**Effects of financial development on income inequality in East Java Province**

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**Abstract**

The research purposes are: (1) to determine the effect of financial sector development on income inequality in East Java Province, (2) to determine the effect of regional characteristics on income inequality in East Java Province. The study uses descriptive quantitative methods. The analysis method uses panel data regression with time series from 2013 to 2017 and cross-sections of 38 districts in East Java Province. The study results are as follows: (1) financial development has a negative and significant effect on income inequality, (2) the regional budget has a positive and significant effect on income inequality in East Java Province, (3) population density has a positive and significant effect on income inequality, (4) poverty has a positive and significant effect on income inequality, and (5) unemployment has no influence and is not significant in income inequality.

***Keywords****: Financial development, Panel data, Regional economics*

**JEL Classification**: O23, R11, C23

**INTRODUCTION**

Financial development is considered a strategic element that plays a fundamental role in the economic development process. The financial sector is primarily regulated because it is considered a supporting economy (Mishkin, 2009). The development of the financial sector is expected to be a function of financial intermediation that can develop and create a better economy. According to Bagehot (1873) explained, the financial sector was significantly able to trigger economic growth by mobilizing a banking sector capital. Furthermore, King & Levine (1993) also show that the financial system is proven to increase economic growth.

Economic growth can be an appropriate indicator of the development process but must consider other factors such as income inequality issues. According to Greenwood & Jovanovic (1990), based on the Kuznets hypothesis, it shows that the financial sector will encourage inequality in the early stages of development. Nevertheless, after the financial sector is at the peak point, inequality will decrease because the financial sector tends to strengthen. This condition indicates a U-reverses hypothesis between financial sector development and income inequality (Tan & Law, 2012). Shortness of access to finance has long been recognized as a potential problem in increasing the gap between poor and rich.

Kappel (2010) investigated the effects of financial sector development on poverty and income inequality, using a panel data regression model. The independent variable of the financial sector development is measured from the banking sector, namely private credit per GDP. It is also covered from the stock sector's development, including the stock market capitalization to GDP, the total market value of shares traded to GDP, and market turnover ratio. The conclusions show that inequality and poverty are reduced through increased market lending and more developed stock markets. In comparison, the effect of financial inclusion on income inequality in Asia was reviewed by Park & Mercado (2015). The study examined the effect of financial inclusion and supporting variables on income inequality and poverty. The result of financial inclusion has a significant reduction effect on income inequality and poverty in selected countries.

The situation of income inequality in East Java Province still needs attention. The income inequality problem is that not all people get the same income from each asset because of the frequently centralized financial resources of prosperous households with access to financial markets (World Bank, 2016). Even though East Java's economic growth is progressing, there is severe inequality in East Java.

East Java

National

**Figure 1.** Gini Ratio of East Java Provinces and National, 2013-2017

*Source: BPS East Java Province*

The Gini ratio's situation in 2013-2014 East Java Province is lower than the national Gini ratio. In 2015-2017, the East Java Province ratio was more leading than the national level Gini ratio. In 2015 there was the highest income inequality, which was 0.42 percent, although it declined in the following year; the problem of inequality must still be considered. In 2017, the province of East Java was rated tenth at the national level with the highest level of income inequality and included in moderate-income inequality, so that if it remains. It can affect the national economy because East Java is a province that plays an important role and is realized as the center of eastern Indonesia, which presents relatively high and significance to the national economy. Therefore, efforts are still needed to alleviate income inequality, one of which is financial development.

This study is revised from Jaumotte (2008), and Seven & Coskun (2016) explain that significantly the financial sector's development positively influences income disparities in selected countries. They use the same financial sector development indicators, particularly private sector credit to GDP, however in the study of Jaumotte (2008), using financial disclosure variables includes FDI, an equity portfolio, financial derivatives, and total reserves minus gold. This research implies that the financial sector's development harms income inequality performed through a credit ratio per GDRP, also providing significant. It indicated that the financial sector is getting deeper (financial deepening), which means that credit access to the public is getting higher (Lynch, 1996). It can decrease the income gap at the regional level district/city of East Java province. Financial sector development measures are also used only in the banking sector's scope and use regional characteristic factor variables to see their income inequality effects.

**METHODS**

The used in this study are secondary data. This study's data type is panel data, covering annual time series data from 2013 to 2017 and cross-sections covering 38 districts/cities in East Java Province. Time series do not use 2018-2019 data because the Gini ratio data used is not yet available, and the latest data is only until 2017. The variable includes the Gini ratio, Financial Sector Development as measured by credit/GDRP ratio, asset ratio/GDRP, Third Party Funds/GDRP ratio, and regional characteristics use APBD, population density, poverty, and open unemployment rates. Sources of data were obtained from the Regional Economic and Financial Statistics through the official website of Bank Indonesia and publications in the East Java Provincial Statistics Agency.

The theory underlying the model in this study is the theory of financial development. According to the International Monetary Fund, in the financial sector development, there are three institutional financial indexes: a financial institution depth index, an index of access to financial institutions, and an index of financial institutions' efficiency.

This study employs various independent variables from many sources. For the bank credit ratio/GDP variable; and the ratio of third party funds/banking GDP, using Bank Indonesia's opinion (2015). For the regional revenue using Hur's opinion (2014). For population density variables using research by Sylwester (2003), for poverty variables using Ahmad & Triani (2019), and for unemployment variables using the idea of Deyshappriya (2017).

The research uses a quantitative approach. The data analysis used is the panel data regression method. The panel data equation model can be written as equation (1) – (3):

𝐺𝑅𝑖𝑡 = 𝛽1 − 𝛽2𝐹𝐷1𝑖𝑡 – 𝛽3𝑌𝑖𝑡 + 𝛽4𝐾𝑃𝑖𝑡 + 𝛽5𝑃𝑀𝑖𝑡 + 𝛽6𝑇𝑃𝑇𝑖𝑡 + 𝑢𝑖𝑡……..……...(1)

𝐺𝑅𝑖𝑡 = 𝛽1 − 𝛽2𝐹𝐷2𝑖𝑡 – 𝛽3𝑌𝑖𝑡 + 𝛽4𝐾𝑃𝑖𝑡 + 𝛽5𝑃𝑀𝑖𝑡 + 𝛽6𝑇𝑃𝑇𝑖𝑡 + 𝑢𝑖𝑡………..…...(2)

𝐺𝑅𝑖𝑡 = 𝛽1 − 𝛽2𝐹𝐷3𝑖𝑡 – 𝛽3𝑌𝑖𝑡 + 𝛽4𝐾𝑃𝑖𝑡 + 𝛽5𝑃𝑀𝑖𝑡 + 𝛽6𝑇𝑃𝑇𝑖𝑡 + 𝑢𝑖𝑡………..…...(3)

𝐺𝑅𝑖𝑡 = Gini Ratio, 𝛽2𝐹𝐷1𝑖𝑡= ratio Credit/GDRP (FD1), 𝛽2𝐹𝐷2𝑖𝑡 = ratio asset/GDRP (FD2), 𝛽2𝐹𝐷3𝑖𝑡 = ratio of third party fund/GDRP (FD3), 𝛽3𝑌𝑖𝑡 = APBD (regional revenue), 𝛽4𝐾𝑃𝑖𝑡 = density population, 𝛽5𝑃𝑀𝑖𝑡 = number of poor population, 𝛽6𝑇𝑃𝑇𝑖𝑡 = unemployment rate.

**RESULTS AND DISCUSSION**

**Chow test and Hausman test**

The Chow test is used to classify between Common Effect Model or Fixed Effect Model methods (Baltagi, 2005). If the P-value is smaller than the significance level of 0.05, the selected model is a fixed model. Otherwise, the model used is the Common Effect Model. Based on Table 1, the best method for the three models is the Fixed Effect Model.

**Table 1.** Chow test results

|  |  |  |  |
| --- | --- | --- | --- |
| Redundant Fixed Effect Test | Model 1 (FD1) | Model 2 (FD2) | Model 3(FD3) |
| Chow Test (Prob). | 0.000000 | 0.000000 | 0.000000 |
| Cross-Section F (Statistic) | 3.743542 | 3.848648 | 3.786771 |

Hausman test is used to choose the Random Effect Model or Fixed Effect Model. If the chi-square probability value is smaller than the significance level of 0.05, the Fixed Effect Model model is used. Otherwise, the model used is the Random Effect Model. Based on Table 2, the best method for the three models is the Fixed Effect Model.

**Table 2**. Hausman test results

|  |  |  |  |
| --- | --- | --- | --- |
| Correlated Random Effects | Model 1(FD1) | Model 2(FD2) | Model 3(FD3)-Hausman Test |
| Uji Hausman (Prob.) | 0.0061 | 0.0059 | 0.0085 |
| Cross-section random  (Chi-Sq. Statistic) | 16.278636 | 16.354333 | 15.465474 |

**Panel data regression estimation**

The FD1 (credit ratio per GRDP) has a negative and significant effect on income inequality (Table 3). The results of this study are in line with research conducted by Beck & Levine (2004), Marsossetiawan & Saleh (2016), and Mohsen & Ruixin (2014), explaining that financial development proxied through private sector credit to GRDP has a negative and significant effect on income inequality. Besides, Neaime & Gaysset (2018) found that financial inclusion affected reducing income inequality. The development of the financial sector, especially in the banking sector, can increase access and use of banking services by the public. The public expects open access to banking services through lending to use it for productive economic activities. Conversely, if access to financial services becomes increasingly difficult, the poor can only rely on limited savings to invest, and small entrepreneurs must rely on profits to continue their business. As a result, income inequality does not decrease (Allen, 2012).

The FD2 (asset ratio per GRDP) negatively and significantly affect income inequality. The study results are in line with Clarke et al. (2006), which analyzes the relationship between finance and income inequality for 83 countries. One measure of financial development variables is banking assets, which statistically negative significant.

The FD3 (ratio of third party funds per GRDP) has a negative and significant effect on income inequality. According to Supartoyo et al. (2018), third-party funds as a source of bank funds used for banking activities such as credit can affect the amount of credit distributed to the public. So that more and more third-party funds will increase the amount of credit extended. More and more loans are channeled so that people can also get large loans to reduce income inequality through investment or the development of community-owned businesses obtained from bank credit capital.

The APBD (Y) significantly and positively influenced income inequality in East Java Province in 2013-2017. It is not by the hypothesis in which the Regional Revenue and Expenditure Budget have a negative and significant effect on income inequality in East Java Province. The results are from research by Wardhana (2013) and Qibthiyyah (2017). Wardhana (2013) states that the increasing income inequality is caused by differences in potential, resources, inadequate infrastructure facilities, and high dependency burden. Besides, there is a tendency for differences in the potential sources of revenue in each province, one of which is that regional income can increase income inequality. Meanwhile, Qibthiyyah (2017) regional income has a positive effect on economic inequality. It seems that provinces with high-income sources have high inequality.

**Table 3.** Panel data regression results

Model 1 (FD1) Credit Ratio/GDRP

Variabel Coefficient Std. Error t-Statistic Prob.

C 0.199803 0.034575 5.778895 0.0000

FD1 -0.032977 0.016465 -2.002871 0.0470\*

Y 1.19E-14 1.56E-15 7.604509 0.0000\*

KP 3.61E-05 9.74E-06 3.705200 0.0003\*

PM 0.000404 0.000233 1.735935 0.0847\*\*

TPT 0.001862 0.002215 0.840563 0.4020

Model 2 (FD2) Asset Ratio/GDRP

C 0.197677 0.034581 5.716293 0.0000

FD2 -0.011862 0.005508 -2.153492 0.0329\*

Y 1.17E-14 1.56E-15 7.495113 0.0000\*

KP 3.39E-05 9.21E-06 3.685106 0.0003\*

PM 0.000415 0.000232 1.789863 0.0755\*\*

TPT 0.001749 0.002210 0.791324 0.4300

Model 3 (FD3) Third Party Funds Ratio/GDRP

C 0.201046 0.034483 5.830202 0.0000

FD3 -0.021692 0.010436 -2.078658 0.0394\*

Y 1.18E-14 1.56E-15 7.576894 0.0000\*

KP 3.35E-05 9.19E-06 3.649327 0.0004\*

PM 0.000410 0.000232 1.763982 0.0798\*\*

TPT 0.001732 0.002213 0.782814 0.4350

F-statistic Model 1 (FD1) 8.738883 Prob. 0.000000

F-statistic Model 2 (FD2) 8.789621 Prob. 0.000000

F-statistic Model 3 (FD2) 8.763953 Prob. 0.000000

Adjusted R-squared Model 1 (FD1) 0.632319

Adjusted R-squared Model 2 (FD2) 0.633837

Adjusted R-squared Model 3 (FD3) 0.633071

*\* Significant at the level 5%, \*\* Significant at the level 10%*

The population density (KP) variable significantly and positively influenced income inequality in East Java Province in 2013-2017. A parallel study was conducted by Matondang (2018) that population density is one factor that can increase inequality in income distribution. Population densities that are increasingly dense or continue to increase decrease income per capita and causing inequality conditions increasingly lame.

The poverty (PM) significantly and positively influenced East Java Province's income inequality in 2013-2017. The results are following research by Ahmad & Triani (2019) and Prastowo (2018), who found that poverty has a positive and significant effect on income inequality. Poverty is closely related to income inequality. Income inequality occurs due to the unequal distribution of community income between high-income and low-income groups and the level of poverty or the number of people below the poverty line (Tambunan, 2001).

The unemployment (TPT) has a positive and not significant effect on East Java Province's income inequality in 2013-2017. The unemployment rate is not affected because the open unemployment rate in 38 districts/cities in East Java is relatively low, affecting income inequality (Hariani, 2019). Proper research conducted by Hindun, Ady, & Hariyati (2019) states that unemployment does not affect Indonesia's income inequality.

**CONCLUSIONS AND RECOMMENDATIONS**

**Conclusions**

This study proposes to examine the impact of financial sector development and regional characteristics on income inequality in East Java Province. The estimation shows that the development of the financial sector, which is proxied by the ratio of credit per GDRP, the ratio of assets per GDRP, and the ratio of three-party funds per GDRP, has a negative and significant effect on income inequality in East Java Province.

For regional characteristic factors, it is determined that new things from the APBD variable have a significant positive effect but are not following the hypothesis. Because East Java Province has an unequal portion of local revenue, around 37 percent of the APBD is used for personnel expenditure, while only about 20 percent for capital expenditure. This distribution makes the budget for regional economic development to occur the lowest, making it difficult to improve people's welfare and increase inequality.

Population density and poverty variables have a positive and significant effect on income inequality in East Java Province. However, the unemployment variable does not affect income inequality in East Java Province because the open unemployment rate in 38 districts/cities of East Java is relatively low, affecting income inequality.

**Recommendations**

Income inequality is still a problem that is usually handled by a country and even in regional areas. To mitigate inequality, developing the financial sector, especially banking, is very important because of its affordability in society. With easy access, people can receive credit and investment to encourage economic improvement, improve income, and are also supposed to succeed in income inequality. The government must also give more attention to regional characteristic factors such as regional income, population density, poverty, and unemployment, affecting income inequality. It is expected that the government's policies will be more cautious so that inequality can be decreased.

This study has several conditions, the shortage of literature on the banking financial sector's development variables, such as assets and third-party banking funds. Also, research only reaches in 2017 because the latest available data is not available until 2019. So that in forthcoming studies, it is better to utilize other income inequality notices such as the Williamson Index and Inflation Rate. Furthermore, it can additionally include more variable independent variables, such as government social assistance programs. Furthermore, we can apply different methods to achieve more conclusive results.

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