

Does regional competitiveness promotes economic growth?



Marsheila Nurul Khasanah ^{a,1,*}, Muhammad Arif ^{a,2}

^aDepartment of Economic Development, Faculty of Economy and Business, Universitas Muhammadiyah Surakarta, Indonesia

¹mnkhasanah@gmail.com; ²ma120@ums.ac.id

* corresponding author

ARTICLE INFO

ABSTRACT

Received : 20-12-2025
Revised : 11-03-2026
Accepted : 02-04-2026
Published : 09-09-2026

Keywords:

Regional Economy
Industry Sector
Competitiveness
Infrastructures
Wages

JEL Classification:

R11, O47, C23,

The relationship between regional competitiveness and economic growth is often assumed to be positive and mutually reinforcing. However, empirical evidence at the sub-provincial level, particularly in developing regions with heterogeneous economic structures, remains limited and inconclusive. This study examines the effects of industrial value added, infrastructure, regional competitiveness, and district/city minimum wages on Gross Regional Domestic Product (GRDP) across districts and cities in Central Java during the period 2022–2024. Using panel data regression and employing the Fixed Effect Model based on Chow and Hausman test results, this study finds that industrial value added and minimum wages exert a positive and statistically significant effect on GRDP, underscoring the importance of real economic activity and household purchasing power in driving short-run regional growth. Infrastructure shows a positive but statistically insignificant effect, while regional competitiveness exhibits a negative and significant relationship with GRDP. These findings suggest that improvements in competitiveness indicators do not always translate into immediate economic gains, particularly when structural readiness and sectoral integration remain uneven. This study contributes to the regional development literature by providing district-level evidence that challenges the conventional assumption of competitiveness-led growth and highlights the dominance of tangible economic factors in shaping short-term regional economic performance.

This is an open access article under the [CC-BY-SA](#) license.



1. Introduction

The processing industry sector constitutes a substantial fraction of the contributions to economic expansion, observable at both global and national scales. In the context of Indonesia, this sector plays a pivotal role in the Gross Domestic Product (GDP) and serves as the principal catalyst for the structural transformation from an agrarian economy to industries characterized by high value addition. Nevertheless, the geographic distribution of industrial activities remains predominantly concentrated in select regions of Java Island, thereby engendering a disparity in growth across different regions. At the provincial tier, Central Java encounters analogous challenges; despite possessing a robust industrial foundation in Semarang, Kudus, and Sukoharjo, the growth trajectory has not been consistent across other districts. This phenomenon corroborates the findings of [Dhora \(2022\)](#) indicated that the flagship processing industry in South Sumatra has failed to engender widespread stimulation of other sectors, alongside [Zahroo \(2022\)](#) affirmed that intersectoral linkages in East Java remain insufficient in fostering regional economic equalization.

Recent international literature highlights that the relationship between regional competitiveness and economic growth is highly context-dependent. [Diemer et al \(2022\)](#) demonstrate that regions may fall into a “development trap” when competitiveness-oriented policies are implemented without

sufficient structural readiness, resulting in limited or even adverse growth outcomes. Similarly, [Di Caro & Fratesi \(2022\)](#) shows that identical regional policies can generate heterogeneous economic effects across territories, depending on institutional capacity and sectoral composition. [Kosfeld & Mitze \(2023\)](#) further emphasize that regional competitiveness enhances economic performance only when supported by strong innovation clusters and productive linkages. These findings suggest that improvements in competitiveness indicators do not automatically translate into higher regional output, particularly at the sub-national level.

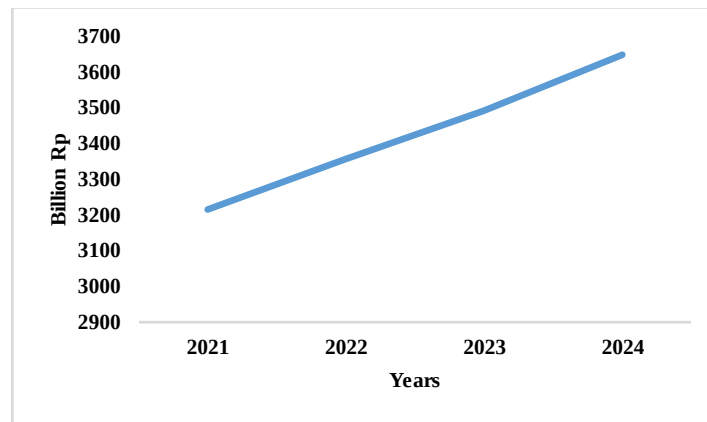
Within this context, the processing industry sector remains a critical real-sector determinant of regional economic performance due to its role in generating value added, employment, and intersectoral linkages. Previous studies by [Pratiwi et al \(2023\)](#) indicates that industrial expansion can stimulate regional growth through increased production capacity and investment, although its impact is often moderated by infrastructure quality and regional disparities. This suggests that industrial value added should be examined alongside structural factors such as infrastructure, competitiveness, and wage dynamics to better understand variations in regional economic growth across districts and cities. In addition to industrial activities, regional growth dynamics are similarly influenced by the prevailing conditions of infrastructure and the levels of local competitiveness, which in turn affect distribution efficiency as well as the investment climate ([Jumiyanti et al., 2026](#)). [Puspitasari & Rahmawati \(2022\)](#) underscore the significance of the regional competitiveness index as a critical indicator for evaluating a region's capacity to attract economic endeavors and optimize sectoral potential. Conversely, [Putra \(2021\)](#) elucidates that the disparities in growth across regions in East Java are attributable not solely to industrial discrepancies, but also to variations in the quality of infrastructure and the regional capacity to enhance productivity. In light of these findings, this study emphasizes the necessity of examining the interplay among the processing industry sector, infrastructure conditions, and regional competitiveness levels in fostering the economic growth of districts and cities within Central Java.

The processing industry sector assumes a pivotal role in fortifying the regional economic framework by generating significant added value, fostering intersectoral connections, and broadening the export base, all of which contribute to the maintenance of regional economic stability. The efficacy of this sector is profoundly affected by the presence of robust infrastructure and the competitive strength of the region. [Zahroo \(2022\)](#) posits that in East Java, the processing sector is fundamental to the formation of interregional economic connections, while [Aulia et al \(2024\)](#) demonstrate that the advancement of both physical and digital infrastructure in Palembang can effectively mitigate logistics expenses and enhance economic interconnectivity. Furthermore, [Sakti & Arifin \(2021\)](#) underscore that heightened regional competitiveness is positively associated with the efficacy of institutions and innovations in the local economy. Within the context of Central Java, the harmonious interplay of industrial efficiency, dependable infrastructure, and augmented competitiveness constitutes a critical foundation for reinforcing the processing industry sector's role as a principal catalyst for inclusive and sustainable economic advancement.

The economic base theory is rooted in the foundational principles of regional economics, which contend that regional growth is predominantly propelled by the activities of the base sector that exports goods and services beyond the local confines, thereby facilitating the influence of external revenue streams. According to [Cámara et al \(2022\)](#) that base sector functions as the primary engine of growth due to its capacity to generate a multiplier effect that stimulates demand for non-base sectors, including local commerce and services. Conversely, the non-base sector caters exclusively to domestic demand and becomes increasingly reliant on the expansion of the base sector. In contemporary discourse, this paradigm retains its relevance by illustrating how fluctuations in base sector output can influence the overarching regional economic structure, as articulated by [Satria et al \(2023\)](#). In the Indonesian context, the processing industry sector exemplifies a quintessential base sector that significantly contributes to the advancement of the regional economy.

Figure 1 shows a sustained increase in the added value generated by the processing industry sector within the Central Java province throughout the period from 2021 to 2024. In the year 2021, the sector's value was documented at approximately Rp3200 billion, progressively rising until it neared Rp3700 billion by 2024. This relatively consistent increase indicates an augmentation of production capacity and a heightened demand for regionally manufactured goods. The observed trend also signifies that the processing sector continues to serve as a significant contributor to the economic advancement of Central Java, primarily through the generation of employment opportunities and the

multiplier effects on ancillary sectors such as trade and transportation. This enhancement in added value aligns with the initiatives undertaken by the local government aimed at bolstering the competitiveness of industries predicated on local resources, thereby reflecting the efficacy of downstream policies and investments directed at fortifying the region's flagship industrial sectors [Saputra & Arif \(2023\)](#).



Source: [BPS \(2024\)](#)

Figure 1. Central Java Processing or Manufacturing Sectors (2021-2024)

Despite the upward trend in the added value of the processing industry sector in Central Java from 2021 to 2024, such growth has not been uniformly mirrored by equitable economic advancement across various districts and cities. This situation suggests that the processing industry's contribution to the region's economic growth is not solely contingent upon the magnitude of industrial output but is also shaped by an array of supporting factors. Variations in infrastructure quality, the degree of regional competitiveness, and distinct regional characteristics are posited to influence the capacity of regions to translate increased industrial activity into more expansive economic growth. A number of preceding studies have tended to infer that infrastructure and regional competitiveness invariably exert a positive influence on economic growth; however, empirical evidence at the district and city level presents a more nuanced picture. Consequently, this study presents a pivotal inquiry: does regional competitiveness consistently facilitate economic growth? This investigation explores the manner in which principal economic and structural factors influence regional economic growth across diverse districts and cities in East Java. This study contributes to the regional economic literature by providing district-level evidence on the short-run effects of regional competitiveness on economic growth in Central Java. By incorporating industrial value added, infrastructure, and district/city minimum wages within a panel data framework, this study challenges the conventional assumption that competitiveness invariably promotes economic growth. The findings are expected to offer policy-relevant insights by highlighting the dominance of tangible economic factors over structural competitiveness indicators in shaping short-term regional economic performance.

2. Literature Review

2.1. Theoretical Foundations: Economic Base and Regional Economic Growth

The economic base theory constitutes a seminal framework within the discipline of regional economics, positing that the growth trajectory of a region is predominantly dictated by the efficacy of the base sector, which refers to the industry responsible for generating goods and services for external markets, thereby facilitating the influx of external income into the regional economy. According to [Cámara et al \(2022\)](#) argued that the base sector acts as the principal catalyst for growth owing to its capacity to engender a multiplier effect on the non-base sector. An upsurge in base sector activity is likely to stimulate demand in domestic sectors, such as commerce and services, thereby amplifying the ramifications of growth on a regional scale. This theoretical perspective underscores the significance of regional exports and intersectoral linkages as pivotal elements in elucidating the dynamics of regional economic growth ([Satria et al., 2023](#)). Within the paradigm of economic base theory, the non-base sector evolves endogenously in response to the proliferation of the base sector; consequently, the economic architecture of the region is profoundly shaped by the composition and performance of its dominant sectors. Regions characterized by robust base sectors are inclined to

experience augmented economic growth as they are adept at sustaining income streams from external locales. Nonetheless, this theoretical construct also acknowledges inherent limitations, particularly when the base sector exhibits spatial concentration and lacks integration with adjacent regions. [Firmansyah \(2021\)](#) demonstrates that the predominance of base sectors within a specific region may exacerbate disparities between regions if the multiplier effect does not disseminate equitably. This observation corroborates the notion that regional economic growth is influenced not solely by the presence of base sectors but also by the region's capacity to effectively manage intersectoral and spatial interconnections ([Zain, 2022](#)).

In the Indonesian context, the processing industry sector is identified as a strategic base sector, given its substantial contribution to the Gross Regional Domestic Product (PDRB), job creation, and the fortification of the regional economic structure. The processing industry possesses the capability to generate significant added value while fostering both backward and forward linkages with ancillary sectors. [Dhora \(2022\)](#) indicates that the preeminent processing industry sector is capable of enhancing regional economic performance through the expansion of production capacity and the demand for local inputs. However, [Zahroo \(2022\)](#) contends that the extent of the processing industry's influence on regional economic growth is largely contingent upon the degree of sectoral integration and the economic structure of the region, thereby suggesting that the mere presence of industry does not inherently ensure inclusive growth.

Moreover, economic base theory provides a framework for understanding the genesis of interregional growth inequality, particularly within core-periphery models. The concentration of base sectors in core regions tends to expedite growth in economic hubs, yet it does not invariably yield substantial spillover effects into peripheral regions. [Firmansyah \(2021\)](#) asserts that this inequality is indicative of disparities in regional capacities to harness the advantages conferred by the base sector. [Satria et al \(2023\)](#) further elaborate that, in the absence of adequate infrastructural support, coherent regional policies, and market integration, the multiplier effects of the base sector may be impeded. Consequently, economic base theory remains pertinent as an analytical framework for comprehending the variations in economic growth among districts and cities in Central Java, which are characterized by industrial concentration and heterogeneity in regional economic structures.

2.2. Processing Industry, Infrastructure, and Regional Economic Growth

The processing industry assumes a pivotal role in fostering regional economic development by generating added value, enhancing productivity, and fostering intersectoral connections. As a foundational sector, the processing industry has the capacity to attract external revenue while simultaneously bolstering domestic economic activities through multiplier effects. [Dhora \(2022\)](#) elucidates that the fortification of the flagship processing industry at the regional level plays a substantial role in augmenting the output of the entire industrial sector. Parallel conclusions are presented by [Pratiwi et al \(2023\)](#) argued the enhancement of production capacity and investment within processing industries propels regional economic growth through the expansion of employment opportunities and the elevation of regional incomes. Consequently, the performance of the processing industry emerges as a critical indicator in elucidating the disparities in interregional economic growth.

Nonetheless, the influence of the processing industry on regional economic growth is not uniformly distributed. Variations in economic structures, industrial scales, and degrees of sectoral integration can significantly influence the capacity of processing industries to generate spillover effects to other sectors. [Zahroo \(2022\)](#) indicates that the interconnectedness of the processing industry with the non-industrial sector predominantly dictates the extent of the multiplier effect generated at the regional level. Concurrently, [Firmansyah \(2021\)](#) highlighted the concentration of industrial activities in specific regions holds the potential to exacerbate inter-regional inequalities unless counterbalanced by the enhancement of supporting sectors in adjacent areas. This observation underscores that the capacity of the processing industry to stimulate regional economic growth is largely contingent upon the structural and spatial context inherent to each region.

Infrastructure constitutes a fundamental supporting element that influences the efficacy of the processing industry's role in promoting regional economic growth. Physical infrastructure, including transportation networks, energy supply, and road systems, serves to reduce logistics costs and enhance inter-regional connectivity, thereby streamlining the movement of goods and services. [Rosik & Wójcik \(2022\)](#) contend that the impact of infrastructure on economic growth is significantly

contingent upon the degree of its integration with regional productive activities. Conversely, [Pandey et al \(2022\)](#) proposes that disparities in infrastructure development may undermine its overall impact on growth, as the benefits of infrastructure are often concentrated in particular regions. Thus, the development of infrastructure does not invariably lead to a consistent enhancement of economic growth throughout the region.

In the realm of emerging economies such as Indonesia, the contribution of infrastructure to regional economic growth is also shaped by institutional capacity and local economic preparedness. [Aulia et al \(2024\)](#) demonstrated that infrastructure development in Palembang City possesses the potential to enhance economic efficiency and connectivity within the region; however, its effects are profoundly influenced by the characteristics of the region's flagship sectors. [Harsono et al \(2024\)](#) emphasizes that investments in infrastructure yield more inclusive economic growth when accompanied by policies designed to integrate underperforming regions into regional economic networks. These findings suggest that infrastructure functions as a complementary factor, whose efficacy is predominantly determined by the industrial structure and economic conditions prevailing in the region.

2.3. Regional Competitiveness and Economic Growth

Regional competitiveness is broadly defined as a region's capacity to sustain economic performance through productivity enhancement, innovation capability, institutional quality, and market efficiency. Within the framework of regional economics, competitiveness affects growth through both direct and indirect transmission channels. The direct channel operates via productivity improvements and efficiency gains that immediately raise regional output. In contrast, the indirect channel works through investment attraction, technological upgrading, human capital accumulation, and institutional strengthening, whose impacts typically materialize over a longer horizon. [Kouskoura et al \(2024\)](#) emphasize that regional competitiveness is inherently multidimensional, reflecting the interaction between economic structure, governance quality, and social capacity.

From a direct-effect perspective, higher regional competitiveness may stimulate economic growth by improving firm productivity, lowering transaction costs, and enhancing market efficiency. Regions with strong innovation ecosystems and dense industrial linkages tend to convert competitiveness into measurable output gains more rapidly. Empirical evidence by [Kosfeld & Mitze \(2023\)](#) shows that competitiveness contributes positively to regional performance when supported by research and development intensity and cluster dynamics. Complementary evidence from [Li et al \(2023\)](#) indicates that the growth effect of regional upgrading is frequently mediated by capital deepening and technological progress, reinforcing the view that competitiveness can operate through multiple reinforcing channels.

However, the competitiveness–growth relationship is not universally positive. A growing body of literature highlights the importance of conditional and indirect mechanisms. [Di Caro & Fratesi \(2022\)](#) demonstrate that identical competitiveness-oriented policies may produce heterogeneous growth outcomes across regions due to differences in institutional capacity and economic structure. Similarly, [Ma et al \(2022\)](#) found that institutional quality acts as a key mediating variable determining whether improvements in competitiveness translate into actual economic expansion. In regions where institutional readiness is weak, competitiveness improvements may fail to generate immediate growth dividends. In the short run, competitiveness reforms may even generate transitional adjustment costs. [Diemer et al \(2022\)](#) conceptualize this phenomenon as a regional development trap, in which regions adopting competitiveness-enhancing reforms without adequate structural readiness experience temporary growth slowdowns. These adjustment costs may arise from regulatory restructuring, resource reallocation, or shifts in production composition. Recent nonlinear evidence by [Zahroo et al \(2022\)](#) suggested that the relationship between innovation-driven competitiveness and economic growth may follow a threshold pattern, where positive effects emerge only after regions reach sufficient structural maturity. Consequently, improvements in competitiveness indicators do not automatically lead to contemporaneous increases in regional output.

The transmission mechanism is therefore highly dependent on regional structural conditions. Regions with diversified economic bases, strong industrial linkages, and adequate institutional capacity are more likely to experience a positive competitiveness–growth nexus. Conversely, regions characterized by structural fragmentation and limited productive integration may face delayed or even negative short-term effects. As noted by [Kouskoura et al \(2024\)](#), competitiveness indicators

often capture improvements in governance and sustainability whose economic payoffs tend to materialize in the medium to long term. Within the context of emerging economies and sub-provincial analysis, the competitiveness–growth relationship becomes increasingly nuanced. Competitiveness improvements at the district level may primarily reflect institutional and regulatory progress rather than immediate expansion of real-sector activity. Therefore, in short-term empirical settings, regional competitiveness may exhibit weak, lagged, or even negative associations with economic growth, particularly in regions with substantial structural heterogeneity. This conditional perspective provides an important analytical basis for interpreting mixed empirical findings in district-level studies.

2.4. Minimum Wages and Regional Economic Growth

The minimum wage constitutes a pivotal instrument within labor policy frameworks, significantly influencing the determination of workers' income levels while simultaneously impacting regional economic dynamics. Within the realm of labor economic theory, wage levels are indicative of the complex interplay among productivity, labor demand, and the structural characteristics of the labor market. Elevations in the minimum wage possess the capacity to enhance worker welfare through augmented real incomes, which may subsequently stimulate household consumption patterns. [Bhuller et al \(2022\)](#) argued the mechanisms governing wage determination bear extensive implications for both income distribution and economic stability. In a regional context, the formulation of minimum wage policy emerges as a critical determinant of economic activity, particularly in areas where economic advancement is predominantly reliant on domestic demand and labor-intensive industries ([Putra, 2021](#)).

From the perspective of demand-driven economic growth, an escalation in the minimum wage may catalyze regional economic expansion via the enhancement of consumers' purchasing power. As workers' incomes experience an upsurge, there is a concomitant expansion in local consumption of goods and services, thereby fostering increased trade and activity within the service sector. [Jardim et al. \(2022\)](#) demonstrated that augmentations in the minimum wage do not invariably exert adverse effects on labor absorption and, in certain instances, may indeed fortify the income stability of low-wage employees. [Marliana \(2022\)](#) highlighted in the Indonesian context, minimum wage policies exert a significant influence on labor market dynamics and household consumption, thereby contributing to broader economic growth. These empirical findings suggest that the minimum wage could function as a stimulus for demand within the regional economic landscape.

However, the repercussions of the minimum wage on regional economic growth are not uniformly distributed across different regions. The industrial composition, levels of productivity, and the prevalence of small and medium-sized enterprises profoundly shape the economic responses elicited by wage policies. [Bhuller et al \(2022\)](#) stated the ramifications of wage increases are largely contingent upon the specific characteristics of the labor market and the adaptive mechanisms employed by firms. In the context of Central Java, [Winarto et al \(2022\)](#) discovered that the elevation of the minimum wage contributes positively to the growth of the processing industry sector, albeit with variations in impact across regions attributable to disparities in productivity and enterprise scale. This finding implies that minimum wage policies possess the potential to invigorate economic growth, particularly in regions characterized by robust industrial foundations and vibrant domestic markets. Within the analytical framework of regional economic growth, the minimum wage can be conceptualized as a variable that influences growth via the income and consumption channels, rather than merely as an element of production expenses. [Putra \(2021\)](#) highlighted that in regions exhibiting a strong local economic focus, the elevation of labor income can reinforce the cyclical nature of the regional economy. [Jardim et al \(2022\)](#) similarly contend that the short-term ramifications of minimum wage policies on the economy manifest predominantly through demand-side mechanisms rather than through structural adjustments on the supply side. Consequently, in the analysis of districts or cities, the policy surrounding minimum wage has the capacity to exert a favorable influence on regional economic growth, particularly in the short term and in locales where domestic consumption constitutes the primary driver of economic activity.

3. Method

This study used a quantitative analysis predicated on secondary data, with all relevant variables derived from the official publications of the Central Statistical Agency (BPS) and the National

Research and Innovation Agency (BRIN). The dependent variable is represented by the Gross Regional Domestic Product (GRDP), while the independent variables encompass Industrial Value Added (VADD), Infrastructure (INFR), Regional Competitiveness Index (IDSD), and the District/Municipal Minimum Wage (UMKK). The analysis in this study is conducted at the district/city level within the Central Java Province, with an observation period spanning from 2022 to 2024. Among the 35 districts/cities, all 35 regions were deliberately chosen as research samples utilizing a purposive sampling methodology. Consequently, the selected 35 districts provide a coherent and representative sample of the regional economic landscape in Central Java. The analytical approach employed is multiple linear regression utilizing panel data, which integrates both time series and cross-sectional data. The time series component encompasses the years 2022 through 2024. The econometric models applied are delineated as follows:

$$GRDP_{it} = \beta_0 + \beta_1 VADD_{it} + \beta_2 INFR_{it} + \beta_3 IDSD_{it} + \beta_4 UMKK_{it} + \varepsilon_{it} \quad (1)$$

Where the Regional Gross Domestic Product (GRDP) served as the principal dependent variable in this investigation, quantified in millions of rupiah to effectively encapsulate regional economic progression. The independent variables encompassed Industrial Value Added, also measured in millions of rupiah, along with Infrastructure and the Regional Competitiveness Index, which were represented by an index, and UMKK (TU) measured in rupiah. The econometric frameworks employed included constants (β_0) and multiple regression coefficients ($\beta_1, \beta_2, \dots, \beta_n$) accompanied by an error term (ε). The data were subjected to analysis through a panel methodology, which amalgamated a seven-year time series with a cross-sectional analysis of 35 districts/cities. Within the model, the GRDP, VADD, and UMKK were logarithmically transformed, yielding log-linear representations for the remaining variables. This transformation was employed due to the extensive scale and pronounced right-skewness of the distributions for GRDP, VADD, and UMKK, thereby stabilizing variance, diminishing heteroskedasticity, and enhancing the interpretability of elasticity (Haghani et al., 2021). Other variables retained their original form to preserve the interpretation in real units.

The estimation phase is conducted by evaluating the panel data model using three alternative specifications, namely the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). Model selection follows a standard specification testing procedure in which the Chow test is first employed to compare CEM and FEM, followed by the Hausman test to determine the appropriate choice between FEM and REM. After identifying the preferred specification, several diagnostic tests are implemented to ensure model validity and reliability. Multicollinearity is assessed using the Variance Inflation Factor (VIF), heteroskedasticity is examined through the Breusch–Pagan test, serial correlation is tested using the Wooldridge autocorrelation test, and functional form misspecification is evaluated via the Ramsey RESET test. The coefficient of determination (R^2) is subsequently interpreted to assess the model's explanatory power (Wooldridge et al., 2016). The use of panel data regression provides important analytical advantages over purely cross-sectional or time-series approaches because it simultaneously captures temporal variation and cross-regional heterogeneity while improving estimation efficiency. This framework is particularly suitable for district and city analysis in Central Java, where structural characteristics such as industrial base, institutional capacity, and geographic conditions—vary across regions but remain relatively stable within the short observation window.

This study adopts a static panel framework because the primary objective is to estimate the contemporaneous within-region association between regional competitiveness and economic growth rather than to model distributional heterogeneity or dynamic adjustment processes. Given the relatively short time dimension of the dataset ($T = 3$), more parameter-intensive approaches such as panel quantile regression or dynamic panel estimators may produce unstable and less reliable estimates. Panel quantile regression is generally more appropriate when the research focus is on heterogeneous effects across the conditional distribution of the dependent variable and when sufficiently long time series are available to ensure robust quantile estimation. Within this empirical setting, the Fixed Effect Model is particularly appropriate because it controls for unobserved time-invariant heterogeneity across districts, allowing the estimated coefficients to reflect genuine within-region changes over time. By removing bias arising from omitted time-invariant regional characteristics, FEM improves the internal validity of the estimated effects of industrial value added, infrastructure, regional competitiveness, and minimum wages on GRDP. This approach follows standard panel econometric practice for short panels emphasizing structural comparison rather than

distributional heterogeneity (Wooldridge et al., 2016). Nevertheless, it is acknowledged that the competitiveness–growth relationship may exhibit heterogeneous or nonlinear patterns across regions. Future research with longer time coverage and richer data structure could employ panel quantile or dynamic specifications to further explore distributional effects and potential lag structures. Within the constraints of the present dataset, however, the static FEM framework represents the most parsimonious and methodologically consistent estimator.

4. Results and Discussion

Table 1 show a substantial variation in Gross Regional Domestic Product (GRDP) and Value Added by Processing Industries (VADD) across various districts and cities within Central Java. The mean GRDP of 31,477.79, accompanied by a significant standard deviation, underscores the pronounced economic disparities between industrialized regions and those predominantly reliant on primary sector activities. A comparable trend is observed in VADD, which reflects the concentration of processing industry activities within specific locales and the diversity inherent in regional economic frameworks. structural variables such as infrastructure (INFR) and the Regional Competitiveness Index (IDSD) exhibit relatively moderate variations, signifying discrepancies in structural and institutional preparedness that are not as pronounced as those observed in tangible economic activities. The District/Municipal Minimum Wage (UMKK) also demonstrates a more limited range of variations, suggesting a coordinated wage policy at the provincial level. This observation corroborates the applicability of the fixed-effect panel data methodology in more precisely capturing regional heterogeneity.

Table 1. Descriptive Statistics

Variable	Mean	Std. Dev	Min	Max	Obs
GRDP	31477.79	28628.87	6889.45	170947.72	105
VADD	9999707.46	13780277.04	976664.10	65167041.01	105
INFR	2.80	0.78	1.51	4.51	105
IDSD	3.45	0.35	2.83	4.39	105
UMKK	2179658.30	243637.32	1819835.17	3243969.00	105

Source: data processed

Table 2 shows a comparative analysis among the Common Effect Model, Fixed Effect Model, and Random Effect Model. The determination of the most appropriate model is conducted through the implementation of the Chow test, which differentiates between the Common Effect and Fixed Effect models, while the Hausman test serves to identify the most fitting model between the Fixed Effect and Random Effect paradigms. The results depicted in Table 2 from the Chow and Hausman tests reveal a probability value that is significantly lower than the alpha threshold of 0.05, thereby allowing for the conclusion that the Fixed Effect Model is the optimal choice among the panel data modeling options.

Table 2. Result of Panel Data

Variable	CEM	FEM	REM
Constant	-84149.1*	-3692.37	-4269.64
VADD	0.0014*	0.0016*	0.0015*
INFR	-3026.67	209.494	179.54
IDSD	14233.8*	-2854.55*	-2890.08*
UMKK	0.02780*	0.0129*	0.0134*
R2	0.7498	0.8428	0.6978
Prob.F	0.000	0.000	0.000

Spesification Model

Chow Test

Cross-section $F_{(34,66)} = 861,91$; Prob. $F_{(34,66)} = 0,000$

Hausman Test

Cross-section random $\chi^2_{(4)} = 15,947$; Prob. $\chi^2 = 0,031$

Source: data processed

Table 2 shows can be concluded that the Fixed Effect Model, often abbreviated as FEM, emerges as the most appropriate and fitting model for conducting a thorough analytical assessment of the data

in question. The validity of the FEM model was substantiated and corroborated by the statistical evidence indicating a Prob F value of 0.000, thereby demonstrating a highly significant level of reliability in the results obtained from this particular modeling approach. The assessment of significance within the context of this research aligns with the assertions made by [Wooldridge et al \(2016\)](#) argued that an independent variable is deemed to exert a significant influence on the dependent variable when the probability threshold is below 0.05. According to the data presented in [Table 2](#), the variables of Infrastructure, Regional Competitiveness Index, and District/Municipal Minimum Wage demonstrate a significant impact at an alpha level of 0.05. Conversely, Industrial Value Added does not exhibit a significant influence on economic growth. Infrastructure exhibits a coefficient of 209.49, indicating that an increment of 1 unit in the infrastructure score correlates with an enhancement of the Gross Domestic Product by 209.49 Million Rupiah. Additionally, the Regional Competitiveness Index possesses a coefficient of -2854.5, signifying that an augmentation of 1 score in the Regional Competitiveness Index results in a decrease of the Gross Regional Domestic Product by 2.854 billion Rupiah. Lastly, the District/Municipal Minimum Wage is characterized by a coefficient of 0.013, implying that each increase of 1 million Rupiah in the Minimum Wage yields an elevation in the Gross Regional Domestic Product by 13 Million Rupiah.

The findings from the estimation indicate ([Table 2](#)) that the value added by the processing industry sector exerts a favorable and statistically significant impact on the Gross Regional Domestic Product (GRDP) of districts and cities within Central Java. These results suggest that an augmentation in industrial output has the potential to substantially enhance regional economic activities. [Pratiwi et al \(2023\)](#) demonstrated that the processing industry sector's contribution is pivotal in fostering regional economic growth, primarily through the expansion of production capacities and the escalation of investments. Similarly, [Setiawan \(2023\)](#) identified that the advancement of the processing industry significantly contributes to the enhancement of the local economy and the elevation of public welfare standards. In the context of Central Java, the rise in industrial added value signifies a fortification of manufacturing activities, which consequently creates employment opportunities, elevates regional income levels, and reinforces the industrial sector's contribution to the GRDP of the respective districts and municipalities ([Asmara & Az Zakiyyah, 2025](#)).

The pronounced impact of industrial value-added on GRDP further illustrates that the processing industry sector maintains a relatively robust interconnection with other economic activities within the region. [Dhora \(2022\)](#) states the processing industry sector can serve as a catalyst for regional economic growth, particularly when it successfully stimulates supporting sectors such as trade, transportation, and services. Furthermore, [Zahroo \(2022\)](#) highlights that heightened activity within the processing industry enhances the region's economic performance via an increased demand for inputs and the distribution of outputs to ancillary sectors. In Central Java, the escalation of industrial value-added is presumed to not only amplify the output of the industrial sector itself but also to bolster economic activities across various sectors, thereby exerting a significant influence on the overall augmentation of district and city GRDP. The positive effect of industrial value added on regional economic growth is consistent with international evidence emphasizing the role of real-sector expansion in regions with sufficient productive linkages ([Kosfeld & Mitze, 2023](#)). Similar findings by [Di Caro & Fratesi \(2022\)](#) suggest that industrial-driven growth tends to be stronger when regional structural conditions support effective spillovers.

Moreover, the results of the estimation revealed that infrastructure exhibits a positive coefficient concerning district GRDP in Central Java; however, this influence lacks statistical significance. These findings imply that improvements in infrastructure are likely correlated with an uptick in regional economic activities, yet the effect has not been sufficiently robust to elucidate the variance in interregional GRDP during the observed period. [Aulia et al \(2024\)](#) discovered that infrastructure development within Palembang City is capable of enhancing distribution efficiency and economic connectivity; however, the extent of this impact is largely contingent upon the scale and equitable distribution of development efforts. Additionally, [Putra \(2021\)](#) emphasized that while infrastructure is crucial in propelling regional economic growth, its influence frequently varies across regions due to disparities in economic characteristics and utilization rates.

The marginal significance of infrastructure's impact on the Gross Regional Domestic Product (GRDP) indicates that the advancement of infrastructure in Central Java has not effectively yielded a uniformly distributed economic effect in the short term. [Prasetya et al \(2021\)](#) argued that the

infrastructure related to roadways and electricity does indeed facilitate an enhancement in regional GRDP; however, the resultant effect is anticipated to be more pronounced in areas characterized by concentrated economic activity and sufficient readiness within the productive sector. In the framework of Central Java, disparities in the levels of infrastructure utilization across various counties and cities are purported to curtail its overall influence on GRDP. Consequently, although the infrastructure reflects a positive correlation, the deficiencies in integration with production and distribution processes render its influence statistically insignificant with respect to the region's economic growth.

The Regional Competitiveness Index (IDSD) demonstrates a negative and statistically significant effect on the GRDP of counties and cities within Central Java. These outcomes imply that an elevation in regional competitiveness scores throughout the observation period was paradoxically linked to a deterioration in regional economic performance. Putri & Sagajoka (2021) revealed that the association between regional competitiveness and economic growth is contextual and is shaped by the structural preparedness of the region. Furthermore, Puspitasari & Rahmawati (2022) underscore that an increase in competitiveness does not necessarily correlate directly with an enhancement in economic output, particularly when competitiveness metrics are predominantly indicative of aspects related to policy, sustainability, and governance. Within the context of Central Java, these findings suggest that enhancements in competitiveness indicators have not been entirely translated into augmented economic activity as reflected in the GRDP. The negative short-run effect of regional competitiveness on economic growth supports the argument that competitiveness-oriented reforms may generate adjustment costs, particularly in regions with limited institutional readiness. Diemer et al (2022) describe this condition as a regional development trap, where structural constraints delay the growth benefits of competitiveness improvements. Ma et al (2022) further highlight the importance of institutional quality in mediating this relationship.

The detrimental impact of IDSD on GRDP may also signify the presence of constraints in the transmission of competitiveness to the aggregate economic performance in the short term. Sakti & Arifin (2021) argued the fortification of regional competitiveness is frequently accompanied by a process of climate and policy adaptation that necessitates time before manifesting tangible economic repercussions. Additionally, Manaraja et al (2023) indicate that competitiveness tends to be sector-specific and does not invariably exert a direct influence on the regional economy in its entirety. In the context of Central Java, the enhancement of competitiveness within specific sectors is purportedly insufficient to counterbalance the declines or stagnation in other sectors, thus resulting in an aggregate negative effect on the GRDP of counties and cities. These findings imply that the advancement of regional competitiveness necessitates comprehensive structural support to effectively stimulate regional economic growth. The insignificant impact of infrastructure on economic growth is consistent with recent evidence indicating that infrastructure investment does not necessarily generate immediate regional output gains when spatial inequality and limited integration with productive activities persist (Ilyasa et al., 2025). Rosik & Wójcik (2022) emphasize that the growth effects of infrastructure depend critically on its alignment with regional economic structures. Similarly, Pandey et al (2022) shows that uneven infrastructure distribution can weaken its aggregate contribution to regional economic performance.

The District/City Minimum Wage (UMKK) exerts a positive and statistically significant influence on the Gross Regional Domestic Product (GRDP) within Central Java. These empirical results suggest that an elevation in the minimum wage serves to enhance regional economic activity. Mukaromah et al (2023) established that the rise in the minimum wage across Indonesia demonstrates a positive correlation with economic growth, primarily through the augmentation of consumer purchasing power and increased household consumption. In the specific context of Central Java, the expansion of Micro, Small, and Medium Enterprises (MSMEs) is believed to catalyze a rise in workers' earnings, thereby amplifying the demand for local goods and services. This phenomenon bolsters the activities within the trade and service sectors, consequently contributing to an overall enhancement of the district's GRDP. The positive effect of minimum wages on regional economic growth is consistent with demand-side explanations emphasizing increased purchasing power and local consumption. Jardim et al (2022) shows that minimum wage increases do not necessarily reduce employment and may stabilize income among low-wage workers, while Bhuller et al (2022) underline the role of wage-setting institutions in shaping regional economic dynamics.

The substantial impact of UMKK on GRDP further reflects the inherent characteristics of the regional economic structure, which exhibits a considerable reliance on domestic demand. [Ningsih et al \(2023\)](#) demonstrated that the elevation of the minimum wage within the Sulawesi Island region effectively promotes economic growth while concurrently influencing the socio-economic conditions of the populace, albeit with varying effects across different regions. Within the framework of Central Java, the proliferation of MSMEs is perceived to act more as an impetus for economic stimulation rather than a constraint on production expenditures, particularly within sectors oriented towards local markets. Variations in business structures and productivity levels among districts and municipalities have resulted in a heterogeneous response; nevertheless, the overall increase in the minimum wage has retained a beneficial impact on GRDP. This illustrates that the UMKK policy occupies a pivotal role in fostering regional economic development.

The empirical evidence indicates that competitiveness and structural determinants do not consistently serve as the primary catalysts for economic growth at the district or city level in Central Java within a short-term framework. Instead, regional economic expansion demonstrates a greater responsiveness to variables that are directly associated with tangible economic activities. The contribution of the processing industry and micro, small, and medium enterprises (MSMEs) exerts a significant positive influence on the Gross Regional Domestic Product (GRDP), thereby affirming the pivotal role of industrial output and labor purchasing power as the principal engines of the regional economy. These conclusions align with the research conducted by [Siwi et al \(2022\)](#), which elucidated that economic growth in Java is predominantly swayed by concrete factors such as capital investment, workforce availability, and technological innovation. Conversely, while infrastructure exhibited a positive yet statistically insignificant effect, the Regional Competitiveness Index demonstrated a significant negative correlation, suggesting that enhancements in structural quality have not yet been effectively manifested in the augmentation of regional economic productivity.

The divergence in the direction and significance of inter-variable influences underscores the heterogeneity of economic conditions and the varying degrees of structural preparedness among districts and cities in Central Java. Regions characterized by a robust industrial foundation and concentrated economic activities tend to respond more expediently to escalations in value-added from the industrial sector and MSMEs, as evidenced by the corresponding increases in GRDP. In contrast, the impacts of infrastructure and regional competitiveness are posited to necessitate a protracted duration before yielding substantial economic benefits. [Cahyadin et al \(2022\)](#) indicated that structural factors at the regional level in Indonesia generally operate through mechanisms that unfold over medium to long-term horizons. In a related vein, [Indrasto & Asyifa \(2025\)](#) stated that the adoption of technology and the readiness for human development in the context of Society 5.0 necessitate sufficient structural capacity to engender a tangible economic impact. These insights imply that regional economic growth is not solely contingent upon enhanced competitiveness; rather, it is significantly influenced by the preparedness of economic structures and the robustness of real economic factors.

It is important to note that the Fixed Effect Model does not imply homogeneous impacts across all districts and cities. Instead, the estimated coefficients represent the average within-region response over time after controlling for time-invariant regional characteristics. Consequently, the economic effects of industrial value added, infrastructure, regional competitiveness, and minimum wages may differ in magnitude across districts such as Semarang, Tegal, and other regions depending on their industrial structure, absorptive capacity, and level of economic maturity. In particular, the negative short-run coefficient of the Regional Competitiveness Index may reflect transitional adjustment dynamics in less prepared regions, where improvements in institutional and governance indicators have not yet been fully translated into real-sector expansion. This interpretation is consistent with the view that competitiveness-driven growth is conditional and often subject to time lags, especially in heterogeneous sub-provincial contexts. Future research may further explore cross-district heterogeneity using distributional or spatial approaches.

5. Conclusion

This study examines the impact of value-added from the processing industry, infrastructure, the Regional Competitiveness Index, and the District/Municipal Minimum Wage on the Gross Regional Domestic Product (GRDP) of districts and municipalities within Central Java Province during the period of 2022 to 2024. The outcomes derived from the Fixed Effect Model estimation revealed that

the value-added from processing industries and small and medium enterprises (SMEs) exerted a statistically significant positive influence on GRDP, signifying that industrial production activities and the enhancement of labor purchasing power serve as pivotal catalysts for regional economic performance. In contrast, infrastructure was found to have a positive yet statistically insignificant impact, whereas the Regional Competitiveness Index manifested a significant negative correlation with GRDP. These results imply that enhancements in competitiveness and structural factors do not invariably yield corresponding increases in regional economic output, particularly within relatively short observation intervals.

The disparity in both the direction and significance of inter-variable influences underscores the heterogeneity of economic conditions and the varying levels of structural preparedness across districts and municipalities in Central Java. The pronounced impact of the value-added from industries and micro, small, and medium enterprises (MSMEs) corroborates the notion that fortifying the productive sector and augmenting individual income remain the most responsive determinants driving regional economic expansion. Conversely, the effects of infrastructure and regional competitiveness are likely to necessitate extended durations as well as cross-sectoral integration support to optimally enhance contributions to GRDP growth. Consequently, the findings of this study convey that regional economic growth is not solely propelled by enhanced competitiveness; rather, it is predominantly contingent upon the readiness of the economic structure and the robustness of fundamental economic factors.

Acknowledgment

The authors would like to express their gratitude to all parties who contributed to the completion of this research. The authors also thank the relevant institutions for providing the data and information necessary for this study. Their support and assistance are greatly appreciated.

Declarations

- Author contribution** : The authors contributed to the conceptualization, methodology, data analysis, interpretation of results, and preparation and revision of the manuscript. All authors have reviewed and approved the final version of the manuscript.
- Funding statement** : This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.
- Conflict of interest** : The authors declare no conflict of interest.
- Additional information** : No additional information is available for this paper.

References

- Aulia, Anisa, S. N., Indah, A., Dipa, M. A. K. & Panorama, M. (2024). Analisis peran infrastruktur dalam pertumbuhan ekonomi pembangunan di Kota Palembang. *Jurnal Publikasi Ekonomi Dan Akuntansi (JUPEA)*, 4(1), 36–54. doi: [10.51903/jupea.v4i1.2435](https://doi.org/10.51903/jupea.v4i1.2435)
- Asmara, G. D., & Az Zakiyyah, N. A. (2025). Identifying growth-driving sectors in Yogyakarta: A sectoral analysis for 2020-2023. *Jurnal REP (Riset Ekonomi Pembangunan)*, 10(2), 352-373. doi: [10.31002/rep.v10i2.2955](https://doi.org/10.31002/rep.v10i2.2955)
- Bhuller, M., Moene, K. O., Mogstad, M. & Vestad, O. L. (2022). Facts and fantasies about wage setting and collective bargaining. *Journal of Economic Perspectives*, 36(4), 29–52. doi: [10.1257/jep.36.4.29](https://doi.org/10.1257/jep.36.4.29)
- BPS. (2024). *Produk Domestik Regional Bruto Provinsi Jawa Tengah 2024*. BPS-Statistics Indonesia.
- Cahyadin, M., Vita Kartika Sari & Szulc, A. I. (2022). Does health contribute to economic growth? An evidence from regional levels in Indonesia. *Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan*, 283–294. doi: [10.23917/jep.v23i2.20106](https://doi.org/10.23917/jep.v23i2.20106)
- Cámara, M., Green, W., MacPhee, C. E., Rakowska, P. D., Raval, R., Richardson, M. C. & Webb, J.

- S. (2022). Economic significance of biofilms: a multidisciplinary and cross-sectoral challenge. *Npj Biofilms and Microbiomes*, 8(1), 42. doi: [10.1038/s41522-022-00306-y](https://doi.org/10.1038/s41522-022-00306-y)
- Dhora, S. T. (2022). Pengaruh industri pengolahan unggulan terhadap pertumbuhan sektor industri pengolahan provinsi Sumatera Selatan. *Elastisitas: Jurnal Ekonomi Pembangunan*, 4(2), 244–252. doi: [10.29303/e-jep.v4i2.68](https://doi.org/10.29303/e-jep.v4i2.68)
- Di Caro, P. & Fratesi, U. (2022). One policy, different effects: Estimating the region-specific impacts of EU cohesion policy. *Journal of Regional Science*, 62(1), 307–330. doi: [10.1111/jors.12566](https://doi.org/10.1111/jors.12566)
- Diemer, A., Iammarino, S., Rodríguez-Pose, A. & Storper, M. (2022). The Regional development trap in Europe. *Economic Geography*, 98(5), 487–509. doi: [10.1080/00130095.2022.2080655](https://doi.org/10.1080/00130095.2022.2080655)
- Firmansyah, M. F. (2021). Analisis pertumbuhan ekonomi dalam penentuan basis ekonomi, isu ketimpangan dan lingkungan di Jawa Barat periode 2010-2019. *Jambura Economic Education Journal*, 3(1), 8–27. doi: [10.37479/jeej.v3i1.8292](https://doi.org/10.37479/jeej.v3i1.8292)
- Haghani, M., Bliemer, M. C. & Hensher, D. A. (2021). The landscape of econometric discrete choice modelling research. *Journal of Choice Modelling*, 40, 100303. doi: [10.1016/j.jocm.2021.100303](https://doi.org/10.1016/j.jocm.2021.100303)
- Harsono, I., Sutanto, H., Rois, I., Fadliyanti, L. & Mulawiani, B. S. W. (2024). Kontribusi infrastruktur dalam mendorong pertumbuhan ekonomi inklusif di Indonesia. *Jurnal Ganec Swara*, 18(1). doi: [10.35327/gara.v18i1.750](https://doi.org/10.35327/gara.v18i1.750)
- Ilyasa, W. N., Kurniawan, M. L. A., Lubis, F. R. A., & Salim, A. (2025). The role of credit for poverty alleviation in Indonesia: Evidence from panel data analysis. *IJBE (Integrated Journal of Business and Economics)*, 9(2), 203-217. doi: [10.33019/ijbe.v9i2.1101](https://doi.org/10.33019/ijbe.v9i2.1101)
- Indrasto, H. B. B. & Asyifa, H. N. (2025). Evaluasi dampak foreign direct investment terhadap kerusakan lingkungan: Studi empiris sektor jasa Indonesia. *JCER: The Journal of Contemporary Entrepreneurship Research*, 1(1).
- Jardim, E., Long, M. C., Plotnick, R., van Inwegen, E., Vigdor, J. & Wething, H. (2022). Minimum-wage increases and low-wage employment: Evidence from Seattle. *American Economic Journal: Economic Policy*, 14(2), 263–314. doi: [10.1257/pol.20180578](https://doi.org/10.1257/pol.20180578)
- Jumiyanti, K. R., Taniu, S., Yakup, A. P., & Walahe, D. (2026). Gorontalo city's strategy as a plastic waste-free coastal city 2030: Qualitative SWOT analysis and blue economy. *Optimum: Jurnal Ekonomi dan Pembangunan*, 16(1), 1-15. doi: [10.12928/optimum.v16i1.14789](https://doi.org/10.12928/optimum.v16i1.14789)
- Kosfeld, R. & Mitze, T. (2023). Research and development intensive clusters and regional competitiveness. *Growth and Change*, 54(4), 885–911. doi: [10.1111/grow.12676](https://doi.org/10.1111/grow.12676)
- Kouskoura, A., Kalliontzi, E., Skalkos, D. & Bakouros, I. (2024). Assessing the key factors measuring regional competitiveness. *Sustainability*, 16(6), 2574. doi: [10.3390/su16062574](https://doi.org/10.3390/su16062574)
- Li, Y., Tian, Z., Niu, X., & Liu, M. (2023). The impact of digital economy on regional technological innovation capability: An analysis based on China's provincial panel data. *PLOS ONE*, 18(7), e0288065. doi: [10.1371/journal.pone.0288065](https://doi.org/10.1371/journal.pone.0288065)
- Ma, J., Ahn, Y.-G. & Lee, M.-K. (2022). The interactive influence of institutional quality and resource dependence on regional economic growth: Evidence from China's resource-based provinces. *Sustainability*, 14(10), 6173. doi: [10.3390/su14106173](https://doi.org/10.3390/su14106173)
- Manaraja, C. D., Engka, D. S. & Rorong, I. P. F. (2023). Analisis potensi unggulan dan daya saing sub sektor pertanian, kehutanan dan perikanan Di Kabupaten Minahasa Selatan. *Jurnal Berkala*

Ilmiah Efisiensi, 23(4), 49–60.

- Marliana, L. (2022). Analisis pengaruh indeks pembangunan manusia, pertumbuhan ekonomi dan upah minimum terhadap tingkat pengangguran terbuka di Indonesia. *Ekonomis: Journal of Economics and Business*, 6(1), 87–91. doi: [10.33087/ekonomis.v6i1.490](https://doi.org/10.33087/ekonomis.v6i1.490)
- Mukaromah, L., Hanifatuzzahra, Z., Nasrullah, A., Latifah, T. M., Purwaningsih, V. T. & Suparta, I. W. (2023). Pengaruh indeks pembangunan manusia, tingkat upah minimum, dan tingkat pengangguran terhadap pertumbuhan ekonomi Indonesia tahun 2022. *ANALISIS*, 13(2), 228–245. doi: [10.37478/als.v13i2.2874](https://doi.org/10.37478/als.v13i2.2874)
- Ningsih, M., Nursini, N. & Sabir, S. (2023). Pengaruh upah minimum, inflasi dan investasi terhadap pertumbuhan ekonomi dan kemiskinan di Pulau Sulawesi. *Economics and Digital Business Review*, 4(2), 362–372.
- Pandey, B., Brelsford, C. & Seto, K. C. (2022). Infrastructure inequality is a characteristic of urbanization. *Proceedings of the National Academy of Sciences*, 119(15). doi: [10.1073/pnas.2119890119](https://doi.org/10.1073/pnas.2119890119)
- Prasetya, D. I., Nuraini, I. & Kusuma, H. (2021). Pengaruh pembangunan infrastruktur jalan raya dan listrik terhadap PDRB di Kota Mojokerto. *Jurnal Ilmu Ekonomi JIE*, 5(2), 233–246. doi: [10.22219/jie.v5i2.14016](https://doi.org/10.22219/jie.v5i2.14016)
- Pratiwi, N. J., Anwar, S., Srivani, M. & Pratiwi, R. (2023). Analisis kontribusi sektor industri pengolahan terhadap pertumbuhan ekonomi Provinsi Sumatera Barat. *Innovative: Journal Of Social Science Research*, 3(2), 6722–6735.
- Puspitasari, N. & Rahmawati, F. (2022). Analisis indeks daya saing dan pengaruh sektor pariwisata dalam meningkatkan ekonomi daerah Kota Batu. *OECONOMICUS Journal of Economics*, 6(2), 59–72. doi: [10.15642/oje.2022.6.2.59-72](https://doi.org/10.15642/oje.2022.6.2.59-72)
- Putra, R. (2021). Determinan pertumbuhan ekonomi dan dampaknya pada tingkat kesejahteraan masyarakat Jawa Timur. *Kajian Ekonomi dan Keuangan*, 5(3), 229–245. doi: [10.31685/rbxaca04](https://doi.org/10.31685/rbxaca04)
- Putri, S. P. & Sagajoka, E. (2021). Analisis pertumbuhan ekonomi dan daya saing daerah Kabupaten Ende tahun 2013-2014. *Jurnal Equilibrium*, 1(1), 100–113. doi: [10.37478/jeq.v1i1.1103](https://doi.org/10.37478/jeq.v1i1.1103)
- Rosik, P. & Wójcik, J. (2022). Transport infrastructure and regional development: A survey of literature on wider economic and spatial impacts. *Sustainability*, 15(1), 548. doi: [10.3390/su15010548](https://doi.org/10.3390/su15010548)
- Sakti, A. B. & Arifin, M. Z. (2021). Menakar daya saing daerah Kota Magelang tahun 2020. *Jurnal Jendela Inovasi Daerah*, 4(1), 16–35. doi: [10.56354/jendelainovasi.v4i1.94](https://doi.org/10.56354/jendelainovasi.v4i1.94)
- Saputra, A. T. & Arif, M. (2023). Analisis pengembangan wilayah Kabupaten Wonogiri berbasis sektor unggulan daerah. *Eksos*, 19(1), 27–41. doi: [10.31573/eksos.v19i1.541](https://doi.org/10.31573/eksos.v19i1.541)
- Satria, A. D., Ridwansyah, R. & Habibi, A. (2023). Pengaruh sektor produk domestik regional bruto (basis dan non basis) terhadap pertumbuhan ekonomi dalam perspektif ekonomi Islam. *Jurnal Ilmiah Ekonomi Islam*, 9(1), 1213–1226.
- Setiawan, H. M. (2023). Analisis pertumbuhan ekonomi dan sektor industri pengolahan di tinjau dalam perseptif islam di Kabupaten Lampung Selatan tahun 2020. *Jurnal Az Zahra: Jurnal Ekonomi Dan Bisnis Islam*, 1(1), 511–520.
- Siwi, V. N., Fevrieria, S. & Archintia, S. (2022). How capital, labor, and technology influence Java's

economic growth. *Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan*, 269–282. doi: [10.23917/jep.v23i2.18278](https://doi.org/10.23917/jep.v23i2.18278)

Winarto, H., Zumaeroh, Z. & Retnowati, D. (2022). Pengaruh human capital, upah minimum dan angkatan kerja terhadap pertumbuhan ekonomi sektor industri pengolahan di Provinsi Jawa Tengah. *Ekonomis: Journal of Economics and Business*, 6(1), 190–194. doi: [10.33087/ekonomis.v6i1.500](https://doi.org/10.33087/ekonomis.v6i1.500)

Wooldridge, J. M., Wadud, M. & Lye, J. (2016). *Introductory econometrics: Asia pacific edition with online study tools 12 months*. Cengage AU.

Zahroo, A. F. (2022). Analisis keterkaitan sektor industri pengolahan terhadap perekonomian di Provinsi Jawa Timur (Pendekatan input-output). *Jurnal Ilmu Ekonomi JIE*, 6(2), 189–202. doi: [10.22219/jie.v6i2.20459](https://doi.org/10.22219/jie.v6i2.20459)

Zain, I. A. A. (2022). Analisis sektor unggulan sebagai pendorong pertumbuhan ekonomi di Kabupaten Pacitan Tahun 2018-2021. *Journal Economics and Strategy*, 3(2), 116–127. doi: [10.36490/jes.v3i2.475](https://doi.org/10.36490/jes.v3i2.475)