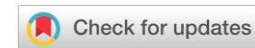# The Effect of the Tourism Sector on Regency and City Gross Regional Domestic Product in Central Java Province

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	ABSTRACT
Keywords: *GRDP; Tourism; Hotels; Restaurant; Population.* **Article Info:** *Submitted:* 26/12/2024 *Revised:* 28/05/2025 *Published:* 27/07/2025	The tourism sector has a strategic role in regional economic development. Central Java, with its wealth of natural, cultural, and historical tourism, has great potential to develop the tourism sector as an economic driver. The development of supporting facilities such as hotels and restaurants, as well as an increase in tourist attraction, is expected to encourage the growth of GRDP in regencies/cities in Central Java. This study examines the influence of the tourism sector on Gross Regional Domestic Product (GRDP) in 35 regencies and cities in Central Java. Using panel data from 2016 to 2022, this study evaluates how the number of hotels, restaurants, tourist attractions, and population affect GRDP. This study uses dynamic panel data regression method with Seemingly Unrelated Regression (SUR) approach. The results show that the number of hotels significantly increases GRDP, while the number of restaurants also has a positive and significant impact. In addition, tourism attraction provides a good contribution to GDRP, and the number of population provides a significant positive influence on GDRP throughout the Central Java region.

INTRODUCTION

As a developing country, Indonesia has abundant resources that must be utilized wisely to realize prosperity. With this situation, it certainly provides a great opportunity to attract tourists, especially from industrialized or high-income countries (Aliansyah & Hermawan, 2019). In this regard, the tourism industry can provide an effective means of economic development with minimal investment. Tourism also has a major impact on society, especially in tourist destination areas. Local governments view tourism development as a major component of their development planning and recognize its potential to boost the local economy (Aliansyah & Hermawan, 2019). In economic growth there are several indicators that must be considered to see the extent of success of economic performance, which are used for national and regional (area) levels (Setyowati

& Khoirudin, 2022). The tourism sector has great potential to be developed as one of the main sources of regional revenue (Suripto, et.al., 2024).

In Central Java, the local government encourages tourism development because it is considered a strategic industry for regional economic growth. The higher the economic growth in a country, the higher the level of progress of the country, as well as for the regional level (Nafisah & Sukarniati, 2015). he government pays attention to the tourism sector because it plays an important role in Indonesia's growth, specifically in terms of regional and national income. Tourism not only provokes the economy but also reduces unemployment in a tourism area. In particular, there is a lot of room for growth in the tourism industry in Central Java which can strengthen the local economy (Ayu & Destiningsih, 2022). Company Size is an aspect that is considered by a number of investors in deciding whether to invest (Laveda & Khoirudin, 2020).

From the contribution of GDP and job creation, The economy of the country and the region, including the original regional income, benefits from the tourism industry. The PAD is a regional income stream that comes from the region's own economic activity (Khoirudin & Khasanah, 2018). It also affects social, cultural and environmental economic aspects. Tourism has direct and indirect economic impacts, such as increased demand for public transportation and employment opportunities for local residents and government involvement. Both government agencies and people who work in the tourism industry can directly or indirectly benefit from this (Wahyu & Triani, 2023).

Table 1. GRDP of Central Java Province in 2016-2022 (Million Rupiah)

Year	GRDP
2016	849.099.354
2017	893.750.296
2018	941.091.143
2019	991.516.543
2020	965.227.269
2021	997.321.131
2022	1.050.278.091

Source: Central Statistic Agency, 2024

From table 1, it is known that GRDP from 2016 to 2022 continues to increase. This indicates a positive trend in Central Java Province, where the economy of Central Java province is developing with an increase in economic activity, production and income made by regional economic sectors, especially tourism in Central Java Province.

Tourism can be used as a driver of economic development in a region because it can have an effect on economic growth in a region. The increase in the tourism sector gave birth to innovations to develop the culture of the community that has been run. Both public and commercial sectors must work to maximize and improve the current tourism industry by promoting and improving its quality and quantity to help regional economic development. The quantity of tourist attractions, the number of tourists and the number

of hotels are important elements driving the growth of the tourism industry. Industry in Central Java has great potential to boost the regional economy. Rastiati & Khoirudin (2024) High economic growth has a significant impact on various aspects within an economy.

Analyzing the influence of the tourism sector on Gross Regional Domestic Product (GRDP) in Central Java Province is very important, considering that this region has considerable potential for economic development, especially those driven by tourism. Discussions on the factors that contribute to economic growth are expected to increase, given the variety of elements that play a role in shaping it. (Kurniawan & A'yun, 2022). The large number of Indonesian migrant workers cannot be separated from the large number of migrant workers who leave illegally (Khoirudin et.al., 2023). The purpose of this study is to investigate how the number of hotels, visitors, workers, tourist destinations, and eating places affect GDP. This research also aims to provide a thorough understanding of the elements that influence Central Java's GDP, especially those influenced by the travel and tourism industry.

LITERATURE REVIEW

The Gross Regional Domestic Product (GRDP) is defined by the Central Statistical Office as the total value of finished goods and services produced by all economic units in a region plus the value added by the various business and service sectors. The economic development of a region can be assessed at both provincial and district/city level using the gross national product. (Soputan et al., 2022). In a macro perspective, the higher the GRDP, the greater the potential for regional income.

In "The Theory of Economic Development" (1934), Joseph Schumpeter developed a theory relevant to the understanding of Gross Regional Domestic Product (GRDP) through an emphasis on innovation as the main driver of economic growth. He argued that innovation in products, processes, and organizations is key to increasing productivity, which in turn contributes to the growth of GRDP.

Entrepreneurship plays an important role as an agent of change that introduces innovation into the economy, where more entrepreneurs are active and able to identify new opportunities will further encourage job creation and investment, thus strengthening regional economic growth. The concept of "creative destruction" introduced by Schumpeter explains how innovation can replace old ways of operating in industries, suggesting that sectors that do not adapt to change will decline, while innovative sectors will grow.

Moreover, the success of innovation and entrepreneurship is highly dependent on a favorable economic environment including access to capital, good infrastructure, and facilitating government policies. Therefore, Schumpeter pointed out that GRDP growth

depends not only on the accumulation of factors of production, but also on the economy's ability to innovate and adapt to change, reflecting the ongoing dynamics within the economy and its impact on productivity and overall economic growth.

METHOD

The data used in this study were obtained from quantitative secondary sources (A'yun & Khasanah, 2022). The Central Bureau of Statistics provided the panel data that included gross regional domestic product (GRDP) data of 35 districts and cities in Central Java Province for the years 2016-2022. Gross Regional Domestic Product (GRDP) is the dependent variable, and population, number of hotels, number of restaurants, and tourist attractions are the five independent variables. Variable definitions used in the study are described as follows:

Table 2. Operational Definitions

Variable	Symbol	Definition	Source
Gross Domestic Regional Product (Million Rupiah)	*PDRB*	Total value added generated by all production and service sectors in a region.	BPS
Total Hotel (Unit)	*JH*	The number of hotels refers to the total number of hotels in a particular region or city.	BPS
Tourist Attraction (%)	*DT*	Something that has an attraction to be seen and enjoyed that is worth selling to the tourism market.	BPS
Total Restaurant (Unit)	*JR*	The number of restaurants refers to the total number of eateries in an area.	BPS
Total Population (Person)	*JP*	Population is the people or population that live and settle in a region.	BPS

The panel data approach is a combination of time-series and cross-sectional, where panel data will provide the advantage of more information about the time period of the relationship under study, so that the error variance structure of both types of data can be analyzed appropriately. (Gujarati, 2009) highlights several advantages of using panel data, including its ability to clearly depict individual heterogeneity, minimize bias due to individual aggregation, and detect effects that are difficult to observe by pure cross-section or time series data.

The modeling used is Seemingly Unrelated Regression (SUR). The modeling used for this study to achieve appropriate results on the effect of each independent variable on the dependent variable with the use of panel data models is described below:

$$PDRB_{it} = \alpha + \beta_1 (JH)_{it} + \beta_2 (DT)_{it} + \beta_3 (JR)_{it} + \beta_4 (JP)_{it} + e_{it}$$

Where:

$PDRB_{it}$	= Gross Domestic Regional Product
JH_{it}	= Total Hotel
DT_{it}	= Tourist Attractions
JR_{it}	= Total Restaurant
JP_{it}	= Total Population
α	= Constanta
$β_1β_2β_3$	= Regression coefficient of the independent variable
e	= Error term
t	= Time series (2016 – 2022)
i	= 35 districts/cities in Central Java province

The Seemingly Unrealted Regression (SUR) method is a common way to address this issue. Zellner developed the SUR model in 1962, which combines multivariate regression with a linear regression structure. The SUR model shows the relationship between the errors of various systems. SUR allows researchers to deal with unmet assumptions and increases the validity of regression analysis using panel data. Although each equation can be estimated using OLS, SUR uses information from the correlation between error terms to produce coefficients with smaller variances and is therefore more efficient. SUR does not always rely on the classical assumptions of OLS (such as homoscedasticity and uncorrelated errors across observations), because it uses Generalized Least Squares (GLS) estimation that can accommodate more complex variance-covariance structures.

RESULT AND DISCUSSION

Result

To determine the best regression estimation strategy, this study uses the Common Effect Model, Fixed Effect Model, and Random Effect Model. The selection among these three models is done to ensure optimal data analysis and accurate results in the context of this research (Lubis, & Az Zakiyyah, 2022).

Table 3. Regression Estimation Model

Variable	CEM		FEM		REM	
	Coeff.	Prob.	Coeff.	Prob.y	Coeff.	Prob.
JH	0.1373	0.000	0.0095	0.692	0.2758	0.240
JR	0.1042	0.000	-0.0268	0.003	-0.0246	0.007
DT	0.0039	0.012	0.0012	0.002	0.0014	0.000
JP	0.0601	0.000	0.8850	0.000	0.7599	0.000

Source: Data Processing, 2024

According to Table 3, the three regression model approaches show different results. The Common Effect Model (CEM) states that in general The dependent variable (Y) is influenced by the independent variables (X), with Gross Regional Domestic Product (GRDP) significantly influenced by the number of hotels (JH), restaurants (JR), tourist attractions (DT), and population (JP). However, findings from the Fixed Effect Model (FEM) reveal that although several independent variables (X) influence the dependent variable (Y), only the number of restaurants (JR), tourist attractions (DT), and population (JP) have a significant influence on GRDP, while the number of hotels (JH) shows no significant influence. Similarly, the Random Effect Model (REM) shows that certain independent variables (X) affect the dependent variable (Y), with the number of restaurants (JR), tourist attractions (DT), and population (JP) significantly contributing to GRDP, while the number of hotels (JH) has no significant effect. In addition to the use of CEM, FEM, and REM, the Seemingly Unrelated Regression (SUR) was analyzed. After comparing the three previous models with the SUR model, the best modeling results were obtained using SUR. This method is considered the most optimal for analyzing the data in this study. The results of the SUR analysis using the FGLS method are as follows:

Table 4. SUR Test Results with FGLS

Variable	Coefficient	Standar Error	Z	P>[z]
C	7.677301	0.1722316	44.58	0.000
JH	0.1373487	0.0182661	7.52	0.000
JR	0.104226	0.0238616	4.37	0.008
DT	0.0039949	0.0014996	2.66	0.000
JP	0.6016676	0.0156461	38.45	0.000

Source: Data Processing, 2024.

From the dynamic panel data regression estimation results of the Seemingly Unrealized Regression (SUR) approach with the Feasible Generalized Least Squares (FGLS) method above, the panel data equation is obtained as follows:

$$LNPDRB = 7.677301 + 0.1373487 *JH + 0.104226 *JR + 0.0039949 *DT + 0.6016676 *JP$$

The constant (C) with a value of 7.677301 shows that the independent variables in the regression, namely Number of Hotels, Number of Restaurants, Tourist Attractions, and Total Population have a constant value, the level of disclosure of Gross Regional Domestic Product as the dependent variable in Central Java Province will be 7.677301.

The positive coefficient of determination of 0.1373487 for the variable Number of Hotels (JH) indicates that a 1 percent increase in the number of hotels will not be influenced by other factors. With a positive coefficient of 0.104226 for the variable total number of Restaurants, an increase in the number of restaurants by one unit leads to an

increase in the dependent variable gross regional product of around 0.104226, with all other parameters remaining constant.

The tourist attraction variable has a coefficient value of 0.0039949 with a positive value, which indicates that if the tourist attraction increases by 1 unit, the dependent variable Gross Regional Domestic Product value will increase by around 0.0039949 as long as other factors are considered unchanged. The Total Population variable has a value of 0.6016676 with a positive value which indicates that if the Total Population increases by 1 unit, the dependent variable Gross Regional Domestic Product value will increase by 0.6016676 as long as other factors are considered unchanged.

Table 5. Simultaneous Significance Test

Variable	Prob > Chi2	Wald Chi2
Total Hotels		
Total Restaurants	0.0000	4328.40
Tourist Attraction		
Total Populations		

Source: Data Processing, 2024.

From the results of simultaneous significance testing, the significance level (Prob> Chi2) is 0.0000 which is lower than 0.05 and the wald chi2 statistic value is 4328.40. This shows that overall, independent variables such as the number of hotels, number of restaurants, tourist attractions, and population have a significant influence on Gross Regional Domestic Product as the dependent variable.

Discussion

According to the study, the number of hotels in 35 regencies and cities in Central Java between 2016 and 2023 significantly and positively affects GDP, which confirms existing ideas. This suggests that GDP growth in the area is correlated with an increase in the number of hotels. In line with research (Adhikrisna et al., 2016) If the number of hotels has a significant and positive impact on the Gross Regional Product of East Java Province. As for the results of research from (Sutrisno, 2013) if the number of hotels significantly and positively influences the Regency/City Retribution Revenue in Central Java. The number of hotels affects the GRDP because hotels are the drivers of the tourism service sector that contributes added value, creates jobs, encourages supporting sectors, attracts investment and tourists, and increases regional income. So, hotel growth is an indicator of local economic growth.

Total restaurants variable has a significant and positive influence on GRDP in 35 districts / cities in Central Java in 2016 - 2023 and supports the existing hypothesis. This states that the more the number of restaurants increases, the greater the impact on increasing GRDP. In accordance with research (Adhikrisna et al., 2016) hat the number Restaurants have a significant and positive impact on GRDP of East Java Province. As for the results of research from (Widiyanti & Dewanti, 2017) In the tourism industry of

the Special Region of Yogyakarta, the varied number of restaurants contributes significantly and favorably to PAD. The number of restaurants affects the Gross Regional Domestic Product (GRDP) because restaurants are an important part of the service sector that directly and indirectly contributes to the economic activity of a region. The more restaurants, the potential for regional tax revenue increases, thus increasing the revenue component in GRDP.

Meanwhile, Tourism Attraction has a positive and significant influence on GRDP in 35 districts / cities of Central Java in 2016 - 2023 and supports the existing hypothesis. This states that the more the tourist attraction of a region increases, the more the GRDP will increase. In line with research (Andriyani & Salam, 2022) if tourist attraction has a significant and positive effect on GRDP. This states that the more tourist attractions offered, the more the GRDP in Central Java will increase. The tourism attractiveness index (for example the number or quality of tourist attractions) affects the Gross Regional Domestic Product (GRDP) because tourist attractions are the main triggers for local economic movements, especially in the tourism and service sectors. All tourist expenditures are recorded in the expenditure component in calculating GRDP, especially household consumption and tourism service exports.

Finally, the population size confirms the current theory and has a large and positive impact on GDP in 35 districts/cities in Central Java from 2016 to 2023. This states that the more the population increases, the GRDP of a region will also increase. In line with (Fauzi, 2016) namely population has a significant and positive effect on PAD. This shows that a district / city in Central Java province gets a larger PAD if the population increases. Population affects Gross Regional Domestic Product (GRDP) because the population is the main actor in economic activities, both as consumers, workers, and producers. With a large market, production can be increased at a lower cost per unit, increasing efficiency and total output of the regional economy.

CONCLUSSION

The results of the study and the discussion on how the tourism industry affects the GDP of the districts and cities in Central Java Province between 2016 and 2022 show that the region's GDP is influenced by the number of hotels, restaurants, tourist attractions and residents. It can be concluded that the tourism industry plays an important role in increasing the GDP in Central Java. The government should therefore pay more attention to the following points management and development of tourist attraction infrastructure in order to maximize the positive economic impact of the tourism sector on GRDP and ensure sustainable tourism management. The limitation of this study is related to the research period between 2016-2022 where there was a COVID-19 pandemic event that

had a major impact on tourism, but has not specifically discussed the effects of the event on tourism. This could be an interesting theme for further research.

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