessing formal financial services (Demirgüç-Kunt et al., 2013), since female borrowers must have permission from their husbands to access financial services (Safavian & Haq, 2013). However, through new technology services, women are aware that the ease of access to digital transactions can provide opportunities in economic activities to support household welfare. Mobile phone users can open new channels to access formal financial services in the form of financial transactions, including making loans and saving money (Aterido et al., 2011).

Table 3. Regression Analysis Saving, Borrowing, and Financial Inclusion

Variables	OLS Model		Probit Model			
	(1)	(2)	(3)		(4)	
	Amount of Saving	Amount of Credit	Awareness of Formal and Informal Borrowing Institution	dy/dx	Mobile Banking	dy/dx
Answering formal institution	0.091	0.799***			-0.116**	0.004
	(0.056)	(0.410)			(0.055)	
Having mobile phone	0.123*	0.108**	-0.012	-0.004		
	(0.073)	(0.052)	(0.027)			
Using mobile banking	0.143	0.062	-0.115*	-0.043		
	(0.143)	(0.106)	(0.065)			
Internet access	0.017	0.101	0.050	0.019	1.805***	0.022
	(0.136)	(0.105)	(0.066)		(0.101)	
Internet sources	-0.023	-0.067	0.047	0.017	2.063***	0.027
	(0.156)	(0.121)	(0.075)		(0.066)	
Marital status	-0.075	0.238***	0.155***	0.058	-0.374***	0.006
	(0.065)	(0.057)	(0.026)		(0.065)	
Age	0.020**	0.006	-0.003	-0.001	-0.010	0.001
	(0.009)	(0.007)	(0.003)		(0.014)	
Age^2	-0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)		(0.000)	
Employment status	-0.037	0.046	0.057**	0.021	0.147***	0.004
	(0.050)	(0.040)	(0.021)		(0.055)	
PCE quintile	0.352***	0.250***	0.038***	0.014	0.127***	0.002
	(0.022)	(0.016)	(0.008)		(0.023)	
Ln asset	0.355***	0.198***	0.124***	0.046	0.074***	0.001
	(0.017)	(0.014)	(0.006)		(0.016)	
Poor health	-0.034	-0.054	-0.062**	-0.023	-0.008	0.004
	(0.061)	(0.046)	(0.023)		(0.063)	
Year of schooling	0.067***	0.052***	0.038***	0.014	0.049***	0.001
	(0.007)	(0.006)	(0.003)		(0.009)	
Household size	0.081***	0.105***	-0.008	-0.003	0.011	0.001
	(0.016)	(0.011)	(0.006)		(0.015)	
Residence area (urban)	-0.013	-0.150**	-0.154***	-0.057	0.176***	0.004
	(0.056)	(0.044)	(0.022)		(0.059)	
BRI distance	0.011	-0.011**	-0.018***	-0.006	-0.009	0.001
	(0.007)	(0.004)	(0.002)		(0.008)	
Women participation in community meeting	-0.084	-0.011**	0.141***	0.051	-0.019	0.005
	(0.068)	(0.004)	(0.033)		(0.073)	
cons	5.671***	9.355***	-2.207***		-4.218	
	0.305	0.261	0.124		0.318	
R^2	0.294	0.290	0.052		0.836	
Wald Chi Square			1080.03		3480.83	
Prob. > F	0.000	0.000				
Prob. > Chi square			0.000		0.000	
Number of observations	4,386	4,571	16,632		16,632	

Note: Based on IFLS data (2014) * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors are in parentheses. All standard errors were adjusted for within cluster.

In column (2) reports women's amount of credit estimation. The coefficient for having a mobile phone is positive and significant, implying that women have a higher amount of credit. Women have a higher opportunity to access information about the type of loan through their mobile phone. Mostly, mobile phone and internet access have consistent signs that affect women's credit. For the most part, mobile phone and internet access have consistent alerts affecting women's credit. This is cause the ease of access to digital transactions in economic activities, thus providing good

opportunities for penetration of payments and financial commercial activities (Fintechnews Singapore, 2018). Therefore, women who have mobile phone have a positive impact in accessing financial services (Abor et al., 2018).

Among the categories for marital status, we find that being single is related to a lower women's credit. Furthermore, it is confirmed with the impact of the household size that single women have lower needs than married women since women with the higher household member much aware of household welfare. This is of great theoretical and practical importance that women living in rural area significantly have a higher amount of credit. This result is similar to Setyari et al. (2018), that credit, especially microcredit, has an important impact on rural household compared to the urban household. Women in the rural area have a higher chance to access credit in spite of borrowing from formal or informal financial institutions.

As we declared before, the financial institution has a role in women's borrowing. In this case, we choose BRI as a proxy formal financial institution since BRI most available in communities in Indonesia. BRI distance is a strong predictor of women's access to credit, because closer distance to BRI encourages women who have higher amounts of credit. Furthermore, the relationship between welfare quantiles and proximity to BRI also has a significant relationship. It means that rich people who live close to BRI may have more saving than other people (Sambodo et al., 2017). Another impressive result was that women who participated in community meetings had lower loan amounts. Sambodo et al., (2017) also mention that job status tends to have free time to interact with the community, so that it will affect the amount of loans they have because of the lack of information obtained from the community.

In Table 3, the possibility of women responding to formal financial institutions is caused by several factors. We found that owning a mobile phone has been shown to reduce the level of awareness of the use of mobile banking. This is because the use of mobile banking requires additional expenses for internet costs, thereby reducing the amount of expenditure for household consumption. This condition is in line with Pangaribowo et al., (2019), women are responsible for household expenses, so that it will reduce other expenses to maximize family consumption. Meanwhile, marital status, education level, and work status have a positive effect on women's preferences for responding to formal financial institutions. Women with higher education and employment status have better experience and information about financial institutions. Many of them will respond to formal financial institutions which give them an advantage over informal financial institutions. In line with Sambodo et al., (2017), higher education levels and types of work can play a role in society and be more involved in formal financial institutions. The correlation between education and employment status makes it easier for people to get loans. Sambodo et al., (2017) added that marital status can increase a person's chance to borrow, because by getting married maybe the borrower will share the risk with his partner.

Level of welfare proxy by total asset and per capita expenditure also influence a person's decision to answer formal financial institutions. Based on the estimation of probit regression, it is stated that the high level of household welfare would likely to access formal financial institutions rather than informal institution. This research is parallel with Fletschner and Mesbah (2011), that women more understand about formal financial institutions when they control more family assets.

As an expected outcome, healthy women are more aware of formal lending institutions than unhealthy women. Healthy women have a greater chance of accessing information from formal lending institutions. In contrast to the effect on the amount of credit, women's participation in community deliberations has a positive impact on the awareness of formal lending institutions. Women benefit socially from information and networks. However, Sui and Niu (2018) state that the impact of Health needs to be interpreted carefully because the measure of Health status is self-reported, even though Health status has a positive effect on account ownership in a bank.

The use of mobile banking is one of the innovations in financial services to encourage financial inclusion in the world. Column (4) shows the factors of women using mobile banking. According to the World Index's Global Index database 2018, most adults use mobile phone for accessing financial services, such as transfer and receive money. Internet access and internet source are requirements to women for accessing mobile banking. The likelihood of women who have internet access from

mobile phone is double for using mobile banking than women who get internet access from other sources.

Unmarried women are more likely to access mobile banking than married women. Unmarried women have a tendency to make decisions on their own without consulting others, they are considered to have higher opportunities and remove barriers to access new technologies (Simonsson & Walin, 2015). Unmarried women have the maximum decision-making ability and are easier to access financial services. They have unlimited time to access financial services in conventional ways, such as making online payments or ATMs. The ability to transact through mobile banking can reduce control from others, for instance a person can pay bills and make transactions, even the ability to invest or save more than before.

The result shows that urban area has positive impact to mobile banking user. Mobile phone user who function it to financial services concentrated in urban area. It is evident that the coverage of mobile networks in rural areas is much lower than in urban area. Developing infrastructure is needed to reach equality of financial inclusion progress. The positive coefficient of welfare households is higher for mobile banking use (Asongu, 2018b). This condition implies that poor households cannot buy mobile phone due to limited purchasing power (Abor et al., 2018).

5. CONCLUSIONS

This study provides more depth results than the impact of mobile phone penetration on financial inclusion among women. The results show that mobile phone have a significant effect on the amount of savings and credits owned. Meanwhile, the ownership of mobile phone also influences the increasing women awareness in accessing formal financial institutions and using mobile banking as a financial transaction tool. This finding further strengthens the evidence that the development of technology as a means of economic development plays a role in increasing financial inclusion in Indonesia. Our findings also found that the success of financial inclusion was more developed in rural areas than in urban areas, both to women's credit and women's awareness of formal financial institutions. This finding is promising and should be explored in future studies.

Variable women participation in local community has different impact to women’s credit and women’s awareness of formal and informal financial institution. Since we know that social capital has varies effects to women’s behavior, particularly in financial activities. It depends on social benefit that women get from social activities. However, further investigations should be needed in future studies. In line with the sustainable development goals of poverty alleviation and food security, the role of mobile phone can encourage economic development through women's financial inclusion. Our results are evident that mobile phone have potential benefits to financial inclusion in Indonesia; giving information, reducing transaction costs, increasing access to financial activities, and being able to issue women from unbanked groups. Furthermore, successful mobile banking solving geography issue and decreasing transaction costs among single and working women.

We recommend efforts to ensure that the majority of those currently in the category of financial intermediaries involved in the financial system with special access to mobile money. Regulatory mechanisms need to reflect the different roles, forms, and structures of formal and informal financial intermediaries. The regulatory framework should be context and situation-based. Policies affecting how financial intermediation should be regulated and need to be expanded to include the informal sector. To future research, our study is encouraging to analyze the discrimination among unbanked groups and should be validated by comparing samples with the control group. Researchers need to ascertain the individual characteristics and the individual variables that determine various statistical results.

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