

DETERMINANTS OF COMPETITIVENESS IN REGENCIES/CITIES IN CENTRAL JAVA PROVINCE IN 2018-2023

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Abstract

This study examines the effect of independent variables consisting of number of working population aged 15 years and over, road length, percentage of population with BPJS health insurance, and GRDP at constant 2010 prices on the Regional Competitiveness Index in Central Java Province. The purpose of this study is to determine the simultaneous and partial effects of the four independent variables on the Regional Competitiveness Index in Central Java Province. The study employed quantitative research methods, utilizing secondary data collected from 34 regencies and cities in Central Java Province for the period 2018-2023. Panel data regression analysis is the primary analytical technique. Based on the findings of the study, it can be seen that the working population aged 15 years and over, road length, percentage of individuals with BPJS health insurance, and GRDP at constant 2010 prices simultaneously have an effect on the competitiveness index of regencies/cities in Central Java Province. Partially, the variable percentage of individuals with BPJS health insurance has a negative and significant effect on the competitiveness index of regencies/cities in Central Java Province. The variables of the number of working population aged 15 years and over, road length, and GRDP at constant 2010 prices have no significant effect on the regional competitiveness index. The findings of this study suggest several key implications for the Central Java Province. First, the Central Java Provincial government should prioritize community-focused initiatives to enhance understanding of appropriate health insurance options, as the variable of the percentage of population with BPJS health insurance has a significant effect on the Regional Competitiveness Index in Central Java Province. Second, the government must enhance the quality of BPJS services, specifically by reducing patient waiting times, ensuring adequate facility availability, and promoting the professionalism of healthcare personnel. Third, local governments should focus on skills training aligned with local labor market demands to enhance productivity, rather than solely focusing on increasing the labor force size. Fourth, the government should enhance the quality of road infrastructure, encompassing both paved roads and key economic corridors, to facilitate improved interregional connectivity. Fifth, the government needs to ensure that the increase in GRDP is not concentrated only in certain regions.

Keywords: Regional Competitiveness, Human Resources, Infrastructure, Economy.

INTRODUCTION

According to Widayanto et al. (2023), referring to the Global Competitiveness Index assessment system by the World Economic Forum, The World Competitiveness Yearbook by the Institute for Management Development, the European Competitiveness Index by the European Commission on Regional Competitiveness and Development Strategies by the Asia Competitiveness Institute, The 2021 Regional Competitiveness Index (RCI) assessment, tailored to the specific conditions and needs of each region in Indonesia, comprises 4 aspects and 12 pillars. The Regional Competitiveness Index is evaluated based on four primary dimensions: (1) the innovation ecosystem, encompassing business dynamics, innovation capacity, and technological readiness; (2) the reinforcing/enabling environment, comprising institutional frameworks, infrastructure, and the regional economy; (3) human capital, which includes health and education/skills; and (4) market

dynamics, encompassing product market efficiency, employment, financial access, and market size. The top ten and bottom ten provinces in Indonesia based on Competitiveness Index (CI) scores are presented in Table 1.2.

Table 1.2 Provincial CI Scores in Indonesia in 2023

No	Province	RCI Score	Rank
1	Jakarta	3.97	1
2	Papua	3.91	2
3	Central Java	3.89	3
4	Bali	3.85	4
5	DI Yogyakarta	3.84	5
6	East Java	3.78	6
7	West Java	3.76	7
8	South Sulawesi	3.70	8
9	Banten	3.60	9
10	North Sumatra	3.58	10
11	East Kalimantan	3.30	25
12	Central Kalimantan	3.27	26
13	Bangka Belitung	3.26	27
14	North Kalimantan	3.26	28
15	Riau	3.25	29
16	Jambi	3.25	30
17	Central Sulawesi	3.25	31
18	North Maluku	3.23	32
19	West Kalimantan	3.20	33
20	West Papua	3.03	34

Central Java Province comprises 29 regencies and 6 cities, each granted autonomy to manage its respective region and pursue regional development, thereby aiming to generate positive impacts for local populations (Millah, 2014). The cities of Magelang, Surakarta, Salatiga, Semarang, Pekalongan, and Tegal are urban areas in Central Java, expected to exhibit high competitiveness when compared to the regency area. However, a 2010 competitive survey, conducted by the Budi Santoso Foundation, the Regional Planning and Development Agency (BAPPEDA) of Central Java Province, the Regional Investment Agency (BPMD) of Central Java Province, Bank Indonesia Semarang, and Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), revealed that these cities did not uniformly rank highly across six indicators (business climate, government performance, infrastructure, economic performance, investment performance, and business dynamics). Regencies including Banyumas, Kudus, and Purbalingga achieved strong

performance ratings, surpassing the cities of Surakarta, Semarang, Salatiga, Tegal, and Pekalongan (Millah, 2014). The top five regencies/cities in Central Java Province, ranked by their Competitiveness Index (IDS) scores, are presented in Table 1.3.

Table 1.3 IDS Scores of Regencies/Cities in Central Java in 2022-2023

No	Regency/city	Year	
		2022	2023
1	Semarang	4.16	3.95
2	Surakarta Regency	4.01	4.08
3	Magelang	3.50	3.81
4	Sukoharjo Regency	3.48	3.69
5	Banyumas Regency	3.43	3.58

The workforce, as a key indicator of human resources, plays a crucial role in the development and improvement of sustainable regional competitiveness (Millah, 2014). In addition to the availability of the workforce, road quality is also a critical factor in regional development (Millah, 2014). The accessibility of BPJS health insurance serves as a key indicator of the financial system's contribution to the development and improvement of regional competitiveness. The quality of public health plays a crucial role in increasing labour productivity and local economic stability.

A study conducted by Sinarti et al. (2018) demonstrates that health insurance, such as BPJS, has a significant impact on increasing productivity and community welfare. This is attributed to the correlation between health insurance coverage and improved individual health, which facilitates increased work productivity and, in turn, strengthens regional competitiveness. Similar results were also found in the study of Ridwan et al. (2018), stating that access to health services through social security programs can be a significant determinant of a region's competitiveness, as it improves public health and reduces social costs. Therefore, the availability of BPJS health insurance was selected as a variable in this study to evaluate the extent of the role of health access in affecting regional competitiveness in Central Java Province. In addition to the percentage of the population with BPJS health insurance, the regional economy, as one of the competitiveness variables, needs to be emphasized for sustainable regional development. The regional economy determines the level of public welfare within the area (Millah, 2014).

Cities, as centers of growth and community activity, should exhibit a higher degree of advancement in human resources, infrastructure, and regional economy when compared to regencies. However, an analysis of the aforementioned data, employed as an indicator of regional competitiveness to determine the ranking of cities within Central Java, reveals a generally low performance (Millah, 2014).

This study is based on the phenomenon of increasing regional competitiveness, increasingly crucial in regional development, particularly in Central Java Province. Data from BRIN (2023) indicates that Central Java Province achieved a Regional Competitiveness Index of 3.89 in 2023, surpassing both East Java and West Java Provinces. In addition, as presented in Table 1.3, the top five regions in Central Java Province with the highest competitiveness include not only urban centers but also regencies. This indicates that several factors, such as the number of working population, road length, percentage of the population with BPJS health insurance, and gross regional domestic product (GDP), significantly influence regional competitiveness. Therefore, understanding the determinants contributing to enhanced regional competitiveness is essential. Therefore, this study focuses on these factors to provide a detailed and comprehensive analysis of the competitiveness of regencies/cities in Central Java Province in 2018-2023.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Regional Competitiveness Concept

Diverse perspectives exist regarding the definition of national competitiveness. Some experts posit that it is a macroeconomic phenomenon influenced by variables such as exchange rates, interest rates, and government deficits. Others contend that competitiveness is contingent upon the availability of abundant and inexpensive labor. Additionally, certain viewpoints correlate competitiveness with the abundance of natural resources. However, Porter (1990) defines national competitiveness as productivity, asserting that a nation's primary objective is to generate and enhance the living standards of its populace. This capacity is predicated on the productivity of both labor and employed capital (Porter, 1990).

Porter (1990) defined national competitiveness as "productivity," specifically the value of output generated by a workforce. The World Bank offers a related perspective, defining competitiveness as the extent and rate of change in the value added per unit of input achieved by companies. According to Porter (1990), both the World Bank and other literature on national competitiveness view that competitiveness transcends a narrow focus on corporate efficiency. Instead, it encompasses a more comprehensive set of considerations, extending beyond the microeconomic level of the firm to include exogenous factors such as a transparent and predictable business environment.

The Diamond of National Advantage

Porter (1990) argues that the increase in industrial productivity in a country depends on four attributes inherent in the country known as the "diamond of national advantage". This model effectively integrates key determinants of a country's competitiveness into a single model.

9 Factor Model

The 9-factor model proposed by Cho et al. (2008) is an extension of the diamond model (Porter, 1990). According to Cho et al. (2008), a more effective model would identify resource creators and delineate the appropriate timing for resource development, rather than simply measuring existing resource quantities. The distinction between the 9-factor model and the diamond model lies in the inclusion of factors external to the diamond framework. Specifically, the 9-factor model incorporates four additional elements: labor, bureaucracy, and politicians, entrepreneurship, technicians, designers, and professional managers. Furthermore, it considers access and opportunity factors, which are critical determinants of international competitiveness. While the development of these factors is generally organic, it remains highly contingent upon the specific circumstances of each country.

Key Indicators of Regional Competitiveness

Santoso (2009) in his study assessing the competitiveness of major cities in Indonesia stated that the key factors that determine competitiveness consist of five key indicators, namely productive business environment, regional economy, employment and human resources, infrastructure, natural resources, and the environment, and banking and financial institutions.

However, regional competitiveness is not only affected by these factors. The number of the working population aged 15 years and over can increase regional productivity, thereby contributing to an increase in the competitiveness index. The high number of the working population is associated with increased regional economic output (Millah, 2014).

In addition, road length as part of the infrastructure plays a crucial role. Robust infrastructure, such as adequate roads, facilitates the flow of goods and services and enhances connectivity between regional areas, which in turn increases regional competitiveness. Furthermore, adequate road length accelerates distribution and supports more efficient economic activities (Ridwan et al., 2018).

The percentage of the population with BPJS health insurance also plays a role in increasing the competitiveness index. Good health allows the population to work productively, thereby

increasing output and economic growth. With health insurance, social risks can be minimized, which has a positive impact on economic stability (Sinarti et al., 2018).

Lastly, the Gross Regional Domestic Product (GDP) at constant prices in 2010 describes the level of economic activity that occurs in an area. The higher the GDP, the stronger the region's economy, indicating enhanced competitiveness. A high GDP indicates a strong production capacity, a key indicator in measuring regional competitiveness (Nurjanah et al., 2022).

Based on the literature review, the following hypotheses are proposed:

H1: Road length, the number of working population aged 15 years and over, GDP at constant prices, and the percentage of population with BPJS health insurance simultaneously have an effect on the Regional Competitiveness Index of regencies/cities in Central Java Province in 2018- 2023.

This hypothesis is consistent with the findings of Millah (2014) and Ridwan et al. (2018), demonstrating a significant relationship between road length, the working population aged 15 years and over, GDP at constant prices, and the percentage of population with BPJS health insurance on the Regional Competitiveness Index.

H2: The number of working population aged 15 years and above has a significant and positive effect on the Regional Competitiveness Index of regencies/cities in Central Java Province in 2018-2023.

This hypothesis is consistent with the findings of Huggins et al. (2014), Popa (2015), Ridwan et al. (2018), and Nurjanah et al. (2022), demonstrating a significant relationship between the number of the working population aged 15 years and over on the Regional Competitiveness Index.

H3: Road length has a positive and significant effect on the improvement of the Regional Competitiveness Index of regencies/cities in Central Java Province in 2018-2023.

This hypothesis is consistent with the findings of Marinov (2016), Ridwan et al. (2018), and Nurjanah et al. (2022), demonstrating a significant relationship between road length and the Regional Competitiveness Index.

H4: The percentage of the population with BPJS health insurance has a positive effect on the Regional Competitiveness Index of regencies/cities in Central Java Province in 2018-2023.

This hypothesis is consistent with the findings of Ridwan et al. (2018), Sinarti et al. (2018), Rusnita et al. (2022), and Widayanto et al. (2023), demonstrating a significant relationship between the percentage of the population with BPJS health insurance on the Regional Competitiveness Index.

H5: GDP at constant prices has a positive effect on the Regional Competitiveness Index of regencies/cities in Central Java Province in 2018-2023.

This hypothesis is consistent with the findings of Ritonga & Hidayat (2015), Puspita et al. (2017), Sinarti et al. (2018), and Affandi (2020), demonstrating a significant relationship between the GDP at constant prices and the Regional Competitiveness Index.

RESEARCH METHODS

Quantitative research methods can be interpreted as research methods based on the philosophy of positivism, used to research certain populations or samples, data collection using research instruments, quantitative or statistical data analysis, with the aim of testing predetermined hypotheses (Sugiyono, 2014). This study was conducted in 35 regencies/cities in Central Java province. This study examined several factors, including the Regional Competitiveness Index, the number of working population aged 15 years and over, road length, the percentage of the population with BPJS health insurance, and the GDP at constant prices (2010) in each regency/city in Central Java in 2018–2023. Data previously collected from sources such as books, reports, journals, and the Central Statistics Agency (BPS) is termed secondary data (Siyoto & Sodik, 2015). This study utilizes secondary data obtained from the Central Statistics Agency of Central Java Province (BPS). Data collection employed documentation techniques, involving a literature review to examine relevant content from established sources.

RESULTS AND DISCUSSION

Chow test

Table 4.9 Fixed Effects Regression Output - Chow Test
 Redundant Fixed Effects Tests
 Equation: Untitled
 Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.802866	(33,131)	0.0105
Cross-section Chi-square	63.278071	33	0.0012

Source: Eviews output 12, processed data

Based on the Chow Test results, the probability value of the cross-section F-statistic is 0.0105. The formulated hypotheses are:

$H_0: F > 0.05$ Common Effect Model (CEM)

$H_a: F \leq 0.05$ Fixed Effect Model (FEM)

The cross-section probability F-statistic yielded a value of $0.0105 < 0.05$, meaning that H_0 is rejected and H_a is accepted. This means that the model selected using the Chow Test is a Fixed Effect Model, thus, the Hausman Test was subsequently performed

Hausman test

Table 4.10 Regression Output of the Hausman Test Random Effect Model
 Correlated Random Effects - Hausman Test
 Equation: Untitled
 Test of cross-sectional random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	18.395781	4	0.0010

Source: Eviews output 12, processed data

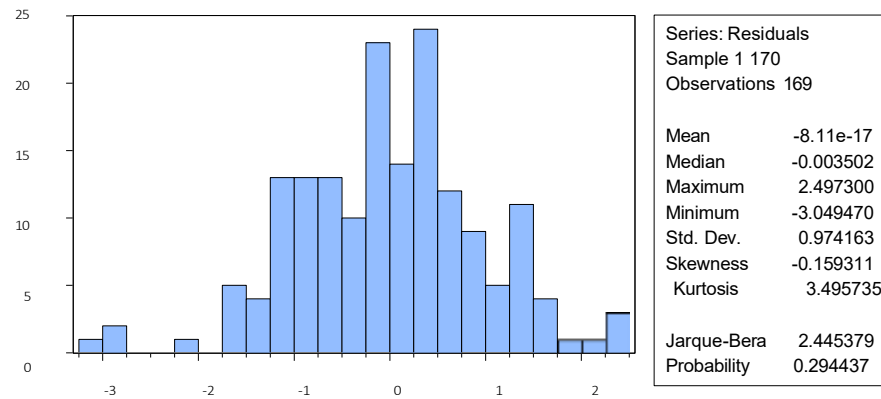
Based on the Hausman Test results, the probability value of Chi-Sq is 0.0010. The hypotheses formed by the Chow Test are:

$H_0: F > 0.05$ Random Effect Model (REM)

$H_a: F \leq 0.05$ Fixed Effect Model (FEM)

The probability value of Chi-Sq is $0.0010 < 0.05$, meaning that H_0 is rejected and H_a is accepted. Based on the Hausman test results, the Fixed Effect Model (FEM) is the most suitable model. Chow Test and Hausman Test yielded consistent results, indicating that the Fixed Effect Model (FEM) is the most suitable model.

Normality Test



Source: Eviews output 12, processed data

Figure 4.1 Output of Fixed Effect Model Regression Normality Test

Based on Figure 4.1, the normality test results of the fixed effect model yield a probability value of $0.294437 > 0.05$, thus, the above data is normally distributed and included in the selected model because it meets the assumption of normality.

Multicollinearity Test

Table 4.1 Multicollinearity Test Regression Output

Variance Inflation Factors

Date: 11/18/24 Time: 11:32

Sample: 1 170

Included observations: 169

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	5.176161	899.8418	NA
X1	0.487315	2713.995	5.912427
X2	0.393882	574.6946	4.317681
X3	3.44E-05	14.19091	1.046331
X4	0.151784	1431.371	2.003183

Source: Eviews output 12, processed data

Based on the Multicollinearity test results, all independent variables exhibit low correlation. It can be seen that the relationship between independent variables is lower than 10.00, thus there is no problem of multicollinearity in this study.

Heteroscedasticity Test

Table 4.2 Heteroscedasticity Test Regression Output

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.676389	Prob. F(4,164)	0.6093
Obs*R-squared	2.742793	Prob. Chi-Square(4)	0.6017
Scaled explained SS	3.223114	Prob. Chi-Square(4)	0.5212

Source: Eviews output 12, processed data

The results of the calculation indicate that there were no symptoms of heteroscedasticity. This is because the Sig. The variable of the regional competitiveness index against absolute residual is 0.6017.

Coefficient of Determination (R²)

The regression analysis, performed using Eviews 12, yielded an R-squared value of 0.43. This indicates that 43% of the variance in the regional competitiveness index is explained by the independent variables: the number of working population, road length, the percentage of population with BPJS health insurance, and Gross Regional Domestic Product (GRDP). The remaining 57% of the variance is attributed to factors not included in the model.

F test

Table 4.13: F-test Results for the Fixed Effects Regression Model

F-value statistics	2.691651
Prob (F statistik)	0.000020
Significance	Signifikan

Source: Eviews output 12, processed data

Based on the results of the calculation with Eviews 12, the calculated F-statistic is 2.691651, while the F-table value at $\alpha = 0.05$ (or a 95% confidence level) is 2.70. Therefore, the model is considered acceptable, and the independent variables can simultaneously explain the dependent variable. Thus, it can be concluded that the variables of the number of working population, road length, percentage of population with BPJS health insurance, and Gross Regional Domestic Product (GRDP) simultaneously have an effect on the variable of the regional competitiveness index in Central Java Province for the 2018-2023 period.

t test

Table 4.14 Independent Variable t-Test Results

Variable	t statistics	t table	Conclusion
Number of the working population	0.2192	1.286	Has no effect
Road length	0.8401	1.286	Has no effect
Percentage of population with BPJS health insurance	0.0000	1.286	Has an effect
GRDP	0.1711	1.286	Has no effect

Source: Eviews output 12, processed data

Number of Working Population

Based on the t-test results, the t-statistic is $1.234 < t\text{-table of } 1.286$. Thus, H_0 is accepted and H_2 is rejected with a significance level of 0.2192.

Road Length

Based on the t-test results, the t-statistic is $0.202 < t\text{-table of } 1.286$. Thus, H_0 is accepted and H_3 is rejected with a significance level of 0.8401.

Percentage of Population with BPJS Health Insurance

Based on the t-test results, the t-statistic is $4.769 > t\text{-table of } 1.286$. Thus, H_0 is rejected or H_4 is accepted with a significance level of 0.0000.

GDP

Based on the t-test results, the t-statistic is $1.376 < t\text{-table of } 1.286$. hus, H_0 is accepted or H_5 rejected with a significance level of 0.1711.

The Effect of the Number of Working Population on the Regional Competitiveness Index

The number of the working population aged 15 years and over has no significant effect on the Regional Competitiveness Index (RCI). These results indicate that a large number of workers is not necessarily accompanied by an increase in productivity or the quality of labor in accordance with market needs. This indicates that the main challenge may not be the quantity of labor, but the quality and suitability of labor skills to the needs of the local economy. This finding contradicts Millah (2014), demonstrating that the size of the labor force has a significant and positive effect on

the regional competitiveness in Central Java. This discrepancy may be attributed to labor quality, which was not the focus of this study. Conversely, this finding is consistent with Ridwan et al. (2018), stating that labor productivity, rather than mere quantity, is a determining factor in competitiveness. In the specific context of Central Java, a substantial labor force is not necessarily productive or has high added value.

The Effect of Road Length on the Regional Competitiveness Index

Road length has no significant effect on the Regional Competitive Index. While road infrastructure is a crucial asset for facilitating the movement of goods and people, this finding indicates that mere road length is insufficient. The effectiveness of roads in supporting economic activities may be hampered by other factors such as road quality, connectivity between regions, or traffic capacity. This result is different from Marinov (2016), stating that road infrastructure supports distribution efficiency and increases regional competitiveness. However, these findings are consistent with Nurjanah et al. (2022), emphasizing the importance of road quality, rather than mere length, in improving regional competitiveness.

The Effect of the Percentage of Population with BPJS Health Insurance on the Regional Competitiveness Index

The percentage of the population with BPJS health insurance has a negative effect on RCI. These results indicate that higher BPJS coverage may reflect challenges in the implementation of health policies. For example, increasing BPJS participation without being balanced with service quality or health system efficiency can cause fiscal pressure and affect local economic stability, thus negatively impacting regional competitiveness. These findings contradict Sinarti et al. (2018), demonstrating that access to health insurance improves labor productivity and regional competitiveness. This discrepancy may be attributed to the distinct analytical focus. Sinarti et al. (2018) primarily examined productivity-related aspects, whereas the present study adopts a broader perspective, encompassing fiscal implications. The current findings are consistent with Rusnita et al. (2022), stating that BPJS coverage can yield negative outcomes in instances of inefficient implementation or cost overruns. The Effect of Gross Domestic Product (GDP) on Regional Competitiveness Index

GDP has no significant effect on RCI. The absence of a significant effect suggests that while GDP is a crucial economic indicator, the level of productivity and economic distribution are likely uneven across regions. In addition, the increase in GDP does not necessarily correlate with overall well-being or competitiveness. This finding contradicts Nurjanah et al. (2022), demonstrating that GDP has a significant effect on regional competitiveness. This difference is attributed to the nature of GDP, which tends to be heavily concentrated in urban areas, thus, it does not reflect the conditions of other regencies/cities. However, this finding is consistent with the study conducted by Popa (2015), stating that competitiveness is affected not solely by economic value, but also by innovation and business dynamics factors that have not been measured in this study.

CONCLUSION

Based on the findings of this study, following the stages of data collection, data analysis, and interpretation of the results regarding the effect of the number of working population, road length, percentage of population with BPJS health insurance, and Gross Regional Domestic Product (GRDP) on the Regional Competitiveness Index of Central Java Province, the results of this study can be concluded as follows:

1. The variables of working population, road length, percentage of population with BPJS health insurance, and Gross Regional Domestic Product (GRDP) simultaneously have an effect on the Regional Competitiveness Index in Central Java Province.
2. Partially, the number of working population, road length, and GRDP have no effect on the Regional Competitiveness Index in Central Java Province. The percentage of the population

with BPJS health insurance has a negative effect on the Regional Competitiveness Index in Central Java Province.

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