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Foreign Direct Investment and Inclusive Growth: Does FDI Reduce Income Inequality in Indonesia?

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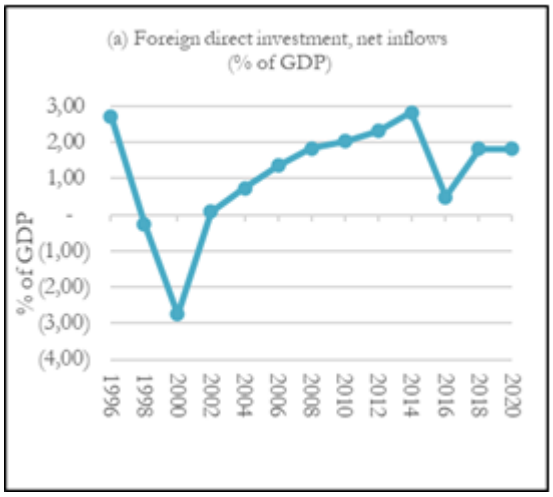
ABSTRAK
Penelitian ini bertujuan untuk menganalisis pengaruh Penanaman Modal Asing (PMA), pertumbuhan ekonomi, dan modal manusia awal terhadap ketimpangan antarwilayah maupun ketimpangan intraregional. Meskipun sejumlah besar penelitian telah mengkaji PMA pada tingkat lintas negara, penelitian ini menitikberatkan pada analisis dinamika PMA dan ketimpangan pendapatan, sekaligus mengkaji pengaruh PMA terhadap ketimpangan pendapatan di Indonesia dengan menggunakan dua instrumen pengukuran ketimpangan pendapatan yang berbeda, yakni Koefisien Gini dan Indeks Williamson. Penelitian ini mempergunakan data runtun waktu Indonesia periode 1996 hingga 2020 yang bersumber dari Badan Pusat Statistik (BPS), Badan Koordinasi Penanaman Modal (BKPM), serta Indikator Pembangunan Dunia (World Development Indicator). Hasil estimasi model ARDL (Autoregressive Distributed Lag) menunjukkan bahwa PMA tidak memberikan pengaruh yang signifikan terhadap distribusi pendapatan rumah tangga yang diukur melalui Koefisien Gini di Indonesia. Akan tetapi, PMA terbukti mampu mereduksi ketimpangan regional sebagaimana tercermin dalam Indeks Ketimpangan Williamson. Temuan ini mengindikasikan bahwa efek limpahan (spillover effect) PMA melalui mekanisme alih teknologi, diseminasi pengetahuan yang lebih mutakhir, serta perluasan kesempatan kerja, berkontribusi dalam mempersempit kesenjangan pendapatan antarwilayah dari kawasan Barat hingga Timur Indonesia. Namun demikian, mekanisme tersebut belum mampu mereduksi ketimpangan pendapatan di dalam lingkup provinsi di Indonesia. Akhirnya, salah satu rekomendasi kebijakan yang dapat dirumuskan berdasarkan hasil penelitian ini adalah perlunya mendorong peningkatan arus masuk PMA ke wilayah-wilayah yang relatif tertinggal di Indonesia dengan mempertimbangkan spesifikasi, keunggulan komparatif, serta keunikan karakteristik masing-masing provinsi, dalam rangka mewujudkan pemerataan distribusi pendapatan secara nasional di Indonesia.

ABSTRACT
This study aims to analyze the effect of FDI, economics growth and the initial human capital on across regional and within regional inequality. Despite the fact that numerous papers studied FDI at cross countries levels, this research focuses on analyzing the dynamic of FDI and income inequality as well as addressing the effects of FDI on income inequality in Indonesia with two different income inequality measurements, namely the Gini Coefficient and Williamson index. This study employs time series data in Indonesia from 1996 to 2020 obtained from BPS, BKPM, and Word Development Indicator. The ARDL statistical results of this study indicate that FDI has no significant effect on household income distribution (Gini Coefficient) in Indonesia. However, FDI can reduce the regional inequality of the Williamson Inequality Index. It means that the spillover of FDI through the transfer of technology, the transfer of more advanced knowledge, and the opening of new jobs are able to close the income gap between the regions from the West to the East of Indonesia but cannot reduce the inequality within the province of Indonesia. Finally, one of the possible recommendations derived from this study is to promote more FDI inflows to underdeveloped regions in Indonesia with the specification, strength, and uniqueness of each province in order to achieve equal distribution of income in Indonesia.

INTRODUCTION

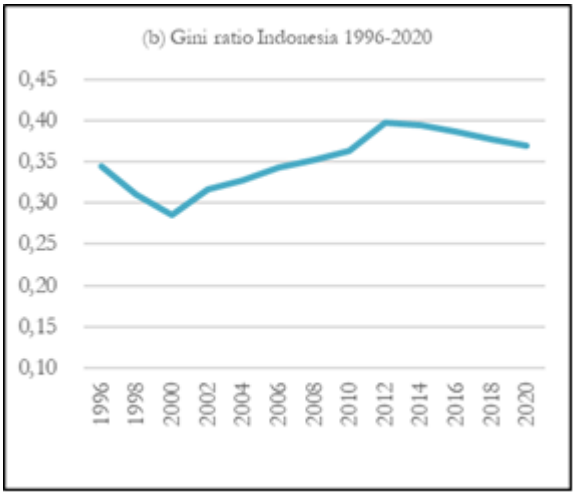
Indonesia is the world's fourth-most populous country, featuring an enormous workforce, high economic growth, and rich natural resources. Thus, this made Indonesia becomes very lucrative to open new market businesses for some stakeholders through FDI. According to Morita & Nguyen (2021), FDI is essential to enhance local firms' quality standards through technology spillovers, also called the quality-enhancing technology spillovers phenomenon. However, among the motivation for having FDI, there are at least two channels for how FDI affects income inequality Farhan et al, (2014). First, according to the Stolper–Samuelson theorem, FDI is urged to help the industry reduce disparities by utilizing abundant low-income unskilled workers in invested regions. Hence, income inequality will be reduced because it will impact employees' wealth. Second, foreign companies tend to provide premium wages for skilled workers, which will increase income inequality. It contradicts previous schemes due to a wage difference between unskilled and skilled workers. Therefore, the two channels lead to different results in economic growth in a country. Information related to FDI inflows and income inequality in Indonesia is depicted in Figure 1 below:

Figure 1. Net inflows of FDI in Indonesia



Source: (a) World Development Indicatios (2023);

Figure 2. Inequality in Indonesia measured by Household Inequality



b) Indonesia Central Bureau of Statistics, (2023)

Figure 1.a illustrates the share FDI inflows to Indonesia for 25 years in the share of the percentage of GDP. It showed clearly that before the Asian crisis 1998, the rate of FDI inflows to Indonesia was relatively high, close to 3%; only since 1998s has the share of FDI to GDP dropped to the lowest rate at minus 2.76% in 2000. Moreover, it grew steadily until returning to its highest percentage, close to 3% in 2014, before experiencing a decline in the next following two years, approaching 0.5% of FDI inflows foreign investment to Indonesia. Importantly, it was the lowest percentage of foreign investment under the government of President Joko Widodo despite a gradual growth in the coming years.

The rate of FDI in Indonesia is relatively increased each year, despite several declines due to the economic crisis (Fajrian et al., 2023), such as in 2000 and 2016. However, Indonesia's income inequality trend has remained unchanged for the last 25 years. It was hovering at the rate of 35% to 37%, which indicates moderate-income inequality. Thus, the link between openness to the global market and Indonesian prosperity is being questioned and has become a concern for the government and Indonesian citizens. Fazaalloh (2019) shows that when Indonesian economic growth increases, income inequality also increases.

However, the trend of Gini coefficients in Indonesia from 1996 to 2020 is relatively steady (figure 1.c). The lowest in Indonesia's Gini coefficient was 29% in 2000 due to the economic shock Asian Financial Crisis (AFC) in 1998 (Hill, 2021). The Gini coefficient recorded its highest point in 2012 at 40%. Then, the Gini coefficient declined slowly from 39% in 2014 to 37% in 2020. Nine provinces had a Gini ratio greater than the national Gini ratio in 2020, including Jakarta (0.40), West Java (0.40), Yogyakarta (0.44), NTB (0.39), South Sulawesi (0.38), Southeast Sulawesi (0.39), Gorontalo (0.41), West Papua (0.38), and Papua (0.40). It shows that most household income was unevenly distributed in certain

provinces (BPS, 2022). Afterwards, it is crucial to address income distribution to the country with over 17000 islands, not less than 300 ethnic groups and more than 270 million people living in Indonesia.

The Williamson Inequality Index measures the development gap between regions, which is an excellent measurement to calculate inequality of inter-region because Indonesia encounters different threads and potentials with a large population spread to 34 provinces (Irawan, 2015). The measurement of income inequality that includes the population in the formula is important to be conducted. This study assesses the effect of FDI on regional disparities, namely the Williamson Inequality Index. It measures the development gap between regions. Hermayeni (2013) believe the Williamson Index is an excellent measurement to calculate inequality of inter-region because Indonesia encounters different threads and potentials with a large population spread to 34 provinces with different natural resources and levels of development. However, the study employed FDI on regional disparity measurement is still rare.

The Williamson Index counts inequality as an aggregate result. It is a comprehensive overview to know which region is the best or worse that contributes to income inequality (Hadri, 2016). Furthermore, Gluschenko (2018) supports the argument that the Williamson index is an appropriate measurement of inequality in a country rather than cross-country inequality. Nevertheless, the calculation of the Williamson index also includes inhabitants' states/regions, which can affect intra-regional income distributions at the national level.

Moreover, a debatable discussion on the effect of FDI on income inequality within the country shows different findings. Ucal et al. (2016) studied the effect of FDI on income inequality in Turkey. It indicates a positive impact in the short run, but the effect disappears in the long run. However, research by Fazaalloh (2019) shows that the effects of FDI on income inequality in Indonesia are indirect and negative via economic growth but insignificant effect via education and trade.

Adams & Klobodu (2017) also show a moderate positive effect of FDI on income inequality in 21 sub-Saharan African (SSA) countries. It indicates restrictions on financial flows to SSA countries should be imposed by the government due to the disadvantages that may appear in a weak economy society. Nevertheless, K.Ravinthirakumaran & N.Ravinthirakumaran (2018) believe that FDI has a negative effect on income inequality in APEC economies. It suggests policymakers lure more FDI and notice a trade-off between productivity gains and more significant income disparity due to FDI.

Therefore, this study is essential to conduct for better analysis with more recent data on the role of FDI in reducing income inequality in developing countries, Indonesia. Finally, this study aims to analyze the dynamic of FDI and income inequality in Indonesia and to investigate the effect of FDI on difference measurement of inequality Williamson Index and Gini coefficient.

LITERATURE REVIEW

Globalization Theory

A world without barriers is a feature of today's civilization marked by the phenomenon of globalization. Globalization is when the boundaries between countries are blurred (borderless) due to technology and information driven by advances in science, technology, economic openness, and international migration. Peter Drucker, a social ecologist from Austria, states that globalization is an "age of social transformation" in which global communication can easily occur, with the rapid growth of international trade and the emergence of global corporate and financial markets.

Scholars believe that globalization is not a new term in economics development. Krugman (2015) revealed before the globalization, industrial revolution has taken place for over a century then the globalization which took a place within a decade to significantly influence worldwide. The effect of globalization has significantly impacted macroeconomic situation through the transmission of exchange rate, international trade, and job opportunity. Furthermore, Stiglitz (2002) describes globalization would not benefit to all nations, especially when it comes to poorer countries. This is since globalization is not well spread in terms of efficiency and inequitably benefits all nations. In fact, social and economic problems are still becoming the main issues such as malnutrition, health disease, internal strife, and drought. For that reason, Jeffrey Sachs (2020) emphasizes globalization is likely to reduce poverty if rich countries provide at least 0.7 percent of country's GDP to poorer country in foreign financial aid. Afterwards, globalization is able to distribute welfare to developing countries more evenly by the development and increase welfare of the local people.

FDI Theory

FDI has been recognized for its benefits of transferring technology, capital, and human resources. FDI in Indonesia is regulated in the provisions of Law 25 of 2007 which explains that FDI is foreign investment in Indonesia carried out by foreign communities both with full capital from abroad and cooperation with foreign communities (RI Law No. 25 of 2007 concerning Investment Capital). Countries

with an open economy will not only get capital flows from abroad but also enter the world market, so they must do export and import. If countries can access technology from more developed countries, it can increase economic growth through the creation of spillover effects, and foreign companies can increase the volume of a country's international trade.

Accordingly, this cycle will have an impact on economic growth through new investment. The new investment will stimulate new job demand, boost consumption, and increase purchasing power. The process of the multiplier effect has a spillover effect on economic growth, both at the regional and national levels. The World Bank defines FDI as cross-border investment associated with a stakeholder in one economy having control or a significant degree of influence on the management of a business that is resident in another economy (World Bank, 2023). It is a form of investment with a minimum of 10 per cent or more of voting stock in an operating business of a foreign economy.

Income Inequality

Population income is said to be evenly distributed to all residents in the area. On the other hand, if the regional income is distributed unequally (there are small, medium, and large) it is said that the region has an inequality in the distribution of income. The theory of inequality in income distribution or widely known as the inverted U curve hypothesis was introduced by Simon Kuznets in 1955. Kuznets argues that initially when development begins, the distribution of income per capita will be increasingly unequal. However, after reaching the highest level of income inequality from the Gini index, the distribution of income becomes more even. According to Todaro and Smith (2010), more equitable distribution in developing countries is a condition or condition that supports economic growth. The more unequal distribution of income in a country will have a negative impact on economic growth. Income inequality between regions depends on the amount of income received by each income recipient in the area, be it community groups or certain areas in the area. The difference in the amount of income received causes a different income distribution, while the size of the difference will determine the level of income distribution (income inequality) in the area. Therefore, this income inequality depends on the size of the difference in the amount of income received by income recipients.

RESEARCH METHODS

This study employs a research method which is in line with Ucal et al. (2016), which used a quantitative approach to see the effect of FDI on income inequality. Then, we added control variables to control the possibility that income inequality within the country can be affected by the stage of economic development variables, namely GDP growth and level of education as the initial of human capital (Yuldashev, et al., 2023). In this case, we assume other variables are ceteris paribus.

As this study focuses on the impact of FDI in Indonesia notably, this study will employ time series analysis using Autoregressive Distributed Lag (ARDL) for a period of 25 years, from 1996 to 2020. Due to the introduction of omnibus laws on the Job Creation Law (Cipta Kerja) No. 11, Year 2020, this study is restricted until 2020. In addition, the quantitative approach of the ARDL model supports a long period of observation data time in the past and present, which consists of the independent variable and the dependent variable that takes into account the long-term and short-term effects of the dependent variable on a unit change in the value of the explanatory variable (Gujarati, 2012). AR model is a model that uses one or more past data from the dependent variable. In contrast, the DL model is a regression linking data at the present time and the past time (lagged) from the independent variables (Gujarati, 2012). The statistical path analysis test and variables observed in this study are stated in the following table:

Table 1 Variables and variable description

Variables	Description and Source
Gini Coefficient (GINI)	Household's expenditure (BPS)
Williamson Index (WI)	Regional disparity (Author's calculation)
Foreign Direct Investment (FDI)	Share of FDI inflows to GDP (WDI)
Gross Domestic Product (GDP)	The growth rate of real GDP per capita (WDI)
Education level (EDU)	Secondary level of education in Indonesia (BPS)

Source: Author (2025)

In this study, FDI is utilized using Inwards FDI as a percentage of GDP. Furthermore, we introduce the level of development as an independent variable linked to the level of economic growth (GDP). In addition, income inequality is measured in two ways; 1. The common income inequality

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measurement Gini coefficient, and 2. Provincial income inequality Williamson index. Data of FDI inward, Gini coefficient and GDP growth derive from BPS Indonesia and World Bank Indicator (WDI). Meanwhile, following to Gluschenko (2018) Williamson index is calculated using the formula by Williamson (1965) as follows:

$$CV_w = \frac{\sqrt{\sum_{i=1}^{n}(yi-\bar{y})^2(\frac{f_i}{n})}}{\bar{y}} \qquad 0<CV_w<1$$

Where:

CV_w	=	Williamson inequality index
y_i	=	Gross regional domestic product (GRDP) in i province
$\bar{y}$	=	Weighted average of GRDP
f_i	=	Number of populations in i province
n	=	Number of populations in Indonesia
i	=	provinces in Indonesia

The following is an estimation using the ARDL Model in Error Correction Model form in short run:

$$\Delta INEQ_t = C_0 + \alpha_1 \mathrm{GROWTH}_{t-1} + \alpha_2 \mathrm{FDI}_{t-1} + \alpha_3 \mathrm{EDU}_{t-1} + \sum_{i=1}^{n} \alpha_1 \Delta \mathrm{GROWTH}_{t-1} + \sum_{i=1}^{n} \alpha_2 \Delta \mathrm{FDI}_{t-1} + \sum_{i=1}^{n} \alpha_3 \Delta \mathrm{EDU}_{t-1} + \varepsilon_t$$

Where delta (∆) is a short-run dynamic. The following is an estimate using the Error Correction Model in the long run.

$$\Delta INEQ_t = C_{0a} \sum_{i=1}^{n} INEQ_t + \alpha_1 \mathrm{GROWTH}_{t-1} + \alpha_2 \mathrm{FDI}_{t-1} + \alpha_3 \mathrm{EDU}_{t-1} + \sum_{i=1}^{n} \alpha_2 \Delta \mathrm{FDI}_{t-1} + \sum_{i=1}^{n} \alpha_3 \Delta \mathrm{GOV}_{t-1} + \sum_{i=1}^{n} \alpha_4 \Delta \mathrm{EDU}_{t-1} + \varepsilon_t$$

A traditional measure of economic development, GDP growth, is introduced to control the possibility that income inequality in the country can be affected by the stage of economic development. Thus, following to the Kuznets Hypothesis, the economic growth (GROWTH) as a process of increasing an economy's production capacity is manifested to have a positive correlation on the income inequality. Further, foreign investment (FDI) as the source of external funds for investment is expected to have a negative effect on the income inequality, whereas educational level (EDU) as the initial human capital is expected to have a positive effect on income inequality.

RESULTS AND DISCUSSION

Before reviewing the estimation results of the ARDL statistical analysis, it is necessary to conduct a unit root test to avoid false regression from time series observation. The unit root test of Augmented Dickey-Fuller (ADF) result stated as follows:

Table 2. Augmented Dickey-Fuller (ADF) Stationary Test

Variables	Unit Root Test	ADF Test	Critical Values 5%	Information
GINI	Level I(0)	-1.6883	0.7249	Non- stationary
	First Difference I(I)	-4.0429	0.0052	Stationary
Williamson Index (CWI)	Level I(0)	-4.5902	0.0066	Stationary
	First Difference I(I)	-4.8775	0.0008	Stationary
GROWTH	Level I(0)	-3.8153	0.0334	Stationary
	First Difference I(I)	-1.2564	0.0000	Stationary
FDI	Level I(0)	-2.9366	0.1694	Non- stationary
	First Difference I(I)	-4.5941	0.0015	Stationary
EDU	Level I(0)	-1.2077	0.3943	Non- stationary
	First Difference I(I)	-3.8997	0.0008	Stationary

Source: Statistical Result (2025)

The Williamson Index (CWI) and GDP growth are stationary at level I(0). Meanwhile, variable GINI, FDI, and EDU are not stationary at the level I (0) since the critical value is more than the significant value 5%. Therefore, it must be done on the first difference I (I). Afterwards, the stationary test of GINI, FDI, and EDU on the first difference I(I) shows the ADF value> the critical value at the levels of 5%. Thus, all variables are stationary in the first difference. In the steps of the ARDL Bound Cointegration Test, we compare the F-statistic value with the lower bound I(0) and the upper bound I(1). If F-statistic value is below the lower bound I(0), it can be concluded that there is no cointegration. However, if the F-statistic value is above the upper bound I(1), then there is a cointegration among the variables. Then, if the F-statistic is between the lower bound and upper bound values, then the result is inconclusive. The results of the cointegration test in this study using the Bound test approach can be seen in the table below:

Table 3. Cointegration Bound Test

Variables model 1	F-statistic	Cointegration	Lag Optimal
GINI, FDI, GROWTH, EDU	6.67	Cointegration	1,1,1,4
	Critical Value	Lower Bound I(0)	Upper Bound I(1)
	1%	4.3	5.23
	5%	3.38	4.23
	10%	2.97	3.74
Variables model 2	F-statistic	Cointegration	Lag Optimal
CWI, FDI, GROWTH, EDU	7.71	Cointegration	1,4,1,2
	Critical Value	Lower Bound I(0)	Upper Bound I(1)
	1%	5.17	6.36
	5%	4.01	5.07
	10%	3.47	4.45

Source: Statistical Result (2025)

Based on the cointegration bound test results in the table above, the F-statistic value is 6.67. This value is greater than the upper bound at the significance level of 1%, 2.5%, 5%, and 10%, which means cointegration exists between the variables in the model in a short-term to long-term equilibrium. Afterwards, we can be confident that our models are suitable for the ADRL test to estimate the short-run and the long run ARDL cointegration test.

Despite an increase in the rate of economic growth, Indonesian income inequality has also increased (Bayu Kharisma, 2013). The Gini index was 32% in the beginning of observed years. Then, it increased to 37% in 2020 (Graph 1.b). Its values range from 0 (equal) to 1 (unequal). Likewise, the increase in the Gini coefficient indicates an increase in the inequality of Indonesian revenues. This research uses the income distribution criteria, with the following classifications: a. If the Gini ratio is between 0.50-0.70, indicating unequal distribution, b. if the value lies between 0.36-0.49, it indicates a moderate gap and c. If it lies between 0.20-0.35, it is stated that equity is relatively high.

The income gap widened a decade after the economic recovery following the 1998 and 2008 crises and is among the largest in Asia and the Pacific (Sulistyaningrum & Tjahjad, 2022). In 1990, the wealthiest 20% of Indonesia's population controlled 39% of the total expenditure of the total population in Indonesia. From 2010 to 2014, the trend for income inequality is increasing, in result, a decrease in the expenditure made the low-income group has increased too. Also, the total expenditure of the wealthiest 20% of people in Indonesia rose by approximately 44% of total spending. Nonetheless, Indonesia's income inequality is generally relatively good compared to other countries in the Lower Middle-Income group (Wibowo, 2016). For the short-run analysis, the effect of FDI, economic growth, and education in Indonesia can be inferred from Table 4 as follows:

Table 4. Short-run ARDL Error Correction Model Test Result

Model 1: Short-run ARDL Error Correction Model Test Result (Gini Coefficient)			
Variable	**Coefficient**	**Std Error**	**t-Statistic**
D(Growth)	0.002747	0.001638	1.676594
D(FDI)	0.000322	0.002844	0.113176
D(EDU)	-9.37E-0.5	0.001899	-0.049366
CointEq(-1)	-0.392705	0.106785	-3.677524*
R-squared	0.594533	F-statistics	16.34504

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Adj R-squared	0.420762	Prob (F-stat)	0.000586
Model 2: Short-run ARDL Error Correction Model Test Result (Williamson Index)			
D(Growth)	-0.000144	0.001646	-0.087548
D(FDI)	-0.001635	0.003219	0-0.508003
D(EDU)	0.012261	0.002880	4.256784*
CointEq(-1)	-0.488905	0.110791	-4.412863*
R-squared	0.747651	F-statistics	44.76499
Adj R-squared	0.61770	Prob (F-stat)	0.000000

* Significance at the level of 5%.
Source: Statistical Result (2025)

Short-run dynamics of the variable's observation can be appropriately examined through the ECT value. ECT or CointEq has a negative sign and is significant at α = 5%, which means that co-integration exists in the long run with the speed of adjustment by 39.2% and 48.9% to the long-run equilibrium for model 1 and model 2, respectively. In the short-run, FDI and economic growth do not influence income inequality for both model 1 and model 2. It shows from significant 5% of probability. Research from K. Ravinthirakumaran & N. Ravinthirakumaran (2018) shows that developing countries accumulate capital, in the long run, to drive economic growth and compensate for domestic savings gaps. Bogliaccini & Egan (2017) states that FDI is likely to generate income inequality because the range of skills is wide, from high-skilled workers such as medical, lawyers, and accountants to low-paid skilled workers such as servants. In addition, a working contract that is quite long may decrease the possibility of wage upgrading for low-skilled labor. Therefore, the effect of FDI and economic growth is significant neither for the within regional inequality nor between regional inequality in the short run.

Then, the short-run ARDL statistical results show that educational level does not significantly influence income inequality within the province in Model 1. However, it significantly affects regional inequality for model 2 in a short-run period. It can be interpreted as a 1% increase in employees' levels of education will increase the Williamson Index by about 0.012 (1.2%). The result is in line with Yuldashev et al., (2023), which implies a high educational level is necessary to increase the labour force's productivity. In addition, workers with a high initial human capital take a high benefit from foreign capital to operate modern enterprises. It made foreign enterprises more likely to work with skilled employees. Consequently, there has been a huge opportunity gap between skilled and unskilled workforce, increasing the cross-region disparity.

In order to prevent income inequality, foreign capital should be evenly distributed across regions and sectors in a country. Only then can the economy benefit from an increased national income, average earnings, and employment rate. Uneven access to foreign capital leads to heterogenous growth opportunities across sectors and dwindling wage levels within and between regions. Furthermore, the estimation results obtained for the long-run analysis for the Gini coefficient and Williamson index in the ARDL model are presented in Table 5 below:

Table 5. Long-run ARDL Model Test Result

Model 1: Long-run ARDL Test Result (Gini Coefficient)			
Variable	**Coefficient**	**Std Error**	**t-Statistic**
Growth	0.026231	0.011473	2.286247*
FDI	-0.009796	0.008127	-1.205366
EDU	0.004217	0.000798	5.285093*
EC = GINI – (0.0262*GROWTH – 0.0098*FDI + 0.0042*EDU)			
Model 2: Long-run ARDL Test Result (Williamson Index)			
Growth	0.036198	0.010600	3.414779*
FDI	-0.033291	0.012595	-2.643165*
EDU	0.000439	0.000748	0.586620
EC = CWI – (0.0362*GROWTH – 0.0333*FDI + 0.0004*EDU)			

* Significance at the level of 5%.
Source: Statistical Result (2025)

The table above gives information on the long-run effect of the observed variables (Growth, FDI, and EDU) on the dependent variables, namely the Gini Coefficient (GINI) and Williamson Index (CWI). In the long run, GDP growth contributes positively to income inequality. It is statistically interpreted as an increase of 1 per cent in GDP growth will contribute to an increase as much as (0.026231) 2.6% to Gini Coefficient (GINI), confirming that GDP significantly increases households' inequality.

This result aligns with the results of Adams & Klobodu (2017) note that high GDP growth is less correlated with employment-generating processes, which consequently it is unlikely to provide access to jobs and open an income stream for the local people. Nevertheless, for the model 2 the economy growth significantly influences regional disparity. It can be inferred from Table 5 that if economic growth increases by 1 per cent, the regional disparity will also increase by 0.036198 (3.6%) in the long run. Chancel et al. (2022), in World Inequality Report, convey that the top 10% of people in Indonesia earn an income equal to 48% in a year, while the bottom 50%of people in Indonesia earn income that is equivalent to just 12.4% of total income share in a year.

Furthermore, FDI does not influence income inequality of the Gini coefficient, with the coefficient in a negative sign of -0.009796 (0.97%). The insignificant impact of FDI on inequality is in line with research conducted by Fazaalloh (2014) and is opposed to Ucal et al. (2016) and Adams & Klobodu (2017). Fazaalloh (2014) conveys that the number of FDI inflows is less significant to reduce inequality compared to the effect of local authority, for example the government funds to alleviate the inequality. However, the statistical test for model 2 concludes that FDI significantly reduces regional disparity of the Williamson index. The statistical results imply if the variable of FDI increases by 1%, the regional disparities decrease by 0.033291 (3.3%).

The result aligns with a study conducted by K.Ravinthirakumaran & N.Ravinthirakumaran (2018), and BKPM (2022) shows that FDI Indonesia has focused on distributing FDI equally from the west to the east of Indonesia. Figure 2 below gives information on FDIs' realization based on location in Indonesia for the last five years. According to BKPM (2022), amongst 27.271 projects in the last five years, West Java, DKI Jakarta, and Banten have always been the top three regions most receiving FDI funds. Sequentially, the share of FDI inflows to the east of Indonesia, such as Papua, Central Sulawesi and North Maluku, start to grow and is currently recorded as the fifth most foreign investment recipient destination regions in Indonesia. Lindblad (2015) conveys that the effect of FDI, such as the transfer of technology, the transfer of more advanced knowledge, and the opening of new jobs, begin to distribute evenly to all regions in Indonesia. Moreover, the government has designed a strategic investment program, namely Indonesia Special Economic Zones (SEZs). It is expected to spread economic development equally to all provinces from the West to the East of Indonesia.

Further, new regional one-stop integrated access centers (PTSPs) and the OSS system were steps in the right direction to improve the business licensing process throughout the country, aiming to harmonize central and regional regulations and ease the investment process. Thus, the ARDL test result shows insufficient evidence to reject the second hypothesis of FDI significantly influencing income inequality of the Williamson index in Indonesia. It aligns with the Kutzet hypothesis that regional inequality follows an inverted U-shaped pattern throughout economic development. It can be understood that some provinces were highly developed due to investment support from abroad (Vujanović et al., 2021).

CONCLUSION

Indonesia strives to conquer an equal income distribution with an external funding source, namely FDI. Thus, it requires good policy to achieve social equity both at cross-regional and within regional measurements. Research findings provided that, in the long run. FDI is not cointegrated with income inequality using the Gini coefficient. In contrast, FDI is correlated with income inequality using the Williamson Index. Furthermore, the regional disparities method is more sensitive when estimating the effect of FDI inflows in Indonesia. The strategic investment programs designed, such as Special Economic Zones and One Single Submission by the government, shows a positively contribute to narrow the regional disparities in Indonesia. Therefore, the first hypothesis of FDI significantly influencing income inequality using the Gini coefficient in Indonesia is rejected. On the contrary, the second hypothesis of FDI significantly influencing income inequality using the Williamson index in Indonesia cannot be rejected.

RECOMMENDATION

A possible recommendation from this research is that public policy should promote the inflows of FDI and inclusive growth to reduce income inequality. The government should address the income inequality issue in Indonesia, especially those related to foreign investment that might not benefit certain sectors or a specific region only. Moreover, despite a growing GDP growth, rural areas should benefit

equally by reducing income inequality. The government needs to assist underdeveloped regions through community empowerment programs that can improve the quality of human resources and acquire necessary skills to work professionally. Finally, with the right policies underdeveloped regions are expected to grow through the absorption of ideas and innovation of technology brought by foreign investors and finally reduce the overall income inequality in Indonesia.

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