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Microfinance and Inequality: Case of Indonesia

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Abstract: This study aims to investigate the role of microfinance from small-sized banks, usually with a limited geographical area of operation, in Indonesia, namely *Bank Perkreditan Rakyat* (BPR) on the income inequality. Using a province level panel data of 2012-2018, the results show that loans from such a bank are associated with income inequality reduction, supporting the arguments that microfinance contributes to income inequality reduction. This study provides an indication that micro finance in the form of small-sized bank also have an important role in the financial inclusion, by providing access to finance to micro and small business as well as to the poor that cannot benefit the development of big national commercial banks and capital market. This study has an important policy implication regarding the role of *Bank Perkreditan Rakyat* in Indonesia.

Keywords: microfinance; BPR; income inequality; Indonesia; small-sized banks

Introduction

This study aims to investigate the role of microfinance institutions in reducing income inequality with the Indonesian setting, where microfinance institutions are relatively massive and well-institutionalized, known as '*Bank Perkreditan Rakyat*' (BPR)[1]. Scholars have been working on how to make a country prosper since Adam Smith's the Wealth of Nations. Studies have also investigated what drives the growth of the economy. Unfortunately, it seems that in the making of prosperity, one cannot get rid of poverty. It seems that higher growth has always been compensated with higher inequality. OECD (2017) reports that developing countries, such as Mexico, Chile, Costa Rica, South Africa, and Indonesia, have recently experienced higher growth, and yet the inequality is also

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[1] *Bank Perkreditan Rakyat* can be translated as banks that provide loans for people. While the smallest national commercial bank category defined as bank with capital below 1 trillion IDR, the authority requires equity of at least 6 billion IDR for BPR. These banks usually have a limited geographical area of operation. There were 1,545 BPR and 164 Islamic BPR by the end of 2019.

getting wider. In the last couple of decades, we have been witnessing fast growth in the economy in China, India, and Indonesia. China's GDP soared 9% on the average, while India and Indonesia followed with 5.5% and 5%, respectively. During that high growth period, inequality in China had been increasing from about 0.38% to 0.43%. The stats for India and Indonesia also show the increasing trend in the GDP is also followed by the increasing trend of the Gini index; the economic growth does not reduce poverty and yet increases the inequality. Meanwhile, poverty and inequality bring many issues in society, such as crime (Anser et al. 2020), health (Mazumdar 2010), happiness (Oishi, Kesebir, and Diener 2011), and also a country's development (Deutsch and Silber 2004), making the issue has always been important to investigate.

There are two arguments on how financial development could shape income distribution, while the empirical findings also provide mixed results. One argues that financial development boosts economic growth and thus reduces the income gap, while the other argues that financial development only benefits the rich. Based on the Kuznets curve, at the early stage, financial development will give more benefit to the rich groups rather than the poor because they have more access to information and finance (Banerjee and Newman 1993; Galor and Zeira 1993). Greenwood and Jovanovic (1990) argue that along with the extensive financial structure, the economy will grow faster and expand the inequality between the rich and the poor. On the other side, the study by Bae, Han, and Sohn (2012) found that access to finance has a positive impact on reducing income inequality. Financial development makes a positive impact on poverty reduction (Jalilian and Kirkpatrick 2002). Omar and Inaba (2020) study how financial inclusion reduced income inequality in 116 developing countries. The result shows that financial inclusion decreases income inequality in developing countries significantly. Furthermore, the study also examines what conditions impact the effectiveness of financial inclusion in influencing income inequality. Another study by Demirgüç-Kunt and Levine (2009) examines the relationship between finance and inequality, focusing on how the financial intermediaries, contracts, and markets provide funding, manage the risk, and monitor the investment. They found that a bank as a financial intermediary contributes to lowering income inequality by providing access for entrepreneurs to leverage the business.

The studies on how microfinance contributes to income inequality also provide mixed results. On the one hand, loans through microfinance allow the poor for income-generating activities (MSMEs) and creating more jobs, which are crucial for reducing the poverty rate (Bangoura et al. 2016; Elsafi Mustafa, Ahmed Elsadig, and Ramanathan 2019; Bikbaeva and Gaibnazarova 2009). In contrast, Chowdhury (2008) argues that the borrowers of microfinance are those who have an asset either skills or education on business, and this does not mean helping the poor without any asset or skills. The study of Hulme and Mosley (1997) concludes that microfinance does not support the poor and even ends up with less incremental income compared to those who do not get the credit.

Regardless of the debate and mixed empirical evidence about the effect of microfinance on inequality, access to finance is one of the essential keys to solve the issue. The other key factor is micro and small enterprises (MSEs). MSEs are the source of economic engines, especially in developing countries. Tambunan (2009) reports that in Bangladesh, Cambodia, China, India, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Pakistan, Singapore, Thailand, Philippines, and Vietnam, small businesses account for about 90% of the businesses in the country. ILO statistics (2015) reveals the fact that most of these MSMEs

are informal businesses (mostly unregistered enterprises). At the same time, they also report that in Asia and the Pacific, small businesses that employed 20 to 99 created most of the jobs. The former is needed for the well-functioning of the latter in the economy. However, asymmetric information is always an issue in providing financing for MSEs. This factor makes microfinance or smaller sized local bank that possesses soft information about the neighbourhoods have a very important role in providing credits to MSEs, which in turn support the development of the economy and equality.

Microfinance institutions, in the form of small local banks (for instance rural banks), are willing to build their local communities and have access to soft information of the small local business, allowing them to charge lower interest, thus supplying small firms with efficient access to financing (Meslier-Crouzille, Nys, and Sauviat 2012). However, the study about the role of small local banks are still sparse, and they only focus on economic development while ignoring the role of reducing income disparity. The neglected small local banks' role might be the solution for the current income disparity issue faced by Asian countries. Henceforth, understanding the role of microfinance is then very important, especially for Asian countries where micro and small businesses are scattered widely throughout the countrywide. If microfinance exerts a significant impact on the income gap, then regulatory and policy reforms designed to promote both aspects are necessary. Therefore, this study aims to investigate the role of microfinance in reducing income equality in a developing Asian country, namely Indonesia. Indonesia has unique and well-institutionalized microfinance in the form of a bank, i.e., *Bank Perkreditan Rakyat* (BPR). This type of bank can be identified as small local banks that operate locally, serving smaller local communities. It has an advantage in detailed information about small local businesses in their area since they are deeply embedded in the communities they serve.

This study is expected to contribute to the policy in the banking industry to boost economic development and income equality, whether to push the growth of these micro banks (BPR) or to reduce the number. While other studies mostly examine the role of overall financial intermediaries to economic development (King and Levine 1993; Beck, Levine, and Loayza 2000; Levine, Loayza, and Beck 2000; Demirguç-Kunt and Levine 2008; Soedarmono, Hasan, and Arsyad 2016), this study will examine the role of micro finance institution in trhe form of banks(BPR) on the income equality in the developing country. If the findings of this study show that such banks exert a significant impact on income inequality, then regulatory and policy reforms designed to promote them is necessary. The results of the study are also expected to be exemplary for other developing Asian countries with similar characteristics. Thus, this study extends the literature of finance-growth nexus by focusing on income inequality, which has become a classical problem for developing countries.

This paper is organized as follows. Section two provides a literature review and hypotheses development. Section three briefly explains the sample and the research method. Section four discusses the results. Finally, section five concludes the study.

Literature Review

Most of developing Asian countries' economy is profoundly dependable on the well-functioning financial system as the intermediary institution that allocates capital for economic productivities. However, unlike big and listed firms, the financiers face a higher

degree of asymmetric information to invest in small businesses, especially those informal ones that do not provide even a simple financial statement. Consequently, banks will charge a very high cost of capital that burdens small businesses. Indeed, large banks have undoubtedly contributed significantly to the economy, but large banks have more difficulties in transmitting soft information for relationship lending through the technology they have (Stein 2002). For instance, a large bank headquarters is commonly in the city centre, in which distance from potential MSMEs borrowers. Hence, it is more difficult for them to process soft information for their decision making (Hauswald and Marquez 2006). Nevertheless, relationship lending needs such a structure that allows managers to monitor officers.

Consequently, big banks with taller organization structures will have difficulties to accommodate such necessity and finally increase greater agency problems inside their organizations (Berger and Udell 2002). These factors make smaller sized local banks, such as rural banks, have a significant role in providing credits to MSMEs, which in turn support the development of the economy and equality. Small, locally-owned banks operating at the regional or rural level have better access to soft local information, a competitive advantage in relationship lending, as well as a better commitment to their community development (Meslier-Crouzille, Nys, and Sauviat 2012). The study shows that relationship lending decreases lending interest (Degryse and Van Cayseele 2000), lowering the cost of capital for MSMEs.

There are only a few empirical studies investigate the role of small financial intermediaries on the economic growth; among others are Berger, Hasan, and Klapper (2004), Burgess and Pande (2005), Meslier-Crouzille, Nys, and Sauviat (2012). In line with the literature on finance-growth nexus, these studies found that small financial intermediaries have a positive role in economic development. Nonetheless, they do not investigate how this channel also reduces the income gap. While on the other hand, Law and Singh (2014), Beck, Degryse, and Kneer (2014), Soedarmono, Hasan, and Arsyad (2016) show that too much finance, but do not specifically test small financial intermediary, might harm economic development, which implies that an optimum number or perquisites in institutional development might exist. For the case of Asian developing countries, in their cross-country studies that involve seven Asian developing countries, Soedarmono, Hasan, and Arsyad (2016) show the impact of financial development on economic growth is different from one country to another. Nevertheless, these studies have not investigated the effect of finance on inequality.

As mentioned by Ang (2010), good financial development is needed to solve inequality in a country. Many researches have discussed how unequal access to finance could influence income inequality and slow down the economy. Bangoura et al. (2016) finds that microfinance intensity has a significantly negative impact on income inequality. Clarke, Xu, and Zou (2006) investigate how financial intermediary development influences income inequality. Their study suggests that the growth of financial intermediary development has a positive impact on aggregate income distribution. The emergence of banks and financial markets will give the opportunity to everyone in the market, including the poor (Rajan and Zingales 2003). Ang (2010) investigates the distributional impact of financial development and financial liberalization on inequality in India. The study finds that the low development of financial systems will harm the poor more than the rich. Hoi and Hoi (2013) evaluate how financial sector development impacts income inequality in Vietnam using provincial

data from 59 provinces and cities. The research reports a positive impact of financial development on reducing income inequality. The same result also provided by Jung and Vijverberg (2019), using the province's data of China from 1998 to 2014, there is evidence that financial development can alleviate income inequality. A study conducted by de Haan and Sturm (2017) examine how the financial liberalization and banking crisis affect income inequality. The result suggests that financial development leverage income inequality. Furthermore, a recent study by Thornton and Tommaso (2020) investigates the long-run relationship between finance and income inequality, and they come to the conclusion that financial development turns down income inequality.

On the other hand, microcredit and microlending are the most widespread microfinance instruments for individuals or groups to start or expand their business. At the macro level, microfinance significantly minimizes the poverty rate (Imai et al. 2012). Beck, Demirgüç-Kunt, and Levine (2007) examine how financial development impacts poverty by using the income share of the poor. Their research shows that financial development increased the income share of the poorest quintile growth. Some research explores the relationship between microfinance and poverty in different countries, such as Mexico (Angelucci, Karlan, and Zinman 2003), Uzbekistan (Alimukhamedova, Filer, and Hanousek 2017), and Malaysia (Al-Mamun et al. 2012). The results reveal that the microfinance institutions have a positive impact on access to durable spending, credit, and the yield of income-generating activities, significantly. Miled and Rejeb (2015) conduct a study about the relationship between microfinance and poverty reduction at the macro level using panel data of 1.132 microfinance institutions from 57 developing countries. Their study shows that countries with a higher gross loan per capita from microfinance institutions have likely lower poverty headcount ratio. Bangoura et al. (2016) assess the impact of microfinance on poverty and inequality and report that a higher intensity of microfinance tends to reduce income inequality. Seven and Coskun (2016) investigates how the bank and stock market development impact income inequality in emerging countries. The research points out that the poor could not benefit from the banks and stock market development.

This trade-off is relevant for Indonesia with vast geographic and rural areas, where the micro banks are relatively numerous. These micro banks, namely *Bank Perkreditan Rakyat* (BPR), is a small-sized bank operating within a limited geographical coverage area. At least there are 1,545 of them registered at the Indonesia Financial Authority in December 2019. On the other hand, the number of MSEs is also voluminous and scattered widely throughout cities and rural areas. In 2015, the Central Bank of Indonesia reported that 99% of reported businesses in Indonesia were micro, small, and medium enterprises (MSMEs), and they contributed 60% of Indonesia's GDP, as reported by the Ministry of Industry in 2016. Despite their significant contribution to the economy, the central banks reported that up to 70% of them did not have access to bank financing. Those that have access to financing are well recorded, where large commercial banks supply 90 % of the credits, and community banks provide the rest. There is no report yet, or whatsoever showing the role of micro banks or microfinance institutions on economic development and equality. While community banks, rural banks, and alike give these micro and small business entities for external financing, hence a much better chance to grow by providing loans (Demirguç-Kunt and Maksimovic 1998). Nonetheless, MSMEs contributed to 80% of employment in Indonesia as of 2016. Thus, we expect micro banks, namely *Bank Perkreditan Rakyat* (BPR), will also reduce the income disparity gap by providing loans to these MSMEs.

The hypotheses of this study are then as follows.

H_a: Loans from micro banks (BPR) reduce income inequality.

Methods

Data and Sampling

The main data used is the official report from Indonesia Financial Authority (OJK) about loans given by *Bank Perkreditan Rakyat* (BPR), i.e., the bank-based microfinance institution, by province from 2011 to 2018, where there will be 34 provinces for eight years period. We start our observation from 2011 since we only test our hypotheses during the normal period. We assume the effect of the global financial crisis took place in 2008. As we need the one-period lag for each variable, we, therefore, start our observation by 2011. This study will use both aggregate reports for BPR loans for each province. For the aggregate data, we will use it to investigate the role of micro banks' credits/loans to inequality. The data is available on the website of OJK. For macroeconomic data, including the Gini index for each province, we will rely on the Statistics Bureau of Indonesia, namely Badan Pusat Statistik (BPS).

Variable Definition

This research is strictly testing the effect of loans by micro banks (BPR) on income inequality at the province level. Therefore, our dependent variable is the Gini index of province i at period t (*Gini$_{i,t}$*) to measure income equality. The main independent variable of this study is aggregate micro bank (BPR) loans or the total size of loans provided by micro banks of the province i at period t. We normalize the loans with the number of populations of the province. The second measure we use is the financial intermediary of the BPR, to reflect the intermediary role of BPR on inequality; thus, we use loans to deposits of BPR in province i at period t.

Due to province-level data limitation, the BPR loans in this study are not specifically for investment and working capital purposes, but also including for consumer loans. We assume that loans for consumption purposes are also able to reduce income disparity.

Model specification

To test if loans by BPR contribute significantly to the economy and income equality, we model economic development and income disparity as the function of lags of loans provided by BPR, namely *BPR Loans*. The econometric specifications to test our hypotheses are the following.

$$Gini_{i,t} = \alpha_i + \beta_1 BPR\ loans_{i,t-1} + \beta_2 Bank\ Loans_{i,t-1} + \sum_{k=1}^{n} \gamma_k Controls_{i,t-1} + \theta_t + \varepsilon_{i,t}$$

Where, *Gini$_{i,t}$* is Gini index of province i at time t. *BPR Loans$_{i,t}$* and *Bank Loans$_{i,t}$* is loans or credits from BPR and national commercial banks of province i at time t normalized by population or deposit respectively. *Controls$_{i,t}$* is control variables related to each of the dependent variables. Government Expenditure over the real gross regional domestic product (GRDP), and the percentage of the workforce of the province i at time t. To control the macroeconomic condition, following Law and Singh (2014), we include the y-o-y inflation rate. King and Levine (1993) as well as Law and Singh (2014) show that human capital is also a source of economic growth. In our study, we use human development

using the Human Development Index (HDI) of each province to control human capital. Nevertheless, a recent study by Owen and Pereira (2018) finds that lower banking industry concentration is associated with less access to loans, implying that banking competition matters to access to finance, which finally contributes to income inequality. Therefore, we use Panzar-Rosse H-statistic to measure banking competition every year, following the method of Bikker, Shaffer, and Spierdijk (2012). Lastly, we control the time fixed effects θ. To estimate our variables of concern, we use Fixed Effects estimator to control the heterogeneity of Indonesian provinces since there might be a substantial difference among the provinces in terms of economic development, as well as controlling another individual heterogeneity influencing our dependent variables.

Levine, Loayza, and Beck (2000) investigate the causality between growth and finance that financial development follows economic growth, indicating there is a bidirectional relationship between the two. On the other hand, Mukhopadhyay, Pradhan, and Feridun (2011) show that this bidirectional relationship does not present in some Asian countries; for instance, their study involving seven Asian developing countries show that the bidirectional relationship only exists for Thailand. A similar relationship might present in the case of finance and income inequality. This issue is also pointed out by Bangoura et al. (2016). Therefore, to ensure if the simultaneity bias present in our main variables, we first perform the Durbin-Wu-Hausman (DWH) test. Due to the data limitation at the province level, we follow Baldé (2011) and Soedarmono, Hasan, and Arsyad (2016) using the lags (lags 1 to 3) of each loan variable as the instruments. Nevertheless, to minimize the potential endogeneity issue, we use the lag value of the variable for all independent variables. Furthermore, it will be more making sense to assume that the effect of loans to the economy will take some time to realize.

Table 1. **Descriptive Statistics, 2011-2018**

	N	Mean	S.D.	Min	Median	Max
Gini	302	0.36	0.04	0.27	0.36	0.46
BPR Loans /Dep	297	122.41	45.81	63.81	108.45	304.69
Loans Bank/Dep	306	109.4	61.02	45.99	95.18	451.85
BPR Loans/Cap (IDR)	297	354,858	550,457	2,947	155,405	3,203,431
Bank Loans/Cap (IDR)	297	15,000,000	34,900,000	2,174,373	8,522,715	289,000,000
H-Stat	8	0.540	0.115	0.565	0.315	0.706
HDI	304	68.61	4.38	55.01	68.73	80.76
GovExp/GRDP	269	0.04	0.02	0.01	0.03	0.12
Labor (%)	306	66.70	8.61	0.00	67.41	79.57
Inflation (%)	306	4.52	2.11	2.72	3.61	8.38
Population (mil.)	297	7.20	10.15	0.76	3.63	43.05

Gini is Gini index of province i at year t, BPR Loans/dep is loans by BPR normalized by its deposits of province i at year t, Bank Loans/dep is loans by banks normalized by its deposits of province i at year t, BPR Loans/cap is loans by BPR normalized by the number of population of province i at year t, Bank Loans/cap is loans by banks normalized by the number of population of province i at year t, HDI is human development index of province i at year t, Labor is ratio of workforce of province i at year t, GovExp/GRDP is ratio of government expenditure to real GRDP of province i at year t, Inflation is national y-o-y inflation at time t, population is the number of population of province i at year t based on the 2010 census data.

Findings

Table 1 reports our summary statistics on our variables for 34 provinces for the 2011 to 2018 observation period. The mean value of Gini ratio is 0.36, with the lowest and the highest value of 0.27 and 0.46, respectively. The BPR loans/deposits mean is 122.41, while for banks is 109.40, indicating both types of banks fulfil their intermediary roles. For the BPR loans per capita, the mean is IDR 354,859 (USD24) per capita, while the bank loans IDR15 million (USD1,034) per capita, showing a big difference in the financing contribution between the two. Nevertheless, we do not see any outliers detected in our variables and use the data as it is for our estimations. Table 2, 2A for loans per deposits and 2B for loans per capita, provides the correlation matrix among the independent variables and shows that there is unlikely multicollinearity issue among our independent variables except for HDI that has a coefficient of 0.35 and 0.47 with Micro (BPR) and Bank Loans respectively. Alternatively, we will orthogonalize variable HDI to eliminate the correlation with both Micro and Bank Loans variables.

Table 2A. **Correlation Matrix of Independent Variables**

No	Variable	VIF	1	2	3	4	5	6	7
1	BPR Loan /Dep	1.16	1						
2	Bank Loan /Dep	1.15	0.18	1					
3	H-Stat	1.18	-0.01	-0.04	1				
4	HDI	1.44	-0.33	-0.05	-0.14	1			
5	GovExp/GRDP	1.29	0.25	-0.02	-0.04	-0.42	1		
6	labor	1.16	0.05	-0.38	0.01	-0.08	0.10	1	
7	Inflation	1.17	0.09	-0.04	-0.09	-0.16	-0.01	-0.1577	1

Table 2B. **Correlation Matrix of Independent Variables**

No	Variable	VIF	1	2	3	4	5	6	7
1	BPR Loan /Cap	2.23	1						
2	Bank Loan/Cap	1.47	-0.01	1					
3	H-Stat	1.36	-0.08	-0.05	1				
4	HDI	1.27	0.35	0.48	-0.14	1			
5	GovExp/GRDP	1.24	-0.12	-0.08	-0.04	-0.42	1		
6	labor	1.17	0.21	-0.04	0.01	-0.08	0.10	1	
7	Inflation	1.16	-0.09	-0.05	-0.09	-0.16	-0.01	-0.16	1

Before we discuss the estimation results, we first ensure whether or not our loan variables are endogenous due to simultaneity bias. The DWH test shows that the chi-squared from the test is only 2.02 with a p-value of 0.15, indicating that our micro (BPR) and bank loan variables are not endogenous in our case. The chi-squared value of the Hansen J statistic for the over identification test of the instruments is 2.511, with the p-value of 0.285, indicating our instruments are valid, not correlated with the regression disturbance. On the other hand, the Kleibergen-Paap rk Wald F statistic of weak identification test shows a value of 28.49, much higher than the value of Stock-Yogo, 11.04), indicating our instruments are appropriate in explaining the instrumented variables. Based on this test, we proceed using Fixed Effects estimation. The main results are reported in Table 3 and 4 for Gini index estimations.

We run three different estimations for each dependent variable to test our main hypotheses. We regress BPR loans and national commercial bank loans on the dependent variable separately in estimation (1) and (2) and include both loans in estimation (3). For the Gini index estimation, as presented in Table 3, the main message of the results is that the loans by micro banks (BPR), measured as loans by BPR over its deposits (*BPR Loans/Dep*), indeed has a negative impact on the Gini index. The coefficient of *L.BPR Loans* is negative and statistically significant at 5% level. The result is consistent in all specifications. Hence, BPR's intermediary role might decrease the income gap between the rich and the poor.

Table 3. **Fixed Effects Regressions Gini Ratio and Bank Loans, 2012-2018**

	(1)	(2)	(3)
Gini	Model 1	Model 2	Model 3
L.BPR Loans/Dep	-0.000124** (0.0000472)		-0.000126** (0.0000474)
L.Bank Loan /Dep		2.125*** (0.570)	2.108*** (0.576)
H-Stat	2.113*** (0.574)	2.125*** (0.570)	2.108*** (0.576)
L.HDI	0.0209** (0.00794)	0.0215** (0.00793)	0.0214** (0.00791)
L.GovExp/ GRDP	0.822*** (0.275)	0.740** (0.311)	0.816*** (0.278)
L.Labor	0.0000986 (0.00103)	0.000159 (0.00103)	0.000128 (0.00103)
L.Inflation	-0.539*** (0.148)	-0.542*** (0.146)	-0.539*** (0.148)
Cons	-0.144 (0.287)	-0.190 (0.289)	-0.166 (0.282)
Year effects	Yes	Yes	Yes
Nbr. of obs.	231	231	231
Nbr. of groups	33	33	33
R-Squared Within	0.353	0.336	0.354

Fixed Effects estimations. The dependent variable is the Gini index. Prefix L. indicating a lagged value (t-1). BPR Loans/Dep is loans over deposits of micro bank (BPR) in a province i at time t; Bank Loan is loans over deposits of national commercial banks in a province i at time t; H-Stat is competition Measure of Panzar-Rosse, HDI is human development index of province i at time t; GovExp is government expenditure over real Gross Regional Domestic Products of province i at time t; Labor is percentage of the workforce of province i at time t; Inflation is national inflation at time t.
Robust standard errors in parentheses, $^{*} p < 0.10$, $^{**} p < 0.05$, $^{***} p < 0.01$

This result is supported by the result reported in Table 4. It shows that variable *L.BPR Loans/Cap* in the column (1) and (3) consistently shows a negative coefficient, statistically significant at 5% level on the Gini ratio, indicating that a higher loan by BPR could reduce the income disparity. Contrary to the study of Hulme and Mosley (1997), our results support the study of Angelucci, Karlan, and Zinman (2003) Imai et al. (2012), Miled and Rejeb (2015) Bangoura et al. (2016) Alimukhamedova, Filer, and Hanousek (2017), that microfinance might reduce income inequality, that access to finance for the poor is important factors and BPR, in this case, BPR in Indonesia has a contribution in providing

access to finance for the poor. BPR, as a micro bank operating in a particular geographic area, has the advantage of possessing soft information of the borrowers (Meslier-Crouzille, Nys, and Sauviat 2012). Thus, it enables them to reduce asymmetric information of micro and small business as well as to the poor and therefore can provide loans (access to finance) more efficiently to these segments.

Meanwhile, both columns 2 and 3 show that the coefficients of *L.Bank Loan*s are consistently positive and significant at 1% level, indicating loans from commercial banks might increase income inequality. This finding shows that loans by national banks are positively associated with Gini index, indicating big commercial banks only benefit the rich only and thus widening the income gap between the two groups (Greenwood and Jovanovic 1990; Seven and Coskun 2016).

Table 4. **Fixed Effects Regressions Gini Ratio and Bank Loans per Capita, 2012-2018**

Gini	(1) Model 1	(2) Model 2	(3) Model 3
LBPR Loans/Cap	-1.96e-08*** (6.42e-09)		-1.96e-08*** (6.63e-09)
L.Bank Loans/Cap		3.50e-11 (9.53e-11)	-3.56e-12 (9.11e-11)
H-Stat	1.753*** (0.575)	2.154*** (0.583)	1.750*** (0.595)
L.HDI	0.0175** (0.00793)	0.0214** (0.00808)	0.0174** (0.00807)
L.GovExp/ GRDP	0.714** (0.298)	0.749** (0.310)	0.713** (0.299)
L.Labor	0.000139 (0.000984)	0.000190 (0.00114)	0.000133 (0.00110)
L.Inflation	-0.448*** (0.148)	-0.549*** (0.149)	-0.447*** (0.152)
Cons	-0.0761 (0.285)	-0.183 (0.303)	-0.0748 (0.296)
Year effects	Yes	Yes	Yes
Nbr. of obs.	231	231	231
Nbr. of groups	33	33	33
R-Squared Within	0.355	0.336	0.355

Fixed Effects estimations. The dependent variable is the Gini index. Prefix L. indicating a lagged value (t-1). BPR Loans/Cap is loans over population of micro bank (BPR) in a province i at time t; Banks Loans/Cap is loans over population of commercial banks in a province i at time t; H-Stat is competition Measure of Panzar-Rosse, HDI is human development index of province i at time t; GovExp is government expenditure over real Gross Regional Domestic Products of province i at time t; Labor is percentage of the workforce of province i at time t; Inflation is national inflation at time t.
Robust standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

However, Table 4, where loans from national banks are measure by loan per capita, does not confirm this result; the coefficient of *L.Bank Loans* is not significant in all specifications. Note that Bank Rakyat Indonesia (BRI) is one of the biggest national commercial banks that provides loans to micro and small business[2]. Although BRI has significant contribution to micro funding in Indonesia, and nevertheless one of the biggest banks in the country, their contribution in income equality is not reflected in our result. One of the probable explanations is that the contribution to micro and small business is relatively small compared to the size of national commercial banks loans in total.

Overall, the result of this study, therefore, supports the notion that microfinance can reduce income disparity. Our results indicate that loans by micro banks (BPR) in Indonesia might successfully give more leverage to the micro and small business to grow and expand as well as provides access to finance for the poor.

Robustness Checks

Firstly, some studies provide empirical evidence of the non-linearity relationship between finance and growth, for instance, Law and Singh (2014), Beck, Degryse, and Kneer (2014), and Soedarmono, Hasan, and Arsyad (2016). We then test if too many loans by BPR will also demonstrate an inverted U-shaped pattern with economic development as well as with income disparity. Thus, we introduce the squared of *L.Micro Loans* to our estimations. For the Gini index estimation, we report the results in Table 5. The results show that we do not find any evidence of the quadratic relationship of loans BPR on the Gini index.

Table 5. **Quadratic Estimations of Loans**

Gini	(1) Loan per Deposit	(2)	(3) Loan per Capita	(4)
L.BPR Loans	-0.000156 (0.000209)	-0.000151 (0.000211)	-8.19e-09 (2.93e-08)	-3.45e-08 (2.30e-08)
L.Bank Loans^2	8.22e-08 (0.000000488)	6.48e-08 (0.000000492)	-3.47e-15 (7.83e-15)	4.88e-15 (6.24e-15)
Cons	-0.139 (0.290)	-0.163 (0.286)	-0.0912 (0.329)	-0.116 (0.307)
Year effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Nbr. of obs.	231	231	224	231
Nbr. of groups	33	33	32	33
R-Squared Within	0.353	0.354	0.192	0.357

Fixed Effects estimations. The dependent variable is the Gini index. Prefix L. indicating a lagged value (t-1). BPR Loans is loans over population of micro bank (BPR) in a province i at time t; Loan Banks is loans over population of commercial banks in a province i at time t; H-Stat is competition Measure of Panzar-Rosse, HDI is human development index of province i at time t; GovExp is government expenditure over real Gross Regional Domestic Products of province i at time t; Labor is percentage of the workforce of province i at time t; Inflation is national inflation at time t.

Robust standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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[2] Micro funding/loans is a big part of BRI's loan portfolio. In 2019, the micro funding is 46.79% of its loan portfolio (as reported in audited consolidated financial report for 2019).

Secondly, we ensure that our results are not driven by DKI Jakarta, the capital of Indonesia, where accounted for about 70% of the economy. Therefore, we run all estimations by excluding DKI Jakarta from the sample. We find that the results remain unchanged, as reported in Tables 6 and 7.

Table 6. **Fixed Effects Regressions Gini Ratio and Bank Loans over Deposits, 2012-2018**

Gini	(1) Model 1	(2) Model 2	(3) Model 3
L.BPR Loans/Dep	-0.000124** (0.0000472)		-0.000126** (0.0000474)
L.Bank Loans Banks/Dep		-0.0000830 (0.000168)	-0.000102 (0.000164)
Cons	-0.184 (0.290)	-0.229 (0.291)	-0.204 (0.285)
Year effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Nbr. of obs.	224	224	224
Nbr. of groups	32	32	32
R-Squared Within	0.350	0.332	0.351

Fixed Effects estimations. The dependent variable is the Gini index. Prefix L. indicating a lagged value (t-1). BPR Loans/Dep is loans over deposits of micro bank (BPR) in a province i at time t; Bank Loans/Dep is loans over deposits of commercial banks in a province i at time t.

Robust standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Lastly, we orthogonalize HDI variable to our loan variable and re-run the estimations. The conclusion from these estimations remains the same as the baseline estimations. We do not report the results, but we can provide it by request.

Conclusion

This study investigates the role of the micro bank, i.e., BPR, on income inequality in the Indonesian setting. Indonesia has a unique microfinance institution, namely *Bank Perkreditan Rakyat* (BPR), that is a small-sized bank specialized in providing loans for micro-businesses with limited geographical coverage. As the literature shows that such financial institution has an advantage of soft information over the neighborhood compared to big commercial banks and thus reducing the asymmetric information to the bank, this study posits a hypothesis that BPR will have a contribution in reducing income disparity by providing access to finance to micro and small business. Using a panel of 34 provinces over the 2012-2018 period, and controlling for related variables, this study shows that loans from such small banks operating in a limited geographical area are associated with income disparity reduction. Thus, the policymaker should put more attention to these types of banks to support them in providing loans for micro and small business while maintaining the financial stability.

Further investigation should look at the role of rich provinces and poor provinces in shaping the relationship between BPR loans and income disparity to get a clearer picture

whether BPR provide more benefit in a poorer area. Nevertheless, the effect of the degree of competition in the banking industry should be explored further in this topic as we also found that the H-statistic always has statistically significant coefficient in our estimation.

Table 7. **Fixed Effects Regressions Gini Ratio and Bank Loans per Capita, 2012-2018**

Gini	(1) Model 1	(2) Model 2	(3) Model 3
L.BPR Loans/Cap	-1.95e-08*** (6.75e-09)		-1.73e-08* (8.67e-09)
L.Bank Loans/Cap		-2.56e-09 (1.91e-09)	-1.18e-09 (2.33e-09)
Cons	-0.0995 (0.290)	-0.238 (0.298)	-0.124 (0.286)
Year effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Nbr. of obs.	224	224	224
Nbr. of groups	32	32	32
R-Squared Within	0.351	0.339	0.352

Fixed Effects estimations. The dependent variable is the Gini index. Prefix L. indicating a lagged value (t-1). BPR Loans/Cap is loans per capita of micro bank (BPR) in a province i at time t; Loan Banks/Cap is loans over deposits of commercial banks in a province i at time t.

Robust standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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