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Tourism growth and investment in Bali's inclusive economic recovery in 2023: A spatial and econometric approach

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ABSTRACT

This study investigates the relationship between tourism development, total realized investment, and inclusive growth in Bali during the 2023 economic recovery period. The primary objective is to analyze how international and domestic tourist visits, along with investment inflows, influence inclusive growth across Bali's regions. This study employs various econometric models, including linear trend analysis, multiple regression, and a spatial lag model (SAR) to capture the spatial dependencies between regions. Using data on tourist visits, realized investments, ICT use, labor force participation, and real per capita expenditure, this study builds an Inclusive Growth Index (IGI) for Bali. The results indicate that tourism and investment significantly contribute to inclusive growth, and spatial factors also play a critical role in determining regional disparities in growth. The findings have important policy implications for promoting sustainable tourism and investment strategies to ensure equitable and inclusive development across Bali.

Keywords: Tourism development, inclusive growth, spatial lag model, total realized investment, Bali, economic recovery.

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1. INTRODUCTION

Factors influencing tourism demand vary widely among studies. Among these factors, the number of visitors or tourists is one of the most significant (Pham et al., 2023). In line with the government's policy of easing international travel restrictions and providing convenience for foreign nationals, such as visa on arrival and second-home visa policies, Bali has once again become a top destination for international travelers. Simultaneously, Bali has experienced an influx of domestic tourists during National Religious Holidays, such as Eid al-Fitr, Christmas, and New Year. This situation fostered confidence in the rapid recovery of Bali's tourism economy. Furthermore, regional agreements have supported an increase in international tourism demand (Pham et al., 2023).

According to Thushara et al. (2019), tourism-driven growth strategies are used in many developing countries to accelerate growth, create employment opportunities, and increase foreign exchange earnings. In Bali's 2023 recovery period, arrivals rebounded strongly: international tourist arrivals exceeded 5 million (5,328,238 people) and domestic tourist visits exceeded 9 million (9,877,911 people) (Mustika, 2024).

Inclusive growth refers to growth that involves everyone contributing to economic growth. Consequently, economic improvements help reduce unemployment, poverty, and inequality. This aligns with the views of Ali and Son (2007) and Wattanakuljarus & Coxhead (2008) who stated that inclusive growth occurs when growth not only creates new economic opportunities, but also provides equal opportunities for everyone, particularly the poor. Thus, growth is considered inclusive if it reduces poverty and income inequality and generates more employment.

The pandemic has hindered efforts to promote inclusive tourism, which aligns with the Sustainable Development Goals (SDGs). Inclusive tourism holds great potential for reducing social disparities and improving the welfare of Bali's population. Inclusive tourism involves engaging all segments of society in the development and benefits of the tourism sector, including indigenous communities, marginalized groups, people with disabilities, and the younger generation (Wattanakuljarus & Coxhead, 2008). The recovery of inclusive tourism in Bali is marked by increased education and training for local communities, development of tourist villages, and promotion of local products.

Interpreting the aforementioned expert opinions, Bali's local government has adopted a focus on inclusive growth to accelerate economic recovery by 2023. According to the 2023 statistical data, Bali's Human Development Index (HDI) has improved across all dimensions, including long and healthy life, knowledge, and a decent standard of living (see Table 1). The largest increase was observed in the dimension of a decent standard of living. This suggests that policies aimed at growing tourism are highly relevant to restoring jobs lost due to the pandemic, particularly those related to informal employment and women, leading to the recovery of a decent standard of living and access to education (Badan Pusat Statistik Provinsi Bali, 2023; Ofori et al., 2024).

Table 1. Bali Human Development Index Indicators

No	Long Life (Years)	Expected Years of Schooling (Years)	Mean Years of Schooling (Years)	Decent Living (Million Rupiah)
2022	74.60	13.48	9.39	13.94
2023	74.88	13.58	9.45	14.34

Moreover, Stiglitz (2013) warned that ineffective economic growth in reducing inequality remains a threat. He points out that inequality increases due to the imbalance between economic growth relative to Gross Domestic Product (GDP) and employment growth relative to GDP, which could lead to global unrest.

Local governments' vigorous efforts to drive economic growth towards inclusivity were halted by the COVID-19 pandemic in early 2020. Bali's economy plummeted to the 24th position in 2021 because of the pandemic. However, international events in Bali in 2022 will contribute to a quicker recovery. In addition, financing policies and digitalization development support Bali's recovery. In terms of financing policy, the President of Indonesia backed Bali's economic recovery by improving investment performance,

such as the continuation of strategic project development ahead of the G20 Summit. Furthermore, although exports experienced a slowdown, they continued to grow rapidly, driven by high service export values, in line with the increasing number of foreign tourists. After the pandemic, the tourism sector has greatly benefited from various government policies.

Investments must stimulate recovery through economic growth (Peterson et al., 2020). A conducive environment and stimulus supports this investment growth. Economic stimulus models are needed to promote investment as long as regulations and impacts are considered. These stimuli may include tax instruments such as tax incentives or holidays for entrepreneurs, interest rate relief, and government support through public infrastructure development.

Foreign Direct Investment (FDI) reached 2.66 trillion rupiah in the first quarter of 2023, while Domestic Investment (DI) only reached 1.41 trillion rupiah in the same period. This indicates that foreign investment will dominate Bali's economic recovery by 2023. Bali received approximately 4.08 trillion in investment during the first three months of the year. Most foreign investment flowed into Bali's housing, business, and office sectors, followed by hotels and restaurants, trade and repair, the food industry, and other services. Both domestic and foreign investments can support Indonesia's inclusive growth, especially in investments related to information and communication technology (ICT) (Herdiyati & Ismail, 2022; Ofori & Asongu, 2021).

After discussing incoming investment, we turn to the potential of digitalization in reviving the tourism sector, as investment has also entered the ICT sector. Tourism plays a crucial role in creating new jobs and fostering the growth of small and medium-sized enterprises (SMEs). However, national economic growth relies on natural resources, creative industries, and the digital economy. Digitalization can help Bali's tourism sector recover after the pandemic, emphasizing how technology can promote destinations, facilitate transactions, and empower local communities. Previous studies show that digitalization has great potential to drive inclusive economic growth. By implementing data-driven strategies and digital technologies, Bali's tourism sector is expected to rebound and make a significant contribution to societal welfare. Alekhina and Ganelli (2023) identified ICT and digitalization as key drivers of inclusive growth (Ofori & Asongu, 2021).

The tourism sector can enhance the role of micro, small, and medium enterprises (MSMEs) in supporting tourism recovery by improving their ability to innovate, adapt, and collaborate (Bakker et al., 2023; Hampton et al., 2018). Digitalization for MSMEs is critical, as it is both a necessity and an expansion of market access (Bakker et al., 2023). This is because digitalization of the MSME sector, along with transactions and trade, is a growing technology that drives economic activity. Additionally, this technology will help Bali's local government optimize tourism tax collection. This can be swiftly implemented in Bali, as nearly all regions have adopted digital payment methods through QRIS technology. This aligns with the Tourism-Based Inclusive Growth Diagnostic Framework (T-DIGD), particularly in the application of digitalization (Bakker et al., 2023).

In the era of Bali's economic recovery in 2023, or during the endemic period, given the resilience and proven strength of MSMEs and Bali's tourism sector throughout the pandemic, these sectors are expected to emerge even stronger as key supporters of the island's economy during the endemic phase. Recent growth in tourism continues to play a crucial role in economic expansion. By 2023, this sector is expected to resume its growth. The micro, small, and medium enterprise (MSMEs) sector is moving forward once again due to the increasing number of visitors. Through digitalization, MSMEs can access international markets.

Considering the introductory discussion as well as the limited research on the subject, where previous studies have mainly examined the relationship between tourism and economic growth during Bali's economic recovery, this research is deemed highly necessary and urgent. This study aims to investigate the relationship between tourism and inclusive growth during Bali's recovery era, providing future policy recommendations for promoting inclusive and sustainable tourism in the pursuit of sustainable development. Therefore, the research problems emerging in relation to the growth of tourism in Bali and inclusive growth during the 2023 economic recovery are outlined as follows: The research questions are divided into three main issues: 1) How has the development of international and domestic

tourist visits to Bali progressed during the 2023 economic recovery era? (2) What are the conditions of Bali's inclusive growth during the 2023 economic recovery era? (3) What was the impact of the development of international and domestic tourist visits on Bali's inclusive growth during the 2023 economic recovery era?

Research objectives were formulated based on these research problems. Therefore, the objectives of this research are as follows: 1) to analyze the development of international and domestic tourists visiting Bali through trend analysis during the 2023 economic recovery era; 2) to analyze the condition of Bali's inclusive growth, measured by the Inclusive Growth Index (IGI) of Bali during the 2023 economic recovery era; and 3) to analyze the impact of the development of international and domestic tourist visits on Bali's IGI during the 2023 economic recovery period.

The approach used in this study was based on development and tourism economics. An empirical approach is employed, combining descriptive qualitative and quantitative methods, utilizing econometric models, such as trend analysis with linear trend classification, the Ali and Son Inclusive Growth measurement approach (Ali & Son, 2007), multiple regression, and spatial lag regression models. The development economics approach is used to provide a theoretical overview of Bali's economic development conditions, particularly those related to tourism demand during the economic recovery era. A descriptive approach using a data tabulation model aims to provide an overview of tourism demand and inclusive growth conditions during the 2023 economic recovery era, which has not yet been extensively studied. The empirical approach employs data analysis using the two models mentioned above. A spatial lag model was used to measure the IGI level to identify the best model. The determination of the best model is based on the Lagrange Multiplier (LM) and Robust Lagrange Multiplier (RLM) tests.

2. LITERATURE REVIEW

The first phase of the research (2018-2022) aimed to identify the indicators and variables that influence inclusive growth and measure inclusive growth. The second phase (2023-2024) focused on obtaining descriptions of tourism demand and its impact on inclusive growth during the 2023 economic recovery period. The third phase evaluated the second phase and provided an assessment of the findings to guide future actions for fostering inclusive growth in the study area. The fourth phase (2025-2026) will evaluate the results of the third phase and implements actions aimed at improving the quality of inclusive growth in the research area. The fifth phase outlines forward-looking action programs to develop policies related to inclusive growth in the region.

This research examines inclusive growth across various sectors, including agriculture; however, few studies have applied this concept to tourism, which is essential for many developing countries, including Indonesia. Therefore, this research is crucial in explaining inclusive growth through the Inclusive Growth Index (IGI) related to tourism demand. The collected data were processed and analyzed using multiple linear regression and spatial lag models. By analyzing several economic and non-economic variables influencing Bali's inclusive growth, the flowchart for this research is presented in Figure 1.

2.1. Previous Research

A growing body of literature examines inclusive growth across various sectors and regions, but a notable research gap remains in the analysis of sector-specific contributions to inclusive growth, particularly in the tourism sector during periods of economic recovery. Previous studies have largely focused on inclusive growth from broader economic perspectives, such as income inequality, globalization, and overall economic growth, often overlooking the unique impact that sectors such as tourism can have on promoting more equitable and inclusive growth (Eugenio-Martin et al., 2004; Govdeli & Direkci, 2017; Habibi et al., 2018; Tabash, 2017). Moreover, these studies rarely address the post-pandemic context, especially how regions such as Bali, which heavily depend on tourism, recover while ensuring inclusivity. Your research, therefore, makes a unique contribution by focusing on the role of tourism and MSMEs in promoting inclusive growth during Bali's economic recovery in 2023. It not only fills the gap in understanding the specific impacts of the tourism sector, but also integrates the digitalization of MSMEs

as a factor that can enhance inclusivity. Additionally, using spatial econometric models, this study offers insights into how regional disparities and interconnections affect the inclusivity of growth, providing a detailed understanding of how tourism can foster sustainable and inclusive development in the recovery phase. Table 2 below compares previous studies to highlight this gap.

Table 2. Comparison of Research Focus and Contributions to Inclusive Growth

Study	Research Focus	Methodology	Key Findings	Contribution to Inclusive Growth Research	Research Gap	This Research's Novelty
Herdiyati & Ismail (2022)	Observed inclusive growth across 34 Indonesian provinces; components supporting inclusive growth in Indonesia.	Secondary data (2014–2020); Poverty Equivalent Growth Rate (PEGR); Dynamic panel data models (3 models).	Economic growth in Indonesia is not fully inclusive; factors like income, education budget, health budget, FDI affect inclusive growth; DDI does not.	Expanded Ali and Son's (2007) IGI model for measuring inclusive growth in Indonesia.	Did not address sectoral analysis, particularly the role of tourism in fostering inclusive growth during recovery.	Fills gap by focusing on tourism's role in inclusive growth during Bali's economic recovery in 2023.
Alekhina & Ganelli (2023)	Examined relationship between economic growth, income inequality, exports, and FDI in ASEAN, focusing on globalization.	Three-Stage Least Square (3SLS) panel regression (1995–2015).	Globalization (exports, FDI) promotes inclusive growth only in upper-middle-income ASEAN countries; bidirectional relationship between growth and inequality.	Added Indonesia and Bali to the inclusive growth measurement study in ASEAN.	Limited sector-specific analysis of tourism and MSMEs impact on inclusive growth in Bali.	Investigates specific sector contributions (tourism & MSMEs) to inclusive growth during economic recovery.
Hampton et al. (2018)	Explored tourism-led inclusive growth, focusing on tourism's economic linkages, ownership, employment, and expenditures.	Fieldwork-based study in Vietnam examining tourism's contributions to local economies.	Tourism's growth has benefited local communities only partially; unclear whether tourism growth will become inclusive in the short to medium term.	Offered insights into tourism's role in economic growth but showed limited alignment with the inclusive growth paradigm.	Did not focus on post-pandemic recovery and inclusive growth related to tourism in Bali.	Explores post-pandemic tourism recovery and inclusive growth during Bali's recovery phase.
Novitasari & Khikmah (2019)	Hypothesized spatial dependency effect on HDI; examined inclusive growth influenced by various factors, including tourism.	Spatial Autoregressive Model (SAR); Ali and Son's inclusive growth index approach (Ali & Son, 2007) applied; factors included tourist visits, investment, ICT use, education.	Spatial dependency affects inclusive growth; factors like tourism, ICT, education, and investments are critical in Bali's inclusive growth.	Applied spatial analysis to inclusive growth but lacked detailed analysis of tourism's role post-pandemic.	Uses spatial econometric models to assess tourism's impact on inclusive growth during Bali's recovery.	

Following the comparison of previous research, it becomes evident that although many studies have focused on inclusive growth, they have primarily approached it from a macro-economic or multi-sectoral perspective, with limited focus on tourism, a critical sector for many developing regions, especially Bali. Additionally, most of the reviewed studies did not explore the dynamics of post-pandemic recovery or the influence of tourism on inclusive growth. In contrast, our research provides a novel approach by examining how tourism recovery and the digitalization of MSMEs can promote inclusive growth in Bali's economic recovery, filling a significant gap in both academic literature and policy discourse.

Herdiyati and Ismail (2022) examined how government spending and investment relate to inclusive growth in Indonesia using panel data, highlighting that fiscal and investment variables can be important drivers of more inclusive outcomes. Alekhina and Ganelli (2023) analyzed determinants of inclusive growth in ASEAN and highlight the roles of fiscal policy, labor participation, FDI, and digitalization in shaping more equitable growth outcomes. The study explored the factors contributing to equitable growth distribution within the ASEAN. Their research measured inclusive growth using variables such as per capita income growth and equity indices.

The study identified fiscal redistribution, female labor force participation, productivity growth, Foreign Direct Investment (FDI) inflows, digitalization, and savings as significant drivers of inclusive growth. Their work is expected to provide additional insights into inclusive growth measurement, with Bali as a focal area, contributing to regional discussions on how to achieve more inclusive economic outcomes. Meanwhile, Hampton et al. (2018) also explored inclusive growth, but their focus was more sector-specific. They investigated tourism-led inclusive growth and explored aspects such as supply chains, economic linkages, ownership, employment, and expenditures. Their fieldwork in Vietnam showed that, while tourism had grown significantly, the economic benefits to local communities were partial and did not fully align with inclusive growth principles. It remains unclear whether tourism-led growth will become more inclusive in the short-to medium-term, highlighting the need for further research into how tourism can foster inclusivity, especially in developing countries.

Finally, Novitasari and Khikmah (2019) explored the spatial dimensions of inclusive growth by hypothesizing that spatial factors could influence the Human Development Index (HDI). Using a Spatial Autoregressive Model (SAR), they incorporated interregional relationships into their analyses. Their study examined inclusive growth through IGI, influenced by variables such as tourist visits to Bali, realized investments, ICT usage, per capita expenditure growth, labor force participation, and education. By integrating spatial analysis and economic indicators, their research offers a framework to better understand the spatial dependencies and drivers of inclusive growth in Bali, thus providing a foundation for future research in this area.

2.2. Conceptual Framework of Research

Based on previous research, the conceptual framework for this study was developed using six independent variables: tourist visits to Bali, realized investment, ICT user percentage, real per capita expenditure, labor force participation rate, and average years of schooling. These variables are related to Bali's inclusive economic growth. Figure 1 presents the conceptual framework of this study.
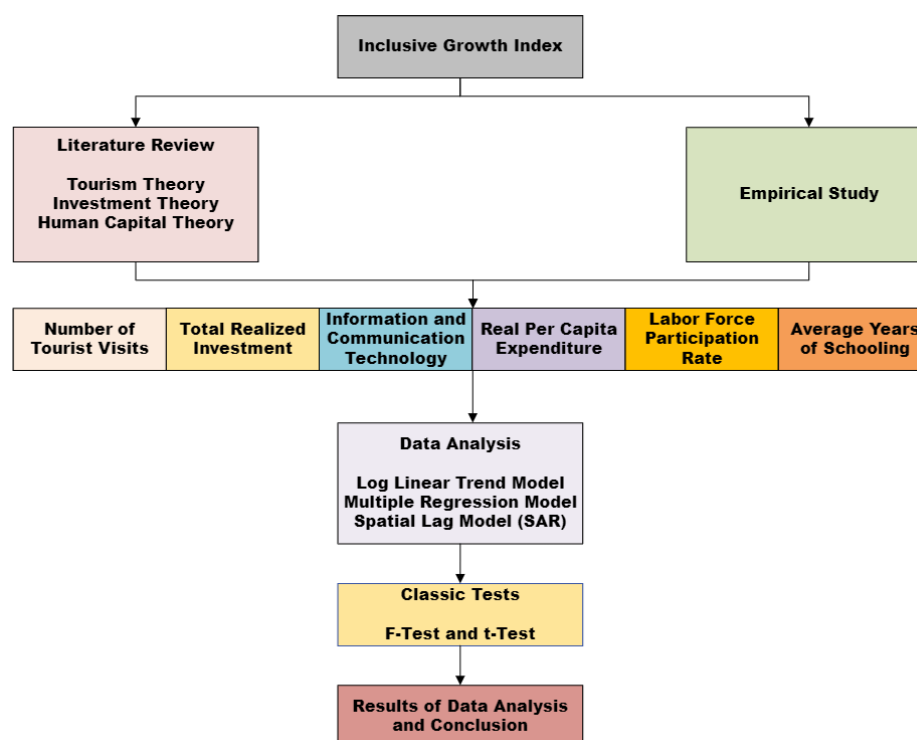
Figure 1. The conceptual framework

Based on previous research, the conceptual framework for this study was developed using six independent variables: tourist visits to Bali, realized investment, ICT user percentage, real per capita expenditure, labor force participation rate, and average years of schooling. These variables are related to Bali's inclusive economic growth. The relationships between these variables can be explained as follows:

2.3. Relationship between Tourist Visits to Bali and the Inclusive Growth Index

Tourism stimulates the demand for goods and services through consumption and investment, leading to increased production activities. Tourists also spend money during their visits, directly driving market demand for goods and services. In addition to being a key source of foreign revenue, tourism has the potential to boost a country's economic growth by reducing unemployment and increasing productivity. Tourism provides continuous benefits to local communities by creating job opportunities (Chok et al., 2007; Hampton et al., 2018). Studies in Turkey and Nigeria (Adeniyi et al., 2023) have found that tourism fosters inclusive growth. Additionally, research in India (Tugcu, 2014) confirms that tourism-led growth is valid, especially in the long term. This finding suggests that tourism plays a crucial role in sustaining long-term inclusive growth.

2.4. Relationship between Total Realized Investment and the Inclusive Growth Index

An increase in investment boosts the economy as higher capital investment drives economic growth (Herdiyati & Ismail, 2022). Both the DDI and FDI serve as major economic drivers essential for achieving targeted growth. The Bali economy, supported primarily by the service, tourism, and trade sectors, reflects this. Hampton et al. (2018) found that FDI fosters inclusive growth in Southeast Asia. Although tourism has great potential to create productive jobs, more effort is needed to ensure that it leads to inclusive growth (Bakker & Messerli, 2017; Dognon et al., 2023). Available data on total investment should be expanded to prioritize investments that contribute to inclusive growth, such as investments in MSMEs, sustainable tourism, and environmental conservation.

2.5. Relationship between ICT Users and the Inclusive Growth Index

Information technology is crucial for enhancing business services. Companies use ICT to improve efficiency and meet customer demand. Technology development allows companies to offer better products and services and enhance business performance.

2.6. Relationship between Real Per Capita Expenditure and the Inclusive Growth Index

Economic performance per capita is often treated as a proxy for welfare improvements. Following the inclusive growth measurement discussion by Ali and Son (2007), this study uses real per capita expenditure as a key welfare indicator linked to inclusive growth outcomes.

2.7. Relationship between the Labor Force Participation Rate and the Inclusive Growth Index

Labor force participation reflects how far economic opportunities translate into employment and income generation. Evidence from ASEAN suggests that higher labor force participation, alongside factors such as investment and digitalization, is associated with more inclusive growth outcomes (Alekhina & Ganelli, 2023).

2.8. Relationship between Average Years of Schooling and the Inclusive Growth Index

Education is a core component of human capital and is closely linked to inclusive growth through productivity and employability. Recent evidence from African economies indicates that human capital development is positively associated with inclusive growth (Ofori et al., 2024).

By examining the relationships between these variables, such as the number of tourist visits, realized investments, ICT usage, per capita real expenditure, labor force participation rate, and average years of schooling, we can construct a comprehensive theoretical framework for this research. This framework aims to elucidate how these factors collectively influence the IGI in Bali. Grounded in theories from tourism economics, investment theory, and human capital theory, this framework integrates both economic and non-economic variables to provide a holistic understanding of inclusive growth in the region. The conceptual model synthesizes insights from a literature review and empirical studies, forming the basis for our research hypotheses.
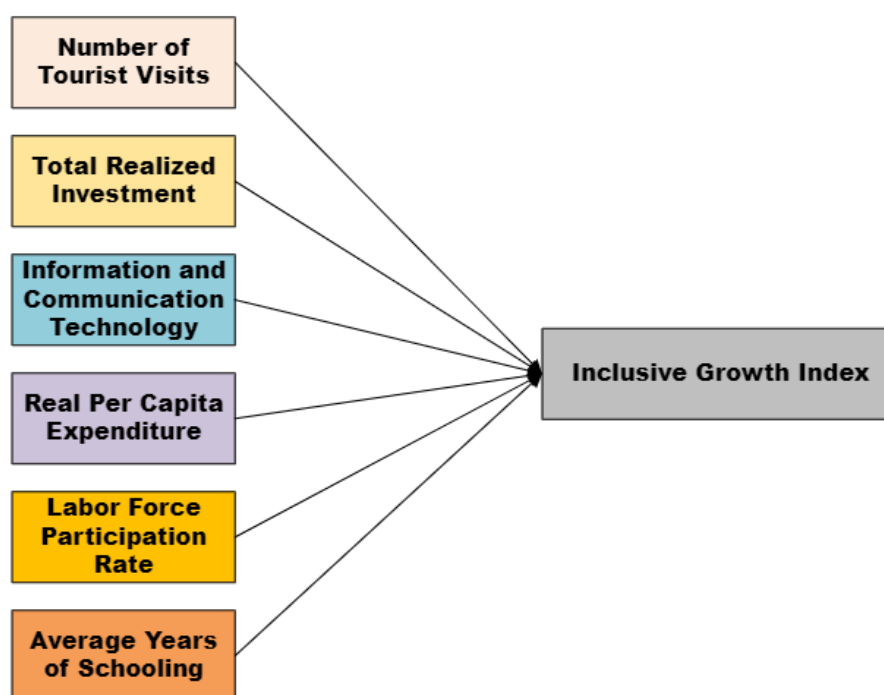

Figure 2. Research Model

The research model depicted in Figure 2 serves as a visual representation of the hypothesized relationships between the independent variables and the dependent variable, IGI. This illustrates how each

variable is expected to interact with and contribute to inclusive growth. For instance, increased tourist arrivals are anticipated to boost economic activity, create employment opportunities, and stimulate investment, thereby enhancing inclusive growth. Similarly, higher realized investments can lead to infrastructure development and job creation, further promoting inclusivity. The integration of ICT usage reflects the role of technology in improving access to information and services, which can empower individuals and businesses. Factors such as per capita real expenditure, labor force participation, and education level are essential indicators of economic well-being and human capital development, which are crucial for sustaining inclusive growth. By capturing these interconnections, the model provides a structured approach for subsequent data analysis and interpretation of results.

3. METHODOLOGY

3.1. Data Collection

This study adopts a quantitative approach, and the data collection is conducted using a sample of 72 data points, gathered from 9 districts/cities in Bali: Denpasar, Gianyar, Tabanan, Jembrana, Buleleng, Badung, Klungkung, Bangli, and Karangasem. The study uses secondary data for seven variables forming the inclusive growth variable, including the number of tourist visits, realized investment, percentage of Information and Communication Technology users, real per capita expenditure, labor force participation rate, average years of schooling, and life expectancy in 2023. A secondary data point for the independent variable was also used for the year 2023. This resulted in 72 sample data points. The collected data were processed and analyzed, and the results were used to test the proposed hypotheses. The data collection process involved observation, interviews, and the use of tools, such as questionnaires and mobile phones, to record or inventory data. As previously mentioned, these activities were conducted at several relevant institutions. The collected data were subsequently analyzed using statistical and econometric techniques, and the results were used to generalize the research issues.

3.2. Object and Location of the Research

The COVID-19 pandemic that struck in early 2029 has affected many countries, including Indonesia and the Bali region. As a result, governments across various countries have implemented policies such as Enforcement of Community Activity Restrictions (PPKM). The widespread impact of PPKM policies has halted people's economic and social lives. The economy has stagnated across various sectors, especially in tourism. This is evidenced by the cessation of travel activities and the decline in tourist visits to major destinations, particularly to Bali.

The chain reaction from the cessation of tourism activities, particularly in Bali, led to the closure of many tourism-related businesses, layoffs (PHK), and the loss of jobs and income for the local population. Consequently, unemployment has increased, leading to a rise in poverty and a decline in both regional/national and personal income. The aftermath of these events resulted in social unrest, such as deteriorating public health, an increase in school dropouts or delayed education, and a rise in crime and security issues. Furthermore, the promotion of inclusive tourism, which is one of the means to achieve Sustainable Development Goals (SDGs), has become increasingly subdued. Therefore, the object and location of this research focuses on tourist visits and inclusive growth in Bali.

3.3. Data Sources and Types

Data sources refer to anything that can provide information on data. The data source used in this study was secondary data derived from the literature, articles, journals, and websites of various private or government institutions or individuals that have made electronic media available online. Some of the institutions, both governmental and private, that provide secondary data include the Central Bureau of Statistics (BPS), Bank Indonesia (BI), Directorate General of Fiscal Balance (DJPK) of the Ministry of Finance, Financial Services Authority (OJK), and Warmadewa University Library. This study used quantitative data, which refers to numerical data. The quantitative data used include the number of tourist visits (both international and domestic) to Bali, per capita expenditure growth, investments (both foreign

direct investment and domestic investment), labor force participation rate, percentage of the population in poverty, average years of schooling, inclusive growth index, Gini ratio, and open unemployment rate.

3.4. Operationalization of Variables

The Inclusive Growth Composite Index (IGCI) method involves four dimensions for measuring inclusive growth. Each dimension consists of sub-dimensions and their corresponding indicators, each scored on a scale of 1 to 10. These scores were then averaged to generate a subdimension score. According to Ali and Son (2007), the four dimensions composing the IGCI are weighted, with a total score of 100%.

3.4.1. Economic Growth, Productive Employment, and Economic Infrastructure Dimension

$$D1 = 0.15 * ((EG + PE + EI)/3)$$

This dimension is divided into three subdimensions: economic growth, productive employment, and economic infrastructure. Each sub-dimension had a weight of 15%.

3.4.2. Poverty and Equity Dimension

$$D2 = 0.18 * ((II + OS1 + OS2)/3)$$

This dimension includes three sub-dimensions with a specific focus on income inequality. Each subdimension was weighed at 18%.

3.4.3. Human Capabilities Dimension

$$D3 = (0.18 * ((ED + H)/2) + 0.19 * WS)/2$$

Human capabilities are critical for inclusive growth, as they enable the workforce to effectively leverage economic opportunities. This dimension consists of education, health, and water and sanitation components, with weights of 18% and 19 %, respectively.

3.4.4. Social Protection Dimension

$$D4 = 0.10 * SP$$

Social protection is essential to reduce poverty and promote inclusive growth. To evaluate this, the ADB uses a social protection index available at the national level. This index includes indicators such as the ratio of social spending to Gross Domestic Product (GDP), which reflects how well the government allocates domestic financial resources. The social protection dimension weighed 10%.

The index values ranged from 1 to 10, with higher scores indicating better progress in inclusive growth within a region. The IGCI developed by Ali and Son (2007) can be categorized as follows.

$$IGCI = D1 + D2 + D3 + D4$$

Where:

Unsatisfactory progress in inclusive growth: Composite index value of 1-3.
Satisfactory progress: IGCI value of 4-7.
Superior progress: IGCI value of 8-10.

Khan et al. (2016) applied McKinley's (2010) inclusive growth composite index approach to Pakistan, adapting several indicators to fit local conditions. Similar adaptations have also been used in Indonesian regional analyses, including the Special Region of Yogyakarta (Balai Statistik Daerah (BAPPEDA DIY) & Badan Pusat Statistik Provinsi Daerah Istimewa Yogyakarta, 2016). See Table 3.

Table 3. Variables Comprising the Inclusive Growth Composite Index

Dimension	Sub-dimension	Indicator
Economic growth, productive employment, and economic infrastructure	Employment	Tourist development (people)
	Labor force participation rate	Percentage of labor force participation (%)

Dimension	Sub-dimension	Indicator
	Economic infrastructure	Percentage of residents owning a laptop/mobile phone and using the internet (%)
Poverty and equity	Income inequality	Real per capita expenditure (thousand rupiah)
Human capabilities	Education	Average years of schooling (years)
	Health and nutrition	Life expectancy (years)

Source: McKinley (2010) (modified)

3.5. Data Analysis Techniques

This data analysis employed various models, each tailored to address the specific research questions posed. A linear trend analysis model was used to analyze the development of tourist visits to Bali. The equation for the linear trend in the logarithmic form is as follows:

$$ln(Y) = \beta1 * ln(T) + \beta0$$

Information:
$\beta1$ = trend coefficient for the time variable.
$\beta0$ = constant.
$ln(Y)$ = natural log of the number of tourist visits (international and domestic) to Bali at time t (January to December, 2023).
$ln(T)$ = natural log of time variable (January–December, 2023).

To analyze the phenomenon of inclusive growth in Bali, the Inclusive Growth Index (IGI) is calculated using various economic and non-economic indicators. The IGI formation process involves the following steps: McKinley (2010) created a composite index to measure inclusive growth using a correlation matrix with data from variables that form inclusive growth, including tourist visits, Total Realized Investment, Information and Communication Technology (ICT) users, Real Per Capita Expenditure, and Labor Force Participation Rate. To construct a composite inclusive growth index, the raw data were first normalized using the min–max method. The normalized values were then multiplied by each indicator's assigned weight, and when a subdimension contained more than one indicator, the indicator weights were averaged before weighting was applied. Next, the Inclusive Growth Index (IGI) was obtained by summing the component indices across all subdimensions. Finally, performance was assessed by scoring each indicator and converting the overall IGI into a Likert-scale rating, where Very Satisfactory = 5, Satisfactory = 4, Fair = 3, Less Satisfactory = 2, and Very Unsatisfactory = 1.

To analyze the effect of independent variables on the dependent variable (IGI), a multiple regression model (Ordinary Least Squares or OLS) was employed. The regression equation for Model 1 was estimated using the pooled OLS method. The equation used is as follows:

$$IGI = \beta0 + \beta1 * TVB + \beta2 * TRI + \beta3 * ICT + \beta4 * RPE + \beta5 * LFP + \varepsilon$$

Information:
$\beta0$ = constant.
$\beta1,…, \beta5$ = coefficients of independent variables.
ε = residual (error).
IGI = Inclusive Growth Index (dependent variable), adopted from McKinley (2010) to comprehensively measure the success of inclusive growth.

The independent variables (X) assumed to influence the Inclusive Growth Index (IGI) include TVB, which represents tourist visits to Bali by district or city; TRI, defined as total realized investment in Bali combining foreign direct investment and domestic direct investment; ICT, measured as the percentage of information and communication technology users by district or city; RPE, referring to real per capita expenditure by district or city in Bali Province; and LFP, which denotes the labor force participation rate (percentage) by district or city in Bali Province.

The growth of the inclusive index (IGI) in one region can be influenced by the growth of the IGI in neighboring regions, spatial shocks, or disparities across regional boundaries and administrative borders. In other words, spatial dependence can occur in these dependent variables, which is commonly referred

to as spatial lag. Therefore, the initial equation can be rewritten to include the spatial effects on the dependent variable.

$$IGI = \rho * W * IGI + \beta1 * TVB + \beta2 * RTI + \beta3 * ICT + \beta4 * RPE + \beta5 * LFP + \varepsilon$$

Information:

ϱ = spatial autocorrelation coefficient of the dependent variable.

W = spatial weight matrix.

The equation indicates that the IGI of a region depends on the IGI of its neighboring regions and local characteristics.

The Spatial Autoregressive model (SAR) parameters were estimated using the Maximum Likelihood method. The use of spatial or non-spatial models is determined using the Likelihood Ratio (LR) test, and SAR is selected through Lagrange Multiplier (LM) and Robust Lagrange Multiplier (RLM) tests.

This spatial regression analysis requires spatial data based on the region and incorporates the unique characteristics of the area. The concept of the region in the spatial regression analysis was operationalized through the spatial weight matrix. The spatial weight matrix used to study economic growth must be exogenous and does not vary over time. In this study, the spatial weight matrix in the form of Queen Contiguity was used, which is a row-standardized matrix. This approach allows for comprehensive analysis using both non-spatial and spatial techniques to evaluate inclusive growth.

4. RESULT AND DISCUSSION

4.1. Development of Tourists to Bali During the Economic Recovery Era in 2023

Bali consists of one city and eight regencies: Denpasar (the capital city), Badung, Gianyar, Bangli, Klungkung, Karangasem, Buleleng, Jembrana, and Tabanan. The development of both domestic (wisnus) and international tourists (wisman) during Bali's economic recovery era was presented for 2023, compared to the pre-pandemic levels in 2019. Figure 3 illustrates the trends in both domestic and international tourist visits during the economic recovery period in Bali by 2023.
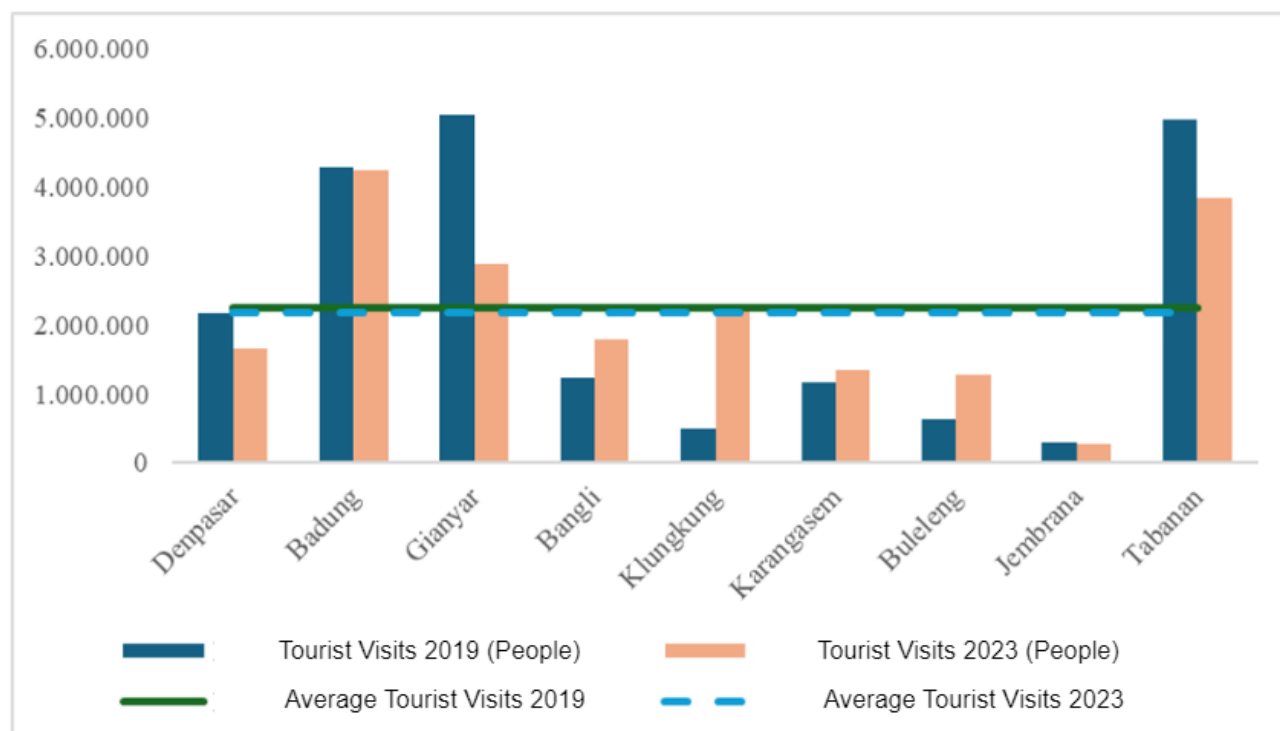

Figure 3. Tourist Visits to Bali by Regency/City in 2019 and 2023

Based on Figure 3, the highest tourist visits in 2023 were recorded in Badung Regency, while the lowest were in Jembrana Regency. Three regencies, Badung, Gianyar, and Tabanan, experienced above-average tourist visits, while Klungkung matched the average. Five areas recorded below-average visits: Denpasar, Bangli, Karangasem, Buleleng, and Jembrana. Badung received the highest number of tourist visits due to its status as the center of tourism activities, with the most developed attractions, such as hotels, restaurants, souvenir markets, and infrastructure, including proximity to the airport, toll roads, and fast access to tourist destinations. Additionally, the availability of quality Information and Communication Technology (ICT) services with strong signals further facilitates tourist experiences.

In 2023, while Klungkung, Bangli, and Buleleng still had below-average tourist visits, they saw significant increases compared to pre-pandemic 2019 levels, as shown in Figure 4. This was due to the opening of the Sanur port in September 2022, as well as Sampalan and Bias Munjul ports, which increased tourist travel from Sanur to Nusa Penida and Nusa Ceningan/Lembongan in Klungkung Regency. Similarly, Bangli experienced a surge in tourism with the opening of several large cafés, including the largest in Southeast Asia that offered Kintamani coffee to visitors. In Buleleng, new recreational sites in Lovina were opened, and the improved road infrastructure with an operational shortcut between Singaraja City and Mengwitani enhanced mobility, making it a scenic route for tourists. Lastly, Karangasem saw significant increases in tourist numbers due to the opening of the Mandalika circuit in the Special Economic Zone (SEZ) for the World Superbike competition in 2021 and the MotoGP in March 2022, which led to an overflow of tourists from Mandalika to Karangasem for accommodation.
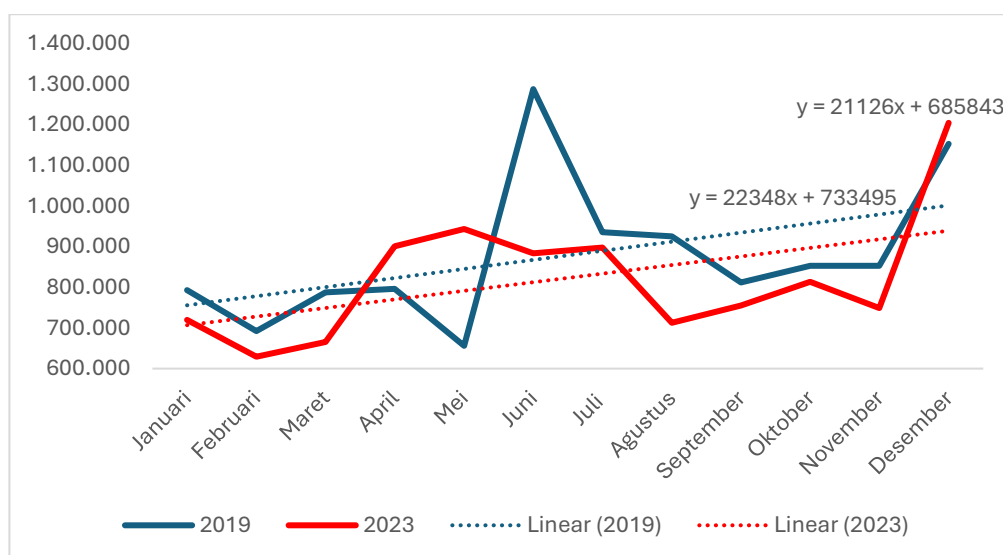

Figure 4. Domestic Tourist Visits to Bali by Regency/City in 2019 and 2023

Based on Figure 4, domestic tourist visits to Bali saw a downward trend in 2023 compared with 2019. The trend coefficient for 2023 was lower than that for 2019, indicating a considerable decline in domestic tourist visits, particularly between May and July. However, a significant increase was observed in May due to the start of school holidays, and holiday travel to Bali gradually recovered, surpassing previous levels during those months. In December, a national policy granted collective leave for year-end holidays, resulting in a surge in domestic tourists.
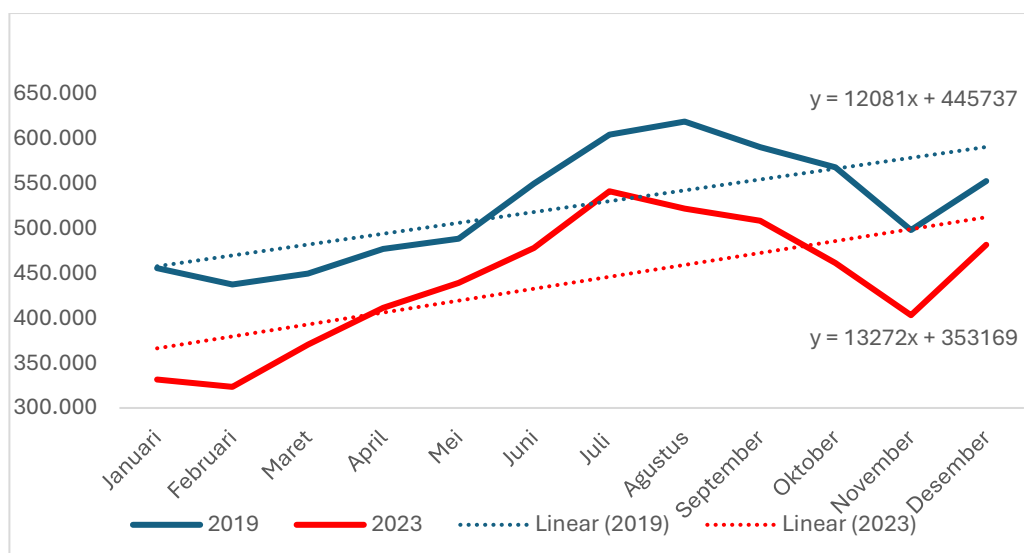
Figure 5. International Tourist Visits to Bali by Regency/City in 2019 and 2023

Figure 5 shows a noticeable increase in international tourist visits in 2023 compared with 2019, with a higher trend coefficient for 2023 across Bali's regencies and cities. The significant rise in international tourists was driven by government policies, including visa exemptions, as well as traditional and cultural events such as the Ogoh-ogoh Parade for Nyepi (Day of Silence), the Bali Arts Festival, and international events such as the Archipelagic and Island States (AIS) Forum 2023.

4.2. Inclusive Growth Conditions in Bali During the Economic Recovery Era in 2023

Figure 6 shows the inclusive growth conditions in Bali Province in 2023 as measured by the composite index. Bali's regencies and cities recorded inclusive growth composite indices ranging from 2.01 7.86 2023. The wide gap in the Inclusive Growth Composite Index (IGCI) between regions with the highest and lowest indices reflects disparities in the indicators used to calculate the index, such as income, education, and health. The highest composite index was recorded in Badung Regency, while Karangasem Regency had the lowest. The differences between the highest and lowest indices were 5.85 points.

In 2016, based on McKinley's (2010) classification, no Indonesian province achieved the "superior" category of inclusive growth. Most provinces reached "satisfactory" levels of progress. Similarly, none of Bali's regencies or cities attained the superior category in inclusive growth by 2023, although most had reached satisfactory levels. However, the Karangasem Regency, with a score of 2.01, had the lowest inclusive growth in Bali. See Figure 6
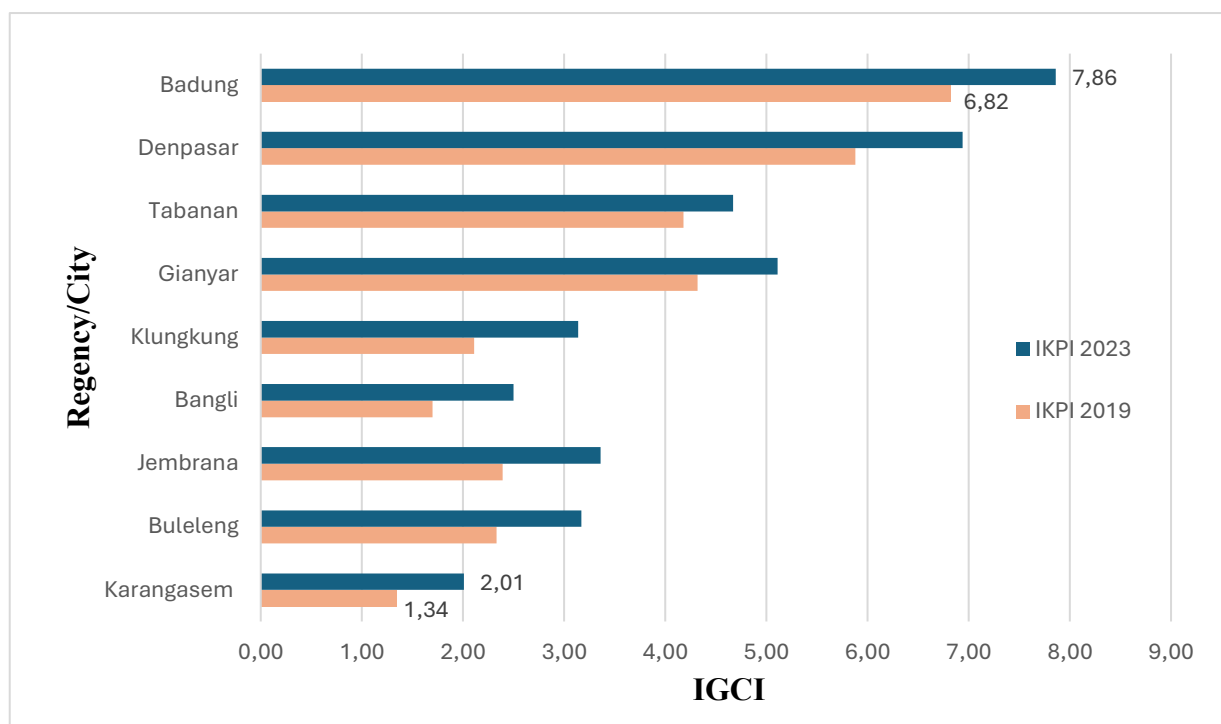
Figure 6. Inclusive Growth Composite Index (IGCI) for Bali's Regencies/Cities in 2023 and 2019

Karangasem's low inclusive growth score is attributed to its lagging economic infrastructure, labor participation, real per capita expenditure, education, and health, compared to other areas in Bali. The average number of years of schooling in Karangasem was only 6.68 years, with a life expectancy of 71.25 years (Badan Pusat Statistik, 2024). This aligns with studies in Africa, where human capital is a key driver of inclusive growth (Ofori et al., 2024).

When comparing inclusive growth in Bali's regencies and cities during the 2023 recovery era to the pre-pandemic era of 2019, Figure 7 reveals that, while Badung had high inclusive growth in 2023, Denpasar led to the growth of IGCI points. This growth was driven by infrastructure development, such as roads and ports, ICT, and investments, including the opening of the Sanur Port in September 2022 and the Sampalan and Bias Munjul ports. This enhanced travel to Nusa Penida, Nusa Ceningan, and Lembongan in Klungkung Regency. Other regencies like Klungkung, Jembrana, and Buleleng also showed above-average IGCI growth, with increases of 0.85 points. In Jembrana and Buleleng, new road shortcuts and bridges, along with recreational sites in Lovina and Gilimanuk, have improved accessibility and boosted tourism.
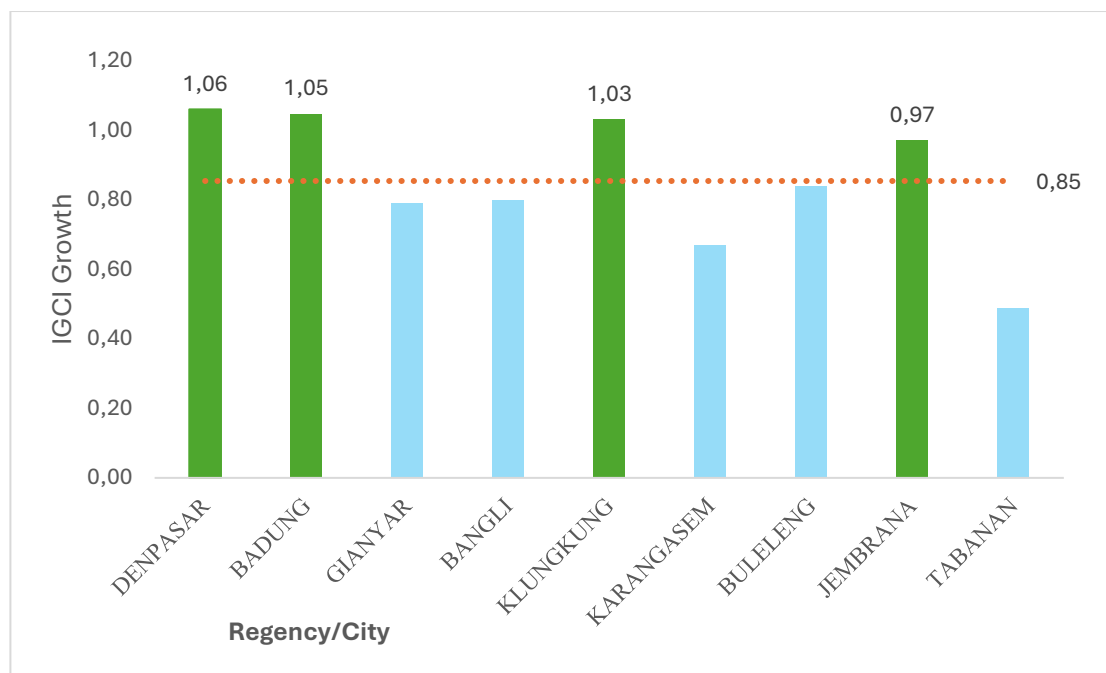
Figure 7. IGCI Growth in Bali's Regencies/Cities in 2023 Compared to 2019

There was also spatial interconnection in IGCI, where connectivity between regions significantly affected IGCI points. For instance, Denpasar's IGCI was strongly influenced by the high IGCI in Badung and Gianyar Regencies, Klungkung by Denpasar and Gianyar, Jembrana by Tabanan, and Buleleng by Badung and Gianyar (Figure 7).

4.3. Analysis of the Impact of International and Domestic Tourist Growth and Total Realized Investment on Bali's Inclusive Growth Index During the 2023 Economic Recovery

To provide a general overview of the Inclusive Growth Index (IGI) in Bali for 2023, this study uses a thematic map that categorizes the IGI for each regency or city in Bali into three categories: very high, high, and moderate. The map is shown below:
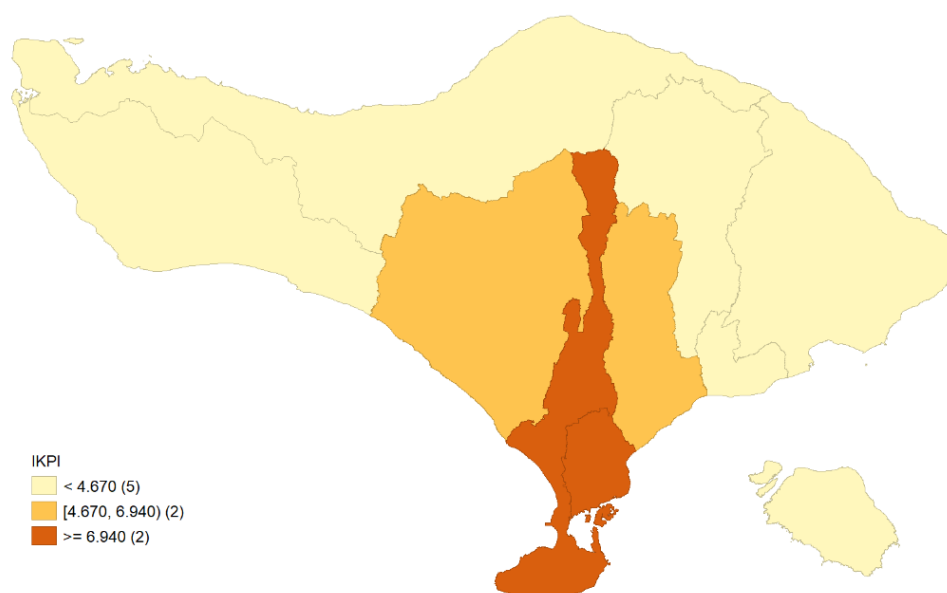

Figure 8. Distribution Pattern of Inclusive Growth in Bali's Regencies/Cities in 2023

Figure 8 shows the clustering tendency among regions with similar levels of inclusive growth. Areas with high inclusive growth tend to be surrounded by other regions with high growth, and the opposite also occurs. The data on inclusive growth rates in Bali for 2023 show spatial correlations. Regions with the highest IGI are depicted in dark shades, with Badung Regency and Denpasar City having the highest IGI. Following these are Jembrana, Buleleng, Klungkung, Bangli, and Karangasem. No region or city had a low IGI, and there were no regencies or cities with an IGI below 60.

In this research, the Queen Contiguity Spatial Weight Matrix was used. A histogram is presented to determine the number of neighbors in each regency or city in Bali. The Queen Contiguity matrix was constructed as a 9×9 matrix based on the number of regencies or cities in the Bali Province. Regions that share borders are given a value of Wij = 1, whereas other regions are assigned Wij = 0:

$$W_{Queen} = \begin{bmatrix} 0 & 1 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 0 \end{bmatrix}$$

For Bali Province, which has nine regencies and cities, the following reduced Queen Matrix is presented:

$$W_{Queen} = \begin{bmatrix} 0 & 1 & 1 & \ldots & \ldots & 0 & 0 & 0 \\ 1 & 0 & 1 & \ldots & \ldots & 0 & 0 & 0 \\ 1 & 1 & 0 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 0 & 1 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 0 & 1 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 0 & 0 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 1 & 0 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 0 & 0 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 1 & 0 & \ldots & \ldots & 0 & 0 & 0 \end{bmatrix}$$

The standardized matrix is as follows:

$$W_{Queen} = \begin{bmatrix} 0 & 1/2 & 1/2 & \ldots & \ldots & 0 & 0 & 0 \\ 1/4 & 0 & 1/4 & \ldots & \ldots & 0 & 0 & 0 \\ 1/4 & 1/4 & 0 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 0 & 1/4 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 0 & 1/3 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 0 & 0 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 1/5 & 0 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 0/0 & 0 & \ldots & \ldots & 0 & 0 & 0 \\ 0 & 1/3 & 0 & \ldots & \ldots & 0 & 0 & 0 \end{bmatrix}$$

Moran's I test, also known as the Moran Index Test, was used to determine the presence of spatial autocorrelation. In this study, a spatial regression model was used to determine whether such a correlation existed. Based on Moran's statistic, the calculation result was 0.6697, with a pseudo p-value of 0.5172, which was higher than the 5% significance level. This indicates that negative spatial autocorrelation will occur in the inclusive growth of Bali's regencies and cities in 2023. Therefore, regions with lower inclusive growth are typically surrounded by regions with higher inclusive growth and vice versa.

The results of the Lagrange Multiplier (LM) and Robust Lagrange Multiplier (RLM) tests are shown in the following table, which demonstrates the selection of the best model in Table 4.

Table 4. The Lagrange Multiplier (LM) And Robust Lagrange Multiplier (RLM)

No.	Spatial Dependency Test	Value	p-value
1	LM-Error	0.0001	0.9693
2	LM-Lag	4.2523	0.0351*
3	RLM-Error	2.1870	0.1560
4	RLM-Lag	6.4392	0.0111*

Source: *Processed data*
Note: *Significant at a = 5%*

The LM-Lag test is significant, but the LM-error test is not, indicating that the Spatial Autoregressive model (SAR) is the better model. The following spatial lag model was estimated:

$$IGIi = 0.73 * \Sigma_{(i \neq j)}{}^{(9)}w_ij * IGIj - 0.36 + 0.01TVBi ** +0.04TRIi *$$

Note: *Significant at a = 5%, **Significant at a = 10%*

$wij . IGIj$ With a coefficient of 0.73, the selected spatial lag model indicates a spatial lag effect on inclusive growth. Additionally, the pseudo R-squared value of 0.961 shows that the number of tourists and the total realized investment account for 96.1% of the variation in Bali's inclusive growth across its regencies and cities in 2023. From the spatial lag regression results, the coefficient of 0.01 for TVB_i indicates that a 1% increase in tourist numbers results in a 0.01-point increase in inclusive growth, significant at α = 10%. Meanwhile, the coefficient of 0.04 for TRI_i, suggests that a 1% increase in total realized investment leads to a 0.04-point increase in inclusive growth, significant at α = 5%. Similarly, the coefficient of 0.73 for shows that a 1-point increase in the IGI of neighboring areas leads to a 0.73-point increase in the region's inclusive growth.

4.4. Influence of Tourist Numbers on Inclusive Growth

This study indicates that higher tourist numbers during the recovery period are associated with higher inclusive growth across Bali's regencies/cities. This is consistent with the tourism-led growth literature, which argues that tourism spending and related investment can raise output and employment through multiplier effects (Adeniyi et al., 2023; Tugcu, 2014).

Tourism continues to provide benefits to local communities by generating employment opportunities (Chok et al., 2007; Hampton et al., 2018). Adeniyi et al. (2023) explored the relationship between tourism and inclusive growth in Turkey and Nigeria. Their findings showed that, while tourism promotes inclusive growth in Turkey, there is no evidence linking the two in Nigeria. However, they concluded that tourism in both countries holds immense potential to become a key driver of inclusive economic growth, provided the sector is realigned to improve performance, with policies focusing on a greater contribution of tourism to real GDP. Further studies in India, such as those conducted by Tugcu (2014) and Eugino-Martin et al. (2004), support the tourism-led growth hypothesis but suggest that its effects are more visible over the long term. These studies concluded that tourism must be a critical sector in the economy for sustainable and inclusive growth in the long run (Gokovali & Bahar, 2006; Tugcu, 2014; Vora-Sittha, 2016).

Tourism is a long-term growth driver; therefore, government policies should focus on expanding tourism infrastructure and attracting both domestic and international tourists (Bakker & Messerli, 2017; Eugenio-Martin et al., 2004). To promote tourism-led inclusive growth, policymakers must consider ownership patterns and governance structures. Research on 45 African countries by Adeniyi et al. (2023) and Southeast Asia by Hampton et al. (2018) underscores that tourism development has a positive effect on inclusive growth.

4.5. Influence of Total Realized Investment on Inclusive Growth

Investment growth drives economic expansion because increased investment stimulates capital formation and promotes overall economic growth (Herdiyati & Ismail, 2022). Both domestic and foreign investments serve as primary economic growth engines as they are essential for achieving economic growth targets. Bali's economy relies heavily on national economic conditions, particularly in the tourism, trade, and services sectors, although there is optimism for the agricultural sector. Hampton and Jeyacheya (2013) find that foreign direct investment (FDI) encourages exclusive growth in Southeast Asia. Although tourism has the potential to create productive jobs for youth, women, rural residents, and previously disadvantaged groups, there is still a need to determine how tourism can further promote inclusive growth (Bakker & Messerli, 2017).

The availability of data in this study is limited to total investment, and does not specify priority investments that would promote Bali's inclusive growth, such as investments in MSMEs and infrastructure. Sustainable tourism development that engages local tourism businesses and protects the environment is essential for inclusive growth. The government should provide greater support to MSMEs, including access to capital, training, and mentoring. Inclusive growth is a complex issue influenced by various factors, such as government policies, socioeconomic conditions, and geographical factors.

4.6. Spatial Lag Effects

The spatial lag model of inclusive growth rates differs for each regency or city, driven by varying degrees of influence from neighboring regions. Below is an example of a spatial lag model for inclusive growth:

For Denpasar City, the spatial lag model equation for inclusive growth is

$$y_hat_Denpasar = -0.36 + 0.38 * y_Badung + 0.34 * y_Gianyar$$
$$+0.01 * TVB ** +0.04 * TRI *$$

The spatial lag model equations for inclusive growth for the regencies and cities neighboring Denpasar are as follows:

$$y_hat_Gianyar = -0.36 + 0.20 * y_Badung + 0.19 * y_Denpasar + 0.15 * y_Bangli$$
$$+0.16 * y_Klungkung + 0.01 * TVB ** +0.04 * TRI *$$
$$y_hat_Badung = -0.36 + 0.19 * y_Denpasar + 0.18 * y_Gianyar + 0.15 * y_Buleleng$$
$$+0.19 * y_Tabanan + 0.01 * TVB ** +0.04 * TRI *$$

According to the spatial model for Denpasar City, an increase of one point in Badung's IGI results in a 0.38-point increase in Denpasar's IGI. Gianyar Regency also has a smaller influence on Denpasar, as indicated by its lower coefficient. Similarly, a 1-point increase in Denpasar's IGI results in a 0.19-point increase in Gianyar's IGI, demonstrating that Denpasar's influence on Gianyar is greater than Badung's influence on Denpasar. However, the overall influence of Denpasar on its neighbors is smaller than that of Badung.

5. CONCLUSION

The increase in both domestic and international tourists in Bali signifies a robust recovery in the tourism sector following the COVID-19 pandemic. Growth in tourist visits is influenced by various factors, including government policies to manage the pandemic, efforts to promote tourism through visa-on-arrival and second-home visa schemes, global economic recovery, and Bali's continued appeal as a

prime tourist destination. Furthermore, completed government investments in infrastructure, such as roads, bridges, and tourist attractions, have improved accessibility. Bali holds a significant potential to attract even more tourists from both established and emerging markets, as evidenced by the substantial rise in foreign tourist visits in 2023 compared to 2019. This trend was particularly notable across tourist sites in various regencies and cities in Bali. However, Bali's tourism sector still faces challenges such as competition from other destinations, changing consumer behavior, and sustainability concerns.

While Bali's tourism sector shows significant signs of recovery, further evaluation is necessary to assess how inclusive the economic growth of Bali will be in 2023. There remains considerable disparity in inclusive growth rates across Bali's regencies and cities. Badung and Denpasar have outperformed other regions, especially Karangasem. Infrastructure development, particularly in transportation, is a key driver of inclusive growth in certain areas. A positive correlation exists between inclusive growth and regional connectivity, with areas with better connectivity tending to exhibit higher levels of inclusive growth. Human resource quality, including education and health, significantly influences the level of inclusive growth. Karangasem continues to face substantial challenges in improving its inclusive growth, particularly in infrastructure, education, and healthcare sectors. Hence, there is a need to further enhance inclusive growth in Bali. By focusing on infrastructure development, improving human capital, and empowering local communities, Bali can achieve more equitable and sustainable growth.

A strong spatial correlation exists between inclusive growth in different regions of Bali, where neighboring areas tend to exhibit similar levels of inclusive growth. The increase in the number of tourists and total realized investment has significantly contributed to enhancing inclusive growth in Bali. The spatial lag model used in this study indicates that inclusive growth in a given region is not solely determined by internal factors but is also influenced by conditions in the surrounding areas. Tourism not only contributes directly to economic growth through foreign exchange earnings but also creates a multiplier effect by increasing demand for goods and services and generating employment opportunities. This study provides a valuable contribution to the understanding of the dynamics of inclusive growth in Bali. These findings indicate that tourism and investment play a crucial role in driving inclusive growth. However, to ensure that inclusive growth is achieved sustainably, comprehensive planning, appropriate policies, and active participation from all stakeholders are essential.

Ethical approval

This research did not require ethical approval.

Informed consent statement

This research did not require informed consent.

Disclosure statement

The authors affirm that the study has no financial or personal relationships with other individuals or organizations that could have improperly influenced the research presented in this manuscript.

Author Contributions

IGLPT contributed to the design of the research framework, data collection, and analysis. Ngurah Wisnu Murthi was responsible for reviewing literature, spatial model development, and interpretation of the results. MV contributed to the methodological design, econometric modeling, and manuscript revisions. All authors read and approved the final version of the manuscript.

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Data availability statement

The data presented in this study are available on request from the corresponding author due to privacy reasons.

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