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UNDERSTANDING THE DYNAMICS OF UNEMPLOYMENT DETERMINING FACTORS IN JAVA ISLAND USING MULTIPLE REGRESSION

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Abstract

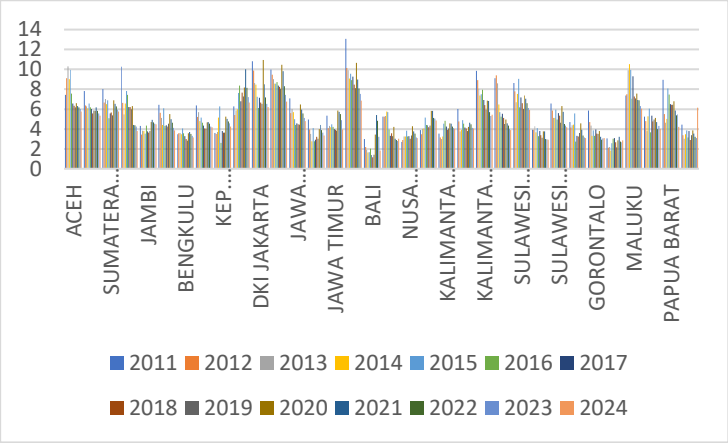
The high unemployment rate in Java, which is exacerbated by the economic crisis such as the COVID-19 pandemic, is a serious problem that requires special attention. This research investigates how investment, regional minimum wages, the Human Development Index (HDI), and household consumption impact the unemployment rate across districts and cities in Java during the 2022–2024 period. A quantitative approach is adopted in this research, employing the Multiple Regression method for data analysis. Secondary data sourced from the Central Statistics Agency and the National Development Planning Agency serves as the foundation for this research. The findings indicate that investment, regional minimum wages, the Human Development Index (HDI), and household consumption contribute to a notable reduction in unemployment levels. This result suggests that higher levels of these four variables may contribute to lowering the unemployment rate. Therefore, policies to increase investment, minimum wages, human development, and household consumption need to be a top priority in efforts to overcome unemployment in Java.

Keywords: Unemployment, investment, district/city minimum wages, human development index, household consumption

Introduction

Indonesia is a developing country, one of the problems in Indonesia is unemployment. However, when viewed from its human resources, Indonesia has a high unemployment rate (Kurniawan et al., 2016). In recent decades, events like the COVID-19 pandemic have triggered crises that led to rising unemployment rates both globally and in Indonesia. The unemployment phenomenon is an important thing that can affect all economies (Moridian et al., 2024). Unemployment is the loss of input that cannot be stored such as labor, meaning the loss of opportunities, besides also causing a decrease in skills and abilities, so that it has a significant impact on individuals and society (Rafiee et al., 2024). Due to limited employment opportunities and a surplus of job seekers, many individuals remain unemployed as they are unable to secure available positions. The number of workers increases along with the increasing population in Indonesia and limited employment opportunities will also increase the unemployment rate. The inability of companies to absorb job seekers who continue to increase every year and with the high number of unemployment, this not only causes economic problems but also causes social problems such as poverty. Numerous earlier studies have sought to determine the factors affecting unemployment rates. According to (Prayuda & Dewi, 2015), through the application of multiple regression techniques, it was found that investment individually exerts a significantly inverse impact on unemployment, meaning that as investment increases, unemployment tends to decline. Furthermore, investment also plays a role in influencing unemployment when considered collectively with other factors. Furthermore, researchers (Buettner, 1999), revealed that increases in wages are strongly associated with a decrease in the level of unemployment. Another interesting finding comes from (Firdhania & Muslihatinningsih, 2017), which employs Multiple Linear Regression analysis, demonstrates that improvements in the Human Development Index are significantly linked to lower levels of unemployment, indicating that a rise in HDI contributes to reducing the unemployment rate. According to (Fagereng et al., 2024) applying an event study framework with a control group reveals that household consumption is inversely associated with the unemployment rate, meaning that every decrease in household consumption increases the unemployment rate.

Although previous studies have provided insight into the factors that influence unemployment, the dynamics of the economy that continue to change, including the impact of the global crisis and changes in policies related to minimum wages, require more in-depth and up-to-date studies. The existence of diverse findings, such as the potential complex impact of minimum wages on labor absorption, indicates the need for further research to comprehensively understand the interaction between various factors in influencing unemployment in Indonesia at different time periods. In addition, a deep understanding of the mechanism of how investment and especially the Human Development Index (HDI) can effectively reduce unemployment is very important in formulating targeted policies.



Source: (Central Bureau of Statistics, 2025)

Figure 1.
Open Unemployment Rate by Province in Indonesia for the Period 2011-2024

According to (World bank, 2025), unemployment is defined as the portion of the workforce that does not have a job but is actively looking for one and is ready to work. Figure 1.1 shows that Java Island has the highest unemployment in 2024, Banten has the highest unemployment in Indonesia ranked first at 6.85, West Java ranked number 2 at 6.75 percent, followed by DKI Jakarta ranked 4th at 6.21 percent, Central Java ranked 13th at 4.78 percent, East Java ranked 22nd at 3.97 percent, then the last is DI Yogyakarta ranked 26th at 3.36 percent. Following an initial increase in unemployment during the early stage of the COVID-19 crisis, the rate gradually decreased and maintained a downward trend through 2024. However, Java Island still has a high unemployment rate nationally. The following is a description of the trend in open unemployment rates in Indonesia and Central Java for the period 2011-2021. The following is a description of the trend in open unemployment rates in Java Island for the period 2022-2024. Unemployment in Java Island is an interesting topic to discuss in a study. Unemployment in Java Island increased when the COVID-19 pandemic emerged, causing the open unemployment rate to spike in 2022 and decline again in 2024.

The data that has been taken starting from unemployment data, investment, district/city minimum wages, human development index, and household consumption in Indonesia can be seen that with increasing unemployment in Indonesia, investment, district/city minimum wages, human development index, household consumption will decrease. This research seeks to examine and reaffirm the beneficial effect of investment in lowering unemployment, specifically within the regional setting of districts and cities across Java Island. The district/city minimum wage was chosen because it is one of the important labor market policy instruments. This study aims to quantitatively test how the increase in the HDI at the district/city level in Java Island contributes to the decline in unemployment. With this study, it is important to retest the relationship with different data and methodologies, and consider the possibility of a non-linear relationship or indirect influence through these variables. This research is urgent to provide a clearer and more contextual picture of the determinants of unemployment in Indonesia today, so that it can be a basis for making more effective policy decisions in overcoming this crucial problem.

Methods

A quantitative method is applied in this research, emphasizing the examination of theories through the analysis of numerical data in an objective manner (Creswell & Creswell, 2014). In the meantime, this research relies on indirect data gathered from established sources (Rachman et al., 2016). From a methodological perspective, the research applies a panel data approach using purposive sampling, integrating both longitudinal and cross-sectional elements (Baltagi, 2021). In this context, data was collected for three years (2022-2024) from 119 districts/cities spread across 6 provinces in Java. This research employs several data analysis procedures, including evaluations of classical assumptions, such as tests for multicollinearity and heteroscedasticity, and hypothesis assessments using F-tests, t-tests, multiple linear regression, and the coefficient of determination, all conducted with the help of the EViews software.

Results

The outcomes of the data analysis will reveal how the predictor variables relate to or impact the outcome variable. The influence explained in the results of data processing is the influence both simultaneously and

partially. To select the appropriate panel data estimation model for further analysis, three types of tests are applied: the Hausman test, the Lagrange Multiplier test, and the Chow test. The purpose of the Chow test is to evaluate whether the Fixed Effect Model or the Common Effect Model provides a more suitable representation of the data. The Hausman test is used to assess whether the Random Effect Model or the Fixed Effect Model is more suitable for the dataset. The Fixed Effect Model was identified as the most appropriate choice.

Classical Assumption Test

1. Heteroscedasticity Test

Table 1. Heteroscedasticity Test

Dependent Variable: RESABS
Method: Panel Least Squares
Date: 05/03/25 Time: 13:31
Sample: 2022 2024
Periods included: 3
Cross-sections included: 119
Total panel (balanced) observations: 357

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.368456	0.342071	1.077133	0.2825
INVESTASI	1.84E-11	3.96E-11	0.464720	0.6426
UMK	-1.24E-07	8.94E-08	-1.384882	0.1674
IPM	0.003800	0.003324	1.143159	0.2541
KRT	-1.02E-05	0.000103	-0.098963	0.9213

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	0.166436	R-squared	0.594997
Mean dependent var	0.299524	Adjusted R-squared	0.383842
S.D. dependent var	0.261895	S.E. of regression	0.205577
Akaike info criterion	-0.059335	Sum squared resid	9.889245
Schwarz criterion	1.276691	Log likelihood	133.5913
Hannan-Quinn criter.	0.472060	F-statistic	2.817818
Durbin-Watson stat	3.660825	Prob(F-statistic)	0.000000

Source: Results of processing using Eviews 12

The probability values observed for investment, UMK, HDI, and household consumption are 0.64, 0.16, 0.25, and 0.92 respectively, all exceeding the 0.05 threshold. Thus, it can be inferred that the data does not exhibit heteroscedasticity.

2. Multicollinearity Test

Table 2. Heteroscedasticity Test

	INVESTASI	UMK	IPM	KRT
INVESTASI	1.000000	0.150435918	0.09419536	-0.01093866
UMK	0.150435918	1.000000	0.304522364	-0.039764694
IPM	0.09419536	0.304522364	1.000000	-0.135972945
KRT	-0.01093866	-0.039764694	-0.135972945	1.000000

Source: Results of processing using Eviews 12

The correlation coefficient between investment and UMK is observed at 0.150, while the correlation between investment and HDI stands at 0.094. The correlation value of investment and krt is -.010. It can be seen that all data are less than 0.90 (<0.90). Hence, it can be concluded that the model does not exhibit multicollinearity.

Table 3. Significance Test Results

Dependent Variable: TPT
Method: Panel Least Squares
Date: 05/03/25 Time: 13:37
Sample: 2022 2024
Periods included: 3
Cross-sections included: 119
Total panel (balanced) observations: 357

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.43542	0.817242	20.11084	0.0000
INVESTASI	-9.08E-11	9.45E-11	-0.961050	0.3375
UMK	-3.56E-06	2.14E-07	-16.68306	0.0000
IPM	-0.010093	0.007941	-1.270992	0.2050
KRT	-0.000303	0.000245	-1.233523	0.2186

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	0.397632	R-squared	0.963561
Mean dependent var	5.569972	Adjusted R-squared	0.944563
S.D. dependent var	2.085977	S.E. of regression	0.491143
Akaike info criterion	1.682497	Sum squared resid	56.44577
Schwarz criterion	3.018524	Log likelihood	-177.3258
Hannan-Quinn criter.	2.213893	F-statistic	50.71928
Durbin-Watson stat	2.047799	Prob(F-statistic)	0.000000

Source: Results of processing using Eviews 12

Referring to the table, the following equation represents the panel data regression:

Regression Equation

$$Y = 16.43 + -9.08\ X1 + -3.56\ X2 + -0.01\ X3 + -0.0003X4$$

Y = Unemployment
X1 = investment
X2 = umk
X3 = ipm
X4 = krt

Referring to the equation, the following explanation can be provided:

1. The constant coefficient has a positive value of 16.43, indicating that if the variables of investment, minimum wage (UMK), HDI, and household consumption are held constant, the unemployment rate would be 16.43.
2. he regression coefficient for the investment variable is -9.08, suggesting that a rise in investment corresponds to a reduction in unemployment by 9.08 units, provided other independent variables are held constant.
3. The UMK variable exhibits a regression coefficient of -3.56, indicating that a rise in UMK corresponds to a reduction of 3.56 units in the unemployment rate, assuming the influence of other variables remains unchanged.
4. The HDI variable, with a regression coefficient of -0.01, indicates that an improvement in HDI is associated with a reduction of 0.01 in the unemployment rate, assuming other factors remain unchanged.
5. With a coefficient of -0.0003, the household consumption variable suggests that a rise in consumption is associated with a 0.0003 reduction in the unemployment rate, assuming other predictors remain unchanged.

Simultaneous Significance Test (F Test)

The F-Statistic probability shown in Table 3 is 0.000000, which is significantly less than 0.05, thereby leading to the acceptance of H1 and the rejection of H0. Thus, investment, district minimum wages, human development index, and household consumption collectively demonstrate a statistically meaningful impact on the unemployment rate.

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Partial Statistical Test (t Test)

Partially, the probability values of investment (0.3375), HDI (0.2050), and household consumption (0.2186) exceed the 0.05 threshold, indicating that these variables are not statistically proven to influence unemployment in a meaningful or favorable direction. Whereas the probability value for UMK is 0.0000, this indicates that the UMK variable has a statistically strong inverse relationship with the unemployment rate Simultaneously Based on the prob value. Since the p-value is 0.000, which falls below the conventional 0.05 cutoff, the finding is considered statistically significant, thereby supporting the alternative hypothesis. These findings suggest that investment, regional minimum wage (UMK), human development index (HDI), and household consumption exert an influence on unemployment.

Determination Coefficient Test

An R-squared value of 0.963561 suggests that the independent variables account for 96.35% of the variance observed in the dependent variable, while the remaining 3.65% is due to factors not captured by the model. The investment, minimum wage (UMK), human development index (HDI), and household consumption variables collectively account for 96.35% of the variation in unemployment, with the remaining 3.65% attributed to other unexamined factors.

Discussions

1. The Effect of Investment on Unemployment
   Regression output indicates that the Investment variable, with a coefficient of -9.08 and a probability value of 0.3375 ($p > 0.05$), exerts a negative but statistically insignificant influence on unemployment levels in Central Java.
2. The Effect of Regency/City Minimum Wages on Unemployment
   Regression results show a statistically significant negative link between UMK and unemployment in Java, as indicated by a coefficient of -3.56 and a p-value of 0.0000.
3. The Effect of the Human Development Index on Unemployment
   The regression analysis indicates a negative association between HDI and unemployment in Java, as shown by the coefficient of -0.010. Nevertheless, the relationship lacks statistical significance given the p-value of 0.2050.
4. The effect of household consumption on unemployment
   According to the regression results, household consumption is inversely related to unemployment in Java with a coefficient of -0.0003. Nonetheless, the p-value of 0.2186 indicates that this relationship is not statistically significant.

Conclusions

The findings reveal a statistically significant inverse relationship between regional minimum wages at the district/city level and the unemployment rate in Java. Higher minimum wages (UMK) are associated with a reduction in unemployment, whereas investment, the Human Development Index (HDI), and household consumption exhibit a negative yet statistically insignificant impact on unemployment in Java. Where the high investment, human development index, and household consumption can cause unemployment to decrease.

References

Baltagi, B. H. (2021). *Econometric Analysis of Panel Data Third edition*. https://library.wbi.ac.id/repository/27.pdf

Buettner, T. (1999). The effect of unemployment, aggregate wages, and spatial contiguity on local wages: An investigation with German district level data. In *Papers Reg. Sci* (Vol. 78).

Creswell, John. W., & Creswell, J. D. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches.* https://books.google.co.id/books?hl=id&lr=&id=335ZDwAAQBAJ&oi=fnd&pg=PT16&dq=Creswell,+J.+W.+(2014).+Research+design:+Qualitative,+quantitative,+and+mixed+methods+approaches.+Sage+publications.&ots=YEwULOztqK&sig=Lv_amIsxhZeP75JpSrwoD_5IDfo&redir_esc=y#v=onepage&q=Creswell%2C%20J.%20W.%20(2014).%20Research%20design%3A%20Qualitative%2C%20quantitative%2C%20and%20mixed%20methods%20approaches.%20Sage%20publications.&f=false

Fagereng, A., Onshuus, H., & Torstensen, K. N. (2024). The consumption expenditure response to unemployment: Evidence from Norwegian households. *Journal of Monetary Economics*, *146*. https://doi.org/10.1016/j.jmoneco.2024.103578

Firdhania, R., & Muslihatinningsih, F. (2017). Faktor-faktor yang Mempengaruhi Tingkat Pengangguran di Kabupaten Jember. *E-Journal Ekonomi Bisnis Dan Akuntansi*, *IV*(1), 117–121.

Kurniawan, A., Khafid, M., & Pujiati, A. (2016). PENGARUH LINGKUNGAN KELUARGA, MOTIVASI, DAN KEPRIBADIAN TERHADAP MINAT WIRAUSAHA MELALUI SELF EFFICACY. *JEE*, *5*(1). http://journal.unnes.ac.id/sju/index.php/jeec

Moridian, A., Radulescu, M., Usman, M., Mahdavian, S. M. R., Hagiu, A., & Serbanescu, L. (2024). Unemployment rate and its relationship with government size, trade, inflation, urbanization, and economic growth in Romania. *Heliyon*. https://doi.org/10.1016/j.heliyon.2024.e41579

Prayuda, M. G., & Dewi, M. H. U. (2015). PENGARUH INFLASI DAN INVESTASI TERHADAP PENGANGGURAN DI PROVINSI BALI TAHUN 1994-2013. *E-JURNAL EKONOMI PEMBANGUNAN*, *5*. https://www.neliti.com/id/publications/44590/pengaruh-inflasi-dan-investasi-terhadap-pengangguran-di-provinsi-bali-tahun-1994

Rachman, A., Yochanan, E., Samanlangi, Andi. I., & Purnomo, H. (2016). *METODE PENELITIAN KUANTITATIF, KUALITATIF DAN R&D*. https://www.researchgate.net/profile/Hery-Purnomo/publication/377469385_METODE_PENELITIAN_KUANTITATIF_KUALITATIF_DAN_RD/links/65a89006bf5b00662e196dde/METODE-PENELITIAN-KUANTITATIF-KUALITATIF-DAN-R-D.pdf

Rafiee, E., Shabani, Z. D., & Hadian, E. (2024). Driving factors on unemployment in Iran's provinces: Do temporal and spatial dynamics matter? *Regional Science Policy and Practice*, *16*(2). https://doi.org/10.1111/rsp3.12715

World bank. (2025). *Unemployment*. https://databank-worldbank-org.translate.goog/metadataglossary/world-development-indicators/series/SL.UEM.TOTL.NE.ZS?_x_tr_sl=en&_x_tr_tl=id&_x_tr_hl=id&_x_tr_pto=sge#:~:text=Pengecualian%20orang%20yang%20ingin%20bekerja,mencari%20pekerjaan%20yang%20lebih%20aman.&text=Seri%20estimasi%20ILO%20juga%20tersedia,estimasi%20ILO%20dengan%20estimasi%20nasional.