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How Does Financial Inclusion Affect Economic Growth and Income Inequality?

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Abstract

Financial inclusion is an important element in creating inclusive economic growth. The availability of easy access to public services can facilitate all levels of society. This study focuses on analyzing the effect of financial inclusion on economic growth and income inequality in countries based on their income categories. The research object is 440 observations with secondary data using cross-section and time-series data for 11 years, 2010 - 2020, and using objects from 40 countries in the world based on their income categories. This research uses panel method regression analysis. The results of panel data regression show that financial inclusion affects economic growth and income inequality when estimated with complementary variables, inflation, and the rule of law. In its effect on economic growth, financial inclusion has proven to be influential in the categories of lower-middle-income and high-income countries. Meanwhile, in terms of its impact on income inequality, financial inclusion is proven to affect the lower-middle-income and upper-middle-income categories of countries. The results of this study become a consideration for countries based on their income categories to increase financial inclusion so that policies can be achieved to improve people's welfare through financial inclusion.

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INTRODUCTION

Inclusive finance which shows the freedom of society in accessing financial facilities can also be referred to as economic liberalization. Financial liberalization has a significant positive effect on the quality of investment and the volume of savings. Goldsmith (1969) argues that financial intermediation positively impacts growth caused by increased efficiency and the importance of investment. Meanwhile, McKinnon (1973) explained the impact of financial liberalization that drives growth. According to McKinnon (1973), the financial sector can increase the volume of savings and the quantity and quality of investment.

Saving activity is one of the drivers of investment but is a negative function of the real interest rate. Savings will decrease when driven by accelerating inflation or a decline in the nominal interest rate. According to McKinnon (1973), money reserves are essential to forming capital. They are developing an inclusive financial system by providing savings and financial services to all economic actors. In addition, King and Levine (1993) stated that about one-third of the inequality in developing countries could sooner or later be eliminated by increasing development in the financial intermediation sector. Financial inclusion describes the ability of the community to enjoy easy access to financial services in the form of transactions, savings, payments, credit, and insurance.

Access to public financial services has become an important part of the development process in many countries. Increasing access to public financial services has a positive impact on the financial sector, which can then become a driving force for increased economic growth. This is because financial access can accelerate the efficient allocation of productive resources to reduce the cost of capital (Nwafor and Yomi, 2018). Improving the quality of human resources through access to adequate financial services, can increase affordable monetary financing activities.

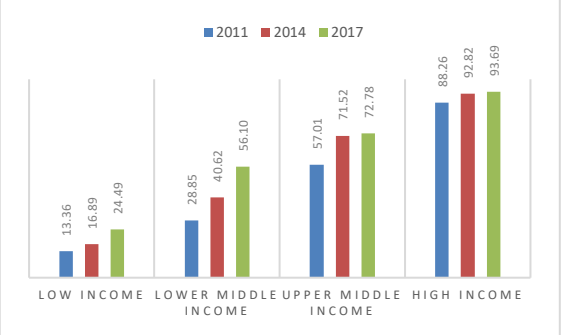

Figure 1. Percentage of Accounts of Financial Institutions Age above 15 years.
Source: World Bank, 2021 (Processed)

Morever, Figure 1 explains the percentage of accounts of financial institutions aged 15 years and over showing that people have accounts, either in their name or with other people at banks or other financial institutions. The data was obtained based on the Global Financial Index Database survey conducted by the World Bank in the period 2011, 2014, and 2017. Overall, people aged 15 years and over who have accounts with financial institutions has increased worldwide. Based on the category, it can be concluded that the income condition of the country influences the availability of public access services in the financial sector.

In the context of financial sector growth that leads to financial inclusion, it needs to be realized in the ease of access and availability of formal financial services such as bank deposits, credit, and insurance for the whole community (Kim, Yu, and Hassan, 2018). Through the availability of access to adequate financial services, of course, can provide convenience for the community to improve welfare. The link between the financial sector and real economic growth has developed into a trickle-down effect concept. Financial inclusion can reduce poverty because income distribution can ultimately encourage increased economic growth (Beck, Demirgüç and Levine, 2007).

Based on the income categories of countries in the world, it is necessary to know how the application of financial inclusion can influence increasing economic growth and reducing income inequality in countries based on their income level categories. As research has

been conducted by Demirgüç-Kunt & Klapper (2013) and Allen et al, (2016) found that economic growth as measured by the proxy indicator of GDP per capita has a positive and significant effect on variations in financial inclusion in the level of account penetration, savings and loan activities between low-income, middle-income, and high-income countries. Research on financial inclusion that compares the country's categories and low income, lower middle income, upper middle income, and high income has not been done much. Most only research on a smaller scale in specific categories.

High economic growth is not necessarily followed by an increase in people's welfare. Problems related to poverty and income inequality are still things that cannot be avoided by many countries, even countries with high economic growth. Therefore, through an increase in financial inclusion, it can provide access to services in the financial sector so that people can enjoy the convenience of accessing banking services to improve their welfare. According to Kabakova & Plaksenkov (2018), a country's financial inclusion is not only determined by factors in the financial market, but is also determined by the entire ecosystem, including economic, social (Robert, Tilman and Nina, 2014), political (Beck, Demirgüç-Kunt and Honohan, 2009), and technological advances (Adner and Kapoor, 2010).

Financial inclusion has contributed to the development of the financial sector, which indirectly reduces poverty and income distribution inequality to be a driver of a country's economic growth. In addition, improving financial access services that are adequate and accessible to all segments of society can enhance the welfare of the poor. Financial inclusion can ensure increased public access it the provision of efficient financial services and accelerate the creation of capital that can provide opportunities for the poor (Dupas et al., 2016). Therefore, developing an inclusive financial system is the right solution to increase development and economic growth.

This difference in country categories based on income levels has implications for public access to financial services. This is reinforced by the conditions of poverty and income inequality that are often found in countries with middle and low categories. Low financial inclusion in countries with high-income inequality conditions causes the marginalization of the poor due to inequality of economic opportunities (Nwafor and Yomi, 2018). Therefore, providing access to financial services to the public is necessary to accelerate inclusive economic growth in all countries. Several previous research that has been carried out have found many different effects between financial inclusion and economic growth, and also income inequality. This difference in influence is due to differences in the proxy variables used to explain financial inclusion and differences in the countries selected to be used as research subjects.

Therefore, this study seeks to answer the effect of financial inclusion by using a variable approach that explains the effect of financial inclusion on economic growth and income inequality by looking at the categories of countries based on their income levels. The financial inclusion proxy variable approach is based on the division of dimensions of financial inclusion according to Sarma (2008), banking penetration, availability of banking services, and use of banking services.

Several studies related to the impact of financial inclusion on economic growth and income inequality have been carried out, such as Sharma (2016), Ratnawati (2020), Nwafor and Yomi (2018), Khera et al, (2021), Onaolapo (2015), Erlando, Riyanto and Masakazu (2020), Neaime and Gaysset (2018), and Omar and Inaba (2020). Besides, the different from those previous research, this study is comparing financial inclusion by income category. The income categories country is income, lower-middle-income, upper-middle-income, and high-income. Thus, the point of view presented in this study can provide a new perspective on how to compare the level of financial inclusion in the world based on income categories.

The research gap of this study is comparing the level of financial inclusion by income category, can provide recommendations

for policymakers to improve the provision of public access to financial services. Especially for countries with low-income and middle-income categories to adapt and adjust policies related to providing access to public services to create inclusive economic development. This research focuses on improving previous research on the effect of financial inclusion on economic growth and income inequality. Moreover, as already studied by Erlando, Riyanto and Masakazu (2020), Ratnawati (2020) Neaime and Gaysset (2018) and Sharma (2016), this study provides a different point of view by comparing the level of financial inclusion based on income categories, namely low income, lower middle income, upper middle income, and high income. Thus, the point of view presented in this study provides a new perspective on how to compare the level of financial inclusion in the world based on income categories.

RESEARCH METHODS

This panel data analysis uses a time series for 11 years, namely 2010 - 2020, by considering the period that has been free from the crisis so that the condition is stable. Several steps were taken to analyze the static panel data regression model to find a good regression result. It was first tested with three models, namely common effect, fixed effect, and random effect. Furthermore, a model suitability test was conducted to determine the best model through the Chow, Hausman, and Lagrange multiplier. After obtaining the best model, the next step is to test the classical assumption, consisting of the multicollinearity and heteroscedasticity tests. This study uses secondary data from various sources such as World Development Indicators, World Governance Indicators, International Monetary Fund, Standardized World Income Inequality, and Statistics.

The panel data analysis method was chosen because it has several advantages, including panel data, a combination of time series and cross-section data, which can provide more data to produce a greater degree of freedom. In addition, by combining information from time series and cross-section data, it can overcome problems that arise when there is a problem of eliminating variables (omitted variables). Referring to Ratnawati (2020), Nwafor & Yomi (2018) and Onaolapo (2015), this study uses a panel data regression equation model. This study has two equations of the research model because it uses two dependent variables. The research equation for economic growth is as follows:

$$lnPDB_{it} = \beta_0 + \beta_1 lnCOM_{it} + \beta_2 LOAN_{it} + \beta_3 INF_{it} + \beta_4 LAW_{it} + e_{it} \quad \text{.....(1)}$$

Then, the equation with the dependent variable of income inequality is as follows:

$$GINI_{it} = \beta_0 + \beta_1 lnCOM_{it} + \beta_2 LOAN_{it} + \beta_3 INF_{it} + \beta_4 LAW_{it} + e_{it} \quad \text{.....(2)}$$

The lnPDB is natural log of economic growth in country i with period t, GINI show the gini coefficient in country I with period t, lnCOM show the natural log of the number of commercial bank branches per 100,000 adults in country I with period t, and LOAN show an outstanding loan from a commercial bank (%of GDP) in country I with a period t, last, the symbol of I show the 40 countries in the world by income category.

The research data used is GDP per capita, with the Gini coefficient as the dependent variable. Then, the independent variables used are the number of commercial bank branches per 100,000 adults and the outstanding loans from commercial banks to GDP. The selection of a proxy for the number of commercial bank branches is an essential element in terms of financial access services throughout the country. Without commercial bank branches that are available and can facilitate the public, access to financial services can be hampered. Then, the proxy for the outstanding loans from commercial banks to GDP is chosen because the flow of funds to borrowers will lead to an efficient and sustainable financial system. Thus, outstanding loans from commercial banks to GDP can measure economic performance in terms of funding. Therefore, by selecting these two indicators as proxies for financial inclusion, it is

possible to measure the level of access to financial services from all walks of life.

This study also adds complementary variables, namely the inflation rate as measured by the GDP deflator and the rule of law as measured by the rule of law indicator. The object of this research is 440 observations with secondary data using cross-section and time-series data for a period of 11 years, namely 2010 - 2020, and using objects from 40 countries in the world based on their income categories, with details of ten low-income countries, ten lower-middle-income countries, ten countries upper middle income, and ten high-income countries.

This study uses two models to explain how the influence of financial inclusion on economic growth and income inequality are interrelated. A country with high-income inequality conditions needs to improve access to public financial services that can provide adequate and easy-to-reach financial services. Thus, it can increase community economic activity, encouraging regional economic growth.

Countries with high-income inequality tend to experience lower economic growth. This is in line with the inverted U concept developed by Kuznets (1955), which states that in an economy that has just entered an initial growth condition, then the distribution of income tends to be poor. Because the existing opportunities and opportunities have been taken advantage of by an already better economy, thus, an economy with higher inequality conditions will lead to inefficiency in the economy, which causes low economic growth. Therefore, the government has not been able to transfer income and expenditure immediately due to the low-income level.

The number of commercial bank branches is the total number of commercial bank branches in the country reported annually by the central bank through the Financial Access Survey (Sarma, 2008). According to Sharma (2016), the contribution of savings and credit can be used as the primary determinant of economic performance. Therefore, a proxy indicator of the proportion of loans to GDP is used as a measure to describe the use of banking system services by the public. The selection of indicators was based on research by Neaime & Gaysset (2018), Kim et al., (2018), Sharma (2016), Khera et al., (2021), Ratnawati (2020), and Onaolapo (2015), which used these indicators. To show the penetration of banking by the public, it is vital to use it as a measure of financial inclusion.

RESULTS AND DISCUSSION

This result and discussion describe the effect of financial inclusion by using the proxy of the number of commercial bank branches and the proportion of loans to GDP on economic growth as measured by gross domestic product and income inequality as measured by the Gini coefficient in each country category based on income levels. Then, the results of this analysis compare how the main factors in financial inclusion that affect economic growth and income inequality differ in each country category based on their income level. The category of state income based on income is divided into four categories, namely low income, lower middle income, upper middle income, and high income.

Table 1. Descriptive Statistics

Variable	Mean	SD	Min	Max
Low Income Countries				
PDB	US$697,213	US$151,550	US$428,926	US$1.194,03
GINI	0,54	0,06	0,33	0,65
lnCOM	3,47	2,10	0,62	8,74
LOAN (%)	16,13	9,46	1,75	41,07
INF (%)	4,43	5,11	11,58	36,99
LAW	-0,70	0,40	-1,50	0,12

Variable	Mean	SD	Min	Max
		Lower Middle-Income Countries		
PDB	US$2.193,79	US$1.014,19	US$785,502	US$4.167,73
GINI	0,44	0,08	0,28	0,60
lnCOM	10,02	6,29	1,75	24,88
LOAN (%)	4,30	3,09	11,05	14,25
INF (%)	0,41	4,46	-1,42	21,26
LAW	-0,51	0,33	-1,20	0,75
		Upper Middle-Income Countries		
PDB	US$8.074,154	US$3.157,825	US$2.437,53	US$14.613,04
GINI	0,42	0,09	0,24	0,72
lnCOM	20,21	11,03	8,97	56,22
LOAN (%)	52,92	27,98	11,16	120,78
INFL (%)	7,78	9,67	-1,04	50,62
LAW	-0,03	0,33	-0,88	0,65
		High Income Countries		
PDB	US$406.878	US$3.765.429	US$12.447,44	US$3.95e+07
GINI	0,33	0,02	0,25	0,36
lnCOM	42,34	20,50	56,53	95,93
LOAN (%)	104,66	50,04	34,46	216,64
INF (%)	1,13	1,22	-1,88	5,56
LAW	1,33	0,51	0,24	2,10

Source: Data Processed, 2022

The descriptive statistics of research variables are presented in Table 1. The table shows a sizeable financial inclusion gap between countries by category, as shown by the significant difference between the minimum and maximum value of the indicators. The World Bank divides countries into four categories based on their income level. The World Bank divides countries into four categories based on their income level. The first category is low-income, with a GNI per capita below USD 1.085. second, namely, the lower middle-income class with a GNI per capita income between USD 1.086 – USD 4.255. Then, the upper middle-income countries with a GNI per capita income between USD 4.256 – 13.205. Meanwhile, the category that Lastly, high income has a GNI per capita income above USD 13.206.

Based on the results of descriptive statistical analysis of each country category, it can be seen that countries with high-income categories have a higher value of gross domestic product per capita. In addition, it can be seen that the condition of income inequality in high-income countries is lower than in other categories of countries. Moreover, it also explains that economic conditions in high-income countries are better than in different categories of countries. Then, the highest score on the financial inclusion proxy indicator was obtained by countries in the high-income category. That proves that countries with high-income categories have better levels of financial inclusion.

The model in this research is already fit because it meets the assumption of BLUE (Best Linear Unbiased Estimator) and is free from multicollinearity, heteroscedasticity, and autocorrelation problems. The heteroscedasticity has been fit by the robust standard error. According to Bai et al., (2020), they proposed a robust standard error with unknown clusters. Robust standard errors are obtained from what is often referred to as the heteroskedasticity-consistent covariance matrix estimator

(HCCME). It was proposed by Huber and rediscovered by White. In econometrics, the HCCME standard errors may be White's standard errors or Huber/White standard errors (Adkins and Hill, 2011).

Table 2. Result of the Economic Growth and Financial Inclusion

Variable	Low Income	Lower Middle Income	Upper Middle Income	High Income
lnCOM	0,09	0,40***	-0,22*	0,04*
	0,63	4,58	-1,80	1,71
LOAN	0,02	0,55*	-0,30	-0,09
	-0,05	1,69	-1,46	-0,43
INF	0,29	-0,37	-0,94***	1,94
	1,07	-1,27	-5,45	1,13
LAW	0,27**	0,37	0,38**	0,85***
	2,13	1,70*	2,32	3,45
Constanta	6,61***	6,71***	9,80***	9,45***
	38,62	19,81	25,16	18,73
Observations	110	110	110	110
R-squared	0,0022	0,4963	0,0313	0,3055
Adjusted R-squared	-0,0201	0,5620	0,2675	0,2933
F Statistic	*Wald Chi2*(4)	*Wald chi*2(4)	*Wald chi*2(4)	*Wald chi*2(4)
	22,27***	61,25***	62,58***	17,73***
Standard Error	0,8382	0,9056	0,9195	0,5840

Note:***,**,* each significant at the level 1%,5%,10%.

Source: Data Processed, 2022

Based on the estimation results of the selected model, the Wald chi2 value is 22.27 in the low-income country category, 61.25 in the lower-middle-income country, 62.58 in the upper-middle-income country category, and 17.73 in the high-income category. The results obtained by Wald chi-squares are significant at the 1% level. The Wald chi value in each country category is greater than the critical chi-square value in df 4 of 13.28, 9.49, and 7.78 at the 1%, 5%, and 10% levels, respectively. This proves that the variables on financial inclusion and the complementary variables consisting of inflation and the rule of law are simultaneously able to influence economic growth. When there is an increase in the dependent variable, it can contribute to economic growth as measured by GDP per capita. These results prove the statement of McKinnon (1973), who argues that financial liberalization through the financial sector can increase the quantity and quality of investment in promoting economic growth.

The coefficient determination of the low-income financial inclusion category toward economic growth is 0.22%. Thus, financial inclusion and the complementary variable shown by inflation and the rule of law can explain economic growth of 0.22%, while other variables explain the 99.88%. This low r-square result is because the banking structure available in low-income countries is not yet sufficiently developed in terms of access to financial services for the public (Neaime and Gaysset, 2018). Access to public financial services has not yet provided a practical impact on increasing community productivity, so it has not contributed to the economy that can boost economic growth.

In the lower middle-income category, the determinant coefficient is 49.63 for economic growth. Thus, financial inclusion and the complementary variables shown by inflation and the rule of law can explain economic growth of 49.63%, while other variables explain the 50.37%. In the upper middle-income category, the determinant coefficient is 3.13%. Thus, financial inclusion and the complementary variables shown by inflation and rule of law can explain economic growth of 3.13%, while other variables explain the 96.87%. Then, the high-income category shows that the coefficient determinant is 30.55%. Thus, financial inclusion and the complementary variable show by inflation and the rule of law can explain

economic growth of 30.55%, while 69.45% is explained by other variables.

In the low-income countries category, it shows that there is no significant effect between financial inclusion and economic growth. This insignificant result is because the banking structure available in low-income countries is not yet sufficiently developed in terms of access to financial services for the public (Neaime and Gaysset, 2018a). Access to public financial services has not yet provided a practical impact on increasing community productivity so it has not contributed to the economy that can boost economic growth. People have not been able to enjoy access to financial services that can encourage activities in the financial sector and the end, will increase economic growth in low-income countries.

These results also provide evidence that the available banking products have not been able to reach the entire community, which in turn will increase economic activity, which has an impact on increasing output. This finding proves that the flow of loan funds circulating in the community has not reached and facilitated all levels of society. That is, an increase in loans or credit is less productive in increasing economic growth. This is because the existing flow of credit funds is mainly used for spending in the real sector (Seven and Coskun, 2016). Therefore, the flow of funds affects the monetary sector, such as the capital market. This also implies that people with strong capital can only reach the flow of loan and credit funds. Thus, it has not been able to encourage the community's economic activities as a whole. This result is in line with research by Sharma (2016), which proves an insignificant relationship between the proportion of loans and economic growth, which can be caused by the enactment of the level of non-performing assets in low-income countries.

In addition, this result is also in line with the findings of Erlando et al., (2020), who found that financial inclusion on the usability dimension hurts economic growth. The available banking structure can sometimes not facilitate the entire community, thus making the public less interested in using these services. In addition, this also proves that the existing flow of credit and savings funds has not been utilized for economic development activities in the form of funding for small, micro, and medium enterprises (MSMEs), which can encourage increased economic activity to contribute to economic growth.

In lower middle-income country categories, shows a significant influence between financial inclusion and economic growth. Availability of access to financial services in the form of affordable bank branches for all people is crucial in increasing output which will ultimately increase economic growth. The ease of access to banking services and expanding the reach of bank branches and ATMs provide positive economic prospects. Because giving easy access to banking services to the general public at low rates, it can encourage economic growth through efficient allocation of funds for the entire community (Sharma, 2016).

This finding indicates that a higher loan rate can encourage the economic growth of a country in the lower-middle-income category. Financial inclusion, as measured by the proportion of loans to GDP, can increase investment activities with high added value to encourage economic growth through increased output. Bank loans play a role in financing a country's economy. With the availability of loans that enable a household to carry out better consumption and investment activities, an increase in loans provided by banks can increase productivity and thus encourage higher economic growth. This result follows the argument of Goldsmith (1969), who argues that there is a positive effect of financial intermediation on change caused by increased efficiency and volume of investment.

In the Upper middle-income category, financial inclusion does not significantly affect economic growth. This insignificant effect occurs because the number of commercial bank branches in upper-middle-income countries has not facilitated access to public financial services as a whole. Thus, people, especially those with low incomes, cannot enjoy the benefits of the banking system. These results indicate that an increase in the number of commercial bank

branches per 100,000 hurts economic growth. This means that the availability of banking services has not provided easy access to finance for the entire community.

Thus, there is no flow of funds in the community's cash and credit movements, which ultimately hampers economic growth. This finding is contrary to that which proves that Burgess & Pande (2005) the ease of availability of banking services can encourage the movement of cash and credit in society through money flow. This result is in line with Naceur & Ghazouani (2007) findings, which state that bank development hurts 11 countries in the Middle East and North Africa. In addition, the results of this study are also supported by research findings by Khan (2011), which found a negative effect of financial inclusion on economic growth. This insignificant result indicates an increase in loans or credit in upper-middle-income countries that are less productive in encouraging economic growth. Credit circulation is mainly used for spending in the real sector (Seven and Coskun, 2016). Thus, the inflow of funds affects the monetary sector, such as the capital market (Erlando, Riyanto and Masakazu, 2020). In addition, this insignificant result may occur because financial inclusion achieved through rapid credit growth or unregulated intermediation of funds can impact financial stability, which results in depressed economic growth Mehrotra & Yetman (2015). These findings are in line with the findings by (Erlando et al., 2020), proving that the dimensions of the use of banking services proxied by the proportion of total deposits and loans to GDP show significant adverse results. In high-income countries, a significant effect is evidenced by the proxy indicator of the number of commercial bank branches. These findings indicate that the banking system has developed quite well. This is evidenced by high access to banking financial services and is supported by high gross domestic product growth as well.

The availability of banking services that have a positive effect indicates that all levels of society have utilized the availability of commercial bank branches. This has contributed to economic activity, particularly in the financial sector. The ease of access and use of financial services for the community has proven to support economic growth. These results are consistent with research conducted by Kim et al., (2018), which found a positive influence between financial inclusion and economic growth and found reciprocal causality with each other. In addition, these results are also supported by the findings of Sharma (2016), who found a positive relationship between economic growth and various dimensions of financial inclusion, including banking penetration.

In the proxy indicator of the proportion of loans to GDP, it was found that the results were not significant for economic growth. These findings do not significantly affect economic growth with existing credit in high-income countries. This insignificant result can occur because financial inclusion achieved through rapid credit growth or unregulated intermediation of funds can have an impact on financial stability, which results in depressed economic growth Mehrotra & Yetman (2015) In addition, this insignificant effect occurs because credit circulation is mostly used for spending in the real sector. Thus, the inflow of funds affects the monetary sector, such as the capital market (Erlando, Riyanto and Masakazu, 2020).

This result certainly contradicts the argument of King & Levine (1993), which provides empirical evidence that supports the banking system as a solid financial intermediary leading to economic growth in capital accumulation that can increase people's productivity. This insignificant effect is in line with research conducted by Mehrotra & Yetman (2015), which proves that access to financial services in the form of savings and credit does not always have a positive impact. However, the results of this study are supported by research findings by Sharma (2016), which found that the amount of credit in proportion to GDP did not show a significant relationship to economic growth. This means that in using banking services in the form of credit, consider the level of non-performing assets in the banking sector of high-income countries.

Table 3. Results of the Income Inequality and Financial Inclusion

Variable	*Low Income*	*Lower Middle Income*	*Upper Middle Income*	*High Income*
lnCOM	0,04	-0,007	0,07***	0,0003
	1,01	-0.42	5.51	0.24
LOAN	-0,49	-0,13***	-0,09**	0,01
	-1,69	-2.97	-2.30	0.88
INF	-0,04	0,09	0,06*	-0,07
	-0,43	0.65	1.90	-0.54
LAW	0,07*	0,08**	-0,01	0,001
	-2,76	2.15	-0.72	0.06
Constanta	0,52***	0,55***	0,25***	0,31***
	11,51	7.42	6.40	8.46
Observations	110	110	110	110
R-squared	0,1212	0,3148	0,2648	0,0710
Adjusted R-squared	0,0021	0,4249	0,1652	0.3427
F Statistic	F(4,9) 7,56***	*Wald chi*2(4) 77,62***	F(4,9) 8,02***	*Wald chi*2(4) 9,87**
Standard Error	-0,8828	0,8335	-0,7610	0,8680

Note:***,**,* each significant at the level 1%,5%,10%.

Source: Data Processed, 2022

Based on the estimation results, the F statistic value is 7.56 in the low-income category, and the F value is 8.02 in upper-middle-income countries, which shows a significant value at the 1% level. Then, in lower middle income and high-income countries, each of them shows a significant wald chi squares value at the 1% level. These results indicate that the financial inclusion proxy variable and the complementary variables, namely inflation and the rule of law, significantly affect income inequality in all country categories. An increase in the independent variables, namely financial inclusion, inflation, and the rule of law, can reduce income inequality in low-income countries.

The value of coefficient of determination shows a high value in the lower-middle-income and upper-middle-income categories. Meanwhile, the low-income and high-income categories show a small coefficient of determination. For low income, the coefficient of determination is 0.0021, which means that only 0.21% of financial inclusion variables and complementary variables can explain variations in income inequality. Then, financial inclusion and the complementary variable can explain income inequality in the lower middle-income category for 42.49%, while other variables explain the 57.51%. In the upper-middle-income category, financial inclusion and the complementary variable can explain income inequality for 26.48%, while other variables explain 73.52%. Then, financial inclusion and the complementary variables can explain income inequality in the high-income category just for 7.1%, while other variables explain 92.9%.

Low-income categories, shows that financial inclusion has no significant effect on income inequality. This insignificant effect arises because the banking structure in low-income countries is not well developed, especially in terms of access to financial services which can effectively impact income inequality and poverty (Neaime and Gaysset, 2018a). This indicates that an increase in commercial bank branches indicates that banking penetration does not reduce income inequality in low-income countries.

The availability of commercial bank branches that should facilitate access to financial services by the public has not been felt by all community members. The ineffectiveness of the financial sector causes the lower labour productivity due to less than optimal allocation of funds. In addition, the lack of development in the number of commercial bank branches causes a low level of competition, so bank loan margins will increase with low-interest rates, ultimately unable to provide incentives for savings (Neaime and Gaysset, 2018a).

The insignificant results on the loan proxy also show that the use of loan facilities that have been used for activities such as savings and investment has not been able to have a significant effect in low-income countries. This insignificant result is in line with the findings by Erlando et al.,(2020)., which prove that an increase in financial inclusion on the usability dimension derived from the proportion of savings and credit indicators encourages wider income inequality. According to him, banking institutions need to pay attention to product innovation based on technology and internet systems to be accepted and benefit all levels of society. These findings are in line with the opinion expressed by Todaro & Smith (2011), which states that the higher the income inequality, the fewer people who qualify for access to financial services such as loans and other credits.

In lower-middle-income categories, the significant variable is shown by an outstanding loan from commercial bank branches, but not for the variable number of commercial bank branches. This insignificant effect arises from the structure of financial institutions and banking in lower-middle-income countries that are not sufficiently developed to provide financial services effectively to the public. Thus, the poor have not been able to enjoy optimal financial access services. The benefits of a developing banking system in lower-middle-income countries do not seem to be felt and reach more poor people.

Meanwhile, the proxy indicator for outstanding loans from commercial bank branches shows a significant effect on income inequality. An increase in the proportion of loans circulating in the community can increase people's income, thereby reducing income inequality. These findings are consistent with the results of research by Beck et al., (2009), which states that financial inclusion can improve the financial condition and standard of living of the poor to reduce income inequality.

In upper middle income, it shows a significant but positive relationship, so it is not according to the research hypothesis. This positive influence indicates that an increase in financial inclusion in the form of the number of commercial bank branches does not necessarily benefit people with low incomes. Many of the banking products provided are not following the conditions of society in several countries. Thus, access to financial services can only facilitate people with sufficient capital conditions. Thus, people with low incomes cannot access banking product services.

The proxy indicator of outstanding loans from commercial bank branches shows a significant effect on economic growth. These results indicate that access to financial services in upper-middle-income countries has reached all levels of society, especially in loan products that can facilitate an increase in the income of low-income people. The fulfillment of easy and affordable access to financial services for the whole community will enable the community to integrate better into active economic activities (Ratnawati, 2020). Thus, financial inclusion can boost the income of low-income people, which ultimately reduces income inequality. These findings follow research by Beck et al., (2007) which states that financial inclusion can improve the financial condition and standard of living of the poor to reduce income inequality. In addition, these results also prove another study by Park & Mercado (2015), which found empirical evidence of a negative and significant relationship between financial inclusion and income inequality and poverty.

In high-income categories, financial inclusion does not significantly affect income inequality. This result is not significant because the structure of financial and banking institutions that are available can only reach people with high incomes. In addition, the banking products provided can only facilitate people with strong capital, so they cannot get people with low incomes.

These results prove that increasing financial inclusion through increasing the number of bank branches is not efficient in reducing income inequality in high-income countries. This means that the increase in bank branches widens income inequality. These results prove that the distribution of the number of

commercial bank branches has not been reached by people with low incomes. Thus, the benefits of the availability of new commercial bank services can be accessed by the public with strong capital.

This finding suggests that most of the funds flowing through credit or loans from commercial banks have not facilitated low-income communities. This means that the flow of loan funds can only use by people who have substantial capital (Erlando et al., 2020). In addition, this is because people with high incomes can only use the products available from financial institution loans. This finding also proves that loan facilities are used primarily for consumptive activities, not investment or savings, so income inequality cannot be affected. In addition, the proportion of loans can only facilitate people with high incomes. These results indicate that the flow of credit funds has not been used for community economic development through the improvement of micro, small and medium enterprises

These findings are in line with research by Erlando et al., (2020) which found that the flow of loan funds was not used in community economic development and the improvement of micro, small and medium enterprises. Thus, causing widespread inequality. Ratnawati (2020) also found evidence that the proportion of credit and loan deposits has no effect on the economy in Eastern Indonesia and developing countries in Asia.

Based on the research analysis results, it can be seen that financial inclusion contributes to economic growth. In its effect on economic growth, simultaneously, each income category proves a significant result. Thus, financial inclusion can simultaneously contribute to increasing economic growth globally. These results demonstrate the statement of McKinnon (1973), who argues that financial liberalization through the financial sector can increase the quantity and quality of investment in promoting economic growth.

Based on the comparison of the coefficient of determination for each category, countries with the lower-middle-income category prove the value of the coefficient of determination is the highest among other categories. This demonstrates that financial inclusion contributes significantly to economic growth in the lower-middle-income category. Meanwhile, the lowest coefficient of determination is in low-income countries. These results indicate that financial inclusion only contributes very little to economic growth in low-income countries. This proves that the condition of financial inclusion in low-income countries has not been appropriately developed so it cannot facilitate the entire community.

Effect on income inequality shows that each model in each country category has a significant impact on income inequality. This significant effect is supported by the argument of Beck, Demirgüç-Kunt and Levine (2007), which states that financial inclusion can improve the financial condition and living standards of the poor to reduce income inequality. In addition, the effect of financial inclusion variables on income inequality is also evidenced by Todaro and Smith (2011), which state that the higher the income inequality, the fewer people who qualify for access to financial services such as loans and other credits.

Based on the coefficient of determination, the lowest value is obtained in high-income countries, and the following order is in low-income countries. These findings indicate that financial inclusion only slightly affects income inequality in low-income and high-income countries. Then, the highest coefficient of determination is shown by the lower middle-income category and the second highest in the upper middle income. These results indicate that both categories have provided excellent and equitable banking service facilities throughout the region.

The ineffectiveness of the financial sector causes lower labour productivity due to less than optimal allocation of funds. In addition, the lack of development in the number of commercial bank branches causes a low level of competition. Bank loan margins will increase with low-interest rates, ultimately unable to provide incentives for savings Neaime and Gaysset (2018). These results show that a lot needs to be addressed in

the financial service system so that it can reach all levels of society.

Based on the results of the comparative analysis, it can be concluded that the financial inclusion variable is proven to contribute to and encourage economic growth and reduce income inequality. Each country category proves different results on each proxy indicator. This can happen due to the different characteristics of different countries.

CONCLUSION

implications in the financial sector that are important in all countries by income category. Increasing economic growth through financial inclusion can be achieved by providing access to financial services that can reach and facilitate all levels of society, reducing income inequality. The government, the central bank, and other financial institutions need to work together to develop financial services infrastructure and improve financial service networks in all regions, especially in disadvantaged areas. Financial institutions need to provide formal financial service products that are innovative and adapted to the needs and conditions of the community. Furthermore, economic activities in developing countries need to be encouraged to increase people's per capita income.

The availability of adequate access to financial services aims to reduce the number of unbanked people who do not have access to financial services. Because having access to banking services such as loan services can increase the community's capacity in choosing appropriate financial service products. Thus, increasing financial inclusion is vital in improving people's living standards. Meanwhile, the development of the financial sector through the small, micro, and medium enterprises sector that supports low-income communities is essential. Therefore, the government and financial institutions and banks can improve the products and services of the banking system, which leads to an increase in the entrepreneurial sector to contribute to economic activity.

The analysis of this study only focuses on the effect of the number of bank branches and the proportion of loans on GDP as a proxy of financial inclusion on economic growth and income inequality. Although the results of this study found a significant simultaneous effect of financial inclusion proxies on economic growth and income inequality, this study has not considered the differences in the countries used as observations. In addition, research analysis on the proxy indicators used has not measured mobile phone transactions which are currently being widely used by the public. Meanwhile, the study of this research only focuses on its effect on economic growth and income inequality. So, we don't know how it affects the poverty rate in all countries. Therefore, the authors recommend further research to explore further how financial inclusion affects poverty in the world. Not to forget, the author recommends further research to use proxy indicators adapted to current conditions, in term of considering the transaction variable by mobile phone transactions on its effect on world poverty.

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Development. 11th ed. Harlow: Pearson Education. Thank you for the comment, but this sentence is not taken from any source. This sentence is the result of the author's analysis based on the results of panel data regression estimates*Financial Inclusion (Global Findex) Database*.