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Transformation of Regional Economic Performance in Indonesia During the COVID-19 Pandemic: A Comparative Analysis of GRDP from 2016 to 2023

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Abstract

The COVID-19 pandemic has caused significant disruptions to the global economy, including Indonesia, as reflected in the fluctuations of Gross Regional Domestic Product (GRDP) across various provinces. This study aims to analyze the differences in provincial GRDP in Indonesia between the pre-pandemic period and the pandemic period (2020–2023) in order to assess the impact of the pandemic on regional economic resilience. A comparative quantitative approach was employed, using the Wilcoxon Signed Rank Test on GRDP data based on constant prices, obtained from Statistics Indonesia (BPS). The analysis revealed a statistically significant difference in GRDP before and during the pandemic (p < 0.001), indicating a substantial economic shock. Sharp declines were particularly evident in provinces reliant on the tourism and manufacturing sectors, while provinces with more diversified economic structures or supported by agriculture exhibited relatively greater resilience. These findings highlight the importance of regional economic diversification and the strengthening of more resilient sectors as key strategies for confronting similar crises in the future.

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BACKGROUND

Prior to the onset of the COVID-19 pandemic, Indonesia's economy exhibited stable growth. According to data from Statistics Indonesia (BPS), the country's Gross Domestic Product (GDP) grew at an average rate of approximately 5% per year during the 2017–2019 period. This growth was primarily driven by key sectors such as manufacturing, trade, and construction, which made significant contributions to national GDP. Macroeconomic stability, as reflected in controlled inflation and a moderate fiscal deficit, also played a supportive role in sustaining this growth (Statistik, 2020).

However, behind this growth lies a persistent challenge of regional development disparities. Prior to the pandemic, there were significant differences in the contributions of economic sectors to the GRDP across regencies and cities in Java. Areas with better infrastructure and broader access to markets tended to experience higher economic growth compared to more remote regions. This disparity underscores the need for more inclusive policies to promote equitable economic development (Hadist & Utomo, 2021).

Moreover, the reliance on specific sectors has rendered Indonesia's economy vulnerable to external shocks. The manufacturing and trade sectors dominate the national economic structure. This dependency poses significant risks in the event of disruptions to these sectors, as was evident during the COVID-19 pandemic. Consequently, economic diversification is essential to enhance the nation's economic resilience against various risks (Syaifudin & M, 2022).

The COVID-19 pandemic has triggered a significant contraction in the global economy. According to a report by the World Bank, the pandemic was estimated to have caused a 5.2% decline in global Gross Domestic Product (GDP) in 2020, marking the deepest global recession since World War II. This decline was driven by disruptions in global supply chains, reduced consumer demand, and mobility restrictions implemented across countries. Sectors such as tourism, aviation, and manufacturing were among the hardest hit due to the widespread downturn in economic activity worldwide (Malahayati et al., 2021).

The impact of the pandemic was also evident in the heightened volatility of global financial markets. The surge in COVID-19 cases and fatalities significantly increased financial market volatility in advanced economies (Ullah et al., 2023). This reflects a high degree of uncertainty among investors and market participants during the pandemic period. Such instability has impacted international capital flows and exchange rates, which in turn have affected the economic stability of developing countries. Furthermore, the pandemic has exacerbated economic and social inequalities across various nations. Five years after the onset of the pandemic, its effects remain evident, with a global increase in government debt by 12 percentage points since 2020 (Sevgili & Laudani, 2025). High inflation, shifts in work patterns, and changes in consumer behavior present additional challenges to the global economic recovery. These changes indicate that the COVID-19 pandemic not only caused a health crisis but also fundamentally altered the structure and dynamics of the global economy.

The COVID-19 pandemic has had a profound impact on the Indonesian economy. In 2020, Indonesia's economy experienced a sharp contraction, with GDP declining by approximately 2.1% due to social restrictions and disruptions in the production and distribution sectors. This directly affected both domestic and global demand, given Indonesia's significant dependence on exports and imports. Key sectors such as trade, transportation, and tourism faced substantial declines, resulting in reduced economic activity across many regions of Indonesia. (Purba et al., 2021).

Furthermore, the impact of the pandemic also affected the structure of domestic consumption and investment. A decline in consumer confidence regarding economic stability led to a decrease in household consumption, which constitutes one of the largest components of Indonesia's GDP. On the other hand, the investment sector also experienced pressure due to a reduction in both foreign and domestic investment flows. This decline in investment was caused by high uncertainty and the need for policy adjustments to address the pandemic. Most investors preferred to wait for situational stability before proceeding with business expansion (Suparta et al., 2025). However, despite significant declines across various sectors, the Indonesian government endeavored to mitigate these impacts through a range of fiscal and monetary policies.

The government provided economic stimulus, including social assistance and financing for MSMEs, which was expected to maintain purchasing power and support the most affected sectors. Although these policies contributed to economic recovery, the distribution of benefits was uneven across Indonesia, particularly in more remote and less developed regions (Pangaribowo et al., 2022).

A comparative analysis of Gross Regional Domestic Product (GRDP) before and during the COVID-19 pandemic holds significant importance in understanding the dynamics of regional economies in Indonesia. GRDP reflects economic activity at the regional level and serves as a key indicator for assessing the economic performance of an area. The COVID-19 pandemic has caused substantial disruptions to global economic activities, including in Indonesia, which directly impacted the decline of GRDP across various regions. By comparing GRDP data from before and during the pandemic, it is possible to identify the extent of the pandemic's impact on regional economies and the sectors most affected. (Kuckertz et al., 2020) .

Furthermore, comparative analysis of GRDP can assist in formulating more effective and targeted economic recovery policies. A thorough understanding of changes in GRDP during the pandemic can provide insights into regional economic resilience and support the planning of recovery strategies that are tailored to local conditions (Fernandes, 2020). This is important considering that the impact of the pandemic has not been uniform across all regions, making region-specific policy approaches crucial. Furthermore, this analysis can also contribute to enhancing future economic resilience. Understanding the patterns of GRDP changes during the crisis can help identify factors influencing the economic resilience of a region. Consequently, the results of the comparative GRDP analysis can serve as a foundation for designing more sustainable and crisis-resilient economic development strategies in the future. (Barro et al., 2020).

Therefore, this study aims to analyze and compare the dynamics of Indonesia's Gross Regional Domestic Product (GRDP) before and during the COVID-19 pandemic, in order to identify the impact of the global health crisis on the structure and performance of regional economies. Scientifically, this research is significant as it provides empirical contributions to the understanding of regional economic resilience in facing external shocks, as well as reveals the sectors that are most vulnerable and adaptive during the crisis period. The findings of this study are expected to serve as a basis for formulating more responsive and data-driven fiscal and regional development policies, as well as strengthening an inclusive and sustainable economic planning framework in the post-pandemic era.

LITERATUR REVIEW

Gross Regional Domestic Product (GRDP) is a primary indicator used to measure the total gross value added generated by all business units within a specific region over a given period. GRDP reflects the economic capacity of a region and serves as a basis for regional development planning as well as for evaluating regional economic performance (Mankiw, 2004). As a macroeconomic indicator, GRDP provides an overview of the regional economic structure and the contribution of economic sectors to regional growth.

Methodologically, GRDP is compiled based on the production approach, the expenditure approach, and the income approach. The production approach calculates the gross value added from each economic sector, the expenditure approach sums all final expenditures on goods and services, while the income approach aggregates all incomes received by the factors of production. These three approaches provide a comprehensive perspective for understanding the dynamics of regional economies (Samuelson & Nordhaus, 2019). The difference between Gross Regional Domestic Product (GRDP) and Gross Domestic Product (GDP) lies in their geographic scope. GDP measures the total gross value added at the national level, whereas GRDP focuses on the regional or local level. Although their calculation methodologies are similar, GRDP provides more specific information about the economic conditions within a particular region, making it more relevant for regional analysis and development planning (Todaro & Smith, 2012).

The main components of GRDP include sectors such as agriculture, manufacturing, trade, and services. Each sector contributes differently to the total

GRDP, depending on the economic structure of the region. Analyzing these components is essential for understanding a region's comparative advantages and for formulating appropriate development strategies (Victor, 2023). A thorough understanding of the concept and definition of GRDP is crucial within the context of this study, particularly for analyzing the impact of the COVID-19 pandemic on regional economies. By comprehending the structure and components of GRDP, the most affected sectors can be identified, enabling the formulation of appropriate policy recommendations for regional economic recovery (Romer, 2015).

METHODOLOGY

This type of research falls under the category of comparative quantitative research, aimed at describing the differences and changes in GDP values before and during the COVID-19 pandemic using numerical data. This approach is employed to objectively portray economic phenomena based on available statistical data (Sugiyono, 2018). Comparative research is highly relevant in this context as it enables researchers to analyze significant differences between two time periods, particularly concerning regional economic growth affected by external disruptions such as a pandemic (Djamba & Neuman, 2002).

This study employs a quantitative longitudinal approach, enabling the researcher to track changes in numerical variables (in this case, GRDP values) over a specified time span. The longitudinal approach is essential for capturing the medium- and long-term dynamics of economic variables, as well as for assessing regional resilience to external shocks such as a pandemic. (Babbie, 2015). Thus, this approach is appropriate for depicting the patterns and trends of GDP over time.

RESULT AND DISCUSSION

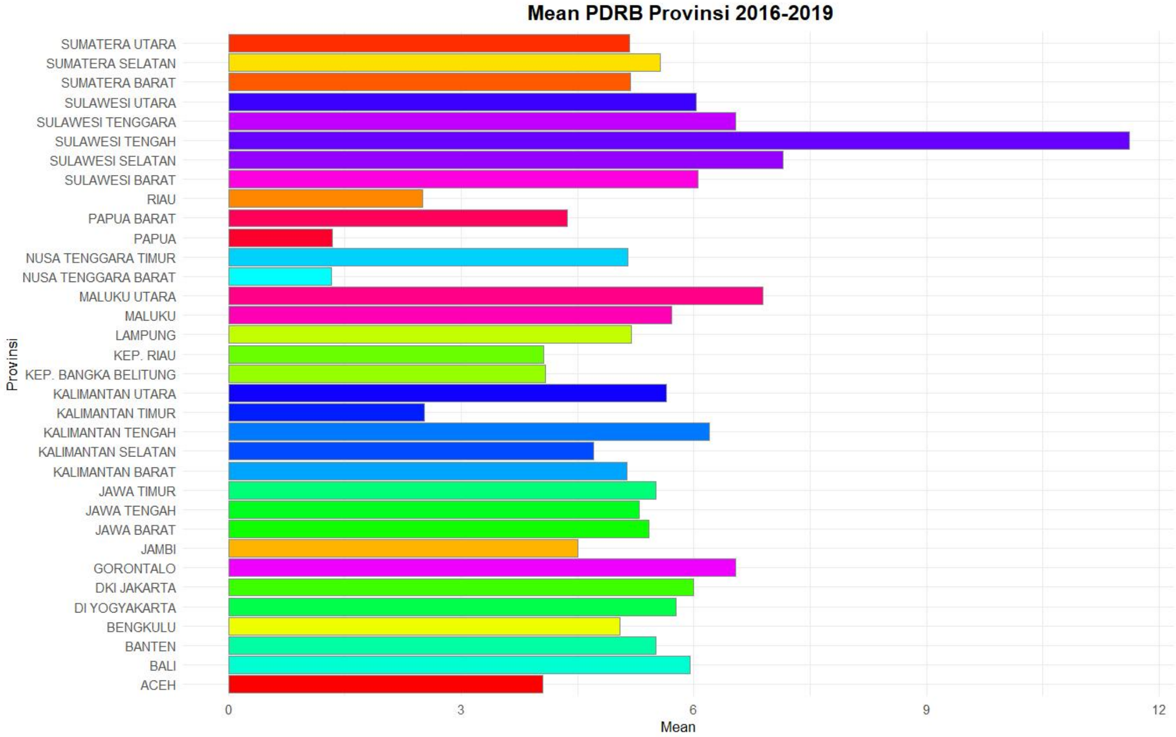

Figure 1. Mean economic growth before COVID-19

Graph 1 presents the average Gross Regional Domestic Product (GRDP) data for each province in Indonesia during the period from 2016 to 2019, which is before the occurrence of the COVID-19 pandemic. Generally, there is a significant variation among provinces in terms of regional economic growth. Central Sulawesi Province recorded the highest average GRDP among all provinces, indicating a very strong economic activity in the region during that period. Additionally, provinces such as West Sulawesi, North Maluku, and Gorontalo also demonstrated high economic performance, signaling promising growth in eastern Indonesia.

DOn the other hand, several provinces, such as West Nusa Tenggara and East Kalimantan, exhibit lower average GRDP compared to other provinces, indicating the need for greater attention to economic development in these regions. Major provinces on the island of Java, such as DKI Jakarta, West Java, and East Java, continued to demonstrate solid economic performance, although they did not dominate the chart excessively. This pattern suggests that, during the pre-pandemic period, economic growth in Indonesia was not solely concentrated in Java but had begun to shift and improve in eastern regions, particularly Sulawesi and Maluku. This narrative is important to consider in the formulation of more equitable and sustainable regional economic policies.

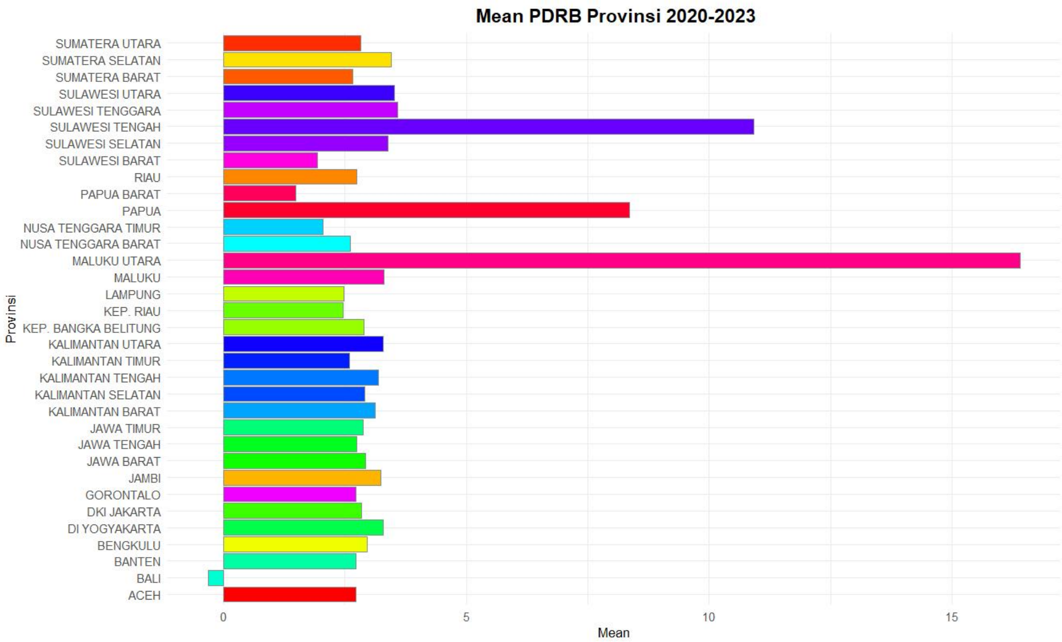

Figure 2. Mean Economic Growth During and After the COVID-19 Pandemic

Figure 2 presents the average Gross Regional Domestic Product (GRDP) of each province in Indonesia during the period from 2020 to 2023, which encompasses the onset of the COVID-19 pandemic through several years afterward. The visualization reveals a significant shift in regional economic performance compared to the pre-pandemic period. North Maluku recorded the highest average GRDP in Indonesia during this period, significantly surpassing other provinces, indicating exceptionally rapid economic growth in the post-pandemic era. Central Sulawesi also maintained a strong position with a high average GRDP, reflecting consistent development and economic activity in the region. In contrast, most provinces in Sumatra and Java—such as West Sumatra, South Sumatra, West Java, and Central Java—exhibited relatively stagnant or slow-growing average GRDP. Several provinces, including West Papua and Bali, displayed notably low mean GRDP, likely still affected by the long-term impacts of the pandemic, particularly in the tourism sector. Overall, the graph indicates that in the post–COVID-19 period, economic growth disparities between regions have become increasingly pronounced. While several provinces in eastern Indonesia have experienced remarkable surges in growth, the majority of other provinces continue to face challenges in returning to the path of economic recovery.

The comparative test employed is the Wilcoxon method, as the data do not meet the assumption of normality. The following hypotheses will be tested.

H_0 : There is no significant difference in GRDP between the pre-COVID-19 period and during the COVID-19 pandemic.

H_1 : There is a significant difference in GRDP between the pre-COVID-19 period and during the COVID-19 pandemic.

The test criterion is to accept H1 based on the following conditions: $P_{value} < \alpha$.

Table 1. Comparison Test

Test Type	P_{value}
Wilcoxon Test	0.00

Based on the table above, the value obtained is $P_{value} = 0.00 < \alpha$. Therefore, it can be concluded that H1 is accepted, indicating a significant difference in GRDP between the pre-COVID-19 period and during the COVID-19 pandemic at a 95% confidence level.

The results of the Wilcoxon Signed-Rank Test indicate a significant difference in Gross Regional Domestic Product (GRDP) values before and after the COVID-19 pandemic across all provinces in Indonesia. This finding reflects the substantial impact of the pandemic on regional economic activity. The decline in GRDP can be attributed to various factors, including mobility restrictions, supply chain disruptions, and decreased global demand. A Computable General Equilibrium (CGE) model was employed to project the short-term effects of the pandemic on Indonesia's economy, showing that sectors such as tourism and manufacturing experienced significant contractions due to activity restrictions and reduced demand. (Malahayati et al., 2021).

During the COVID-19 pandemic, several economic sectors in Indonesia experienced significant impacts, particularly the tourism, manufacturing, and informal sectors. The tourism sector underwent a sharp contraction due to travel restrictions and a decline in tourist arrivals. This decrease affected not only economic output but also household incomes and poverty levels across various regions. The pandemic exacerbated poverty in areas dependent on the informal and tourism sectors, highlighting the uneven economic impacts across regions. (Pham & Nugroho, 2022).

The manufacturing sector was also significantly affected due to global supply chain disruptions and decreased demand. This resulted in reduced production and exports, as well as adverse effects on the workforce within the sector. The decline impacted not only economic output but also household incomes and poverty levels across various regions. The pandemic exacerbated poverty in areas dependent on the informal and tourism sectors, highlighting the uneven economic impacts across regions (Pham & Nugroho, 2022). The informal sector, which accounts for more than 59% of the workforce in Indonesia, also experienced significant impacts. Income reduction and job losses became major challenges for workers in this sector. A survey conducted by PSKK UGM revealed that 70.53% of respondents within the low-income group (<1.8 million IDR) experienced a decline in income during the pandemic (UGM, 2020).

Overall, the COVID-19 pandemic has exerted substantial pressure on Indonesia’s key economic sectors, highlighting the need for targeted recovery strategies and policy support for the most affected sectors.

Significant differences in Gross Regional Domestic Product (GRDP) across provinces during the COVID-19 pandemic reflect the varying levels of regional economic resilience in Indonesia. Provinces with more diversified economic structures or strong agricultural sectors tended to be more resilient compared to those heavily reliant on tourism or manufacturing sectors. A two-dimensional inequality decomposition analysis was conducted to assess the structural impact of the pandemic on income disparities among provinces in Indonesia. The results indicate that the information and communication (IC) sector, financial services, and business services in the Java-Bali region (Region 2) experienced rapid growth and contributed significantly to inter-provincial disparities. Conversely, the tourism sector, including hospitality and restaurants, experienced a sharp contraction, particularly in provinces heavily dependent on tourism such as Bali and the Riau Islands. This decline reflects the vulnerability of provinces with undiversified economies to external shocks like the pandemic (Akita & Alisjahbana, 2023). Regions with high dependence on specific sectors are more vulnerable to external shocks such as the pandemic. Provinces whose economies rely on the informal and tourism sectors experienced greater increases in poverty compared to those with more diversified economic structures. This underscores the importance of regional economic diversification to enhance resilience against crises (Pham & Nugroho, 2022).

The statistical test results indicating significant differences in the economic impact on provinces before and during the COVID-19 pandemic emphasize the need for regional development strategies that consider sectoral economic diversification and the strengthening of sectors that are adaptive and responsive to external shocks. Policies supporting the development of agriculture, information technology, and financial services across various regions can enhance regional economic resilience in the future.

CONCLUSION

Indonesia's economic conditions, as reflected by significant differences in Gross Regional Domestic Product (GRDP) among provinces before and during the 2020–2023 period, demonstrate substantial variation. The results of the Wilcoxon Signed-Rank Test indicate a significant difference in GRDP before and after the pandemic, suggesting that the pandemic constituted a major external shock that fundamentally altered the structure and dynamics of the national economy.

Economic resilience across provinces in Indonesia has proven to be uneven. Provinces with more diversified economic structures or those relying on primary sectors such as agriculture exhibited higher resilience compared to provinces heavily dependent on sectors vulnerable to crises, such as tourism and manufacturing. Dependence on a single economic sector makes a region more susceptible to global fluctuations, as evidenced by the pandemic's impact on tourism-dependent provinces.

This study underscores the importance of regional economic diversification and the strengthening of sectors that are more resilient to external shocks. The policy implications of these findings highlight the need for development strategies that balance economic growth with structural resilience, including investments in sustainable agriculture, the digitalization of SMEs, and the expansion of access and infrastructure beyond the tourism sector. Such strategies are essential for fostering inclusive and sustainable economic growth in the post-pandemic era.

Future research could be directed towards a more in-depth analysis of the determinants influencing regional economic resilience to external shocks, such as labor structure, regional fiscal capacity, and human development indices. Additionally, a post-pandemic longitudinal approach may be employed to examine the temporal dynamics of economic recovery across provinces, as well as to compare the effectiveness of fiscal and non-fiscal policies implemented. Expanding the study to include a cross-country perspective within Southeast Asia's developing nations would provide a broader understanding of economic resilience patterns. Furthermore, integrating social and environmental dimensions into the analysis would enrich the understanding of the pandemic's multidimensional impacts, alongside highlighting the importance of digitalization as a driver of economic recovery, particularly in supporting the transformation of SMEs and public sectors at the regional level.

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