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Determinants of Labor Productivity in Java 2020–2024

Intan Ambarsari Sihaloho[1], Dedy Yuliawan[2] *

[1,2]Department of Development Economics, Faculty of Economics and Business, University of Lampung, Indonesia

Corresponding Email: dedy.yuliawan@feb.unila.ac.id

Abstract

Java Island is the center of national economic activity, contributing around 57 percent of Indonesia's total GRDP and accommodating 56.8 percent of the national labor force, or more than 86 million people, yet labor productivity across its provinces still shows significant disparity, with DKI Jakarta consistently outperforming the other provinces. This study aims to analyze the effect of the Provincial Minimum Wage, the Human Development Index (HDI), and Foreign Direct Investment (FDI) as a proxy for technology on labor productivity in six provinces of Java Island during the 2020–2024 period. The study uses a quantitative approach with panel data comprising 30 observations, combining five years of time-series data and cross-sectional data from six provinces, namely DKI Jakarta, West Java, Central Java, DI Yogyakarta, East Java, and Banten. The estimation model was selected through the Chow Test and the Hausman Test, both of which indicated the Fixed Effect Model (FEM) as the best model, and all data were processed using EViews 13. The FEM estimation results show that Provincial Minimum Wage has a positive and significant effect on labor productivity. HDI has a negative and significant effect, indicating that improvements in human development quality have not been fully matched by competencies suited to labor market needs. Meanwhile, FDI has a positive and significant effect as a channel of technology transfer that improves production efficiency and labor productivity.

Keywords: Labor Productivity, Provincial Minimum Wage, Human Development Index, Foreign Direct Investment, Panel Data, Fixed Effect Model

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INTRODUCTION

Economic development is essentially aimed at improving people's welfare through sustainable growth, expanded employment opportunities, and equitable income distribution. The success of development is not measured solely by the magnitude of economic growth achieved, but also by a region's ability to improve the efficiency of its use of production factors. One of the main indicators of that efficiency is labor productivity, which reflects the capacity of the workforce to generate output from each unit of input used (Todaro & Smith, 2021; ILO, 2023).

Table 1. Contribution to GRDP by Island (Percentage %)

Kelompok Pulau	2020	2021	2022	2023	2024
Pulau Jawa	58.75	57.89	56.48	57.05	57.02
Pulau Sumatera	21.36	21.7	22.04	22.01	22.12
Pulau Kalimantan	7.94	8.25	9.23	8.49	8.24
Pulau Sulawesi	6.66	6.89	7.03	7.1	7.12
Bali & Nusa Tenggara	2.94	2.78	2.72	2.77	2.81
Maluku & Papua	2.35	2.49	2.5	2.58	2.69
Total Indonesia	100	100	100	100	100

Source: Badan Pusat Statistik

Java Island plays the most dominant economic role in Indonesia. Based on data from Statistics Indonesia (BPS), Java Island's contribution to national GRDP during the 2020–2024 period ranged between 56 and 59 percent. In addition, Java Island accommodates around 56.8 percent of the national labor force, equivalent to more than 86 million people. The large concentration of economic activity and human resources in Java Island makes this region a highly relevant subject for analyzing the determinants of labor productivity.

Tabel 2. Labor Productivity in Java Island, 2020–2024

Tahun	Jawa Timur	Jawa Barat	Jawa Tengah	DKI Jakarta	Banten	DI Yogyakarta

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2019	76.87	67.05	55.04	384.67	79.46	47.83
2020	79.32	67.57	55.92	391.79	80.89	48.18
2021	81.33	67.80	57.11	400.70	81.50	50.38
2022	81.26	71.03	55.16	404.21	91.98	55.44
2023	82.86	71.76	55.46	421.13	91.71	57.08

Source: Ministry of Manpower RI

Although Java Island as a whole dominates the national economy, empirical data show a considerable disparity in labor productivity across its provinces. DKI Jakarta has consistently recorded the highest labor productivity during 2020–2024, supported by a concentration of high-value-added service sectors, quality infrastructure, and the highest Provincial Minimum Wage in Java Island, This difference indicates that labor productivity is determined not only by the size of the workforce, but also by structural factors such as wage levels, the quality of human resources, and the inflow of foreign investment that brings technology.

Several factors have been theoretically and empirically shown to affect labor productivity, namely the provincial minimum wage, the quality of human resources as reflected in the Human Development Index (HDI), and the inflow of Foreign Direct Investment (FDI) as a proxy for technology use. provincial minimum wage serves as a wage-policy instrument as well as an incentive that drives work motivation and loyalty. HDI in Java Island shows an increasing trend across all provinces during 2020–2024 and integrates the dimensions of health, education, and decent living standards as a representation of human capital. Meanwhile, FDI brings not only additional financial capital but also technology, managerial knowledge, and spillovers that improve production efficiency (Borensztein et al., 1998); the highest FDI realization during the study period was recorded in West Java, which increased from USD 69.03 million in 2020 to USD 149.58 million in 2024, while DI Yogyakarta recorded the lowest FDI realization among the six provinces of Java Island.

Most previous studies, such as Maharani (2022), Fadillah (2020), and Rahman (2024), generally use a national scope or a specific industrial sector and a pre-pandemic period, so they have not specifically captured the dynamics of post-pandemic labor productivity in the region with the highest economic concentration in Indonesia. This is the gap that the present

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study seeks to fill, which also constitutes the novelty of this study compared with previous work.

The choice of the 2020–2024 study period is based on the consideration that it covers a complete economic cycle, from the contraction caused by the COVID-19 pandemic (2020), early recovery (2021), expansion (2022–2023), to growth consolidation (2024). This range produces broad data variation, resulting in more robust model estimates. Based on the description above, this study aims to analyze the partial effects of PMW, HDI, and FDI on labor productivity in six provinces of Java Island during the 2020–2024 period using a panel data regression approach with the Fixed Effect Model.

LITERATURE REVIEW

Solow Growth Theory

Solow (1956) argued that economic growth is influenced not only by the accumulation of capital and labor, but also by technological progress as the main driver of long-run growth. In the Solow model framework, capital and labor exhibit diminishing marginal returns, so growth that relies solely on increasing these two factors is temporary. In the long run, an economy will reach a steady state in which sustained growth can only be obtained through technological progress. In the context of this study, FDI is used as a proxy for technology that helps increase capital intensity per worker (capital deepening), thereby driving productivity gains.

Human Capital Theory

Becker (1964) and Schultz (1961) stated that human beings constitute a form of capital whose value can be increased through investment in education, training, and health. Workers with better education and health have a greater capacity to operate technology, improve efficiency, and adapt to economic change. In this study, HDI is used as a composite indicator representing the quality of human capital through the dimensions of health, education, and decent living standards.

Efficiency Wage Theory

Shapiro and Stiglitz (1984) and Akerlof and Yellen (1986) explained that firms that pay wages above the market equilibrium will obtain a more productive workforce. Higher wages can increase work motivation, reduce absenteeism, curb labor turnover, and encourage optimal performance. In this study, PMW is regarded as a policy instrument that has the potential to increase labor productivity through the wage-incentive mechanism.

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Technology Spillover Theory and Endogenous Growth

Romer (1986) explained that technology is the main factor driving productivity and long-run economic growth. Borensztein, De Gregorio, and Lee (1998) confirmed that FDI is an important channel for technology transfer from developed to developing countries. Incoming foreign investment brings modern machinery and equipment, new production methods, and managerial knowledge that spreads to domestic firms through knowledge spillover, labor mobility, and technology imitation.

Labor Productivity

Labor productivity is the ratio between the output produced and the amount of labor used. According to BPS (2020), labor productivity is calculated as the ratio of GRDP at constant prices to the number of employed population, thereby describing the real capacity of the workforce to generate added value. ILO (2018) confirmed that labor productivity is influenced not only by the size of the workforce, but also by the quality of human resources, education level, health, skills, and a conducive working environment.

Previous Research

Various previous studies have examined the determinants of labor productivity with varying results. Maharani (2022) found that health and the minimum wage had a significant positive effect on labor productivity across 33 Indonesian provinces, while education and foreign investment were not significant. Wahyuni (2022) showed that FDI had a positive effect on productivity in both foreign- and domestically-owned firms. Fadillah (2020) found that PMW and economic infrastructure had a significant positive effect, but HDI had no effect on productivity. Rahman (2024) concluded that the minimum wage and HDI had a significant effect on labor productivity in the manufacturing industry. Riyanto (2022) demonstrated that the minimum wage had a positive effect on wages, which subsequently increased labor productivity through a spillover effect. Zakaria (2022) found that HDI had a significant negative effect on productivity in large and medium industries in East Java, consistent with the findings of the present study.

RESEARCH METHOD

Scope and Data

This study was conducted in Java Island, covering six provinces: DKI Jakarta, West Java, Central Java, DI Yogyakarta, East Java, and Banten. The data used are secondary panel data, combining time-series data (2020–2024) and cross-sectional data from the six

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provinces. The data were obtained from Statistics Indonesia (BPS), the Ministry of Manpower of the Republic of Indonesia, and the Ministry of Investment/BKPM.

Table 2. Types and Sources of Data

Variable	Symbol	Unit	Data Source
Labor Productivity	LP	Ratio	Ministry of Manpower RI
Provincial Minimum Wage	PMW	Rupiah/month	Ministry of Manpower RI
Human Development Index	HDI	Index (0–100)	Statistics Indonesia (BPS)
Foreign Direct Investment	FDI	Million Rupiah	Ministry of Investment/BKPM

Research Model

This study uses panel data regression analysis with the following model equation:

$$LP_{it} = \alpha + \beta_1 PMW_{it} + \beta_2 HDI_{it} + \beta_3 FDI_{it} + \varepsilon_{it}$$

Note:

LP = Labor Productivity;

PMW = Provincial Minimum Wage

HDI = Human Development Index

FDI = Foreign Direct Investment (proxy for technology)

α = constant

β_1 , β_2, β_3 = regression coefficients

i = province

t = time period

ε = error term.

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Model Selection and Testing

Three panel data approaches were tested: the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM). The best model was selected through the Chow Test (CEM vs. FEM), the Hausman Test (FEM vs. REM), and the Lagrange Multiplier Test (CEM vs. REM). Before interpreting the results, classical assumption tests were carried out, covering normality (Jarque-Bera), multicollinearity (correlation matrix), heteroscedasticity (Glejser), and autocorrelation (Durbin-Watson). Hypothesis testing was conducted using the t-statistic at a 5 percent significance level, and the model's explanatory power was assessed through the coefficient of determination (R-squared).

RESULTS AND DISCUSSION

Descriptive Statistics

Table 3. Descriptive Statistics of Research Variables

Statistic	LP	PMW (Rp)	HDI	FDI (Million Rp)
Mean	123.7498	2470802.	75.77833	48093282
Median	74.31294	2011809.	73.80500	46799906
Maximum	421.1308	5067381.	83.08000	1.50E+08
Minimum	47.83000	1704608.	71.71000	140009.0
Std. Dev.	126.6098	1039942.	4.033128	37330743
Observations	30	30	30	30

Source: EViews 13, processed 2026

Based on the descriptive statistics, the LP variable has a mean of 123.75 with a standard deviation of 126.61, which is larger than the mean, indicating high heterogeneity in productivity across provinces and periods. The maximum LP value of 421.13 and minimum of 47.83 reflect a significant disparity, especially between DKI Jakarta and the other provinces. The HDI variable has the smallest standard deviation (4.03), indicating relative uniformity in the quality of human development across Java Island. The FDI variable shows the largest variation, with a maximum value reaching IDR 150 billion and a minimum of only IDR 140 million, reflecting the uneven concentration of foreign investment across provinces.

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Model Specification Test

Table 4. Summary of Model Specification Test Results

Effects Test	Statistic	d.f.	Prob.	**Keputusan**
Chow Test (F)	630.571.673	(5,21)	0,0000	FEM > REM
Hausman Test (Chi-Sq)	150.545.425	5	0,0000	FEM > CEM

Source: EViews 13, processed 2026

The Chow Test produced an F-statistic of 630.57 with a probability of 0.0000 (< 0.05), so H0 is rejected and the Fixed Effect Model is more appropriate than the Common Effect Model. The Hausman Test produced a Chi-Square statistic of 35.60 with a probability of 0.0000 (< 0.05), so the Fixed Effect Model is better than the Random Effect Model. Accordingly, the model used in this study is the Fixed Effect Model (FEM).

Classical Assumption Tests

The Jarque-Bera normality test produced a probability value of 0.7593, greater than 0.05, so the model's residuals are normally distributed. The multicollinearity test showed correlations among the independent variables below 0.80 (PMW-HDI correlation: 0.6424; PMW-FDI: 0.3027; HDI-FDI: -0.1233), so there is no multicollinearity problem. The Glejser heteroscedasticity test produced probability values above 0.05 for all independent variables, so there is no heteroscedasticity problem. The Durbin-Watson value of 1.9046 falls within the range DU < DW < (4-DL) (1.6498 < 1.9046 < 2.7862), so there is no autocorrelation.

Fixed Effect Model Estimation Results

Table 5. Fixed Effect Model Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	467.1432	120.2249	3.885579	0.0009
PMW	4.78E-05	6.91E-06	6.912471	0.0000
HDI	-6.165791	1.778233	-3.467370	0.0023

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FDI	1.21E-07	4.53E-08	2.673756	0.0142

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.999678	Mean dependent var	123.7498
Adjusted R-squared	0.999555	S.D. dependent var	126.6098
S.E. of regression	2.670525	Akaike info criterion	5.045752
Sum squared resid	149.7657	Schwarz criterion	5.466111
Log likelihood	-66.68628	Hannan-Quinn criter.	5.180229
F-statistic	8145.341	Durbin-Watson stat	1.904561
Prob(F-statistic)	0.000000		

Source: EViews 13, processed 2026

The panel data regression equation obtained from the Fixed Effect Model is as follows:

LP = 467.1432 + 4.78E-05 PMW − 6.1658 HDI + 1.21E-07 FDI + [CX=F]

Individual Effects Across Provinces

Table 6. Individual Effect Values Across Provinces

Provinsi	*Effect*	*Individual Effect*
Jawa Timur	-36,17358	430,96962
Jawa Barat	-50,16854	416,97466
Jawa Tengah	-54,96613	412,17707
DKI Jakarta	206,96820	674,11140

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Banten	-57,76555	409,37765
DI Yogyakarta	-7,894405	459,24880

Source: EViews 13, processed 2026

DKI Jakarta has the highest individual effect (674.11), reflecting structural advantages such as a concentration of high-value-added service sectors, quality infrastructure, and an advanced business ecosystem. Banten has the lowest individual effect (409.38), with the largest negative effect value (-57.77), indicating regional structural factors that have not yet optimally supported productivity beyond the influence of the three variables studied.

Effect of Provincial Minimum Wage on Labor Productivity

The Provincial Minimum Wage variable has a coefficient of 4.78E-05 with a probability value of 0.0000, smaller than the 5 percent significance level. Thus, PMW has a positive and significant effect on labor productivity in Java Island during the 2020–2024 period, so the first hypothesis is accepted. This coefficient indicates that every IDR 100,000 increase in PMW raises labor productivity by around 4.78 units, assuming other variables remain constant.

This result is consistent with Efficiency Wage Theory (Shapiro & Stiglitz, 1984), which states that higher wages increase motivation, reduce absenteeism, curb turnover, and encourage workers to maintain optimal performance. Empirically, this result is in line with Riyanto (2022), who demonstrated a spillover effect of minimum wage increases on productivity improvements in the Indonesian manufacturing industry. In addition, an increase in PMW encourages firms to improve management efficiency, provide training, and optimize technology to remain competitive, which indirectly also increases labor productivity (Mankiw, 2018).

Effect of HDI on Labor Productivity

The Human Development Index (HDI) variable has a coefficient of -6.1658 with a probability of 0.0023 (< 0.05). This result shows that HDI has a negative and significant effect on labor productivity in Java Island, so the second hypothesis is accepted, although in the opposite direction from the initial expectation. This coefficient means that every one-point increase in HDI decreases labor productivity by 6.1658 units, ceteris paribus.

This result is not in line with Human Capital Theory (Becker, 1964), which predicts a positive relationship between the quality of human resources and productivity. However,

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this finding can be explained through two mechanisms. First, there is a skill mismatch between improving education quality and the needs of economic sectors, particularly in an era of rapid digital transformation. Second, during the 2020–2024 period, which covered the pandemic and economic recovery, many business sectors were not yet able to optimally absorb educated workers. Similar results were found by Zakaria (2022), who found that HDI had a significant negative effect on productivity in large and medium industries in East Java, explaining that the increase in HDI has not yet been accompanied by the productive use of human resource quality in the economic process.

Effect of FDI on Labor Productivity

The Foreign Direct Investment (FDI) variable, used as a proxy for technology, has a coefficient of 1.21E-07 with a probability of 0.0142 (< 0.05). This result shows that FDI has a positive and significant effect on labor productivity in Java Island, so the third hypothesis is accepted. Every increase in FDI raises labor productivity, assuming other variables remain constant.

This result is in line with Endogenous Growth Theory (Romer, 1986) and Technology Spillover Theory (Borensztein et al., 1998). FDI entering Java Island, particularly in the processing, manufacturing, electronics, and automotive industries, brings modern technology, better management systems, and worker training that improve production capability and efficiency. Wahyuni (2022) also demonstrated that FDI has a positive effect on labor productivity through technology spillover. The post-pandemic economic recovery process, driven by ease-of-doing-business policies, has also accelerated the inflow of technology-oriented foreign investment, making its contribution to productivity increasingly evident during the study period.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Based on the results of the panel data regression analysis using the Fixed Effect Model for six provinces in Java Island during the 2020–2024 period, the following conclusions are drawn. First, the Provincial Minimum Wage has a positive and significant effect on labor productivity. An increase in PMW encourages workers' motivation, loyalty, and performance quality through the efficiency-wage mechanism, while also encouraging firms to improve production efficiency. Second, the Human Development Index (HDI) has a negative and significant effect on labor productivity, indicating that improvements in the quality of human development have not been fully accompanied by skills that match labor-market needs and

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adequate technology adoption during the study period. Third, Foreign Direct Investment (FDI), as a proxy for technology, has a positive and significant effect on labor productivity through the mechanisms of technology transfer, knowledge spillover, and improved production process efficiency. The model has a very high explanatory power, with an R-squared value of 0.9997.

Recommendations

Based on the research findings, several policy recommendations can be formulated. PMW determination needs to consider the balance between improving workers' welfare and the capacity of businesses, accompanied by workforce skill-improvement programs. Improvements in HDI need to be followed by policies more focused on vocational education, industry-based job training, and strengthening the linkage between education and the labor market so that improved human resource quality can directly affect productivity. The government needs to encourage the inflow of high-technology-oriented FDI and knowledge transfer to the local workforce in order to maximize the benefits of technology spillover. Future research could expand the set of variables by adding economic infrastructure, unemployment rates, or digitalization indicators, and broaden the geographic scope beyond Java Island.

REFERENCES

Akerlof, G. A., & Yellen, J. L. (1986). Efficiency wage models of the labor market. Cambridge University Press.

Statistics Indonesia (BPS). (2020). Concepts and definitions of labor productivity. BPS RI.

Statistics Indonesia (BPS). (2025). GRDP, labor force, and provincial HDI data for Java Island 2020–2024. BPS RI.

Becker, G. S. (1964). Human capital: A theoretical and empirical analysis. Columbia University Press.

Blomström, M., & Kokko, A. (1998). Multinational corporations and spillovers. Journal of Economic Surveys, 12(2), 1–31.

Borensztein, E., De Gregorio, J., & Lee, J.-W. (1998). How does foreign direct investment affect economic growth? Journal of International Economics, 45(1), 115–135.

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Fadillah, M. R. (2020). Analysis of the determinants of labor productivity in Indonesia. Jurnal Ekonomi Pembangunan.

ILO. (2018). World employment and social outlook: Trends 2018. International Labour Organization.

ILO. (2023). Global employment trends for youth 2023. International Labour Organization.

Ministry of Manpower of the Republic of Indonesia. (2024). Provincial minimum wage data 2020–2024. Kemnaker RI.

Maharani, N. R. (2022). The effect of education, health, minimum wage, foreign investment on labor productivity in 33 provinces of Indonesia. Jurnal Ekonomi dan Pembangunan.

Mankiw, N. G. (2018). Principles of macroeconomics (8th ed.). Cengage Learning.

Rahman, M. (2024). Determinants of manufacturing industry labor productivity in Indonesia (Case study of 2018–2022). Jurnal Ekonomi Industri.

Riyanto, A. (2022). The impact of minimum wage on labor productivity: A case study of the Indonesian manufacturing industry. Jurnal Ekonomi dan Pembangunan Indonesia.

Romer, P. M. (1986). Increasing returns and long-run growth. Journal of Political Economy, 94(5), 1002–1037.

Schultz, T. W. (1961). Investment in human capital. American Economic Review, 51(1), 1–17.

Shapiro, C., & Stiglitz, J. E. (1984). Equilibrium unemployment as a worker discipline device. American Economic Review, 74(3), 433–444.

Simanjuntak, P. J. (2001). Introduction to human resource economics. LPFE-UI.

Sinungan, M. (2014). Productivity: What and how (8th ed.). Bumi Aksara.

Solow, R. M. (1956). A contribution to the theory of economic growth. Quarterly Journal of Economics, 70(1), 65–94.

Todaro, M. P. (2015). Economic development (12th ed.). Pearson.

Todaro, M. P., & Smith, S. C. (2021). Economic development (13th ed.). Pearson.

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UNDP. (2023). Human development report 2023/2024. United Nations Development Programme.

Wahyuni, K. T. (2022). The effect of spillover foreign direct investment on labor productivity in Indonesia. Jurnal Ekonomi dan Bisnis.

Widarjono, A. (2018). Econometrics: Introduction and applications with an EViews guide (5th ed.). UPP STIM YKPN.

World Bank. (2024). World development indicators 2024. World Bank Group.

Zakaria, A. (2022). Analysis of labor productivity in large and medium industries across regencies and cities in East Java Province, 2015–2019. Jurnal Ekonomi Regional.

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