Resilience Amidst Challenges: Unraveling Factors Shaping Unemployment In Yogyakarta Special Region

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Abstrak

Pengangguran merupakan isu ekonomi yang krusial di Indonesia, termasuk di Daerah Istimewa Yogyakarta (DIY), yang memerlukan analisis kebijakan berbasis data. Penelitian ini bertujuan untuk mengidentifikasi determinan pengangguran di DIY selama periode 2015–2022. Data diperoleh dari Badan Pusat Statistik (BPS) dan dianalisis menggunakan metode regresi data panel dengan Fixed Effect Model (FEM). Penggunaan FEM dipilih karena mampu mengontrol heterogenitas yang tidak teramati antar kabupaten/kota, sehingga mengurangi potensi bias estimasi dan menghasilkan hasil yang lebih reliabel. Hasil penelitian menunjukkan bahwa secara parsial, belanja modal, pendidikan, dan kemiskinan tidak berpengaruh signifikan terhadap tingkat pengangguran. Sebaliknya, pandemi Covid-19 memiliki pengaruh signifikan terhadap peningkatan pengangguran. Secara simultan, keempat variabel tersebut berpengaruh signifikan dan mampu menjelaskan 51,12% variasi dalam tingkat pengangguran. Temuan ini memberikan dasar bagi pemerintah daerah untuk menyusun kebijakan strategis yang mencakup peningkatan keterampilan tenaga kerja, kemitraan dengan sektor swasta, serta pengembangan sektor ekonomi unggulan sebagai upaya menciptakan lapangan kerja yang berkelanjutan dan adaptif terhadap dinamika ekonomi.

Kata Kunci: Belanja Modal; Pendidikan; Kemiskinan; Covid-19; Pengangguran

Abstract

Unemployment is a critical economic issue in Indonesia, including in the Special Region of Yogyakarta (DIY), and requires data-driven policy analysis. This study aims to identify the determinants of unemployment in DIY during the period 2015–2022. The data were obtained from the Central Bureau of Statistics (Badan Pusat Statistik/BPS) and analyzed using panel data regression with a Fixed Effect Model (FEM).

The FEM was chosen for its ability to control for unobserved heterogeneity across districts, thereby reducing estimation bias and producing more reliable results. The findings indicate that, partially, capital expenditure, education, and poverty do not have a statistically significant effect on unemployment. In contrast, the Covid-19 pandemic has a significant impact on increasing unemployment. Simultaneously, all four variables show a significant influence and collectively explain 51.12% of the variation in unemployment levels. These findings provide a foundation for local governments to formulate strategic policies focused on enhancing workforce skills, fostering partnerships with the private sector, and developing key economic sectors as part of a sustainable and adaptive approach to job creation in response to evolving economic conditions.

Keywords*: Capital Expenditure; Education; Poverty; Covid-19; Unemployment*

Introduction

Unemployment remains one of the most pressing challenges faced by many countries, including Indonesia. It is not merely an economic issue, but also a reflection of systemic failures with far-reaching implications for social inequality, quality of life, and overall human development (Brown & De Cao, 2018; Kukaj, 2018; Pohlan, 2019; Voßemer et al., 2018). In the context of sustainable development, high unemployment rates can hinder economic growth (Makaringe & Khobai, 2018), exacerbate poverty (Adam et al., 2018), and generate complex social pressures within communities (Thompson & Dahling, 2019). This challenge becomes even more urgent when it occurs in regions with significant human and cultural resource potential, such as the Special Region of Yogyakarta (DIY). Despite its reputation as a city of education and cultural center, DIY is not immune to the growing and dynamic problem of unemployment.

The Special Region of Yogyakarta is characterized by a fluctuating unemployment rate. According to data from Statistics Indonesia (BPS), the Open Unemployment Rate (TPT) in DIY stood at 3.24% in 2013. In the following years, it rose sharply to 5.61% in 2016, before declining again to 3.02% in 2017. However, despite this decrease in 2017, the unemployment rate rose once more, reaching 4.06% in 2022. These fluctuations in the unemployment rate represent a phenomenon that can trigger significant social impacts and economic instability (Berry & Sabot, 1984). In a region like DIY, which is rich in cultural heritage and educational institutions, the persistence of high unemployment demands serious and in-depth analysis.

Yogyakarta's rich cultural and historical heritage has made it a major tourist destination (Wisnumurti, 2013). Furthermore, as an educational hub with many prominent universities, it attracts individuals seeking educational and employment opportunities. Nonetheless, despite its potential, unemployment remains a pressing concern. In DIY, unemployment is not only structural in nature, but is also influenced by global economic dynamics, technological change, and local factors. Recent data shows that the unemployment rate in this region has reached a significant level, creating an urgent need to understand the contributing factors, such as government capital expenditure, the level of public education, poverty, and the impact of the Covid-19 pandemic.

Capital expenditure plays a crucial role in driving regional economic activity due to its significant influence (Rizky et al., 2016). Quality economic growth can generate new employment opportunities and reduce unemployment. Faizal et al. (2023) stated that higher capital expenditure can reduce the unemployment rate in Indonesia. However, there has been no research focusing specifically on the Special Region of Yogyakarta. Therefore, it is important to examine the extent to which capital expenditure affects the unemployment rate in this region, where unemployment levels have fluctuated from year to year.

Education is also regarded as a key factor in determining workforce qualifications. With its high-quality educational institutions, Yogyakarta is expected to reflect a community with a high level of education, and thus competent in the labor market. Therefore, this study needs to explore more deeply whether education (measured by the average length of schooling) truly impacts unemployment in this area. Previous studies have yielded mixed results: while Radila et al. (2021) found that education significantly affects unemployment, other studies such as that by

Karisma et al. (2021) argue that education has no influence on unemployment.

From the perspective of poverty, it can serve as a driving factor for unemployment (Corcoran & Hill, 1980). The relationship between poverty and unemployment must be carefully examined to formulate appropriate policies to reduce economic inequality and improve job opportunities. This is supported by findings from Anggraini et al. (2023), which indicate that poverty has a positive and significant influence on unemployment. Conversely, Radila et al. (2021) found the opposite, concluding that poverty has no significant effect on unemployment.

The ongoing issue of unemployment has become even more difficult to address following the global outbreak of Covid-19, particularly in Indonesia. The pandemic has reshaped the global economic landscape, including in the Special Region of Yogyakarta, presenting new challenges in creating and maintaining employment opportunities. Syahrial (2020) found that the Covid-19 pandemic caused a disproportionate economic impact in Indonesia, aggravating inequality and affecting large segments of the workforce. In addition, Covid-19 also contributed to rising unemployment in the country (Azzahrah, 2022). Therefore, it is important to assess the extent to which Covid-19 has contributed to unemployment in this region.

By gaining a deeper understanding of the factors that influence unemployment in the Special Region of Yogyakarta, this study aims to offer valuable insights to all stakeholders, including government bodies, business actors, and educational institutions. The knowledge generated from this research may assist stakeholders in formulating more targeted strategies to reduce unemployment, improve economic conditions, and enhance the welfare of the local population. Furthermore, the findings of this study are expected to serve as a solid foundation for the development of more effective policies in addressing unemployment challenges in the Special Region of Yogyakarta.

Literature Review and Hypothesis Development

Unemployment

According to classical economic theory, unemployment arises from an imbalance between the wages demanded by workers and those offered by firms. Within this framework, unemployment is viewed as a temporary phenomenon, wherein the labor market tends to return to equilibrium through wage adjustments and changes in labor demand. For instance, if there is a labor surplus, wages will tend to decline until a point is reached where labor demand and supply are balanced. This theory assumes that the labor market is flexible and capable of quickly adjusting to changes in economic conditions.

On the other hand, Keynes (1937) posited that unemployment can be structural and persist in the long term. He argued that imbalances in aggregate demand may lead to persistent unemployment, which is not automatically corrected by market mechanisms. In situations where aggregate demand is low, firms may be reluctant to hire more workers, even if wages decline. Hence, Keynes emphasized the role of fiscal and monetary policies in managing aggregate demand to achieve low levels of unemployment.

Furthermore, in the context of globalization and rapid technological advancement, labor market dynamics have evolved significantly. Globalization has expanded markets and increased competition, while technological innovation

continues to transform the nature of work and the types of skills demanded. These changes may create mismatches between the workforce's skills and the qualifications required by the labor market. For example, the rise of automation and artificial intelligence has reduced the demand for manual labor while increasing the need for technical and digital skills. Such mismatches can lead to sustained structural unemployment, where a large portion of the workforce is unable to find jobs that align with their skills.

Capital Expenditure

Referring to Government Regulation No. 71 of 2010 concerning Government Accounting Standards (SAP), capital expenditure is defined as budgetary spending used to acquire fixed assets and other assets that provide benefits beyond one accounting period. From a macroeconomic perspective, government capital expenditure plays a significant role in promoting national economic growth. These investments not only enhance public sector productivity and efficiency but also stimulate private sector growth by creating new demand and expanding production capacity.

In relation to unemployment, government capital expenditure has a considerable multiplier effect. When the government allocates funds to infrastructure and development projects, it creates new demand in the economy. For example, the construction of roads, bridges, and other projects requires both direct and indirect labor, such as engineers, technicians, construction workers, and various service providers. This directly reduces unemployment levels by creating new job opportunities for those involved in these projects.

H1: Capital expenditure has a negative and significant effect on unemployment.

Education

The level of education plays a crucial role in reducing unemployment. The longer an individual engages in formal education, the higher their quality and competence, leading to better access to job opportunities and promoting economic growth. Higher education is often associated with deeper knowledge and more refined skills that are highly valued in the labor market. Individuals with lower educational attainment tend to face greater difficulties in finding decent employment, resulting in higher unemployment rates among this group. This is primarily due to limited skills and qualifications, which make them less competitive in the labor market (Oreopoulos et al., 2012).

Additionally, proper education helps individuals develop essential soft skills such as communication, teamwork, and critical thinking—skills that are highly sought after by employers. Higher educational attainment significantly improves an individual's chances of obtaining stable and well-paying employment, not only helping them avoid unemployment but also enhancing the quality of life for themselves and their families. Moreover, education broadens individuals' awareness of career opportunities, enabling them to pursue career paths that align with their interests and abilities. Therefore, as education levels increase, unemployment tends to decline as more individuals are absorbed into the workforce.

H2: Education has a negative and significant effect on unemployment

Poverty

Poverty and unemployment are closely interrelated and form a complex relationship. Poverty can be both a cause and a consequence of unemployment, creating a vicious cycle in which individuals living in poverty face difficulties in obtaining decent and stable employment. Poverty often limits access to education and training, hindering social mobility and the acquisition of skills needed in the labor market. Moreover, poverty can reduce individuals' ability to access necessary support systems such as transportation and healthcare—factors essential for maintaining employment. These barriers increase the risk of long-term unemployment and deepen economic inequality (Katz & Murphy, 2013).

Furthermore, individuals raised in impoverished environments frequently experience a lack of resources that hinders their early development. Children from poor families may suffer from malnutrition and an unconducive learning environment, which can impair academic performance and reduce opportunities for pursuing higher education. As adults, they may encounter discrimination and stigma in the labor market, further narrowing their chances of securing quality employment.

In addition, poverty can exacerbate physical and mental health problems, reducing productivity and the ability to seek employment. Poor living conditions and inadequate social services can worsen these challenges. On a broader economic scale, high unemployment in impoverished communities may inhibit regional economic growth, as underutilized labor equates to lost productive potential. Thus, increasing poverty is associated with rising unemployment.

H3: Poverty has a positive and significant effect on unemployment.

The Covid-19 Pandemic

The Covid-19 pandemic had a profound impact on unemployment levels across many countries, including Indonesia. The social and economic restrictions imposed to control the spread of the virus led to a dramatic decline in business activity, which in turn caused job losses and heightened economic uncertainty. Various sectors—including tourism, hospitality, and manufacturing—experienced sharp drops in demand, forcing companies to significantly scale back operations. As a result, unemployment rates increased as businesses faced financial hardships and were compelled to cut jobs to survive (McKibbin & Fernando, 2020).

Moreover, the pandemic's impact extended beyond job losses to include new labor market challenges, such as growing uncertainty about the future of work, shifts toward remote work, and the need to adapt to new skills required by a rapidly changing market. Policymakers worldwide have struggled to develop effective economic recovery strategies, including financial aid for affected businesses, strengthening social safety nets, and implementing reskilling programs for displaced workers. Overall, the Covid-19 pandemic revealed the vulnerability of labor markets to external shocks and underscored the need for responsive and adaptive policy interventions to navigate unforeseen crises. Therefore, the pandemic has had a considerable effect on increasing unemployment.

H4: Unemployment during the Covid-19 pandemic was higher than under normal conditions.

Research Method

This study employs a quantitative approach using panel data regression analysis, which combines cross-sectional and time-series data. To ensure the accuracy of the estimation results, this research adopts the Fixed Effect Model (FEM). This model is intended to address potential bias arising from unobserved and time-invariant heterogeneity (Wooldridge, 2018), such as differences in cultural characteristics, social structures, or regional government policies. Nevertheless, the researcher also applies a statistical approach to support the selection of the most appropriate model. Furthermore, the panel data regression equation used in this study adopts the model proposed by Bosna (2022), who previously examined unemployment, with adjustments made to the variables employed.

$$Unem_{it} = \beta o_i + \beta 1 Capex_{it} + \beta 2 Educ_{it} + \beta 3 Pvrt_{it} + \beta 4 Cov_{it} + \varepsilon_{it}$$

In this equation, the independent variables include capital expenditure (in million rupiahs), education (average years of schooling), poverty (in percentage), and Covid-19 (dummy variable). The dependent variable is the unemployment rate (in percentage). The data used in this study consist of panel data from regencies and municipalities in the Special Region of Yogyakarta for the period 2015–2022. The data were obtained from Statistics Indonesia (Badan Pusat Statistik/BPS) and subsequently processed using the statistical software STATA 16.

As previously mentioned, although the Fixed Effect Model (FEM) is applied to mitigate bias due to regional heterogeneity, statistical testing is still conducted to validate the choice of the most appropriate model. To ensure the validity, accuracy, and reliability of the regression results, classical assumption tests are also performed. In the context of panel data regression, only multicollinearity and heteroskedasticity tests are required, while other assumption tests are deemed unnecessary (Baltagi, 2005). Finally, the panel data regression analysis is carried out to examine the influence of the independent variables on the dependent variable, both partially and simultaneously.

Result and Discussion

Data Analysis Results
  1. Model Selection
Although this study emphasizes the use of the Fixed Effect Model (FEM) to address unobserved and time-invariant heterogeneity across regions—such as differences in culture, social structure, or local government policies—the model selection process does not solely rely on theoretical justification. A rigorous statistical approach is still essential to ensure that the chosen model provides reliable and valid estimates. By combining theory-driven reasoning with empirical testing, the research aims to strengthen the credibility and robustness of the findings derived from the panel data analysis. Therefore, to statistically validate the appropriateness of the FEM, this study conducted both the Chow test and the Hausman test.

Table 1. Model Selection Test

	Prob.
Chow Test	0.0000
Hauman Test	0.0000

Source: Processed data, 2023

The results showed that the probability values for both tests were below the 0.05 significance level. This empirical evidence confirms that, in addition to theoretical rationale, the Fixed Effect Model is indeed the most suitable and statistically supported model for estimating the effects of the independent variables on unemployment in this study.

2. Classical Assumption Testing
a) Multicollinearity Test

Multicollinearity is a critical assumption that must be addressed in regression models to ensure no significant correlation exists between independent variables. The multicollinearity test results are presented in the table below.

Table 2. Multicollinearity Test Results

	Capex	Educ	Povrt	Covid
Capex	1.00000			
Educ	0.0976	1.00000		
Povrt	-0.2606	-0.8997	1.00000	
Covid	-0.3797	0.1093	-0.1006	1.00000

Source: Processed data, 2023

The table shows that all correlation values among the independent variables are below 0.8 ($r < 0.8$), indicating that multicollinearity is not present in the model.

b) Heteroscedasticity Test

To determine whether the residual variances are consistent across observations, the Breusch-Pagan test is used.

Table 3. Heteroscedasticity Test Results

Chi2 (1)	**3.26**
Prob > Chi2	0.0709

Source: Processed data, 2023

The probability value is 0.0709, which is greater than 0.05, suggesting that the model is homoscedastic and the assumption of no heteroscedasticity is satisfied.

3. Panel Data Regression
a) F-Test

Table 4. F-Test Results

F	**8.11**
Prob > F	0.0001

Source: Processed data, 2023

The F-statistic value of 8.11 with a significance level of 0.0001, compared to the critical F-table value of 2.51, indicates that the independent variables Capex (Capital Expenditure), Educ (Education), Povrt (Poverty), and Covid (COVID-19) jointly have a significant effect on unemployment. This is supported by F-stat > F-table and p-value < 0.05.

b) R-Squared Test

Table 5. R-Squared

R-Squared
0.51127751

Source: Processed data, 2023

The R-squared value of 0.5113 suggests that the independent variables collectively explain approximately 51.13% of the variation in the unemployment rate, while the remaining 48.87% is explained by other factors not included in the model.

c) T-Test

Table 6. T-Test Results

Variabel	Coef.	T-Stat	T tabel	P>|t|	Alpha	Ket.
Capex	-0.000000521	-0.26	1.99	0.798	0.05	NS
Educ	-220.001	-1.70	1.99	0.099	0.05	NS
Povrt	0.1202041	0.72	1.99	0.476	0.05	NS
Covid	191.808	4.07	1.99	0.000	0.05	S
_Cons	2.264.427					

Source: Processed data, 2023

Note:
NS : Not Significant
S : Significant

Based on the data presented in the table, we can observe the results of the t-statistical analysis regarding the influence of various independent variables on the unemployment rate, as follows:

- The Capex variable (Capital Expenditure) demonstrates a negative but statistically insignificant effect on unemployment, with a coefficient of -0.000000521 and a t-statistic value of -0.26, which is lower than the t-table value (1.99), along with a p-value of 0.798, which exceeds the 0.05 significance level.
- Similarly, the Educ variable (Education) also shows a negative but statistically insignificant influence on unemployment, with a coefficient of -2.20001, a t-statistic of -1.70—lower than the critical value of 1.99—and a p-value of 0.099, which is greater than 0.05.
- The Povrt variable (Poverty) exhibits a positive but statistically insignificant relationship with unemployment, as indicated by a coefficient of 0.1202041, a t-statistic of 0.72 (again below the critical t-value of 1.99), and a p-value of 0.476, which is above the 0.05 threshold.
- In contrast, the Covid variable (COVID-19) shows a statistically significant effect on unemployment, with a positive coefficient of 1.91808, a t-statistic of 4.07—exceeding the t-table value of 1.99—and a p-value of 0.000, which is well below the 0.05 level.

From the results of the analysis, the following regression equation is obtained:

$$Unemployment = 22.64427 + -0.000000521 Capex + -2.20001 Educ + 0.1202041 Povrt + 1.91808\ Cov + \ \varepsilon$$

When all independent variables in the model are held constant (i.e., equal to zero), the predicted unemployment value is 22.64427. In this case, capital expenditure is found to have no significant impact on unemployment. Similarly, education and poverty also exhibit no significant effect on unemployment. However, the COVID-19 variable shows a statistically significant difference in unemployment levels between pandemic and non-pandemic conditions. This indicates that the unemployment rate increased by approximately 1.91% during the COVID-19 period compared to the normal (non-pandemic) period.

Discussion

1. The Partial Effect of Capital Expenditure

Based on the statistical tests conducted previously, it can be concluded that capital expenditure does not have a significant effect on the unemployment rate. This phenomenon can be explained by several economic and policy-related factors. First, capital expenditure is often focused on infrastructure development or long-term projects, which tend not to have an immediate impact on job creation. This is because such projects require a considerable amount of time to complete, so their benefits in terms of reducing unemployment are only felt in the long term.

Second, technological advancements in the execution of these projects may significantly reduce the demand for labor. The use of machinery and advanced technology replaces the role of manual labor, thereby decreasing the number of workers needed. As a result, even though capital expenditure increases, it is not necessarily accompanied by a decrease in unemployment.

Moreover, external factors such as global market uncertainty or international economic conditions also play a crucial role in determining the effectiveness of capital spending. For instance, global economic instability can limit investments and

business expansion, ultimately hindering job creation. This situation illustrates that capital expenditure does not always correlate positively with unemployment reduction, due to the complex dynamics involving many other variables.

Therefore, it can be concluded that capital expenditure does not have a direct influence on the unemployment rate in this study. Factors such as a focus on long-term projects, technological efficiency, and global economic uncertainty are among the main reasons why capital expenditure fails to significantly reduce unemployment. This finding is consistent with the study conducted by Yenie (2023), which also found that capital expenditure does not significantly affect unemployment.

2.   The Partial Effect of Education

The statistical tests conducted indicate that the education variable does not significantly influence unemployment in the Special Region of Yogyakarta. Although education is generally regarded as a key factor in improving employment opportunities, this finding highlights the complexity of various other contributing factors that influence an individual's success in obtaining employment in the region.

One possible explanation is the presence of other variables that play a more dominant role in determining the unemployment rate. Factors such as regional economic conditions, industrial sector development, and the level of competition in the labor market may exert a greater influence than education level. In addition, the availability of job opportunities that align with the skills and competencies of graduates may also be a critical factor to consider.

This study also suggests the need for a more in-depth analysis to understand local economic dynamics more comprehensively. For example, the role of the informal sector, local government policies in job creation, and industry adaptation to technological changes could be relevant topics for further research. Thus, a more holistic and integrative approach is essential to capture the full picture of the factors influencing unemployment in the Special Region of Yogyakarta. This finding is consistent with that of Karisma et al. (2021) who found that education does not have a significant effect on unemployment.

3.   The Partial Effect of Poverty

Referring to the findings presented in the statistical test section, it is revealed that poverty does not have a significant influence on the unemployment rate in the Special Region of Yogyakarta. This indicates that the poverty rate does not always have a direct correlation with the unemployment rate, as various other factors contribute to determining unemployment. These include government policies, labor market conditions, and individual participation and initiative in seeking employment. This finding provides new insights into the complex dynamics between poverty and unemployment at the regional level.

The result also underscores the importance of implementing comprehensive and integrated policies to address regional economic challenges. Hence, a holistic approach in formulating policies is necessary to effectively reduce both poverty and unemployment in the Special Region of Yogyakarta. This finding is aligned with the study by Radila et al. (2021), which concluded that poverty does not significantly affect unemployment.

4. The Partial Effect of the Covid-19 Pandemic

This study reveals that the Covid-19 pandemic had a highly significant impact on the unemployment rate in the Special Region of Yogyakarta. Based on data analysis, it was found that the unemployment rate increased by 1.91% during the pandemic compared to normal conditions before the pandemic. This increase can be attributed to the widespread decline in economic activity, especially in key sectors such as tourism and trade.

The tourism sector, one of the main pillars of the region's economy, experienced a drastic downturn due to mobility restrictions and a sharp decline in tourist arrivals. Social restriction policies and travel bans caused many tourism-related businesses, such as hotels, restaurants, and travel agencies, to suffer substantial revenue losses. These losses forced many business operators to reduce their workforce, thereby directly contributing to a rise in unemployment.

In addition, the trade sector was also severely affected by the pandemic. Decreased consumer purchasing power and disruptions in global supply chains caused operational difficulties for many businesses. These conditions compelled companies to implement efficiency measures, including workforce reductions, to remain operational. As a result, many workers in the trade sector lost their jobs. This finding is consistent with that of Krisnandika et al. (2021), who found that the Covid-19 pandemic had a significant effect on the unemployment rate in Indonesia. In other words, the pandemic led to an increase in the number of unemployed individuals in the country.

5. The Simultaneous Effect of All Independent Variables

This study's findings show that all independent variables—Capex (Capital Expenditure), Educ (Education), Povrt (Poverty), and Covid (COVID-19)—have a jointly significant effect on the dependent variable, namely the unemployment rate (Y) in the Special Region of Yogyakarta for the period 2015–2022. This conclusion is supported by the estimation results, which indicate that the F-statistic is greater than the F-table value, with a significance level below 0.05. These results suggest a strong correlation among the variables in influencing the unemployment rate.

Furthermore, based on the R-squared value of 0.51127751, it can be interpreted that approximately 51.12% of the variation in the unemployment rate can be explained by the independent variables in this study, while the remaining 48.88% is influenced by other factors not included in the model. This R-squared value falls within the range of 0.40 to 0.599, indicating that the model possesses a moderately strong predictive power in explaining data variability.

This study provides valuable insights into how capital expenditure, education, poverty, and the COVID-19 pandemic collectively influence the unemployment rate in the Special Region of Yogyakarta. In particular, the findings emphasize the importance of considering various economic and social factors holistically when designing policies aimed at reducing unemployment. In other words, addressing the complex issue of unemployment requires a comprehensive and integrated approach that involves increasing investment in capital expenditure, improving access to and quality of education, alleviating poverty, and effectively managing the impacts of the COVID-19 pandemic.

In addition, this research highlights the need for further studies to identify and incorporate other variables that may influence unemployment, in order to improve model accuracy and provide more targeted policy recommendations. Other factors

such as technological developments, macroeconomic policies, and the dynamics of local and global labor markets could be relevant areas for further investigation in efforts to better understand and address unemployment in the Special Region of Yogyakarta.

Conclusions

Based on the findings of this study regarding the influence of Capital Expenditure, Education, Poverty, and Covid-19 on the unemployment rate in the Special Region of Yogyakarta, several important conclusions can be drawn. First, simultaneously, the independent variables—Capital Expenditure, Education, Poverty, and Covid-19—have a significant effect on the unemployment rate. The analysis demonstrates that these four variables collectively contribute to influencing unemployment levels in the region. However, when analyzed individually (partially), only the Covid-19 variable shows a significant effect on unemployment. Capital Expenditure, Education, and Poverty, when assessed separately, do not exhibit a statistically significant influence on the unemployment rate.

This finding indicates that the Covid-19 pandemic has had a substantial and immediate impact on increasing unemployment in the Special Region of Yogyakarta, whereas the other variables may require more targeted interventions to yield a measurable effect. The data highlight the urgent need to address unemployment not only through traditional economic levers but also by acknowledging the profound disruptions caused by external shocks such as global pandemics.

Based on these results, it is recommended that the government adopt more strategic measures in tackling the issue of unemployment. One crucial step is to develop more targeted skill training programs aimed at enhancing the competencies and competitiveness of the local workforce. In addition, partnerships with the private sector should be strengthened to create new job opportunities and stimulate local economic innovation. Prioritizing the development of sectors with high employment potential should also become a central strategy to drive sustainable economic growth.

These measures are expected to not only address the current challenges of unemployment but also contribute to the creation of a more resilient and adaptive labor market system in response to future economic changes. By reducing reliance on traditional factors that have proven less effective, the government can refocus its efforts on innovative and sustainable approaches to lowering unemployment and improving the welfare of the population in the Special Region of Yogyakarta. Through well-coordinated collective efforts, the challenges of unemployment can be addressed more effectively and efficiently.

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