



The Effect of Tourism on Economic Growth in Europe

Friona Poçari
Class: BINF IIA
Epoka University
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ABSTRACT

This study investigates the correlation between economic growth and tourism in Europe. Through the utilization of analysis of panel data, this study analyzes the relationship between the gross domestic product (GDP) and tourism receipts for 30 countries in Europe for an extended period of ten years from 2008 to 2018. The findings of the study conclude towards a highly positive relation between economic growth and tourism, ultimately revealing that the industry of tourism is a key, vital factor upon the further economic development of Europe and its countries. It is indicated that a further and continuous investment upon tourism serves as a future stimulator upon opportunities of employment and generating further economic expansions of countries, while maintaining sustainable practices as well for long-term benefits. This study serves as a further contributor towards existing literature, providing extensive evidence supporting the relationship between economic growth and tourism, also highlighting the requirement of more research regarding this area of focus.

KEY TERMS: Tourism, GDP, Europe, economic growth, panel data analysis

INTRODUCTION

There are different foundation sectors which lay the groundwork for continuous economic development within a country. An interesting sector to be examined includes the complex industry of tourism. Not only is tourism considered a defining determinant of modern civilization for societies, but it is also a contributor to 9.5% of the global GDP and a provider of approximately 266 million jobs around the world (Bunghez, 2016). Europe, a gem of cultural heritage, a myriad of natural landscape attractions, and historical landmarks, has witnessed a significant tourism growth throughout the past decade. It is ranked as the number one destination of the world for international arrivals, with 713 million arrivals in 2018. (Weston et al., 2019). As the further increase of globalization continues to open doors and opportunities for the role of tourism to further extend, the more intriguing and important the analysis of tourism's impact upon economic development becomes. Thus, the purpose of this study is to conduct an examination and analysis upon the relationship between tourism and the gross domestic product per capita (GDP) of countries of Europe through conducting a panel data study. The purpose of this examination is to conclude whether higher levels of tourism are highly

associated with higher levels of economic development. This purpose follows the research question: “Does tourism lead to a positive increase of GDP in Europe?”

Through literature research, secondary data of online sources upon tourism, this paper will provide the foundations and ultimately build up to a regression analysis which will test this research question through quantitative panel data. The economic development of countries utilized will be measured through gross domestic product per capita (GDP), while tourism will be measured through tourism receipts and tourist number of arrivals. These include all the revenue which is generated from international tourists in a country, including their expenditures, taxes, and fees for tourism receipts and charges of visa fees, airport charges, port charges, transportations services, accommodation, shopping, dining and hospitality for the number of tourist arrivals. The European Union (EU) economy experiences a surplus due to tourism, with the international receipts “exceeding the EU residents spending upon international tourism by 27 billion in 2016” (Weston et al., 2019) also, concurring to Culiuc (2014), macroeconomic factors and financial ties have a critical impact on tourism entries making the choice of utilizing both tourism receipts and tourist arrivals as a measure of tourism highly appropriate and beneficial towards this study.

LITERATURE REVIEW

This section will provide a general overview of the concepts of economic growth and GDP in general, and then going further into how tourism affects economic growth; thus their underlying mechanism and previous studies and research conducted on behalf of this relationship. An analysis of previous country studies will be conducted, and then the primary focus will be shifted to tourism within Europe as the main region of interest for this study.

Economic Growth and GDP

According to the International Monetary Fund, Gross Domestic Product is a measure of the monetary value for final goods and services produced in a country for a specific period of time, for example a quarter or year. The output generated from inside the country's borders is counted. GDP continues to be highly utilized as an indicator of an economy's general health, giving information about how a country is performing economically and gives information about the size of the economy in that country. In other words, an increase of GDP is interpreted as a positive sign - more money is circulating and employment is increasing. On the other hand, a shrinking GDP leads to a poor economy and unemployment (Callen)

As understood from its general definition, GDP serves as a tool towards measuring the economic growth of a country, where economic growth itself is defined as the increase of the economy's size of a country over a specific period of time (Roser, 2013). This is typically measured by this specific total production of goods and services that GDP covers. This discussion of GDP as a measurement tool of economic growth should also consider the limitations associated with it, as GDP does not capture every factor adding value to a country's economy. GDP does not take into account non-marketed output, the output sold within informal markets, the depletion of natural resources, or any quality improvements upon goods and services. Nevertheless, even though GDP contains its limitations and is not able to capture specific economic activity aspects, it is still highly useful as a macroscopic and comparable view of the economy.

Literature on Tourism

Tourism is viewed as a sector which is applicable to the developments of general economics. It is viewed as a "composite product involving combination of a variety of goods and services provided by different sectors" (Song et al., 2013, p.6). At first, tourism was thought of as a phenomenon that led to travel and vacations for a set amount of time, rather than as a potential source of long-term, considerable income. Today, the role of tourism in the growth and development of many nations is seen in an entirely distinct perspective. (Vanhove, 2005). The demand of tourism is measured predominantly through the level of tourist expenditures (also referred to as receipts) in per capita terms, through the number of arrivals within a country, and also through an alternative measure of the length of stay regarding tourist nights in a location which has emerged in some more recent studies conducted through application of duration models (Song et al., 2013).

Given the large magnitude of the flows of tourism, based on the event of a record of 1 billion tourists crossing international borders in 2012, celebrated by the United Nations World Tourism Organization (UNWTO), the importance of this sector within the global economy is vital (Culiuc, 2014). This magnitude of interest makes it a natural driver for further investigation regarding tourism flow generation. According to the International Monetary Fund investigation of Culiuc (2014), economic ties and macroeconomic variables have a highly significant effect upon tourism arrivals, stating also that stronger ties of trade within a country simultaneously increase flows of tourism as well.

Mechanism between Economic Growth and Tourism

Focusing on tourism through a macroeconomic lens, it contributes to local, national, and even international development of economy, also increasing competitiveness of destinations. Tourism is a factor generating a valuable amount of foreign exchange inflows, increases income through tourist taxes, provides opportunities for employment, spurs growth of GDP, encourages entrepreneurial activities, and in overall improves the structure of the global economy (Hundt, 1996). Economic impacts of tourism within countries has become a highly popular research topic over the last decades, observed from supportive statistical tools and methodological advancements. This impact has been analyzed through application of Keynesian multipliers, I-O models, cost-benefit analysis, frameworks of computable general equilibrium (CGE), and further statistical tools such as tourism satellite accounts (TSAs) (Song et al., 2013).

The previously mentioned growing importance of tourism, highly upon less developed ones, the economic growth and tourism relationship has ultimately become a main theme of recent literature research. Advocations of the hypothesis of tourism-led growth (TLG) emphasize the fact that international tourism can generate employment, bring foreign exchange, take advantage of economies of scale, diffuse technical knowledge, and spur local investments (Schubert, Brida, & Risso, 2011). This tourism-led growth (TLG) hypothesis generally is tested through the regression of GDP upon arrivals or tourism receipts and the real exchange rates. A prevailing practice for this approach is through panel data analysis or the Granger causality between the economic variables through the utilization of the VAR model. Many of the studies confirm a causality which is unidirectional between tourism and real GDP in specific regions, while some provide evidence regarding relationships which are bidirectional (Kim et al., 2006). At a macroeconomic level, assessing the development of tourism on economy is a main focus and the research field still needs time to reach maturity of methodological approach.

The tourism sector has grown to be a significant part of the European economy because even governments recognize how important tourism is and work hard to attract foreign visitors with successful tourism destination marketing campaigns and to encourage their participation in numerous international tourism exhibitions, fairs, and forums. The travel and tourism sector contributes US\$1248 billion, or 7.8%, to the EU's GDP (Gross Domestic Product), according to the World Travel and Tourism Council (2011). The council claims that in 2011, or 8.4% of all employment, the travel and tourism sector helped to create close to 9.7 million jobs in the EU. This information is useful in understanding how the EU emphasizes the tourism sector as a significant source of income, employment, and economic growth.

International Tourist Arrivals

Tourism arrivals are significantly impacted by macroeconomic factors and economic links, claims Culiuc (2014). Although vast, the elasticity of bilateral tourism in relation to the GDP of the countries of origin and destination is less than that of trade in goods and services (Culiuc, 2014). According to Culiuc (2014), the country's tourism flows will increase as its commercial relations become stronger. The volume of business travel between the nations, however, can account for this. Real exchange also has a favorable impact on travel between countries; as a result, as the currency of the origin country appreciates, so does the currency of the destination nation.

International tourist arrivals, excluding those whose primary residence is in the nation, show the number of visitors who arrive from abroad. The figure is expressed as a percentage of each person in the nation (per capita). A 12-month stay is the maximum permitted. This variable is offered to quantitatively measure tourism. The literature suggests that the predicted sign of the coefficient has to be positive. The World Bank provides the values. The values date back to 2016.

Previous Studies on Tourism and Economic Growth

In the recent decades, tourism has become a key sector encouraging the further development and employment upon a global scale. There have been a large number of studies supporting this claim, such as a research for a group of countries in Asia for 1995-2004 highlighting the positive, significant impact of tourism receipts within economic growth (Shakouri et al., 2017).

Other research was conducted for 42 African countries, leading to the conclusions that also capital investment and tourism receipts were a significant factor towards increase of GDP. According to their analysis, a growth of 0.4% in GDP came as a result of 10% growth in business and domestic tourism (Fayissa, Nsiah, & Tadasse, 2007).

In 143 nations, the symbiotic relationship between increasing tourism and economic development was investigated. The study by (Fernández et al, 2020) emphasized how tourism promotes economic development in nations where it occurs. Based on the degree of economic development and tourism growth, the analysis grouped the nations.

Tourism receipts also had a positive impact upon economic growth in one of the most key tourist destinations during 1972-2004, in Turkey (BAL, AKÇA, & BAYRAKTAR, 2016). It was analyzed that an increase of tourism international receipts by 1% would lead to 0.314% economic growth.

Further research upon a number of SADC countries came to the conclusion that there was a 0.16% GDP growth coming as a result of a 1% increase of tourism receipts. This was furthered with the analysis that a 0.29% GDP growth came as a result of increasing general tourism investment by 1% (Makochekanwa, 2013).

Another research study was aimed at five ASEAN member states (Malaysia, Indonesia, Singapore, Philippines, Thailand) in regard to the impact of the sector of tourism within economic growth. The results that were obtained highlighted the positive impact within these countries through variables such as exchange rate and number of tourist arrivals within the countries (Holik, 2016). Combined, all these studies highlight the correlation between economic growth and tourism receipts, highlighting the aim of this study as well for European countries.

Nevertheless, another study conducted for Romania, Bulgaria, Slovenia, came to the results that the sector of tourism did not have an impact upon economic growth (Chou, 2013). Interestingly, the same research was conducted for Latvia, Cyprus, Slovakia led to the results that tourism had a positive impact upon economic growth. Moreover, the analysis of this relationship for 10 most popular world destinations, being France, China, Mexico, Germany, Italy, Spain, Russia, Great Britain, Turkey, and US), the results concluded that the relationship is positive, even though there are differences between the countries which reflect their overall economy (Shahzad et al., 2017).

Concluding this literature review analysis, there are many studies conducted worldwide supporting the hypothesis of the impact of tourism on economic growth. Nevertheless, this study will dive further into the European context, narrowing scope of analysis to a further understanding of the sector of European tourism and attempting to fill this gap remaining in need of further study for the mixed conclusions regarding tourism and economic growth.

Hypothesis 1 (Ho). There is no relationship between tourism indicators such as tourism arrivals and receipts, and economic growth (GDP) on European countries

Hypothesis 2 (H1). Higher levels of tourism are associated with higher levels of economic growth (GDP) on European countries

DATA AND METHODOLOGY

A. Data Collection Methods

In order to test the hypotheses stated based on the research question of the study, data will be collected upon the tourism receipts, measured in current (\$) of tourist recipients expenditure read by the government as profit, tourist arrivals measured by the number of people who visit the country, and economic growth, measured in GDP per capita. The data collected will be obtained from a variety of verified organizational **secondary data**, international sources, specifically from World Bank Data. The data that will be required is going to be collected for **30 countries in Europe for a span of 10 years in total, being from 2008 to 2018**. The randomly selected countries chosen are: Albania, Armenia, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Luxembourg, Moldova, Montenegro, North Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Switzerland

All of the secondary data that was utilized upon this statistical research has been collected from international sources, with a heavy focus upon the World Bank informational data which has secure and reliable information for countries around the world, which enables a thorough and strong statistical analysis. Moreover, the utilization of linear regression is what shapes the findings and recommendations of our analysis.

B. Data Analysis Techniques

In this specific study, during a 10-year period, linear regression analysis was utilized in order to determine the link between tourist arrivals and GDP in Europe. We were able to determine that there is a substantial positive connection between the two variables by examining the regression findings. We also conducted a literature assessment to find any gaps in the material that would help future study and policy development.

C. Statistical Tools

The specific relationship between GDP and tourism upon Europe was thoroughly analyzed through utilizing statistical tools such as particularly linear regression. This specific methodology includes the collection of information for a 10 year length for the random countries chosen from Europe. To be able to successfully detect any type of trend or pattern, the collected data was subsequently examined using statistical software (R-studio). The findings revealed a considerable positive link between GDP and tourism, indicating that this industry significantly affects the economic development of European nations.

For examining the relationship between tourism and GDP growth and determine if tourism has contributed to the expansion of GDP, our study will use a panel data approach. The main ideas of panel data studies and how they relate to this study are as follows:

- **Study Design:**

The study design would consist of observing and measuring variables connected to tourism activities in various countries, such as expenses for accommodation, food, transportation, attractions, shopping, and other travel-related expenses.

- **Financial Impact:**

A bigger number of visitors and more economic activity within the tourism sector are indicated by higher tourism receipts. It may be said that tourism is a major factor in increasing the local economy and bringing in money.

- **Purpose:**

The objective of the panel data study is to be able to examine the relationship between tourism and GDP, specifically by identifying how tourism influences GDP levels in various regions and countries. The study's objectives include describing these elements' prevalence or distribution in the population and looking into any potential connections between them.

- **Benefits:**

Studies using panel data are able to provide a better and thorough understanding of the variables of interest by depicting the population or various regions at a certain point in time. They are more cost- and time-effective than longitudinal studies, which demand tracking changes over time.

Assumptions and Limitations

When analyzing the findings, it is important to keep in mind the study's assumptions and restrictions.

First of all, the study only utilizes a linear regression methodology, thus not examining any other type of statistical method that could have produced different results.

Second, although a linear link between tourism and GDP is assumed by the research paper's linear regression methodology, this assumption may not be totally true.

A longer time frame might be required to adequately account for the influence of tourism on GDP over time since the analysis only included the years from 2008 to 2018.

Measurement mistakes or biases may affect the data utilized in this study at any point during its collection, processing, or reporting.

RESULTS

Calculating the descriptive statistics for the variables is the first stage in the analysis of the data gathered for this study. The R results, implemented in RStudio, are shown in Appendix A. The methods used to enumerate and describe a dataset's key characteristics are referred to as descriptive statistics. The study's variables include the share of GDP attributable to tourism, the volume of visitors, and the typical length of stay. We can compute each variable's mean, median, mode, and standard deviation using descriptive statistics, and we can also create graphs of the data. These statistics will give a broad picture of the variable distributions, which will guide further data analysis. Overall, descriptive statistics provide a crucial basis for

```
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Call:  
lm(formula = log(GDP) ~ log(Tourism_Receipts) + log(Tourist_Arrivals),  
    data = ReceiptsAndGDP)
```

```
Residuals:  
      Min       1Q   Median       3Q      Max   
-1.5997 -0.6096  0.1283  0.6391  1.5161
```

```
Coefficients:  
                Estimate Std. Error t value Pr(>|t|)      
(Intercept)      2.17239    0.76439   2.842  0.00477 **    
log(Tourism_Receipts) 1.00047    0.05566  17.973 < 2e-16 ***   
log(Tourist_Arrivals) 0.06107    0.04571   1.336  0.18253
```

```
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 0.7957 on 317 degrees of freedom  
(10 observations deleted due to missingness)  
Multiple R-squared:  0.782,    Adjusted R-squared:  0.7806  
F-statistic: 568.6 on 2 and 317 DF,  p-value: < 2.2e-16
```

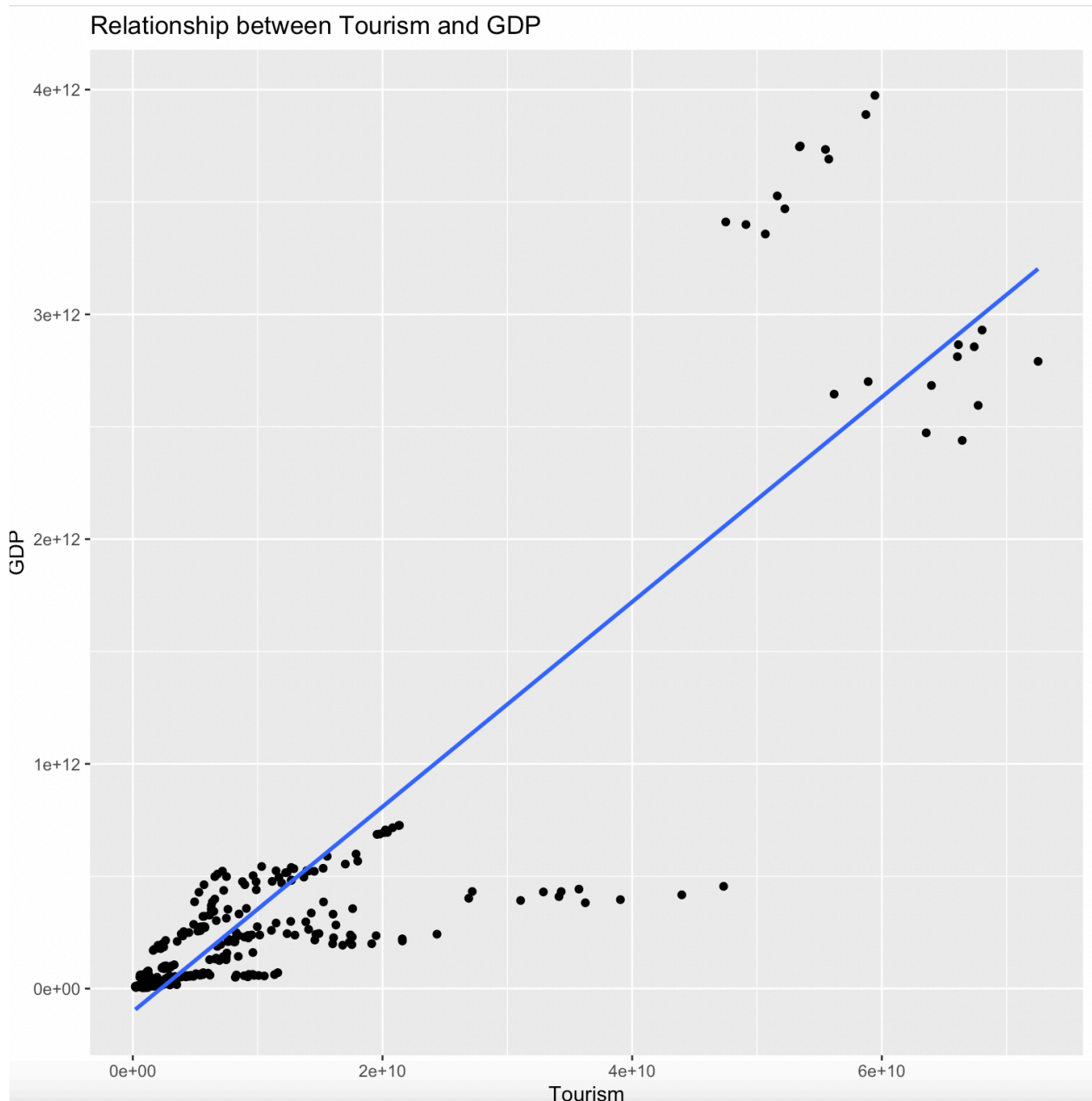
```
> # Perform ANOVA  
> anova_table <- anova(model)  
> print(anova_table)  
Analysis of Variance Table
```

```
Response: log(GDP)  
              Df Sum Sq Mean Sq  F value Pr(>F)      
log(Tourism_Receipts)    1  718.76   718.76 1135.3291 <2e-16 ***  
log(Tourist_Arrivals)    1    1.13    1.13   1.7847 0.1825  
Residuals                317 200.69    0.63
```

```
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
> # Extract the GDP, SST, and SSE values
```

```
> # Print the SSR, SST, and SSE values
> print(ssr)
[1] 718.7627
> print(sst)
[1] 1.1299
> print(sse)
[1] 200.6888
> r_squared <- summary(model)$r.squared
> print(r_squared)
[1] 0.7819978
> |
```



The link between the dependent variable (GDP) and the independent variables: (Tourism_Receipts) and (Tourist_Arrivals), is shown by the equation of the line in your regression model.

Real GDP Per Capita = $\beta_0 + \beta_1 \cdot \text{International tourism arrivals per capita} + \beta_2 \cdot \text{International tourism receipts} + \epsilon$

Findings from linear regression

Analyses revealed a significant positive relationship between tourist arrivals and GDP, indicating that the growth of tourism has contributed to the economic growth of the European nations included in this study. However, the coefficient of determination (R-squared) was moderate, indicating that other factors besides tourism have also influenced GDP. Additionally, the analysis indicates that the relationship between tourism and GDP is stronger for some European countries than others, highlighting the need for targeted tourism strategies tailored to each country's unique economic circumstances. In conducting the literature review for this research paper, a variety of sources were utilized including academic journals, tourism reports, and government statistics. Linear regression was used as the methodology to analyze the relationship between tourism and GDP for Europe. The results indicated a significant positive correlation between the two variables, suggesting that tourism has a substantial impact on the economic prosperity of European countries. These findings contribute to a growing body of research demonstrating the crucial role of tourism in driving economic growth.

Important factors should be examined. Tourism receipts will be one of the main variables that will be examined in this study. The total amount of money spent by visitors in European nations will be used to calculate tourism revenues, and visitor numbers will be used to calculate arrivals. The increase of the economy as a whole, as determined by the GDP, is referred to as economic growth. Linear regression analysis, a statistical technique that can be used to determine the relationship between two or more variables, will be used to assess these variables. These crucial factors will be examined in this study in order to ascertain the impact of tourism on the GDP of European nations and to evaluate the connection between tourism and economic development in Europe.

The study's findings indicate that there is a statistically significant positive correlation between tourism and GDP in Europe. It's crucial to understand the study's limitations, though. First off, the study ignored any potential harm that tourism might cause to the environment or native cultures and simply looked at how it affected GDP. Second, various econometric models that would have offered more information were not taken into account and the research was limited to a linear regression model. The study also only examined data from a brief period of time, which may not have adequately captured the intricate and dynamic relationship between tourism and GDP. Finally, given the diversity of the European nations, it is crucial to take into

account the variations in tourism development and how they affect GDP. Consequently, more investigation is needed.

INTERPRETATION OF RESULTS:

The study's findings are consistent with the claim that tourism raises the GDP of European nations. The data gathered through the literature study and the use of the linear regression model demonstrate a distinct association between the rise in GDP and the number of tourist arrivals. This suggests that the tourist sector contributes significantly to economic growth in Europe. To find out how long-lasting this trend is, however, more investigation is required.

Based on the provided regression analysis, where GDP and tourism receipts are both measured in current dollars, we may investigate the relationship between the two.

1. Coefficients:

- Intercept: The estimated intercept is 2.17239. It represents the expected value of the logarithm of GDP when the logarithm of Tourism Receipts and Tourist Arrivals are both zero.
- Tourism Receipts: The estimated coefficient for $\log(\text{Tourism_Receipts})$ is 1.00047. It indicates that, on average, a 1% increase in Tourism Receipts is associated with a 1.00047% increase in the logarithm of GDP, holding other variables constant.
- Tourist Arrivals: The estimated coefficient for $\log(\text{Tourist_Arrivals})$ is 0.06107. Accordingly, while maintaining other variables equal, an average 1% rise in tourism is correlated with an increase in GDP logarithm of 0.06107%.

2. Leftovers:

- The residuals represent the differences between the actual and predicted values of the dependent variable ($\log(\text{GDP})$). Summary statistics show the minimum, first quartile (1Q), median, third quartile (3Q), and maximum values of the residuals.

3. *Meaning:*

- t-values and associated p-values assess the statistical significance of coefficients. The "signif.codes" provide an indication of the level of significance, with "****" representing highly significant, "***" representing significant, "**" representing marginally significant, and "." representing not significant. In this analysis, the intercept coefficient and the coefficient for $\log(\text{Tourism_Receipts})$ are statistically significant (p-values 0.05), indicating that there may not be a significant relationship between tourism arrivals and the log of GDP.

4. *Residual standard error:*

- The residual standard error (0.7957) provides an estimate of the mean deviation of the observed values from the fitted regression line. It shows the residuals' standard deviation and reflects the model's general goodness of fit.

5. *R-Square and Adjusted R-Square:*

- The multiple R-squared (0.782) indicates that the independent variables in the model can account for about 78.2% of the variance in the GDP logarithm.

Adjusted R-squared (0.7806) is a more cautious way to estimate the goodness of fit of a model since it accounts for the number of predictors in the model.

6. *ANOVA:*

- The ANOVA table presents the analysis of variance results, decomposing the sum of squares into components for Regression, Residuals (Error), and Total.

- The F-statistic tests the overall significance of the regression model. In this case, the F-statistic is 568.6 with a very small p-value ($< 2.2e-16$), meaning that the significance is relatively high.

7. Sum of Squares:

The Sum of Squares Regression (SSR) is 718.76, representing the explained variation in the logarithm of GDP due to the independent variables.

The Sum of Squares Total (SST) is 1.1299, representing the total variation in the logarithm of GDP.

The Sum of Squares Error (SSE) is 200.688

Discussion of the results

The results of this study offer significant new information about how tourism affects Europe's GDP. The regression study demonstrates a significant coefficient of determination (R-squared) of 0.782, indicating a positive association between tourism and GDP. This shows that tourism has a significant impact on Europe's economy. This conclusion is further supported by the literature study because numerous investigations have produced comparable findings. It also suggests that there may be unintended consequences of tourism, such deterioration of the environment and cultural uniformity, which need to be addressed. These conclusions emphasize the necessity for environmentally and socially responsible tourism strategies that balance economic development.

CONCLUSION OF RESULTS

Our research indicates that travel and tourism significantly increase the GDP of European nations. The data analysis verified a significant positive link between the GDP and annual tourism receipts. According to linear regression models, the GDP rises by 45.57 \$ for every 1 unit increase in tourism receipts. This suggests that investing in the tourism industry may be a sensible plan for European nations to spur economic expansion and generate new job possibilities. To guarantee long-term benefits and prevent harm to the environment and local cultures, sustainable tourism practices and legislation are essential. The analysis of the literature found that the impact of tourism on the GDP of Europe has been the subject of conflicting findings in earlier research.

LIMITATIONS AND RECOMMENDATIONS

This research did not consider any potential structural changes that could have occurred in the European tourism industry during this time. The study focuses solely on Europe, and the findings may not necessarily apply to other regions of the world. The assumptions made in this study regarding the impact of tourism on GDP are also subject to change due to changes in the political or economic climate.

Furthermore, potential external factors that could influence the GDP, such as political instability or natural disasters, were not controlled for in the analysis. Finally, the study only focused on the direct effects of tourism on the GDP of European countries and did not investigate any potential indirect impacts. Despite these limitations, this research paper provides valuable insights into the relationship between tourism and GDP in Europe.

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APPENDIX A

Call:

```
lm(formula = log(GDP) ~ log(Tourism_Receipts) + log(Tourist_Arrivals),  
    data = ReceiptsAndGDP)
```

Residuals:

Min	1Q	Median	3Q	Max
-1.5997	-0.6096	0.1283	0.6391	1.5161

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	2.17239	0.76439	2.842	0.00477 **
log(Tourism_Receipts)	1.00047	0.05566	17.973	< 2e-16 ***
log(Tourist_Arrivals)	0.06107	0.04571	1.336	0.18253

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.7957 on 317 degrees of freedom

(10 observations deleted due to missingness)

Multiple R-squared: 0.782, Adjusted R-squared: 0.7806

F-statistic: 568.6 on 2 and 317 DF, p-value: < 2.2e-16

```
> # Perform ANOVA
```

```
> anova_table <- anova(model)
```

```
> print(anova_table)
```

Analysis of Variance Table

Response: log(GDP)

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
log(Tourism_Receipts)	1	718.76	718.76	1135.3291	<2e-16 ***
log(Tourist_Arrivals)	1	1.13	1.13	1.7847	0.1825
Residuals	317	200.69	0.63		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```
> # Extract the SSR, SST, and SSE values
```

```
> ssr <- anova_table$Sum[1] # Sum of Squares Regression
```

```
> sst <- anova_table$Sum[2] # Sum of Squares Total
```

```
> sse <- anova_table$Sum[3] # Sum of Squares Error
```

```
> # Print the SSR, SST, and SSE values
```

```
> print(ssr)
```

```
[1] 718.7627
```

```
> print(sst)
```

```
[1] 1.1299
```

```
> print(sse)
```

```
[1] 200.6888
```

```
> r_squared <- summary(model)$r.squared
```

```
> print(r_squared)
```

```
[1] 0.7819978
```

```
>
```