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Article

Unveiling the Nexus Between ICT and Inclusive Growth in West Java Province

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Abstract

Inclusive economic development has become a concern for many countries, including Indonesia. National economic development inclusivity continues to improve. Nationally, economic development inclusivity continues to improve, but disparities still exist in some regions, such as Java Island. West Java Province becomes the province with a relatively low Inclusive Economic Development Index (IPEI). Although its inclusivity rate is above the national average, West Java Province still faces issues of high poverty levels and inequality. This can be caused by various factors, including technological advancement. This research aims to provide an overview and assess the influence of ICT usage and other factors on the achievement of inclusive economic development in West Java Province for the period 2017-2022. The research results using panel data and fixed effect FGLS modelling show that variables such as mobile phone users, computer users, physical capital stock, and the Human Development Index (HDI) have proven to have a positive and significant impact on achieving inclusive economic development.

Keywords: Economic Growth; ICT; Inclusive Economy; Mobile Phone, Panel Data.

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1. Introduction

Indonesia, as one of the emerging economies in the world, has been experiencing impressive economic growth over the past few decades. This growth has positioned the country as a significant player in the global economic landscape, particularly within the Southeast Asian regions. It requires Indonesia to enhance its readiness in order to accelerate the achievement of becoming a developed nation, ensuring that development outcomes and prosperity are equitably accessible to all members of society. This aligns with the concept of inclusive growth as defined by Klasen (2010) and Ranieri & Ramos (2013), which emphasizes economic development that not only prioritizes economic growth but also aims to diminish inequalities among various segments of society (Kartiasih, 2019b; Kartiasih et al., 2023a, 2023b).

As Indonesia strives to transition from a middle-income country to a developed nation, the nation has recognized the significance of inclusive economic development as a key driver for achieving prosperity and well-being for all its citizens. This imperative is underscored by the Sustainable Development Goals (SDGs), particularly Goal 8, which aims to foster sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. In line with this global agenda, Indonesia has embarked on a strategic trajectory outlined in its National Medium-Term Development Plans (RPJMN). The RPJMN serves as a blueprint for guiding the country's socio-economic development efforts. Notably, inclusive economic growth has been a central theme in both the 2015-2019 and 2020-2024 RPJMN periods. The strategic focus on inclusivity reflects Indonesia's commitment to ensuring that the benefits of economic progress are equitably distributed across society. One of the tools used to measure the inclusivity of economic development in Indonesia is the Inclusive Economic Development Index (IPEI), developed by the National Development Planning Agency (Bappenas). Over the past five years, the national IPEI has shown an upward trend, reaching its peak at 6.13 points in 2022.

Although Indonesia has made significant progress toward inclusive economic development, regional inequalities still exist. Among the regions, West Java, as one of the most populous and economically dynamic provinces in Indonesia, warrants particular attention. West Java plays a crucial role in Indonesia economies, yet it faces challenges at achieving inclusive economic development. Despite being situated in an island renowned for its economic activities, the economic development in West Java has relatively less inclusive than other provinces, making it an intriguing case for investigating the nuances of inclusive economic development dynamics. The high disparities in income and poverty in West Java can lead to economic inequality which showed by the increasing of gini ratio from 2017 and reaching 0.428 in 2022, indicating ongoing disparities in various areas of West Java. This inequality is identified as an indicator of insufficient inclusivity in economic development (Ali & Zhuang, 2007). Moreover, the trend of IPEI within West Java presents a concerning picture. Despite its economic significance, West Java has experienced a decline in its national IPEI ranking over the past few years. For instance, from being ranked 12th in 2017, it has descended to 21st place in 2022 (Bappeda Jawa Barat, 2019). This decline underscores the pressing need to examine the factors influencing inclusive economic development within the province.

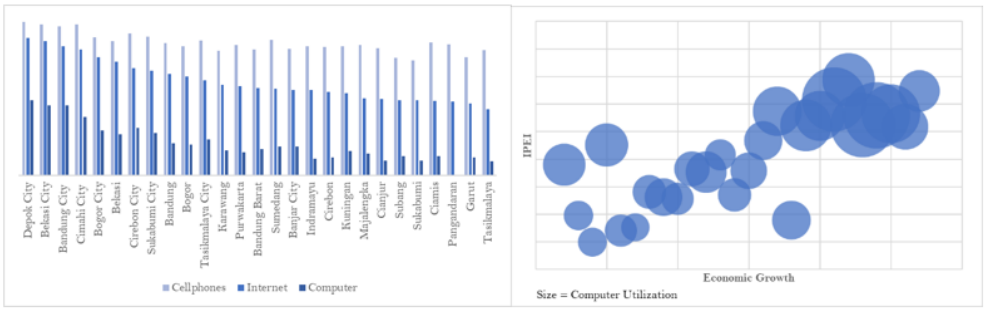


Figure 1. (a) Average Level of ICT Usage by Distict/City in West Java 2017-2022; (b) Bubble Chart of Economic Growth, IPEI, and Computer Usage in West Java in 2022

Source*:* data processed.

In light of Indonesia's pursuit of inclusive economic growth and the specific challenges faced by West Java, this research aims to investigate the impact of various factors on the inclusivity of economic development in the region. Against this backdrop and drawing upon the neoclassical theory of economic growth proposed by Solow (Todaro & Smith, 2015), which emphasizes the role of physical and human capital, technological progress, this study seeks to examine how these factors influence the inclusivity of economic development in SWest Java. Innovation and technological advancements, as stated in Schumpeter's "Creative Destruction" theory, serve as key drivers of economic growth that can also increase per capita income, reduce income inequality, and lower the unemployment rate in the long term (Adejumo et al., 2020). Adequate infrastructure can improve living standards, reduce poverty rates, and play a significant role in regional economic development (Kartiasih, 2019a; Majumder, 2012). One such pivotal aspect in economic development is the role of Information and Communication Technology (ICT) infrastructures (Adeleye & Eboagu, 2019; Kartiasih et al., 2023), which depicts the technological progress nowadays, serves as a catalyst for socioeconomic advancement and equitable growth. The use of Information and Communication Technology (ICT), including internet access, mobile phones, and computers, can promote inclusive economic development (Mefteh & Benhassen, 2015). This finding is consistent with prior research indicating that ICT contributes positively to inclusive growth (Bello et al., 2024; Khalid et al., 2023). The utilization of ICT in West Java shows varying levels across its districts and cities. While most areas in West Java have access to the internet and cellphones, the usage of computers remains predominantly concentrated in urban centers and comparatively lower in rural districts, as illustrated in Figure 1a. Figure 1b provides evidence that ICT serves as a catalyst for inclusive economic development. It demonstrates that economic growth alone is insufficient to ensure inclusive economic development. However, a higher usage of computers, one of the components of ICT infrastructure, leads to a more inclusive economic growth.

Theoritically, the quantity of labor, considered a production factor, along with adequate education, skills, and health that constitute human capital, plays a vital role in boosting productivity and ensuring fair distribution of economic advantages. Although it experienced a decline in 2022 due to Covid-19, the number of workers in West Java managed to recover. Similarly, physical capital is also known essential for creating an enabling

environment for businesses and individuals to thrive. According to the "industrialization-led development" theory, the manufacturing sector plays a pivotal role in propelling economic growth and progress in a manner that benefits all sectors of society. As the manufacturing sector expands, it generates employment opportunities, encourages innovation and technological progress, boosts productivity, and stimulates demand for goods and services (Hanifah & Kartiasih, 2018; Kusumasari & Kartiasih, 2017). Consequently, this leads to increased incomes, decreased poverty rates, and enhanced living standards for a broader spectrum of individuals, thereby promoting inclusive growth. In recent years, investment in human capital holds a crucial role in stimulating inclusive development. Scholars have discussed that human capital index that provides future potential country's education and health outcomes can give a useful perspective long-term human capital development and its relationship with future economic growth and inclusivity. In this study, we use human development index to measure the quality of human capital as its ability to reflect current health, education, and income levels makes it more suitable for evaluating inclusive economic development in the context of Indonesia. Industrialization is also being the priorities outlined in RPJMN strategies. Thereby, the addition of industrial sector as the leading sector in West Java makes this research different from others.

This study enhances comprehension regarding ICT and other factors that is believed to affect inclusive growth in West Java from 2017 to 2022, building upon the Solow theory and earlier investigations. By analyzing the interplay between these factors, the research seeks to provide valuable insights for policymakers, development practitioners, and stakeholders to formulate evidence-based strategies for fostering inclusive and sustainable economic growth in the region and beyond.

2. Method

According to Kuznets, economic growth is a crucial indicator for assessing the success of economic development in a region (Basuki et al., 2020). Economic development solely focused on economic growth may potentially lead to inequality within society (Adwendi & Kartiasih, 2016; Hawari & Kartiasih, 2017; Wirabrata, 2019). Hence, it can be implied that economic development and growth should significantly contribute to reducing poverty levels (Asri et al., 2023; Belantika et al., 2023; Pribadi & Kartiasih, 2020) and enhancing development equality, allowing for sustainable and inclusive economic development.

The concept of inclusive growth, according to the United Nations Development Programme, is closely related to economic growth accompanied by increased equality and the equitable distribution of benefits derived from that growth, leading to improved welfare for all members of society (UNDP, 2017). This definition aligns with the Organisation for Economic Co-operation and Development (OECD) definition of inclusive economic development in 2014, which emphasizes that economic growth should be even, fair, and open up new economic opportunities for all members of society. According to the National Development Planning Agency (Bappenas), inclusive economic development is economic growth that creates broad access and opportunities for all societal layers fairly, enhances welfare, and reduces disparities between groups and regions. Definitions above implies that economic development can be considered inclusive if it emphasizes creating economic opportunities accessible to all segments, aiming to reduce economic, social, and

environmental disparities through the redistribution of growth benefits and comprehensive participation from all societal layers.

The Inclusive Economic Development Index (IPEI) drawn up by Bappenas reflects the extent to which the inclusivity level of economic development in a region is measured through aspects of economic growth, inequality and poverty, as well as access and opportunities. The IPEI consists of three main pillars, eight sub-pillars, and 21 indicators. The three main pillars in the IPEI are Economic Growth and Development, Income Distribution and Poverty Reduction, and Expansion of Access and Opportunities. The first pillar is divided into three sub-pillars: Economic Growth, Employment Opportunities, and Economic Infrastructure. The second pillar is divided into two sub-pillars: Inequality and Poverty. The third pillar is divided into three sub-pillars: Human Capability, Basic Infrastructure, and Inclusive Finance.

The Solow economic growth model is an improvement on the economic growth model previously introduced by Harrod-Domar. The Solow and Swan theory states that economic growth depends on the influence of increasing the provision of production factors such as population growth, capital (physical and human), and technological progress on the level of economic output and its growth (Solow & Swan, 1956). Referring to the neoclassical Solow theory and the Cobb-Douglas production function, the influence of ICT development on economic growth can be demonstrated by the following equation (Todaro & Smith, 2015):

$$Y = AK^{a}L^{1-a} \quad (1)$$

Capital used in production is represented by K, and L includes labor in the production process. Physical capital, such as new factories, equipment and machinery, as well as raw materials or, in other words, the total net value in real terms of all physical capital that can produce or support production. Capital comprises human capital, which involves enhancements in skills and quality through education and better health, anticipated to yield positive effects on productivity (A), in this case, technological progress. Labor in the production also measures by the number of workers in this research. Technological progress, especially labor-saving and with the same amount of input, can increase the output produced. Furthermore, technology can also affect the productivity of the inputs themselves in the economy. The technological progress in the Solow theory refers to manufacturing activities in the early 20th century. As time progressed, by the end of the 20th century, technological advancements were often measured by the presence of computerization just like what the Brynjolfson-Hitt model did to insert information technology as technological progress in its model (Brynjolfsson & Hitt, 1995). Thus, if ICT usage is evenly distributed across all regions, it is expected to result in even economic growth and address interregional disparities. These factors—ICT, labor, stock, and HDI—have been demonstrated to significantly contribute to positive outcomes in inclusive growth (Nchake & Shuaibu, 2022).

This study employs two methods of analysis, descriptive analysis and inferential analysis. Descriptive analysis is conducted using visualization tools such as graphs and scatter plot to depict the general conditions of the research variables. Inferential analysis in this study involves panel data regression modelling to determine the relationship between the usage of ICT and other factors on the inclusivity rate of economic development in each district/city of West Java Province from 2017 to 2022. The variables used in the study are detailed as follows (Table 1).

Table 1. Variables used in the research.

Variables	Operational Definitions	Source
(1)	(2)	(3)
IPEI	Inclusive Economic Development Index (IPEI)	Bappenas
INT	Percentage of population aged 5 year and over who have accessed the internet during the last 3 months	BPS (Susenas)
CELL	Percentage of population aged 5 year and over who use cellular phone during the last 3 months	BPS (Susenas)
COMP	Percentage of population aged 5 year and over who use computer during the last 3 months	BPS (Susenas)
WORKER	The number of people in the workforce and currently employed in tens of thousands people.	BPS
HDI	Human Development Index	BPS
STOCK	The restricted physical capital stock is calculated by the proportion of Gross Fixed Capital Formation (GFCF) to real Gross Domestic Product (GDP) at the depreciation rate.	BPS (processed)
IND_VA	The amount of value added by the Industrial Sector in each district/city in trillion rupiahs.	BPS

Source: author.

The panel regression model is employed to assess how various factors influence the attainment of inclusive economic development. The initial model is outlined as follows:

$$IPEI_{it} = \alpha + \beta_1 INT_{it} + \beta_2 CELL_{it} + \beta_3 COMP_{it} + \beta_4 WORKER_{it} + \beta_5 HDI_{it} + \beta_6 STOCK_{it} + \beta_7 IND\_VA_{it} + u_{it} \quad (2)$$

Description

i : Districts/Cities in West Java (i = 1, …, 26)

t : Research period (t = 2017, …2022)

α : Intercept

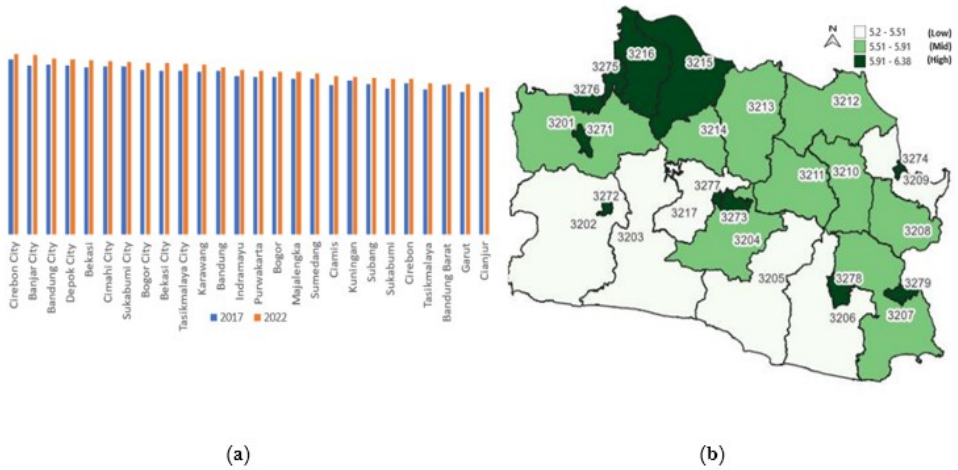
β_k : Regression Coefficient of independent variable k-th ($k = 1, 2, \dots, 7$)

u_{it} : Error term

3. Results, Analysis, and Discussions

The Inclusive Economic Development Index (IPEI), which depicts the level of inclusivity in economic development, still exhibits differences in characteristics among regions and over time. Figure 2a shows that overall, the IPEI values across all districts/cities have increased. Cirebon City has the highest IPEI score, while Cianjur District has the lowest. This may be due to high poverty rates in Cianjur District. Statistics Indonesia (BPS) records that the percentage of poor population in Cirebon City in 2022 is lower than in Cianjur District, at 9.82 percent. Figure 2b also indicates that on average by dividing it using

natural breaks, only a few areas are classified as having high IPEI, specifically 11 out of 26 districts/cities in West Java. Meanwhile, there are 9 districts/cities classified as having moderate IPEI, and 6 districts/cities classified as having low IPEI. Regions that serve as economic hubs in West Java and industrial zones may create opportunities for new economic ventures, potentially influencing higher inclusivity in economic development compared to other areas. This may be due to the polarization effect resulting from the concentration of economic growth in certain areas, as stated by Hirschman (1958) in his theory.



(a) (b)

Figure 2. (a) IPEI Development by District/City in West Java 2017 and 2022; (b) Thematic Map of Average IPEI in West Java from 2017 to 2022

Source*:* data processed.

Based on the previous discussion, the use of ICT is considered one of the factors that may affect the achievement of inclusive economic development in a region. Figure 3 shows that overall, the use of ICT in all districts/cities in West Java Province has high percentages and has increased from 2017 to 2022. Internet usage experienced significant growth in 2022. Internet and mobile phone users in all districts/cities have fairly similar figures across regions. Depok City, Cimahi City, and Bekasi City are the areas with the highest percentages of internet and mobile phone users. Meanwhile, the percentage of computer users tends to indicate concentration in several areas, namely Depok City, Bandung City, Cimahi City, and Bekasi City. The significant differences between regions are likely due to variations in economic activities in those areas.

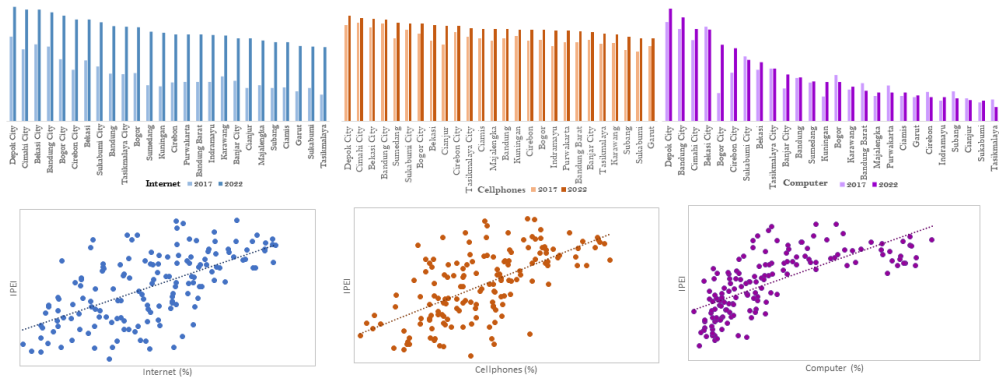


Figure 3. ICT Development from 2017 to 2022 and Scatter Plot Linkage Between ICT and IPEI

Source*:* data processed.

Figure 3 also indicates the relationship between the percentage of ICT users and the achievement of inclusive economic development. All ICT usage indicators used in this study show a positive relationship with the IPEI value. This is evidenced by the linear upward trend lines. It indicates that an increase in the percentage of ICT usage will enhance the inclusivity of economic development in a region.

Apart from ICT usage, there are other factors suspected to influence the achievement of inclusive economic development according to the theoretical framework discussed earlier, namely physical and human capital. An overview of these factors and their relationship with the achievement of inclusive economic development will be shown below.

The number of workers in West Java appears to increase from 2017 to 2022, with Bogor City having the highest number. The number of workers tends to vary significantly across regions, such as in Bogor City with 2.5 million people employed and Banjar City with 89 thousand people employed. However, observing the scatter plot relationship between the number of workers and the achievement of inclusive economic development, it appears that the relationship tends to be negative. This contradicts the previous theory stating that human capital plays a positive role in economic development. On the other hand, in terms of the quality of human resources, the HDI achievement in all districts/cities is high and increases every year. This indicates that the human resources in West Java Province have excellent quality, which is expected to serve as an asset in achieving inclusive economic development. The relationship between HDI and the achievement of inclusive economic development also shows a positive correlation. This means that there is an indication that higher-quality human resources lead to more inclusive economic development in West Java.

Furthermore, another driving factor of economic development is physical capital. Physical capital stock tends to decrease from 2017 to 2022, with Depok City having the highest level of physical capital stock in West Java and Karawang District having the lowest. Meanwhile, other districts/cities tend to have similar levels of physical capital stock. Then, observing its relationship with the achievement of inclusive economic development through scatter plot analysis, it can be seen that there is an indication that physical capital stock has a positive relationship with the achievement of inclusive economic development, meaning

that an increase in physical capital stock will enhance the achievement of inclusive economic development in West Java.

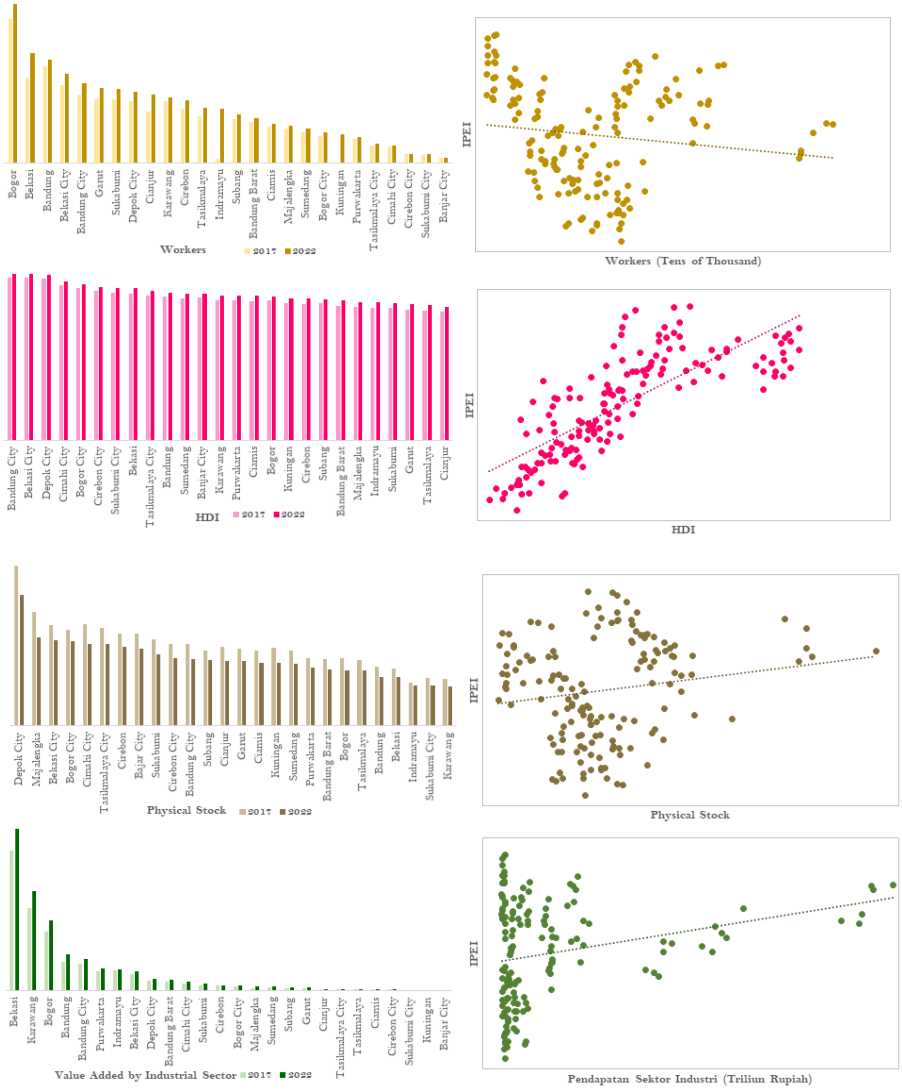


Figure 4. Development of Factors Such as Number of Workers, HDI, Physical Stock, and Industrial Sector from 2017 to 2022 and Scatter Plot Linkage Between Each Factors and IPEI

Source*:* data processed.

Besides physical and human capital, which are suspected factors in achieving inclusive economic development, this study incorporates income from the industrial sector to analyze the influence of the industrial sector as the leading sector of the West Java economy on efforts to achieve inclusive economic development in West Java. Figure 4 shows that despite an increase from 2017 to 2022, there are only a few areas with industrial sector income advantages, such as Bekasi District, Karawang District, and Bogor District. This is likely due to the number of large companies or industries in each respective area. Furthermore,

when examining the relationship between industrial sector income and the achievement of inclusive economic development in West Java through scatter plot analysis, there is an indication of a positive relationship between industrial sector income and the achievement of inclusive economic development in West Java.

To assess the influence of ICT usage and other independent variables on the Inclusive Economic Development Index empirically, panel data regression modelling is conducted. To determine the best model, Chow test and Hausman test are performed, yielding the following results:

Table 2. Model selection.

Test	Statistics	P-value	Results
(1)	(2)	(3)	(4)
Chow	27.209	0.0000	Fixed effect is better than common effect
Hausman	24.754	0.0008	Fixed effect is better than random effect

Source: data processed.

Based on the data processing results above, the findings as presented in Table 2 are obtained. Both the Chow test and the Hausman test reject the null hypothesis, indicating that the Fixed Effect Model (FEM) is superior to the Cross-Sectional Effect Model (CEM) and Random Effect Model (REM) in panel data regression. Theoretically, the regression model formed must meet certain assumptions to fulfill the principle of BLUE (Best, Linear, Unbiased Estimator). Therefore, a series of tests are conducted to ensure that the model is free from issues that may undermine the BLUE properties of the estimator. In this study, tests for autocorrelation, heteroscedasticity, and multicollinearity detection are performed on the developed FEM model. To determine whether the model has BLUE properties, classical assumption tests are conducted with the following results:

Table 3. Classic Assumption Tests

Assumptions	Test	P-value	Results
(1)	(2)	(3)	(4)
Homoskedasticity	Lagrange Multiplier Test	0.0003	Reject H_0
Cross-sectional correlation	λ LM	0.0000	Reject H_0

Source: data processed.

Based on the testing results of several classical assumptions above, it is evident that there are violations of the homoscedasticity assumption and the presence of cross-sectional correlation. This is indicated by the p-values being less than the 5% significance level, which means there are issues of heteroscedasticity and cross-sectional correlation in the formed equations. To accomodate these issues, the Feasible Generalized Least Squares (FGLS) method is chosen. This method is highly suitable for model facing problems of heteroscedasticity and cross-sectional correlation. The regression results using the

FGLS/SUR PCSE method provide estimations from the selected model are presented in Table 4.

In terms of the adjusted R-squared value in Table 4, the value of 0.9772 means that 97.22% of the IPEI in West Java from 2017 to 2022 can be explained by the model in equation 3, while the remaining 2.78% is explained by variables outside the model. Furthermore, the results of simultaneous testing with the F-test are indicated by the p-value of the F-statistic, which is 0.0000. A value smaller than the five percent significance level indicates that the null hypothesis is rejected, meaning that at least one of all independent variables in the model significantly influences the IPEI in West Java.

Table 4. Estimation results.

Variable	Coefficient	*Std. Error*	*t-statistic*	*p-value*
(1)	(2)	(3)	(4)	(5)
Intercept	-7.4699*	2.9519	-2.5305	0.0127
INT	-0.0049	0.0026	-1.8680	0.0641
CELL	0.0055*	0.0021	2.5343	0.0125
COMP	0.0050*	0.0018	2.7425	0.0070
WORKER	0.0021	0.0014	1.5188	0.1314
HDI	0.1704*	0.0420	4.0533	0.0001
STOCK	0.0010*	0.0005	2.0264	0.0449
IND_VA	0.0002	0.0025	0.0777	0.9382
Adjusted R²	0.9722			
F-statistic	170.4146			
Prob (F-statistic)	0.0000			

Source*:* data processed.

Based on the results and discussions of this study, the following conclusions are drawn:

$$\widehat{IPEI}_{it} = (-7.4699 + \hat{\mu}_i) - 0.0049INT_{it} + 0.0055CELL^*_{it} + 0.0050COMP^*_{it} + 0.0021WORKER_{it} + 0.1704HDI^*_{it} - 0.0010STOCK^*_{it} + 0.0002IND\_VA_{it} \quad (3)$$

*) Significance at 5% level

According to Gujarati & Porter (2009), the FGLS/SUR method can accommodate the presence of heteroscedasticity and autocorrelation, so classical assumption testing that needs to be done is only normality and non-multicollinearity detection. The Jarque-Bera test was performed to assess the normality of the chosen model. The obtained p-value, 0.1043, exceeds the researcher's chosen alpha value of 5 percent. Therefore, the decision is not to reject the null hypothesis, suggesting that the residuals in the model follow a normal distribution. Non-multicollinearity detection also found that the VIF values of each variable less than 10. These results can conclude that there is no multicollinearity issue in the model and no multicollinearity among independent variables.

Based on panel data regression, the regression coefficient of the mobile phone usage variable is 0.0055. This indicates that a one percent increase in the percentage of mobile

phone users contributes to an increase in IPEI of 0.0055 points, assuming other independent variables remain constant. This result is consistent with the research by Adeleye et al. (2023), Asongu & Le Roux (2017), and Nchake & Shuaibu (2022). With wider mobile phone penetration, people can more easily access information, financial services, and economic opportunities. This can accelerate economic and social integration, especially in areas that are still difficult to reach. Mobile phone usage contributes to reducing the poverty rate by strengthening social networking, cutting travel operational costs, maximizing activity efficiency, and improving community welfare (Sife et al., 2010). Therefore, increasing mobile phone usage is considered a key factor in supporting inclusive growth by providing better access to resources and opportunities for all segments of society.

The regression results for the computer usage variable show a coefficient of 0.0050, indicating that a one percent increase in the percentage of computer users can contribute to an IPEI increase of 0.0050 points, with other independent variables remaining constant. This result is consistent with the research by Murthi et al. (2022), where computers are more used for productive work processes, such as completing tasks and other business objectives. In the context of inclusive growth, increasing computer usage can improve productivity and reduce poverty and unemployment rates. Therefore, computer usage plays an important role in driving inclusive economic development.

The regression coefficient on the HDI variable is 0.1704, indicating that a one-point increase in the HDI can contribute to a change in the IPEI of 0.1704 points, assuming other independent variables remain constant. This result is consistent with the findings of Puspa et al. (2019) where improving the quality of human resources, especially in terms of education and health, will make people more productive, thus increasing community welfare. HDI improvement can be considered a crucial catalyst for inclusive economic growth, creating a strong foundation for the participation of all elements of society in development, which in turn creates a fair and sustainable social and economic environment.

The regression on the stock variable shows a coefficient of 0.0010, indicating that an increase in physical capital stock can contribute to an IPEI increase of 0.0010 points, with other independent variables remaining constant. An increase in physical capital stock will increase labor productivity, build social production, stimulate social employment, and increase national income (Ding et al., 2021). Investment in the form of providing physical capital stock will not only increase production but also create new job opportunities. Capital formation also leads to technological progress, which ultimately leads to large-scale production efficiency, as well as opening the door to industrialization and market expansion, which are essential for economic progress. Therefore, physical capital stock plays a positive role in creating fair and sustainable economic development.

The fixed-effect panel data regression model produces individual effects from the 26 Districts/Cities in West Java Province. Indramayu District has the largest individual effect, at 1.07 units, while Depok City has the smallest individual effect, at -1.87 units. This means that if all districts/cities experience changes in the percentage of internet users, mobile phone users, computer users, employed population, HDI, physical capital stock, and industrial sector income, the highest change in IPEI value occurs in Indramayu District, while the lowest change occurs in Depok City.

4. Conclussion and Recommendation

The inclusivity of economic development in the 26 districts/cities of West Java Province generally increased from 2017 to 2022. However, there are still disparities in the inclusivity rate in each district/city which are reflective of broader socio-economic dynamics in Indonesia. Similarly, the use of ICT indicates that there are several regions with high levels of ICT usage, primarily areas with higher economic activity compared to others. The use of ICT is indicated as a driving factor for inclusive economic development. In general, the independent variables in this study experienced an increase and showed a positive relationship with the achievement of inclusive economic development, except for the number of employed population and physical capital stock. The number of workers increased but tended to have a negative relationship with the achievement of inclusive economic development. Physical capital stock decreased but had a positive relationship with inclusive development achievement. Furthermore, the Human Development Index (HDI) and income from the industrial sector increased and had a positive relationship with the achievement of inclusive economic development in West Java.

Based on the results, it also found that the FGLS model was selected as the best model as it could accommodate the presence of heteroscedasticity and cross-sectional correlation problem in the fixed-effect model. The results showed that variables such as mobile phone users, computer users, HDI, and physical capital stock had a significant positive impact on the change in the Inclusive Economic Development Index (IPEI) in West Java from 2017 to 2022. Meanwhile, other independent variables such as internet users, number of workers, and industrial sector income have not been proven to significantly influence changes in the value of IPEI.

From the results above, this research recommends the West Java Provincial Government to give more attention and increase ICT usage by prioritizing ICT development in areas that are still relatively low in terms of ICT usage. This could involve providing ICT training and awareness campaigns to facilitate digital literacy programs, particularly in rural areas, for a more balanced development and increased inclusivity of economic development in West Java so that everyone can fully participate in digital economy. Efforts to increase ICT usage could also involve transitioning administrative or governance systems to modern systems, indirectly encouraging people to utilize ICT. In areas where public sector interventions are strong, the role of ICT aligns with democratic principles of empowering citizens through equitable access to technology, which can bridge gaps in education, employment, and economic opportunity. Additionally, the government needs to focus on improving the quality of human resources through enhancing educational quality and improving healthcare facilities across various regions, ensuring that people in more marginalized districts can get the same opportunities as those in urban areas. Evaluation of assistance programs, such as social assistance or educational scholarships to be implemented right on target, which has to focus on vulnerable populations, is also necessary to ensure that they are not excluded from the benefits of economic development. Furthermore, creating a favorable investment climate and long-term planning for routine maintenance and preventive care to prevent wastage and larger losses in the future are needed. Purchasing advanced machinery and equipment can also stimulate production and economic growth. For further research, it is suggested to conduct additional analysis by adding other variables not

included in this study or using spatial data analysis methods to determine the presence of spatial effects affecting the achievement of inclusive economic development.

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