THE EFFECT OF MINIMUM WAGES, AND THE GENDER DEVELOPMENT INDEX ON LABOR PRODUCTIVITY IN INDONESIA

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Abstract

Workforce productivity serves as a fundamental gauge of macroeconomic achievement, as it captures how effectively and qualitatively human capital transforms inputs into measurable output. This research is designed to investigate the influence of statutory minimum wages, the Gender Development Index (GDI), export activity, import activity, and mean per capita expenditure on labor productivity across Indonesia throughout the 2018–2023 timeframe. The study utilizes secondary panel data, integrating cross-sectional observations from six provinces with longitudinal data spanning six consecutive years. To assess the intervariable dynamics, panel regression analysis is conducted through the Common Effect Model (CEM). The empirical findings reveal that minimum wage levels exert a positive and statistically significant impact on labor productivity, implying that wage increases are associated with improvements in worker effectiveness and overall efficiency. Average Per Capita Expenditure also shows a positive and significant effect and emerges as the most dominant variable influencing productivity. In contrast, the Gender Development Index, Exports, and Imports do not exhibit statistically significant effects during the observed period. These findings imply that improvements in wage policy and economic welfare play a more direct role in increasing labor productivity than trade activities and gender development indicators in the short term.

Keywords: Export-Import, Gender Development Index, Labor Productivity, Minimum Wage, Per Capita Expenditure

INTRODUCTION

Labor productivity is a key indicator of economic activity that determines long-term national growth. High productivity not only increases workers' income but also reflects a country's global competitiveness (Firdaus & Indira Hasmarini, 2023). However, Indonesia's labor productivity remains lower than that of neighboring countries, with slowing growth in recent years due to disparities in human capital quality and suboptimal utilization of production factors (Mahfudj & Aisyah, 2025). According to the ASEAN Statistical Yearbook (2023), regional economic indicators show notable disparities in labour output across member states. Additionally, data from the ILO, (2023) highlights that Indonesia's labour productivity in 2023 was ranked fifth among ASEAN countries, underscoring the region's productivity gap. In 2022, provincial labor productivity was classified into five categories, with most provinces falling within the low to medium range and only a few achieving high or very high productivity levels, indicating substantial regional disparities across Indonesia.

Various factors are presumed to influence labor productivity, including trade openness, minimum wages, per capita expenditure, and gender equality. Trade openness through exports and imports can enhance efficiency, stimulate structural economic transformation, and expand employment opportunities, although its impact depends on the composition of exported goods and import patterns (Siregar et al., 2020). Minimum wages may increase work motivation, efficiency, and the adoption of new technologies, provided they are accompanied by improvements in workers' skills (Elitaş, 2025). Per capita expenditure, as an indicator of welfare, reflects households' capacity to invest in education, health, and basic needs that contribute to higher productivity (Qurrata & Ramadhani, 2021). Furthermore, the Gender Development Index affects human capital quality by promoting equal economic participation between men and women, thereby maximizing talent utilization and innovation (Marlida & Prasetyo, 2023).

Minimum wages are widely discussed in the literature as an important determinant of labor productivity. From the efficiency wage perspective, higher wages can improve worker morale, reduce turnover, and encourage greater effort, ultimately leading to higher output per worker. Empirical evidence from developing countries shows that moderate increases in minimum wages are associated with productivity gains, particularly when accompanied by improvements in skills and working conditions (Andrean et al., 2025). In Indonesia, several recent studies find that wage adjustments can stimulate labor performance and enhance firm-level efficiency, especially in labor-intensive sectors where income levels directly affect workers' welfare and motivation (Kurnia, 2024). International findings also suggest that adequate wage policies may incentivize firms to adopt more efficient technologies and management practices, thereby raising overall productivity (Abdul et al., 2024). However, the magnitude of the effect often depends on regional economic structure, labor market flexibility, and the quality of human capital.

Beyond remuneration levels, labor productivity is also profoundly shaped by the Human Development Index (HDI), since this composite indicator reflects fundamental aspects of human capital, including educational attainment, health conditions, and standards of living. From the standpoint of human capital theory, advances in schooling and healthcare enhance employees' competencies, flexibility, and intellectual functioning, thereby

generating a direct escalation in productive performance. Empirical studies in ASEAN countries demonstrate that higher HDI levels significantly correlate with productivity growth and economic competitiveness (Alma'ruf, 2023). In the Indonesian context, regional disparities in HDI are closely linked to variations in labor productivity, as provinces with better education attainment and health outcomes tend to exhibit higher output per worker. Recent international research further confirms that sustained investment in human development enhances long-term productivity through innovation, technological adoption, and improved labor quality (Kundhani, 2023). Therefore, HDI is considered a fundamental structural factor influencing productivity performance across regions.

Although numerous studies have examined the individual effects of trade openness, minimum wages, per capita expenditure, and the Gender Development Index on labor productivity, most prior research in Indonesia analyzes these variables separately or focuses on only one or two determinants within a limited scope. Very few studies integrate external factors (exports and imports), labor market policy (minimum wage), welfare indicators (per capita expenditure), and gender development simultaneously within a single empirical model. In addition, previous studies often rely on cross-sectional data or cover periods prior to the post-pandemic economic adjustment phase, thereby not capturing the structural changes occurring during 2019–2023. This study differs from earlier research by employing a panel data approach across provinces and incorporating both economic and social dimensions in a unified framework, allowing for a more comprehensive and contemporaneous analysis of labor productivity determinants in Indonesia.

The contribution of this study is twofold. Empirically, it provides updated evidence on the relative and dominant effects of economic openness, wage policy, welfare level, and gender development on labor productivity during a period marked by economic recovery and structural transformation. Methodologically, it enriches the literature by integrating macroeconomic, labor, and social development indicators into one regression model, offering a multidimensional perspective rather than a partial analysis. Practically, the findings provide clearer policy implications for central and regional governments in designing coordinated strategies such as wage-setting policies, welfare improvement programs, trade strategies, and gender-inclusive development to enhance labor productivity more effectively and equitably across provinces.

Hypothesis Development

The Effect of Minimum Wage on Labor Productivity

From the standpoint of efficiency wage doctrine, statutory pay floors are conceptually associated with variations in workforce output, as this framework maintains that more generous remuneration can stimulate heightened drive, stronger occupational contentment, and superior task execution. With improved financial rewards, employees tend to exert greater diligence, display lower rates of absence, and operate with enhanced procedural effectiveness. Moreover, increased earnings enable individuals to sufficiently secure essential necessities including adequate nutrition, healthcare access, and educational opportunities which in turn foster improved physiological well-being and sharper cognitive functioning. Irawan & Khoirudin, (2024) also indicate that wage increases can positively affect productivity, particularly in developing economies where income levels significantly influence workers' welfare. Therefore, it is hypothesized that minimum wage has a positive effect on labor productivity.

H_1: Minimum Wage has a positive effect on Labor Productivity.

The Effect of the Gender Development Index on Labor Productivity

Parity between women and men across the spheres of health outcomes, educational attainment, and income distribution is captured through a composite indicator placed at the end, namely the Gender Development Index (GDI). Interpreted within a human capital framework, the contraction of gender-based disparities strengthens the aggregate quality of the labor supply by opening equivalent educational pathways and economic prospects to both sexes. As such imbalances recede, participation in the labor market becomes increasingly comprehensive and efficiently allocated, which in turn fosters gains in overall productivity. Utami, (2025) suggests that gender equality contributes to economic growth and productivity improvements. Thus, it is proposed that the Gender Development Index positively influences labor productivity.

H_2: The Gender Development Index has a positive effect on Labor Productivity.

The Effect of Exports on Labor Productivity

Exports are associated with productivity through trade openness and technological spillover effects. According to international trade theory, firms engaged in export activities tend to adopt more advanced technologies, improve efficiency, and enhance competitiveness to meet global standards. Exposure to international markets can stimulate innovation and knowledge transfer, which may increase output per worker. Aqilah et al., (2024) also shows that export-oriented economies often experience productivity gains due to scale economies and market expansion. Therefore, exports are expected to positively affect labor productivity.

H_3: Exports have a positive effect on Labor Productivity.

The Effect of Imports on Labor Productivity

Imports can influence productivity by providing access to higher-quality intermediate goods, capital goods, and advanced technologies. The availability of imported inputs may enhance production efficiency and allow firms to operate at lower costs with better technology. Moreover, import competition can pressure domestic firms to improve efficiency and innovation. Iskandar & Hamid, (2020) find that trade openness, including imports, contributes to productivity improvements in developing countries. Hence, imports are hypothesized to have a positive impact on labor productivity.

H_4: Imports have a positive effect on Labor Productivity.

The Effect of Average Per Capita Expenditure on Labor Productivity

Average per capita expenditure reflects the level of household welfare and purchasing power. Higher expenditure levels indicate better access to essential goods and services, including food, healthcare, and education, which are fundamental components of human capital development. Improved welfare conditions can enhance workers' physical health, skills, and overall work performance. The argument advanced by Kistanti (2024) underscores the pivotal contribution of household-level economic well-being to the shaping of workforce productivity, particularly within the context of emerging and developing nations. In light of this perspective, higher average expenditure per individual is anticipated to exert a favorable effect on labor productivity.

H_5: Average Per Capita Expenditure has a positive effect on Labor Productivity.

RESEARCH METHOD

The investigation relies on archival datasets, integrating cross-sectional observations from six Indonesian provinces with longitudinal figures spanning the 2018–2023 period. Empirical estimation is performed through panel regression techniques utilizing EViews 9.0, in which pooled data constitute the fusion of temporal sequences and interregional units of analysis. The specified econometric framework is employed to explore the linkage between explanatory variables and the outcome variable, thereby generating a thorough evaluation of determinants shaping labor productivity across provincial contexts and throughout the observed timeframe.

$$LP_{it} = \alpha + \beta_1 WAGE_{it} + \beta_2 GDI_{it} + \beta_3 EXS_{it} + \beta_4 IMP_{it} + \beta_5 ACE_{it}$$

Where :

LP	= Labor Productivity
α	= Constant Value
WAGE	= Minimum Wage
GDI	= Gender Development Index
EXS	= Exports
IMP	= Imports
ACE	= Average Per Capita Expenditure
β1…. β5	= Coefficients of the independent variables
μit	= Error term at time t for cross-sectional unit i
i	= 1, 2, 3, ..., 6 (cross-sectional data of regencies/cities in Indonesia)
t	= Time series data, years 2018–2022

Table 1.
Operational Definition of Variables

Variable	Operational Definition	Unit
	Dependent	
Labor Productivity (LP)	The level of labor productivity in each province during the 2017–2022 period, reflecting the ability of labor to generate output.	Percentage (%) – Central Bureau of Statistics
	Independent	
Minimum Wage (WAGE)	The Provincial Minimum Wage determined annually by the government in each province.	Indonesian Rupiah per month (IDR/month) – Central Bureau of Statistics
Exports (EXS)	The total annual value of goods exported from each province.	Million US Dollars (Million US$) – Central Bureau of Statistics
Imports (IMP)	The total annual value of goods imported into each province.	Million US Dollars (Million US$) – Central Bureau of Statistics

Gender Development Index (GDI)	An index measuring gender gaps in human development achievements between males and females in each province.	Percentage (%) – Central Bureau of Statistics
Average Per Capita Expenditure (ACE)	The average monthly consumption expenditure per capita reflecting the welfare level of the population.	Indonesian Rupiah per month (IDR/month) – Central Bureau of Statistics

Source: Secondary data from Central Bureau of Statistics (2018–2023), processed by the author.

Panel data analysis encompasses multiple methodological options, such as the pooled (common) effect, fixed effect, fixed effect segmented by groups, and random effect frameworks (Gujarati & Potter, 2013, cited in Ashari, 2023). In selecting the optimal approach, this investigation initiates with the Chow examination to discriminate between the pooled and fixed effect structures, proceeds with the Hausman evaluation to weigh fixed versus random effect suitability, and culminates with the Lagrange Multiplier (LM) assessment to verify whether the random effect paradigm surpasses the pooled alternative in adequacy.

Prior to the execution of hypothesis evaluations, a series of classical diagnostic procedures are undertaken to affirm the robustness of the analytical model. This encompasses probing multicollinearity to uncover excessive interdependence among predictors, inspecting heteroskedasticity to ascertain uniformity in residual dispersion, and scrutinizing autocorrelation to reveal potential temporal linkage among error terms. The discrete contribution of each predictor to labor productivity is interrogated via t-statistics, whereas the aggregate influence of all covariates is adjudicated through the F-statistic. Coefficients β_1 to β_5 are meticulously interpreted to elucidate both the polarity and intensity of their respective effects, yielding an exhaustive portrayal of how export-import flows, statutory minimum wages, per capita expenditure averages, and the Gender Development Index collectively shape labor productivity trajectories within Indonesia.

RESULTS AND DISCUSSION

Table 2 encapsulates a synopsis of outcomes derived from econometric modeling, encompassing the Pooled Least Squares (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM), together with the examinations conducted for determining the aptness of model selection.

Table 2.
Results of Panel Data Regression Econometric Model Estimation

Variables	PLS	FEM	REM
C	51.47758	68.75874	51.47758
WAGE	2.15E-06	9.43E-07	2.15E-06
GDI	0.002031	-0.159243	0.002031
EXP	-4.08E-05	9.52E-05	-4.08E-05
IMP	7.14E-05	5.79E-05	7.14E-05
ACE	1.27E-05	1.16E-05	1.27E-05

Model Selection Test
1. Chow
Cross-Section F(5,25) = 1.815520; Prob, F(0.0485) = 0.1462
2. Hausman
Cross-Section Random X2(4) = 9.077698; Prob. X2(5) = 0.31060

Source: Data processing, 2026

The probability yielded by the Chow examination, amounting to 0.1462 (surpassing 0.05), intimates that favoring the Common Effect Model (CEM) is judicious. Subsequently, the Hausman scrutiny returns a probability of 0.31060 (again above 0.05), intimating that the Random Effect Model (REM) is preferable over the Fixed Effect Model (FEM). Given the divergence, Chow advocating for CEM while Hausman leans toward REM, resorting to the Lagrange Multiplier (LM) evaluation becomes imperative to adjudicate the optimal choice between the Common Effect Model (CEM) and the Random Effect Model (REM).

Table 3.
Lagrange Multiplier Test

	Cross Section	Test Hypothesis Time	Both
Breusch-Pagan	0.031026	0.077977	0.109003
	(0.8602)	(0.7801)	(0.7413)

Source: Data processing, 2026

When results from the Chow and Hausman tests diverge, the Breusch-Pagan LM test serves as the decisive arbiter. The guideline dictates that a P-value below 0.05 favors the Random Effect Model, whereas a P-value exceeding 0.05 recommends adopting the Common Effect Model. Given that the obtained P-value equals 0.7413, surpassing the 0.05 threshold, the analytical procedure should proceed utilizing the Common Effect Model (CEM).

Multicollinearity

Table 4.
Multicollinearity Using the Pairwise Correlation Method with a Correlation Value Limit < 0.80

	EXP	IMP	WAGE	ACE	GDI
EXP	1	0.7215	0.1925	0.1593	-0.6219
IMP	0.7215	1	0.1336	0.1456	-0.6697
WAGE	0.1925	0.1336	1	-0.1694	-0.0128
ACE	0.1593	0.1456	-0.1694	1	0.3297
GDI	-0.6219	-0.6697	-0.0128	0.3297	1

Source: Data processing, 2026

An examination of multicollinearity conducted through the pairwise correlation approach indicates that the intercorrelations among the explanatory variables remain below the critical cutoff of 0.80. The most pronounced association appears between EXP (Exports) and IMP (Imports), yielding a coefficient of 0.7215, which may be considered comparatively high yet still falls within an acceptable tolerance range. Meanwhile, EXP and GDI have a negative correlation of −0.6219, and IMP and GDI show a negative correlation of −0.6697; however, these values remain below 0.80 in absolute terms. Other variable pairs, such as

WAGE and ACE, exhibit weak correlations (below 0.40), indicating low linear association. Consequently, one may infer that multicollinearity complications are absent within the regression framework employed in this investigation.

Hypothesis Testing

Partial t-test

An individual assessment of each predictor's contribution to the outcome variable is carried out through the t-statistic (partial examination). This procedure involves contrasting the obtained t-score with the corresponding critical threshold or, alternatively, evaluating the probability (sig.) value under a 5% alpha criterion. When the empirical t-score exceeds the critical benchmark or the significance probability falls below 0.05, the null hypothesis (H_0) is dismissed in favor of the alternative hypothesis (H_1), signifying that the predictor exerts a statistically meaningful influence on the response variable. In contrast, should the computed t-score remain beneath the critical boundary or the probability value surpass 0.05, the null hypothesis is retained while the alternative is declined, implying the absence of a statistically substantiated effect of the predictor on the dependent variable.

Table 5.
t-Test Results

Variable	T_{count}	T_{table}	Probability
WAGE	3.766404	2,032245	0.0007
GDI	0.078371	2,032245	0.9381
EXP	-0.445897	2,032245	0.6589
IMP	0.827801	2,032245	0.4143
ACE	8.260402	2,032245	0.0000

Source: Data processing, 2026

Inspection of the partial t-test outcomes presented in Table 5 reveals that neither Export (EXP) nor Import (IMP) exert a statistically meaningful influence on Labor Productivity (LP), as their probability scores stand at 0.6589 and 0.4143, each surpassing the 0.05 threshold. In a parallel vein, the Gender Development Index (GDI), with a probability of 0.9381 (> 0.05), fails to assert a significant sway over labor productivity. Contrastingly, Wage (WAGE) manifests a positive and consequential effect, evidenced by its probability value of 0.0007 (< 0.05) alongside a positive t-statistic of 3.766404. Similarly, Economic Growth (ACE) exhibits a pronounced and affirmative influence on labor productivity, with a t-statistic of 8.260402 and a probability score of 0.0000 (< 0.05). Thus, only wages and economic growth significantly affect labor productivity at the 5% significance level.

Simultaneous F-Test

Table 6.
Simultaneous Test Results

Description	Value
F-statistic	29.43753
Prob (F-statistic)	0,000000
F table ($\alpha = 0.05$; df1 = 5; df2 = 31)	2,52254

Source: Data processing, 2026

Table 6 reveals that the computed F-statistic, amounting to 29.43753, surpasses the critical F-value of 2.52254, while the associated probability, 0.000000, lies well beneath the

0.05 threshold. Consequently, the null hypothesis (H_0) is refuted, favoring the alternative (H_1), thereby implying that, in unison, the independent variables exert a statistically meaningful influence on the dependent variable.

Determination Coefficient Test

To gauge how much sway the independent variable wields over fluctuations in the dependent variable, the regression model enlists the coefficient of determination as its metric of discernment.

Table 7.
R-square Test Results

Information	Value
R-squared	0.830688
Adjusted R-squared	0.802469

Source: Data processing, 2026

Referring to Table 7, the Adjusted R^2 registers at 0.802469, equivalent to 80.2469%. Such a magnitude suggests that the variables under study collectively account for 80.2469% of the fluctuations observed in labor productivity, leaving a residual 19.7531% to influences not encompassed within this model. Consequently, the employed regression framework demonstrates robust capacity in elucidating the dependent variable's variance.

Panel Data Regression Equation

The estimation output derived from the panel regression model reveals that WAGE carries a parameter estimate of 0.00000215 with a significance level of 0.0007 (below 0.05), thereby confirming a positive and statistically meaningful contribution to Labor Productivity (LP). Put differently, holding other variables constant, every additional one-unit rise in wages corresponds to a 0.00000215-unit escalation in labor productivity. Conversely, GDI records a coefficient of 0.002031 accompanied by a probability value of 0.9381 (exceeding 0.05), which denotes a positive direction of association that fails to attain statistical significance. In addition, EXP yields a parameter value of -0.0000408 with a probability of 0.6589 (greater than 0.05), implying an inverse relationship with LP that is likewise statistically unsubstantiated. Similarly, IMP presents a coefficient of 0.0000714 and a probability of 0.4143 (above 0.05), indicating a positive yet statistically non-significant linkage with labor productivity. Finally, ACE exhibits a coefficient magnitude of 0.0000127 with a probability value of 0.0000 (less than 0.05), signifying a positive and statistically robust effect on labor productivity.

The Effect of Minimum Wage on Labor Productivity

Hypothesis 1 (H1) posits that labor productivity (LP) rises in response to increases in the minimum wage. Empirical analysis reveals that the wage parameter produces a t-statistic of 3.766404, surpassing the critical t-value of 2.032245, accompanied by a p-value of 0.0007, which is below the 0.05 threshold. This outcome confirms that wages exert a positive and statistically meaningful influence on labor productivity, leading to the acceptance of Hypothesis 1. The regression coefficient, measured at 2.15×10^{-6}, suggests that an incremental single-unit augmentation in wages corresponds to a 0.00000215-unit rise in labor productivity. Although the initial research framework proposed that all independent variables would significantly affect labor productivity, the findings reveal that only wages and economic growth are statistically significant. This suggests that during the 2019–2023

period, labor productivity in Indonesia was more directly influenced by wage incentives compared to other macroeconomic factors. This outcome aligns with the postulations of efficiency wage theory, which posits that more generous remuneration schemes may cultivate heightened employee motivation, stronger workplace discipline, and superior performance levels (Khoirudin, 2023; Zulha et al., 2024). Complementary evidence from Rachmadani et al. (2023) further corroborates this perspective, demonstrating that upward adjustments in statutory minimum wages contribute to improvements in labor welfare and the refinement of human capital, which subsequently translates into greater productivity. Therefore, the minimum wage policy during 2019–2023 played an important role in promoting increased labor productivity in Indonesia.

The Effect of the Gender Development Index on Labor Productivity

Statistical estimation reveals that the Gender Development Index (GDI) produces a t-value of 0.078371, falling well below the critical t-threshold of 2.032245, and is accompanied by a significance level of 0.9381, which exceeds the 0.05 criterion. These figures collectively imply the absence of a statistically meaningful association between GDI and Labor Productivity. Thus, Hypothesis 2, which proposed that GDI affects labor productivity, is not supported. The insignificance of this variable may be explained by several factors. First, improvements in gender development indicators do not automatically translate into immediate productivity gains, as their impact tends to be long-term and structural. Second, disparities in job quality, occupational segregation, and limited female participation in high-productivity sectors may weaken the direct contribution of gender development to overall labor productivity. Third, the relatively short observation period may not fully capture the gradual economic effects of improvements in gender equality.

These findings differ from theoretical expectations suggesting that improved gender equality in education, health, and employment opportunities enhances human capital quality and labor market efficiency (Mersiana, 2020). Similarly, the World Bank (2020) argues that greater female participation in economic activities can expand the productive labor base and increase output per worker. However, the results of this study indicate that, during the research period, improvements in GDI were not sufficient to generate a statistically significant impact on labor productivity.

The Effect of Exports on Labor Productivity

The partial t-test analysis reveals that the Export (EXP) variable produced a t-statistic of -0.445897, falling below the critical t-value of 2.032245, accompanied by a probability of 0.6589 (> 0.05). This outcome suggests that exports exert no statistically discernible influence on Labor Productivity (LP) in Indonesia across the 2019–2023 span. Consequently, Hypothesis 3, which posited a significant impact of exports on labor productivity, finds no empirical support. Despite the regression coefficient of -0.0000408 indicating an inverse association, the lack of statistical significance implies that variations in export volumes are not substantiated as determinants of labor productivity within the scope of this research.

The rejection of this hypothesis may be explained by the structure of Indonesia's exports, which are still largely dominated by primary commodities and capital-intensive sectors. Such sectors tend to rely more on capital and natural resources rather than labor efficiency, so increases in export value do not necessarily translate into higher labor productivity. In addition, fluctuations in global demand and commodity prices during the

study period may have affected export performance without directly improving domestic labor productivity.

This finding is consistent with previous studies suggesting that an increase in exports does not automatically enhance labor productivity, particularly when export activities are concentrated in low-value-added sectors (Nurcahyani, 2025). Similarly, Larasati et al., (2022) argues that exports can improve labor productivity only when accompanied by technological advancement, value-added production, and high-quality human capital. Therefore, the insignificant effect of exports on LP in this study indicates that Indonesia's export activities during 2019–2023 have not yet been fully effective in driving improvements in labor efficiency and productivity.

The Effect of Imports on Labor Productivity

Examination of the data reveals that the Import indicator (IMPOR) yields a t-statistic of 0.827801, falling short of the critical t-value of 2.032245, accompanied by a probability of 0.4143 (> 0.05). This outcome implies that import activity fails to exert a statistically discernible influence on Labor Productivity. Consequently, Hypothesis 4, which posited a meaningful impact of imports on labor productivity, lacks empirical support. Even though the regression coefficient is positive (0.0000714), intimating that each incremental unit of imports could elevate labor productivity by 0.0000714 units, the effect remains statistically negligible.

The rejection of this hypothesis may be explained by several factors. First, the structure of imports in Indonesia may be dominated by consumption goods rather than capital goods or technology-intensive inputs that directly enhance production efficiency. Second, even when imports consist of capital goods or intermediate inputs, their contribution to productivity depends on the capacity of the domestic workforce to utilize them effectively. Without adequate skills, technological readiness, and complementary investments, imported goods may not translate into higher labor productivity. Additionally, structural constraints such as limited industrial upgrading and unequal distribution of technology adoption across regions may weaken the productivity impact of imports.

This finding is in line with Clarissa, (2025) which argue that imports, particularly of capital goods and raw materials, do not automatically increase labor productivity unless accompanied by workers' ability to adopt advanced technologies and improved production processes (Agus & Aisyah, 2025). Dike, (2025) also highlights that the impact of imports on productivity tends to be indirect and highly dependent on the quality of human resources and supportive workforce training policies. Thus, the insignificant effect found in this study suggests that import activities in Indonesia have not yet been fully optimized as a mechanism for enhancing labor productivity.

The Effect of Average Per Capita Expenditure on Labor Productivity

Hypothesis five (H5) posited a consequential link between Average Per Capita Expenditure (ACE) and labor productivity. Empirical regression analysis revealed a t-statistic of 8.260402 for ACE, surpassing the critical t-value of 2.032245, accompanied by a probability of 0.0000, which is below the 0.05 threshold. Consequently, H5 is corroborated, confirming that ACE exerts a positive and statistically robust impact on labor productivity. The coefficient, quantified at 1.27E-05, denotes that a single-unit escalation in ACE corresponds to a 0.0000127-unit augmentation in labor productivity. When compared with

other predictors, ACE emerges as the most influential, as evidenced by its preeminent t-statistic.

Although the initial hypothesis assumed that all independent variables would significantly affect labor productivity, the empirical results show that only wages and ACE are significant. The strong significance of ACE suggests that variations in household welfare levels are more directly associated with productivity improvements compared to trade-related variables or gender development indicators within the observed period. This may occur because per capita expenditure more immediately reflects real purchasing power and living standards, which directly influence workers' physical capacity, access to education, and overall well-being.

The present result aligns with a range of earlier empirical inquiries. Nabila (2023) demonstrates that elevated per capita spending serves as an indicator of strengthened living standards and greater purchasing capacity, both of which contribute to the advancement of human capital. In a comparable vein, Nanda (2025) argues that when households possess sufficient financial outlays, individuals are better positioned to secure fundamental necessities including adequate nutrition, educational attainment, and healthcare access thereby fostering higher competence and work efficiency. Furthermore, Bambang (2020) substantiates that the economic well-being of households constitutes a pivotal determinant in elevating workforce productivity across developing economies, Indonesia among them. Thus, the results of this study reinforce prior evidence that economic welfare at the household level is a key determinant of labor productivity.

CONCLUSION

Labor productivity is an important indicator of economic performance, as it reflects the efficiency and quality of human resources in generating output. Various macroeconomic and social factors, such as international trade, wages, welfare levels, and gender development, are theoretically expected to influence labor productivity. Therefore, this study aims to analyze the effect of Exports, Imports, Wages, Average Per Capita Expenditure, and the Gender Development Index on Labor Productivity during the 2018–2023 period.

This study applies panel data estimation through the Common Effect Model (CEM) to investigate how the explanatory variables are associated with labor productivity. The empirical estimation reveals that Wages exert a positive and statistically meaningful influence on Labor Productivity, suggesting that increases in wage levels are aligned with higher levels of worker output. Conversely, the Gender Development Index (GDI) fails to demonstrate statistical significance in explaining variations in Labor Productivity. Likewise, both Exports and Imports do not exhibit a significant relationship with productivity levels. In contrast, Average Per Capita Expenditure displays a positive and statistically robust effect on Labor Productivity and emerges as the most influential determinant among the variables examined. These findings suggest that improvements in economic welfare and wage policies play a more direct role in enhancing labor productivity compared to trade activities and gender development indicators during the observed period.

The limitation of this study is the relatively short observation period (2018–2023) and the scope of variables included in the model. Therefore, future research is recommended to extend the study period, apply alternative panel data models for comparison, and incorporate

additional variables such as education quality, technological advancement, and industrial structure to provide more comprehensive and robust findings.

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