

The Effect of Minimum Wage, Gross Regional Domestic Product (GRDP) and Open Unemployment Rate on Labor Absorption in Manufacturing Industry Sector in Java Island

**Rebion Raga Munggaran^{1*}, Asep Munir Hidayat², Billy Tejaarief³,
Kenedi Kenedi⁴, Anti Wulan Agustini⁵**

¹⁻⁵Economics Study Program, Faculty of Economics and Business, Universitas Bina Bangsa, Banten, Indonesia

Email: ¹⁾ rebionragamunggaran@gmail.com, ²⁾ asepmunir7@gmail.com, ³⁾ billy.tejaarief@gmail.com,
⁴⁾ 17satriaforbangsa@gmail.com, ⁵⁾ antiyagustini@gmail.com

Received : 19 August - 2025

Accepted : 27 September - 2025

Published online : 03 October - 2025

Abstract

The manufacturing industry in Java Island plays an important role in Indonesia's economy, contributing significantly to Minimum Wage, Gross Regional Domestic Product, and Open Unemployment Rate. However, there are imbalances between provinces influenced by regional policies, economic conditions, and industrial sectors. This research aims to analyze the long-term, short-term effects, and long-term adjustment mechanism (Error Correction Term) in Java Island, covering six provinces: DKI Jakarta, West Java, Central Java, DI Yogyakarta, East Java, and Banten. The method used is a quantitative approach with secondary data from Statistics Indonesia (BPS) for the period 2010-2024, analyzed using Panel Autoregressive Distributed Lag (ARDL) model with EViews version 13 software. The research results show that in the long term, Minimum Wage and Open Unemployment Rate have significant negative effects on Labor Absorption, while Gross Regional Domestic Product has a significant positive effect. In the short term, these variables do not significantly affect most provinces. However, analysis of the long-term adjustment mechanism (Error Correction Term) shows that provinces such as West Java, DI Yogyakarta, East Java, and Banten have significant adjustments, while DKI Jakarta and Central Java do not show significant adjustments. The research conclusions indicate that Gross Regional Domestic Product has a positive effect on labor absorption, while Minimum Wage and Open Unemployment Rate have negative effects. Long-term adjustment mechanisms are significant in several provinces, but DKI Jakarta and Central Java face structural barriers. Therefore, more responsive and balanced economic policies are needed.

Keywords: Gross Regional Domestic Product, Labor Absorption, Minimum Wage, Open Unemployment Rate, Panel ARDL Model.

1. Introduction

The manufacturing industry in Java Island plays an important role in Indonesia's economy, serving as the main center of the manufacturing sector that contributes significantly to Gross Regional Domestic Product (GRDP or PDRB) and labor absorption. With better infrastructure and high population density, Java Island becomes a strategic location for industrial and economic development. Nevertheless, there are imbalances in labor absorption between provinces, influenced by local government policies, local economic conditions, and differences in industrial sectors (Asmara, 2018).



One of the main indicators for assessing a country's economic performance is labor absorption. High absorption rates reflect strong economic growth, social stability, and adequate job opportunities. In national development processes, job creation becomes a top priority because it has direct impact on improving community welfare. Labor absorption not only reflects economic productivity but also reflects the success of development policies that emphasize social inclusion. Therefore, deep understanding of factors affecting labor absorption is very important for planning sustainable economies (Chomariah & Sri, 2023)

Java Island serves as the center of national industrial and economic activities with high labor absorption rates, particularly in the manufacturing sector. Nevertheless, not all regions in Java Island show uniform absorption rates. Factors such as differences in regional economic conditions, local government policies, and external factors like minimum wages and unemployment rates affect labor absorption in the industrial sector. Therefore, it is important to conduct in-depth analysis regarding how economic factors, such as Minimum Wage, Gross Regional Domestic Product, and Open Unemployment Rate, affect labor absorption in Java Island (Suaib & Agustina, 2022).

One factor affecting increased labor absorption is minimum wage, which is one factor affecting increased labor absorption, set by the government to protect workers from wages that are too low. This policy aims to ensure workers receive wages appropriate to economic conditions and industrial sectors, which ultimately can increase their purchasing power and improve quality of life (Trimaya, 2014).

In Java Island, minimum wage policies often vary between provinces, reflecting differences in cost of living and economic structure in each region. These differences have direct impact on employment dynamics in the manufacturing industry sector. For example, high minimum wages in DKI Jakarta can become a burden for entrepreneurs, so they choose to invest in provinces with lower labor costs, such as Central Java. These differences affect investment patterns and industrial distribution, and create variations in labor absorption. Therefore, minimum wage becomes one of the key variables in analyzing labor absorption in Java Island.

Citing Juardi et al. (2024), minimum wage policies in Java Island often trigger debates between worker and entrepreneur interests. On one hand, wage increases are expected to improve worker welfare, but on the other hand, this becomes an additional burden for industries, particularly in labor-intensive sectors. As a result, many entrepreneurs conduct efficiency by reducing the number of workers or moving businesses to areas with lower wages. Implementation of this policy is also not uniform, especially in the informal sector. This condition creates challenges in designing fair and sustainable minimum wage policies.

Besides minimum wage, another factor affecting labor absorption is Gross Regional Domestic Product (GRDP), which is an important indicator for measuring the total added value of goods and services produced by a region in a certain period, reflecting the economic strength of that region. High GRDP shows great economic potential in creating jobs and improving welfare (Widyapangesti & Soelistyo, 2022).

The main problem faced related to Gross Regional Domestic Product (GRDP) in Java Island is growth inequality between regions and sectors. Although GRDP overall shows high numbers, economic growth tends to be concentrated in certain sectors, such as large industries and financial services. Although these sectors contribute significantly to the economy, they are unable to absorb labor in significant numbers. As a result, the impact on unemployment reduction becomes limited, especially in areas with high unemployment rates. This imbalance prevents equal distribution of economic benefits for all society (Widodo & Woyanti, 2023a).

On the other hand, although Gross Regional Domestic Product (GRDP) shows positive numbers at the aggregate level, its impact on society, especially those living in areas with high unemployment rates, is very limited. Therefore, more inclusive policies are needed to ensure that economic growth is not only focused on certain sectors. Such policies must be able to spread throughout regions and create more jobs in more diverse sectors, to improve overall community welfare (Widodo & Woyanti, 2023a).

Regions with low Gross Regional Domestic Product (GRDP) often face major challenges related to limited access to infrastructure and investment. This inequality worsens inter-regional gaps, which in turn hinders welfare distribution. Regions with insufficient infrastructure tend to have difficulty attracting investment, which ultimately hinders the development of productive sectors. This condition creates cycles of poverty and backwardness that are difficult to overcome without significant improvements in the infrastructure sector (Widodo & Woyanti, 2023a).

Besides Minimum Wage and Gross Regional Domestic Product, another factor affecting labor absorption is Open Unemployment Rate. Open Unemployment Rate is an important indicator for assessing labor market health, measuring the percentage of the labor force that is looking for work but has not found it. This can be caused by economic growth that is not fast enough, lack of investment, or mismatch between skills possessed by the workforce and market needs. In the development context, reducing Open Unemployment Rate becomes a top priority for creating social and economic stability. Therefore, deep understanding of Open Unemployment Rate is very important in formulating policies that support job creation (Permatasari & Huda, 2022).

Based on Aulia et al. (2025), Java Island, as the region with the largest population and industrial center, still faces challenges in reducing unemployment rates. Although economic activity in this region is high, Open Unemployment Rate in several provinces such as Banten and DKI Jakarta remains relatively high. This shows that job creation has not been fully balanced with labor force growth.

Studies on employment absorption have indeed been conducted extensively, however, most of them still focus on the national level or across sectors in general. Siregar et al. (2023) examined the influence of minimum wages, investment, and GRDP on employment absorption in Indonesia in aggregate, while Silvia & Susilowati (2023) combined the variables of Provincial Minimum Wage, GRDP, and HDI, but have not specifically examined the manufacturing sector nor the differences between provinces on Java Island. Other research with more limited scope, such as studies in East Java on large and medium manufacturing industries or in the Madiun Residency which found that GRDP does not always have a significant effect on employment absorption, shows variations in empirical findings (Widodo & Woyanti, 2023b). Thus, there is still a research gap in the form of a lack of studies that comprehensively analyze the influence of minimum wages, GRDP, and open unemployment rate on employment absorption in the manufacturing sector across provinces on Java Island, even though this region is the center of national industry with significant employment absorption inequality problems.

Based on various issues explained, researchers are interested in conducting research regarding the effect of minimum wage, gross regional domestic product (GRDP) and open unemployment rate on labor absorption in manufacturing industry sector in Java island. Seeing the importance of labor absorption, this research is relevant in the economic context, because high labor absorption can drive economic growth, reduce unemployment, and improve community welfare through income distribution and optimization of manufacturing industry sector productivity.

2. Literature Review

Employment absorption from the perspective of economic theory is influenced by the interaction between labor demand and supply. In neoclassical labor demand theory, an increase in minimum wages tends to raise labor costs so that it can reduce company demand for workers, especially in labor-intensive sectors. However, monopsony theory and some empirical evidence show that minimum wages do not always have a negative impact, because in non-competitive labor markets wage increases can enhance worker productivity and loyalty (Havan, 2024).

The concept of employment absorption in labor economics is closely related to labor demand theory and labor market dynamics. Neoclassical labor demand theory explains that companies will add labor as long as the marginal product value of labor is greater than or equal to the prevailing wage rate. Thus, an increase in minimum wages can decrease labor demand, especially in labor-intensive industries that have limited capital substitution for labor (Borjas, 2016). However, in the monopsonistic approach, minimum wages actually have the potential to increase employment absorption because companies with strong monopsony power tend to pay wages lower than worker productivity. An increase in minimum wages under these conditions can encourage increased labor participation and improve labor market equilibrium (Manning, 2021).

On the other hand, the relationship between output growth reflected in Gross Regional Domestic Product (GRDP) and employment absorption can be explained through the concept of employment elasticity, namely that labor-intensive economic growth will be more effective in absorbing labor compared to capital-intensive sector growth (Bertocco & Kalajzić, 2019). Gross Regional Domestic Product (GRDP) reflects the level of economic output of a region and becomes an important indicator in explaining a region's ability to create employment. The theory of employment elasticity of output states that an increase in regional output tends to increase labor demand, although the magnitude of the effect is highly dependent on labor intensity in the dominant sector (Goodwin et al., 2022).

Meanwhile, the open unemployment rate (OUR) describes the proportion of the labor force that is actively seeking employment but has not yet been absorbed in the labor market. According to mismatch unemployment theory, high OUR is not only influenced by low labor demand, but also by the mismatch between labor skills and industry needs. In the context of the manufacturing sector in Indonesia, high OUR often indicates limitations in the availability of skilled labor as well as structural barriers in labor mobility between regions (McConnell et al., 2017). Thus, OUR plays a dual role, namely as a macro variable that suppresses the level of employment absorption, as well as an indicator of the effectiveness of human resource development policies and regional labor markets.

3. Methods

3.1. Research Type and Approach

This research uses a quantitative approach with a secondary data analysis design based on panel data, which is a combination of time series and cross-section data. The data analyzed covers six provinces on Java Island (DKI Jakarta, West Java, Central Java, DI Yogyakarta, East Java, and Banten) during the period 2010–2024. The method used is Panel Autoregressive Distributed Lag (Panel ARDL) with the Pooled Mean Group (PMG) approach, which is capable of estimating long-term relationships as well as short-term relationships and capturing the Error Correction Mechanism (ECM). This research applies a quantitative correlational approach to identify and measure relationships between two or more variables

in numerical form, with the aim of assessing the strength of relationships between variables without direct intervention from researchers (Prihatini et al., 2020).

3.2. Research Location and Period

The research was conducted in six provinces on Java Island with annual time coverage from 2010 to 2024. This location was chosen because Java Island is the center of the manufacturing industry in Indonesia and absorbs the majority of the national workforce.

3.3. Data Sources and Collection Techniques

The research data source is secondary data obtained from official publications of the Central Statistics Agency (BPS), especially data on provincial minimum wages, Gross Regional Domestic Product (GRDP), open unemployment rate, and the number of workers in the manufacturing industry sector. Data was collected through annual publications as well as the BPS portal, then processed into a panel dataset. The processing includes data cleaning, logarithmic transformation of certain variables, and unit adjustment for consistency.

3.4. Data Analysis Techniques

Data analysis in this study was conducted using EViews software. The data analysis technique used in the research uses Panel Autoregressive Distributed Lag (ARDL), panel data is a combination of cross section and time series data. Cross section data is data from one or more variables collected for several individuals at one time. While time series data is data from one or more variables collected from time to time. So in this panel data, the same cross section units are collected from time to time (MacCarthy, 2025).

According to Lima Campos & Cysne (2025), Panel Autoregressive Distributed Lag (ARDL) is a statistical method used to analyze short-term and long-term relationships between variables in panel data. Panel data consists of several individuals or entities observed over a certain period. Panel ARDL combines traditional ARDL models with panel data analysis, thus enabling handling of heterogeneity among entities and temporal dynamics. From the explanation above, here are the steps used in estimation of the Panel ARDL model:

1) Stationarity Test

The Stationarity Test is one of the main requirements in econometric models for time series data. Stationary data shows that the data is consistent every time it is analyzed, so the time series model becomes more stable (mean remains constant or unchanged over time, variance remains constant, and there are no trends or patterns that change over time) (Purnomo, 2010).

2) Optimal Lag Test

The best lag test is needed to overcome models that cannot estimate actual errors accurately. If too few lags are used, white noise will not be displayed by residuals and regression. Conversely, if too many lags are used, it will be difficult to reject the null hypothesis because adding too many parameters can reduce degrees of freedom. The best lag is chosen based on the smallest number of AIC, SIC, and HQ or the smallest final prediction error (FPE) compared to all proposed lags (Fishman, 2014).

3) Cointegration Test (Fisher-type test)

The cointegration test is conducted to identify the existence of long-term relationships between variables in panel data. This testing becomes a crucial stage in Panel ARDL (PMG) analysis, because the approach requires that variables that are stationary at the level and at the first difference level also have cointegration relationships. Cointegration needs to be proven so that the model can capture long-term relationships between variables. Without cointegration, the ARDL model will only explain short-term relationships and long-term

estimation results are not valid. Thus, the cointegration test serves as the basis for ensuring model feasibility in estimating long-term dynamics between analyzed variables (Samargandi et al., 2015).

Panel cointegration test based on Fisher-type test, which is a development of the Johansen approach, uses VAR (Vector Autoregressive) model as the initial basis before being transformed into VECM (Vector Error Correction Model) form. This model tests long-term relationships between variables that are non-stationary, but integrated at the same order, generally $I(1)$ (Ikhsan & Amri, 2022).

4) Panel ARDL Model Estimation

After conducting the cointegration test, the next step is to estimate using the Panel ARDL model to analyze the dynamics of long-term and short-term relationships simultaneously in panel data (Pedroni, 2019). In this research, the Pooled Mean Group (PMG) approach is used because it is considered most suitable for the sample characteristics used in this research, namely all Provinces in Java Island. PMG assumes that long-term relationships between variables are homogeneous across all units (Provinces), but still accommodates differences in short-term dynamics.

PMG selection is based on the uniformity of institutional systems, policies, and economic structures in Java Island, which allows the assumption of long-term homogeneity. Meanwhile, differences between Provinces are still reflected in variations in short-term relationships. Thus, this model is expected to provide efficient and representative estimates (Pedroni, 2019). After proving there are long-term relationships, the Panel ARDL model is then derived into Error Correction Model (ECM) form to identify adjustment mechanisms toward long-term equilibrium through Error Correction Term (ECT) components (Bagaskara, 2023)

5) Model Diagnostic Test Cross-Sectional Dependence (CD) Test

After the Panel Autoregressive Distributed Lag (ARDL) model is estimated, model diagnostic tests are conducted to ensure validity of estimation results. The main test used is the Cross-Sectional Dependence (CD) Test. This test is used to detect the presence of correlation (linkage) between cross-section units in model residuals. This dependence can cause invalid estimation results. Testing is conducted using Pesaran CD Test and Breusch-Pagan LM Test methods on PMG model residuals.

6) Partial Effect Test (t-test)

Used to test the partial effect of each independent variable on the dependent variable.

4. Results and Discussion

4.1. Research Results

4.1.1. Stationarity Test

The stationarity test is conducted to ensure that data is stable and not affected by time dependence or trends that can affect analysis results. This test is conducted at two levels, namely Level and 1st Difference. Test results in table 1 show that STK (capital stock) variable is not stationary at level because most p values > 0.05 , but becomes stationary after 1st difference with all p values = 0.0000. This implies that capital stock tends to follow long-term trends due to capital investment accumulation and depreciation. LOG_UM (per capita income) variable shows varied results at level, where some tests are significant and some are not, so there is a possibility of weak stationarity. However, after 1st difference, all tests become significant so this variable is stationary. This reflects that per capita income tends to grow

following long-term trends, so its absolute value is not stationary, but its income growth can be analyzed.

Table 1. Stationarity Test

Variable	LLC Test		Im, Pesaran and Shint W-Stat		ADF - Fisher Chi-square		PP - Fisher Chi-square	
	Level	1st	Level	1st	Level	1st	Level	1st
STK	0.0084	0.0000	0.0330	0.0000	0.0655	0.0000	0.0660	0.0000
LOG_UM	0.0000	0.0000	0.0073	0.0000	0.0030	0.0000	0.0001	0.0009
LOG_PDRB	0.0000	0.0000	0.1038	0.0019	0.1420	0.0064	0.0008	0.0045
TPT	0.0016	0.0000	0.0172	0.0000	0.0387	0.0000	0.0328	0.0000

Source: EViews13 (processed by author)

LOG_PDRB (Gross Regional Domestic Product) variable is also not stationary at level, but becomes stationary after 1st difference. GRDP which tends to increase every year in accordance with regional economic growth makes GRDP growth analysis more relevant than its nominal value. Furthermore, TPT (unemployment rate) variable shows similar results, where it is not fully stationary at level but becomes stationary after first differencing. This is consistent with the nature of unemployment which is influenced by economic cycles and macro conditions, so unemployment change analysis is more informative than its absolute level.

Based on these results, it can be concluded that all analyzed economic variables, namely STK, LOG_UM, LOG_PDRB, and TPT, are not stationary at level, but stationary after 1st difference. This condition reflects long-term trends in the economy, both related to investment growth, GRDP, per capita income, and unemployment rate dynamics. By using data in first difference form, analysis can be focused on growth and changes, for example capital growth on productivity, GRDP growth on income and employment, and unemployment rate changes as responses to economic policies and business cycles. More broadly, there are close linkages between variables, where capital stock growth through investment can encourage GRDP and per capita income increases. GRDP increase in turn can reduce unemployment rates if economic growth can absorb labor. Meanwhile, increasing per capita income reflects better community welfare and potential consumption increases, which ultimately also drives regional economic growth.

4.1.2. Optimal Lag Test

In Panel ARDL analysis, the next step is lag determination, where lag length will affect the model to be formed. Below are the results of optimal lag testing used in this research:

Table 2. Optimal Lag Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-83.36953	NA	0.002343	5.295123	5.476518	5.356157
6	235.8033	32.89216*	2.02e-08*	-8.230501*	-3.695630*	-6.704655*

Source: EViews13 (processed by author)

Based on VAR Lag Order Selection Criteria test results in table 2, from the five criteria used namely LR, FPE, AIC, SC and HQ overall recommend using lag 6 as optimal lag. Based on this, it can be said that lag 6 is chosen in forming Panel ARDL (Autoregressive Distributed Lag) model estimation in the conducted research. The next step is cointegration test.

4.1.3. Fisher Cointegration Test (Johansen)

Fisher Cointegration Test (Johansen) is conducted to identify whether there are long-term relationships between variables in the research model. This test is important because although the variables used are non-stationary at level, the existence of cointegration shows that linear combination of these variables move together toward long-term equilibrium.

Table 3. Fisher Cointegration Test (Johansen)

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-eigen test)	Prob.
None	117.3	0.0000	85.15	0.0000
At most 1	161.2	0.0000	143.8	0.0000
At most 2	120.1	0.0000	128.6	0.0000
At most 3	25.41	0.0130	25.41	0.0130

Source: Eviews13 (processed by author)

Fisher Cointegration Test (Johansen) results in table 3 show cointegration testing using two approaches, namely trace test and maximum eigenvalue test. This test examines the number of cointegration (CEs) existing between used variables, with hypotheses tested starting from no cointegration (None) to maximum three cointegrations (At most 3). In the None hypothesis, Fisher statistic from trace test is 117.3 with probability 0.0000, and from max-eigen is 85.15 with probability 0.0000, indicating cointegration existence. Likewise in At most 1 and At most 2 hypotheses, with Fisher statistics showing significant values and probability 0.0000, indicating cointegration existence. However, in at most 3 hypothesis, although there is still cointegration, the probability is higher (0.0130), showing that cointegration possibility at this level is lower. Overall, this cointegration test result shows the existence of long-term relationships (cointegration) between tested variables, with all hypotheses having probability less than 0.05 showing significant cointegration.

4.1.4. Panel ARDL Model Estimation Test

This testing is important to see how much influence the three variables have on labor absorption at regional level. This model automatically selects lag 1, using Akaike Information Criterion (AIC) for model selection. Estimation results show coefficients of each variable in long-term and short-term models, as well as significance of relationships between variables.

Table 4. Panel ARDL Model Estimation Test

Variable	Coefficient	Std. Error	t-statistic	Prob.
Long-run (Pooled) Coefficient				
LOG_UM	-0.275334	0.101240	-2.719605	0.0081
LOG-PDRB	0.328015	0.125015	2.623796	0.0105
TPT	-0.966086	0.011748	-82.23736	0.0000
Short-run (Mean-Group) Coefficient				
COINTEQ	-1.078875	0.078706	-13.70763	0.0000
D(LOG_UM)	-0.265172	0.438519	-0.604698	0.5473
D(LOG_PDRB)	1.361715	0.943232	1.443669	0.1531
D(TPT)	0.087968	0.085915	1.023890	0.3093
C	107.9068	7.790541	13.85100	0.0000
Log-Likelihood:	88.37008			

Source: Eviews13 (processed by author)

Based on estimation results, LOG_UM variable has negative coefficient value at -0.275334, with t-statistic value of $-2.719605 < -1.66462$, meaning partially LOG_UM significantly affects Labor Absorption, strengthened by probability value at significance level

of 0.0081. This shows that in the long term, minimum wage increases have negative and significant effects on labor absorption. LOG_PDRB variable shows positive coefficient of 0.328015, with t-statistic value of 2.623796 > 1.66462, meaning partially LOG_PDRB has significant effect on Labor Absorption, with probability value at significance level of 0.0105, strengthening the test results. This can show that in the long term, increases in GRDP value have positive and significant effects on labor absorption.

Meanwhile, TPT variable has very strong negative coefficient of -0.966086, with t-statistic value of -82.23736 < -1.66462, meaning partially TPT variable significantly affects labor absorption and is at significant level with probability value of 0.0000. This indicates that increased open unemployment rate significantly reduces labor absorption. In the short term, error correction coefficient (Error Correction Term/COINTEQ) has coefficient value of -1.078875, with t-statistic value of -13.70763 < -1.66462, can be interpreted that partially there is adjustment mechanism that significantly affects, with significance level of 0.0000. This negative and significant value shows the existence of adjustment mechanism toward long-term equilibrium.

D(LOG_UM) variable representing minimum wage changes in the short term has coefficient of -0.265172, with t-statistic value of -0.604698 > -1.66462, which partially D(LOG_UM) value does not significantly affect labor absorption, proven by p-value = 0.5473, which can be interpreted that there is no positive and significant effect of D(LOG_UM) on labor absorption in the short term.

Similarly with D(LOG_PDRB) variable which has positive coefficient of 1.361715, with t-statistic value of 1.443669 < 1.66462, meaning partially D(LOG_PDRB) has significant effect on labor absorption, with p-value = 0.1531 exceeding significance level. This shows that D(LOG_PDRB) in the short term has positive influence direction, but not significant. D(TPT) has coefficient value of 0.087968, with t-statistic 1.023890 > 1.66462 (p-value = 0.3093), both also not significant. This shows that in the short term, the three variables do not yet provide real effects on labor absorption in studied regions.

4.1.5. Panel ARDL Model Estimation per Cross-Section (Region)

To see short-term dynamics and correction processes of each region, per cross-section estimation is conducted. Following are short-run estimation results and error correction coefficient (ECT) in each Province:

a. DKI Jakarta Province

DKI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ	-1.321493	0.852286	-1.550528	0.1554
D(LOG_UM)	-0.276468	1.249944	-0.221184	0.8299
D(LOG_PDRB)	1.618532	3.965981	0.408104	0.6927
D(TPT)	0.302874	0.750875	0.403361	0.6961
C	131.6666	84.82470	1.552220	0.1550

Figure 1. DKI Jakarta Cross-Section Test Results

Source: Eviews13 (processed by author)

Results of Panel ARDL model estimation for DKI Jakarta Province show that error correction coefficient (COINTEQ) value of -1.321493 is not significant (p = 0.1554). Short-term variables, namely minimum wage changes (D(LOG_UM)), GRDP (D(LOG_PDRB)), and open unemployment rate (D(TPT)), are also not significant at 5% level, as well as model constant. Overall, these results show that in the short term these variables do not significantly affect labor absorption in DKI Jakarta.

b. West Java Province

☰ JABAR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ	-0.989125	0.413620	-2.391389	0.0405
D(LOG_UM)	-0.150800	0.165308	-0.912236	0.3854
D(LOG_PDRB)	-0.605136	1.167676	-0.518239	0.6168
D(TPT)	-0.027651	0.385771	-0.071676	0.9444
C	99.06779	41.37699	2.394273	0.0403

Figure 2. West Java Cross-Section Test Results

Source: Eviews13 (processed by author)

ARDL model estimation results for West Java Province show that error correction coefficient (COINTEQ) is significant ($p = 0.0405$), indicating long-term relationship with labor absorption. Meanwhile, minimum wage changes, GRDP, and open unemployment rate do not significantly affect. Constant is actually significant ($p = 0.0403$), showing the role of other factors outside main variables. Thus, only COINTEQ and constant significantly affect labor absorption in West Java.

c. Central Java Province

☰ JATENG

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ	-0.977107	0.514233	-1.900125	0.0992
D(LOG_UM)	-0.259672	0.651985	-0.398279	0.7023
D(LOG_PDRB)	-0.847329	0.791046	-1.071151	0.3196
D(TPT)	-0.046396	0.486359	-0.095395	0.9267
C	98.02274	51.54371	1.901740	0.0990

Figure 3. Central Java Cross-Section Test Results

Source: Eviews13 (processed by author)

ARDL model estimation results for Central Java Province show that error correction coefficient (COINTEQ) is not significant ($p = 0.0992$), so there is no long-term relationship between variables. Short-term variables, namely minimum wage changes, GRDP, and open unemployment rate, are also not significant, as well as model constant ($p = 0.0990$). Overall, no variables significantly affect labor absorption in Central Java at 5% significance level.

d. DI Yogyakarta Province

☰ DIY

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ	-1.287145	0.475507	-2.706888	0.0303
D(LOG_UM)	1.076658	1.338190	0.804563	0.4475
D(LOG_PDRB)	4.219073	3.298178	1.279213	0.2416
D(TPT)	0.340593	0.448324	0.759703	0.4722
C	128.7578	47.65034	2.702139	0.0305

Figure 4. DI Yogyakarta Cross-Section Test Results

Source: Eviews13 (processed by author)

ARDL model estimation results for DI Yogyakarta Province show that error correction coefficient (COINTEQ) is significant ($p = 0.0303$), indicating long-term relationship between variables. However, short-term variables such as minimum wage changes, GRDP, and open

unemployment rate are not significant, while constant is significant ($p = 0.0305$). Overall, only COINTEQ and constant significantly affect, while other variables do not.

e. East Java Province

≡ JATIM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ	-0.823589	0.297613	-2.767312	0.0278
D(LOG_UM)	0.214489	0.128431	1.670073	0.1388
D(LOG_PDRB)	-0.246135	0.139536	-1.763957	0.1211
D(TPT)	-0.188667	0.291783	-0.646601	0.5385
C	82.50158	29.80760	2.767804	0.0278

Figure 5. East Java Cross-Section Test Results

Source: Eviews13 (processed by author)

ARDL model estimation results for East Java Province show that error correction coefficient (COINTEQ) is significant ($p = 0.0278$), showing long-term relationship among variables. Yet, short-term variables such as minimum wage changes, GRDP, and unemployment are uninfluential at 5% level. Meanwhile, constant is significant ($p = 0.0278$), showing influence of other factors outside main variables. Thus, only COINTEQ and constant are significant, while other variables do not significantly affect labor absorption in East Java.

f. Banten Province

≡ BANTEN

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ	-1.074787	0.371471	-2.893329	0.0178
D(LOG_UM)	-2.195238	1.835113	-1.196241	0.2622
D(LOG_PDRB)	4.031284	3.743015	1.077015	0.3095
D(TPT)	0.147055	0.329667	0.446072	0.6661
C	107.4243	37.07346	2.897605	0.0177

Figure 6. Banten Cross-Section Test Results

Source: Eviews13 (processed by author)

ARDL model estimation results for Banten Province show that error correction coefficient (COINTEQ) is significant ($p = 0.0178$), indicating long-term relationship between variables. However, short-term variables such as minimum wage, GRDP, and unemployment are not significant, while constant is significant ($p = 0.0177$). Overall, only COINTEQ and constant affect, while other variables do not significantly affect labor absorption in Banten.

4.1.6. Model Diagnostic Test Cross-Sectional Dependence (CD) Test

This Cross-Sectional Dependence (CD) test results aim to test whether there is dependence between cross-section units in panel model. This test uses several statistical methods to measure the extent of correlation between units in panel data.

Table 5. Diagnostic Model Cross-Sectional Dependence (CD) Test

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	97.89667	15	0.0000
Pesaran scaled LM	15.13479		0.0000
Bias-corrected scaled LM	14.90402		0.0000
Pesaran CD	9.745367		0.0000

Based on Cross-Section Dependence (CD) test results shown in the table 5, it can be known that all types of tests used, namely Breusch-Pagan LM, Pesaran scaled LM, Bias-corrected scaled LM, and Pesaran CD, show significant statistic values with probability (p-value) of 0.0000. P-value far below 5% significance level indicates that null hypothesis stating no correlation between cross-sections must be rejected. This means there is dependence or correlation between cross-sections in used panel data model, which in this case involves six provinces during 2010 to 2024 period. This finding shows that each province is not independent of each other in the context of relationships between analyzed variables.

4.2. Discussion

The results of this research indicate that in the long run, minimum wages and open unemployment rate have a negative effect on employment absorption in the manufacturing industry sector, while Gross Regional Domestic Product (GRDP) has a positive effect. This finding is in line with neoclassical labor demand theory which explains that an increase in minimum wages tends to raise production costs, so companies reduce the number of workers, especially in labor-intensive industries (Borjas, 2016). This is reinforced by research by Zamrodah (2016) which found that minimum wage disparities between provinces on Java Island encourage investment relocation to regions with lower labor costs, thus deepening employment absorption inequality.

This research also confirms the importance of economic growth in driving job creation. Higher GRDP contributes positively to employment absorption, as explained in the concept of employment elasticity of output, where labor-intensive economic growth will be more effective in absorbing labor (Goodwin et al., 2022). Research by Widyapangesti & Soelistyo (2022) also supports this finding by stating that the increase in GRDP on Java Island is closely related to increasing employment in the industrial sector. Meanwhile, the negative effect of the open unemployment rate on employment absorption indicates structural barriers in the labor market, such as skill mismatches and limited labor mobility. This is consistent with mismatch unemployment theory, that high unemployment is not only caused by low labor demand, but also by the mismatch between worker skills and industry needs (McConnell et al., 2017). This condition can explain why despite high economic growth, some provinces such as Banten and DKI Jakarta still face relatively high open unemployment rates (Aulia et al., 2025).

The finding that long-term adjustment mechanisms are significant in several provinces (West Java, DI Yogyakarta, East Java, and Banten), but not in DKI Jakarta and Central Java, indicates differences in structural capacity between regions. Factors such as infrastructure quality, flexibility of regional policies, and industrial structure become determinants of employment absorption effectiveness. This is in line with the analysis of Widodo & Woyanti (2023a) which emphasizes that GRDP growth concentrated in capital-intensive sectors actually limits its effect on reducing unemployment. Thus, the results of this research confirm that increased employment absorption in the manufacturing sector of Java Island does not only depend on the rate of economic growth, but also on balanced wage policies, strategies for reducing structural unemployment, and equitable development between regions.

5. Conclusion

Panel ARDL model estimation results with PMG approach show that in the long term, GRDP positively affects labor absorption, while minimum wage and open unemployment rate have significant negative effects. This indicates that economic growth can drive job creation, but wage and unemployment policies need to be managed in a balanced way so as not to become obstacles. Further analysis shows that long-term adjustment mechanism (COINTEQ)

is significant in West Java, DI Yogyakarta, East Java, and Banten, indicating convergence toward labor market equilibrium. Conversely, DKI Jakarta and Central Java do not show significance, indicating structural barriers or external factors. Meanwhile, short-term variables do not significantly affect labor absorption, although constants in several provinces show the role of other factors outside main variables. Overall, research results emphasize that increasing labor absorption in Java Island requires policies that not only encourage economic growth, but also strengthen adjustment mechanisms and overcome structural barriers that still exist in several provinces.

Increasing employment absorption on Java Island requires policies that encourage economic growth while strengthening labor market adjustment mechanisms, managing minimum wages so as not to suppress job opportunities, and reducing unemployment through training and skills enhancement. Provinces with structural barriers need specific interventions, such as investment in labor-intensive sectors and improved coordination between the labor market and education, so that economic growth can be optimally translated into job creation.

6. References

- Asmara, K. (2018). Analisis Peran Sektor Industri Manufaktur Terhadap Penyerapan Tenaga Kerja Di Jawa Timur. *Journal of Economics Development Issues*, 1(2), 33–38. <https://doi.org/10.33005/jedi.v1i2.18>
- Aulia, W., Putri, A., & Boedirochminarni, A. (2025). Dinamika Pengangguran Terbuka di Provinsi Pulau Jawa : Analisis Data Panel. *Jurnal Pustaka Nusantara Multidisiplin*, 3(2), 1–7.
- Bagaskara. (2023). Modelling the Drivers of Housing Price using Autoregressive Distributed Lag-Error Correction Model (ARDL-ECM) in Indonesia. *Journal of Asset Management and Public Economy (JAMPE)*, 2(1), 53–64. <https://doi.org/10.12928/jampe.v2i1.6696>
- Bertocco, G., & Kalajzić, A. (2019). *Great Recession and macroeconomic theory: a critical analysis of the Blanchard, Amighini and Giavazzi textbook*. 1–44. <https://econpapers.repec.org/paper/pkewpaper/pkwp1905.htm>
- Borjas, G. J. (2016). *Labor Economics*. McGraw-Hill Education, Business & Economics.
- Chomariah, W. I., & Sri, R. I. (2023). Analisis Faktor-Faktor Penyerapan Tenaga Kerja Sektor Industri Besar dan Sedang Di Kabupaten Gresik. *JEMSI (Jurnal Ekonomi, Manajemen, Dan Akuntansi)*, 9(4), 1170–1181. <https://doi.org/10.35870/jemsi.v9i4.1264>
- Fishman, G. S. (2014). 4. Distributed Lag Models. *Spectral Methods in Econometrics*, 146–180. <https://doi.org/10.4159/harvard.9780674334076.c4>
- Goodwin, N., Harris, J. M., Nelson, J. A., Rajkarnikar, P. J., Roach, B., & Torras, M. (2022). *Macroeconomics in context*. Routledge.
- Havan, C. (2024). *George J. Borjas.(2020). Labor Economics. United States: McGraw-Hill Education Press*. Kirklareli University.
- Ikhsan, I., & Amri, K. (2022). Does electrification affect rural poverty and households' non-food spending? Empirical evidence from western Indonesia. *Cogent Economics and Finance*, 10(1), 1–18. <https://doi.org/10.1080/23322039.2022.2095768>
- Juardi, Nurjannah, & Bustan Ramli. (2024). Pengaruh Upah Minimum , Pendidikan Dan Pertumbuhan Ekonomi Terhadap Penyerapan Tenaga Kerja Di Kabupaten Bulukumba. *YUME : Journal of Management*, 7(1), 211–221.
- Lima Campos, E., & Cysne, R. P. (2025). A cross-sectional panel ARDL approach to fiscal sustainability analysis. *Journal of Applied Economics*, 28(1). <https://doi.org/10.1080/15140326.2025.2464505>
- MacCarthy, J. (2025). The Effect of Sustainability Reporting on the Firm's Value: Application

- of Panel Autoregressive Distributed Lag (ARDL) Approach. *Journal of African Business*, 00(00), 1–40. <https://doi.org/10.1080/15228916.2025.2466347>
- Manning, A. (2021). Monopsony in labor markets: A review. *ILR Review*, 74(1), 3–26. <https://doi.org/10.1177/0019793920922499>
- McConnell, C., Brue, S., & Macpherson, D. (2017). *Contemporary Labor Economics (11th ed.)*. McGraw-Hill.
- Pedroni, P. (2019). Panel cointegration techniques and open challenges. *Panel Data Econometrics: Theory*, 1, 251–287. <https://doi.org/10.1016/B978-0-12-814367-4.00010-1>
- Permatasari, C., & Huda, N. (2022). Analisis Kualitas Pelayanan Lembaga Amil Zakat terhadap Loyalitas Muzaki. *As-Syirkah: Islamic Economics & Finacial Journal*, 1(1), 39–56. <https://doi.org/10.56672/assyirkah.v3i2.167>
- Prihatini, D., Wibisono, S., & Wilantari, R. N. (2020). Determinan penyerapan tenaga kerja di Indonesia tahun 2011-2015. *E-Journal Ekonomi Bisnis Dan Akuntansi*, 7(1), 36–41. <https://doi.org/10.19184/ejeba.v7i1.15844>
- Purnomo, K. (2010). Estimasi Underground Economy di Indonesia Periode 2000-2009 Melalui Pendekatan Moneter. In *Universitas Indonesia*. <https://lib.ui.ac.id/file?file=digital%2F135661-T+27931-Estimasi+underground-Analisisi.pdf>
- Samargandi, N., Fidrmuc, J., & Ghosh, S. (2015). Is the Relationship Between Financial Development and Economic Growth Monotonic? Evidence from a Sample of Middle-Income Countries. *World Development*, 68(1), 66–81. <https://doi.org/10.1016/j.worlddev.2014.11.010>
- Silvia, A., & Susilowati, D. (2023). Faktor-Faktor Penyerapan Tenaga Kerja di Pulau Jawa. *Jurnal Ilmu Ekonomi JIE*, 7(04), 531–539. <https://doi.org/10.22219/jie.v7i04.28107>
- Siregar, T. H., Lubis, F. A., & Inayah, N. (2023). Analisis Pengaruh Produk Domestik Regional Bruto (PDRB), Upah Minimum Regional (UMR) dan Tingkat Pengangguran Terbuka (TPT) Terhadap Kesejahteraan Dalam Perspektif Ekonomi Islam di Provinsi Sumatera Utara. *Ekonomi Bisnis Manajemen Dan Akuntansi (EBMA)*, 4(1), 1290–1303. <https://doi.org/10.36987/ebma.v4i1.4368>
- Suaib, A. R. A., & Agustina, N. (2022). Analisis Penyerapan Tenaga Kerja Terdidik Sektor Industri Pengolahan di Pulau Jawa Tahun 2011-2019. *Seminar Nasional Official Statistics*, 2022(1), 779–788. <https://doi.org/10.34123/semnasoffstat.v2022i1.1162>
- Trimaya, A. (2014). Pemberlakuan Upah Minimum dalam Sistem Pengupahan Nasional untuk Meningkatkan Kesejahteraan Tenaga Kerja. *Aspirasi: Jurnal Masalah-Masalah Sosial*, 5(1), 11–20.
- Widodo, P. E. N., & Woyanti, N. (2023a). Analisis Pengaruh PDRB, Unit Usaha, dan UMK Terhadap Penyerapan Tenaga Kerja Industri Manufaktur Besar dan Sedang di Jawa Timur Tahun 2015 - 2019. *BISECER (Business Economic Entrepreneurship)*, 6(2), 34. <https://doi.org/10.61689/bisecer.v6i2.394>
- Widodo, P. E. N., & Woyanti, N. (2023b). Determinan Penyerapan Tenaga Kerja Industri Manufaktur Besar dan Sedang Jawa Timur. *Jurnal Ekonomi Pembangunan*, 5(1), 66–78. <https://doi.org/10.32938/jep.v5i1.3957>
- Widyapangesti, D. I., & Soelistyo, A. (2022). Analisis Pengaruh PDRB, Investasi, Upah Minimum Provinsi Terhadap Penyerapan Tenaga Kerja Di Pulau Jawa. *Jurnal Ilmu Ekonomi JIE*, 6(1), 123–133. <https://doi.org/10.22219/jie.v6i1.19128>