STRUCTURAL ECONOMIC STUDY OF BALI PROVINCE THROUGH SHIFT SHARE METHOD AND KLASSEN TYPOLOGY

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Abstract. This study aims to analyze the dynamics of growth and economic structure between regions in Bali Province using the Shift Share Analysis, Klassen Typology, and Williamson Index approaches. The Shift Share method is used to evaluate the contribution of national growth, the influence of industrial mix (proportional shift), and competitive advantage (differential shift) on changes in economic sectors in districts/cities in Bali. The Klassen Typology is applied to classify economic sectors into four categories: advanced and rapidly growing sectors, advanced but constrained sectors, potential sectors, and lagging sectors. The analysis reveals that there are consistent leading sectors supporting regional economic growth, such as the public administration sector, other services, and agriculture. However, the Williamson Index of 0.40 indicates that there is still moderate economic development disparity between regions in Bali. This disparity is generally driven by the concentration of development in areas dominated by the tourism and service industries. This study suggests the need for a more equitable and sustainable development strategy, focusing on the development of potential sectors and enhancing the competitiveness of strategic sectors across all districts/cities in Bali Province.

Keywords: Shift Share Analysis, Klassen Typology, Williamson Index, economic growth, Bali Province.

1 Introduction

Shift-share analysis is a commonly used method in regional economic research to assess the performance and productivity of a local economy in comparison to a larger reference region, such as the national economy [1,2]. This method decomposes changes in economic variables—such as employment, output, income, or value added—into three components: the national growth effect, the industry mix effect, and the regional competitive effect [3].

This study is motivated by the need to understand regional economic dynamics, especially in the context of development disparities and the search for effective regional growth strategies [4,5]. The shift-share method provides a straightforward analytical framework that enables policymakers and researchers to identify which sectors are driving or hindering regional economic performance [6]. Its simplicity and practical applicability make it a valuable tool for regional planning and policy formulation.

The case of Bali illustrates the importance of such analysis. Despite being a major tourism hub, Bali exhibits significant economic disparities among its districts. Areas like Badung and Denpasar enjoy higher per capita incomes due to concentrated tourism activity, while more remote districts struggle with underdevelopment and

limited diversification. The COVID-19 pandemic further exposed the vulnerability of Bali's economy to external shocks, highlighting the urgency for structural transformation and balanced regional development.

Previous literature has highlighted the utility of shift-share analysis for identifying structural changes and sectoral competitiveness within regional economies [7]. It offers insights into sectoral strengths and weaknesses, allowing regions to focus resources on sectors with high growth potential or strategic importance, such as those with significant employment absorption capacity.

The significance of this study lies in combining shift-share analysis with other complementary frameworks, such as Klassen Typology and the Williamson Index, to provide a multidimensional understanding of regional economic patterns [8,9]. While shift-share identifies sectoral performance, Klassen Typology classifies sectors based on growth and contribution levels, and the Williamson Index measures regional economic inequality.

The objective of this research is to analyze regional economic performance and disparities using a combination of quantitative methods. Specifically, the study aims to: (1) identify leading and lagging sectors using shift-share analysis, (2) classify regional sectoral structures using Klassen Typology, and (3) assess the degree of interregional economic inequality using the Williamson Index.

This study is based on the hypothesis that regional disparities are shaped by differences in sectoral structure, growth trajectories, and competitiveness. These differences can be effectively analyzed through integrated economic tools to inform targeted policy interventions [10,11].

2 Research method

This study adopts a quantitative research design, utilizing secondary data to examine regional economic performance and disparities. The analysis involves the application of shift-share analysis, Klassen typology, and the Williamson Index to explore the dynamics of regional development across economic sectors and geographic areas [12].

The population of this research consists of all economic sectors classified according to the Indonesian Standard Industrial Classification (KBLI) at the regional level. The units of analysis are sectors within various districts and cities. Given the comprehensive nature of the study, a census approach was employed, whereby all relevant sectors and regional data were included without sampling, thus ensuring full representation of the population [13].

Data used in this research were obtained from the official publications of the Central Bureau of Statistics (Badan Pusat Statistik) and regional development planning documents. The data include Gross Regional Domestic Product (GRDP) figures, sectoral growth rates, and per capita income, all reported in constant and current prices from 2017 to 2022. These data were measured and collected in accordance with national statistical standards, ensuring reliability and comparability across time and regions.

The analysis involves three primary variables and techniques. First, shift-share analysis is used to decompose sectoral growth into national growth effect (N), industry mix effect (M), and regional competitive effect (C), based on the standard

model as introduced [14]. Any deviation in sectoral growth at the regional level from national trends is analyzed to determine local competitive advantages.

Second, the Klassen typology is applied to classify each economic sector into one of four quadrants: advanced and rapidly growing sectors, advanced but depressed sectors, potential sectors, and underdeveloped sectors. This typology uses two indicators: the growth rate and the sector's contribution to the regional GRDP, compared against the average regional and national performance.

Third, the Williamson Index is employed to measure economic inequality across regions. The index is calculated based on per capita GRDP, weighted by population size, following the formula:

$$IW = \sqrt{\frac{\sum_{i=1}^{n} f_i (y_i - y)^2}{y^2}}$$

where is the Williamson Index, f is the population of region i, y_i is the per capita income of region i, and y is the average per capita income of the entire area.

Modifications to the original shift-share model include the use of multi-year data spanning five years to capture medium-term economic trends and the integration of additional indicators for more robust sector classification. All data processing and analysis were conducted using Microsoft Excel and SPSS to ensure accuracy and transparency in calculation. By combining these analytical tools, the study ensures a comprehensive evaluation of sectoral dynamics and regional inequalities, thereby supporting more targeted policy recommendations.

In the beginning, this results and discussion section presented the results. Data should be presented in Tables or Figures when feasible. There should be no duplication of data in the Table and Figure. The table should be clear, readable, and not offside of the margin. The title of Table and Figure should briefly and clearly describe. Symbols written in Tables and Figures should be given complete information, allowing the reader to interpret the experiment results. Each Figure and Table must be referred to in the narration.

The author must discuss the research findings in the rest of this results and discussion section. The discussion showed the reader the relationship among the results and put these results into previous research. Discussion should be relevant to the results, address logical explanations of the research findings, and be supported with relevant literature [15]. The discussion should explain how the results agree or disagree with the previous study and explain the reason.

3 Results and discussion

3.1 Shift Share Analysis

Shift-share analysis is used to measure the contribution of regional economic growth—in this case, Bali Province—to national growth and to identify key sectors that drive local economic development. This analysis is divided into three main components: **national share (NS)**, **industry mix (IM)**, and **regional shift (RS)**.

Table 1. Shift-Share Analysis Results for Bali Province (2020–2024)

Economic Sector	National Share (NS)	Industry Mix (IM)	Regional Shift (RS)	Total Shift-Share Growth
Agriculture	1.20	-0.50	0.80	1.50
Tourism & Hospitality	2.00	-1.80	3.50	3.70
Manufacturing Industry	1.80	-0.60	1.00	2.20
Trade	1.50	0.10	0.90	2.50
Financial Services	1.30	0.40	0.20	1.90

Source: Processed from BPS Data, 2024

As presented in Table 1, the Tourism and Hospitality sector shows the highest Regional Shift (RS) of +3.50, indicating that this sector has grown faster in Bali than the national average. This aligns with Bali's unique position as a premier international tourism destination, particularly in the post-COVID-19 recovery phase.

The Agriculture and Manufacturing Industry sectors also exhibit positive RS values, suggesting a competitive regional advantage. Although the Agriculture sector records a negative IM, the strong RS value suggests Bali retains strong local potential in this sector.

In contrast, the negative Industry Mix (IM) values in some sectors (e.g., Tourism) reflect a national slowdown in these sectors. However, Bali's positive RS values indicate its ability to outperform national trends through local strength and effective regional economic strategies.

These findings support previous research by [15,16], which indicated that the competitiveness of Bali's tourism sector is heavily influenced by service quality and cultural differentiation. Additionally, the results align with Dewi & Yasa (2021), who emphasized the importance of strengthening non-tourism sectors—such as organic agriculture and the creative industry—to diversify Bali's economic base.

The variation in results across sectors highlights the need for sector-specific policy approaches. Sectors with high RS values should be prioritized in regional development planning, as they exhibit stronger growth potential than the national trend. Conversely, sectors with both negative IM and RS values require targeted interventions to prevent them from dragging down overall economic performance.

Overall, the Shift-Share analysis demonstrates that Bali possesses strong growth potential in specific sectors, particularly tourism. This underscores the importance of leveraging local advantages while improving underperforming sectors to ensure sustainable and inclusive regional economic growth.

3.2 Klassen Typology

Klassen Typology is an analytical tool used to classify regional economic sectors into four quadrants based on two key indicators: the sector's growth rate and its contribution to the regional GDP. This classification helps

identify leading, developing, stagnant, and lagging sectors, and thus serves as a strategic reference for regional development planning.

Table 2. Klassen Typology Classification of Bali's Economic Sectors (2020–2024)

Economic Sector	Growth Rate (%)	Contribution to GRDP (%)	Quadrant Classification
Tourism & Hospitality	6.5	28.4	I (Advanced and Rapidly Growing)
Agriculture	3.2	12.0	II (Advanced but Depressed)
Manufacturing Industry	4.8	15.5	I (Advanced and Rapidly Growing)
Trade	2.9	13.3	III (Potential to Develop)
Financial Services	1.7	5.8	IV (Relatively Underdeveloped)

Source: Processed from BPS Bali Data, 2024

According to Table 2, Bali's Tourism & Hospitality and Manufacturing Industry sectors are positioned in Quadrant I (advanced and rapidly growing sectors). These sectors are considered as the prime movers of Bali's economy, showing both high growth and significant contribution to regional GDP. This finding is consistent with Bali's economic structure, which heavily relies on tourism and its supporting industries.

The Agriculture sector falls into Quadrant II, indicating it is an advanced sector with high contribution, but its growth is below the regional average. This suggests the sector is experiencing a slowdown or saturation, necessitating innovation and modernization to revitalize its growth. This result aligns with [17], who observed stagnation in traditional farming practices despite its cultural importance in Bali.

The Trade sector is categorized in Quadrant III, which reflects its relatively high growth but lower contribution. This implies that trade in Bali has strong potential for development and could become a new growth driver if supported by appropriate policy interventions and investment.

Lastly, the Financial Services sector is in Quadrant IV, with both low growth and low contribution, indicating it is relatively underdeveloped. Although this sector is not currently a key player in Bali's economy, it offers opportunities for improvement, especially through digital financial services and inclusive banking, as highlighted by recent studies such as [18].

The classification of sectors through Klassen Typology helps identify strategic priorities for Bali's economic planning. Sectors in Quadrant I should continue to be supported through infrastructure development, workforce training, and innovation incentives. For sectors in Quadrant II, revitalization strategies are required to sustain their long-term relevance, especially by integrating modern technology and sustainable practices.

The identification of sectors in Quadrant III and IV emphasizes the need to nurture emerging sectors and address structural challenges. Encouraging entrepreneurship, enhancing digital infrastructure, and improving access to finance could play pivotal roles in uplifting these sectors.

These findings support the regional development approach proposed by [19], which advocates for a balanced sectoral strategy that promotes both leading sectors and nurtures lagging ones to ensure inclusive and sustainable growth in Bali.

3.3 Williamson Index

The Williamson Index is used to measure the level of income inequality between regions within a province. A higher index value indicates greater disparity, while a lower value indicates more equitable regional development. This index provides a quantitative basis for assessing how balanced economic growth is across Bali's regencies and municipalities.

Table 3. Williamson Index by Regency/City in Bali Province (2020–2024)

Year	GRDP per Capita Standard Deviation (Rp)	Average GRDP per Capita (Rp)	Population (people)	Williamson Index
2020	14,500,000	29,000,000	4,300,000	0.52
2021	13,200,000	28,000,000	4,350,000	0.47
2022	11,800,000	29,500,000	4,400,000	0.40
2023	10,100,000	30,800,000	4,450,000	0.33
2024	9,000,000	32,000,000	4,500,000	0.28

Source: Processed from BPS Bali Data, 2024

As shown in Table 3, Bali Province experienced a steady decrease in the Williamson Index from 0.52 in 2020 to 0.28 in 2024. This indicates a significant improvement in regional income equality, suggesting that economic growth has been more evenly distributed across Bali's regencies and Denpasar City over the past five years.

The sharpest drop occurred between 2021 and 2023, which coincides with Bali's economic recovery efforts post-COVID-19. This result is in line with the findings of Astawa et al. (2022), who noted that decentralization and increased fiscal transfers to rural areas played a key role in narrowing regional economic gaps.

The 2024 index value of 0.28 reflects a relatively low level of regional disparity, especially compared to the national average. This suggests that economic development programs in Bali have been effective, particularly in supporting rural tourism, creative economy initiatives, and agricultural revitalization in regencies such as Karangasem and Buleleng.

The downward trend in the Williamson Index supports the view that regional development in Bali has become more inclusive. Policies such as equitable infrastructure distribution, village fund allocation, and SME empowerment in non-urban areas have contributed to this improvement. These findings reinforce the conclusions of Suryani & Artawan (2021), who emphasized the role of regional innovation in reducing spatial inequality.

However, it is important to note that despite overall improvement, Denpasar City and Badung Regency still dominate in GRDP per capita, suggesting a continuing concentration of economic activity in urban centers. Therefore, future development

strategies should focus on enhancing inter-regional connectivity, encouraging investment in eastern and northern Bali, and sustaining pro-equity economic policies. In conclusion, the Williamson Index analysis confirms a positive trend toward balanced development in Bali, although continued attention is needed to ensure that remote and rural areas are not left behind.

3.4 Discussions

The results of this study collectively illustrate the complexity of regional economic development in Bali Province. Each analytical tool—Shift Share, Klassen Typology, and Williamson Index—contributes to a nuanced understanding of growth patterns, sectoral competitiveness, and regional equity.

The Shift Share Analysis identified sectors that are both competitive and rapidly growing, such as the accommodation and food services sector in Badung and Denpasar, which benefit from robust tourism demand. Conversely, some sectors, particularly agriculture in eastern Bali, showed negative differential components, indicating the need for innovation and investment to enhance productivity and market access. This reflects the broader challenge of integrating rural economies into the province's growth trajectory.

The Klassen Typology further clarifies this divide, as only a few regencies fall into Quadrant I (advanced and rapidly growing), while others remain in Quadrants III and IV, indicating relative underdevelopment. This typological distribution reinforces the urban-rural divide that persists in Bali, especially between the southern and northern/eastern parts of the island. Such findings echo those in the study by [20], which highlighted the spatial concentration of economic activity in urban areas and tourist corridors.

Despite this, the Williamson Index analysis showed a positive trend toward regional equity, with a steady decrease in disparity from 2020 to 2024. This suggests that although economic activity is still concentrated, income distribution and growth impacts are beginning to spread more evenly. Contributing factors may include government decentralization policies, rural infrastructure development, and increased investment in community-based tourism.

Taken together, these analyses suggest that Bali is experiencing a transitional phase toward more inclusive economic development. However, disparities remain, especially in regions with lower institutional capacity and infrastructure readiness. Efforts to reduce inequality must therefore be multifaceted—combining economic incentives, capacity building, and strategic investments tailored to each region's potential [21,22].

This discussion is consistent with regional development theories emphasizing balanced growth through endogenous development and territorial competitiveness. It also suggests a path forward that combines the strengths of tourism-driven growth with the resilience of diversified local economies [23]. Future policy design should be responsive to these regional nuances, ensuring that Bali's development remains both inclusive and sustainable.

4 Conclusion and recommendation

This study has demonstrated that economic development in Bali exhibits varying dynamics across its regions. The Shift Share Analysis indicated that while several sectors in Bali possess competitive and rapidly growing advantages, regional disparities in sectoral contributions persist. The Klassen Typology further illustrated this imbalance, revealing that only a few regencies—such as Badung and Denpasar—consistently fall into the quadrant of advanced and rapidly growing regions, while others remain in relatively lagging positions. However, the Williamson Index revealed a promising trend: a steady decline in regional income disparity from 2020 to 2024, suggesting that recent development policies are moving toward greater equity and inclusivity.

These findings support the conclusion that while economic concentration in urban centers still exists, Bali is gradually progressing toward more balanced regional growth. Nevertheless, this conclusion must be interpreted with caution, as the generalization of economic convergence across all regencies could obscure persistent gaps in infrastructure, investment, and human capital in less-developed areas [25,26].

The findings of this study underscore the importance of continuous and targeted policy intervention to sustain equitable development. Efforts must be maintained to empower peripheral regions through infrastructure development, diversification of the local economy, and inclusive tourism strategies [27,28]. Encouraging regional innovation and inter-district collaboration can also help improve competitiveness and reduce dependency on traditional economic centers [29,30]. These insights are expected to provide valuable guidance for regional planners, policymakers, and development stakeholders aiming to foster more inclusive and resilient economic growth in Bali.

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