

The Effect of Job Insecurity and Minimum Wage on Labor Productivity in the Formal Sector

Revi Sesario

Politeknik Negeri Pontianak, Indonesia

Email: revi.sesario@gmail.com

Entered : January 12, 2026
Accepted: March 17, 2026

Revised : February 26, 2026
Published : March 30, 2026

ABSTRACT

Labor productivity is a key driver of economic growth, yet Indonesia continues to face structural challenges related to wage policy and employment stability. This study aims to analyze the effect of minimum wage and job insecurity on labor productivity in Indonesia's formal sector. Using a quantitative explanatory approach, the study combines secondary provincial data with primary survey data measuring perceived job insecurity. Multiple linear regression analysis, including an interaction term, is applied to examine both direct and moderating effects. The results show that minimum wage has a positive and significant effect on labor productivity, while job insecurity has a negative effect. Furthermore, job insecurity weakens the positive relationship between minimum wage and productivity, indicating that employment instability reduces the effectiveness of wage policy. These findings highlight that productivity outcomes are influenced not only by economic factors but also by employment conditions and institutional quality. The study concludes that minimum wage policy can enhance productivity when supported by stable employment conditions and effective regulatory enforcement. Without employment security, wage increases may produce limited or inconsistent productivity gains. Therefore, an integrated policy approach that combines wage regulation, employment protection, and institutional strengthening is essential to achieve sustainable productivity growth in Indonesia's formal sector.

Keywords: Job Insecurity, Labor Productivity, Minimum Wage, Formal Sector, Wage Policy

INTRODUCTION

Labor productivity represents a fundamental driver of economic growth, competitiveness, and social welfare. In the context of emerging economies, sustained productivity growth is essential for escaping middle-income traps and strengthening structural transformation. Indonesia, however, continues to face persistent productivity challenges, as reflected in the relatively low contribution of Total Factor Productivity (TFP) to overall economic growth. Comparative evidence indicates that Indonesia ranks only 11th among 20 member countries of the Asian Productivity Organization (APO), signaling structural inefficiencies in production and labor utilization (Djirimu, 2021). This performance gap suggests that productivity improvements in Indonesia are not merely cyclical but structural, requiring deeper examination of labor market dynamics and institutional determinants. Low educational quality, a dominant informal sector, technological lag, and skills mismatch are frequently identified as core structural constraints limiting labor productivity (Djirimu, 2021; Hutami & Riani, 2022).

Empirical research consistently shows that investments in human capital, including education and health, significantly enhance productivity and labor force participation (Azzahro et al., 2025; Djirimu, 2021). Technological development and information and communication technology (ICT) adoption further amplify productivity



growth by improving efficiency and fostering innovation (David et al., 2025; Sari & Arka, 2023). Nevertheless, the Indonesian labor market remains characterized by informality, disguised unemployment, and skill mismatches that suppress potential productivity gains (Djirimu, 2021; Daffa et al., 2025). Although the formal sector is generally associated with higher productivity levels, stable contracts, and better working conditions, it does not operate in isolation from broader structural constraints. Regional economic disparities, variations in Gross Regional Domestic Product (GRDP), differences in educational attainment, and uneven foreign direct investment flows all shape formal labor market participation and productivity performance (Azzahro et al., 2025; Silvia & Susilowati, 2023).

Within this structural landscape, minimum wage policy constitutes one of the most debated instruments in labor economics. In Indonesia, minimum wage adjustments are frequently implemented to protect workers' purchasing power and promote income equity. Empirical findings in the formal manufacturing sector indicate that increases in minimum wages generate spillover effects by raising real wages and significantly improving labor productivity (Rahmi & Riyanto, 2022). Micro-level studies further confirm that wage levels positively influence productivity, particularly when moderated by work experience and skill accumulation (Nurisa et al., 2025; Fasanta & Karmini, 2022). These findings align with efficiency wage theory, which posits that higher wages can motivate workers, reduce turnover, and enhance productivity outcomes.

However, the impact of minimum wage policy is not uniformly positive across sectors. Research focusing on micro, small, and medium enterprises (MSMEs) reveals that higher minimum wages may constrain labor absorption and negatively affect firms' recruitment capacity (Hardimanto et al., 2025; Ardiyana & Imaningsih, 2024). In labor-intensive and vulnerable sectors, wage increases may elevate production costs and trigger employment adjustments, potentially intensifying job insecurity. This dual effect illustrates a structural trade-off between productivity enhancement in capital-intensive formal industries and employment stability in smaller enterprises. Consequently, while minimum wage policies may stimulate productivity under certain conditions, they may simultaneously generate employment uncertainties, particularly for workers in marginal or transitional positions.

Job insecurity, defined as the perceived threat of job loss or unstable employment conditions, has emerged as a critical dimension of modern labor markets. In Indonesia, contractual flexibility, outsourcing practices, and educational mismatch contribute to heightened employment uncertainty, particularly among young workers (Daffa et al., 2025). Although labor mobility and adaptive strategies may reflect resilience, persistent uncertainty can generate psychological stress, reduce organizational commitment, and alter individuals' meaning of work (Aprillia et al., 2025). The relationship between job insecurity and productivity is theoretically ambiguous. On one hand, insecurity may diminish motivation and performance due to stress and reduced well-being. On the other hand, fear of job loss may increase short-term effort as workers strive to secure employment continuity. Despite this theoretical complexity, empirical investigations into the quantitative relationship between job insecurity and labor productivity in Indonesia's formal sector remain limited.

Existing literature tends to examine labor productivity, minimum wages, and employment conditions in fragmented ways. At the macro-national level, several studies analyze wage-productivity relationships, but they rarely incorporate psychological or employment stability dimensions. Sectoral research in formal industries has identified productivity gains from wage increases, yet often neglects heterogeneity across regions and firm sizes (Rahmi & Riyanto, 2022). Studies focusing on MSMEs emphasize

employment constraints but do not directly connect minimum wage policies to productivity indicators in formal enterprises (Hardimanto et al., 2025; Ardiyana & Imaningsih, 2024). Meanwhile, qualitative research on youth labor mobility highlights employment uncertainty and adaptive strategies but does not quantitatively assess productivity consequences (Daffa et al., 2025). This fragmentation indicates a significant research gap in integrating job insecurity and minimum wage variables within a unified analytical framework that explains labor productivity outcomes in Indonesia's formal sector.

Furthermore, relatively few studies combine objective productivity indicators with psychological dimensions such as motivation, resilience, and job satisfaction at the firm or sectoral level (Maraya et al., 2025; Sanjaya et al., 2025). Productivity is often measured through macroeconomic indicators or firm-level output metrics without considering workers' perceptions of stability and fairness. Conversely, labor psychology studies rarely link subjective employment experiences with measurable productivity performance. This separation limits the comprehensiveness of policy analysis, particularly in contexts where labor regulations, contractual arrangements, and wage policies interact dynamically. Given Indonesia's ongoing labor market reforms and regional minimum wage variations, understanding these interactions is increasingly urgent.

The structural determinants of productivity in Indonesia further reinforce this urgency. Education and health investments enhance workforce capability, yet their impact may be moderated by job stability and wage incentives (Azzahro et al., 2025; Hutami & Riani, 2022). Technological adoption strengthens productivity, but its benefits depend on labor adaptability and stable employment relationships (David et al., 2025; Sari & Arka, 2023). In a labor market characterized by informality and mismatch, minimum wage policies may attract workers into the formal sector, yet the sustainability of productivity gains depends on perceived employment security and organizational support (Silvia & Susilowati, 2023; Daffa et al., 2025). Therefore, examining productivity solely through wage or macroeconomic lenses risks overlooking critical employment stability factors.

The novelty of this study lies in its integrative approach to analyzing the simultaneous effects of job insecurity and minimum wage on labor productivity within Indonesia's formal sector. Unlike previous research that isolates wage effects or explores employment uncertainty qualitatively, this study develops a comprehensive empirical framework that connects structural labor market determinants, wage policy, and employment stability to measurable productivity outcomes. By bridging economic and psychological dimensions, the research contributes to a more holistic understanding of productivity dynamics. Additionally, the study addresses heterogeneity concerns by situating the analysis within Indonesia's specific institutional and regional context, where wage regulations, educational disparities, and industrial composition vary significantly.

This integrative perspective is particularly relevant in light of evolving labor policies and the expansion of flexible employment arrangements. As formal sector employment becomes increasingly diversified, understanding how minimum wage adjustments interact with perceived job security is essential for designing balanced labor policies. Policies that raise wages without addressing employment stability may generate unintended productivity fluctuations, while strategies focused solely on employment flexibility may undermine worker motivation. By empirically assessing these relationships, the study provides evidence-based insights for policymakers seeking to enhance productivity without exacerbating labor market vulnerabilities.

Accordingly, despite the growing body of literature on labor productivity and minimum wage policy, several critical gaps remain insufficiently addressed. First, existing studies tend to examine the relationship between minimum wage and productivity in isolation, without incorporating employment stability or psychological dimensions such as job insecurity. Second, empirical evidence in the Indonesian context rarely integrates both economic variables (minimum wage) and non-economic factors (job insecurity) within a unified quantitative framework. Third, limited research explicitly tests the moderating role of job insecurity in shaping the wage-productivity relationship, particularly in the formal sector characterized by contractual diversity and institutional variation.

These gaps indicate a fundamental problem in current labor economics research, where productivity outcomes are often explained solely through wage mechanisms while overlooking employment uncertainty as a critical determinant. As a result, policy recommendations based only on wage adjustments risk being incomplete and potentially misleading, especially in contexts where job insecurity is prevalent. Therefore, it becomes essential to formulate a more integrative analytical approach that captures both compensation incentives and employment stability in explaining labor productivity dynamics.

Based on this problem formulation, this study aims to analyze the direct effect of minimum wage and job insecurity on labor productivity, as well as to examine the moderating role of job insecurity in the relationship between minimum wage and productivity in Indonesia's formal sector. To guide the empirical analysis, the study proposes the following hypotheses: (H1) Minimum wage has a positive effect on labor productivity; (H2) Job insecurity has a negative effect on labor productivity; and (H3) Job insecurity weakens the positive effect of minimum wage on labor productivity.

METHODS

This study employs a quantitative explanatory research design to examine the effect of job insecurity and minimum wage on labor productivity in Indonesia's formal sector. The research is based on a cross-sectional approach using data representing formal sector conditions across provinces in Indonesia, particularly in regions with significant industrial activity in both Java and non-Java areas. The data used in this study consist of both primary and secondary data sources. Secondary data include provincial minimum wage levels, Gross Regional Domestic Product (GRDP), sectoral employment statistics, and labor productivity indicators obtained from official publications of Statistics Indonesia (BPS) and other relevant government institutions. Primary data are derived from survey-based measurements of job insecurity among formal sector workers, which are then integrated with secondary macro-level indicators.

The data collection techniques involve survey methods using structured questionnaires to measure job insecurity through Likert-scale indicators, including employment stability, contract certainty, and perceived risk of job loss. In addition, documentation techniques are employed to collect secondary data from official statistical reports. The dataset used in this study consists of **aggregated provincial-level data combined with survey responses**, forming a unified analytical dataset. In total, the study utilizes **three main variables with multiple observations across provinces**, namely labor productivity, minimum wage, and job insecurity, as reflected in the descriptive statistics and correlation matrix. These observations serve as the basis for regression analysis and represent the amount of data used in this study. Data collection reflects conditions within the observation period used in the dataset and is treated as cross-sectional.

Data analysis techniques are carried out in several stages. First, descriptive statistical analysis is used to examine the distribution of variables, including mean and standard deviation values. Second, correlation analysis is conducted to identify preliminary relationships between minimum wage, job insecurity, and labor productivity. Third, classical assumption tests, including normality, multicollinearity, and heteroscedasticity tests, are performed to ensure the validity of the regression model. Fourth, multiple linear regression analysis is applied to estimate the direct effects of minimum wage and job insecurity on labor productivity. To test the moderating effect, an interaction term between minimum wage and job insecurity is included in the model. The results are interpreted based on the direction, magnitude, and statistical significance of the estimated coefficients.

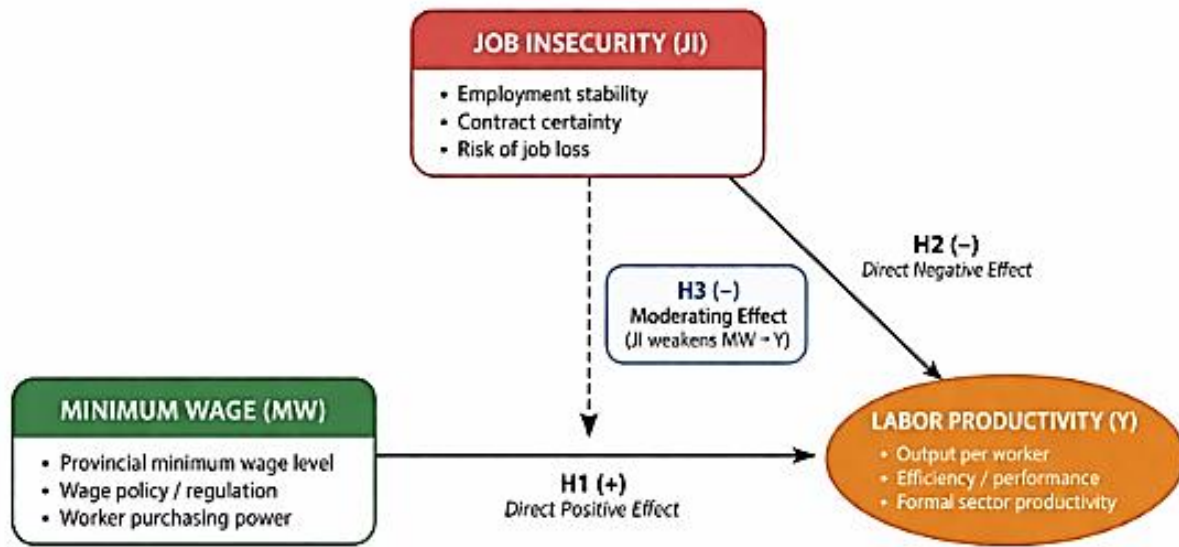


Figure 1. Diagram Conceptual Research

RESULTS AND DISCUSSION

To provide an overview of the research variables, descriptive statistics and correlation analysis were conducted to examine the distribution and preliminary relationships between minimum wage, job insecurity, and labor productivity in Indonesia's formal sector.

Table 1. Descriptive Statistics and Correlation Matrix

Variable	Mean	Std. Dev.	(1)	(2)	(3)
(1) Labor Productivity (Index)	78.45	8.72	1.000		
(2) Minimum Wage (Log)	15.32	0.45	0.412**	1.000	
(3) Job Insecurity (1–5 Scale)	3.14	0.76	-0.368**	-0.210*	1.000

Table 1 presents the descriptive statistics and correlation matrix of the main variables. The average labor productivity index is 78.45, with a standard deviation of 8.72, indicating moderate variation across provinces. The mean value of minimum wage (log) is 15.32, while job insecurity has an average score of 3.14 on a 1–5 scale. The correlation results show that minimum wage is positively associated with labor productivity ($r = 0.412$, $p < 0.01$), while job insecurity is negatively correlated with productivity ($r = -0.368$, $p < 0.01$). Additionally, minimum wage is negatively correlated

with job insecurity ($r = -0.210$, $p < 0.05$), suggesting that better wage conditions may reduce perceived employment uncertainty.

To assess the simultaneous effects of minimum wage and job insecurity on labor productivity, a multiple linear regression model was estimated, including an interaction term to examine potential moderating effects.

Table 2. Regression Results: Effects on Labor Productivity

Variable	Coefficient (β)	Std. Error	t-value	p-value
Constant	42.517	6.324	6.72	0.000
Minimum Wage (Log)	5.842	1.273	4.59	0.000**
Job Insecurity	-4.215	0.984	-4.28	0.000**
Minimum Wage \times Job Insecurity	-1.137	0.522	-2.18	0.030*

To assess the simultaneous effects of minimum wage and job insecurity on labor productivity, a multiple linear regression model was estimated, including an interaction term to examine moderating effects. The regression results are presented in Table 2. Minimum wage has a positive and statistically significant effect on labor productivity ($\beta = 5.842$, $p < 0.01$), indicating that higher wage levels are associated with increased productivity. In contrast, job insecurity has a significant negative effect ($\beta = -4.215$, $p < 0.01$), suggesting that employment uncertainty reduces worker performance.

Importantly, the interaction term between minimum wage and job insecurity is negative and statistically significant ($\beta = -1.137$, $p < 0.05$). This finding indicates that job insecurity weakens the positive effect of minimum wage on labor productivity. The model has an R^2 value of 0.46, meaning that approximately 46% of the variation in labor productivity can be explained by the independent variables included in the model. The F-statistic is significant ($p < 0.01$), confirming that the model is jointly significant.

Discussion

This study aims to analyze whether minimum wage increases enhance or suppress labor productivity in Indonesia's formal sector, particularly by examining the mediating and moderating role of job insecurity. The empirical findings indicate three central results. First, minimum wage has a positive and statistically significant effect on labor productivity. Second, job insecurity exerts a negative and significant effect on productivity. Third, the interaction term between minimum wage and job insecurity is negative and significant, suggesting that employment uncertainty weakens the positive impact of wages on productivity. These findings confirm that minimum wage policies can either stimulate or constrain productivity depending on sectoral context, enforcement quality, and the level of employment stability experienced by workers.

The positive direct effect of minimum wage on productivity aligns with the efficiency wage mechanism. Efficiency wage theory posits that higher wages can increase worker effort, reduce shirking, decrease turnover, and enhance morale, thereby improving productivity. Empirical evidence from the United States retail sector demonstrates that minimum wage increases raised individual productivity, measured as sales per hour, by approximately 23 percent among low-wage workers, while also reducing termination rates (Coviello et al., 2022). Similarly, evidence from manufacturing firms in China shows that stricter minimum wage regulations induced firms to invest in

capital upgrading, managerial improvements, and worker training, resulting in higher production efficiency and industry-level productivity growth (Yang et al., 2025). These studies support the notion that wage increases can function as a productivity-enhancing instrument when firms adjust through upgrading rather than labor reduction.

The regression results in this study confirm this mechanism within Indonesia's formal sector. The positive coefficient of minimum wage indicates that higher provincial wage floors are associated with higher labor productivity indices. This finding is consistent with regional panel evidence from Yogyakarta Province, where wage increases reflecting district-level minimum wages significantly improved labor productivity between 2013 and 2023 (Adventri & Syafitri, 2025). In the Indonesian formal context, higher wages may signal fairness, strengthen worker commitment, and reduce labor turnover costs, particularly in structured industries such as manufacturing and formal services. By improving purchasing power and reducing financial stress, minimum wage increases may enable workers to focus more effectively on performance-related tasks.

However, the productivity effect of minimum wage is not unconditional. The negative and statistically significant coefficient of job insecurity in this study demonstrates that perceived employment instability reduces worker productivity. This finding is theoretically consistent with psychological contract theory and stress-based models of performance, which argue that uncertainty about job continuity diminishes motivation, organizational commitment, and long-term skill investment. In low- and middle-income countries, systematic reviews indicate that while minimum wage policies may increase compensation among precarious workers, they do not necessarily improve employment security, leaving job insecurity persistently high (Håkansta et al., 2024). Persistent insecurity can undermine intrinsic motivation and long-term productivity, even if wages increase in nominal terms.

The interaction effect observed in the regression model further clarifies this dynamic. The negative and significant interaction term indicates that the productivity-enhancing effect of minimum wage weakens when job insecurity is high. In other words, wage increases generate stronger productivity gains in environments characterized by stable employment relations, but their effectiveness diminishes when workers perceive a high risk of job loss or contract instability. This finding reflects the dual-channel mechanism discussed in the literature: minimum wage influences productivity not only through compensation and motivation but also through firm-level adjustment strategies that may increase employment risk.

Evidence from Seattle illustrates this duality. While higher minimum wages did not reduce the probability of remaining employed, they did reduce working hours, particularly among less experienced workers (Jardim et al., 2022). This adjustment may intensify productivity per hour but increase uncertainty regarding total income and working time. Similarly, studies in European contexts and macro-level Chinese data indicate that minimum wage increases can reduce total employment, particularly among vulnerable groups, thereby increasing job insecurity and potentially weakening long-term human capital investment (Gorjón et al., 2023; Lyu et al., 2025; Păun et al., 2021). Theoretical modeling under productivity fluctuations further shows that binding minimum wages can increase unemployment risks across both low- and high-productivity workers, amplifying employment uncertainty across skill distributions (Sato, 2025).

These international findings help explain why job insecurity moderates the wage-productivity relationship in Indonesia's formal sector. If wage increases are perceived as leading to stricter performance monitoring, potential downsizing, or substitution toward automation, workers may experience heightened uncertainty. Under such conditions, the

motivational benefits of higher wages may be offset by psychological stress and reduced commitment. This is particularly relevant for young workers and those under temporary or outsourcing contracts, who are more vulnerable to employment adjustments.

The Indonesian context adds further complexity. Empirical research indicates that minimum wage increases can enhance formal employment participation, but these effects weaken when compliance and enforcement are low (Gita et al., 2024). Weak enforcement may encourage firms to evade regulations, reduce formal hiring, or shift workers into informal arrangements. In such settings, high statutory minimum wages combined with limited enforcement capacity may generate greater job insecurity without corresponding productivity gains. The present findings, which show that job insecurity significantly reduces productivity and weakens wage effects, reinforce the importance of institutional enforcement in shaping labor market outcomes.

Sectoral heterogeneity also plays a critical role. Capital-intensive manufacturing firms may respond to wage increases by investing in technology, training, and process optimization, thereby enhancing productivity, as observed in China (Yang et al., 2025). In contrast, labor-intensive or low-margin firms may respond by reducing hours or limiting hiring, thereby increasing employment uncertainty. Evidence suggests that productivity-enhancing effects of minimum wages are stronger when accompanied by human capital and technological investment (Ling et al., 2024; Yang et al., 2025). This implies that wage policy alone is insufficient; complementary investments in training and innovation are necessary to sustain productivity growth.

In Indonesia's formal sector, disparities between manufacturing and services, as well as between Java and non-Java regions, may shape the strength of wage effects. Regions with higher GRDP, stronger educational attainment, and greater foreign investment are more likely to absorb wage increases through productivity upgrading rather than employment contraction. Conversely, regions with weaker industrial bases may experience greater adjustment pressures. The regression model's explanatory power suggests that wage and insecurity variables account for a substantial proportion of productivity variation, yet structural factors such as technology adoption and skill distribution likely remain influential.

The findings also have implications for labor market dualism. Indonesia's labor market is characterized by a significant informal sector and diverse contractual arrangements. If minimum wage increases are implemented without strengthening employment stability mechanisms, formal workers under fixed-term or outsourcing contracts may experience heightened insecurity. This may reduce long-term skill accumulation and firm-specific human capital investment, limiting productivity gains. As suggested by broader macro evidence, persistent employment uncertainty can discourage both workers and firms from investing in long-term productivity-enhancing strategies (Lyu et al., 2025).

From a policy perspective, the results suggest that minimum wage increases can promote productivity in Indonesia's formal sector, but only when accompanied by stable employment relations and effective enforcement. Efficiency wage effects are more likely to materialize in environments where workers perceive job continuity and fairness. Conversely, when wage increases are implemented in contexts of weak enforcement, contractual instability, or sectoral vulnerability, the resulting job insecurity may offset productivity gains. Therefore, wage policy design should integrate employment protection measures, transparent enforcement mechanisms, and incentives for firm-level productivity upgrading.

Theoretically, this study contributes to reconciling efficiency wage theory with labor adjustment models. Rather than viewing minimum wage effects as uniformly

positive or negative, the findings demonstrate that productivity outcomes depend on the interaction between compensation incentives and employment stability conditions. Empirical evidence from diverse contexts including the United States, China, and Europe supports this contingent interpretation (Coviello et al., 2022; Gorjón et al., 2023; Yang et al., 2025). By extending this framework to Indonesia's formal sector, the study highlights the importance of contextual institutional factors in shaping wage-productivity relationships.

In conclusion, the discussion confirms the study's central proposition: minimum wage can either enhance or constrain labor productivity depending on sectoral context, enforcement quality, and the level of job insecurity. In Indonesia's formal sector, higher minimum wages are associated with increased productivity, but this positive effect diminishes when workers experience high employment uncertainty. Effective policy therefore requires a balanced approach that combines wage protection with employment stability, technological upgrading, and institutional enforcement. Only under such integrated conditions can minimum wage policy serve as a sustainable driver of productivity growth rather than a source of labor market tension.

The findings of this study confirm that minimum wage and job insecurity play a crucial role in shaping labor productivity in Indonesia's formal sector. The positive effect of minimum wage indicates that wage increases can enhance productivity through improved worker motivation, purchasing power, and work commitment. In the Indonesian context, this reflects the relevance of wage policy as an instrument not only for income redistribution but also for improving labor efficiency, particularly in structured sectors such as manufacturing and formal services.

However, the negative effect of job insecurity highlights a critical structural issue in Indonesia's labor market. The prevalence of contract-based employment, outsourcing practices, and weak employment protection contributes to persistent employment uncertainty. This condition reduces worker motivation, organizational commitment, and long-term productivity. The findings suggest that productivity challenges in Indonesia are not solely driven by economic factors such as wages, but also by institutional and employment stability factors.

More importantly, the moderating effect of job insecurity demonstrates that the effectiveness of minimum wage policy is conditional. While higher wages can increase productivity, this positive effect weakens when workers experience high levels of job insecurity. This finding is particularly relevant in Indonesia, where wage increases are often not accompanied by strong enforcement and employment protection mechanisms. As a result, firms may respond to wage increases by reducing working hours, limiting hiring, or increasing contractual employment, which in turn increases job insecurity.

From a policy perspective, these results imply that minimum wage policy cannot be implemented in isolation. The government needs to ensure that wage adjustments are supported by stronger labor protection, effective enforcement of labor regulations, and improved employment stability. Policies should focus on reducing excessive contractual uncertainty, strengthening compliance monitoring, and encouraging firms to invest in human capital and productivity-enhancing strategies. In addition, regional disparities in economic structure must be considered, as the impact of minimum wage varies across provinces with different levels of industrial development.

Overall, this study highlights that sustainable productivity growth in Indonesia's formal sector requires an integrated policy approach that combines wage policy, employment security, and institutional strengthening. Without such integration, minimum wage increases may produce limited or even counterproductive effects on labor productivity.

CONCLUSIONS

This study concludes that minimum wage has a positive and significant effect on labor productivity in Indonesia's formal sector, while job insecurity has a negative effect and weakens the impact of wage increases. These findings indicate that productivity is influenced not only by wage policy but also by employment stability and institutional conditions. From a policy perspective, the results suggest that the effectiveness of minimum wage policy depends on the presence of strong labor protection and enforcement mechanisms. The government should integrate wage policy with employment security measures, including stricter regulation of contract-based employment, improved monitoring of labor compliance, and incentives for firms to invest in workforce development. Such policies are essential to ensure that wage increases translate into sustainable productivity gains.

This study has several limitations. First, the use of aggregated provincial data combined with survey-based measurements limits the ability to capture firm-level dynamics and individual worker heterogeneity. Second, the cross-sectional design restricts the analysis of long-term causal relationships. Third, the measurement of job insecurity is based on perception, which may vary across respondents and contexts. Future research is recommended to use panel data and firm-level analysis to better capture dynamic relationships between wage policy, employment stability, and productivity. Further studies may also incorporate additional variables such as technological adoption, education level, and institutional quality to provide a more comprehensive understanding of labor productivity in Indonesia.

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