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THE EFFECT OF POPULATION SIZE, EDUCATION LEVEL, MINIMUM WAGE, ECONOMIC GROWTH, AND INVESTMENT ON THE UNEMPLOYMENT RATE IN BALI PROVINCE

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Abstract
Unemployment is one of the major issues affecting the success of regional economic development. This study aims to analyze the effects of population size, education level, minimum wage, economic growth, and investment on the unemployment rate across regencies/municipalities in Bali Province. This study employs secondary panel data comprising 135 observations from nine regencies/municipalities in Bali Province during the 2011–2025 period. The analytical technique used is panel data regression, with the Random Effects Model (REM) selected as the most appropriate estimation model. The results indicate that population size has a positive but statistically insignificant effect on the unemployment rate, while education level has a negative and significant effect on the unemployment rate. Minimum wage and economic growth also have negative and significant effects on the unemployment rate. Meanwhile, investment has a positive but statistically insignificant effect on the unemployment rate. Simultaneously, all independent variables have a significant effect on the unemployment rate in Bali Province.
Keywords: unemployment rate, population size, education level, minimum wage, economic growth, investment

INTRODUCTION

Unemployment remains one of the fundamental issues in macroeconomics and continues to pose a challenge for almost every country worldwide, including Indonesia. Theoretically, unemployment is defined as a condition in which an individual who is part of the labor force is actively seeking employment but has not yet succeeded in obtaining a job (Mankiw, 2021). Statistics Indonesia (BPS) uses the Open Unemployment Rate (OUR) as the official labor market indicator, defined as the percentage of unemployed individuals relative to the total labor force. The OUR comprises four groups: individuals who are seeking employment, preparing to establish a business, discouraged workers who believe they are unlikely to obtain employment, and individuals who have secured employment but have not yet started working (BPS, 2025). High unemployment rates directly contribute to poverty, income inequality, and declining social welfare. Therefore, a comprehensive understanding of the factors influencing unemployment is crucial for formulating effective and well-targeted employment policies in each region.

At the national level, Indonesia has experienced fluctuations in the Open Unemployment Rate over the past decade. Based on data from the National Labor Force Survey (Sakernas) released by BPS, Indonesia's OUR stood at 7.48 percent in 2011

and consistently declined to 5.23 percent in 2019. Following fluctuations during 2020–2021, the labor market began to recover, with the national OUR declining to 5.86 percent in 2022, 5.32 percent in 2023, 4.91 percent, and eventually reaching 4.85 percent in August 2025, the lowest level in Indonesia's modern employment history (BPS, 2025). Despite this generally positive national trend, the absolute number of unemployed individuals remained relatively high, at approximately 7.46 million out of a total labor force of 154.11 million people in August 2025. This figure demonstrates that unemployment remains an unresolved issue requiring measured policy interventions at both the national and regional levels.

Despite the improvement in the national OUR, disparities among Indonesian provinces remain substantial, reflecting differences in the structural economic conditions of each region. Based on the August 2025 Sakernas data, Papua Province recorded the highest Open Unemployment Rate nationally at 6.96 percent, followed by Southwest Papua at 6.85 percent, West Java at 6.77 percent, and Banten at 6.69 percent. These figures were considerably higher than the national average of 4.85 percent, indicating persistent disparities in labor market conditions across provinces. Conversely, several provinces recorded OUR levels substantially below the national average. These pronounced disparities indicate that each region has distinct labor market characteristics and dynamics; therefore, a uniform policy approach may not be effective in comprehensively addressing unemployment (BPS, 2025). Such diversity in regional labor market conditions also highlights the need for region-specific studies capable of generating more contextual and evidence-based policy recommendations.

Bali recorded an OUR of 1.49 percent in August 2025, the second lowest nationally after Highland Papua at 1.32 percent and substantially below the national average of 4.85 percent (BPS, 2025; RRI, 2025). This achievement is closely associated with the structural characteristics of Bali's economy, which is predominantly supported by services, trade, accommodation, and tourism sectors that have historically absorbed substantial amounts of labor. Nevertheless, Bali's OUR has not consistently remained at a low level. Historical data indicate considerable fluctuations during the 2011–2025 period, with the unemployment rate ranging from 1.37 percent in 2018 to 5.63 percent in 2020.

Higher levels of education provide individuals with knowledge and skills that enhance labor productivity. Education plays an essential role in supporting economic activities and promoting sustainable economic development. As a means of achieving higher development objectives, education enables individuals to participate in development activities that ultimately contribute to improved quality of life in the future. As populations develop and societies become increasingly modern, the role of education continues to grow in importance. Cahyani and Marhaeni (2022), in their study of the Sarbagita region (Denpasar, Badung, Gianyar, and Tabanan), confirmed that education level has a significant effect on unemployment. Their findings indicate that improvements in educational quality that are not accompanied by adjustments to curricula in accordance with labor market needs may instead exacerbate educated unemployment.

Economic growth should theoretically create new employment opportunities and increase labor absorption, thereby reducing unemployment, as reflected in **Okun's**

Law. However, economic growth driven by the recovery of the tourism sector does not necessarily result in a proportional increase in labor absorption.

Emanuelle and Wenagama (2022), who analyzed economic growth and the effects of population growth and minimum wages on unemployment in Bali Province during 2011–2020, found that the relationship between economic growth and unemployment in Bali is not always linear, as it depends on the sectors driving economic growth. Findings from a regional study covering five provinces, including Bali, also confirmed that economic growth significantly affects unemployment, although the magnitude of its effect is moderated by other structural factors (Farid, 2025).

In 2019, domestic investment (PMDN) realization declined to IDR 11.97 trillion. This decline may have been influenced by various factors, including changes in national and global economic conditions that affected investment decisions. Despite the decrease, the value of incoming investment remained relatively high, indicating that Bali continued to be an attractive investment destination for domestic investors.

A sharper decline occurred in 2020 and continued into 2021, when PMDN realization reached IDR 6.60 trillion and IDR 6.45 trillion, respectively. This condition was closely associated with the COVID-19 pandemic, which had a substantial impact on Bali's economy. Restrictions on community activities, declining tourist arrivals, and economic uncertainty prompted many investors to postpone or reduce their investment plans. Consequently, economic and investment activities experienced a considerable slowdown compared with previous years.

In 2022, PMDN realization began to recover, increasing to IDR 7.39 trillion. This increase was consistent with improvements in post-pandemic economic conditions and the gradual recovery of the tourism sector, which constitutes a leading sector in Bali Province. Furthermore, various government policies aimed at promoting investment and economic recovery contributed positively to renewed interest among domestic investors in investing in Bali.

In 2023, PMDN realization slightly declined to IDR 6.95 trillion. Although lower than in the previous year, this figure indicates that investment activity in Bali remained relatively strong. Overall, the development of PMDN realization in Bali Province during 2018–2023 illustrates investment dynamics influenced by economic conditions, government policies, and external factors such as the COVID-19 pandemic.

Investment constitutes an important pillar for expanding production capacity and employment opportunities. Paramartha and Suasih (2023), who specifically examined regencies/municipalities in Bali Province, confirmed that investment significantly affects the unemployment rate. Their study also found that minimum wages and investment simultaneously influence economic growth and unemployment in Bali, demonstrating the close interrelationship among these macroeconomic variables (Paramartha, 2023). Similarly, Mahayana and Sukadana (2014) found that every 1 percent increase in investment in Bali increases labor demand by 1.15 percent. The challenge for Bali is to ensure that incoming investment is not predominantly capital-intensive, with limited absorption of local labor, but also includes labor-intensive investment that directly contributes to reducing unemployment, particularly in regencies with relatively higher unemployment rates. Theoretically, increased investment expands production capacity, encourages business expansion, and

ultimately generates additional demand for labor, thereby tending to reduce unemployment (Sukirno, 2013).

Although previous studies have extensively examined the determinants of unemployment in Bali, several research gaps remain. First, most previous studies, including Sopianti and Ayuningsasi (2013), Mentari and Yasa (2016), and Emanuelle and Wenagama (2022), employed relatively limited study periods and did not cover the post-COVID-19 pandemic period, even though 2020–2024 represented a critical phase in reshaping Bali's labor market structure. Second, Paramartha and Suasih (2023) and Cahyani and Marhaeni (2022) tended to examine only two or three variables simultaneously. Consequently, the simultaneous effects of five variables—population size, education level, minimum wage, economic growth, and investment—on unemployment across Bali's regencies/municipalities have not been comprehensively examined within a single integrated model. Third, previous studies have not specifically analyzed the interaction between demographic pressures and minimum wage policies within the context of Bali's post-pandemic economic recovery using recent panel data.

The urgency of this study is further reinforced by several recent developments in Bali. The tourism sector, which constitutes the backbone of Bali's economy, began showing signs of a slowdown in early 2025, potentially affecting the stability of the recovering labor market. Furthermore, demographic changes resulting from high levels of inward migration to Bali have directly increased pressure on the labor force, particularly in urban areas. From a policy perspective, the continued annual increase in minimum wages requires rigorous empirical assessment to prevent an adverse trade-off between workers' welfare and employers' capacity to absorb labor. Therefore, a comprehensive analysis based on recent regency/municipality-level panel data in Bali is necessary to generate well-targeted policy recommendations, distinguishing this study from previous research that remains partial and has not incorporated recent data from the 2023–2025 economic recovery period.

This study is expected to provide both academic and practical contributions. Academically, it is expected to enrich the literature on development economics and human resource management by providing recent empirical evidence regarding the simultaneous effects of population size, education level, minimum wage, economic growth, and investment on the unemployment rate in Bali Province using recent panel data for the 2011–2025 period. The findings are expected to address existing gaps in the literature, particularly from the perspective of post-pandemic economic recovery in a region highly dependent on tourism. Practically, the results are expected to serve as an evidence-based reference for the Bali Provincial Government, labor authorities, and policymakers across individual regencies/municipalities in designing employment policies that are more effective, measurable, and responsive to the specific conditions of each region, thereby supporting the sustainable reduction of unemployment in Bali.

RESEARCH METHOD

This study employs a quantitative approach with an explanatory research design to empirically analyze the effects of population size, education level, minimum wage, economic growth, investment, and a COVID-19 dummy variable on the unemployment rate in Bali Province during the 2011–2025 period. The quantitative approach was

selected because it enables hypothesis testing through statistical analysis of panel data that combines time-series and cross-sectional dimensions (Creswell, 2018; Sugiyono, 2023). The study covers nine regencies/municipalities in Bali Province, yielding a total of 135 observations (9 regencies/municipalities × 15 years). The dependent variable is the Open Unemployment Rate (OUR), while the independent variables include population size, education level proxied by Mean Years of Schooling (MYS), minimum wage, economic growth measured by the growth rate of Gross Regional Domestic Product (GRDP) at constant prices, domestic investment (PMDN), and a COVID-19 dummy variable assigned a value of 1 for the 2020–2022 period and 0 for all other periods (Todaro & Smith, 2011; Sugiyono, 2023).

The study utilizes quantitative secondary data obtained from Statistics Indonesia (BPS), local governments, and other official publications. Data were collected using the documentation method by compiling, selecting, and organizing relevant data according to the research requirements, thereby constructing a panel dataset capable of capturing both temporal dynamics and variations in regional characteristics. Panel data were employed because they provide more efficient estimates, increase the degrees of freedom, and enable the control of unobserved heterogeneity compared with the separate use of time-series or cross-sectional data (Sekaran & Bougie, 2016; Rachman et al., 2024; Wooldridge, 2020).

Data analysis was conducted using panel data regression through descriptive and inferential statistical analyses. The most appropriate estimation model was selected by comparing the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) using the Chow test, Hausman test, and Lagrange Multiplier (LM) test (Sakti, 2018). Subsequently, the selected model was evaluated using classical assumption tests, including normality, multicollinearity, autocorrelation, and heteroskedasticity tests. Hypothesis testing was then performed using the F-test and t-test to determine the simultaneous and partial effects of the independent variables on the unemployment rate (Ghozali, 2018; Hair et al., 2019; Wooldridge, 2020)

RESULT AND DISCUSSION

Description of Variables

Based on the descriptive statistical results, the unemployment rate had a mean of 2.316593% with a standard deviation of 1.638547%, and its distribution tended to be right-skewed and leptokurtic. Population size had a mean of 472.6718 thousand people with considerable variation, while education level recorded an average of 8.268815 years and the minimum wage averaged IDR 2.136902 million. Overall, the distributional characteristics of these four variables indicate substantial data variability throughout the observation period.

Economic growth exhibited the most pronounced fluctuations, with a mean of 4.456148% and a range from –16.50% to 7.64%, reflecting the considerable economic dynamics experienced during the study period. Meanwhile, investment had a mean of IDR 1.087719 trillion, with a highly right-skewed and leptokurtic distribution, indicating substantial disparities in investment values across observations. Overall, the analysis comprised 135 panel data observations, with each research variable exhibiting distinct characteristics and degrees of variation.

Panel Data Regression Model Selection

Table 1. Panel Data Regression Results Using the Common Effect Model (CEM)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.187928	3.894366	2.359287	0.0198
X1	0.629299	0.229324	2.744148	0.0069
X2	0.222594	0.071561	3.110527	0.0023
X3	-0.008580	0.002715	-3.159652	0.0020
X4	-0.142714	0.033505	-4.259476	0.0000
X5	0.027371	0.063410	0.431642	0.6667
DUMMY	2.043509	0.329999	6.192464	0.0000

R-squared	0.678561	Mean dependent variable	2.316593
Adjusted R-squared	0.663493	S.D. dependent variable	1.638547
S.E. of regression	0.950508	Akaike information criterion	2.766819
Sum squared residuals	115.6436	Schwarz criterion	2.937463
Log likelihood	-181.1103	Hannan–Quinn criterion	2.848037
F-statistic	45.03481	Durbin–Watson statistic	0.869407
Prob(F-statistic)	0.000000	—	—

Source: Processed by the researcher

Table 2. Panel Data Regression Results Using the Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.16066	5.877903	3.260277	0.0014
X1	-1.642736	1.066163	-1.542238	0.1256
X2	0.311375	0.184677	1.683321	0.0949
X3	-0.006299	0.003895	-1.617351	0.1084
X4	-0.137011	0.031064	-4.411058	0.0000
X5	-0.020906	0.066976	-0.312088	0.7553
DUMMY	2.034911	0.302229	6.733009	0.0000

Statistic	Value	Statistic	Value
R-squared	0.762046	Mean dependent variable	2.316593
Adjusted R-squared	0.723117	S.D. dependent variable	1.638547

Statistic	Value	Statistic	Value
S.E. of regression	0.862198	Akaike information criterion	2.645775
Sum squared residuals	89.20623	Schwarz criterion	2.968644
Log likelihood	-163.5680	Hannan–Quinn criterion	2.776956
F-statistic	25.59708	Durbin–Watson statistic	1.092789
Prob(F-statistic)	0.000000	—	—

Source: Processed by the researcher

Table 3. Panel Data Regression Results Using the Random Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.03051	3.945655	2.542165	0.0122
X1	0.481980	0.337139	1.429618	0.1553
X2	0.271559	0.100169	2.711012	0.0076
X3	-0.008728	0.002671	-3.267949	0.0014
X4	-0.146974	0.030463	-4.824578	0.0000
X5	0.008009	0.061877	0.129430	0.8972
DUMMY	1.992455	0.299809	6.645751	0.0000

Statistic	Value	Statistic	Value
R-squared	0.689039	Mean dependent variable	1.254989
Adjusted R-squared	0.674462	S.D. dependent variable	1.544650
S.E. of regression	0.881314	Sum squared residuals	99.41935
F-statistic	47.27115	Durbin–Watson statistic	1.001831
Prob(F-statistic)	0.000000	—	—

Source: Processed by the researcher

After obtaining the regression results using the Common Effect, Random Effect, and Fixed Effect models, the next step is to conduct a model selection test to determine which estimation model is more appropriate between the Common Effect Model and the Fixed Effect Model. The Chow test is employed to select the most appropriate panel data regression model between these two alternatives.

The Chow test is used to determine whether the Common Effect Model (CEM) or the Fixed Effect Model (FEM) is more appropriate for estimating panel data. The hypotheses and decision criteria for the Chow test in this study are as follows:

a. If the Chi-square probability value < 0.05, the Fixed Effect Model is selected.
b. If the Chi-square probability value > 0.05, the Common Effect Model is selected.

If the Chow test indicates that the Common Effect Model is more appropriate, the Lagrange Multiplier Test (LM Test) should subsequently be conducted to determine whether the Common Effect Model or the Random Effect Model is preferable. However, if the Chow test indicates that the Fixed Effect Model is more appropriate, a

further test, namely the Hausman test, should be performed to determine whether the Fixed Effect Model or the Random Effect Model is the most appropriate model.

Table 4. Chow Test Results

Effects Test	Statistic	d.f.	Prob.
Cross-section F	4.445438	(8, 120)	0.0001
Cross-section Chi-square	35.040907	8	0.0000

Equation: EQ_FEM
Test: Cross-section Fixed Effects

Source: Processed by the researcher

The results presented in Table 4 indicate that the probability value of the Cross-section Chi-square is 0.0000, which is lower than the significance level of 0.05. Based on the decision criteria, H_0 is rejected and H_1 is accepted, indicating that the Fixed Effect Model (FEM) is the more appropriate model. Therefore, since the Chow test results demonstrate that the Fixed Effect Model is more suitable than the Common Effect Model (CEM), a further test using the Hausman test is required to determine whether the Fixed Effect Model (FEM) or the Random Effect Model (REM) is the most appropriate model.

Table 5. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	6	1.0000

Equation: EQ_REM
Test: Cross-section Random Effects
Note: Cross-section test variance is invalid. The Hausman statistic is set to zero.

Source: Processed by the researcher

To determine the most appropriate model using the Hausman test, the decision is based on the probability value of the Cross-section Random. If the probability value is less than 0.05, the Fixed Effect Model (FEM) is selected. Conversely, if the probability value is greater than 0.05, the Random Effect Model (REM) is considered more appropriate.

Based on the Hausman test results, the probability value of the Cross-section Random is 1.0000, which is greater than 0.05. Therefore, H_0 is accepted and H_1 is rejected, indicating that the Random Effect Model (REM) is selected. The statement, "Cross-section test variance is invalid. Hausman statistic set to zero," indicates that the Hausman statistic could not be calculated normally; consequently, EViews sets the test statistic to 0 and the probability value to 1.0000. This condition commonly occurs when the covariance matrix does not satisfy the required properties, for example, due to singularity or a non-positive-definite covariance difference matrix.

Table 6. Lagrange Multiplier Test Results

Test	Cross-section	Time	Both
Breusch-Pagan	17.56373 (0.0000)	0.151522 (0.6971)	17.71525 (0.0000)
Honda	4.190911 (0.0000)	-0.389268 (0.6515)	2.688174 (0.0036)
King-Wu	4.190911 (0.0000)	-0.389258 (0.6516)	3.108458 (0.0009)
Standardized Honda	5.791551 (0.0000)	0.268142 (0.3943)	-0.002577 (0.5010)
Standardized King-Wu	5.791551 (0.0000)	0.268142 (0.3943)	0.619403 (0.2678)
Gourieroux et al.	—	—	17.56373 (0.0001)

Null Hypothesis: No effects.

Alternative Hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives.

Source: Processed by the researcher

Based on the Lagrange Multiplier test results presented in Table 6, the Breusch-Pagan probability value for the Cross-section is 0.0000, which is less than 0.05. Therefore, H_0 is rejected and H_1 is accepted, indicating that the Random Effect Model (REM) is more appropriate.

Based on the panel data model selection results, the Chow test indicates that the Fixed Effect Model (FEM) is more appropriate than the Common Effect Model (CEM), whereas the Hausman and Lagrange Multiplier tests indicate that the Random Effect Model (REM) is more appropriate than the alternative models. Therefore, the panel data regression model employed in this study is the Random Effect Model (REM).

Panel Data Regression Analysis

Table 7. Random Effect Model Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.03051	3.945655	2.542165	0.0122
X1	0.481980	0.337139	1.429618	0.1553
X2	0.271559	0.100169	2.711012	0.0076
X3	-0.008728	0.002671	-3.267949	0.0014
X4	-0.146974	0.030463	-4.824678	0.0000
X5	0.008009	0.061877	0.129430	0.8972
DUMMY	1.992455	0.299809	6.645751	0.0000

Source: Processed by the researcher

In panel data regression analysis, model selection was conducted using the Chow, Hausman, and Lagrange Multiplier (LM) tests. The results identified the Random Effect Model (REM) as the appropriate model; therefore, the estimation was performed using the Generalized Least Squares (GLS) approach. According to Gujarati and Porter (2009), GLS accounts for the variance-covariance structure of the error terms, thereby producing more efficient estimators than OLS when heteroskedasticity or correlation exists within the error components. Consistent with Wooldridge (2020), REM estimation using GLS places greater emphasis on the accuracy of model specification and the exogeneity assumption, particularly the assumption that unobserved individual

effects are uncorrelated with the independent variables. Therefore, classical assumption tests such as heteroskedasticity and autocorrelation are not the primary focus to the same extent as in OLS-based estimation.

Based on the REM estimation results presented in Table 7, Population Size has a positive but statistically insignificant effect on the Open Unemployment Rate (OUR), with a coefficient of 0.481980 and a probability value of 0.1553. Education Level has a positive and significant effect, with a coefficient of 0.271559 and a probability value of 0.0076, whereas the Minimum Wage has a negative and significant effect, with a coefficient of –0.008728 and a probability value of 0.0014. Economic Growth also has a negative and highly significant effect on the OUR, with a coefficient of –0.146974 and a probability value of 0.0000, while Investment has a positive but statistically insignificant effect, with a coefficient of 0.008009 and a probability value of 0.8972. Meanwhile, the crisis/pandemic dummy variable has a coefficient of 1.992455 and a probability value of 0.0000, indicating that during the 2020–2022 crisis/pandemic period, the Open Unemployment Rate in Bali Province was, on average, 1.992455 percentage points higher than during normal periods. Thus, Education Level, Minimum Wage, Economic Growth, and crisis/pandemic conditions are empirically demonstrated to have significant effects on the Open Unemployment Rate in this study.

Coefficient of Determination (R^2)

The R-squared value is 0.689039, while the Adjusted R-squared value is 0.674462. This indicates that population size, education level, minimum wage, economic growth, investment, and the crisis dummy variable collectively explain 67.45% of the variation in the Open Unemployment Rate in Bali Province, while the remaining 32.55% is explained by other factors outside the research model, such as inflation, migration, and the sectoral structure of the economy.

Simultaneous Significance Test (F-Test)

The F-statistic value of 47.27115 with a Prob(F-statistic) of 0.000000 (< 0.05) indicates that H_0 is rejected. Therefore, all independent variables simultaneously have a significant effect on the Open Unemployment Rate in Bali Province..

Hypothesis Testing

1) Effect of Population Size on the Unemployment Rate

The probability value of the Population Size variable is 0.1553, which is greater than the significance level of 0.05. This indicates that Population Size does not have a significant effect on the Unemployment Rate in Bali Province. Nevertheless, the coefficient value of 0.481980 indicates a positive relationship, suggesting that an increase in population size tends to increase the unemployment rate; however, this effect is not statistically significant.

2) Effect of Education Level on the Unemployment Rate

The probability value of the Education Level variable is 0.0076, which is lower than 0.05. This indicates that Education Level has a positive and significant effect on the Unemployment Rate in Bali Province. The coefficient value of 0.271559 indicates that a

one-unit increase in education level increases the unemployment rate by 0.271559 units, ceteris paribus.

3) Effect of Minimum Wage on the Unemployment Rate

The probability value of the Minimum Wage variable is 0.0014, which is lower than 0.05. This indicates that the Minimum Wage has a negative and significant effect on the Unemployment Rate in Bali Province. The coefficient value of –0.008728 indicates that a one-unit increase in the minimum wage decreases the unemployment rate by 0.008728 units, ceteris paribus.

4) Effect of Economic Growth on the Unemployment Rate

The probability value of the Economic Growth variable is 0.0000, which is lower than 0.05. This indicates that Economic Growth has a negative and significant effect on the Unemployment Rate in Bali Province. The coefficient value of –0.146974 indicates that a one-unit increase in economic growth decreases the unemployment rate by 0.146974 units, ceteris paribus.

5) Effect of Investment on the Unemployment Rate

The probability value of the Investment variable is 0.8972, which is greater than 0.05. This indicates that Investment does not have a significant effect on the Unemployment Rate in Bali Province. The coefficient value of 0.008009 indicates a positive relationship, suggesting that an increase in investment tends to increase the unemployment rate. However, this effect is not statistically significant, indicating that changes in investment have not been able to explain changes in the unemployment rate during the study period.

6) Effect of the Dummy Variable on the Unemployment Rate

The probability value of the Dummy variable is 0.0000, which is lower than 0.05. This indicates that the Dummy variable has a positive and significant effect on the Unemployment Rate in Bali Province. The coefficient value of 1.992455 indicates that during the period represented by the dummy variable, the average unemployment rate was 1.992455 units higher than during the reference period, ceteris paribus.

Discussion

The findings indicate that the dynamics of unemployment in Bali Province are not solely determined by population growth but are more closely related to the capacity of the labor market to absorb additional workers. Population growth can still be accommodated by employment opportunities in tourism, trade, services, and other productive sectors; therefore, population size has not become a major determinant of unemployment. In contrast, an increase in education level is associated with the phenomenon of educated unemployment. This condition suggests that improvements in educational attainment have not been fully accompanied by the availability of jobs that correspond to graduates' competencies and expectations. The mismatch between graduates' skills and labor market requirements (skill mismatch), along with the tendency of highly educated workers to be more selective in choosing employment, may prolong the job-search period.

From an economic perspective, minimum wage policies and economic growth play an important role in supporting labor absorption in Bali. An increase in the minimum wage does not necessarily reduce employment opportunities; instead, it may improve

workers' welfare, productivity, and purchasing power, which can subsequently stimulate production activities and labor demand. This finding is consistent with Efficiency Wage Theory, which suggests that higher wages can improve worker productivity and efficiency. Similarly, stronger economic growth can expand production activities and create new employment opportunities, thereby contributing to a reduction in unemployment. This condition is consistent with Okun's Law, which emphasizes an inverse relationship between economic growth and unemployment. Meanwhile, investment has not optimally contributed to labor absorption, which may be attributable to the concentration of investment in capital-intensive sectors and the greater use of technology relative to labor.

In addition to demographic and economic factors, the COVID-19 pandemic constituted an external shock that placed substantial pressure on Bali's labor market. Bali's strong dependence on the tourism sector meant that mobility restrictions during the pandemic had widespread effects on hospitality, trade, transportation, and various supporting industries. The decline in business activity prompted firms to implement efficiency measures, reduce their workforce, and even suspend operations, thereby reducing employment opportunities and increasing unemployment. These findings confirm that unemployment in Bali is a multidimensional issue that cannot be addressed solely through increased investment or educational attainment. Instead, it requires improvements in the quality and relevance of workforce competencies, the promotion of employment-intensive economic growth, and the diversification of the economic structure to strengthen the resilience of Bali's labor market against external shocks.

CONCLUSION

Based on the results of the data analysis and discussion regarding the effects of population size, education level, minimum wage, economic growth, investment, and the dummy variable on the unemployment rate in Bali Province during the 2011–2025 period, the following conclusions can be drawn:

1. Population size has a positive but statistically insignificant effect on the unemployment rate in Bali Province. This finding indicates that population growth does not significantly explain changes in the unemployment rate.
2. Education level has a positive and significant effect on the unemployment rate in Bali Province. This finding indicates that higher educational attainment is associated with an increase in the unemployment rate, suggesting a mismatch between graduates' competencies and labor market requirements or the presence of educated unemployment.
3. The minimum wage has a negative and significant effect on the unemployment rate in Bali Province. This finding indicates that an increase in the minimum wage is associated with a decrease in the unemployment rate.
4. Economic growth has a negative and significant effect on the unemployment rate in Bali Province. This indicates that stronger economic growth enhances labor absorption, thereby reducing the unemployment rate.
5. Investment has a positive but statistically insignificant effect on the unemployment rate in Bali Province. This finding indicates that increased investment has not yet produced a statistically significant effect on changes in the unemployment rate.

6. The dummy variable representing the 2020–2022 period has a positive and significant effect on the unemployment rate in Bali Province. This finding indicates that the COVID-19 pandemic period had a significant impact on increasing the unemployment rate compared with the non-pandemic period.
7. Simultaneously, population size, education level, minimum wage, economic growth, investment, and the dummy variable have a significant effect on the unemployment rate in Bali Province. Furthermore, the research model explains a substantial proportion of the variation in the unemployment rate, while the remaining variation is attributable to other factors outside the model.

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