

Article

Sustainable Tourism Dynamics: Understanding the Impact of Tourist Stays on Regional Revenue and Development

Eleonora Santos 

Centre of Applied Research in Management and Economics, School of Technology and Management, Polytechnic University of Leiria, 2411-901 Leiria, Portugal; eleonora.santos@ipleiria.pt

Abstract: Utilizing a dataset covering four Portuguese NUTS II regions from 2009 to 2022 and employing multiple regression analyses, this research challenges traditional tourism theories by providing empirical evidence on how various factors—average stay, overnight stays, and foreign guests—affect regional revenue in tourist accommodations. In the context of sustainable tourism development, these findings have revealed a significant negative relationship between average stay duration and revenue, indicating that longer stays may be associated with lower daily revenues. This necessitates a re-evaluation of tourist spending behavior and accommodation of pricing strategies to promote economic sustainability. This study underscores the consistently positive impact of overnight stays on revenue, reinforcing the importance of maximizing overnight stays as a strategy for sustainable economic growth within the tourism sector. Additionally, the mixed results regarding the proportion of foreign guests reveal varying regional impacts, suggesting that region-specific strategies are essential for optimizing revenue from international tourists in a sustainable manner. This research integrates these factors to offer practical insights for refining revenue strategies in tourism management, emphasizing the need for multifaceted theoretical models that account for the complexity of sustainable tourism dynamics. Future research should focus on these nuanced approaches to better understand and manage the interplay between tourism dynamics and sustainable development.

Keywords: sustainable tourism; tourism economics; revenue management; average stay duration; foreign guests; regional variations; sustainable development goals (SDGs); economic growth



Citation: Santos, E. Sustainable Tourism Dynamics: Understanding the Impact of Tourist Stays on Regional Revenue and Development. *Sustainability* **2024**, *16*, 8403. <https://doi.org/10.3390/su16198403>

Academic Editors: Eduardo Parra-López, Almudena Barrientos-Báez and David Caldevilla Domínguez

Received: 28 August 2024
Revised: 22 September 2024
Accepted: 25 September 2024
Published: 27 September 2024



Copyright: © 2024 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Tourism is a major economic driver globally, influencing revenue generation in various regions through its multifaceted dynamics [1]. However, the specific factors that influence revenue generation in tourist accommodations have remained insufficiently explored, creating a gap in the understanding of key drivers for sustainable growth. Yet the COVID-19 pandemic has had significant negative effects on tourism [2,3]. The pandemic underscored the necessity for flexible business models and sustainable practices to navigate global uncertainties and maintain a competitive advantage [4]. Despite these challenges, evidence suggests that some tourist destinations are resilient [5]. This study aims to fill a critical gap by exploring how variables such as the average stay duration (“estada”), the number of overnight stays (“l dorm”), and the proportion of foreign guests (“hospf”) affect tourism revenue, contributing to the development of region-specific strategies aligned with sustainable development goals (SDGs).

While traditional models suggest that longer stays generally lead to increased revenue due to extended use of facilities and higher overall spending, as supported by the Length of Stay Model [6], the Tourist Expenditure Model [7], the Accommodation Utilization Theory [8], and the Destination Choice Model [6], this study challenges this assumption by examining regional variations in revenue outcomes across different tourist accommodations. This study also explores how different aspects of tourism—such as the proportion of

foreign guests and seasonal variations in overnight stays—affect not only revenue but also economic sustainability outcomes. For example, the influx of foreign guests may have complex impacts on local economies, influencing both economic performance and the sustainability of tourism practices [9]. This approach aims to reconcile traditional revenue-focused models with contemporary sustainability concerns.

Existing studies, such as those by Aguiló, Rosselló, and Vila [10], provide econometric evidence that longer stays can lead to higher total expenditures; however, variations in tourism type, seasonality, and infrastructure may moderate this relationship. Thrane and Farstad [8] argue that longer stays do not always correlate with higher revenue, especially when accounting for factors like the tourist's country of origin, regional characteristics, and seasonality. Northcote and Macbeth [11] emphasize the need for yield management strategies to ensure that extended stays do not lead to unsustainable resource use or environmental degradation. By examining these dynamics, this study seeks to uncover underexplored patterns in how different regions of Portugal manage tourism and revenue generation, particularly during periods of economic and environmental stress.

This article utilizes data from four Portuguese NUTS II regions (North, Algarve, Azores, and Madeira Islands) and applies multiple regression analyses to examine how average stay duration, overnight stays, and the proportion of foreign guests influenced revenue between 2009 and 2022. By explicitly focusing on these variables and examining their distinct impacts, this study contributes to a more nuanced understanding of tourism economics and provides empirical evidence that informs both regional development strategies and broader sustainable development goals (SDGs). These findings emphasize the importance of developing region-specific strategies that foster sustainable tourism practices; enhance economic, social, and environmental well-being; and align with the United Nations' SDGs.

This article is structured as follows: the introduction outlines the research context and significance; the theoretical framework integrates traditional tourism economics with sustainable development perspectives; Section 2 describes the data sources and methodology; Section 3 presents the findings of the regression analyses across different Portuguese regions; and Section 4 interprets these results in relation to existing theories and highlights implications for tourism management. Finally, Section 5 addresses this study's limitations and contributions to the field.

2. Data and Methods

This study utilizes a dataset retrieved from the PORDATA site (www.pordata.pt) encompassing four Portuguese NUTS II regions (North, Algarve, Azores, Madeira) over the period of 2009 to 2022. The dataset includes key variables related to tourism accommodations, captured annually for each region. This analysis aims to explore not only the economic aspects but also how these variables can be interpreted in the context of sustainable tourism development, contributing to a deeper understanding of the regional impacts on sustainability goals. The variables are as follows:

Variable Overview

- **reg**: Region identifier
- **year**: Year of observation
- **ldorm**: Logarithm of overnight stays in tourist accommodations
- **lprov**: Logarithm of the total revenues of tourist accommodations
- **estada**: Average stay in tourist accommodations
- **dormver**: Proportion of overnight stays in tourist accommodations between July and September
- **dormver**: Proportion of overnight stays in tourist accommodations between July and September
- **hospf**: Proportion of foreign guests in tourist accommodations

2.1. Data Collection and Processing

Data were retrieved from the PORDATA database, which consolidates information from national and regional statistical sources. The dataset is collected annually and includes variables relevant to tourism revenue and sustainability. The inclusion criteria for the data focus on ensuring comprehensive coverage of all four NUTS II regions and a consistent time span from 2009 to 2022. The data were pre-processed to normalize distributions and handle skewness, including logarithmic transformations for revenue and overnight stays to stabilize variance and address potential outliers.

The choice of variables was guided by their significance in understanding tourism revenue dynamics; “Proportion of foreign guests” (*hospf*) was selected due to its impact on local economic performance and sustainability. Higher foreign guest proportions often lead to increased revenue and can influence local economic and infrastructural development. “Average length of stay” (*estada*) is crucial for assessing revenue potential, as longer stays generally result in higher expenditures per guest.

Hypotheses

Hypothesis H1. *There is a positive relationship between the average stay duration (“estada”) and revenue in the tourism sector.*

Longer stays are traditionally expected to lead to increased revenue, as extended use of accommodation services and higher total expenditures per guest are generally observed in tourist behavior (supported by the Length of Stay Model [7], Tourist Expenditure Model [8], and Accommodation Utilization Theory [6]). However, this study explores whether these patterns hold across different regions in Portugal, considering factors such as seasonality and infrastructure variations that may moderate this relationship. Previous research by Aguiló, Rosselló, and Vila [10] found that longer stays do indeed lead to higher expenditures, but this outcome can be influenced by the type of tourism, the region’s characteristics, and external factors like the COVID-19 pandemic, which disrupted traditional tourism patterns [2,3]. By examining these regional dynamics, we aim to contribute to region-specific strategies that foster sustainable tourism aligned with SDG 8 (Decent Work and Economic Growth).

Hypothesis H2. *An increase in the number of overnight stays (“ldorm”) positively impacts revenue across the four Portuguese NUTS II regions.*

Higher occupancy rates are expected to enhance overall revenue through increased guest spending (supported by the Destination Choice Model [6] and Thrane and Farstad’s work [8]). However, variations in seasonality and infrastructure capacity could influence how this relationship plays out across different regions. While greater numbers of overnight stays generally lead to higher revenue, the effectiveness of this relationship may depend on yield management strategies to avoid overuse of resources or unsustainable tourism practices, as highlighted by Northcote and Macbeth [11]. This hypothesis was tested through regional analysis, particularly in the context of post-pandemic recovery and economic resilience [5].

Hypothesis H3. *A higher proportion of foreign guests (“hospf”) is positively associated with increased revenue.*

Regions with a greater share of international visitors are expected to experience higher revenue due to the typically higher spending habits of foreign tourists, as evidenced by studies on international tourism expenditures [9,10]. However, the economic and sustainability impacts of foreign guests may vary depending on local infrastructure, cultural factors, and environmental carrying capacity. This study will assess how foreign tourist inflows interact with regional characteristics to influence not only revenue generation

but also the long-term sustainability of tourism practices. The findings are expected to inform policy recommendations aimed at promoting economic growth while ensuring that the influx of foreign guests contributes to sustainable development, in line with SDG 12 (Responsible Consumption and Production).

Table 1 shows the basic statistics for the whole sample. The variable *lprov* (total revenue) has a mean of 12.48 with a narrow range (10.31 to 14.17), indicating relatively stable revenue levels across observations. This stability in revenue is essential for assessing sustainable economic growth in the tourism sector, as consistent revenues support long-term planning and development. *Estada* (average stay) varies from 2.00 to 6.00 days, with a mean of 3.71, showing a moderate spread in stay durations, which can influence the environmental impact and resource consumption patterns in different regions.

Table 1. Baseline statistics for the whole sample.

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>lprov</i>	56	12.48	0.99	10.31	14.17
<i>estada</i>	56	3.71	1.33	2.00	6.00
<i>ldorm</i>	56	6.83	1.23	4.74	8.41
<i>hospf</i>	56	57.33	16.07	24.00	82.00
<i>dormver</i>	50	40.22	6.31	30.30	57.50

Ldorm (log of overnight stays) has a mean of 6.83 and ranges from 4.74 to 8.41, suggesting significant variability in overnight stays. The *hospf* (proportion of foreign guests) variable varies widely from 24.00% to 82.00%, with a mean of 57.33%, indicating substantial differences in the composition of guests. This variation is crucial for understanding how different tourist demographics contribute to or detract from sustainable tourism practices. *Dormver* (the proportion of overnight stays between July and September) ranges from 30.30% to 57.50%, with a mean of 40.22%, reflecting seasonal variations in overnight stays. Understanding these seasonal patterns can help in developing strategies that align with sustainable tourism objectives by balancing tourist influx throughout the year.

2.2. Statistical Analysis

Regression Model:

$$lprov_{it} = \beta_0 + \beta_1 estada_{it} + \beta_2 ldorm_{it} + \beta_3 hospf_{it} + \beta_4 dormver_{it} + \alpha_i + \epsilon_{it} \quad (1)$$

The regression analyses were conducted using Stata 17.0, which provided a robust tool for statistical modeling and data analysis. Coefficients were tested for statistical significance using *t*-tests and *p*-values. Adjusted R-squared values were used to assess the explanatory power of the models. These models were developed with an emphasis on understanding how tourism dynamics influence sustainability, assessing not only economic outcomes but also the potential for sustainable development in the tourism sector. This study aims to offer robust insights into the factors influencing revenue in tourist accommodations and their regional variations while also highlighting the implications for sustainable tourism practices.

Implications for Estimation Methods:

OLS (Ordinary Least Squares): The relatively stable mean and narrow range of *lprov* suggests that OLS can effectively capture average relationships if the assumptions of linearity and homoscedasticity hold. However, the wide ranges in *hospf* and *dormver* could indicate potential outliers or heteroscedasticity, which might affect the robustness of OLS estimates. Considering the goals of sustainable tourism, OLS can help identify average trends in revenue that support long-term economic stability.

FE (Fixed Effects): The Fixed Effects model is well-suited for controlling time-invariant regional characteristics. Given the moderate within-region variability in *estada* and *ldorm*,

FE can effectively handle unobserved heterogeneity but may lose power if the variability within regions is limited. By accounting for region-specific factors, FE models can offer insights into how sustainable practices may vary across different geographic and socio-economic contexts.

QREG (Quantile Regression): The significant variability in *hospf* and *dormver* suggests that QREG could provide valuable insights into how different quantiles of revenue are influenced by predictors, offering a robust analysis of heterogeneous effects across the revenue distribution. This method is particularly useful if there are outliers or non-normal error distributions. Quantile Regression can reveal how diverse tourist behaviors impact sustainability outcomes across different levels of revenue, which is critical for tailored policymaking.

By incorporating these three estimators, this study aims to provide a comprehensive analysis that not only explores economic impacts but also aligns with sustainable tourism principles.

3. Results

Table 2 presents the regression results using OLS, FE, and QREG estimators for the entire sample of four regions. *estada* (average stay in tourist accommodations). The coefficient for the average stay is negative and significant across the OLS, FE (−0.741, $t = -3.42$), and QREG (−0.802, $t = -2.02$), indicating that longer average stays are associated with decreased total revenues. This may seem counterintuitive, as one would expect longer stays to result in higher total revenues. However, this result can be explained by examining the spending patterns of tourists. Longer stays might be associated with reduced daily expenditures, as tourists may economize over extended periods, leading to lower total revenue despite the increased length of stay. Furthermore, longer stays could potentially reduce revenue if tourists choose lower-cost accommodations or participate in less expensive activities during extended visits.

Table 2. Results for the whole sample.

Variable	FE	RE	QREG
<i>estada</i>	−0.741 ** (−3.42)	−0.741 ** (−3.42)	−0.802 * (−2.02)
<i>ldorm</i>	0.214 (0.67)	0.214 (0.67)	0.0769 (0.13)
<i>hospf</i>	0.0773 *** (3.53)	0.0773 *** (3.53)	0.0807 (2.00)
<i>dormver</i>	0.0434 (1.43)	0.0434 (1.43)	0.0771 (1.38)
<i>_cons</i>	7.618 *** (7.44)	7.618 *** (7.44)	7.534 *** (4.00)
N	50	50	50
adj. R-sq	0.420	0.420	-

Notes: N is the number of observations; t statistics are in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Hospf (proportion of foreign guests in tourist accommodations): The coefficient for the proportion of foreign guests is positive and highly significant in the OLS and FE (0.0773, $t = 3.53$). This suggests that a higher proportion of foreign guests is associated with increased total revenues, as foreign tourists typically spend more compared with domestic tourists. However, an increase in the proportion of foreign guests could also be associated with higher operational costs and challenges in balancing the environmental and social impacts of international tourism. Thus, efforts to attract foreign tourists should focus on those who engage in sustainable practices, such as eco-tourism or cultural tourism, to ensure that the benefits outweigh any negative impacts.

3.1. Territories and Transportation Hubs

The north of Portugal is characterized by its rugged terrain and historic cities like Porto. Major transportation hubs include the Francisco Sá Carneiro Airport in Porto, which is a significant entry point for international tourists. The region's well-developed rail and road networks also facilitate tourist movement.

The Algarve, known for its sunny climate and beautiful beaches, is a popular tourist destination in Southern Portugal. Faro Airport serves as the main gateway for international tourists, with an extensive network of roads and regional railways connecting various coastal and inland destinations.

The Azores archipelago consists of nine volcanic islands known for their lush landscapes and unique natural beauty. João Paulo II Airport in Ponta Delgada is the primary international airport, with inter-island flights and ferries providing transportation between the islands.

Madeira, an island group located in the Atlantic Ocean, is renowned for its mountainous terrain and subtropical climate. The main gateway is Cristiano Ronaldo International Airport in Funchal, which connects Madeira to mainland Portugal and other international destinations.

3.2. Average Tourist Profiles

Tourists in the North, particularly around Porto, are generally young, active, and upper-middle class with above-average income. They are drawn by cultural, historical, and natural attractions, especially wine tourism in the Douro Valley and nature-based tourism in Protected Natural Areas. Visitors include a mix of international and domestic tourists, often from urban centers like Lisbon and Porto. Many tourists in this region are wine enthusiasts, nature lovers, or those seeking cultural experiences [12].

Tourists to the Algarve are primarily sun-and-beach seekers, often from European countries such as the UK, Germany, and France. While relaxation and coastal resorts remain the primary draw, there is a growing interest in the region's cultural and historical offerings, such as architectural landmarks and traditional villages. A younger demographic also engages in activities like water sports and nightlife, diversifying the tourist base [13].

The tourist profile in the Azores includes a mix of international and domestic visitors, with a strong focus on eco-tourism and nature-based activities. Tourists are attracted to the region's volcanic landscapes, hiking trails, and whale-watching opportunities. Many are interested in sustainable tourism and immersive experiences, seeking to connect with the natural environment and local culture [14].

Madeira tourists are often younger, including retirees and students, with a significant portion being first-time visitors from mainland Portugal. They are drawn to the island's gastronomy, natural beauty, and outdoor activities, such as walking in nature. Madeira's famous wine culture remains a key attraction, and tourists appreciate the balance between tradition and independent exploration. High-quality hospitality and personalized service also play a role in fostering loyalty among repeat visitors [15].

3.3. Regional Analysis and Sustainable Development Implications

Table 3 shows the regression results for the north region. The results indicate that increasing overnight stays (Ldorm) significantly boost total revenues (OLS: 1.701, $t = 9.28$; QREG: 1.505, $t = 6.35$). This underscores the importance of promoting longer stays to enhance revenues. However, the negative coefficient for the proportion of foreign guests (Hospf) in the OLS (-0.0318 , $t = -2.65$) suggests that foreign guests may prefer lower-cost accommodations or there might be a mismatch between foreign tourists' preferences and the region's offerings. To address this, targeting higher-value tourists who appreciate and are willing to pay for sustainable practices could be beneficial.

Table 4 presents the regression results for the Algarve. In the Algarve, the negative coefficients for the average stay (estada) in the OLS (-0.298 , $t = -3.35$) and QREG (-0.262 , $t = -2.93$) mirror the overall sample results, suggesting that longer stays reduce total revenues. This reduction in revenue from longer stays could be attributed to the phenomenon where tourists with extended stays might spend less daily, possibly opting for budget-friendly activities and accommodations.

Table 3. Results for the north.

Variable	OLS	FE	QREG
estada	0 (.)	0 (.)	0 (.)
ldorm	1.701 *** (9.28)	1.701 *** (9.28)	1.505 *** (6.35)
hospf	−0.0318 * (−2.65)	−0.0318 * (−2.65)	−0.0202 (−1.31)
dormver	−0.0226 (−1.36)	−0.0226 (−1.36)	−0.0106 (−0.49)
_cons	6.098 *** (13.16)	6.098 *** (13.16)	6.187 *** (10.33)
N	14	14	14
adj. R-sq	0.981	0.981	-

Notes: N is the number of observations; t statistics are in parentheses. * $p < 0.05$, *** $p < 0.001$.

Table 4. Results for the Algarve.

Variable	OLS	FE	QREG
estada	−0.298 ** (−3.35)	−0.298 ** (−3.35)	−0.262 * (−2.93)
ldorm	1.836 ** (4.50)	1.836 ** (4.50)	1.731 ** (4.22)
hospf	−0.0138 (−0.94)	−0.0138 (−0.94)	−0.0139 (−0.94)
dormver	0.0255 (1.44)	0.0255 (1.44)	0.0264 (1.48)
_cons	−0.272 (−0.08)	−0.272 (−0.08)	0.346 (0.10)
N	14	14	14
adj. R-sq	0.912	0.912	-

Notes: N is the number of observations; t statistics are in parentheses. * $p < 0.05$, ** $p < 0.01$.

Strategies should aim to increase daily spending by tourists with longer stays, potentially through sustainable activities that promote the local culture and environment. The positive coefficient for overnight stays (ldorm) across estimators (OLS: 1.836, $t = 4.50$; QREG: 1.731, $t = 4.22$) highlights the significance of increasing overnight stays to boost total revenues. Sustainable policies should encourage longer stays that minimize environmental impact, such as off-season travel and supporting local businesses.

Table 5 shows the regression results for the Azores. The coefficient for overnight stays (Ldorm) remains highly positive and significant across all estimators (OLS: 1.248, $t = 19.63$; QREG: 1.209, $t = 13.18$), reinforcing the importance of increasing tourist numbers and their lengths of stay. The negative coefficient for the proportion of foreign guests (Hospf) in the OLS (−0.00788, $t = -2.58$) may reflect lower spending or preferences for budget options among foreign tourists. Understanding these spending patterns and tailoring offerings to attract higher-spending tourists while promoting sustainability is essential. Sustainable strategies in the Azores could include promoting eco-friendly accommodations and reducing the environmental impact of tourism activities.

Table 5. Results for the Azores.

Variable	OLS	FE	QREG
estada	0 (.)	0 (.)	0 (.)
ldorm	1.248 *** (19.63)	1.248 *** (19.63)	1.209 *** (13.18)
hospf	−0.00788 * (−2.58)	−0.00788 * (−2.58)	−0.00627 (−1.43)
dormver	0.00296 (0.54)	0.00296 (0.54)	0.00339 (0.43)
_cons	3.401 *** (7.67)	3.401 *** (7.67)	3.545 *** (5.54)
N	14	14	14
adj. R-sq	0.978	0.978	-

Notes: N is the number of observations; t statistics are in parentheses. * $p < 0.05$, *** $p < 0.001$.

Table 6 presents the regression results for Madeira. The negative coefficient for the average stay (Estada) in QREG (−0.0247, $t = -3.01$) aligns with the results from other regions, indicating that longer stays reduce total revenues. This finding suggests that tourists with extended stays might economize on daily expenses, affecting overall revenue.

Table 6. Results for Madeira.

Variable	OLS	FE	QREG
estada	−0.0160 (−1.05)	−0.0160 (−1.05)	−0.0247 (−3.01)
ldorm	0.973 *** (15.63)	0.973 *** (15.63)	0.946 *** (28.27)
hospf	0.00157 (0.46)	0.00157 (0.46)	0.00272 (1.47)
dormver	−0.00982 (−1.42)	−0.00982 (−1.42)	−0.00979 (−2.64)
_cons	5.288 ** (11.31)	5.288 ** (11.31)	5.451 *** (21.69)
N	8	8	8
adj. R-sq	0.996	0.996	-

Notes: N is the number of observations; t statistics are in parentheses. ** $p < 0.01$, *** $p < 0.001$.

Strategies to mitigate this impact could involve developing high-value, sustainable tourism experiences that enhance daily spending. The positive coefficient for overnight stays (Ldorm) across all estimators (OLS: 0.973, $t = 15.63$; QREG: 0.946, $t = 28.27$) emphasizes the importance of increasing overnight stays to boost revenues. Sustainable tourism strategies in Madeira should focus on enhancing accommodation facilities and promoting practices that reduce environmental impact, such as energy-efficient buildings and waste reduction programs.

4. Discussion

The results of this study provide nuanced insights into the relationship between tourism activities and revenue generation across different regions in Portugal, with significant implications for sustainable tourism development and management. By examining the interplay between the average stay (“estada”), overnight stays (“ldorm”), and the proportion of foreign guests (“hospf”), the findings reveal both consistencies and variations that align with and challenge existing tourism theories, particularly with the traditional models suggesting that longer stays generally lead to increased revenue through extended use of facilities and higher overall spending [6–8,10].

The findings reveal that regional characteristics and accessibility significantly influence tourism dynamics and revenue generation across Portugal. For instance, the North region’s strong emphasis on cultural and wine tourism is complemented by its well-connected transportation infrastructure, including major rail and road networks and the Francisco Sá Carneiro Airport. This accessibility attracts a younger, affluent demographic eager to explore historical sites and engage in nature-based activities, leading to a positive correlation between overnight stays and total revenues (Table 3). The data suggest that targeting high-value tourists who are willing to invest in sustainable practices can further enhance revenue, especially given the negative impact of foreign guests who may prefer budget accommodations.

Conversely, the Algarve’s primary appeal as a sun-and-beach destination is accessible through Faro Airport, attracting a diverse range of European tourists. However, the regression results (Table 4) indicate that longer stays correlate with reduced total revenues. This might be explained by the tendency of tourists in this region to engage in budget-friendly activities and accommodations during extended stays, reflecting a mismatch between their spending patterns and the higher-cost offerings of the region. The accessibility of various leisure options may lead to lower daily expenditures, highlighting the importance of developing strategies to encourage higher daily spending, such as promoting unique cultural and sustainable activities.

In the Azores, the focus on eco-tourism is appealing to visitors seeking sustainable experiences, with significant accessibility provided through João Paulo II Airport and inter-island transport options. The positive correlation between overnight stays and revenue (Table 5) reinforces the necessity of promoting the region’s unique natural offerings. However, the negative coefficient for the proportion of foreign guests indicates that their spending patterns may not align with local economic benefits. This discrepancy sug-

gests that while accessibility attracts tourists, understanding their preferences is crucial to optimizing revenue, particularly by tailoring offerings to attract higher-spending visitors.

Madeira, accessible via Cristiano Ronaldo International Airport, presents a diverse tourist profile that combines cultural heritage with outdoor activities. Despite positive revenue from overnight stays (Table 6), the negative impact of the average stay suggests that tourists may economize during extended visits. This outcome underscores the importance of enhancing the region's offerings to promote higher daily spending while ensuring sustainability, such as through eco-friendly accommodations and local culinary experiences.

Sustainable tourism that incorporates environmental, socio-cultural, and economic aspects must be adaptive and region-specific, balancing development with resource conservation [16–18]. This study underscores the necessity for tailored tourism strategies that align with regional characteristics and tourist profiles to optimize revenue generation while promoting sustainable practices.

Thus, the findings do not support Hypothesis H1, as several regions, including the Algarve and Madeira, exhibit a counterintuitive relationship where longer stays are associated with lower revenue. This finding contradicts traditional tourism economics theories positing that longer stays enhance revenue due to greater facility utilization and spending [6–8,10]. Although the existing literature generally supports the notion that longer stays contribute positively to revenue through maximizing accommodation use and increasing overall expenditures [6], recent studies suggest that tourists who stay longer may spend less per day, often opting for budget-friendly choices or reducing their spending over time [11,19–21]. This negative impact, observed in regions like the Algarve and Madeira, underscores the need for a nuanced understanding of tourist behavior and spending patterns, considering factors such as the type of tourism (e.g., leisure vs. business), seasonal variations, and available infrastructure.

Hypothesis H2 is supported, revealing a positive and significant relationship between the number of overnight stays and revenue across all regions, including the north and the Algarve. This finding reinforces the traditional view that increasing the number of nights tourists stay can enhance revenue and aligns with established theories linking higher occupancy rates to increased revenue generation [8]. However, the effectiveness of this strategy may vary based on regional characteristics, such as accommodation quality and local attractions, emphasizing the need for localized strategies that consider region-specific dynamics.

Hypothesis H3 is partially supported. Regions like the Algarve and Madeira show a positive impact on revenue with a higher proportion of foreign guests, attributable to additional spending by international tourists. In contrast, the Azores present a negative outcome, where an increased proportion of foreign guests does not significantly boost revenue and may even be associated with lower revenue. This reflects the complex relationships posited in tourism economics theories. The positive impact in regions such as the Algarve and Madeira supports the idea that foreign guests contribute to higher revenue through increased spending. However, the negative impact observed in the Azores indicates variability that challenges the generalized assumption that more foreign tourists always equate to increased revenue. Factors such as visitor spending patterns and local economic conditions are crucial, as highlighted in previous research [3,9].

By leveraging the potential of technology and system dynamics in tourism planning, regional tourism authorities can tailor strategies to meet sustainable development goals while enhancing economic resilience in a post-pandemic world [19,22].

5. Conclusions

These results contribute significantly to tourism management theory by challenging traditional assumptions and highlighting the necessity of understanding the causal relationships that influence tourism revenue. By elucidating the complex interactions among the average stay, overnight stays, foreign guests, and revenue, this study advocates for the development of comprehensive theoretical models that capture the complexities of tourism

economics. Such models should integrate economic, environmental, and social factors to provide a more holistic perspective on tourism dynamics.

These findings indicate that tourism managers must adopt a more sophisticated approach to revenue management, transcending the focus on merely increasing occupancy rates or average stays. To enhance daily spending during extended stays, managers should implement targeted strategies, such as offering a diverse range of activities, premium services, and specially curated packages that incentivize higher daily expenditures. Furthermore, crafting tailored marketing initiatives that optimize the mix of foreign and domestic tourists can bolster the economic benefits derived from international visitors while mitigating potential environmental and social impacts.

The regional variations observed in this study underscore the importance of localized tourism management strategies that account for unique local characteristics and market conditions. Recognizing that tourism dynamics can vary significantly based on regional contexts supports the development of region-specific models and strategies designed to maximize tourism outcomes while promoting sustainability. By establishing clear causal links between these variables and revenue strategies, the findings offer actionable insights for improving revenue generation in the tourism sector.

6. Limitations and Future Research

This study provides valuable insights into tourism revenue dynamics and their implications for sustainable tourism development; however, it is subject to several limitations. Primarily, the focus on Portuguese NUTS II regions may limit the generalizability of these findings to other geographical contexts, as regional characteristics can significantly influence tourism economics. Furthermore, the reliance on secondary data restricts the depth of analysis regarding factors such as accommodation quality, guest satisfaction, and real-time economic conditions.

To address these limitations, future research should consider expanding the scope to include a broader range of regions and countries, thereby enhancing the applicability of findings. Additionally, exploring the impact of emerging trends—such as digital transformation in tourism, changes in consumer behavior post-pandemic, and the influence of global economic conditions—could provide a more nuanced understanding of tourism revenue dynamics.

This study contributes to a more comprehensive understanding of tourism revenue by integrating sustainability into the analysis of tourism activities. It challenges traditional assumptions about the relationship between tourist activity metrics and revenue, emphasizing the need for region-specific strategies. By promoting sustainable tourism practices that balance economic, environmental, and social considerations, this research offers valuable insights that can inform the development of sustainable tourism policies and enhance the long-term viability of tourist destinations.

Funding: This paper was financed by the National Funds of the FCT—Portuguese Foundation for Science and Technology within the project «UIDB/04928/2020».

Informed Consent Statement: Not applicable.

Data Availability Statement: The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author.

Conflicts of Interest: The author declares no conflict of interest.

References

1. Manente, M. Destination management and economic background: Defining and monitoring local tourist destinations. In Proceedings of the International Conference on Measuring Tourism Economic Contribution at Sub-National Levels, Malaga, Spain, 29–31 October 2008; Volume 10, pp. 1–21.
2. Baños-Pino, J.F.; Boto-García, D.; Del Valle, E.; Sustacha, I. The impact of COVID-19 on tourists' length of stay and daily expenditures. *Tour. Econ.* **2023**, *29*, 437–459. [[CrossRef](#)]

3. Mahendru, M.; Arora, V.; Chatterjee, R.; Sharma, G.D.; Shahzadi, I. From over-tourism to under-tourism via COVID-19: Lessons for sustainable tourism management. *Eval. Rev.* **2024**, *48*, 177–210. [[CrossRef](#)] [[PubMed](#)]
4. Santos, E.; Castanho, R.A. The impact of size on the performance of transnational corporations operating in the textile industry in Portugal during the COVID-19 pandemic. *Sustainability* **2022**, *14*, 717. [[CrossRef](#)]
5. Santos, E.; Castanho, R.A.; Meyer, D. Is investment contributing to competitiveness in nautical tourism in the Atlantic area? *Water* **2022**, *14*, 2964. [[CrossRef](#)]
6. García-Sánchez, A.; Fernández-Rubio, E.; Collado, M.D. Daily expenses of foreign tourists, length of stay and activities: Evidence from Spain. *Tour. Econ.* **2013**, *19*, 613–630. [[CrossRef](#)]
7. Baker, D.A.; Crompton, J.L. Quality, satisfaction, and behavioral intentions. *Ann. Tour. Res.* **2000**, *27*, 785–804. [[CrossRef](#)]
8. Thrane, C.; Farstad, E. Tourists' length of stay: The case of international summer visitors to Norway. *Tour. Econ.* **2012**, *18*, 1069–1082. [[CrossRef](#)]
9. Glyptou, K. Operationalising tourism sustainability at the destination level: A systems thinking approach along the SDGs. *Tour. Plan. Dev.* **2024**, *21*, 95–121. [[CrossRef](#)]
10. Aguiló, E.; Rosselló, J.; Vila, M. Length of stay and daily tourist expenditure: A joint analysis. *Tour. Manag. Perspect.* **2017**, *21*, 10–17. [[CrossRef](#)]
11. Northcote, J.; Macbeth, J. Conceptualizing yield: Sustainable tourism management. *Ann. Tour. Res.* **2006**, *33*, 199–220. [[CrossRef](#)]
12. Liberato, D.; Liberato, P.; Sousa, B.; Paíga, H. Exploring wine tourism and competitiveness trends: Insights from Portuguese context. *E-Rev. Estud. Intercult. E-J. Intercult. Stud.* **2023**, *11*, 1–17.
13. Pérez-Aranda, J.R.; Guerreiro, M.; Mendes, J. Are Myths and Legends Used in Tourism Communication as a Resource? The Case of Algarve Online Brochures. *Enlightening Tour.* **2015**, *5*, 65–99.
14. Castanho, R.A.; Santos, C.; Couto, G. Creative tourism in islands and regional sustainable development: What can we learn from the pilot projects implemented in the Azores territory? *Land* **2023**, *12*, 498. [[CrossRef](#)]
15. Garcês, S.; Pocinho, M.; de Jesus, S.N. Madeira Tourists Profile A Positive Psychology Approach. In *Managing Destinations*; Emerald Publishing Limited: Bradford, UK, 2024; Volume 14, pp. 69–83.
16. Baloch, Q.B.; Shah, S.N.; Iqbal, N.; Sheeraz, M.; Asadullah, M.; Mahar, S.; Khan, A.U. Impact of tourism development upon environmental sustainability: A suggested framework for sustainable ecotourism. *Environ. Sci. Pollut. Res.* **2023**, *30*, 5917–5930. [[CrossRef](#)] [[PubMed](#)]
17. Bramwell, B.; Lane, B. Sustainable tourism: An evolving global approach. *J. Sustain. Tour.* **1993**, *1*, 1–5. [[CrossRef](#)]
18. Stojanović, T.; Trišić, I.; Brđanin, E.; Štetić, S.; Nechita, F.; Candrea, A.N. Natural and sociocultural values of a tourism destination in the function of sustainable tourism development—An example of a protected area. *Sustainability* **2024**, *16*, 759. [[CrossRef](#)]
19. Das, D.K. A System Dynamics model for regional tourism planning and development management. *Rev. Bus. Technol. Res. (RBTR) Vol. 3* **2010**, *2010*, 243.
20. Thrane, C.; Farstad, E. Domestic tourism expenditures: The non-linear effects of length of stay and travel party size. *Tour. Manag.* **2011**, *32*, 46–52. [[CrossRef](#)]
21. Riasi, A.; Schwartz, Z.; Liu, X.; Li, S. Revenue management and length-of-stay-based room pricing. *Cornell Hosp. Q.* **2017**, *58*, 393–399. [[CrossRef](#)]
22. Neshat, N.; Moayedfar, S.; Rezaee, K.; Amrollahi Biuki, N. Sustainable planning of developing tourism destinations after COVID-19 outbreak: A deep learning approach. *J. Policy Res. Tour. Leis. Events* **2024**, *16*, 1–21. [[CrossRef](#)]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.