Socioeconomic determinants of blue-collar employment in West Java Province: A binary logistic regression approach

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Abstract
Employment issues remain a persistent national challenge in Indonesia, particularly in West Java Province, which has a high concentration of blue-collar workers. These workers, typically engaged in manual and technical sectors, often face structural vulnerabilities, including low job security, limited social protection, wage stagnation, and restricted career advancement opportunities. This study aims to analyze the characteristics and determinants influencing individuals' likelihood of becoming blue-collar workers in West Java Province. Using a quantitative approach, the research draws on microdata from the 2022 National Labor Force Survey (SAKERNAS) provided by Statistics Indonesia (BPS). A binary logistic regression model is employed to examine how individual and employment-related characteristics affect the probability of working in blue-collar occupations. The results show that gender, marital status, education level, job training, participation in the Pre-employment Card program, age group, regional minimum wage category, and area classification significantly influence this likelihood. Notably, individuals with lower educational attainment are 2.9 times more likely to become blue-collar workers. The findings underscore the critical role of education in shaping labor market segmentation. Strengthening the education, vocational training, and Pre-employment Card ecosystem is essential to reduce the vulnerability of blue-collar workers and expand their access to decent, inclusive employment opportunities.

Keywords: *Binary logistic regression; Blue-collar employment; Labor market segmentation; Socioeconomic determinants*

JEL Classification: C25, J21, J23

INTRODUCTION

Indonesia has a large population, with West Java Province reaching 49 million people in 2022, according to census projections from Statistics Indonesia (BPS, 2022). Employment issues—particularly unemployment—remain significant challenges that hinder sustainable economic growth. These problems are exacerbated by the imbalance

between labor demand and supply, especially in regions with high population densities. West Java Province, which has the largest workforce in Indonesia, faces additional difficulties due to the post-COVID-19 impact. The workforce, comprising employed individuals and the unemployed who are actively seeking jobs, is closely related to the labor force participation rate (LFPR), which reflects the proportion of working-age individuals who are either employed or seeking employment.

Based on BPS projections (2022), the Indonesian workforce is concentrated on the island of Java, with East Java recording 32,106,491 workers and Central Java 27,490,859. West Java has the largest workforce in the country, amounting to 38,667,809 people—significantly higher than other provinces, each with fewer than 10 million workers. The workforce includes individuals aged 15 to 65 years (BPS, 2022). However, in the province with the largest population—exceeding 49 million—there are not enough employment opportunities to match the size of its labor force. This imbalance has led to employment problems, including high open unemployment rates and skill mismatches.

According to Ginting et al. (2021), regions with large workforces, such as West Java, tend to experience higher unemployment rates. The study emphasizes the importance of improving workforce quality through education and training programs aligned with labor market demands, as well as the need for greater investment in sectors that can absorb workers, such as manufacturing and agriculture. Structural challenges, including limited access to quality education and disparities in infrastructure development, have further worsened the situation. The COVID-19 pandemic has also aggravated these issues, particularly within the informal sector.

Previous research shows that blue-collar workers—who dominate the labor market in West Java—often face difficulties due to a lack of skills required by industry, thereby increasing unemployment among this group. This condition underscores the need for targeted policies to bridge the gap between workforce skills and industrial needs, especially for blue-collar workers employed in labor-intensive sectors. Improving the quality of vocational education, implementing competency-based job training, and fostering collaboration between the government, educational institutions, and industry stakeholders are essential to enhancing workforce competitiveness. In addition, equitable infrastructure development is critical to ensuring that job opportunities extend beyond urban centers to rural areas. Thus, the abundant labor potential in West Java can be optimized to promote sustainable regional economic growth and reduce high unemployment rates.

Widodo & Anwar (2024) argue that one of the main causes of this mismatch is limited access to technical job training relevant to industrial needs. Moreover, industries that require blue-collar workers are concentrated in specific industrial zones, thereby intensifying disparities between regions with high labor concentration and those with limited employment opportunities. In West Java, the high supply of blue-collar workers is often not optimally absorbed by sectors that demand them, partly due to the absence of integrated skills certification and job training programs.

Blue-collar workers possess essential physical and technical skills, including those required for production, assembly, and manual machine maintenance (Eurofound, 2022). This study focuses on the dynamics of blue-collar labor supply by examining factors contributing to the gap between the number of available workers and market demand, and by identifying strategic measures to enhance labor absorption in this sector.

Putranto (2022) notes that blue-collar workers tend to have lower skill levels and typically occupy non-managerial positions. Nonetheless, they play a crucial role in supporting various industrial sectors that form the backbone of the economy. However, blue-collar workers often face challenges regarding wages, benefits, and career advancement opportunities. Understanding their characteristics and challenges is therefore essential for formulating policies to improve their welfare and reduce social inequality. According to Njoto & Habib (2023), white-collar workers, in contrast, are individuals engaged in administrative functions—typically office-based—who handle management, planning, and coordination tasks, as well as information and data processing. In today's increasingly complex work environment, white-collar workers play an essential role in ensuring the smooth operation of organizations in both the public and private sectors.

Figure 1 shows that the number of blue-collar workers exceeds that of white-collar workers and has continued to rise from 2020 to 2023. The significant contribution of blue-collar workers to West Java's workforce underscores the need to examine the factors influencing individuals' decisions to become blue-collar workers.

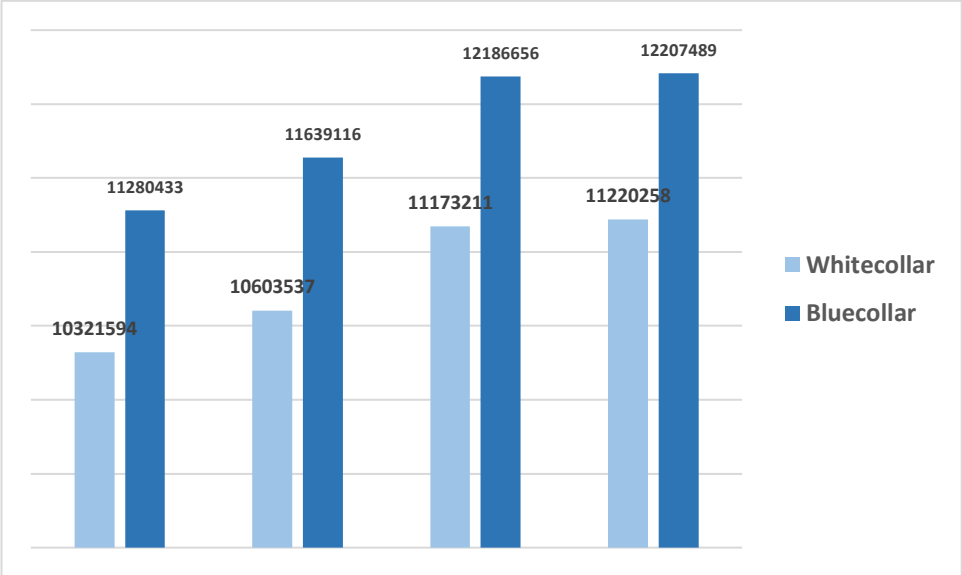

Figure 1. Workforce in West Java Province 2020 - 2023
Source: National Labor Force Survey 2020-2023, processed

Figure 2 indicates that blue-collar workers earn lower wages than white-collar workers. The vulnerability experienced by blue-collar workers may hinder the achievement of several Sustainable Development Goals (SDGs), particularly Goals 3 (welfare), 8 (decent work and economic growth), and 10 (reducing inequality) (Sultana & Rahman, 2022).

The minimum wage policy serves as a crucial economic instrument for improving workers' welfare and fostering local economic growth. It not only raises workers' living standards but also contributes to more equitable income distribution, thereby promoting sustainable economic development (Riyanto et al., 2025).

Given the issues outlined above, it is essential to conduct research examining the determinants of blue-collar employment in West Java. This study also aims to address a research gap in the study of employment issues among blue-collar workers and the limited use of SAKERNAS microdata to analyze their determinants. The findings can serve as a

valuable reference for policymakers—both at the central and regional levels—in designing employment-supportive policies.

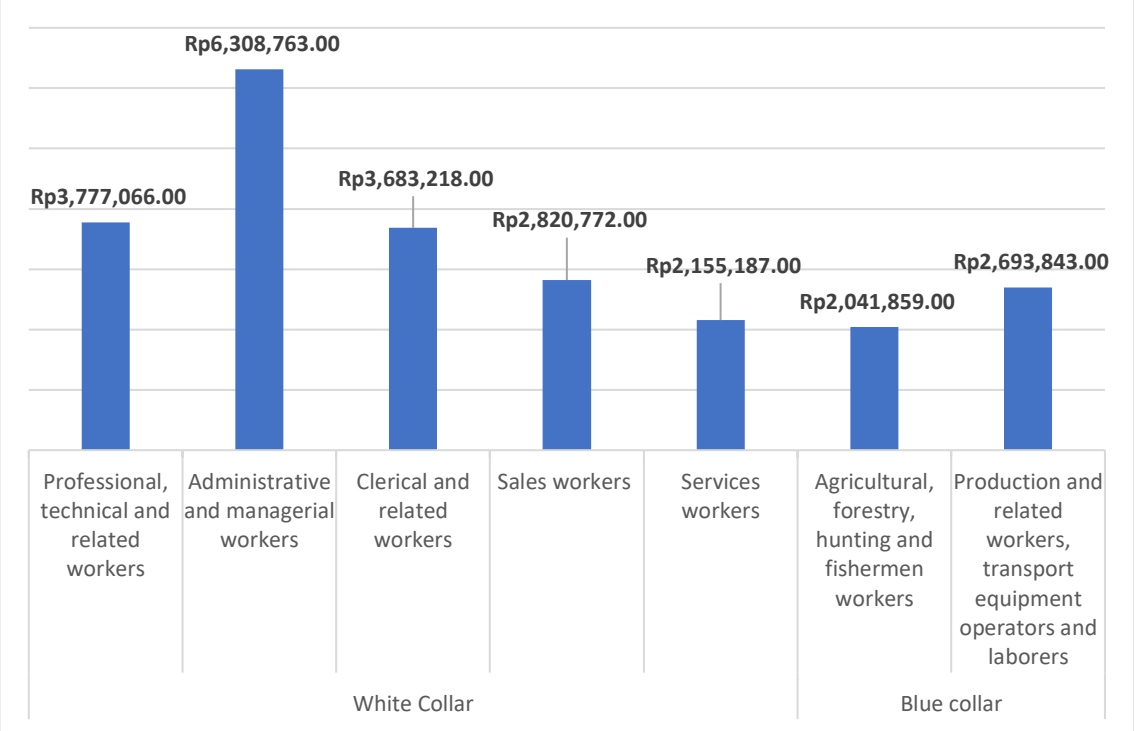

Figure 2. Wages by job type in West Java Province 2022
Source: BPS 2022, processed

Moreover, this study incorporates regional characteristics by using macro-level data at the regency/city level in its econometric model, thereby constituting a key novelty. Accordingly, this study seeks to address the following research questions: (1) What are the characteristics of blue-collar workers in West Java Province? (2) How do gender, marital status, education level, training, pre-employment status, age, district/city minimum wage (UMK), and regional classification influence individuals' likelihood of becoming blue-collar workers in West Java?

METHODS

This study utilizes data from the National Labor Force Survey (SAKERNAS), conducted by Statistics Indonesia (BPS) in August 2022, along with macro-level data published by BPS West Java Province in 2022. The study employs cross-sectional individual data from a single survey period. The observations consist of workers residing in West Java Province in 2022, totaling 34,135 respondents. Descriptive statistics were generated through tabulation using sample weights derived from the SAKERNAS microdata provided by BPS, thereby producing population-level estimates.

Blue-collar workers are defined as individuals occupying non-managerial positions or possessing relatively low levels of skill. The worker classification is based on the Indonesian Standard Classification of Occupations (KBJI), which aligns with the International Standard Classification of Occupations (ISCO). According to Eurofound (2022), blue-collar workers correspond to KBJI/ISCO codes 6, 7, 8, and 9, encompassing skilled agricultural, forestry, and fisheries workers; processing and craft workers;

machine operators and assemblers; and manual laborers.

All variables used in this study are based on the SAKERNAS metadata published by Statistics Indonesia, facilitating replication for future research. The independent variables include gender, marital status, education level, participation in job training, participation in the Pre-employment Card program, age group, regency/city minimum wage classification, and regional classification (Table 1).

Table 1. Research variables

Variable	Category	
Dependent Variable	Type of Worker	0=White-Collar Worker (reference category) 1=Blue-collar Worker
Independent Variable	Gender	0=Female (reference category) 1=Male
	Marital Status	0=Married (reference category) 1=Unmarried
	Education	0=High (reference category) 1=Low
	Training	0=No (reference category) 1=Yes
	Pre-employment card	0=No (reference category) 1=Yes
	Age group	0=Unproductive (reference category) 1=Productive
	Classification Regency/City Minimum Wage (UMK)	0=High (reference category) 1=Low
	Regional Classification	0=Rural (reference category) 1=Urban

The gender variable is categorized into two groups: male and female (reference category). The marital status variable is divided into two categories: never married and ever married (including divorced and widowed), with ever married serving as the reference category. The education variable is classified into higher education — which includes senior high school (*SMA/MA/SMK equivalents*), diploma levels (D1–D4), and university degrees (S1–S3) — and lower education, which covers primary and junior secondary levels (*SD/MI and SMP/MTs equivalents*). In this study, higher education is coded as 0 (reference category), while lower education is coded as 1.

The job training variable distinguishes between individuals who have participated in job training and those who have not (reference category). Similarly, the Pre-employment Card variable distinguishes individuals who have participated in the Pre-employment Card program from those who have not (the reference category). The age group variable categorizes respondents into productive and non-productive age groups, with individuals aged 15–64 classified as productive. Non-productive ages are coded as 0 (reference category), while productive ages are coded as 1.

The regency/city minimum wage (UMK) variable is a numeric variable expressed in rupiah that represents the minimum wage applicable in the respondent's working area. The UMK is classified into low and high categories based on the average of all regency/city UMKs in West Java. In this study, high UMK is coded as 0 (reference

category) and low UMK as 1. The regional classification variable distinguishes between urban and rural areas, with rural serving as the reference category.

This study employs a binary logistic regression model to examine the effects of several independent variables on a binary dependent variable. The objective is to determine whether the independent variables significantly influence the dependent variable, either simultaneously or individually, and to predict the likelihood of an outcome based on specific values of the independent variables. This model allows for the identification of relationships between various factors and the dependent variable (Widariono, 2010; Hosmer & Lemeshow, 2019).

The logistic regression model is expressed as follows:

$$ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1\, Gender + \beta_2\, Marital\ Status + \beta_3\, Education + \beta_4\, Training + \beta_5\, Pre-employment + \beta_6\, age + \beta_7\, UMK + \beta_8\, Regional\ Clasification$$

Where: Pi: Probability of becoming blue-collar
1-Pi: Probability of becoming white-collar

After estimating the logistic regression model, the overall model significance was tested using the G-test, while the significance of individual independent variables was evaluated using the Wald test. The G-test examines the joint influence of all independent variables, whereas the Wald test assesses the impact of each variable individually.

The estimated coefficients were interpreted using odds ratios, which indicate the likelihood of an event occurring based on specific characteristics. To assess the goodness-of-fit of the logistic regression model, a classification accuracy table was used. This method evaluates the model's ability to correctly classify individuals into their respective categories—in this case, distinguishing blue-collar from white-collar workers—based on predicted probabilities. A model is considered to have acceptable predictive performance when its overall classification accuracy exceeds 50% (Hosmer Jr et al., 2013).

RESULTS AND DISCUSSION

This section presents and discusses the study's empirical findings, based on data from the 2022 National Labor Force Survey (SAKERNAS) and supplementary regional statistics from West Java Province. The presentation begins with a descriptive analysis of the spatial distribution and characteristics of blue-collar workers across regencies and cities, followed by the results of the binary logistic regression model that identifies the main determinants influencing individuals' likelihood of becoming blue-collar workers. The discussion further interprets these findings in relation to existing theories and previous empirical studies.

Results

Blue-collar workers by regency/city in West Java Province

Figure 3 presents the distribution of blue-collar workers across regencies and cities in West Java Province in 2022. The largest number of blue-collar workers was recorded in Bogor Regency**,** with 1,274,406 people, followed by Cianjur Regency **(**886,228) and Bekasi Regency (818,383**).** In contrast, Cirebon City had the fewest blue-collar workers, totaling 49,609.

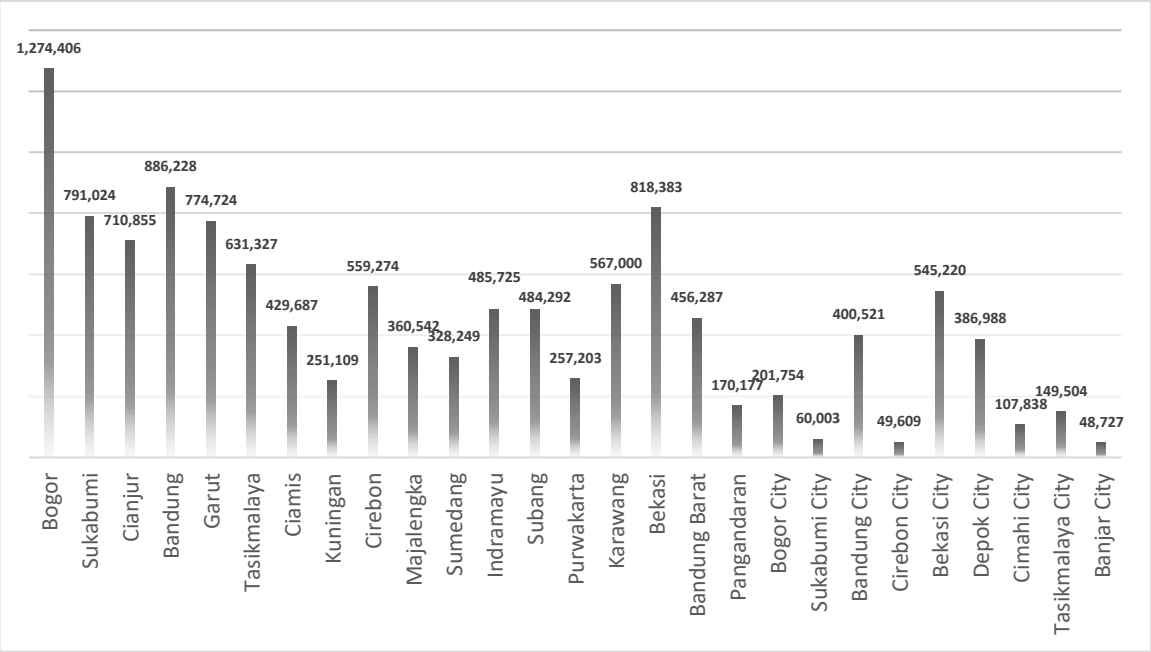

Figure 3. Overview of Blue-collar Workers in West Java Province in 2022
Source: National Labor Force Survey 2022, processed

Characteristics of blue-collar workers in West Java Province

Based on Table 2, most blue-collar workers in West Java Province are male (72.7%)**,** married (85.3%)**,** and have a low level of education (71.1%)**.** In addition, the majority have not participated in job training (88.4%) or the Pre-employment Card program (98.3%)**,** and are within the productive age group (91.3%)**.** Furthermore, 57.6% of blue-collar workers are located in high-UMK areas, and 70.2% live in urban areas.

Table 2. Characteristics of workers in West Java Province by type of worker, 2022

Characteristics		Type of Worker	
		White-collar (%)	Blue-collar (%)
Gender	Female	45.9	27.3
	Male	54.1	72.7
Marital Status	Married	80.1	85.3
	Unmarried	19.9	14.7
Education	High	59.0	28.9
	Low	41.0	71.1
Training	No	72.9	88.4
	Yes	27.1	11.6
Pre-Employment Card	No	97.7	98.3
	Yes	2.3	1.7
Age category	Unproductive	4.5	8.7
	Productive	95.5	91.3
UMK Classification	High	68.8	57.6
	Low	31.2	42.4
Regional Classification	Rural	15.0	29.8
	Urban	85.0	70.2

Source: National Labor Force Survey 2022, processed

Logistic regression results and model evaluation

The logistic regression model was statistically significant (χ^2 = 3739067.954, df = 8, p < 0.001), indicating a good model fit. The coefficients, significance levels, and odds ratios are presented in Table 3.

Table 3. Logistic regression results and model fit statistics

Variable	Coefficient	Significance	Odds Ratio
Gender (Male)	0.966***	0.000	2.628
Marital Status (Unmarried)	0.071***	0.000	1.073
Education (Low)	1.080***	0.000	2.945
Training (Yes)	−0.565***	0.000	0.569
Pre-employment Card (Yes)	0.548***	0.000	1.730
Age (Productive)	−0.220***	0.000	0.802
UMK (Low)	0.099***	0.000	1.104
Region (Urban)	−0.524***	0.000	0.592
Model Fit (Chi-square = 3,739,067.954; df = 8; Sig. = 0.000)			

*Notes:*** Significant at the level 1%*

The results reveal that all independent variables significantly affect the probability of becoming a blue-collar worker at the 1% level. Males are 2.63 times more likely than females to become blue-collar workers. Individuals with lower levels of education are 2.95 times more likely to work in blue-collar occupations than those with higher levels of education. Participation in job training reduces the likelihood of being a blue-collar worker (odds ratio = 0.57), suggesting that job training increases the likelihood of securing a white-collar position. Participants in the Pre-employment Card program are 1.73 times more likely to be blue-collar workers, possibly because the program primarily targets unemployed individuals or those in the informal sector. Individuals within the productive age group have a slightly lower probability (odds ratio = 0.80) of being blue-collar workers, which may reflect their transition into other types of employment. Workers residing in regions with low minimum wages (UMK) are 1.10 times more likely to be blue-collar workers than those in high-UMK areas. Finally, individuals living in urban areas are less likely (odds ratio = 0.59) to be blue-collar workers, as urban regions generally offer more diverse employment opportunities, including a higher proportion of white-collar positions.

To further evaluate the model's predictive performance, Table 5 presents the classification results. The model correctly predicts 68.4% of the observed cases, indicating that logistic regression demonstrates strong discriminative power in distinguishing between blue-collar and white-collar workers. Since the overall accuracy exceeds the 50% threshold, the model is considered valid and reliable for predicting individuals' likelihood of being classified as blue-collar workers.

Table 5. Classification table

Observed	Predicted		
	White collar	Blue collar	Percentage Correct
White collar	10573	5298	66.6
Blue collar	5477	12787	70.0
Overall Percentage			68.4

Discussion

Gender and the tendency to become a blue-collar worker

Gender has a significant positive influence on the likelihood of becoming a blue-collar worker. Men are considerably more likely than women to be employed in blue-collar occupations. This finding supports the human capital theory, which posits that differences in physical characteristics and innate abilities between men and women influence the types of jobs they pursue. Because blue-collar occupations often require substantial physical strength, men—with their greater physical capacity—are more likely to work in this sector.

Research by Cortes & Pan (2017) supports this result, highlighting that perceptions of men's superiority in physical and motor skills influence occupational choices. Similarly, the Ministry of Women's Empowerment and Child Protection (2016) found that men's productivity is generally higher than women's because men tend to possess stronger physical attributes. In contrast, women more often rely on emotional and interpersonal skills. This aligns with the findings of Wielgoszewska et al. (2023), who observed that women tend to concentrate in administrative and secretarial roles (74%), care, entertainment, and service jobs (78%), and sales and customer service positions (65%). In contrast, men dominate skilled trades (89%) and occupations involving machinery operation and factory work (91%). These patterns illustrate that physical demands and gender-based occupational segmentation continue to shape labor market outcomes in West Java and beyond.

Marital status and the tendency to become a blue-collar worker

Marital status also has a significant positive effect on the likelihood of becoming a blue-collar worker. Unmarried individuals tend to have a slightly higher likelihood of being employed in blue-collar occupations than married individuals (including those who are divorced or widowed). Differences in responsibilities and mobility between married and unmarried workers can explain this relationship. Unmarried individuals often have fewer family obligations and, consequently, greater flexibility to change jobs or relocate in search of employment opportunities. In contrast, married individuals typically face greater financial responsibilities—such as providing for their family's basic needs—and therefore tend to prioritize job stability and financial security.

These findings are consistent with career adjustment theory, which suggests that marital and familial responsibilities influence workers' employment decisions. Nandi (year) notes that office-based employment tends to offer greater flexibility, including maternity or parental leave, making it more attractive to married women with household responsibilities. In contrast, single individuals often exhibit greater geographic mobility, enabling them to take up jobs that require physical presence or relocation, such as construction work. Similar conclusions were reached by Goussé and Leturcq (2022), who found that manual labor is generally riskier and less flexible than office work. If women depend more on their partners for financial support, they tend to prefer safer and more flexible jobs, such as office-based positions.

Education level and the tendency to become a blue-collar worker

One key aspect of human capital that influences the likelihood of becoming a blue-collar worker is education level. Individuals with lower levels of education are significantly more likely to be employed in blue-collar occupations than those with higher levels of education. In other words, the lower a person's level of education, the greater

their tendency to engage in blue-collar employment.

This finding reflects the nature of manual labor, which typically does not require advanced educational qualifications. Jobs in sectors such as construction, manufacturing, and mining primarily demand manual dexterity and physical strength rather than academic credentials. Consequently, individuals with limited formal education have fewer opportunities to obtain positions requiring higher education or specialized expertise. Conversely, they are more likely to enter blue-collar occupations, as these jobs are more accessible to workers with basic or intermediate educational backgrounds.

These results are consistent with Putranto's (2022) findings, which reported that blue-collar workers, on average, have lower levels of education. Similarly, Li (2023) and Hayati (2023) explain that education level is positively correlated with productivity and employment opportunities. Individuals with higher educational attainment are more likely to choose office-based or professional occupations rather than manual labor. Thus, education not only enhances workers' productivity but also expands their access to jobs in higher-skilled and higher-income sectors.

Training and the tendency to become a blue-collar worker

The training variable shows a significant negative effect on the likelihood of becoming a blue-collar worker. Individuals who have participated in job training are less likely to engage in blue-collar occupations than those who have not received any training. This finding suggests that participation in training programs enhances individuals' skills and employability in higher-skilled or white-collar positions.

This relationship aligns with human capital theory, which posits that training enhances an individual's skills, competencies, and knowledge, thereby increasing their employability in occupations that require higher qualifications. As Mamaqi (2023) notes, workers who receive training acquire advanced capabilities that improve their access to managerial, technical, or professional roles. Consequently, their likelihood of working in manual or low-skilled positions decreases.

Furthermore, Ada et al. (2023) emphasize that job training reduces the likelihood that individuals engage in manual labor by equipping them with specialized skills demanded by higher-value sectors. Similarly, Le-Dai et al. (2023) explain that job-seeking training programs are designed to facilitate participants' reintegration into the labor market as efficiently as possible. One of the key pathways toward re-entry into the formal or primary labor market—typically associated with office-based or professional employment—is through the acquisition of new qualifications obtained via such training initiatives.

Pre-Employment Card and the tendency to become a blue-collar worker

Possession of a Pre-Employment Card significantly increases the likelihood of becoming a blue-collar worker. Individuals who participate in the program are more likely to work in blue-collar occupations than those who do not. This suggests that the Pre-Employment Card program, which primarily offers technical and vocational training, channels its participants toward labor-intensive sectors where practical skills are in higher demand.

This result aligns with career adjustment theory, which posits that active labor market policies, such as the Pre-employment Card program, are designed to help unemployed individuals readjust their career trajectories and reenter the labor market more effectively. However, due to the program's technical and vocational orientation, participants are more likely to be absorbed into blue-collar sectors. The types of training

provided through the Pre-employment Card program predominantly focus on technical skills associated with blue-collar occupations, such as automotive engineering, machine operation, welding, culinary arts, electrical installation, and construction.

Because the program primarily offers short-term, technical-vocational training, it does not provide the advanced qualifications required for professional or managerial occupations. Consequently, participants are more likely to enter employment in labor-intensive or manual sectors rather than administrative or conceptual fields. The competencies gained through the program equip participants with foundational practical skills that enhance their employability in blue-collar jobs but limit their access to positions that require higher academic credentials or specialized certifications.

Research by Sjoer & Biemans (2020) supports this conclusion, indicating that pre-employment training programs tend to emphasize manual and technical skills, thereby channeling participants toward blue-collar work. Similarly, Zaki & Pertiwi (2023) explain that the Pre-employment Card program was introduced as an active labor-market policy to mitigate unemployment during the COVID-19 pandemic. Most of its beneficiaries were individuals who had lost their jobs due to layoffs. Through this program, participants received opportunities to acquire new competencies that would facilitate their re-entry into the workforce. According to data from the North Sulawesi Manpower and Transmigration Office (DISNAKERTRANS Sulawesi Utara), the training modules offered include electrical work, masonry, mechanical workshops, and computer operations—occupations predominantly technical in nature. Thus, holding a Pre-employment Card increases the probability of working in blue-collar sectors, reflecting the program's orientation toward vocational and practical skill development.

Age and the tendency to become a blue-collar worker

Age has a significant negative relationship with the likelihood of becoming a blue-collar worker. Individuals in the productive age group (15–64 years) are less likely to engage in blue-collar employment than those in older age groups. This indicates that blue-collar work remains relatively more common among older workers, reflecting limited occupational mobility and labor-market segmentation by age.

These findings are consistent with career adjustment theory, as outlined by Savickas (2020), which emphasizes that older workers often experience declining adaptability in cognitively demanding or skill-intensive occupations. Consequently, they tend to remain in or transition to manual or routine jobs that require less training and lower cognitive flexibility. Similarly, Oesch (2020) found that older workers are more frequently excluded from white-collar occupations due to age discrimination, leading to their concentration in blue-collar or low-skill sectors.

In contrast, Amorós et al. (2019) observed that older individuals are more likely to engage in self-employment or entrepreneurial activities. Although this differs from blue-collar work, it reflects similar structural constraints—namely, limited access to formal white-collar employment—consistent with broader patterns of labor market segmentation by age.

From a labor economics perspective, these findings correspond with classical labor supply and demand theory, which posits that lower wage standards can drive the expansion of low-skill employment in labor-intensive industries. Firms in such sectors prioritize cost efficiency and leverage the comparative advantage of abundant, lower-cost labor, thereby reinforcing the prevalence of blue-collar employment among older or less-educated workers.

UMK and the tendency to become a blue-collar worker

Regional differences in minimum wage levels are positively associated with the likelihood of blue-collar employment. Regions with lower minimum wages tend to have a higher concentration of blue-collar workers, reflecting the dominance of labor-intensive industries in low-wage areas. This pattern is consistent with classical labor-supply theory, which suggests that employers operating in regions with lower labor costs are more likely to engage in production activities that depend heavily on manual labor.

This result complements the findings of Hikmah and Sishadiyati (2024), who observed that assurances of minimum-wage protection encourage unskilled workers to remain in physically demanding occupations, thereby reinforcing the appeal of blue-collar work. Similarly, Salverda (2024) examined the dynamic effects of rising minimum wages across regions and found a short-term increase in the supply of unskilled labor in sectors such as retail and tourism. Although these studies differ in scope, both underscore the strong relationship between wage policies and the structure of low-skill employment.

Accordingly, the present result should be interpreted as reflecting a spatial pattern: regions with lower wage standards tend to host a greater share of blue-collar employment. In contrast, previous studies highlight the micro-level behavioral and policy-driven dynamics that shape labor supply and occupational composition. Together, these perspectives illustrate how variations in regional wage policies contribute to the geographical concentration of blue-collar industries across West Java.

Regional classification and the tendency to become a blue-collar worker

The regional classification shows a significant negative relationship between living in urban areas and the likelihood of being employed in blue-collar occupations. Individuals living in urban areas are generally less likely to work in blue-collar sectors than those in rural areas. This finding reflects structural differences in employment composition, where urban economies are dominated by tertiary activities—such as services, finance, trade, and administration—that demand higher education and cognitive skills. In contrast, rural economies remain characterized by agriculture, manufacturing, and construction, which rely more heavily on manual labor.

Similar findings were reported by Shaikh et al. (2023)**,** who found that the concentration of skill-intensive industries in cities reduces demand for low-skill or physical occupations. This spatial distribution of employment aligns with the dual-sector model proposed by Lewis (1954)**,** which posits that developing economies typically consist of a modern urban sector and a traditional rural sector. The rural economy absorbs surplus labor in agriculture and other manual work, while the urban economy attracts skilled workers into higher-productivity, knowledge-based occupations. Consequently, rural regions tend to maintain a relatively high share of blue-collar employment.

This pattern also supports Lipton's (1977) urban-bias hypothesis, which argues that the economic and institutional concentration of resources—such as investment, education, and infrastructure—in urban areas creates structural barriers that limit blue-collar employment. Conversely, rural regions sustain such opportunities through industrial decentralization and the persistence of labor-intensive production systems.

From a sociological standpoint, Sarantakos (2005) emphasizes that social and regional contexts shape occupational structures and the distribution of labor. Rural communities often value physical work as an integral component of livelihood systems, whereas urban residents—benefiting from better education and diversified employment options—tend to aspire to occupations associated with stability, prestige, and professional

advancement. Together, these theoretical perspectives explain why blue-collar employment remains spatially concentrated in rural West Java, while urban areas continue to shift toward white-collar and service-oriented occupations.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Based on the research findings, several factors were identified as significantly influencing the tendency to become a blue-collar worker in West Java Province. These determinants include gender, marital status, education, training, pre-employment status, age, district/city minimum wage (UMK), and location of residence. The results of statistical tests and the odds ratios indicate that these eight factors strongly influence individuals' likelihood of engaging in blue-collar occupations.

The characteristics of blue-collar workers in West Java are predominantly male, unmarried, with low educational attainment, who have never participated in formal training, in pre-employment status, older, working in regions with low UMK, and residing in rural areas. This profile reflects the socioeconomic conditions of rural communities, where most individuals work as farmers or agricultural laborers, performing physically demanding work. Socio-demographic factors such as gender and marital status influence occupational preferences and household responsibilities. At the same time, education and training determine an individual's skill level and employability in specific types of work.

These findings underscore the importance of implementing regional employment policies that improve human capital quality through education and training—particularly by expanding the scope of Pre-employment Card programs to include skill development relevant to white-collar occupations. Furthermore, it is crucial to promote equitable employment opportunities between urban and rural areas, adjust minimum wage policies to balance labor quality and competitiveness, and strengthen protections for vulnerable worker groups, enabling them to transition into more productive and decent forms of employment.

Recommendations

Drawing upon the empirical findings of this study, several policy implications can be proposed to strengthen the quality and resilience of blue-collar employment in West Java Province and, more broadly, in Indonesia.

First, the government should design specialized programs to enhance workers' skills and certifications through collaboration with industry, ensuring that training curricula align closely with labor market demands and technological advancements in the era of the Fourth Industrial Revolution (Industry 4.0). Such initiatives are expected to strengthen Indonesia's workforce's competitiveness in an increasingly digitalized and globalized economy.

Second, vocational education and training for low-income groups must be expanded and prioritized in strategic sectors such as manufacturing, logistics, and technology-based services. The government should also provide incentives for companies that actively participate in internship and job training programs, thereby facilitating better alignment between education and employment.

Third, there is a need to increase education funding for individuals with low educational attainment to develop competent human resources. In addition, vocational education institutions should be strengthened through adaptive national curriculum standards and regular evaluations to ensure that their graduates are genuinely job-ready

and able to compete in both domestic and international labor markets.

Collectively, these recommendations are intended to guide policymakers in designing strategies that enhance the quality, productivity, and welfare of blue-collar workers in West Java and other regions of Indonesia.

This study has several limitations that warrant consideration. First, it focuses exclusively on West Java Province; therefore, the findings may not fully represent conditions in other provinces, which may exhibit different social, economic, and labor-market characteristics. Second, the set of variables analyzed remains limited and does not encompass all potential factors influencing individuals' likelihood of becoming blue-collar workers. Future studies should broaden the scope by incorporating additional variables—such as technological exposure, industrial structure, or regional labor policies—to obtain a more comprehensive and accurate picture.

Third, this study is based on cross-sectional data, which constrains the ability to establish causality. While logistic regression identifies significant associations between individual characteristics and the probability of being a blue-collar worker, it does not account for potential endogeneity or omitted-variable bias. Therefore, future research utilizing longitudinal or panel data is recommended to strengthen causal inference and better understand the dynamics of occupational choice and labor market transitions over time.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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