Efficient Vol 9 (1) (2026): 1-14 DOI: https://doi.org/10.15294/efficient.v9i1.36679

EFFICIENT

Indonesian Journal of Development Economics

https://journal.unnes.ac.id/sju/index.php/efficient

The Effect of Human Development Index, Foreign Direct Investment, and Technology on Income Inequality in Six Asian Countries

Nasywa Anindita Athaullah, Dwi Darma Puspita Sari✉, Feny Marissa

Development Economic Study Program, Faculty of Economics and Business, Universitas Sriwijaya

Permalink/DOI: https://doi.org/10.15294/efficient.v9i1.36679

Submitted: July 2025; Revised: October 2025; Accepted: January 2026

Abstract

Economic growth usually shows how much a country has grown. The ASEAN-5 which includes Indonesia, Malaysia, Thailand, Singapore, and the Philippines are important for Southeast Asia's economy. This study examines the effect of government spending, gross fixed capital formation, and labor on economic growth in the period 2000–2023 using secondary data from the World Bank. This study applies panel data regression through the Fixed Effects Model (FEM). The findings show that government spending, gross fixed capital formation, and labor have a positive and significant impact on economic growth in the ASEAN-5 countries. Thus, the effectiveness of government spending, optimization of fixed capital investment, and utilization of productive labor are important factors in promoting sustainable economic growth in the region.

Keywords: Government Expenditure, Gross Fixed Capital Formation, Labor Force, Economic Growth, ASEAN-5

How to Cite: The Effect of Human Development Index, Foreign Direct Investment, and Technology on Income Inequality in Six Asian Countries. (2026). Efficient: Indonesian Journal of Development Economics, 9(1), 1-14. https://doi.org/10.15294/efficient.v9i1.36679

© 2026 Semarang State University. All rights reserved

✉ Correspondence Address :
Address: Gedung L2 Lantai 2 FE Unnes
Kampus Sekaran, Gunungpati, Semarang, 50229
E-mail : dwidarmaps@fe.unsri.ac.id

INTRODUCTION

The long-term effects of income inequality on welfare, poverty, and development sustainability have developing countries on edge. Economies in Asia have grown significantly, but this growth hasn't translated to improved income distribution – a discrepancy that suggests a missing link in the growth-development relationship. This discrepancy suggests a missing link in the growth-

development relationship. Theories like the Kuznets curve and growth theory explain the inverse relationship between economic development and inequality.

Table 1. Gini Ratio in Six Asian Countries from 2019-2023

Year	Indonesia	Thailand	India	Sri Lanka	Lebanon	China
2019	0.5784	0.612	0.612	0.5655	0.6448	0.5539
2020	0.5784	0.6185	0.5992	0.5655	0.6448	0.5602
2021	0.5784	0.6356	0.6012	0.5655	0.6448	0.5613
2022	0.5784	0.6356	0.6089	0.5655	0.6448	0.5644
2023	0.5784	0.6356	0.6089	0.5655	0.6448	0.5644

Source: World Bank, 2025

When it comes to health, education, and living standards, the expectation is that inequality decreases as individuals create more value. However, institutional quality, labor market organization, and regional ineqalso play a role uality (Heshmati, 2019). This study aims to fill a research gap by examining the relationship between ultimate and proximate determinants of inequality in Asia using a cross-country study design.

Six countries – Indonesia, Thailand, India, Sri Lanka, Lebanon, and China – offer a diverse framework for analyzing varying economic structures, human development levels, and inequality patterns. China and Thailand have increased human development and reduced inequality, while Lebanon struggles with inequal persistentity.

In contrast, Lebanon still struggles with the selected countries – inequality. Indonesia and India face significant regional disparities, and Indonesia also lacks equitable public service distribution. The selected countries provide a rich analytical backdrop to examine the varying patterns and forms of inequalities. Over the past decade, economic development and inequality have been studied with a growing emphasis on empirical evidence. Theories like the Kuznets curve and growth theory explain the inverse relationship between economic development and inequality. The Kuznets curve suggests that structural changes reduce inequality as development progresses. Growth theory emphasizes the importance of human resources, investments, and technology, which are positively correlated with economic development.

It is legitimate, therefore, that these theories combine to explain the expected relationship between HDI, FDI, technology, and inequality (within and among countries) through a variety of channels and mechanisms, positively and differently.

This study examines the impact of human development index, foreign direct investment, and technology on income disparity in the Asian-6 countries from 2009 to 2023. The study aims to contribute to the literature on disparity and assist policymakers in addressing the challenges of inequality in a more sustainable and inclusive manner.

In analyzing income inequality, the statistical measurement tool used is the Gini index, which is based on the Lorenz curve. This curve compares the cumulative distribution of actual income with the ideal, even distribution

of income (Janah, 2022). The Gini index value ranges from 0 to 1. A value of 0 means perfect income equality, while a value of 1 indicates that all income is controlled by a single individual or group (Todaro & Smith, 2003).

Table 2. Human Development Index in Six Asian Countries 2019-2023 (Scale 0-1)

Year	Indonesia	Thailand	India	Sri Lanka	Lebanon	China
2019	0.718	0.801	0.638	0.775	0.76	0.775
2020	0.712	0.8	0.638	0.777	0.742	0.781
2021	0.707	0.797	0.633	0.783	0.725	0.785
2022	0.713	0.803	0.644	0.78	0.723	0.788
2023	0.743	0.804	0.644	0.78	0718	0.79

Source: World Bank, 2025

Table 1 shows the Gini coefficient, which measures income inequality, for Indonesia, Thailand, India, Sri Lanka, Lebanon, and China over the past 5 years. On average, Lebanon has the highest level of inequality with a Gini coefficient of 0.645 over the past 5 years. China had the lowest income inequality index value, which was 0.564 in 2023.

The Human Development Index (HDI) is an important indicator for measuring the quality of life, encompassing education, health, and a decent standard of living (Saputro, 2022). Education, as a key component of the HDI, plays an important role in reducing inequality. A high level of education reflects an individual's ability to absorb technology, access complex jobs, and earn higher incomes (Suradi, 2012). Thus, improving the quality of human resources will narrow the economic and social gap. The productivity level of society is also directly proportional to the HDI.

Table 3. Foreign Direct Investment Tahun 2019-2023 (% of GDP)

Year	Indonesia	Thailand	India	Sri Lanka	Lebanon	China
2019	2.233	1.017	1.785	0.835	3.694	1.311
2020	1.811	-0.858	2.406	0.515	5.067	1.723
2021	1.788	3.04	1.412	0.668	2.593	1.931
2022	1.873	2.392	1.489	1.192	2.51	1.064
2023	1.571	1.265	0.787	0.844	0	0.24

Source: World Bank, 2025

The HDI is not only an indicator of well-being but also reflects the economic potential of a region (Azim et al., 2022). Increasing the HDI will lead to higher productivity, which can ultimately increase community income (Faqihudin, 2010). Table 2 shows the Human Development Index (on a scale of 0-1) for Indonesia, Thailand, India, Sri Lanka, Lebanon, and China over the past 5 years. In 2023, Thailand led with the highest value of 0.804, indicating the most advanced human development achievement compared to other

countries during that period. This figure far exceeded the values of other countries in the data. Conversely, India has the lowest HDI among other countries, but it also shows steady growth, indicating gradual improvements in human development. Table 3 shows Foreign Direct Investment (% of GDP) for Indonesia, Thailand, India, Sri Lanka, Lebanon, and China over the past 5 years. Lebanon leads with the highest average FDI at 5.604295086 percent of GDP, while Sri Lanka has the lowest average FDI at 1.056699262 percent of GDP.

Table 4. Technology Index in Six Asian Countries 2019-2023 (Scale 0-10)

Tahun	Indonesia	Thailand	India	Sri Lanka	Lebanon	China
2019	5.32	5.62	2.61	3.07	4.1	5.36
2020	5.59	5.68	2.63	3.11	4.1	5.41
2021	5.76	5.85	2.68	3.15	4.3	5.52
2022	5.85	5.94	2.74	3.19	4.2	5.56
2023	5.9	5.97	2.83	3.27	4.1	5.62

Source: World Bank, 2025

Beside HDI and FDI, which are closely related to income inequality, there is also technology. According to Simon Kuznets in (Jhingan, 2004), economic growth is heavily influenced by technological advancements. Technology increases efficiency, opens up digital job opportunities, and supports innovation and productivity. However, access to technology is not yet evenly distributed. Communities in remote or low-income areas are often unable to access and utilize technological advancements (Dewi et al., 2022) As a result, income inequality is also widening.

Technology Index in Six Asian Countries 2019-2023 (Scale 0-10)From the data in Table 1.4, it can be seen that the growth of the technology index (on a scale of 0-10) in Indonesia, Thailand, India, Sri Lanka, Lebanon, and China over the past 5 years. Thailand continued to experience an increase, reaching almost 6 in 2023, with a score of 5.97, followed by Indonesia with a score of 5.90 in 2023. Lebanon remained relatively stable over the past 5 years, ranging from 4.1 to 4.3 in 2021. India and Sri Lanka showed the lowest technology development index, ranging from only 2.61 in India to 3.27 in Sri Lanka in 2023, compared to the other four countries.

Income inequality between regions is influenced by several key factors. First, the difference in the human development index between regions indicates inequality in the quality of life of the community. Second, uneven investment allocation leads to disparities in economic growth between regions. Then, the ease of access to technology between regions limits new opportunities such as jobs, business innovation, and so on. As a result, some regions experienced rapid growth while others lagged behind and struggled to catch up

RESEARCH METHODS

This study focuses on six Asian countries: Indonesia; Thailand; India; Sri Lanka; Lebanon; and China. The six Asian countries because represent diverse economic structures, HDI trajectories, and inequality dynamics. The research period (2009–2023) is selected as it captures post–global financial crisis adjustments,

rapid technological expansion, and major policy and institutional shifts across Asia that are relevant to income inequality trends. Panel data regression is used with three possible estimators: the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM).

Model selection follows the standard decision hierarchy, namely Chow Test to determine whether CEM or FEM is more appropriate to use, Hausman Test to determine whether FEM or REM is more appropriate to use and Lagrange Multiplier (LM) Test to determine whether CEM or REM is more appropriate to use if required. This sequence ensures that the estimator chosen is the most appropriate given the structure of the data. The panel regression model is specified as:

$$GINI_{it} = \alpha_{it} + \beta_1 IPMit + \beta_2 FDIit + \beta 3 TKNit + \epsilon_{it}$$

Where GINI represents income inequality and serves as the dependent variable, IPM is the Human Development Index measured in the scale of 0-1, FDI measured in percentage of GDP, and TKN represents Technology measured in the scale of 0-10. IPM, FDI and TKN serves as independent variable.

RESULTS AND DISCUSSION

The findings of the panel data analysis for Indonesia, Thailand, India, Sri Lanka, Lebanon, and China are covered in this chapter. The time frame under observation, which spans from 2009 to 2023, provides a fairly broad picture of income inequality in each country. After experimenting with several model specifications and assessing them using the Chow and Hausman tests, the Fixed Effect Model was chosen because it produced estimates that made the most sense for this dataset and more correctly reflected the differences between countries. Before analyzing the regression results, I reviewed the descriptive statistics for the variables.

This enhanced my comprehension of the information, especially the variations in the economic conditions of the various countries. If these basic patterns had not been recognized beforehand, the interpretation of the regression results would have been less significant.

Table 5. Descriptive Statistics Output

	GINI	IPM	FDI	TKN
Mean	37.0477	0.7249	2.4028	3.93244
Median	36.9000	0.7425	1.81489	3.88500
Maximum	45.8000	0.8040	13.5696	5.97000
Minimum	30.6000	0.5620	-0.8579	1.8000
Std. Dev.	3.3374	0.0598	2.1279	1.19025
Skewness	0.73986	-0.9082	2.0509	0.1750
Kurtosis	3.88717	3.00054	5.86510	1.7442
Jarque-Bera	11.1624	12.37255	489.996	6.373217
Probability	0.0037	0.00206	0.0000	0.041312
Sum	3334.30	65.2420	216.253	353.920
Sum Sq. Dev.	991.285	0.31885	403.014	126.086
Obs	90	90	90	90

Source: Data Processed, 2025

Six Asian countries Indonesia, Thailand, India, Sri Lanka, Lebanon, and China sampled 90 observations from 2009 to 2023. This data quantity is useful because it provides sufficient variation in panel analysis over time across countries.

The average income inequality (GINI) is 37.04 with a standard deviation of 3.33, the average HDI is 0.724 with a standard deviation of 0.059, the average FDI is 2.403 percent of GDP with a standard deviation of 2.128, and the average technology is 3.93 with a standard deviation of 1.19. The lowest income inequality across six Asian countries from 2009 to 2023 was

found in Lebanon at 30.6, India at 0.562, Thailand at -857.99 percent of GDP, and India at 1.80. The highest income inequality across six Asian countries from 2009 to 2023 was found in Lebanon at 45.8, Thailand at 0.804, Lebanon at 13.57 percent of GDP, and Thailand at 5.97 percent of GDP.

Table 6. Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	12.84086	(5,81)	0.000
Cross-section Chi-square	52.53234	5	0.000

Source: Data Processed, 2025

The Common Effects Model (CEM), the Fixed Effects Model (FEM), and the Random Effects Model (REM) are the three primary methods for estimating the structure of your model while performing panel data regression. You must determine which one best suits your data after testing those. To choose between CEM and FEM, we used the Chow test; to choose between FEM and REM, we used the Hausman test. These assessments ought to direct you toward the appropriate model for your course of study. We conducted tests to determine which panel data model best fits the data. The following tables show the outcomes of the Chow, Hausman, and LM Breusch-Pagan tests.

Table 7. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	24.726885	3	0.0000

Source: Data Processed, 2025

The results of the Chow test are displayed in Table 6. The alternative hypothesis (Ha) is accepted since the probability value (0.0000) is less than 0.05. Thus, the best approach is the Fixed Effect Model (FEM). We employed the Hausman test to determine if the Random Effect Model (REM) or FEM would be a better fit for the panel data regression. The table shows the outcomes.

The probability value of 0.0000 is less than the predefined significance level of 0.05, according to the results shown in Table 3. Consequently, the null hypothesis (Ho) is disproved. It is determined that the Fixed Effect Model (FEM) is the best estimating model.

Table 8. Estimation Results of the Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	76.558	10.870	7.042	0.000
IPM	-49.262	17.578	-2.802	0.063
FDI	-0.979	0.184	-5.302	0.000
TKN	-0.367	0.635	-0.578	0.564
R-squared	0.499			
Adjusted R-squared	0.449			
F-statistic	10.086			
Prob (F-statistic)	0.000			

Source: Data Processed, 2025

The results of a test to choose the optimal model indicated that FEM was the most suitable model to employ in this investigation. Based on these results, the researchers carried out the following statistical tests in line with the chosen model.

Based on the estimation results using the Fixed Effect Model (FEM), it was found that the constant value was positive at 76.558 and significant, indicating that if the HDI, FDI, and

technology were fixed or constant, then the income inequality value would be 76.558. The Human Development Index (HDI) variable showed a regression coefficient of -49.262 in this case indicating that every 1 percent increase in HDI would result in a decrease in income inequality of -49.262. Furthermore, the Foreign Direct Investment (FDI) variable showed a regression coefficient of -0.979 percent meaning that every 1 percent increase in FDI would result in a decrease in income inequality of -0.979.

The Technology variable showed a regression coefficient of -0.367 indicating that every 1 percent increase in Technology would result in a decrease in income inequality of -0.367. In terms of model quality, the R-squared value of 0.499 indicates that 49.9% of the variation in income inequality (Gini) can be explained by the independent variables in the model, while the remainder is influenced by factors outside the model. A Prob(F-statistic) of 0.000 confirms the model's overall significance.

The Prob(F-statistic) value of 0.000 < 0.05 indicates that Ha is accepted and Ho is rejected. This indicates that simultaneously, the variables Income Inequality (GINI), Human Development Index (HDI), Foreign Direct Investment (FDI), and Technology (TKN) significantly influence Income Inequality (GINI) in six Asian countries: Indonesia, Thailand, India, Sri Lanka, Lebanon, and China, from 2009 to 2023.

The regression results using the Fixed Effects Model (FEM) show an R-squared value of 0.499055 and an Adjusted R-squared value of 0.449579. This means that the independent variables used in this study, namely the Human Development Index (HDI), Foreign Direct Investment (FDI), and Technology (TKN), together explain 44.95% of the variation in income inequality, while the remaining 55.04% is explained by other factors beyond the scope of this study.

Human Development Index (HDI) has a negative impact on income inequality in six Asian countries from 2009-2023, as shown by the results of panel data regression analysis, which indicate a calculated t-value of 2.802420, greater than the t-table value of 1.98793 (2.802420 > 1.98793), and a probability value of 0.0063 < 0.05. Therefore, Ho is rejected and H1 is accepted, indicating that the research successfully proves the hypothesis.

This finding aligns with the results of research by (Makipantung et al., 2023) which states that the Human Development Index (HDI) has a negative and significant effect on income inequality in Minahasa Regency, North Sulawesi, and that increasing the HDI can reduce income inequality.

This is also in line with the findings of (Farhan & Sugianto, 2022), who noted that the HDI affects income inequality on the island of Java. However, in the opinion of (Wijayanti & Putri, 2023), who also conducted research on Java, the HDI did not significantly affect income inequality, indicating that other factors may be more dominant in that context and depend on the regional context being studied.

An elevating HDI shows that a country has developed its human resources, which is consistent with endogenous growth theory. Health, education, and standard of living (the components of the HDI) constitute the investments that increase labor productivity and economic engagement (Todaro & Smith, 2003).

A high HDI level in a region is generally a sign of less income inequality since people have enough education, good healthcare, and earn decent wages. Improved education increases economic value of labor, and improved

healthcare increases the productivity of the people, which results in equitable distribution of economic opportunities. On the other hand, when the HDI is low, the lack of education and healthcare services increases income inequality because a large number of people are trapped in low wages or the informal sector.

The fact that income inequality is high can also limit the extent to which HDI can be improved since poor people are unable to access basic services, which leads to a persistent cycle of poverty. As such, improving access to education, healthcare, and living standards with the purpose of improving HDI is increasingly becoming a crucial approach to reducing income inequality and fostering inclusive development in Asia, especially in developing countries.

The analysis regarding the actual HDI situation in the six selected countries indicates that China is the leader with the best HDI record due to the fact that the government gives strong support to the provision of basic education that is equitable to all, and that there is broad universal health coverage. Bahia, Sri Lanka has a high HDI record due to the provision of a public service system that is fairly equitable and accessible to all the constituents.

Thailand also continues to record HDI increases as a result of the provision of universal health coverage and the improvement of education particularly in the rural areas. Indonesia's HDI is also increasing albeit gradually and there is still a significant gap with other countries due to its persistent regional imbalances and inequities in the public service.

The imbalances in social services have also affected India the most, wherein the slow rate of HDI increases can be attributed to the poor state of its infrastructures and the high population density, although its social programs were quite useful. Lebanon, although in the middle HDI group, has not been able to reduce inequality as a result of lack of equity in access due to the political and social instabilities and the unevenly developed areas of the country. This situation also demonstrates that the influence of the HDI on inequality is more considerable, but is also context-specific.

Foreign Direct Investment negatively affects income inequality in six Asian countries from 2009-2023. The results of panel data regression testing show that the calculated t-value of 5.302035 is greater than the t-table value of 1.98793 (5.302035 > 1.98793), and the probability value is 0.0000 < 0.05. Therefore, H0 is rejected and H1 is accepted, which means the FDI variable has a significant negative effect.

This aligns with research by (Fazaalloh, 2019), which highlights that although FDI is necessary to drive economic growth, there is a trade-off between economic growth and income inequality, particularly in developing countries. The research indicates that FDI benefits particular segments of society, especially the highly skilled, leaving others disadvantaged.

This corresponds with (Hakim & Rosini, 2022), whereby despite FDI's contribution to economic growth of a region, the economic growth vis-à-vis the levels of income inequality resulted in a negative relation. This is also supported by (Lessmann, 2013), where FDI remains more beneficial for developed areas, thereby widening the gap between the developed and the underdeveloped. Other studies show that a rise in FDI is associated with a decline in income inequality.

FDI leads to technology transfer, new knowledge, and improved managerial skills and productivity of the local employees (Adiastuti, 2011). This, as per endogenous growth theory,

fosters economic growth by creating more inclusive development through more employment opportunities. The Kuznets hypothesis also supports that economic growth, including FDI, after reaching a certain development stage, economic inequality declines. FDI enhances innovation and more diversified economic developments. It achieves lower economic concentration by sectors and less disparity in economic development between regions, thus aligned with the Kuznets hypothesis (Todaro & Smith, 2011).

The largest recipient of FDI throughout the researched years was China. The Chinese government managed to steer foreign investment toward its manufacturing and high-tech industries which assimilated millions of workers into the economy and created a sizeable middle class. Furthermore, the development of special economic zones and policies of fiscal decentralization spurred economic development in previously lagging regions.

FDI in China not only promotes economic development, but it also reduces income inequality on a cross-regional basis. While income inequality gaps between the coastal and inland regions still persist, FDI has made economically beneficial impacts on a substantial number of previously lagging regions. After economic reforms in the early 1990s, India also witnessed a considerable FDI uptick. However, India's income inequality impacts of FDI remained restricted.

The FDI that India receives is predominantly in the IT and Financial Services sectors, which are both capital-intensive and high-skill service sectors, thereby economically benefiting educated segments of the urban areas more than the unskilled rural areas. Nevertheless, initiatives such as infrastructure investment and Make in India, which are aimed at the manufacturing sector, attempt to spread the FDI more evenly to the economically lagging regions, thus supporting the potential for a reduction in income inequality over time.

Foreign Direct Investment (FDI) has been particularly constructive in fostering growth across the manufacturing, mining, and infrastructure sectors in Indonesia. With the construction of Interstate tollroads, FDI inflow into inter-Java infrastructure projects will likely be countered by government investments into non-Java infrastructure projects.

With the emerging of non-Java construction projects, the government will have measures in place to mitigate sectoral imbalances by constraining FDI into construction. Detailing FDI inflows into construction projects will likely minimize the inequality impacts of imported labor, as knowledge and technology will not flow into the other sectors of the economy through construction.

With the non-technology reliant and labor absorbing construction projects, inequality impacts may be offset by the internal immigration of labor into the inter-Indonesia construction projects. In anticipation of the construction projects, the short-term regional inequality impacts will likely be balanced by other sectoral measures to contain construction FDI inflows.

In anticipating the impacts of imports used in the construction projects, the inequality impacts will be balanced by regional labor immigration to the area of inter-Indonesia construction projects. With the non-technologically reliant and labor absorbing construction projects, inequality impacts may be offset by the internal immigration of labor into

the inter-Indonesia construction projects. Sri Lanka has experienced an increase in FDI in recent decades, particularly after the end of the civil conflict.

However, the flow of FDI is still limited and concentrated in the property, tourism, and service sectors, which do not always have a direct impact on lower-income groups. The disparity between the western and eastern regions of Sri Lanka also indicates that FDI has not been sufficiently geographically dispersed. Nevertheless, the government has attempted to attract investment to the manufacturing and agricultural sectors thru the development of special economic zones, which are expected to reduce income inequality in the future.

Lebanon, on the other hand, has different dynamics. FDI in Lebanon tends to fluctuate due to political and economic instability. Foreign investment is heavily concentrated in the financial, real estate, and construction sectors, which are dominated by elite groups and do not have a significant impact on widespread job creation. Additionally, weak economic equalization policies mean that the benefits of FDI are only enjoyed by a small portion of the population, resulting in a very limited effect on reducing income inequality.

In the context of Lebanon, FDI actually risks widening inequality if not accompanied by inclusive and accountable policies. Technology has a negative impact on income inequality in six Asian countries from 2009-2023. The research results show that the calculated t-value of 0.578953 is smaller than the t-table value of 1.98793 (0.578953 < 1.98793) and the probability value is 0.5642 > 0.05. Therefore, Ho is accepted and H1 is rejected, meaning there is no significant impact of technology on income inequality, but in a negative direction.

Technological advancement usually suggest increased income inequality. but this statement may not always be true. Investing in human capital and innovation, facilitates an increase in productivity and the creation of new employment opportunities, as supported by the endogenous growth theory. This study reinforces the findings of (Dewi et al, 2022) stating that technology can foster economic growth.

Providing people with technology, education and training empowers them with the necessary skills to participate positively in the digital economy irrespective of their income class. Moreover, innovation in technology can lead to affordable services and products which in turn improves the living standards of the poor. The Kuznets hypothesis indicates inequality increases in the early stages of economic growth but decreases as development progresses and income distribution improves.

Disparities in access to technology and infrastructure can be seen in Indonesia, where urban areas like Jakarta, Surabaya, or Bandung have experienced rapid digitalization, while remote areas in Papua, Nusa Tenggara, and parts of Kalimantan still face limitations in internet access, electricity, and digital devices.

According to data from BPS and the Ministry of Communication and Information, digital literacy rates and internet penetration in Indonesia are highly uneven across regions, resulting in technology-based job opportunities being available only to certain segments of society.

Additionally, India faces similar challenges, with the information technology sector rapidly expanding in major cities like Bangalore and Mumbai, but millions of rural residents still lack access to basic digital infrastructure. Similarly, in Sri Lanka and

Lebanon, although technology is developing in the financial and urban sectors, its distribution has not yet reached rural communities that lack basic infrastructure needs such as electricity and connectivity.

Table 9. Intercept

Countries	Coefficient C	Countries Coefficient	Intercept
Indonesia	76.55864	-2.253321	74.305319
Thailand	76.55864	2.400336	78.958976
India	76.55864	-9.126735	67.431905
Sri Lanka	76.55864	1.089458	77.648098
Lebanon	76.55864	4.617168	81.175808
China	76.55864	3.273094	79.831734

Source: Data Processed, 2025

This inequality creates a situation where the benefits of technology are not distributed inclusively, thus the potential of technology to reduce income inequality has not been fully realized. Therefore, policies that emphasize expanding access to technology, digital education, and infrastructure development in underdeveloped regions are crucial to ensure that all members of society can participate in the digital economy. With proper management, technology can not only be a driver of economic growth but also an important tool for promoting social justice and more equitable income distribution in developing countries.

The equation in panel data regression analysis has an intercept, which means that if the independent variables in this study, namely the Human Development Index (HDI), Foreign Direct Investment (FDI), and Technology, are at their lowest values, then the dependent variable, income inequality, will experience growth according to the value of that intercept. Based on the intercept values in the table 9, the model formulation for each country can be explained as follows:

Indonesia Model Equation:

GINIit_INDONESIAn= 74.305319 - 49.26274* HDIit_INDONESIA – 0.979551* FDIit_INDONESIA – 0.367729* TKNit_INDONESIA+ εit

Thailand Model Equation :

GINIit_THAILAND = 78.958976 -49.26274* HDIit_THAILAND – 0.979551* FDIit_THAILAND – 0.367729* TKN it_ THAILAND + εit

India Model Equation :

GINIit_INDIA = 67.431905 -49.26274* HDIit_INDIA – 0.979551* FDIit_INDIA – 0.367729* TKNit_INDIA + εit

Sri Lanka Model Equation :

GINIit_SRI_LANKA = 77.648098 - 49.26274* HDIit_SRI_LANKA – 0.979551* FDIit_SRI_LANKA – 0.367729* TKNit_SRI_LANKA + εit

Lebanon Model Equation :

GINIit_LEBANON = 81.175808 -49.26274* HDIit_ LEBANON – 0.979551* FDIit_ LEBANON – 0.367729* TKNit_ LEBANON + εit

China Model Equation :

GINIit_CHINA = 79.831734 -49.26274* HDIit_CHINA – 0.979551* FDIit_CHINA – 0.367729* TKNit_ CHINA + εit

From the individual model equation, there are 4 countries with positive intercept values: Thailand, Sri Lanka, Lebanon, and China, while there are 2 countries with negative intercept values: Indonesia and India. High intercepts in

countries like Lebanon, China, Thailand, and Sri Lanka may indicate worse initial conditions of inequality or a lack of benefit from HDI, FDI, and technology in reducing inequality. Conversely, low intercepts in India and Indonesia may reflect better initial conditions or a greater positive impact of independent variables on reducing inequality.

Lebanon's high intercept can be linked to the weak contribution of the HDI, FDI, and technology variables in driving income equalization. Empirically, Lebanon does indeed face limitations in the overall quality of its human development, with high disparities in access to education and healthcare services between urban and rural areas. Although Lebanon has a high literacy rate and a relatively medium development index, its distribution is uneven and not accompanied by equal job opportunities or well- being, so the HDI does not effectively reduce income inequality.

Furthermore, FDI inflows into Lebanon also tend to be concentrated in capital- intensive financial and real estate sectors, which are only enjoyed by urban elite groups. FDI, which should ideally create jobs and reduce inequality, in the context of Lebanon, actually strengthens the concentration of wealth. Similarly, the Technology Index in Lebanon, although it has experienced growth in the last decade, tends to be utilized by high-income groups and is not widely distributed socially.

Technology is not becoming a tool for economic democratization, but rather only strengthens the advantages of already economically established groups. The failure of these three variables to create a redistributive effect is reflected in the very high intercept value. Lebanon's interception rate is high because historically and structurally, the country has a high level of inequality due to the economic crisis, an uneven political system, and limited access to basic services. The high intercept value reflects that despite low or zero values for HDI, FDI, and technology, inequality in Lebanon remains high.

India's lowest intercept shows that while technology, FDI, and HDI are statistically significant factors affecting income inequality, the underlying fixed factors of India's social and economic structure play a major role in maintaining low levels of inequality. India's HDI indicates steady and comparatively inclusive development, despite not being the highest of the nations in this study.

The quality of life for the impoverished has been directly improved by government initiatives in basic healthcare, education, and public services like the Mid-Day Meal Scheme and Universal Health Coverage.In the meantime, foreign direct investment (FDI) into India is concentrated in the manufacturing, energy, and telecommunications sectors, which can employ a sizable workforce and distribute income more fairly, even though it is smaller in relation to GDP than in Lebanon.

The role of technology in India also tends to be more inclusive. Government digitalization initiatives like Digital India, the Unified Payments Interface (UPI), and the growth of technology- based startups outside major cities demonstrate that technology is not only used for market efficiency, but also for expanding access to financial services, education, and entrepreneurship for the poor.

India's intercept is low because fundamental factors in the country, such as its social protection system, rural employment programs, and inclusive digitalization policies, were able to withstand structural inequalities

from the outset. This means that even without the influence of HDI, FDI, and technology, India has a relatively more equitable income distribution compared to other countries in the study. This difference in intercept values not only reflects statistical conditions but is a real reflection of each country's effectiveness or failure in optimizing the influence of HDI, FDI, and technology on income distribution.

In Lebanon, these variables are present but not evenly distributed, whereas in India, although on a smaller scale, their influence extends to a wider population and creates a stronger equalizing effect. In other words, the difference in intercept values between Lebanon and India indicates that the success of managing the three independent variables within the structural and institutional contexts of each country is highly determinant of how inequality is formed.

The intercept figures for each country reflect the impact of factors outside the research variables that affect income inequality. In the case of Indonesia, the fairly elevated intercept figure can be accounted for by the informal sector dominance and the unequal development regionally, especially between Java and outside Java. Thailand, meanwhile, has an intercept figure influenced by the impact of the concentration of development in the urban and industrial areas, which creates the persistent urban-rural divide.

In the case of Sri Lanka, the size of the intercept in this case has more to do with the political situation, domestic strife, and lack of economic diversification, which the rest of the variables do not capture. In contrast, China has an intercept figure which is relatively high because, although the government has undertaken redistributive policies, directed urbanization, and balanced industrialization, still the gaps between the rural and urban areas are enormous.

CONCLUSION

Based on the regression results, several policy actions are recommended for the Asian-6 governments. Since HDI has a significant negative effect on income inequality, governments should prioritize policies that strengthen human development, particularly by improving access to education, healthcare, and basic public services in underserved regions. Expanding vocational training and increasing investment in human capital will support more equitable income distribution.

The negative relationship between FDI and inequality indicates that foreign investment can contribute to reducing disparities when directed toward sectors that generate broad employment opportunities. Therefore, governments should encourage FDI inflows into labor-intensive industries, SMEs, and regions with lower economic development, while ensuring that investment regulations remain transparent and supportive of inclusive growth.

Technology also plays an important role in lowering inequality, suggesting the need for policies that expand digital access. Governments should focus on improving broadband infrastructure, reducing internet costs, and promoting digital literacy programs to narrow the digital divide. Ensuring equitable access to technology will allow more individuals to participate in digital markets and benefit from new economic opportunities.

REFERENCES

Adiastuti, A. (2011). Implementasi Foreign Direct Investment (FDI) di Indonesia (Sebelum dan Setelah diundangkannya Undang-Undang Nomor 25 Tahun

2007 Tentang Penanaman Modal). Pandecta Jurnal Penelitian Ilmu Hukum, 6(2), 140–149.

Azim, A. N., Sutjipto, H., & Ginanjar, R. A. F. (2022). Determinan Ketimpangan Pembangunan Ekonomi Antarprovinsi Di Indonesia. Jurnal Riset Ilmu Ekonomi, 2(1), 1–16. https://doi.org/10.23969/jrie.v2i1.23

Dewi, D. M., Setiadi, Y., Ikhwanuddin, M., & Fadhilah, L. A. (2022). Kontribusi Teknologi Informasi dan Komunikasi terhadap Kelompok Ketimpangan Pendapatan Daerah. Jurnal Ekonomi Dan Pembangunan Indonesia, 22(2), 221–242. https://doi.org/10.21002/jepi.2022.13

Faqihudin, M. (2010). Human Development Index (HDI) Salah Satu Indikator Yang Populer Untuk Mengukur Kinerja Pembangunan Manusia. Cermin, 047, 241331.

Farhan, M., & Sugianto, S. (2022). Analisis Faktor- Faktor Yang Mempengaruhi Tingkat Ketimpangan Pendapatan di Pulau Jawa. SIBATIK JOURNAL: Jurnal Ilmiah Bidang Sosial, Ekonomi, Budaya, Teknologi, Dan Pendidikan, 1(4), 243–258. https://doi.org/10.54443/sibatik.v1i4.29

Fazaalloh, A. M. (2019). Is foreign direct investment helpful to reduce income inequality in Indonesia? Economics and Sociology, 12(3), 25–36. https://doi.org/10.14254/2071- 789X.2019/12-3/2

Hakim, D. R., & Rosini, I. (2022). Regional Income Inequality in Indonesia: The Role of Public and Private Investment. Jurnal Ekonomi Malaysia, 56(3), 87–101. https://doi.org/10.17576/JEM-2022-5603-05

Heshmati, A. (2019). Inequality and growth: A review of recent empirical studies. Economies, 7(1), 1–28. https://doi.org/10.3390/economies7010017

Janah, M. (2022). Analisis Pengaruh Tingkat PDRB Per Kapita, Indeks Pembangunan Manusia, dan Penanaman Modal Asing terhadap Ketimpangan Pendapatan di Indonesia periode tahun 2019-2021. Profit: Jurnal Manajemen, Bisnis Dan Akuntansi, 1(4), 23–44.

Jhingan. (2004). Ekonomi Pembangunan dan Perencanaan. PT.Raja Grafindo Persada.

Lessmann, C. (2013). Foreign direct investment and regional inequality: A panel data analysis. China Economic Review, 24(1), 129–149. https://doi.org/10.1016/j.chieco.2012.12.001

Makipantung, R. O., Walewangko, E. N., & Niode, A. O. (2023). Pengaruh Pertumbuhan Ekonomi Dan Indeks Pembangunan Manusia (Ipm) Terhadap Ketimpangan Distribusi Pendapatan di Wilayah Kabupaten Minahasa Provinsi Sulawesi Utara. Jurnal Berkala Ilmiah Efisiensi, 23(7), 157–168. https://ejournal.unsrat.ac.id/v3/index.php/jbie/article/view/50012/43524

Putri, S. O. (2014). Anlisis Pengaruh Invetasi Asing (FDI), Pertumbuhan Ekonomi, Indeks Pembangunan Manusia dan Populasi Terhadap Ketimpangan di Indonesia Tahun 1990-2020. Universitas Islam Indonesia.

Saputro, M. H. (2022). Analisis Pengaruh Tingkat Kemiskinan Terhadap Indeks Pembangunan Manusia (IPM) Dengan Model Regresi Linier (Studi Kasus Di Kabupaten Bengkulu Utara Pada Tahun 2010-2021). EKOMBIS REVIEW: Jurnal Ilmiah Ekonomi Dan Bisnis, 10(2), 809–816. https://doi.org/10.37676/ekombis.v10i2.2647

Suci, A. D. N., & Sarpini. (2024). Tingkat Konsumsi di Indonesia: Perbandingan Antara Perkotaan dan Pedesan. Musytari: Necara Manajemen, Ekonomi, 10(5).https://doi.org/10.8734/Musytari.v1i2.365

Suradi. (2012). Pertumbuhan Ekonomi Dan Kesejahteraan Sosial. Sosio Informasi, 17(3). https://doi.org/10.33007/inf.v17i3.81

Todaro, M. P., & Smith, S. C. (2003). Pembangunan Ekonomi di Dunia Ketiga. Erlangga.

Todaro, M. P., & Smith, S. C. (2011). Pembangunan Ekonomi (Kesebelas). Erlangga.

Wibowo, T. (2016). Ketimpangan Pendapatan dan Middle Income Trap Income Inequality and Middle Income Trap. Kajian Ekonomi Keuangan, 20(2), 112–132.

Wijayanti, D., & Putri, I. D. N. (2023). Analisis determinan ketimpangan pendapatan di Pulau Jawa tahun 2017-2022. Jurnal Kebijakan Ekonomi Dan Keuangan, 2(2), 126–134. https://doi.org/10.20885/jkek.vol2.iss2.art2