

From Resources to Industrial Dominance: Structural Transformation and Sectoral Imbalance in Morowali Regency

Muh Fardan Ngoyo¹, Dirmansyah Darwin², I Made Jyotisa Adi Dwipatna³

¹Universitas Negeri Makassar, Indonesia

²Universitas Negeri Makassar, Indonesia

³Universitas Negeri Makassar, Indonesia

E-mail: muh.fardan.ngoyo@unm.ac.id¹, dirmansyah.darwin@unm.ac.id², made.jyotisa@unm.ac.id³

Article History:

Received: 17 April 2026

Revised: 25 Mei 2026

Accepted: 07 Juni 2026

Keywords: *Structural Transformation, Regional Economic Development, Sectoral Dynamics, Location Quotient (LQ), Morowali Regency.*

Abstract: *This study examines the trajectory of structural transformation in Morowali Regency over the period 2005–2025, focusing on how the transition from the primary to the secondary sector occurred. Drawing from a quantitative descriptive approach using secondary data on gross regional domestic product (GRDP) of Morowali Regency and Central Sulawesi, this study analyzes sectoral dynamics through changes in the contributions of the primary, secondary, and tertiary sectors over time, examined by Location Quotient (LQ) analysis to identify base and non-base sectors. The results indicate a significant shift away from the dominance of the primary sector toward the secondary sector, particularly through industrial expansion in resource-based manufacturing. However, this transformation exhibits characteristics of uneven structural change, where manufacturing sector remains highly concentrated which accounted for 79 percent from total GRDP and 1,78 of LQ score in 2025, where is not fully accompanied by broad-based diversification or strong inter-sectoral linkages. These findings suggest the need for policies that promote economic diversification and enhance sectoral linkages to ensure more inclusive and sustainable regional economic development. This study contributes to the literature by providing a long-term, region-specific analysis of structural transformation in a resource-rich economy, highlighting the tension between rapid industrialization and sustainable development pathways in emerging regions.*

INTRODUCTION

Structural transformation constitutes a fundamental pathway of economic development, reflecting the reallocation of resources from low-productivity activities toward more productive sectors. This transformation Structural transformation refers to the shift from primary activities

(agriculture, fisheries, forestry, and mining) to secondary (manufacturing and construction) and ultimately tertiary (services) sectors, driving sustained economic growth and improved living standards (Pereira et al., 2024; Sen, 2019; Syrquin, 2008). Classical development theories emphasize the centrality of industrialization in this transition. Simon Kuznets (1966) associates economic growth with sectoral shifts toward industry, while W. Arthur Lewis (1954) highlights labor reallocation from traditional agriculture to modern industry as a key driver of productivity gains. Importantly, these frameworks implicitly assume that industrial expansion is eventually complemented by the development of the service sector, which underpins innovation, human capital accumulation, and long-term economic resilience.

However, contemporary development experiences increasingly challenge this linear and balanced view of structural transformation. In resource-rich developing regions, rapid industrialization, often driven by extractive industries and downstream processing, does not necessarily translate into a proportional expansion of high-value service activities. Dani Rodrik (2016) conceptualizes this phenomenon as premature deindustrialization, where structural change becomes truncated, limiting the transition toward a service-based, knowledge-intensive economy. In such situation, industrial growth may coexist with weak service sector development, generating structural imbalances that undermine long-term sustainability and inclusiveness.

Morowali Regency, located in Central Sulawesi, Indonesia, represents a critical case of resource-based structural transformation. Over the past two decades, the region has experienced rapid economic expansion driven by mining and downstream industrialization, particularly following the establishment of the Indonesia Morowali Industrial Park (IMIP) in 2013 through a partnership among PT Morowali Industrial Park, Tsingshan Group and Delong Group in Indonesia (Pradana et al., 2024). This development expanded further in 2017 involving “the construction of a carbon steel factory, smelter and power plant within the industrial area” (Pradana et al., 2024). Since the expansion, the industry in Morowali has contributed significantly to Indonesia’s economy, becoming the world’s second-largest producer of stainless steel.

For better understand the context, one must consider the fact that the Government of Indonesia, in 2009, implemented Law No. 4/2009 on the Mineral and Coal Mining, which instituted the legal basis for processing and refining, and subsequently, for the export bans on unprocessed minerals, including nickel (Östensson, 2019; Setiawan & Horman, 2022). This policy culminated in a total ban on the export of unprocessed ores in 2014, in order to ensure that mining companies would construct smelters and invest in downstream processing and further contribute to increasing the domestic value addition.

Consequently, regions which endowed with nickel such as Morowali, began to witness a surge in investments in the processing of minerals, and smelting of nickel, along with the associated manufacturing, thus making Morowali a main industrial hub for downstreaming strategy (Jordy, 2025; Matthew et al., 2023). This policy shift was instrumental in accelerating the industrialization of the region and reconfiguring its economy, increasing the contribution of the secondary sector, and reducing the economy’s dependence on the export of raw materials, positioning Indonesia no longer exporting nickel ore, but rather producing and exporting processed nickel for EV batteries and stainless steel (Fitrianto et al., 2025; Setiani et al., 2024). Therefore, this context is a really interesting topic to explore as this development has significantly increased the contribution of the processing industry to regional economic development, accounted for 68,7 percent in the Domestic Gross Regional Product (GDRP) of Morowali Regency in 2020 (Badan Pusat Statistik Kabupaten Morowali, 2022).

Despite a growing body of literature on regional economic development in Central

Sulawesi, existing studies remain fragmented and analytically limited. First, several research such as adopts short-term or sector-specific perspectives, focusing on particular periods such as the mining boom or individual sectors, without providing a long-run, integrated analysis of structural transformation (Jordy, 2025; Pradana et al., 2024; Rezaldi et al., 2025). Consequently, there is a lack of continuous, multi-decade evidence tracing the joint evolution of primary, secondary, and tertiary sectors, including structural shifts and potential turning points. Second, the literature is heavily skewed toward mining and resource-based industrialization, with comparatively less attention given to the role and development of the service sector. Services are frequently treated as residual or lagging sectors, rather than as a central component of structural transformation. As a result, there is limited understanding of whether rapid industrialization in Morowali has been accompanied by adequate service sector upgrading, diversification, and integration.

These limitations highlight a critical research gap regarding the structural balance and sustainability of resource-based industrialization at the subnational level. In particular, it remains unclear whether Morowali's economic transformation reflects a balanced transition across sectors or a skewed development pattern characterized by industrial dominance and service-sector stagnation, with potential implications for inequality and long-term resilience. This study tackles the following research question: *Does the economic growth reflect structural transformation in Morowali over the period 2005–2025?*. To answer this question, the study adopts a quantitative descriptive approach using PDRB data, analysing sectoral contributions and Location Quotient (LQ).

This research offers a novel long-run, sector-wide analysis of structural transformation at the subnational level, with particular emphasis on the imbalance between rapid industrial expansion and the underdevelopment of the service sector. Unlike previous studies that focus on isolated sectors or short time frames, this study carefully traces the trajectory of all three sectors over a twenty-year period. However, several limitations remain, as the sectoral analysis relies on aggregate regional data and does not incorporate firm-level dynamics or environmental indicators.

By offering a comprehensive assessment of sectoral dynamics, this study contributes to the wider discourse on sustainable and inclusive development in resource-based regions, particularly in relation to the agenda of United Nations Sustainable Development Goals (SDGs) including SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), and SDG 10 (Reduced Inequalities) (United Nations, 2015).

LITERATURE REVIEW

Structural transformation is widely recognized as a central mechanism of economic development, reflecting the reallocation of resources from low-productivity traditional sectors to more productive modern sectors. Classical scholars such as Lewis (1954) and Kuznets (1966, 1973) have contributed to the discussion on this topic, by emphasizing a sequential transition from primary activities toward industrialization, followed by the expansion of the service sector. This process is expected to generate productivity gains, structural diversification, and long-term economic resilience. However, more recent studies suggest that structural transformation is not always linear, particularly in resource-dependent economies where industrialization may occur without sufficient development of the service sector (McMillan & Rodrik, 2011; Rodrik, 2016).

Empirical studies on regional development in Central Sulawesi, especially in Morowali have largely focused on sectoral contributions and growth dynamics. Existing research generally identifies mining and agriculture as dominant contributors to regional output, while manufacturing and trade are emerging sectors with increasing importance. Several studies

highlight the role of mining expansion and downstream industrialization, particularly in the context of nickel processing and industrial park development, as key drivers of regional economic growth. At the same time, other studies emphasize the declining role of agriculture and its implications for rural livelihoods.

Despite these contributions, the existing literature exhibits several important limitations. First, several studies rely on short-term or cross-sectional analyses, focusing on specific periods such as the mining boom or particular years of sectoral performance, rather than providing a continuous, long-run perspective (Nazir et al., 2020; Rauf et al., 2021). Thus, there is limited understanding of the dynamic transition of sectoral contribution over time, including the identification of structural turning points. In addition, the literature is heavily concerned on mining and industrial sectors, while the tertiary sector remains largely underexplored and often treated as residual or lagging sectors, with limited attention to their role in supporting industrial upgrading, innovation, and inclusive growth (Pradana et al., 2024).

This fragmented approach limits a comprehensive understanding of the balance and sustainability of structural transformation in resource-based regions. In particular, there is insufficient empirical evidence on whether rapid industrial expansion in Morowali has been accompanied by adequate growth and diversification of the service sector. This creates a critical research gap concerning the long-run dynamics and sectoral balance of regional economic transformation.

This study addresses these gaps by providing a long-term analysis of structural transformation in Morowali over 2005–2025. It examines the interaction among the primary, secondary, and tertiary sectors, with a particular focus on identifying structural shifts, sectoral dominance, and the extent of service-sector development. By integrating a long-run perspective with a sector-wide analysis, this research adds to a more comprehensive understanding of the inclusiveness and sustainability of resource-based industrialization at the regional level.

RESEARCH METHOD

This study uses a quantitative descriptive approach to examine the structural transformation of Morowali Regency over the period 2005–2025. The method captures long-run sectoral dynamics by examining changes in the contributions of the primary, secondary, and tertiary sectors over time. It provides a lens for tracking process of structural transformation through evolving sectoral interactions (Herrendorf et al., 2014). Rather than a static snapshot, it highlights shifts in economic dominance, productivity, and the reallocation of labor and capital across sectors (Elouaourti & Ibourk, 2025; van Neuss, 2019). This approach is consistent with prior studies on structural transformation, which commonly utilize sectoral decomposition and comparative regional analysis to identify patterns of economic change (Pelealu et al., 2024; Rezaldi et al., 2025).

Data and Variables

The analysis is based on secondary data obtained from the National Statistical Bureau or Badan Pusat Statistik (BPS), covering Morowali Regency and Central Sulawesi. The dataset includes sectoral Gross Domestic Regional Domestic Product (GDRP) data for 17 sectors. This study classify the sector into the primary, secondary, and tertiary sectors for the years 2005, 2015, and 2025. These time points are selected to represent key phases of economic transformation, including the pre-industrial period, the onset of rapid industrialization, and the recent stage of industrial dominance.

The main variables used in this study include sectoral PDRB (in constant prices) for each sector; total PDRB at the regional and provincial levels; sectoral shares (percentage contribution to total PDRB). To address the research objectives, this study adopts a combination of analytical methods commonly applied in regional economic analysis:

Location Quotient (LQ)

The Location Quotient (LQ) analysis is used to measure the degree of sectoral specialization in Morowali relative to the provincial level. This approach is widely used in the studies of regional development to identify leading sectors and competitive advantages. The LQ is defined as:

$$LQ = \frac{(S_i/S)}{(P_i/P)}$$

where S_i and S represent sectoral and total GRDP in Morowali, and P_i and P denote sectoral and total GRDP at the provincial level in Central Sulawesi. An LQ value greater than one indicates regional specialization, while a value below one suggests relative underrepresentation.

Sectoral Contribution Analysis

Sectoral contribution analysis is used to examine changes in the composition of the regional economy. The share of each sector is calculated as a percentage of total GRDP, allowing the identification of structural shifts across the primary, secondary, and tertiary sectors over time. This method is widely applied in studies of structural transformation to track the evolution of economic structures.

Growth Trend Analysis

To complement the relative analysis, this study also evaluates absolute growth trends by examining sectoral output in monetary terms. This allows for a distinction between relative decline and absolute expansion, providing a more nuanced understanding of sectoral dynamics.

Data Processing and Visualization

All data were processed using Microsoft Excel to compute sectoral shares and LQ values. The results are presented through descriptive tables and charts to illustrate structural changes and sectoral trends over time.

Limitations

As the analysis relies on aggregate secondary data, this study acknowledged limitation which limits the ability to capture micro-level dynamics such as firm behavior and labor mobility. Second, the use of three time points constrains the ability to observe short-term fluctuations. Finally, the study focuses on sectoral structure and does not explicitly incorporate environmental or distributional indicators, which are important dimensions of sustainable development.

RESULT AND DISCUSSION

Sectoral Contribution and Structural Shift

The structural transformation of Morowali Regency over the period 2005–2025 is consistently reflected across sectoral contribution trends and Location Quotient (LQ) analysis. As illustrated in Figure 1, the regional economy in 2005 was dominated by the primary sector, accounting for more than 60% of total GRDP. This pattern is reinforced by the LQ results presented in Table 1, where agriculture ($LQ = 1.27$) and mining ($LQ = 2.03$) functioned as base sectors, indicating strong regional specialization in resource-based activities.

However, this structure underwent a fundamental shift following the mid-2010s. As shown

in Figure 1, the contribution of the secondary sector increased sharply, surpassing the primary sector by 2015 and becoming overwhelmingly dominant by 2025. This transformation is closely aligned with the LQ dynamics in Table 1, where manufacturing experienced a dramatic rise from a non-base sector (LQ = 0.53 in 2005) to a highly specialized base sector (LQ = 3.05 in 2015 and 1.78 in 2025). This shift reflects the rapid expansion of resource-based industrialization, particularly nickel processing following the implementation of the mineral export ban and the development of the Indonesia Morowali Industrial Park (IMIP).

At the same time, Figure 2 demonstrates that this transformation is driven by disproportionate growth in the secondary sector, which expanded exponentially in absolute terms compared to the more modest growth observed in the primary and tertiary sectors. While the primary sector continued to grow in absolute value, its relative contribution declined significantly, accompanied by a reduction in LQ from 1.27 to 0.10 in agriculture and from 2.03 to 1.12 in mining. This indicates a gradual erosion of relative specialization, despite continued output expansion.

More importantly, the transformation is characterized by a persistent weakness in the tertiary sector. As shown in Table 1, most service sectors exhibit LQ values consistently below one across all periods, with several sectors declining further over time. For example, information and communication (6.29 to 0.11) and financial services (0.51 to 0.12). This pattern is also visible in Figure 1, where the share of the tertiary sector contracts sharply to 3% by 2025. The absence of rising LQ values in services suggests that the sector has failed to develop into a complementary base sector, limiting its role in supporting industrial expansion.

Table 1. Location Quotient (LQ) Analysis based on sectors in Morowali Regency (2005, 2015, and 2025).

Sector	2005	2015	2025
Primary			
A. Agriculture, Forestry, and Fishing	1,27 (base)	0,43	0,10
B. Mining and Quarrying	2,03	2,55	1,12 (base)
Secondary	0,00	0,00	0,00
C. Manufacturing	1,90 (base)	3,05(base)	1,78 (base)
D. Electricity and Gas Supply	1,62 (base)	0,27	0,08
E. Water Supply, Sewerage, Waste Management and Recycling	1,52 (base)	0,19	0,07
F. Construction	1,94 (base)	1,38	0,66
Tertiary			
G. Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	0,84	0,52	0,24
H. Transportation and Storage	6,74(base)	0,10	0,21
I. Accommodation and Food Service Activities	0,94	0,22	0,11
J. Information and Communication	6,29(base)	0,34	0,11
K. Financial and Insurance Activities	1,97 (base)	0,39	0,12
L. Real Estate Activities	0,52	0,47	0,17
M,N. Business Activities	4,55	0,07	0,03

O. Public Administration and Defence; Compulsory			
Social Security	1,35 (base)	0,19	0,06
P. Education	N/A	0,17	0,05
Q. Human Health and Social Work	1,12	0,28	0,08
R,S,T,U. Other Service Activities	1,54	0,34	0,14

Source: Author's calculation based on BPS data of Morowali Regency and Central Sulawesi Note: LQ > 1 indicates a base sector.

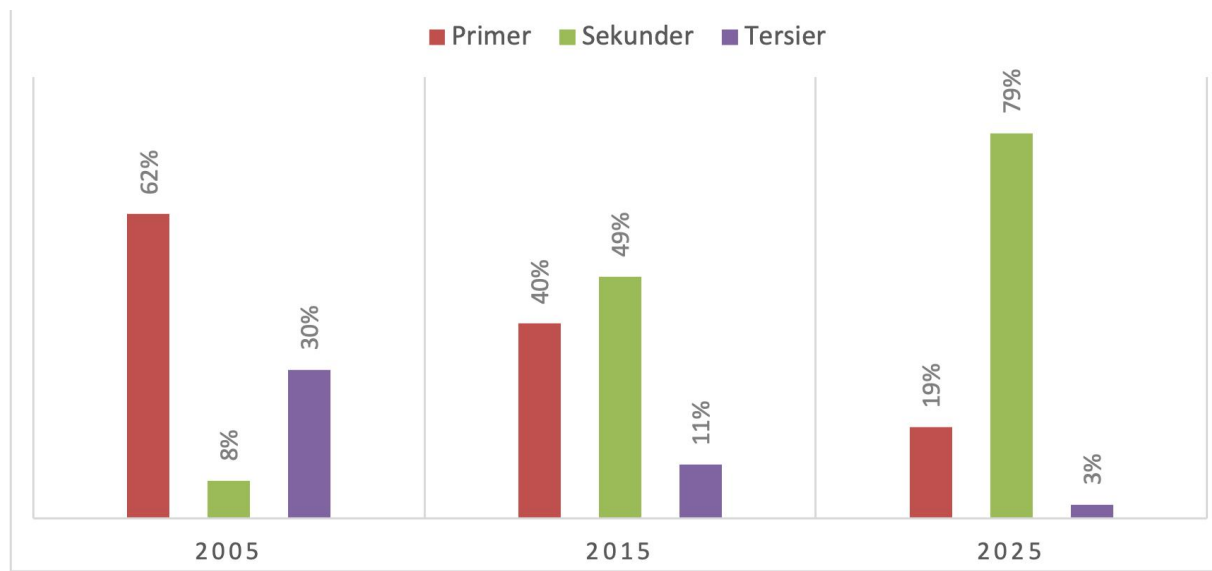
Taken together, the evidence from Table 1 and Figures 1 indicates that Morowali's transformation reflects a highly concentrated and unbalanced structural change, rather than a broad-based transition. The dominance of manufacturing and mining, combined with the persistent non-base status of most service sectors, points to a pattern of enclave-type industrialization, where economic growth is driven by a narrow set of capital-intensive activities with limited inter-sectoral linkages. This finding is consistent with the literature on resource-based development, which emphasizes that rapid industrialization does not necessarily lead to diversification or inclusive growth (McMillan & Rodrik, 2011; Rodrik, 2016).

The empirical results reveal a profound structural transformation in Morowali Regency over the period 2005–2025. In 2005, the regional economy was heavily dominated by the primary sector, which accounted for 62.04% of total PDRB, indicating a traditional, resource-based economic structure. The tertiary sector contributed 30.27%, while the secondary sector remained marginal at 7.63%, reflecting limited industrial capacity.

By 2015, a major turning point occurred. The secondary sector expanded rapidly to 49.37%, surpassing the primary sector (39.74%) and marking the onset of industrial dominance. This shift coincides with the establishment of the Indonesia Morowali Industrial Park and the implementation of export ban regulation. This implies that industrial policy and investment played a significant role in accelerating structural shift, while receiving push factor from ore export ban that mandates the companies to have smelter for accelerating industrial downstreaming agenda.

By 2025, the transformation turned even more pronounced, with the secondary sector accounting for 79% of total GRDP. In contrast, the primary sector declined to 19%, while the tertiary sector dropped sharply to only 3%. This pattern indicates a highly concentrated industrial structure, where the economic activity is overwhelmingly driven by manufacturing and resource-processing industries.

Figure 1. GRDP at constant price of Morowali Regency in percentages based on sectors (2005, 2015, and 2025)



Source: Author's calculation based on BPS data of Morowali Regency.

Absolute Growth versus Relative Decline

An important finding appears when comparing relative shares with absolute values. Despite the declining share of the primary sector, its output increased substantially from 657.20 million rupiah in 2005 to 35,048.44 million rupiah in 2025. Similarly, the tertiary sector experienced modest absolute growth, although its relative contribution declined significantly.

The most striking growth is observed in the secondary sector, which expanded from 80.72 million rupiah to 148,516.49 million rupiah over the same period. This divergence between absolute growth and relative decline highlights a key characteristic of structural transformation: sectors may continue to grow in absolute terms while losing relative importance due to the faster expansion of other sectors.

Absolute Growth versus Relative Decline

An important finding appears when comparing relative shares with absolute values. Despite the declining share of the primary sector, its output increased substantially from 657.20 million rupiah in 2005 to 35,048.44 million rupiah in 2025. Similarly, the tertiary sector experienced modest absolute growth, although its relative contribution declined significantly.

The most striking growth is observed in the secondary sector, which expanded from 80.72 million rupiah to 148,516.49 million rupiah over the same period. This divergence between absolute growth and relative decline highlights a key characteristic of structural transformation: sectors may continue to grow in absolute terms while losing relative importance due to the faster expansion of other sectors.

Tabel 2. Sectoral Contribution to GRDP at constant prices of Morowali Regency (2005, 2015, and 2025)

Sector	2005	2015	2025
Primary	657,20	5.091,99	35.048,44
Secondary	80,72	6.326,56	148.516,49
Tertiary	320,48	1.399,68	5.297,11
Total GRDP	1.058,41	12.818,23	188.862,04

Source: Author's calculation based on BPS data of Morowali Regency

Industrialization without Service-Based Shift

The combined evidence from sectoral shares and LQ values highlights a critical deviation from the classical structural transformation pathway. While industrialization has occurred rapidly, the tertiary sector has not evolved into a complementary base sector. The persistently low LQ values (<1 across all years) indicate that services have failed to develop the competitiveness necessary to support and sustain industrial expansion.

In standard development trajectories, the service sector typically emerges as a new driver of growth, supported by increasing demand for logistics, finance, and business services. However, in Morowali, the absence of rising LQ in the tertiary sector suggests weak forward and backward linkages, limiting productivity spillovers from industrial activities. This pattern reflects what can be described as incomplete or unbalanced structural transformation, where industrial growth is not accompanied by broader economic diversification. Such dynamics are common in resource-based economies, where industrialization is driven by external investment and commodity demand rather than endogenous structural upgrading (McMillan & Rodrik, 2011; Rodrik, 2016).

Structural Imbalance and Economic Risks

The high and persistent LQ values of the secondary sector indicate strong regional specialization; however, they also signal increasing structural concentration. By 2025, the dominance of a secondary sector with both high contribution to GRDP and LQ, suggests that Morowali's economy has become heavily dependent on resource-based industrialization.

While this specialization enhances export capacity, it also introduces vulnerability to external shocks, including fluctuations in global nickel prices, changes in international demand, and policy shifts in global value chains. At the same time, the declining LQ values of both primary and tertiary sectors indicate weakening diversification, reducing the region's ability to buffer against such shocks.

The extremely low LQ of the service sector is particularly concerning, as it reflects a structural absence of supporting industries necessary for long-term economic resilience. This condition aligns with the concept of enclave industrialization, where economic activity is concentrated in a narrow sector with limited spillover effects on the wider economy (Addison & Roe, 2024; Phelps et al., 2015).

Implications for Development Strategy

The integration of sectoral contribution and LQ analysis provides important insights for regional development policy. While the secondary sector has successfully emerged as the dominant base sector, long-term sustainability requires the development of additional sources of regional specialization, particularly within the service sector. Policy efforts should focus on increasing the competitiveness—and thus the LQ—of the tertiary sector by investing in logistics, digital infrastructure, education, and business services. Strengthening these areas would support industrial activities while also creating new growth drivers.

Furthermore, diversification within the industrial sector itself is essential to reduce dependence on a single commodity-based value chain. Expanding into higher value-added activities and strengthening linkages with global value chains can help transform Morowali's current specialization into a more resilient and diversified economic structure. Ultimately, the

challenge is not only to sustain industrial growth but to achieve a more balanced configuration of sectoral specialization, where multiple sectors contribute to long-term development, resilience, and inclusive economic transformation.

CONCLUSION

This study demonstrates that the structural transformation of Morowali over the period 2005–2025 is characterized by a prominent shift towards secondary sectors, contributed from the expansion of manufacturing industry, while the primary sector declines and the tertiary sector remain relatively underdeveloped. The findings show that the transformation in Morowali does not fully follow the classical trajectory of balanced sectoral evolution; instead, it reflects a skewed pattern in which industrial growth is not adequately accompanied by service sector upgrading. This imbalance limits the potential for productivity spillovers, weakens economic diversification, and raises concerns about long-term sustainability and inclusiveness. By providing a long-run, sector-wide analysis at the subnational level, this study contributes to the literature by highlighting how resource-based industrialization can generate imbalance structural results particularly in regions with strong dependence on extractive industries.

However, this study is subject to several limitations. The analysis relies on aggregate GDRP data, which constrains the ability to capture firm-level dynamics, labor mobility, and intra-sectoral productivity changes. In addition, the absence of detailed environmental and social indicators limits a more comprehensive assessment of sustainability and welfare impacts. Future research should therefore incorporate micro-level data, spatial analysis, and environmental metrics to better understand the distributional and ecological consequences of structural transformation. Further studies could also explore the role of institutions, governance, and global value chains in shaping regional development outcomes. Despite these limitations, this study provides important empirical evidence and policy-relevant insights, emphasizing that achieving sustainable and inclusive growth in Morowali requires a more comprehensive regional development strategy that integrates industrial expansion with strengthened service sector and broader structural resilience.

REFERENCES

- Addison, T., & Roe, A. (2024). Extractive industries: enclaves or a means to transform economies? *WIDER Working Paper*. <https://doi.org/10.35188/unu-wider/2024/486-1>
- Badan Pusat Statistik Kabupaten Morowali. (2022). *Kabupaten Morowali dalam angka 2022*. Badan Pusat Statistik Kabupaten Morowali. <https://morowalikab.bps.go.id/id/publication/2022/02/25/08f2bbc3a150a3c56f6cd93a/kabupaten-morowali-dalam-angka-2022.html>
- Elouaourti, Z., & Ibourk, A. (2025). A new methodology to track the dynamics of structural transformation applied to the case of a developing country. *Journal of Open Innovation: Technology, Market, and Complexity*, 11(2), 100539. <https://doi.org/10.1016/j.joitmc.2025.100539>
- Fitrianto, G., Permana, Y., Sanjaya, M. R., Sholihin, M., & Farouqi, M. A. (2025). Examining the linkage and structural transformation effects of nickel industrialization: A case of South Halmahera, Indonesia. *Asian Journal of Economic Modelling*. <https://doi.org/10.55493/5009.v13i3.5528>
- Herrendorf, B., Rogerson, R., & Valentinyi, Á. (2014). Growth and Structural Transformation. In Philippe Aghion & Steven Durlauf (Eds.), *Handbook of Economic Growth* (Vol. 2, pp. 855–941). Elsevier. <https://doi.org/10.1016/B978-0-444-53540-5.00006-9>

- Jordy, J. (2025). Untangling Nickel Downstreaming: A Political Economy Analysis of Indonesia's Morowali Industrial Park. *International Journal of Social and Political Sciences*. <https://doi.org/10.69812/ijsp.v2i2.136>
- Kuznets, S. (1966). *Modern Economic Growth: Rate, Structure and Spread*. Yale University Press. .
- Kuznets, S. (1973). Modern economic growth: findings and reflections. *The American Economic Review*, 63(3), 247–258.
- Lewis, W. A. (1954). Economic Development with Unlimited Supplies of Labour. *The Manchester School*, 22(2), 139–191. <https://doi.org/10.1111/j.1467-9957.1954.tb00021.x>
- Matthew, J., Jans, S. R., & Huang, A. (2023). The Prisoner's Dilemma: Indonesia and the European Union in Export Commodity Disputes. *Jurnal Sentris*. <https://doi.org/10.26593/sentris.v4i1.6794.86-100>
- McMillan, M., & Rodrik, D. (2011). *Globalization, Structural Change and Productivity Growth*. <https://doi.org/10.3386/w17143>
- Nazir, M., Murdifin, I., Putra, A. H. P. K., Hamzah, N., & Murfat, M. Z. (2020). Analysis of Economic Development Based on Environment Resources in the Mining Sector. *The Journal of Asian Finance, Economics and Business*, 7(6), 133–143. <https://doi.org/10.13106/jafeb.2020.vol7.no6.133>
- Östensson, O. (2019). Promoting downstream processing: resource nationalism or industrial policy? *Mineral Economics*, 32, 205–212. <https://doi.org/10.1007/s13563-019-00170-x>
- Pelealu, B. D. C., Mopangga, H., & Abdul, I. (2024). Analisis Pertumbuhan dan Perubahan Struktur Ekonomi di Provinsi Sulawesi Tengah Tahun 2018 - 2022. *Economic Reviews Journal*, 3(4). <https://doi.org/10.56709/mrj.v3i4.571>
- Pereira, W., Missio, F., & Jayme, F. (2024). Structural Change in the 21st Century: The Role of the Modern Services Sector in the Economic Development Strategy. *Review of Political Economy*, 1–25. <https://doi.org/10.1080/09538259.2024.2342431>
- Phelps, N., Atienza, M., & Arias, M. (2015). Encore for the Enclave: The Changing Nature of the Industry Enclave with Illustrations from the Mining Industry in Chile. *Economic Geography*, 91, 119–146. <https://doi.org/10.1111/ecge.12086>
- Pradana, G. W., Kuncaravita, S. A., & Alina, A. N. (2024). Policy and Impact Analysis of Smelter Development in Morowali Sulawesi: A Multidisciplinary Review of Social, Economic and Environmental Aspects. *East Asian Policy*, 16(04), 114–127. <https://doi.org/10.1142/S1793930524000327>
- Rauf, R. A., Suparman, Husnah, Halwi, M. D., Pratama, M. F., Mayapada, A. G., & Arsyad, M. (2021). Industrialization and regional income inequality: agriculture transformation. *IOP Conference Series: Earth and Environmental Science*, 681(1), 012088. <https://doi.org/10.1088/1755-1315/681/1/012088>
- Rezaldi, R., Yunus, S., Sading, Y., Yunus, R., & Musdayati, M. (2025). Analysis of Leading Sectors and Structural Shifts in the Economy in Tojo Una-Una District in 2019-2023. *JOURNAL OF HUMANITIES SOCIAL SCIENCES AND BUSINESS (JHSSB)*, 4(3), 574–590. <https://doi.org/10.55047/jhssb.v4i3.1718>
- Rodrik, D. (2016). Premature deindustrialization. *Journal of Economic Growth*, 21(1), 1–33. <https://doi.org/10.1007/s10887-015-9122-3>
- Sen, K. (2019). Structural Transformation around the World: Patterns and Drivers. *Asian Development Review*, 36(2), 1–31. https://doi.org/10.1162/adev_a_00130
- Setiani, H., Valennia, R., & Rusni, N. K. (2024). Nickel export ban policy in Indonesia - a path to

-
- sustainable economic development? *EcoProfit: Sustainable and Environment Business*.
<https://doi.org/10.61511/ecoprofit.v1i2.2024.468>
- Setiawan, A., & Horman, J. (2022). PERKEMBANGAN REGULASI PENINGKATAN NILAI TAMBAH NIKEL DI INDONESIA. *INTAN Jurnal Penelitian Tambang*.
<https://doi.org/10.56139/intan.v2i2.31>
- Syrquin, M. (2008). Structural change and development. *International Handbook of Development Economics*, 1, 48–67.
- United Nations. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*
- van Neuss, L. (2019). THE DRIVERS OF STRUCTURAL CHANGE. *Journal of Economic Surveys*, 33(1), 309–349. <https://doi.org/10.1111/joes.12266>