FINANCIAL INCLUSION AND POVERTY REDUCTION IN ACEH PROVINCE: COMPARISON BETWEEN CORE REGION AND PERIPHERY REGION

ALIASUDDIN
Associate Professor at the Department of Economics, Faculty of Economics and Business
Universitas Syiah Kuala, Banda Aceh, Indonesia
aliasuddin@unsyiah.ac.id

Taufiq C. DAWOOD
Assistant Professor at the Department of Economics, Faculty of Economics and Business
Universitas Syiah Kuala, Banda Aceh, Indonesia
taufiq.dawood@unsyiah.ac.id

Nanda RAHMI
Assistant Professor at the Department of Economics, Faculty of Economics and Business
Universitas Syiah Kuala, Banda Aceh, Indonesia
nanda_rahmi84@unsyiah.ac.id

Abstract

This study analyzes the role of financial inclusion on poverty reduction in Aceh Province, the comparison between the core region (Banda Aceh) and periphery region (Aceh Besar). This study uses cross-sectional data from Banda Aceh and Aceh Besar with sample total of 598 and 686 households, respectively. The logistic model is used in this study. The results show that financial inclusion is negatively not significant in Banda Aceh but negatively significant in Aceh Besar. Meanwhile, sex and educational level are negatively significant in Banda Aceh and Aceh Besar, and family size is positively significant in both regions. The biggest marginal effect on poverty is sex in Banda Aceh and Aceh Besar regions. Female is more vulnerable to be poor compared to male in term of poverty

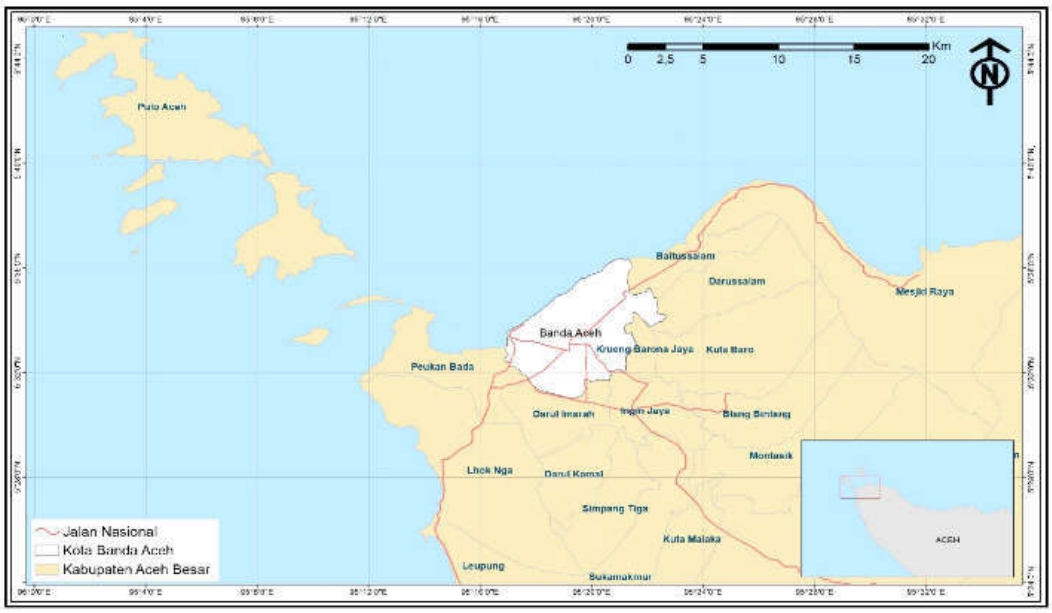
Keywords: financial inclusion, Aceh, poverty reduction, logistic
JEL classification: N95, B23, B26, I32

1. Introduction

Banda Aceh is capital of Aceh Province and it also the business center of the province, hence it becomes core region in this province and Aceh Besar is the periphery of Banda Aceh (Figure 1). Theoretically stated that at the beginning of development, the core region has back wash effect on periphery region because all of the potential resources will go to core region and at this stage the periphery region growth faster and catch up the core region. In the next step, when the core region become congestion, there will be a spread effect on the periphery region. Banda Aceh is more developed than Aceh Besar. According to the theory, Aceh Besar receives the spread effects from Banda Aceh, hence there is no different between Banda Aceh and Aceh Besar. This means that the development of Banda Aceh has a positive effect on Aceh Besar. At this point, there is no different between Banda Aceh and Aceh Besar because these regions have the same stage of development. There is no different in term of development in Banda Aceh and Aceh Besar if the spread effect works as stated by the theory.

Ideally, the development in these regions are in the same stage, however, the study of Wolff (2018) shows that the periphery area is losing importance. This means that there is a disparity between core and periphery regions. It is very interesting in analyzing the core and periphery regions relationship, especially in term of fiancial inclusion and poverty because the development of internet banking nowadyas, there is no different between these regions because the internet is avaiable every where and it supports digital finance.

Figure 1. The Map of Banda Aceh and Aceh Besar



Digital finance supports financial inclusion even though some experts are not supporting digital finance. Ozili (2018) states that digital finance has positive effects for financial inclusion and this digital finance provides to individuals with low and variable incomeis more valueable to them compared to conventional regulated banks. However, the work of Zins and Weill (2016) concludes that being man, richer, more educated and older favor financial inclusin with the higher influence of education and income. This means that education and income have an important role in financial inclusion even though there is a development of digital finance.

Financial inclusion is very important because it has positive on economic growth. This is supported by the work of Kim et.al (2018) finds that financial inclusion has a positive effect on economic growth in 55 countries of the Organization of Islamic Cooperation (OIC). If there is economic growth means there is a positive effect on income, hence poverty will decreas. The role of financial inclusion has been proven in some countries, but in this study it is very interesting in analyzing the effect of financial inclusion in core and periphery regions.

2. Theoretical Review

Kim et.al (2018) use VAR and Granger causality test show that financial inclusion has a positive effect on economic growth in 55 countries of OIC. Furthermore, they also find that economic growth has a positive effect on financial inclusion. Economic growth is very important to increase income and to reduce poverty and when income increase the people will use banking services to support their daily transaction. Income and financial inclusion have caulasity relationship. Increase in income will cause an increase in financial inclusion. In this case, there is a relationship between core and periphery regions because Wolff (2018) states that there is the interrelationship between the core region and hinterland. The growth in core region will cause the same growth in the hinterland. These results are suppoted by the work of Kim et.al (2017), where they find that there is a strong relationship between core region provinces with their hinterland in Korea.

Li (2018) confirms that financial inclusion has a positive effect on poverty reduction in China. However, Neaime and Gaysset (2018) find a different result, where financial inclusion has no effect on poverty reduction in MENA countries. Their results also show that financial inclusion decreses inequality, population size and inflation to increase income inequality. The studies of Zins and Weill (2016) and Lyons et.al (2018) find that there are some factors affecting financial inclusion such as man, richer, more educated, and older favor financial inclusion with higher education and income. Libois and Somville (2018) add another variable that has a positive and significant effect on poverty, the variable is the family size. Meanwhile, Swamy (2014) finds that the impact leaned positively toward women and is

noticed from the fact that the income growth of net inflation was of the order of bigger again men. This means that gender has a signifcant role in determining financial inclusion.

The increase of financial inclusion is determined by digital finance, where digital finance has a positive impact both in emerging market and developed market (Ozili, 2018). This means that financial inclusion will not be applicbale if it is not supported by digital finance. Furthermore, the role of banking is also significant to promote financial inclusion (Iqbal and Sami, 2017). In addition, Tchamyou et.al (2019) find that ICT reduces income inequlaity through formal financial development.

Financial development has also important to decrease poverty in the low–and midle–income income countries (Boukhatem, 2016). Financial development is beneficial for the poor by increasing their access to various funding sources. However, financial instability has negative effects on the poor. In addition, the poor have a low ability to loanable funds and the poor become vulnarable (Burlando and Canidio, 2017).

The proverty reduction is also related to educational level because educated men will find and create a good job and earn more money than uneducated ones. Mihai et.al (2015) document that education and welfare level are correlated and the latter decreasing substatially as educational level increases. Furthermore, they explain that the educational level and poverty have causal relationships on long-run or short-run. The most similar results also shown by the research of Kabakova and Plaksenkov (2018) that there are some factors affecting financial inclusin sucs as demographic, politic, economic development, technology, and social factors.

3. Research Method

This study is conducted in Aceh Province where Banda Aceh is capital for Aceh Province and Aceh Besar is periphery region. Theoretically stated that in the beginning, there is back wash effect on periphery region because all of the resources are concentrated in the core region. Furthermore, after the core region becomes more developed, there are spread effects on the periphery region, then this periphery region becomes more developed. So, this study is a comparison between the core region and the periphery region in term of financial inclusion and its effect on poverty.

3.1. Data

The data in this study are primary data that are collected directly from the household in Banda Aceh and Aceh Besar. Slovin model is used to determine the numbers of household samples in these regions as follows (Tejada & Punzola, 2012):

$$n = \frac{N}{1+Ne^2} \quad (1)$$

Where n is sample size, N is population, e is error term, in this study is set 5 percent. Based on equation (1), the numbers of samples are:

Table 1. Households and Sample Sizes in Banda Aceh and Aceh Besar

Items	Banda Aceh	Aceh Besar
Number of households	64,008	94,683
Sample size (e is 5 %)	395	398
Actual samples	598	686

Source: Field Research, 2019.

3.2. Model

The logistic model is used in this study, the model is a nonlinear model. The model is stated as:

$$Pov = \beta_1 + \beta_2 FI + \beta_3 EL + \beta_4 SEX + \beta_5 FS + \varepsilon \quad (2)$$

Theoretical coefficients: $\beta_2, \beta_3, \beta_4 < 0$ and $\beta_5 > 0$

Where *Pov* is poverty is proxied by a dummy variable, 1 for poor and 0 otherwise. This variable is measured by poverty line, USD 42 and USD 29, per month per capita, respectively. This poverty line is set by the government. In addition, *FI* is financial inclusion proxied by a dummy variable, 1 for households that have access to financial institutions and 0 otherwise, *EL* is educational level, 1 for higher educational level and 0 otherwise, and *FS* is the family size (persons), and *SEX* is 1 for male and 0 otherwise. The equation (2) is estimated by the maximum likelihood method.

4. Results and Discussions

4.1. Statistics of Respondents

Statistics of the respondents show that educational levels in the study show that most of the respondents have lower educational level both in Banda Aceh and Aceh Besar. The respondents in Banda Aceh that have a lower educational level total of 333 (55.7 percent) households meanwhile 541 (78.9 percent) households in Aceh Besar. This means that less than half of the respondents that have a higher educational level. The lowest age of respondent in Banda Aceh is 18 years old, meanwhile in Aceh Besar 17 years old. Meanwhile, the highest age of the respondents are 71 years and 85 years, respectively with the average age in each region is 33.98 years and 42.93 years, respectively.

The average income per month in Banda Aceh is USD 309.71 and in Aceh Besar is USD 188.42. The highest income in Banda Aceh is USD 12,413.79 and Aceh Besar is USD 6,896.55 with standard deviations are USD 651 and USD 289.45, respectively. This means that the bigger income in Banda Aceh than Aceh Besar but the higher income inequality in Banda Aceh because the standard deviation in Banda Aceh is bigger than in Aceh Besar (Table 2). Table 2 shows that educational level is better in Banda Aceh compared to Aceh Besar because the highest is the same but the standard deviation is bigger in Aceh Besar indicates that there is higher inequality in educational level in Banda Aceh.

These statistics indicate that there is a disparity between the core region (Banda Aceh) dan periphery region (Aceh Besar). This means that there is no spread effect happen between the core region and periphery region in this study because there is a big disparity in term of educational level and income as some of the economic indicators.

Table 2. Statistics of Respondents in Banda Aceh and Aceh Besar

Items	Banda Aceh			
	Minimum	**Maximum**	**Mean**	**Standard Deviation**
Age (years)	18	71	33.98	11.30
Income (USD)	20.69	12,413.79	309.71	651.00
Years of Schooling	0.00	23.00	13.28	2.80
	Aceh Besar			
Age (years)	17	85	42.93	12.26
Income (USD)	8.28	6,896.55	188.42	289.45
Years of Schooling	0.00	23.00	10.95	3.86

Source: Field Research, 2019.

4.2. Estimated Results

The logistic models of the role of financial inclusion on poverty reduction are estimated by using the maximum likelihood method for Banda Aceh as core region and Aceh Besar as periphery region. As mentioned in equation (2), there are four independent variables in the model i.e. financial inclusion (FI), sex of head of household (SEX), educational level (EL), and family size (FS). Theoretically stated that FI, SEX, and EL are negatively signed, whereas FS is positively signed. The estimated results are as follow:

Table 3. Estimated Results of Financial Inclusion Model of Core Region

Variable Name	Estimated Coefficient	T-ratio	Odds Ratio
FI	–0.1855	–0.3481	0.8307
SEX	–1.3048	–4.1953	0.2712
EL	–1.1299	–3.3661	0.3231
FS	0.7796	7.8141	2.1806
Constant	–3.1279	–8.7871	0.0438
Estrella R-Square	0.16923	Durbin–Watson	1.7744
Chow R-Square	0.20999	Log of Likelihood Function	-152.88

Source: Estimated Results, 2019.

Table 4. Estimated Results of Financial Model of Periphery Region

Variable Name	Estimated Coefficient	T-ratio	Odds Ratio
FI	-0.7661	-3.0112	0.4648
SEX	-0.8856	-3.6554	0.4125
EL	-0.5761	-1.5572	0.5621
FS	0.8634	10.0010	2.3712
Constant	-3.6193	-10.4230	0.0268
Estrella R-Square	0.2533	Durbin–Watson	1.7398
Chow R-Square	0.2594	Log of Likelihood Function	-235.07

Source: Estimated Results, 2019.

All of the variables in the estimated results of core and periphery regions are theoretically and statistically significant except the coefficient of financial inclusion in the core region model. The models reach stability because after five times iterations. This means that the models are suitable to be used in analysis and discussion.

4.3. Discussion

Financial inclusion is not significant in the core region (Banda Aceh) means that financial inclusion has no significant effect on poverty reduction even though the effect is negative. This variable is not significant in this region because only 41 respondents that have financial access both for digital finance and conventional banking system. It is surprising because this core region is located in the capital of Aceh Province where this region is also the business center of the province. The use of banking service is relatively limited in this region whereas banking offices are available almost in every corner. This result confirms the study of Neaime and Gaysset (2018) but it is not not consistent with the works of Kim et al (2018) and Li (2018).

Furthermore, other variables are theoretically, statistically, and negatively significant for sex and educational level and positively significant for family size. Female is more vulnerable in this case because the probability of being poor is bigger compared to male. Meanwhile, the lower educational level has a bigger probability of being poor than a higher educational level, because the educational level has negative and significant coeeficient. In addition, family size has positive and significant coefficient means that the increase in family size has the possibility to poor as much as two times (Table 3). This means that this

coefficient has the biggest effect on poverty. This study confirms the studies of Zins and Weill (2016), Libois and Somville (2018), Swamy (2014), and Mihai et al (2015).

For the periphery region, all of the estimated coefficients are theoretically and statistically significant. The biggest magnitude of coefficient in this region is sex, means that male has the biggest opportunity to not poor compared to female and female is more vulnerable in term of poverty. If the household is led by a female then the possibility that family becomes poor is bigger compared to male. The second is family size means that the bigger the size of the family then the bigger possibility to be poor. These results are consistent the works of Zins and Weill (2016), Libois and Somville (2018), Swamy (2014), and Mihai et al (2015).

Furthermore, financial inclusion has the third larger coefficient where this coefficient is negarive and significant. This means that if the households have financial access to bank and other financial institutions then the family become richer than the families have not financial access. The same effect is also found in the educational level variable where this variable is negatively sloped means that the higher educational level the bigger possibility to be rich. These results confirm the work of Kim et al (2018) and Li (2018) but not consistent to study of Neaime and Gaysset (2018).

The effect of each variable on poverty reduction can also be analyzed from odd ratios as presente in Table 3 and 4. Table 3 shows that family size has the biggest effect on poverty where this coefficient has 2.1806 times to be poor and followed by financial inclusion as the second variable. Financial inclusion has 0.8307 times to be not poor if the family has financial access. The almost the same results also found in Table 4, where the variable that has the biggest effect is the family size as 2.3712 times to poverty level. However, the second variable is the educational level has 0.5621 times to poverty reduction and the third variable is financial inclusion that has 0.4648 times.

Detail analyses of financial inclusion effect on poverty reduction are derived from the cross–tabulation statistics of the core region and periphery region. Table 5 is used to analyze the effect of financial inclusion on poverty reduction by sex in the core and periphery regions. Both female and male are more vulnerable as poor in the periphery region comaped to core region because the statistics are significant at 99 percent. Table 5 shows that families those have finacial inclusion in the periphery region have bigger poverty level than the core region. This means that the periphery region is more suffering in term of the poverty level.

Furthermore, financial inclusion effect on poverty reduction by educational level shows that female is more vulnarable than male both in the core and periphery regions. Female become more vulnarable become they have to fulfill all of the family expense alone, meanwhile male usualy is supported by a female in their daily life. For detail results of the statistics of the effect of financial inclusion on poverty reduction by educational level are presented in Table 6.

Table 5. Cross–Tabulation Statistics of Financial Inclusion Effect on Poverty Reduction by Sex in Core and Periphery Regions

Sex of Respondents	Pearson Chi–Square Values		df	Two–Sided Significant	
	Core Region	Periphery Regions		Core Region	Periphery Regions
Female	0.733	11.865	1	0.487	0.001
Male	0.729	16.198	1	0.694	0.000
Total	0.785	26.739	1	0.424	0.000

Source: Field Study (counted), 2019.

Table 6. Cross–Tabulation Statistics of Financial Inclusion Effect on Poverty Reduction by Educational Level in Core and Periphery Regions

Sex of Respondents	Pearson Chi–Square Values		df	Two–Sided Significant	
	Core Region	Periphery Regions		Core Region	Periphery Regions
Female	8.254	9.962	1	0.004	0.001
Male	2.930	2.675	1	0.114	0.115
Total	10.212	11.369	1	0.001	0.001

Source: Field Study (counted), 2019.

5. Conclusion

Conclusions of the study are: (i) financial inclusion has negative and significant effect on poverty reduction in the regions except for Banda Aceh as core region; (ii) female as head of household has bigger possibility to be poor in both regions; (iii) educational level has negative and significant effect on poverty reduction in core and periphery regions; (iv) family size has positive and significant effect on poverty reduction. Based on these results, the government should encourage banking and financial institutions to wider their services for all people in order to decrease the poverty level. In addition, household led by female should be guided by the government in order to reduce the poverty level. Furthermore, the educational level must be increased by providing financial supports and scholarships for poor people to pursue a higher educational level, hence the level of poverty could be decreased. Family size should be controlled to have a quality family and possibility to be poor is lower.

The effects of variables from odd ratios coefficients show that family size has the biggest effect on the poverty level. This variable has more than twice to increase the poverty level both in core and periphery regions.

References

Boukhatem, J. (2016). Assessing the direct effect of financial development on poverty reduction in a panel of low- and middle-income countries. Research in International Business and Finance, 37, 214–230.

Burlando, A., & Canidio, A. (2017). Does group inclusion hurt financial inclusion? Evidence from ultra-poor members of Ugandan savings groups. Journal of Development Economics, 128, 24–48.

Iqbal, B. A., & Sami, S. (2017). Role of banks in financial inclusion in India (Papel de los bancos en la inclusión financiera en la India). Contaduría y Administración, 62, 644–656.

Kabakova, O., & Plaksenkov, E. (2018). Analysis of factors affecting financial inclusion: Ecosystem view. Journal of Business Research, 89, 198–205.

Kim, D.-H., Seung, C. K., & Seo, Y.-I. (2017). Multi-regional economic impacts of recreational fisheries: Analysis of Small Sea Ranch in Gyeong-Nam Province, Korea. Marine Policy, 84, 90–98.

Kim, D.-W., Yu, J.-S., & Hassan, M. K. (2018). Financial inclusion and economic growth in OIC countries. Research in International Business and Finance, 43, 1-14.

Li, L. (2018). Financial inclusion and poverty: The role of relative income. China Economic Review, 52, 165-191.

Libois, F., & Somville, V. (2018). Fertility, household size and poverty in Nepal. World Development, 103, 311–322.

Lyons, A. C., Grableb, J. E., & Joo, S.-H. (2018). A cross-country analysis of population aging and financial security. The Journal of the Economics of Ageing, 12, 96–117.

Mihai, M., E. Ţ., & Manea, D. (2015). Education and poverty. Procedia Economics and Finance, 32, 855 – 860.

Neaime, S., & Gaysset, I. (2018). Financial inclusion and stability in MENA: Evidence from poverty and inequality. Finance Research Letters, 24, 230-237.

Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. Borsa Istanbul Review, 18, 329-340.

Swamy, V. (2014). Financial inclusion, gender dimension, and economic impact on poor households. World Development, 56, 1–15.

Tchamyou, V. S., Erreygersa, G., & Cassimon, D. (2019). Inequality, ICT and financial access in Africa. Technological Forecasting & Social Change, 139 , 169–184.

Tejada, J. J., & Punzola, J. R. (2012). On the misuse of Slovin's formula. The Philippine Statistician, 61, 129-16.

Wolff, M. (2018). Understanding the role of centralization processes for cities – Evidence from a spatial perspective of urban Europe 1990–2010. Cities, 75, 20-29.
Zins, A., & Weill, L. (2016). The determinants of financial inclusion in Africa. Review of Development Finance, 6, 46–57.