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## Changes in Travel Behavior: COVID-19 Pandemic and New Mobility Trends

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*A Mia Madre,  
per non avermi mai lasciata sola*



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# Introduction

The study of travel behavior is a recent area of research that developed alongside the rise of transportation systems. Indeed, early studies investigated whether vehicle ownership within a household increased the likelihood of travel.

From that moment on, several research focused on travel behavior examining the numerous factors that influence the decisions during the journey.

With the outbreak of the COVID-19 pandemic, which began in Wuhan (China) in 2019, many sectors faced severe crises, and tourism was no exception. Many authors studied the changes in travel behavior, as government restrictions and the fear of contagion led to a significant decline in the number of trips. In particular, the international travel sector was hit harder than the domestic one, which is typically more resilient to crises. Indeed, according to the literature, when international tourist numbers decline, attention shifts back to domestic tourism.

In the context of the COVID-19 crisis, domestic tourism emerged as a key driver of economic recovery in several destinations worldwide (UN Tourism, 2020).

The study of tourism flows in the pre-, during-, and post-pandemic context provides insights into new travel trends, whether lasting or temporary, that emerged because of the crisis. However, analyzing these flows requires a deep understanding of the sources through which they are identified. Indeed, for better knowledge, comprehension, and interpretation of travel patterns and tourist behaviors, it is essential to know the statistical sources of tourism.

These sources can refer to both tourism demand and supply, providing different information types. Furthermore, these often involve surveys addressed to competent authorities in the case of supply or households in the case of demand. Specifically, tourism demand provides information about visitors (tourists and excursionists) and individuals who did not travel. The data collected often focuses on travel choices, particularly on behavior at the destination, including spending patterns, accommodation, travel motivations, and more. In this case, the perspective

adopted for studying tourism is that of the visitor, which allows for the collection of valuable information about tourism at the destination.

On the other hand, the analysis of tourism supply involves primarily tourism businesses or accommodation facilities, collecting information on tourism services, hotel occupancy rates, and similar aspects.

The development of the first statistical sources on tourism in Italy is relatively recent, beginning in 1959 when the Italian National Statistics Institute (ISTAT) started collecting data on Italian holiday travelers through a national household survey (ISTAT, n.d.). Over time, tourism also gained social and economic importance across Europe, leading to the need for a standardized system of tourism statistics.

In Europe, the first effort to harmonize tourism statistics came with Directive 95/57/EC of the Council of the European Union, issued on November 23, 1995. This directive was later repealed in favor of Regulation (EU) No. 692/2011 of the European Parliament and of the Council, adopted on July 6, 2011. This regulation provides a common framework for tourism statistics at the European level. It thus enables a harmonization of these sources allowing a comparison among European countries. The methodological guidelines countries have to follow are provided by *the International Recommendations for Tourism Statistics* (IRTS) published in 2010 by the United Nations Statistical Commission. Specifically, this document is a “comprehensive methodological framework for collection and compilation of tourism statistics in all countries irrespective of the level of development of their statistical systems” (UNWTO, 2010, p. iii). Furthermore, this document offers key definitions and foundational concepts in tourism to promote consistency across European tourism statistics sources.

At the European level, tourism supply and demand surveys exhibit notable similarities, and this work will focus on surveys from Italy, Spain, France, and Germany. Specifically, the main characteristics of surveys on demand and supply will be considered, including information such as the type of flow under examination, the main aggregates addressed, the sample design, the data collection technique, limitations, and more. By analyzing the data and microdata on supply,

and more specifically on tourism demand, it becomes possible to trace and study travel behavior.

Today, understanding travel behavior is crucial for forecasting travel demand and improving the management and organization of services designed to meet the needs of tourists at the destination. Indeed, according to Juvan et al. (2017), "Monitoring tourist behavior is a key factor in the planning of tourist services" (p. 8). Furthermore, Mao (2023) states, "Strengthening the analysis of travel behavior can organically combine qualitative analysis and quantitative analysis to more effectively assess and predict traffic demand and formulate more effective policies and measures for traffic construction, management, and control" (p. 4).

However, defining travel behavior is not straightforward, as it is a broad concept that requires consideration of various elements. When addressing travel behavior, it is essential to account for trip variables, which are fundamental to describing it. The study of these variables referred to as "travel determinants" offers a deeper understanding of tourists' preferences. Certainly, when discussing travel behavior, it is important to consider the purpose of the trip, such as leisure, business, or Visiting Friends and Relatives (VFR), among others. Other crucial variables include the mode of transportation used, the length of stay, the type of accommodation chosen, expenditures, and socio-demographic characteristics.

With the advent of the COVID-19 pandemic, travel behavior has changed. This shift alters travelers' preferences, leading them to favor certain types of accommodation over others, choose specific modes of transportation, or opt for different types of trips. In this time of crisis, new travel behaviors emerged, primarily driven by the necessities imposed by the pandemic. During this period, trips declined not only in frequency but also in distance.

Proximity tourism became critically important during the COVID-19 years. Due to government restrictions on tourism, people were unable to undertake international trips and, as a result, tended to travel to nearby regions. Proximity, understood in this context as geographical proximity, actually has numerous interpretations in literature. Among these are cognitive, organizational, social, institutional, and the one relevant to our study, geographical proximity (Boschma, 2004).

With the onset of the pandemic, many authors focused on the concept of proximity related to tourism, offering various definitions. Among them, proximity tourism is a “particular form of tourism that emphasizes local destinations, short distances, and lower-carbon modes of transportation” (Salmela et al., 2021, p.46).

Proximity tourism allows tourists to explore nearby destinations they may not have had the opportunity to visit or experience before. In this sense, residents become visitors in their own cities or nearby areas.

In the context of the study of proximity tourism, it is interesting to understand whether this trend had occurred in two European countries, Italy and Spain. Both destinations are located in the Mediterranean area and are characterized by intense tourist flows. Specifically, in Italy, the tourism sector is a driving force for the economy, contributing to the maintenance of many jobs and the creation of new ones (approximately 185,000 new jobs in 2023) (WTTC, 2024), while in Spain, before the pandemic, international arrivals were around 83 million (UNWTO, 2019). Moreover, the comparison between these two countries is made possible thanks to the availability of microdata provided by the respective national statistical offices: ISTAT for Italy and INE for Spain.

In the first part of the analysis, some descriptive statistics will be implemented, and then an attraction coefficient (Gálvez et al., 2014) will be applied to 10 origin-destination matrices for both countries. The analysis covers 5 years (2019-2023), allowing for an examination of the pre-, during-, and post-pandemic periods. The attraction coefficient could reveal the presence or absence of proximity tourism and travel patterns that developed during the pandemic period.

In addition to Italy and Spain, another study will highlight the relationship between COVID-19 and travel choices, although in a different way. The country considered is Denmark, a Northern European country that is part of the Scandinavian Peninsula. Specifically, this study will examine the relationship between the fear of COVID-19 and the travel choices made by tourists to determine whether any significant relationships exist. This study will be conducted by implementing multiple logit models, considering three dependent variables: the type of accommodation, the length of stay, and activities during the trip, such as “spending

time in nature”. The results will indicate whether these variables are related to the fear of COVID-19.

In conclusion, this thesis explores the topic of travel behavior from multiple perspectives.

First of all, the first chapter will introduce the statistical sources on tourism demand and supply across four European countries. It will also present Regulation 692/2011 and the International Recommendations for Tourism Statistics (IRTS), providing a foundation for understanding the nature of the data analyzed in the following sections.

The second chapter reviews the literature on travel behavior, focusing on how key travel variables have evolved with the COVID-19 pandemic.

Lastly, three case studies involving two Mediterranean countries and one Nordic country will be presented in the third and last chapters.

Chapter three specifically examines a new travel trend, proximity tourism, that emerged during the COVID-19 years, focusing on Italy and Spain.

Although this study covers a broad time frame, it does not provide a definitive basis to interpret these changes as being associated with COVID-19. For this reason, the last chapter shifts to the Danish case study, where logit models are employed to explore the relationship between the fear of COVID-19 and changes in travel behavior.

This work, in addition to enhancing knowledge about tourism statistics sources, uses three case studies to identify some changes in travel behavior in the medium and long term. This can help improve the understanding of how tourism trends may change over time and in times of crisis, offering valuable insights for professionals involved in tourism planning, policy-making, and destination development.

# Chapter 1

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## Chapter 2

# The Influence of the COVID-19 Pandemic on the Main Travel Features: A Literature Review

### Abstract

*This chapter provides an overview of the effects of the COVID-19 pandemic on travel behavior, based on a review of existing literature.*

*First of all, the concept of travel behavior will be defined, tracing its origins and exploring the early studies on this topic.*

*These studies offer various perspectives on the factors influencing tourist decisions and provide important insights into tourism development. Before delving into the effects of the pandemic, it is crucial to consider the key variables that shape travel behavior. Among these, the choice of accommodation, mode of transportation, purpose, and trip duration are important.*

*This work further explores how these travel variables have changed after the COVID-19 pandemic and, in particular in the short-, medium-, and long-term.*

*Through this comprehensive exploration, the chapter aims to provide a clearer understanding of how the pandemic has reshaped tourism behavior in general, across different timeframes.*

## 2.1 Introduction

The purpose of this chapter is to study the main changes in travel behavior caused by the COVID-19 pandemic, by identifying those manifested in the short, medium, and long term. Before delving into this topic, it is crucial to define the concept of travel behavior and identify its nuances and origins, in order to better understand how this concept has evolved over time, up to the present day.

This literature review aims to investigate pioneering studies on travel behavior, exploring the circumstances that contributed to its development and identifying the time and methods with which this concept was initially studied. Furthermore, the objective of this study is to understand the key influences on travel behavior, namely the variables that determine travelers' decisions and choices. Finally, the impact of COVID-19 on these variables will be examined to understand if some changes will last over time.

Studying travel behavior is greatly important for gaining knowledge about the tourism sector, especially after the downturn caused by COVID-19. Numerous studies emphasize its relevance. Among these, Juwan et al. (2017) argues that "The behavior of tourists is the most important indicator or predictor of future tourist behavior" (p.23) and they go on to state, "Monitoring tourist behavior is a key factor in the planning of tourist services" (p.30).

The study of travel behavior is closely tied to the examination of tourist movements within destinations. It holds significance within the framework of traffic planning in tourist destinations. In fact, according to Mao (2023):

Travel behavior theory is one of the most important theories in traffic planning and even traffic management and control [...]. Strengthening the analysis of travel behavior can organically combine qualitative analysis and quantitative analysis to more effectively assess and predict traffic demand and formulate more effective policies and measures for traffic construction, management, and control (p.4).

## 2.2 Travel Behavior in Literature

Travel behavior or tourist behavior is generally used to describe the area of inquiry of Consumer behavior (Cohen et al., 2014). In particular, travel behavior refers to consumption behavior within the tourism industry. Therefore, it is, in itself, a consumption behavior in a specific context. As concerns consumer behavior, it “involves certain decisions, activities, ideas, or experiences that satisfy consumer needs and wants” (Cohen et al., 2014, p.872).

Consumer behavior can be studied in numerous ways, all of which are different from each other. This is the reason why there are also several definitions that are rarely general, instead, the majority of them is focused on some elements.

Other definitions of travel behavior have focused on the change in environmental settings, considering travel behavior as: "The consumption of both everyday and unusual products and services outside the environment of everyday life" (Juvan et al., 2017, p.24).

According to the authors, for a comprehensive understanding of travel behavior, it is important to distinguish the key aspects of a tourist's behavior while on vacation from their behavior in everyday life. Today, looking at the international context, what could be considered determinants of travel are included within the International Recommendations for Tourism Statistics (IRTS). This document, published in 2010 by the United Nations Statistics Division in collaboration with UNWTO, provides guidelines for the collection of tourism data (UNWTO, 2010). Chapter 3 of IRTS is dedicated to tourist demand, specifically focusing on travel and visitor characteristics. Among the expressions of travel behavior, the following are included: motivation, type of *tourism product*, travel duration, origin, and destination, mode of transportation, and type of chosen accommodation.

Generally, travel behavior refers to a series of choices, attitudes, and preferences that the tourist exhibits before, during, and after the journey. For this reason, providing an exact definition of travel/tourist behavior is not straightforward, and it is not easy to find in literature a concise definition of what travel behavior is; instead, it is easier to encounter a broader range of observations related to this topic that involves numerous elements.

What emerges from the study of literature is that travel behavior is the combination of many elements that literature has focused on over the years. Among these elements, there are, for example, expenditure (daily or total), the mode of transportation such as car, or air transport, the type of accommodation (hotel, B&B, etc.), the duration of the trip (short, long), and the company during the journey (with family, alone, with friends, etc.).

Therefore, travel behavior originates from the traveler's will and intention, which shapes their journey and prompts choices throughout it that ultimately shape their judgment of the destination and influence their willingness to return or not.

Attempting to provide a comprehensive and concise definition of what travel behavior represents, it will be referred to as:

The collection of choices carried out by the tourists before, during, and after the journey, that defines the trip's modalities and the type of journey.

Henceforth, when discussing travel behavior, the aforementioned statement will be referred to as the "operational definition" to mitigate any potential ambiguities.

### **2.3 First Studies on Travel Behavior**

The term "behavior" is implicitly linked to the field of psychology, which has always studied its essence. Human behavior has indeed been analyzed by psychologists, psychotherapists, and experts in the field and is still the subject of numerous studies.

Over time, various definitions of behavior have been shared. In particular, within the field of psychology, John Watson, considered the father of behaviorism, argued that human beings are conditioned by the surrounding environment and learn through stimuli to which they respond.

From the concept of behavior emerging from the field of human study, the concept of travel behavior can be traced, which, although different, is not disconnected from the underlying principles of behavior. According to Caldito (2015), to understand

what truly influences tourists' decisions, the purpose of their travel, or how travel choices are made, it is important to delve into the psychology of travelers. In other words, it is necessary to investigate how travelers think, feel, and how the external environment can influence their decisions.

Furthermore, in the study of Pizam and Calantone (1987) on values as determinants of travel behavior, the thoughts of some psychologists are mentioned, stating that an individual's behavior is influenced by their values, which are shared beliefs with members of society.

The study of travel behavior is relatively recent and originated in the 1950s, coinciding with the development of motorization in the major US cities. Subsequently, through technology transfer from the US, similar developments occurred in Europe (Goulias, 2018).

Moreover, during this period and the following years, some events drew attention to the transportation sector, particularly aviation, thereby fostering the study of travel patterns.

In fact, in 1958, the world's first jet-powered transatlantic flight operated by BOAC (British Overseas Aircraft Corporation) contributed to shaping the history of aviation (Airways Magazine, 2023).

Approximately 20 years after this event, the introduction of deregulation completely changed the civil aviation industry and laid the foundation for the rise of low-cost airlines. This deregulation allowed airlines to set their own fares and flight routes. From that moment on, numerous airlines emerged, and many others expanded (Smithsonian National Air and Space Museum, 2021).

These changes in the American landscape facilitated the expansion of air transportation, likely encouraging travel and accelerating the rise of the low-cost system. As low-cost travel grew in popularity and trips became more frequent, it is plausible that this trend likely encouraged further exploration of travel behavior.

The initial studies began to focus on travel behavior to analyze the impact of motorization on trips and, consequently, on modes of transportation (Goulias, 2018). For example, these analyses aimed to understand if the use of a car in a household increased the likelihood of traveling. Moreover, these studies were

conducted by estimating travel demand to simulate traffic flow in cities using techniques “from considerations of population travel behavior and spatial interaction.” (Goulias, 2018, p.2). According to the author (p.2), travel behavior “aims to understand how traveler values, norms, attitudes, and constraints lead to observed behavior.” Indeed, the values and attitudes of travelers, as well as motivational or cognitive components, influence human behavior, highlighting once again the connection between the study of tourist behavior and the study of human behavior.

Other authors define the objectives of travel behavior research differently, dissociating it from psychological aspects and the theme of human behavior. Among them, Axhausen (2007) argues that travel behavior research studies the physical movement of people outside their “reference locations for any purpose.” Specifically, according to the author, the main objective of research on travel behavior is to study the percentage of people who leave their reference location, as well as the time these individuals spend away from the reference location, understood as the place they return to at the end of the day. Studies on travel behavior can be divided into four classes which are: “studies that apply one or more concepts of consumer behavior to tourism, studies that deal with the influence of satisfaction on loyalty, [...], quantitative research [...] and a small group of longitudinal studies aimed at understanding the whole process of tourist behavior (Juvan, 2017, pp 25,26).

The study of travel behavior has changed over the years. As previously mentioned, since it originated with the advent of motorization, many studies focused on the use of a vehicle to explain behavior. However, over the years, many other variables have become the subject of study, and the traveler’s lifestyle has also become important for understanding travel behavior. According to Davis (2020), most studies focus on a limited set of variables, such as using a private vehicle, while rarely exploring life events that influence travel behavior (likely due to complexity). The first study on the influence of lifestyle on travel behavior surprisingly dates back to 1960, but it has only been more extensively explored by researchers in the last decade (Van Acker et al., 2016). In addition to this, literature focused on how

beliefs, values, and convictions influence travel behavior. For instance, in 2020 Arroyo et al. published a study on how tourists' values influence travel behavior. Indeed, according to the author what is important to study is not only the psychosocial variables but also how these interact among them. The authors try to hypothesize all possible relationships and test them through two different equation models. The results of this study demonstrate that tourists' values influence the use of transportation modes. For example, people who are interested in walking or cycling have less probability of being associated with the use of a motorized vehicle.

It is clear that most of the time, studies focus on a specific travel behavior precisely because, being travel behavior a broad and rich concept with numerous elements, it is very challenging to encompass in a single study analysis related to dozens of travel variables that define the tourist's behavior. For this reason, studies on travel behavior often revolve around a few variables, if not just one.

#### **2.4 The Determinants of Travel Behavior**

Let's define "determinants" all the variables that can describe travel behavior. These variables are of fundamental importance for understanding tourists' preferences and their choices. Most of the time, they can be measured using statistical indicators but obtaining them is not easy. To do so, national statistical agencies or other private entities implement surveys that, although not straightforward to implement and sometimes costly, provide valuable information on tourist flows. The determinants of behavior are defined in various ways in the literature and may slightly differ from one study to another, even though they share the same objective, which is to describe a trend, a choice, or a decision of a sample of tourists and rarely even an individual tourist.



### 2.4.1 Socio-Demographic Attributes: Nationality, Age and Gender

In his work, Goulias (2018) argues that to understand the variability of travel behavior, socio-demographic factors are particularly important. These factors include gender, age, vehicle ownership, and profession. In addition, he also recognizes the importance of travel-related variables such as place of origin, destination, and purpose of the trip. The data from his research included demographic factors, spatial travel determinants such as traffic information, and actual descriptors of travel behavior, including "number of trips, distance traveled, travel time, purpose of the trip, origin of the trip, destination of the trip, travel schedule, mode of transportation for each trip, and the number of people with whom each trip was taken" (p.3).

The importance of the influence of socio-demographic factors on travel behavior is also highlighted by the U.S. Federal Highway Administration (2016) in its report *Understanding Travel Behavior*. The report recognizes that socio-demographic factors are often associated with different travel behaviors. Among these factors, the report particularly acknowledges gender, age, income, and race, to which vehicle ownership and general occupation should be added. According to the report, these factors are important in determining choices in transportation modes.

In 1995 a study was conducted (Pizam & Sussmann, 1995) to understand if nationality influences travel behavior. The study involved distributing questionnaires containing 20 behavioral characteristics to a group of tour guides. These guides, in turn, administered the study to tourists of Italian, Japanese, French, and American nationalities. From this work, it emerged that Italian and French tourists were the most similar in terms of travel behavior, while French and American tourists were the most different. Japanese tourists were the least similar to all the others. The interesting aspect lies in the behaviors listed by the authors, including interactions with other tourists, travel companions, duration of the trip, attitudes towards spending (souvenir purchases), and other factors related to knowledge of the visited location, and preferences for local food or otherwise.

Another study (Jönsson & Devonish, 2008) seeks to understand whether factors such as nationality, gender, and age influence travel motivation. Specifically, the

study examines the differences in travel motivation based on the nationality of tourists visiting Barbados. Additionally, it aims to discover any variations in motivations between male and female tourists and different age groups. The study was implemented through a semi-structured survey between 2006 and 2007. The findings of the study revealed that there are significant differences in travel motivations based on the tourist's nationality, while conversely, there are no significant differences between gender and travel motivation. Finally, regarding age differences, this study demonstrated that older tourists are more inclined to travel for relaxation or cultural attractions, while younger tourists have other motivations, including sports activities.

According to Axhausen (2007), what should be studied in research on travel behavior is the reference location, which is the place where the traveler returns at the end of the day, as well as the total time spent outside of it. Furthermore, between the time the subject leaves the reference location and the time they return, the activities chosen by tourists, their motivation to travel, the location, and spending should be considered and studied.

#### **2.4.2 Purpose**

Among the studies that describe the major travel determinants, numerous ones focus on one or two variables at most and produce results related to those two travel determinants. Among these studies, numerous ones choose to address the motivation for travel as the determinant. As Fodness asserted in 1994, "Motivation is nevertheless a critical variable because it is the driving force behind all behavior" (p.555). According to Caldito et al. (2015), "motivation can be defined as those primary forces that encourage, guide, and sustain a person's behavior (p.111). This variable includes all the reasons that drive tourists to undertake the journey, and although these reasons can be multiple, in Italy, ISTAT classifies vacation motivations into two main categories: leisure trips and business trips. Within the former, ISTAT includes four additional categories, which include pleasure, leisure,

and vacation; visiting relatives or friends; religious reasons, pilgrimage; health and thermal treatments.

In literature, there are numerous references related to travel motivation. For example, it is important to mention Crompton's model (1979). According to this model, push factors are socio-psychological conditions that push an individual to travel. These may include the desire to visit a new place or the need for relaxation and escape. On the other hand, pull factors are attraction factors that arise from external stimuli for the tourist, such as a famous attraction within a tourist site or the presence of a particular event in a destination.

It is important, for the study of travel behavior, to analyze the motivations that drive tourists to travel because the motivation for the trip also influences other choices related to the trip itself, such as accommodation. For example, if a tourist is traveling for a vacation during the summer, he/she might choose to stay at a resort with a pool and attractions. On the other hand, if the tourist is traveling for business, he probably leans towards a hotel in the city center where conference centers are easily accessible.

Furthermore, many times the motivation for travel is used as a predictor to forecast the future behaviors of travelers (Caldito et al., 2015). Caldito argues that the importance of this factor should be recognized in the contribution it makes to the destination in defining the tourism product and segmenting markets to meet the expectations, needs, and desires of the tourist.

The study of travel motivation as a behavioral variable can also be found in one research in which tourist behavior is examined before, during, and after the visit (Poria et al., 2003). In this study, first of all, the motivation for the visit is studied beforehand. Then, during the visit, the actions of tourists are examined, such as souvenir purchases and the duration of the visit. Lastly, the variable studied concerns the intention to return to the visited destination.

In the study by Hsu et al. (2010) that focuses on a behavioral model of tourism, a list of studies addressing travel motivation is proposed, starting with Dann's study from 1977 and concluding with Park and Yoon's study from 2009.

The list of these studies dedicated to travel motivation has been presented by the author to demonstrate how there is a variety of research in the literature on travel motivations, with numerous facets.

### **2.4.3 Means of Transportation**

In addition to motivation, the mode of transportation can also be considered a determinant, and many authors have addressed this over time.

A research that examines the influence of constantly changing urban networks on travel behavior is the study by Rasouli et al. (2014). According to this research, transportation researchers need to develop models to analyze and predict tourists' decisions under conditions of absolute uncertainty. In fact, according to this study, research models on travel behavior often assume that tourists make choices under conditions of certainty, even though, considering the speed at which transportation networks vary, this is not the case. To understand travel behavior, the U.S. Federal Highway Administration (2016) examines transportation knowledge for a better understanding of travel behavior and its influence on future travel. This demonstrates the significance of the "transportation" variable in the study of travel behavior. Furthermore, this report allows for an understanding of the measurement of travel behavior and analyzes how the socio-demographic components of Americans influence their travel behavior.

On the other hand, the mode of transportation used can provide important insights into tourism trends and is a significant source of information. In his work, Mammadov (2012) traces the moment of the creation of the first means of transportation in the 19th century, also recalling Thomas Cook's realization of the first organized trip that involved the use of steam trains. According to the author, transportation is a fundamental element, and tourism cannot be considered without taking transportation into account.

#### **2.4.4 Length of stay**

Another variable of utmost importance that literature has focused on is the duration of the trip. ISTAT defines a short vacation as one that lasts a minimum of one night and a maximum of three. On the other hand, a long vacation involves spending four or more nights at the destination. (ISTAT, 2023). In 2015 a work focused on the impact of trip duration on mood during travel by using the American Time Use Survey's well-being module (Morris & Guerra, 2015).

They have associated different types of transportation with various emotions, including happiness, stress, fatigue, sadness, and pain. They have concluded that longer trips are associated with a more negative mood for car drivers due to increased stress and fatigue. Additionally, they argue that long-duration bus commuting is detrimental to mood, and long bicycle trips involve more pain.

There are, in addition, some studies that focus on different travel variables, not only one. For instance, in 2018 some authors studied the effects of trip mode, duration, purpose, and companionship on emotional well-being (Zhu & Fan, 2018). Data used came from the *American Time Use Survey* and covered the period 2012-2013. The study demonstrated that public means of transport has a negative association with happiness, the duration of the trip is also negatively associated with happiness and positively with stress.

#### **2.4.5 Accommodation**

An important determinant of travel behavior is represented by the type of accommodation chosen by tourists. The choice of accommodation has been studied in various research. Among these, the study proposed by Pulido-Fernández et al. (2023) aims to understand whether the type of accommodation influences travel behavior. In particular, the study, conducted in a region of Spain, called Jaén, compares two different types of accommodation: hotels and rural establishments. The authors hypothesize in their study that the behavior of tourists staying in hotels differs from those staying in rural accommodations, and there is also a significant difference in spending between those who stay in a hotel and those who opt for

another type of lodging. The results obtained by the researchers confirm their initial idea, namely that the choice of accommodation influences the behavior that the tourists exhibit in the area, and therefore their activities as well. As it is quite deducible, tourists who prefer staying in hotels tend to visit urban and cultural areas, while those staying in rural accommodations prefer natural destinations.

Another study examines the choice of peer-to-peer accommodation and travel behavior (Tussyadiah & Pesonen, 2016). The study, conducted through the implementation of two online surveys targeting travelers from the USA and Finland, aims to understand the changes that these types of accommodations can bring about. Specifically, what emerges from the study is that peer-to-peer accommodation influences destination choices, travel frequency, length of stay, and activities undertaken.

#### **2.4.6 Expenditure**

Tourist spending represents a significant source of information about travel behavior. Specifically, tourist spending refers to the expenses incurred by tourists during their vacation, which can encompass various elements including experiences or excursions, food, accommodation, souvenirs, and more. Many times, econometric approaches are used to measure tourism expenditure. Studies employing these approaches often consider explanatory variables such as income, socio-demographic variables, and those related to trips. These are typically tested using traditional linear regression techniques. However, new studies will shift towards psychographic variables and aim to establish stronger relationships with economic theories (Brida & Scuderi, 2013).

The expenditure variable can also be studied in relation to multiple variables. For example, in literature, some studies focus only on the spending of elderly tourists or even on the spending of cruise tourists or tourists in a specific destination.

A study conducted by Kozak in 2001 argues that there are various approaches for choosing the methodology to study destination performance in relation to tourist expenditure. The first approach is based on calculating the average amount spent

per tourist or per family, while the second categorizes tourists based on their total spending.

The third approach, on the other hand, considers the major factors that influence expenditure, including income level, vacation duration, or even the type of vacation, which can inherently be more or less expensive.

Among the second group, there is a study conducted in 2001 by Jang et al., that divides pleasure travelers in Japan into three categories: low spenders, medium spenders, and light spenders. In particular, the study yields interesting results, indicating that spending increases with age, group dimension, and trip length. It also suggests that those traveling with a spouse or a friend tend to spend more and that summer is the season when tourists spend the most. Other findings related to the study show that honeymoon travelers spend more compared to those traveling for business or leisure.

Travel expenditure has also been studied in relation to repeat purchases at the destination. For example, a study conducted in 2010 by Alegre et al. analyzes consumer spending with repeat purchasing. In particular, the study estimates the role of quality as a motivational factor in purchasing and distinguishes between occasional visitors and regular visitors. The study hypothesizes that quality as a motivational factor has a greater effect on occasional consumers compared to regular ones. What the research suggests is that first-time visitors to the destination perceive a higher price as indicative of something of higher quality compared to those who have made multiple purchases.

#### **2.4.7 Others**

Among the other categories of variables involved, UNWTO in IRTS (2010) defines the *Type of Tourism Product*, as:

A combination of different aspects (characteristics of the places visited, modes of transport, types of accommodation, specific activities at destination, etc.) around a

specific center of interest, such as nature tours, life on farms, visits to historical and cultural sites, visits to a particular city, the practice of specific sports, the beach, etc. (UNWTO, 2010, p.26)

This variable can differ in the categories from country to country and allows to understand the type of holiday spent by the tourist. Many studies focus only on one type of tourism product such as sea and sun tourism, cultural tourism, and nature tourism, and aim to analyze its main characteristics.

Another important variable that defines tourist behavior investigates the travel company, identifying the traveler who travels alone and the one who, on the contrary, travels with other people. In particular, those traveling in company could be accompanied by a group or even by their family/friends. This variable is often linked with the type of trip purchased.

What is also interesting to investigate is the channel through which the purchase of the trip was made. Some data, and in particular those made available by ISTAT on national tourism, include one or more variables inherent to the holiday booking channel Airbnb, Booking, Expedia, TripAdvisor, etc., which contrasts with the variable related to the travel agency channel.

## **2.5 Models and Analysis for Travel Behavior**

The use of models for studying and understanding travel behavior is of fundamental importance, as they represent the means through which it is possible to estimate the number of visitors to a destination, the future travel choices of tourists, future sales of tourist products, and so on.

Travel behavior can be analyzed through qualitative methods involving aspects related to sociology or marketing, but also through quantitative methods as often happens, where various variables are related to each other to observe, at times, to what extent one might influence the others.

The first time that travel behavior was modeled was in 1976 by Wahab, Crompton, and Rothfield (Caldito et al., 2015) who focused on tourists' decision-making



process. According to them, tourists want to maximize their utility when buying tourist products. In particular, they believe that tourists are influenced by the opinions of other people when purchasing products.

The decision-making process is mainly based on five steps (Lunenburg, 2010):

1. Problem recognition in which the consumer recognizes the need for the product
2. Generating and evaluating alternatives
3. Choosing an alternative
4. Implementing decision
5. Evaluating decision effectiveness.

In the information search stage, which means stage two, the consumer can meet internal or external stimuli influencing the purchase. In the case of the tourism field, these stimuli could be for example the advertising campaign for a destination or, for example, the review of a destination on a website.

In the literature, several authors focused on tourists' decision-making process to forecast the future choices of travelers. Indeed, within the field of travel behavior, many studies employ predictive models. In general, in the field of tourism, predictive models are applied to forecast tourist demand, predict tourists' intentions to visit one place over another, or even forecast intentions to visit a specific attraction within one destination rather than another.

In the 2020 study by Sohrabi et al., the travel preferences of Iranian tourists visiting foreign countries are analyzed. Through the use of text mining, the study seeks to predict the future travel intentions of tourists based on their interests and travel history. This work considers a dataset extracted from social media and aims to understand the relationship between the tourist's interests and the destinations chosen for their journey. Similarly, the previously mentioned article by Hsu. et al. (2010) also aims to predict tourists' behavioral intentions.

Another important model to mention when discussing travel behavior is Solomon's model. Indeed, many studies on travel behavior are associated with consumer

behavior, considering trips as a tourism product. According to this model, various stakeholders play important roles in travel behavior. Moreover, the purchase process does not end with the act of buying, but it is a complex process involving three different stages. This model takes both the consumer's and the marketer's perspectives within these three stages: pre-purchase, purchase, and post-purchase (Figure 2.1).

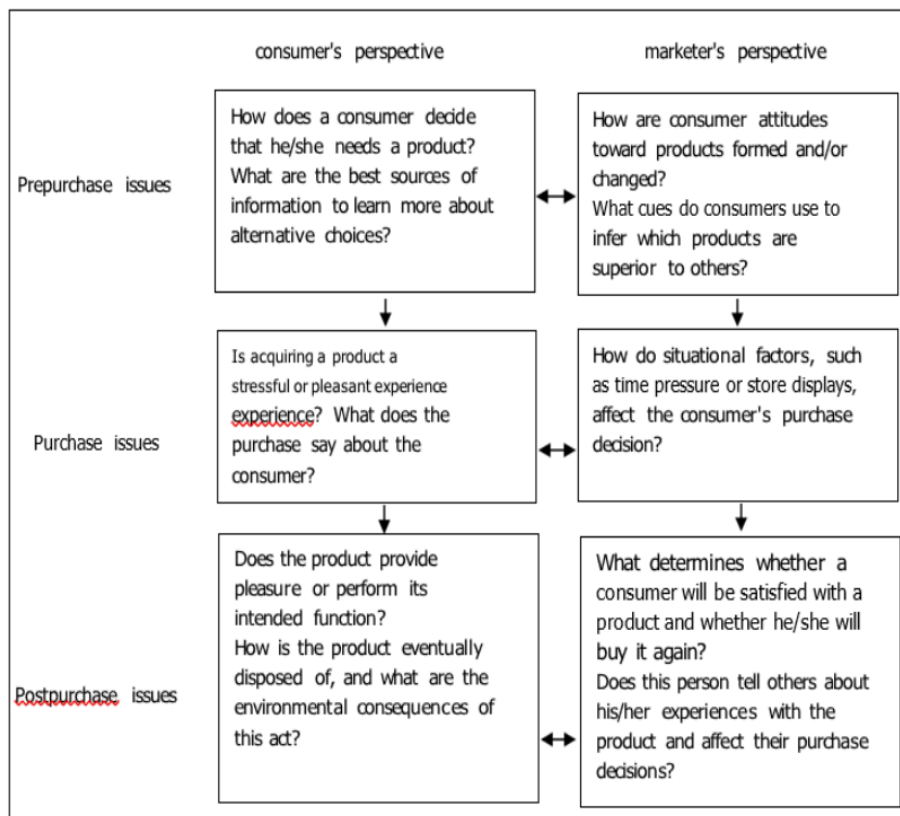


Figure 2.1: Tourist Behavior Model. Nirwana, 2024

According to Goulias (2018), there are currently two methodological advancements aimed at analyzing travel behavior: choice models and the activity-based approach. The first model aims at analyzing at the individual level and examines various aspects of behavior through mathematical and statistical analyses. The second approach (activity-based) considers everyday life in the analysis of travel behavior, not only focusing on the activities carried out by tourists during the vacation but focusing on the entire life processes within travel behavior.

This trend, as mentioned earlier, has primarily developed in recent years and aims specifically to consider every aspect of daily life that influences travel behavior.

Over the years, other models have focused on travel choice factors. In his work *Travel Behavior Models* published in 2018, Goulias presents several models from different authors. According to the author, within the context of travel behavior, a paradigm often used is related to the tourist's decision-making process, known as the *Random Utility Model*. According to this model, devised by McFadden in 1974, rational decisions are linked to human behavior that employs a strategy to make the best choices. The first application of this model (RUM) was found in the case of the *San Francisco Bay Area Rapid Transit (BART)*, where it was possible to accurately predict the mode choice (Goulias, 2018).

In addition to these, some models focus on the behavior of tourists within the destination, which partly depends on the internal characteristics of the destination itself and its proximity to other points of interest. In this regard, in tourism economics, the movements of tourists within destinations are classified according to three distinct models (Mantovani, 2017):

1. The monopolar model (*modello monopolare in the original work*)
2. The star-shaped model (*modello stellare*)
3. The circuit model (*modello circuitale*)

In the monopolar model, the destination is the unique point of interest for the visiting tourist. The tourists travel only to visit it. In these cases, the destinations have a big cultural heritage and are centers of significant attraction. Examples of such destinations include Rome or Paris.

In the second case, however, the center of attraction is located near equally interesting places. In this scenario, what happens is that the tourist incorporates this destination within a broader context that includes visits to various nearby locations. Very often, these destinations are connected through sightseeing circuits that allow visitors to explore multiple points of interest at a discounted price.

The last model, the circuit model, is common in organized tours where visitors explore different locations by moving from one place to another and often returning to the starting point (Mantovani, 2017).

## **2.6 The Influence of COVID-19 on Travel Determinants**

This paragraph discusses the changes in travel trends that may be caused by the COVID-19 pandemic. Specifically, it seeks to determine whether COVID-19 has not only altered travel behavior but has also fundamentally changed its nature, for instance, by encouraging one group of travelers over another. Furthermore, this review will attempt to understand the temporal effects of COVID-19, exploring whether, beyond the initial sharp decline in travel numbers, there will persist medium and long-term effects, and what these might be. This study, which intends to gather the most significant existing literature, will first focus on the previous variables considered, and then proceed to identify the key works that address the short, medium, and long-term effects of COVID-19, to understand if the work conducted brings similar or, conversely, divergent results.

The immediate impact of COVID-19 on the tourism sector is evident through the drastic collapse in the number of trips, which has affected countries worldwide. According to UNWTO, in 2022, 900 million tourists traveled internationally, which is double compared to 2021, but still 37% lower than in 2019 (UNWTO, n.d.).

The decline in international tourist arrivals in 2020 recorded a decrease of 72% and this was the worst year for tourism, while in 2021 it was 71%, both compared to 2019. The sector's economy was severely impacted, leading to a loss of export revenues by 63% in 2020 and 61% in 2021, resulting in a cumulative total loss of \$2.1 trillion for both years. According to UNWTO, the tourism direct GDP recorded a loss of a significant \$1.8 trillion in 2020 and a substantial \$1.4 trillion in 2021.

Using data collected since the outbreak of the pandemic, UNWTO has been able to outline a description of the new travel trends that followed the pandemic's onset. In particular, domestic tourism has gained significant importance in this description. This is likely due to both the fear of contagion and governmental restrictions, causing tourists to prefer traveling to places near their homes, avoiding distant

destinations. The preferred tourist destinations are those away from crowded city centers, instead favoring rural destinations in nature.

Furthermore, UNWTO's observations reveal a heightened sense of responsibility and authenticity in travel. Travelers are increasingly drawn to the concept of local authenticity, expressing a desire for genuine connections. Lastly, when analyzing variables such as travel expenditure and duration, a clear increase in spending per trip is evident, along with a surprising rise in the number of nights spent during trips.

UNWTO's inquiry revolves around the longevity of these changes. It questions whether these trends are merely short-lived phenomena or if they are enduring attitudes born during the era of COVID-19, destined to persist into the future.

UNWTO predicts that in 2023, international arrivals in Europe and the Middle East will reach between 80% and 95% of pre-pandemic levels, which, clearly, were not achieved in the preceding years.

<p><b>CLOSER</b></p> <p>Domestic tourism has shown positive signs in many markets since people tend to travel closer. Travelers go for 'staycations' or vacations close to home.</p>	<p><b>MORE RESPONSIBLE</b></p> <p>Sustainability, authenticity and localhood: travelers believe in the importance of creating a positive impact on local communities, increasingly searching for authenticity.</p>
<p><b>GET AWAY</b></p> <p>Nature, Rural Tourism and Road Trips have emerged as popular travel choices due to travel limitations and the quest for open-air experiences.</p>	<p><b>LONGER STAYS &amp; HIGHER SPENDING</b></p> <p>2021 has seen a significant increase in spending per trip and longer stays</p>

**Figure 2.2:** *Changes in Consumer Trends, Short-lived trends or here to stay? UNWTO, 2020*

In these changes in consumer trends, it is possible to identify some travel variables previously discussed. Indeed, considering the first quadrant, “closer”, this is linked to the distance variable, as during the COVID-19 era, tourists were more reluctant to travel long distances and instead preferred to stay in places close to home. Indirectly, this leads to a shift in transportation usage, with a decrease in air travel and an increase in the use of cars.

Another variable that can be identified within the four quadrants is the travel type, which includes leisure or business trips, as well as the type of destination, such as coastal or rural destinations, among others. The quadrant related to more responsible tourism can be said to be linked to the socio-demographic component of the tourist. Indeed, the tourist's choices related to sustainability or the desire for authenticity are influenced by social factors and are connected to the individual's life context. Finally, the last quadrant is related to the variables of travel duration and travel expenditure, which have changed with the advent of the pandemic, favoring an increase in travel spending and longer duration.

### **2.6.1 Socio-demographic attributes**

With the onset of the COVID-19 pandemic, many scholars have focused on its potential effects on tourism and travel trends. Some studies have specifically centered on the pandemic's influence on age groups, while others, on the contrary, have explored how socio-demographic characteristics impact post-pandemic travel intentions. In particular, the study published by Peluso and Pichierri in 2021 focuses on the socio-demographic effects, the sense of control that characterizes post-pandemic travel intentions. This study focuses on socio-demographic variables including age, gender, education, income, health status, and number of children, to examine their influence on individuals' sense of control over the post-pandemic travel situation, and consequently, on their intention to travel. This research was carried out in Italy through a survey administered to 860 Italian citizens via web. It reveals how older respondents and those in poorer health feel less capable of controlling uncertain situations because of the pandemic, and therefore, they are less inclined to travel.

Another article that focuses on changes in travel behavior was published by Chen et al in 2021. According to the authors, cultural and age differences have influenced tourists' travel behavior during the pandemic. The study was conducted in China, and the data came from approximately 942 respondents belonging to different age groups. The questionnaire submission process followed multiple phases and

encompassed three sections. The results reveal that travel behavior, particularly choices related to transportation, travel mode, and companionship, significantly varies with the traveler's age.

Another article aims to study the role of socio-demographic determinants on future post-pandemic travel behavior (Sinha & Nair, 2021). The article examines the differences between socio-demographic variables and the motivations underlying destination choice. The analysis was conducted through the implementation of an online survey carried out across various social media platforms and reached a total of 483 responses.

According to the results, the variables that significantly impacted the destination choice are gender, marital status, education and monthly income. On the contrary, other variables such as age do not affect the destination choice.

### **2.6.2 Purpose**

Regarding changes in travel motivations during the COVID-19 pandemic, numerous studies have focused on the motivational factor. This paragraph examines whether the COVID-19 pandemic has influenced travel motivations, and not just travel frequency. A shift away from crowded urban centers in favor of isolated destinations characterized by wide open spaces would be expected. According to Aebli et al., (2022) what drives tourists to travel during the era of COVID-19 is undoubtedly the need for social connection, and mental and psychological well-being, which has been severely tested during the pandemic and particularly during lockdown phases. In this way, travel motivations changed, with the socio-psychological need becoming the primary and sometimes the unique motivation for traveling, leaving all other motivations outside of this context. This research is based on Herzberg's two-factor theory according to which there are two categories of factors influencing satisfaction at work:

- Hygiene factors include work conditions, good pay, vacations, etc.

- Motivators such as responsibility, advancement opportunity, personal realization, etc.

The paper highlights the importance of addressing these needs that have emerged during the pandemic period.

Another study that analyzes changes in travel motivation after the pandemic was conducted by PS and Das (2020). The study collected data from 218 respondents through an online survey promoted on social media platforms and sent to various demographic profiles. The study demonstrates a shift in motivational factors previously centered around the *Travel Career Pattern model* (Pearce & Lee, 2005) which suggests that travel motivations can be recognized as a series of patterns that represent a combination of various motivational factors, influenced by age groups. A study conducted in Nepal (Bhatta et al., 2022) highlights the importance of understanding travel motivations at the destination with the ultimate goal of shaping demand and tailoring it to the needs of different types of tourists visiting the area. The data were collected in the year 2021 through an online questionnaire administered to the population of Nepal. From this study, what particularly emerges is a common interest among various groups of tourists with different characteristics in favoring visits to rural destinations, while overlooking visits to city centers. This is quite intuitive, considering that many tourists, due to the fear of contagion and the lockdown during the pandemic era, might prefer spending time outdoors, in spacious areas, and less in crowded places.

Another interesting study that focused on examining travel motivations with the onset of the pandemic was published by Kusumaningrum and Wachyuni in 2020. The authors aimed to identify the types of tourists and the motivational factors that drove them to travel after COVID-19. In this work, an intriguing classification of motivations that drive tourists to travel is mentioned. These include:

- Physical or physiological motivations: encompassing the need for relaxation, health, and comfort;



- Cultural motivations: including the desire to explore new places and discover the beauty of their traditions, religion, etc.;
- Social or personal motivations: encompassing the need to meet new people, socialize, and spend time with friends and family;
- Fantasy motivation: representing the need to escape from the daily routine.

To achieve their intended goal, the authors administered an online questionnaire in Indonesia and collected data through it. The results revealed, once again, a preference for natural destinations followed by culinary ones. As for motivation, most respondents indicated a desire to travel to relax both body and mind followed by interpersonal motivation. From the study of motivational components after the COVID-19 pandemic, an important need for psychophysical relaxation and connection/socialization with friends/family arises. These motivations take precedence over cultural factors, which nevertheless remain important.

### **2.6.3 Means of transportation**

As previously mentioned, the study of travel behavior originated when the first means of transportation arose. Initially, air travel allowed covering great distances in significantly less time, playing a crucial role in globalization. However, with the onset of COVID-19 and the travel restrictions that followed, the transportation sector also experienced a crisis and a significant setback. This paragraph aims to examine the evolution of changes in the utilization of transportation modes by tourists during the pandemic era. With the imposition of government restrictions, one of the main effects was the collapse of air travel. According to Nižetić (2020), the reduction in the number of flights in Europe reached around 89%, peaking in April 2020.

From a study by Corbisiero and Monaco in 2021, aimed at examining the challenges faced by the tourism sector after the pandemic, significant and intriguing findings emerge. Particularly, through a survey conducted with 700 Italian tourists, the results indicate that in Italy, especially in the southern regions, tourists prefer to

travel using automobiles, thus avoiding train and air travel. This preference derives from the desire to avoid potential infections by using public transportation where contact with unknown individuals is more likely.

In general, it's quite intuitive that, due to the higher likelihood of contagion, tourists prefer to rely on private means of transportation rather than public ones, even if this entails spending more money or experiencing greater stress. This preference became a scientific observation in a study published in 2020 (Abdullah et al.,). The results came from surveys conducted using Google Forms in various countries worldwide, and approximately 1203 responses were gathered.

From the responses concerning the modes of transportation used for travel before and after the pandemic, it is evident that 36% of respondents used public transportation before COVID-19, whereas only 13% have been using them since the pandemic outbreak. Conversely, looking at private transportation methods, their usage has increased from 32% to 39%.

The use of private cars instead of public transportation raises an issue related to environmental sustainability. Some researchers see COVID-19 as an opportunity to detach from the use of unsustainable modes of transportation and, on the contrary, to embrace sustainable ones. According to them, it is also an opportunity to reduce the negative impact of tourism on destinations by enhancing sustainable changes.

Several studies have delved into researching tourists' inclination to use sustainable modes of transportation during the COVID-19 period. Among these, one stated that the ever-growing need for sustainability must be addressed by guiding and redirecting tourists toward a "green" direction (Więckowski, 2021). For instance, they recommend reaching destinations using more sustainable transportation methods, especially for short distances, or even discouraging short-term trips in favor of longer-term ones, shortening the itinerary.

The COVID-19 pandemic may have also pushed towards sustainable forms of transportation that involve activities such as walking to reach a point of interest or cycling to reach a destination. In fact, since the beginning of the pandemic, bike sharing has become more widespread.

According to a study conducted by Jobe al. (2021), bike sharing can support safe transportation because it enables maintaining distance between individuals. The authors noted that in the city of San Antonio (TX), some individuals increased their use of bike sharing by approximately 43%, and it is likely that even after the pandemic, this system will continue to be popular.

#### **2.6.4 Length of stay**

Another important variable related to travel is the length of stay. The goal of this paragraph is to understand whether and how this has changed during the years of the pandemic. Several scenarios can be envisioned. On one hand, it is likely that with the onset of the pandemic, not only do tourists travel less, but they also travel for shorter periods to reduce potential opportunities for contagion. On the other hand, what can be expected is that with the decrease in travel frequency, tourists might prefer to spend more days within a single destination rather than traveling for short periods to many different destinations, thus increasing the risk of contagion due to public transportation or different accommodations. Although these are individual choices, an attempt will be made to identify a common attitude among tourists during these years. The third option, although highly unlikely, excludes changes in the duration of the vacation during the pandemic era, keeping the travel duration unchanged.

Looking at the situation in Italy, according to the annual report released by ISTAT (2020) on Trips and Holiday surveys (which considers trips by residents in Italy and abroad), in 2019, the average duration of trips was 5.7 nights, while in 2020, it slightly increased to 6.3 nights. Furthermore, according to the 2021 report (ISTAT, 2022), the average trip duration continued to grow, reaching 6.9 nights. The latest report for 2022 (ISTAT, 2023) shows a slight decrease in the length of stay from 6.9 nights to 6.5, but it remains higher compared to the initial recording in 2019.

From this report, it would seem that the trend of length of stay in Italy is moving closer to the second hypothesis. Outside the Italian landscape, the situation doesn't

appear to be the same, and according to some studies, the vacation duration has decreased.

Specifically, in the European context, focusing on the northern part of Spain, microdata from the years 2019-2020 have been compared. This analysis, conducted by Baños-Pino et al. (2023), reveals a decrease in vacation duration during 2020. The analysis was carried out using regression adjustment, inverse probability weighting regression, and propensity score matching. Particularly, what the analysis records is a decline of 1.26 nights, equivalent to 23.8%.

These two contrasting data suggest that the travel duration during the pandemic varies from country to country, even based on the focus of observation. Indeed, for a meaningful comparison with Italian data published by ISTAT regarding the average length of stay, it is more accurate to look at the same type of data in another territory, namely the data produced and derived from the same type of survey. In the case of Spain, the equivalent of Trips and Holidays surveys in Italy and abroad is called *Encuesta de Turismo de Residentes*, and it reports interesting results.

In particular, these two surveys focus on studying the tourist flows of residents within and outside the respective countries. Therefore, the first case deals with the trips of Italians within Italy and abroad, and the second case, examines the movements of Spanish in Spain and abroad. Looking at the Spanish data (INE, 2023), it emerges that in 2019, the average duration in terms of nights was 4.09, and it significantly increased over the year to reach 4.86 in 2020. However, in the year 2021, the average duration decreased again to 4.38, and further to 4.35 in 2022. Thus, even when looking at the same type of data for this country, what is possible to observe is a decline in vacation duration in 2021 with respect to 2020.

Another study, conducted in Serbia (Bratić et al., 2021) aimed to investigate how the perception of COVID-related risk influenced tourists' vacation planning behavior. The survey was conducted in Serbia and distributed online to a total of 1445 Serbian citizens. The final total sample consisted of approximately 557 respondents. The study reveals that participants who have a strong sense of anxiety about COVID-19 or a higher perception of infection risk tend to take shorter vacations. In general, the implications of the pandemic on vacation length are

different and can be a direct consequence of government-imposed measures during the pandemic period. It's also important to reflect on the fact that the pandemic period, for many, was a time of economic loss, and a decrease in the length of stay might indeed result from the economic challenges that countries around the world were experiencing during that period.

### **2.6.5 Accommodation**

The pandemic affected the most significant travel variables that, one by one, contribute to the description of travel behavior. Accommodation choice is also among these variables and is of fundamental importance because it can gather information from both the demand and supply sides. This paragraph aims to study the major implications of COVID-19 on the accommodation sector by looking at the Italian and European landscape.

What could be expected in terms of changes is a preference for private accommodation, where the risk of contagion is certainly lower compared to that of highly crowded establishments. Therefore, a preference for extra-hotel accommodations is quite likely. On the other hand, however, public facilities face greater pressures for implementing anti-contagion measures, which could reassure tourists and drive them towards official accommodations. What seems clear is that accommodations have certainly had to adapt their offerings to a situation of absolute uncertainty, where not making changes would have resulted in business closure.

It is therefore highly likely that the service offerings have undergone changes aimed at avoiding contact between guests and, at the same time, providing greater flexibility in bookings with longer-term free cancellations.

An example of how hotels have modified their offerings can be found in the work conducted by Bonfanti et al. (2021). Specifically, this study analyzes the measures that have been adopted by some luxury hotels. The authors administered a questionnaire to the companies and identified 7 measures related to "hygiene and protection, internal work reorganization, servicescape reorganization, investments in technology and digital innovations, customer wait time reorganization, staff

training, and updated communication" (p.4). The final goal of this work is to create strategies for improving the tourist experience, which represents a valuable source for understanding how the tourism offerings have adapted to the new customer's needs.

In addition to this, there are numerous studies concerning tourists' choices regarding various types of hotels during the COVID-19 period. A study conducted by (Kim & Han, 2022) examines the attributes through which tourists choose one hotel over another. Through a qualitative analysis before and a quantitative analysis after, this work examines tourists' choice behavior of hotel accommodations both before and after the pandemic. The results show that the factors positively influencing the choice of accommodation would be contagion precaution measures and hotel cleanliness, attributes that affect the image of the accommodation.

Once again, a study conducted by Del Chiappa et al. (2022) aims to understand the factors that influence tourists' choice of accommodation. The analysis is carried out by considering a sample of about 4,300 consumers using a mixed qualitative and quantitative method. In particular, interviews are first conducted to understand the characteristics of the facilities that influence travelers' choices in future travel decisions. Subsequently, through quantitative analysis, key factors in tourists' choices are identified, and consumers are classified based on their preferences. From the results, it emerges that "PPE use, physical distancing in restaurant service, room service delivery, reception automation, and social and environmental engagement (p.1037)" are the key elements that influence tourists' destination choices.

Several other studies have focused on understanding what the actual travel preferences of tourists were during the pandemic era, and specifically whether they preferred private accommodations or, conversely, public lodgings. According to an interesting study conducted by Bresciani et al. (2021) during the pandemic, tourists preferred booking entire apartments on Airbnb rather than opting for hotel rooms, and even shared rooms were scarcely chosen by tourists. The utility of the article lies precisely in the suggestions provided to maximize bookings in an unprecedented pandemic era.

### **2.6.6 Expenditure**

As previously stated, tourist expenditure is of fundamental importance among the determinants of travel behavior. It allows to understand how much tourists (both residents and non-residents) spend within destinations. With the advent of COVID-19, tourist expenditure has also experienced a significant decline. However, what is important to understand, beyond the reduction in this expenditure, are the changes that have occurred during this period and whether tourists have altered their spending behaviors or not. For instance, it could be hypothesized that during the pandemic, tourists spend less on public transportation within destinations and, on the opposite, allocate more of their budget towards dedicated services that minimize contact with the public.

In a study published in 2023 (Baños-Pino et al.), the spending behaviors of visitors to Asturias, Spain, are examined, and it is evident that even though the overall travel expenditure is the same as in 2020, it is being allocated differently. Specifically, the results indicate that expenses dedicated to cultural activities and visits have increased, while, conversely, those related to accommodation have decreased. Furthermore, the study highlights an increase in transportation spending, with a particular rise in the demand for private cars. The study also addresses the managerial implications by suggesting the development of private tours for small groups, as well as mountain-related activities and, in general, multi-destination trips. This could answer the emerging needs of tourists visiting Asturias.

### **2.6.7 Others**

As previously mentioned, the type of tourist product refers to the type of holiday chosen and purchased by the tourist consumer. With the advent of the COVID-19 pandemic, this choice also seems to have changed. In fact, according to some studies, what tourists prefer most in terms of choosing a destination is proximity to natural and, why not, uncontaminated places. This choice lies in the possibility of avoiding contagion and crowded places.

During 2020 in Italy ISTAT recorded a sharp decline in participation in cultural events by tourists; this data helps to understand how this type of tourism is suffering more than others. According to the data, participation in visits to museums and exhibitions went from 25.7% in 2019 to 22.1% in 2020, and in shows and events went from 29.6% to 11.3%.

What emerged in Italy in 2020 is the use of direct travel booking and the abandonment of intermediation. In this period in Italy, reservations are made by contacting the structures directly and instead avoiding reservations through travel agencies which unfortunately are forced to close. Thanks to the use of the internet, reservations can also be made via the web. In its 2020 report, ISTAT states that 65.9% of bookings take place online compared to the 58.4% recorded in 2019. The report also claims that the collapse of intermediation agencies is considerable and reaches a drop of 72%.

### **2.7 The Impact of COVID-19 on Travel Behavior**

The COVID-19 pandemic has had a great impact on many sectors and in particular on tourism where its effects can be assessed based on the period for which they persist. In particular, it is possible to distinguish short, medium, and long-term effects. Among the short-term effects, the most immediate one is certainly the collapse in the demand for trips. As reported by UNWTO, international travel decreased by 72% in 2020 and 71% in 2021. This was caused also because most air companies decided to cancel flights to different destinations and the government imposed several restrictions. The UNWTO estimated that because of the pandemic around 100-120 million tourism-related jobs were at risk causing a crisis in this sector.

The medium-term effects are instead those that manifested themselves in a period not too far from the outbreak of the pandemic but not too close, which means not immediately after the pandemic outbreak. In this period, tourism is still suffering the effects of COVID-19 and among these effects, it emerges a reduction in travel prices. During this period, the tourism sector implemented adjustments to holiday prices to stimulate an increase in demand and foster recovery. Also, other sectors



related to tourism decreased their prices. According to an article published in 2023, Morlotti and Redondi found that considering “all major European flights, departing from and arriving in Italy, the results reveal a 31% overall decrease in airline price per kilometer (p.1)”.

The prices offered by OTAs decreased and instead, the demand for direct bookings, made by calling the structure directly, increased. It is in this period that last-minute deals stop being low-cost in Italy. Tourists trusted last-minute bookings because, given the fickleness of the pandemic, the possibility of contracting the disease, and the constant changes in anti-COVID measures, they prefer an immediate holiday rather than one booked for a longer term.

Another medium-term effect caused by the pandemic is the growth of local tourism. Given the strength of the restrictions and the first easing, tourists are starting to travel but avoiding long distances. With the car, tourists move towards the nearest places and look for less crowded places to spend their holidays. This inevitably leads to a rediscovery of one's landscape and region which allows the growth of domestic tourism. It is in this period that the tourism supply tries to change to adapt to the new local demand. Several studies focused on proximity tourism during the year after the pandemic and these recognized the importance of this form of tourism to enhance and restart the sector. This is the reason why some governments decide to invest money in these flows rather than in international tourism flows and also because they thought that domestic tourism would drive a faster recovery (OECD, 2020). In particular, according to the OECD, domestic tourism accounts for 75% of the total economy related to tourism in OECD countries. This situation caused by the pandemic overturned one of the previous years in which governments focused a lot on international tourism which brought greater revenues.

Finally, considering the long-term effects of the pandemic on tourism these are not easy to define both because these effects are subject to continuous changes and because the current studies referring to this topic are few and, probably, still in progress. What emerges from the literature is a growing modification of the tourist offer towards greener solutions. The pandemic, indeed, has brought greater attention to the sustainability and environmental impact of tourism in destinations.

A study published in 2023 (Cai et al.), aims to improve the built-environment strategies for B&B. This study allows to understand the interest in this field in the tourism sector. Other works sustain the important role of the pandemic in offering the opportunity to organize the supply in a greener way. According to Ioannides and Gyimóthy (2020), the pandemic offered academic actors the opportunity to “consolidate the transition towards a greener and more balanced tourism” (p.1). This effect can be considered long-term because it takes time to adapt the tourism supply to this growing need for greener tourism, especially if it means modifying the structures. Another change that can be considered in long-term effects is linked to the way tourists use the technology during the trips. In particular, as it is evident, the pandemic has facilitated the spread of technology in many areas, including the field of tourism. Much more frequently, tourists use electronic keys provided by hotel apps that eliminate physical contact and the "hand-to-hand" exchange. Given the advancement of technology, it is not unlikely that these practices will persist over time even as restrictions ease. An article published in 2020 by Lau takes into account the practices implemented in the hotel sector in China. In particular, it considers software facial recognition to have access to rooms or other places or the integration of 5G and artificial intelligence to develop a personalized service for guests. What emerged from the COVID-19 pandemic is that the tourism industry during the years immediately after the outbreak but also in the following years, is adapting to the new travel tendencies. This is a behavior that was simply adopted to survive during these years of crisis, and it has had an impact on this sector, which may continue to influence in the future.

## 2.8. Conclusion

The study of travel behavior emerged alongside the spread of the first vehicles and then it changed in relation to subsequent events. From this can be deduced that the influences on behavior are multiple and, as previously mentioned, the factors that influence it are also related to the personal sphere of the individuals themselves. Indeed, the new studies focus on the psychological factors that influence travel behavior, while reasoning on the difficulty of precisely identifying the influencing components.

In 2019, with the outbreak of the COVID-19 pandemic, the tourism sector suffered major disruptions. Although the changes in travel behavior are not all directly attributable to COVID-19, this disease has triggered many factors that have contributed to the change in travel behavior including the fear of contagion, and the restrictions imposed by the governments. The numbers of trips drop drastically, but not only that: the effect of COVID-19 also affects the main travel variables differently, in all European countries and around the world.

Tourists started to move within their regions of residence, abandoning international borders. This leads to a modification and renewal of the tourism supply in territories that were previously little visited by tourists. In Italy, tourists willing to travel are predominantly young as older people are more afraid of contracting the disease. The reasons for traveling are linked to socio-psychological needs, instead of taking visits to monuments or events to the background. During this period, tourists tend towards naturalistic destinations, where human contact is reduced and where they can spend time outdoors.

They preferred private means of transport for traveling as public transport, given the number of people it hosts, could be a vehicle for infection. The duration of the holiday varies from country to country. In Italy, for example, in both 2020 and 2021, the duration of the trip increased compared to 2019, while in Spain 2020 recorded an increase compared to 2019 but 2021 and 2022 recorded a decrease compared to 2020. Therefore, in Spain, it also increased compared to 2019 but while in Italy growth is recorded in all the years following 2019, this did not happen for Spain

where there was a decrease in 2021 compared to 2020 without reaching the 2019 levels.

As regards the type of accommodation, however, what tourists prefer is a private type, very often involving the rental of an entire house rather than just a room with spaces to share. Private types become preferred due to the possibility of reducing contact with other subjects to a minimum. Expenses are also managed differently. Tourists visiting Spain, for example, prefer to spend more on private transport and cultural activities. Finally, trip booking methods were also changing with a strong preference for direct and last-minute bookings.

What emerges from the literature review is that the changes in travel behavior triggered by the COVID-19 pandemic are different from country to country and that they manifest themselves at different times and intensity. Some of these changes are destined to fade over time and return to how they were in the pre-pandemic period; others, however, will maintain their effects for longer until they change due to new shocks or simply due to the influence of new factors. What is clear is that the tourism industry has had to quickly adapt to these new changes, responding to the new and growing needs of tourists.

The study of the effects of COVID-19 on tourist behavior and, in particular, long-term ones, is important to respond to these needs and, why not, to try to predict the future.

## Chapter 3

# Closer to Home: Embracing the Proximity Tourism

### Abstract

*This chapter explores the changes in travel behavior in Italy and Spain during the COVID-19 pandemic. In that period, the fear of contagion and government restrictions led to a significant decline in trips, especially abroad. In this context, domestic tourism emerged as a potential driver of recovery for the tourism sector. Indeed, as suggested by the literature, when international travel decreases, attention shifts toward domestic tourism as individuals prefer destinations closer to home fostering the rise of proximity tourism.*

*First, this work focuses on descriptive statistics to examine changes in key travel variables in a five-year period (2019–2023).*

*Secondly, some ratios are calculated to identify shifts in the leading Italian and Spanish regions in terms of trip origins and destinations.*

*Finally, an attraction coefficient (Gálvez et al., 2014) was applied to the Spanish and Italian Origin-Destination Matrices, providing insightful results.*

*Furthermore, the availability of long-term data allows for a detailed evaluation of whether the observed trend toward proximity tourism is a short-term reaction or a lasting change that could continue over the medium to long term.*

### 3.1 Introduction

With the advent of the COVID-19 pandemic and the consequent government restrictions, the tourism sector suffered a severe hit and experienced a sharp decline in demand. International tourism, more than domestic, faced a situation in which trips were banned for an extended period. It is in this context that attention turned to domestic tourism as a means for the sector's recovery. Proximity trips, understood as movement between neighboring or nearby regions, gained importance, allowing tourists to travel even if only short distances.

This chapter examines the changes in travel behavior that occurred during the pandemic, focusing specifically on Italy and Spain. These destinations are both important Mediterranean countries characterized by an intense flow of international and domestic tourists. Furthermore, the pandemic's course in these two nations and the restrictions adopted appear to share similarities.

First, an overview of the data available will be provided, and a series of descriptive statistics will be presented for both countries. These statistics will offer insight into the great decline in tourism demand during the pandemic years, while also revealing how trip-related variables change from year to year and from country to country.

Five years have been considered for this analysis, enabling observations and assessments of changes in tourism from a pre-, during-, and post-COVID-19 perspective.

Secondly, this chapter aims to study whether changes in travel behavior have led to new trends. In particular, the trend under examination is proximity tourism. Specifically, it seeks to determine whether certain movement patterns that are specific to proximity arose during the pandemic period and if these lasted through 2023, the latest year for which data is available and the furthest from the pandemic outbreak. The data used for the analyses come from the same typology of survey based on national tourism. These surveys, which are produced and disseminated in a harmonized way according to Regulation 692/2011 of the European Parliament and Council, collect information on the movement of residents within their country of origin and abroad.

Italian data come from the survey called Trips and Holidays (*Viaggi e Vacanze*) released annually by ISTAT (Italian National Statistics Institute) while Spanish come from *Encuesta de Turismo de Residentes*, released with an annual cadence and distributed by INE (*Instituto Nacional de Estadística*).

To measure proximity, this study takes inspiration from a 2014 article by Gálvez, Romero, and Devesa which introduces an index called *Coefficient of Attraction* ( $Ca_{ij}$ ). This seems to be particularly effective in assessing domestic tourism and proximity-based movements.

To reach the objective of measuring proximity tourism changes, an analysis based on O-D matrices is implemented with the calculation of the so-called attraction coefficient.

In this study, the coefficient of attraction will be applied to ten origin-destination matrices (five for Italy and five for Spain) representing one matrix for each year. The application of this coefficient will provide valuable insights into the changes in movement patterns between 2019 (the pre-pandemic year), 2020 (the year during the pandemic), and 2023 (the post-pandemic year).

The expected results of this analysis focus on the rise in proximity-based travel and whether this trend (marked by a renewed appreciation for places of origin and nearby destinations) persisted three years after the onset of the COVID-19 crisis or remained confined to specific, predefined periods.

The underlying premise of this study highlights the pandemic's potential role in fostering domestic tourism. It is plausible that, through short-haul trips, tourists rediscovered attractions previously crowded with foreign visitors and uncovered the hidden beauty of their local surroundings. Additionally, this shift may have supported small-scale producers during a period of profound economic difficulties. Finally, this study has mainly a cognitive purpose but can also provide suggestions for adapting the tourism supply in both countries in times of crisis such as that of COVID-19.

### **3.2 Study Context**

The COVID-19 pandemic broke out at the end of 2019, impacting the global economy. The first cases of contagion occurred in Wuhan (China), but soon the virus spread worldwide, triggering a global health emergency. Since the pandemic outbreak, many sectors have entered a crisis, and tourism has not been an exception. The tourism sector experienced substantial losses due to government-imposed restrictions and lockdowns, with a decline of approximately US\$ 1.3 trillion in tourism exports (UNWTO, 2021). Furthermore, after a long period of 10 years of sustained tourism growth, the number of international trips fell sharply in 2020, to an extent not seen even in previous crises. Indeed, the SARS epidemic (2003) caused a reduction of 2 million arrivals and the 2009 global economic crisis a decrease of 37 million trips. In 2020 there was a decrease of 74% in international trips compared to the previous year, with a loss of 1.1 billion international tourist arrivals (UNWTO, 2021). The international tourism landscape was shaped by the specific circumstances of each country. Government-imposed restrictions and their impact on the tourism sector varied widely across nations. However, the effects of the pandemic on tourism in each country were influenced not only by the severity of the restrictions but also by the predominant type of tourism within each destination. Indeed, it is reasonable that the destinations heavily reliant on international tourism were among the most severely affected by the crisis.

#### **3.2.1 The Italian Case**

In Italy the tourism sector is a driving force for the economy, contributing to the maintenance of many jobs and the creation of new ones (approximately 185,000 new jobs in 2023) (WTTC, 2024).

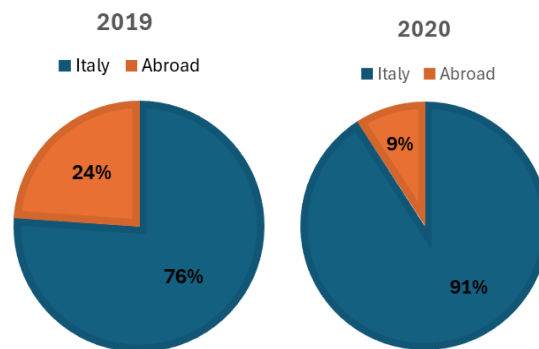
The tourism sector and in particular the international was severely affected. The number of domestic trips reached a historic low since 1997 of around 37 million (ISTAT, 2021). According to the ISTAT, during the year 2020, international trips decreased by around 80%, while the Italian destination by 37,1%. The number of overnight stays is also drastically reduced compared to 2019 with -43.5%, as many as 160 million for holiday trips and around 18 million for business trips. The



greatest reduction in the number of trips was recorded in the second quarter of 2020 during the first lockdown period. This quarter saw a total trip and night reduction of approximately 79%. There is also a -76.5% for holiday trips and a -91.3% for business trips. After the implementation of the restrictive regulations, airport traffic experienced a significant reduction. Specifically, in 2021, national flights decreased by approximately 41.8 million (-35%) compared to 2019. International flights witnessed a substantial decline of 70.4%, totaling 37.9 million. Overall, the total number of flights decreased by 58.2% (Federalberghi, 2021).

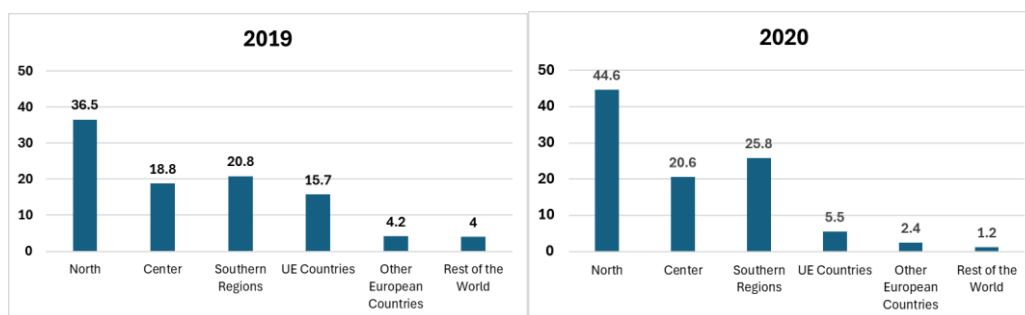
In Italy, the collective accommodation establishments were greatly affected by the consequences of the pandemic as tourists prefer private accommodation. These lost around 53.2% of resident trips and 55.3% of overnight stays. Among accommodation facilities, hotels are certainly the most affected, recording -57.8% of trips and -62.2% of nights.

From the figure below (Figure 3.1) it is possible to see how trips made in Italy by Italian residents increased in 2020 compared to international ones, because of the pandemic and the resulting travel bans imposed during the year.



**Figure 3.1:** *Percentage of trips by Italians in Italy and abroad 2019-2020. Adapted from ISTAT, 2021*

In detail, ISTAT also provided the subdivision by macro-region shown below in Figure 3.2



**Figure 3.2:** *Percentage of trips by Italians in Italy and abroad 2019-2020. Adapted from ISTAT, 2021*

In 2021, the occupancy rate of hotel rooms decreased by 37.8%, while the average revenue per occupied room declined by 36.8%.

Tourist spending also experienced a notable downturn. Specifically, comparing the third quarter of 2021 to that of 2019, spending by foreigners in Italy decreased by 30.4%. Similarly, spending by Italians abroad during the same period saw a significant decline of 41.9%.

Finally, the tourism supply sector has also felt the impact of the pandemic. In 2021, the number of employees in the hotel sector with permanent contracts decreased by 28.7% compared to 2019, while those on temporary contracts decreased by 41.7%, resulting in an overall decrease of 36.8% (Federalberghi, 2021).

### 3.2.2 The Spanish Case

The consequences of the pandemic on tourism were devastating in Spain too. In this country, such as Italy, tourism is a sector particularly important for the whole economy. Indeed, tourism contributes significantly to the GDP; according to the OECD (2020), it accounted for 11.8% of GDP in 2017 and sustained 13.5% of employment (or 2.6 million direct jobs) in 2018. According to the UNWTO data from 2019, Spain has been ranked as the world's second most popular destination and before the pandemic, international tourism in Spain was constantly growing. In 2019 the international arrivals in Spain were around 83 million (UNWTO, 2019). With the advent of the pandemic, Spain experienced a loss of 77% in arrivals in 2020 (Osorio et al., 2023) and in 2022 the tourism sector in this country “employs

2.67 million of people” (12.7% of total Spain employment) (Vayá et al., 2024, p.1021). According to the INE report released in 2020, in the same year:

The number of trips made by residents in Spain decreased by 30.2% in the first quarter, [...] 370.000 trips were made in the second half of March, compared to 8.5 million in the same period for 2019. Considering the total expenditure, this decreased by 22.6% reaching 6,441 million euros (INE, 2020, p.1).

Furthermore, as concerns domestic tourism, the total expenditure fell by 24.3% and 19.1% abroad.

The same INE report shows through the figure below (Figure 3.1) the trips and average duration by main destination.

**Table 3.1:** *Trips and average duration by main destination*

	<b>First Quarter 2020</b>			<b>Average Duration</b>	
	<b>Trips</b>			<b>Overnights</b>	<b>Annual variation</b>
	<b>Total</b>	<b>%</b>	<b>Annual Variation</b>		
<b>TOTAL</b>	29,172,048	100	-30.2	3.4	11.2
Spain	26,165,898	89.7	-30.7	2.9	8
Abroad	3,006,150	10.3	-25.2	7.7	18.6

*Note.* Adapted from INE,2020.

Regarding Spanish data on the tourism supply, restrictions implemented during the first three months of 2020 led to only 35.4% of hotels remaining open, with bed availability reduced to 17.6% compared to 2019. Additionally, overnight expenses in hotel establishments decreased by 95.1% in June 2020.

Unfortunately, the containment measures led to the closure of several businesses, thus affecting various economic sectors (González-Torres et al., 2021).

### 3.2.3 Measures for Tourism Recovery

Some measures both in Italy and in Spain were settled against COVID-19.

In particular, in Spain, these measures concerned “mortgage moratoriums for tourist activities, financial support for projects promoting the digitization of tourism and

the sustainability of tourist destinations, as well as social security exemptions” (Arbulú et al., 2021, p.5).

Even the Italian government has settled different measures to support the tourism industry. Among these initiatives, *Digitour* was implemented. Digitour is a tax credit aimed at travel agencies and tour operators to support their digital investments. The funds can be used for the purchase of digital equipment and software. This facilitation has been granted by the Ministry of Tourism and amounts to approximately 19 million euros, with a maximum amount per enterprise of 25,000 euros. This initiative is part of the approved national recovery plan (NRRP) aimed at revitalizing the economy after COVID-19 (Giovani 2030, 2024).

A second initiative aimed at supporting the tourism sector is the bonus for tour guides. This bonus is intended for those industry experts who have not received other financial aid and who are holders of a VAT number. The contribution amounts to a maximum of 7500€ per beneficiary, for a total of 2 million euros (Confcommercio,n.d.).

### **3.3 Proximity Tourism**

In a panorama of total crisis for international travel, domestic tourism has made its way, guaranteeing its survival. This typology of tourism considers “the activities of a resident visitor within the country of reference either as part of a domestic tourism trip or part of an outbound tourism trip” (UNWTO, 2010, p. 15).

Attention to domestic tourism has very often taken a back seat, leaving space for international tourism. Different authors tried to explain that this happens probably because domestic tourists do not generate significant foreign exchange for the country; instead, they simply redistribute wealth from one region to another (Weaver & Lawton, 2010).

The importance of domestic tourism during the pandemic and, in general, during the period of crisis, has not to be underestimated. Governments and Destination Management Organizations (DMOs) often prioritize international tourism, as it is typically associated with “higher spending capacities and foreign exchange” (Arbulù et al., 2021, p.5).

Despite this, domestic tourism can bring several benefits to the economy above all in the crisis period by supporting small-scale firms and the development of the countries.

Furthermore, the literature demonstrated that when international tourist numbers decline, attention returns to domestic tourism. For example, in the case of the 2004 tsunami in the Indian Ocean where the government supported local businesses by promoting the domestic tourism sector (Weaver, & Lawton, 2010). This is not an isolated case. Even in the case of the Kenyan crisis, after the 2008 election and during the 1997/98 Malaysian financial crisis, governments implemented a recovery plan that also included the promotion of domestic tourism (Woyo, 2021). Domestic tourism has therefore gained attention during the pandemic and post-pandemic period, and it has been considered an important driver in some destinations for the revival of the tourism industry (Arbulù et al., 2021) but also of the entire economy worldwide (UN Tourism, 2020).

In addition to initiatives aimed at helping industry stakeholders, Italy has launched an initiative focused heavily on domestic tourism as a vehicle for relaunching the sector. Indeed, it launched a bonus, called *Bonus Vacanze* during the relaunch decree of May 19, 2020. This bonus consists of a cash contribution intended for families with certain income requirements to be spent on the payment of tourist services, tour operators, and travel agencies at a national level.

However, Italy is not the only one to implement practices to increase domestic tourism. Indeed, also Malaysia allocated around 100 million for travel discounts and expenditure for domestic tourism.

Even Argentina created an observatory of domestic tourism to improve the image of the destination to tourists (UN Tourism, 2020).

The COVID-19 pandemic, beyond leading to a decline in tourism demand, may have also altered its characteristics. It can be assumed that, due to lockdown measures, during the pandemic years and those immediately following, residents traveled more within their region or to neighboring areas.

It is during this period that attention is given to the opportunities that small communities and villages can offer. Indeed, while the COVID-19 pandemic

severely affected urban and densely populated areas, rural areas were impacted to a lesser extent. What were initially considered "weak points," such as low population density and production, actually became strengths for marginal destinations during this period (Cresta, 2021). As a result, tourism of authenticity emerges, along with a need to immerse oneself in unique and "slow" experiences. This growing demand for authenticity is also clearly evident in the consumption habits of tourists. During the COVID-19 period, there was a notable shift towards a greater interest in healthier food options (Zanetti et al., 2022), with travelers becoming more conscious of the quality and origins of the food they consume. This trend presented valuable opportunities for agritourism operators in Italy, who had the opportunity to strengthen their offer.

Moreover, activities such as hiking and pilgrimages were considered among the tourism options that offer the highest level of safety (De Luca et al., 2020). This is primarily due to their inherent characteristics, which naturally align with social distancing requirements and take place in open-air natural environments, reducing potential risks.

Even in Spain, during this period, the pandemic has brought changes in the consumption of tourism products. The demand for slow tourism has emerged here as well. This form of tourism, understood as an opportunity to discover the true identity of the visited location, seemed to play an important role in addressing the emerging needs of tourists. A study aiming to analyze a case of slow tourism in Northern Spain, emphasizes that slow tourism is powerful when the production-consumer relationship happens in the same place (Fusté-Forné, 2023), and it is this type of authentic experiences that tourists were seeking after the COVID-19 crisis. In this context proximity tourism assumes greater significance, enabling lesser-known destinations and more remote rural areas to be valued and transformed into destinations for authentic and genuine experiences.

So, one of the consequences of the pandemic could be the boosting of proximity tourism "whether within a country (i.e., domestic tourism), in a region, or in some part of the border areas between one's home country and neighbouring states." (Lebrun et al., 2022, p.471).

Moreover, the concept of proximity has been extensively described by economists, geographers, and experts from various fields. Many of them have attributed various dimensions to it, which have helped to better understand its facets. In 1990, in France, the Proximity Dynamics Group, comprised of economists and spatial economists, aimed to explain the nature of proximity effects, hypothesizing that space is not neutral but, on the contrary, must be carefully analyzed. This is mentioned in Gilly and Torre (2000), in which the concept of proximity is applied to regional industrial studies. In this work, the authors recognize two dimensions of proximity: the organizational and the geographical proximity.

The first one is based on the logic that “the actors close in organizational terms belong to the same space of relations” (adherence logic), furthermore, “the actors close in organizational terms have the same reference space and share the same knowledge” (similarity logic) (Gilly & Torre, 2000, p.3). These two dimensions are related to the concept of economical proximity. As concerns the geographical one, this is related to space and the relations in terms of distance. This is linked to the localization of enterprises and the “social dimension of economic mechanism”.

The dimensions of the concept of proximity are also discussed in an important work dating back to 2004 by Boschma. The author identifies five dimensions of proximity: cognitive, organizational, social, institutional, and geographical. He presents their positive and negative effects on the economy as well as the connections between them. With cognitive proximity, the author means that people who share similar knowledge and skills can easily learn from each other. On the other hand, organizational proximity is defined in various ways, including that of Gilly and Torre previously mentioned. Social proximity indicates that economic relationships are always embedded in a social context, and social ties have an impact on economic outcomes. Institutional proximity, instead, is linked to an institutional and political framework. According to the author, this dimension of proximity translates into the idea that economic actors are "embedded" within institutional rules and common values. Finally, geographical proximity, which is the focus of this work, can facilitate the flow of information among economic actors.

The concept of proximity examined in this study is related to geographical proximity. The theme of proximity in tourism was discussed in literature, especially with the advent of COVID-19 but also because of the increased awareness of climate change (Salmela et al., 2021). Proximity tourism is a “particular form of tourism that emphasizes local destinations, short distances and lower-carbon modes of transportation” and “in addition to this, it is not only about distance, everyday surroundings anew” (Salmela et al., 2021, p. 46).

Proximity tourism is a type of tourism in which the tourists rediscover places near to where they reside. It's therefore an unusual form of tourism in which the tourists stop to look at places they may have passed by before or only crossed through to reach more distant destinations.

Proximity tourism challenges the traditional tourist figure, often juxtaposed with that of the resident. These two figures, often set in opposition, lose their clear boundaries within the realm of proximity tourism, acquiring a more heterogeneous dimension. Thus, as Jeuring (2018, p.148) states, "residents can experience a city, region, or country both as a tourist and as a resident."

Furthermore, proximity tourism is not just a matter of physical distance, but it requires a change of perspective that encourages the tourist to rediscover the nearby places (Zhang et al. 2024).

As previously mentioned, the pandemic was not the sole reason that brought proximity tourism into focus, however, it was a significant one. Indeed, it is undeniable that the pandemic prompted tourists to visit destinations closer to their places of residence. On the other hand, the restrictions applied during that year did not allow for international travel freedom, and tourists began moving towards nearby regions easily accessible by car, thus avoiding public transportation. That the COVID-19 crisis would bolster proximity tourism had already been hypothesized in 2020 (Navarro et al, 2020 in Romagosa, 2020) and since that moment, several authors focused on this topic.

One of these (Lebrun et al.,2022) aims to study the impact of the COVID-19 pandemic on the travel intention of French people by settling a questionnaire and applying then the *PLS-SEM model*. This model aimed to check the influence of



perceived risk and attitude towards COVID on proximity tourism. The results of this study suggest that the pandemic encouraged people to choose closer destinations for their vacations, and these findings could be valuable in strengthening local tourism marketing strategies. Furthermore, the importance of proximity tourism during the pandemic period is also linked to its nature in itself. Indeed, since proximity tourism is linked to supporting local culture and a familiar environment, the offer of handmade or artisanal products is particularly appreciated after a long period of social distancing (Zhang et al., 2024).

Finally, beyond researchers and tourism enthusiasts, even worldwide organizations and entities have recognized the importance of proximity tourism in times of global crisis, such as the pandemic.

Indeed, the 2021 report of UNWTO confirms that domestic tourism was a strong driver for the tourism sector during the pandemic period, enabling a faster recovery for those destinations where this form of tourism is particularly prevalent.

### **3.4 Data and Methods**

As mentioned above, the data used for these analyses come from the national tourism surveys of Italy and Spain. Both countries and the other Member States must comply with Regulation 692/2011 of the European Parliament and the Council for the harmonized production and dissemination of tourism statistics. This regulation makes surveys and the results of analyses directly comparable. Indeed, despite having different sample sizes, these surveys have common methodological points and, thanks to the weights present in the dataset, the expansion to the population is possible. Before starting the analysis, a cross-check was carried out to verify the correctness of the dataset. In particular, the total number of trips recorded for each year was compared with official data published by the statistical sites of Italy and Spain. As regards methodological similarities in data sampling, both surveys involve a two-stage sampling. The Italian survey, in particular, involves a two-stage sampling (municipalities-households) with stratification of first-stage units. The Spanish sampling, on the other hand, involves a stratified two-stage sampling in which the first stage units are households and the second stage

units are the subjects living in these households. For both surveys, the frequency of data collection is continuous on a quarterly basis and the number of sample units is 32,000 households per year for the Italian survey and about 13,000 people per month for the Spanish one. Data are collected differently. In particular, ISTAT uses the CAPI (Computer-assisted personal interview) technique. Each Italian household receives three visits from the surveyors, where they can provide them with the necessary information. The records of trips and excursions refer to the current month even if previous information is also collected.

The Spanish survey is conducted using both CATI (Computer-Assisted Telephone Interviewing) and CAPI (Computer-Assisted Personal Interviewing) methodologies, with the latter employed as a complementary approach when the former proves insufficient. The information collected here refers to the two months preceding the interview and, if the information is not obtained by CATI technique, the family will receive at least 4 visits from the surveyor.

Based on the interviews conducted on the sample over the five years considered, the databases include respectively 272,113 records (trips) for Spain compared to 30,644 records in the Italian dataset. Below, the annual details will be presented, and expanded to the universe, to provide an overview of the total number of trips undertaken by each residing population during this five-year period.

**Table 3.2:** *Italian and Spanish Trips by residents 2019-2023*

	Italy		Spain	
	Frequency	Percent	Frequency	Percent
2019	71,254,275	27.7	193,874,716	24.4
2020	37,527,418	14.6	101,523,862	12.8
2021	41,641,594	16.2	142,893,460	18.0
2022	54,810,955	21.3	171,388,138	21.5
2023	52,136,418	20.3	185,895,162	23.4
Total	257,370,660	100	795,575,338	100.0

Both datasets have a wide variety of different variables. In particular, these variables can be distinguished into:

- Trips-related variables
- Socio-demographic variables

In particular, the following variables are classified within the first group:

- Number of nights spent
- Means of transport
- Travel company
- Type of accommodation
- Motivation
- Total and daily travel expenses
- Destination of the journey

The variables relating to the characteristics of respondents include:

- Age
- Gender
- Degree of education/training
- Professional status
- Region of origin

The variables "Region of origin" and "Region of destination" are particularly important for the following analysis since these represent the base from which the origin-destination matrices were created.

Clearly, each dataset includes unique variables not included in the other; however, a meaningful comparison is achievable due to the presence of key variables common to both. During the initial exploratory analysis, significant efforts were made to harmonize categories that were classified differently. For instance, variables such as "Trip Motivation," "Means of transport," and "Type of accommodation" feature distinct categories that were standardized into homogeneous and comparable groups through a recoding process.

In this study, a gradual approach was adopted for the dataset analysis.

First of all, the initial section focuses on descriptive statistics, which provide valuable insights into the structure and composition of both datasets. Among the

preliminary analyses, the Spearman index was calculated to test data consistency across years (Gálvez et al., 2014).

Furthermore, the *Net Balance Rate* was computed to examine potential shifts among the top regions both in terms of trip destinations and trip origins for each country.

In addition, departure and arrival rates were calculated to capture the annual regional variations in inbound and outbound trips.

Finally, these results were subsequently visualized through heat maps for greater clarity.

Following these analyses, an attraction coefficient was applied to the Italian and Spanish data. This coefficient, which reflects the attraction strength between a region and its neighboring regions (Gálvez et al., 2014), serves as a useful measure of proximity. When applied to matrices across successive years, it allows for the identification of changes in proximity over time.

This coefficient, explained in detail in the following paragraph, was then applied to 10 matrices, 5 for Spain and 5 for Italy from 2019 until 2023.

Later and for simplicity, some results will be shown only related to the years 2019-2020-2023 considered as reference years pre-during-post pandemic.

Subsequently, six additional heatmaps (covering 2019, 2020, and 2023 for both countries) will be presented to enhance the clarity of the results obtained.

### **3.5 Descriptive Analysis**

The primary objective of this analysis is to assess whether proximity tourism emerged or increased during the COVID-19 pandemic period. The study aims to examine changes in the travel patterns of residents in both countries to identify any temporal differences and determine whether residents have shifted toward regions closer to their place of residence. The main variables focused on for this analysis are the region of residence and the region of destination, which are included in both datasets. However, before proceeding with the analysis, an overview of the key travel variables will be provided to familiarize with the data and assess the potential of these datasets. Among the travel variables mentioned earlier, an overview over

time will be provided for four of them: length of stay, mean of transportation used, motivation, and type of accommodation. Regarding the length of stay (LOS), the analysis was conducted by reclassifying the original numerical variables into two categories. Specifically, trips with a length of 1 to 3 nights are categorized as short vacations, while those lasting 4 or more nights are classified as long vacations. This classification aligns with the one provided by ISTAT for the length of stay. In the absence of a corresponding classification from Spain, this approach was applied to both datasets.

**Table 3.3: Italian and Spanish Trips by Length of Stay 2019-2023**

		Italy			Spain		
		Frequency	Percentage	Cumulative Percentage	Frequency	Percentage	Cumulative Percentage
Length	Short Vacation*						
	Long Vacation**						
	Total						
2019	Short Vacation*	33,828,360	47.5	47.5	133,040,939	68.6	68.6
	Long Vacation**	37,425,916	52.5	100.0	60,833,777	31.4	100.0
	Total	71,254,276	100.0		193,874,716	100.0	
2020	Short Vacation	17,289,775	46.1	46.1	68,400,587	67.4	67.4
	Long Vacation	20,237,644	53.9	100.0	33,123,275	32.6	100.0
	Total	37,527,419	100.0		101,523,862	100.0	
2021	Short Vacation	15,961,616	38.3	38.3	96,379,206	67.4	67.4
	Long Vacation	25,679,979	61.7	100.0	46,514,255	32.6	100.0
	Total	41,641,595	100.0		142,893,461	100.0	
2022	Short Vacation	23,430,419	42.7	42.7	114,589,907	66.9	66.9
	Long Vacation	31,380,536	57.3	100.0	56,798,232	33.1	100.0
	Total	54,810,955	100.0		171,388,138	100.0	
2023	Short Vacation	22,364,599	42.9	42.9	122,656,153	66.0	66.0
	Long Vacation	29,771,820	57.1	100.0	63,239,009	34.0	100.0
	Total	52,136,419	100.0		185,895,163	100.0	

\*(1-3 Nights according to ISTAT classification)  
 \*\*(4Nights or more according to ISTAT classification)

Table 3.3 gives the absolute numbers and percentages of domestic and international short and long-term trips made in Italy and Spain in the five years 2019-2023. In particular, looking at Italy, it is possible to note the large decrease (-47.34%) in the absolute number of trips that occurred between 2019 and 2020. Looking at the percentages of short trips in the years, we can see a decrease in 2020 and 2021 and then find an increase in the following 2 years. Thus, it could be said that the number of long-distance trips is always higher each year than the number of short-distance trips, and there is a decrease in the number of short-distance trips in the years 2020 and 2021.

As for the Spanish trips, it seems that short holidays are preferred over long ones, showing in each year higher percentages for the first category of trips. Looking at long journeys it seems that they have increased from 2019 to 2023.

**Table 3.4:** Italian and Spanish Trips by Mean of Transportation 2019-2023

		Italy			Spain		
		Frequency	Percentage	Cumulative Percentage	Frequency	Percentage	Cumulative Percentage
2019	Air Transportation	15,419,812	21.6	21.6	22,456,523	11.6	11.6
	Sea Transportation	1,342,380	1.9	23.5	2,195,415	1.1	12.7
	Land Transportation	53,370,080	74.9	98.4	168,576,440	87.0	99.7
	Other	1,122,004	1.6	100.0	646,339	.3	100.0
	Total	71,254,276	100.0		193,874,716	100.0	
2020	Air Transportation	3,865,714	10.3	10.3	6,506,443	6.4	6.4
	Sea Transportation	643,523	1.7	12.0	999,248	1.0	7.4
	Land Transportation	32,573,015	86.8	98.8	93,617,502	92.2	99.6
	Other	445,167	1.2	100.0	400,669	.4	100.0
	Total	37,527,419	100.0		101,523,862	100.0	
2021	Air Transportation	5,101,044	12.2	12.2	10,072,123	7.0	7.0
	Sea Transportation	1,405,513	3.4	15.6	1,477,960	1.0	8.1
	Land Transportation	34,560,974	83.0	98.6	130,845,932	91.6	99.7
	Other	574,064	1.4	100.0	497,446	.3	100.0
	Total	41,641,595	100.0		142,893,461	100.0	
2022	Air Transportation	10,051,774	18.3	18.3	18,700,040	10.9	10.9
	Sea Transportation	1,342,249	2.4	20.8	2,362,209	1.4	12.3
	Land Transportation	42,797,005	78.1	98.9	149,942,124	87.5	99.8
	Other	619,928	1.1	100.0	383,765	.2	100.0
	Total	54,810,955	100.0		171,388,138	100.0	
2023	Air Transportation	10,827,843	20.8	20.8	22,828,477	12.3	12.3
	Sea Transportation	1,485,665	2.8	23.6	2,689,347	1.4	13.7
	Land Transportation	39,378,414	75.5	99.1	159,954,866	86.0	99.8
	Other	444,497	.9	100.0	422,473	.2	100.0
	Total	52,136,419	100.0		185,895,163	100.0	

The second variable considered is the transportation mode. Again, both datasets featured different classifications, not only regarding the type of vehicle used but also in the "ownership" of the transportation. For this reason, it was decided to adopt macro classifications, which, although potentially causing some loss of information, appeared to be the most appropriate choice for enabling comparison between both datasets. The information obtained from the frequency distribution of transport is interesting and intuitive at the same time. What can be observed is that from 2019 to 2020 the number of air travel in both destinations decreased. This is clearly due to government restrictions on lockdowns and border closures. In the

case of Italy, comparing the air transportation aggregate over time, it is possible to note that even in 2023 the percentage does not reach the pre-pandemic level (22%). Car travel represents an important share for both countries and, intuitively, increases in Italy after the pandemic. In Spain, the average number of air trips is lower than in Italy but, in this country, the percentage of this type of travel reaches and exceeds the pre-pandemic levels.

**Table 3.5: Italian and Spanish Trips by Motivation 2019-2023**

		Italy			Spain		
		Frequency	Percentage	Cumulative Percentage	Frequency	Percentage	Cumulative Percentage
<b>Main Motivation</b>							
2019	Leisure	44,075,349	61.9	61.9	106,315,474	54.8	54.8
	VFR	17,224,218	24.2	86.0	66,891,177	34.5	89.3
	Religion	855,572	1.2	87.2	796,774	.4	89.8
	Health Treatment	1,311,605	1.8	89.1	3,428,633	1.8	91.5
	Business	7,787,532	10.9	100.0	16,442,659	8.5	100.0
	<b>Total</b>	<b>71,254,276</b>	<b>100.0</b>		<b>193,874,716</b>	<b>100.0</b>	
2020	Leisure	25,351,668	67.6	67.6	51,188,423	50.4	50.4
	VFR	8,902,842	23.7	91.3	38,635,916	38.1	88.5
	Religion	82,539	.2	91.5	254,820	.3	88.7
	Health Treatment	687,314	1.8	93.3	1,995,353	2.0	90.7
	Business	2,503,056	6.7	100.0	9,449,350	9.3	100.0
	<b>Total</b>	<b>37,527,419</b>	<b>100</b>		<b>101,523,862</b>	<b>100.0</b>	
2021	Leisure	28,266,406	67.9	67.9	75,429,458	52.8	52.8
	VFR	9,872,900	23.7	91.6	52,347,433	36.6	89.4
	Religion	185,892	0.4	92.0	299,906	.2	89.6
	Health Treatment	359,887	0.9	92.9	2,240,510	1.6	91.2
	Business	2,956,510	7.1	100.0	12,576,153	8.8	100.0
	<b>Total</b>	<b>41,641,595</b>	<b>100.0</b>		<b>142,893,461</b>	<b>100.0</b>	
2022	Leisure	37,180,286	67.8	67.8	95,274,580	55.6	55.6
	VFR	12,911,325	23.6	91.4	58,532,645	34.2	89.7
	Religion	322,863	0.6	92.0	430,387	.3	90.0
	Health Treatment	625,129	1.1	93.1	2,618,800	1.5	91.5
	Business	3,771,352	6.9	100.0	14,531,727	8.5	100.0
	<b>Total</b>	<b>54,810,955</b>	<b>100.0</b>		<b>171,388,138</b>	<b>100.0</b>	
2023	Leisure	35,200,326	67.5	67.5	102,498,953	55.1	55.1
	VFR	11,861,869	22.8	90.3	62,146,266	33.4	88.6
	Religion	462,980	0.9	91.2	627,183	.3	88.9
	Health Treatment	503,304	1.0	92.1	2,737,077	1.5	90.4
	Business	4,107,940	7.9	100.0	17,885,684	9.6	100.0
	<b>Total</b>	<b>52,136,419</b>	<b>100.0</b>		<b>185,895,163</b>	<b>100.0</b>	

The third variable considered in terms of frequency is travel motivation which is a very important variable for understanding travel behavior at the destination. The common classification for this variable was made by adapting the Spanish classification to the Italian one for simplicity. However, while the Spanish dataset provided a single variable that included both leisure and business trips, the Italian dataset had two distinct variables that were modified to create a unique version.

What can be observed in the Italian data is that from 2019 onwards, leisure travel has increased and still, in 2023 the percentage of these is higher than in 2019. Business trips have declined and are no longer at pre-pandemic levels. In Spain, on the other hand, work-related travel has not decreased; on the contrary, leisure trips have exceeded pre-pandemic levels in 2022. It is also interesting to note that in the years 2020 and 2021, the percentage of the *Visiting Friends and Relatives* (VFR) travel reasons increased, returning to similar pre-pandemic levels in 2022.

**Table 3.6: Italian and Spanish Trips by Type of Accommodation 2019-2023**

		Italy			Spain		
		Frequency	Percentage	Cumulative Percentage	Frequency	Percentage	Cumulative Percentage
<b>Type of Accommodation</b>							
2019	Hotel Accommodation	27,099,505	38.0	38.0	46,443,023	24.0	24.0
	Extra-Hotel Accommodation	44,154,771	62.0	100.0	147,431,694	76.0	100.0
	Total	71,254,276	100.0		193,874,716	100.0	
2020	Hotel Accommodation	11,681,394	31.1	31.1	17,106,909	16.9	16.9
	Extra-Hotel Accommodation	25,846,025	68.9	100.0	84,416,953	83.1	100.0
	Total	37,527,419	100.0		101,523,862	100.0	
2021	Hotel Accommodation	13,352,722	32.1	32.1	29,654,605	20.8	20.8
	Extra-Hotel Accommodation	28,288,873	67.9	100.0	113,238,856	79.2	100.0
	Total	41,641,595	100.0		142,893,461	100.0	
2022	Hotel Accommodation	19,996,249	36.5	36.5	43,394,959	25.3	25.3
	Extra-Hotel Accommodation	34,814,706	63.5	100.0	127,993,180	74.7	100.0
	Total	54,810,955	100.0		171,388,138	100.0	
2023	Hotel Accommodation	19,521,916	37.4	37.4	45,533,754	24.5	24.5
	Extra-Hotel Accommodation	32,614,503	62.6	100.0	140,361,409	75.5	100.0
	Total	52,136,419	100.0		185,895,163	100.0	

Another important variable to consider in analyzing travel behavior is the type of accommodation chosen. To obtain distributions of the same category for both datasets, the classification model of hotel and extra-hotel facilities proposed by ISTAT was used. According to ISTAT hotel accommodations are: "1-5 star hotels, hotel villages, tourist residences, guest houses, motels, period residences, furnished or garnì hotels, historic wellness centers (beauty farm) and all other types of accommodation that according to regional regulations are comparable to hotels". The following are defined as extra-hotel or complementary activities: "campsites, tourist villages, mixed forms of campsites and villages tourism, business-managed



rental accommodation, agro-tourist accommodation, holiday homes, hostels, youth, alpine refuges and other accommodation not elsewhere classified" (ISTAT, 2010, p.2).

Table 3.6 reveals a clear, evolving preference for extra-hotel accommodation over traditional hotels. Notably, in both destinations, the choice of such facilities has increased with the onset of COVID-19. Moreover, the data for 2023 appear to align closely with those from 2019, suggesting a return to pre-pandemic patterns. Data indicates also that tourists residing in both destinations consistently prefer complementary accommodations to hotels, a preference that, while amplified during the COVID-19 years, was already evident beforehand.

The variables for which the frequencies have been identified are fundamental for understanding travel behavior. Examining their distribution over five years provides an initial indication of how COVID-19 impacted these patterns. However, a more detailed understanding emerges from analyzing the monthly distribution of the data, as it highlights short-term fluctuations and seasonality.

The subsequent analyses focus on three key aggregates:

- Number of nights: capturing the total volume of overnight stays.
- Number of trips: reflecting the frequency of travel activity.
- Average stay: indicating the duration of trips.

These aggregates are examined in their monthly distribution to more precisely capture the effects of the pandemic, particularly during the critical months of 2020. This approach helps uncover not only the immediate disruptions caused by COVID-19 but also the longer-term shifts in travel behavior and preferences.

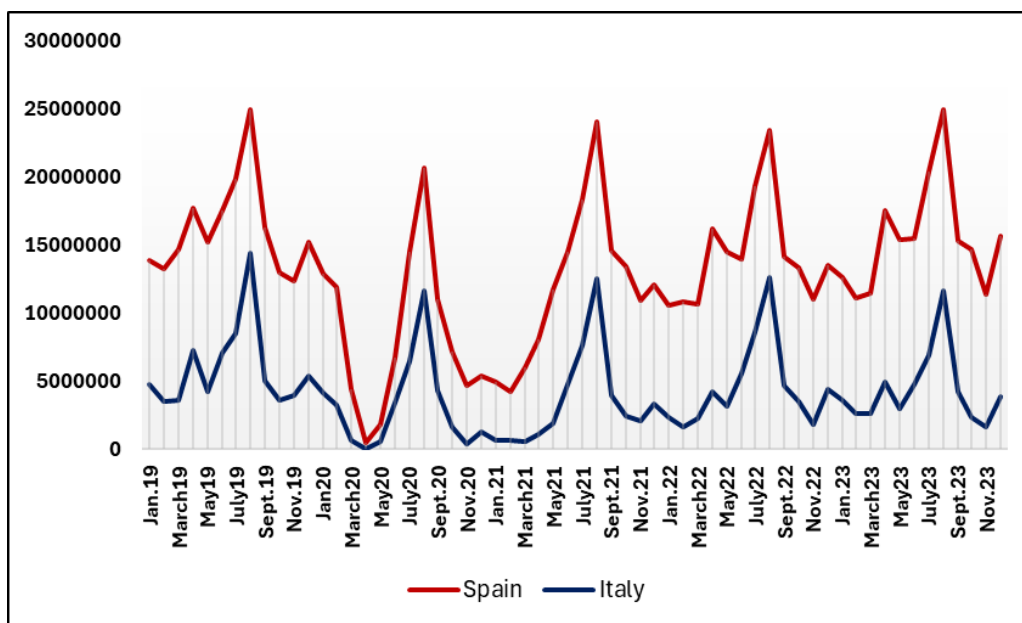


Figure 3.3: Italian and Spanish absolute number of trips by month 2019-2023

The figure above illustrates the domestic and outgoing trips in absolute numbers for Italy and Spain from January 2019 to December 2023. The data reveal that the volume of trips in Spain surpasses those in Italy. For instance, during the summer of 2019, Spanish trips reached approximately 25 million, compared to 15 million in Italy for the same period.

The chart highlights several key aspects, including seasonality, the impact of government restrictions, and the varying degrees of recovery following the COVID-19 pandemic. Regarding seasonality, both countries exhibit similar patterns, characterized by peaks during the summer months (often preceded by a "left shoulder") and declines in the autumn and winter months. This highlights the shared seasonal nature of tourism in both destinations.

The effects of the pandemic are particularly evident in 2020, especially during March and April, when the absolute number of trips dropped to zero. This dramatic decline corresponds to the declaration of a state of emergency and the subsequent lockdowns imposed on March 9 in Italy and March 14 in Spain.

Finally, the comparison between 2023 and 2019 provides additional insights into post-pandemic recovery. In Spain, the summer season of 2023 appears to have

regained the same absolute numbers as 2019. However, this is not the case for Italy, where the peak in 2023 falls short of the levels recorded in 2019.

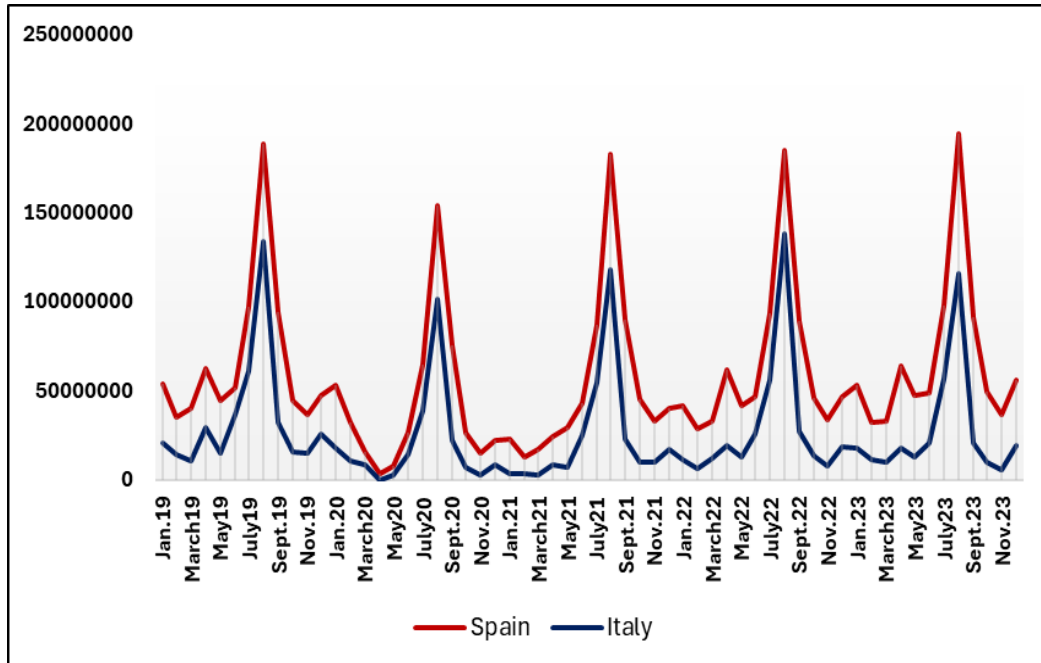


Figure 3.4: Italian and Spanish absolute number of overnight stays 2019-2023

The graph shows the absolute number of nights spent by tourists in Italy and Spain. Unlike Table 3.3, which distinguishes between short and long holidays, this representation gives the absolute total of nights spent. This variable is particularly important in studying travel behavior since it allows us to distinguish tourists from excursionists: the tourist spends at least 24 hours at the destination, while the excursionists spend a day without overnight.

As with the absolute number of trips, the Spanish also outnumber the Italians in terms of nights spent. Moreover, the trend of this variable indicates that in Spain, the levels of overnight stays observed in 2019 were reached again in 2023. In contrast, Italy, despite reaching 2019 levels by 2022, experiences a decline in the subsequent year.

The final aggregate analyzed in monthly detail is the average length of stay, calculated as the ratio between the total number of nights spent and the number of

trips taken. Figure 3.5 illustrates the month-by-month evolution of the average stay from 2019 to 2023.

The analysis reveals that Italy recorded the highest average stay during both the pre-COVID and post-COVID periods. However, it seems that the average stay in Italy was more heavily impacted by the pandemic compared to Spain. In Italy, there is a sharp decline during the pandemic, reaching a minimum that the Spanish average stay never approached.

Interestingly, before this negative drop, Italy experienced an anomalous peak in average stay, exceeding 12 days (an unusually high value). While this phenomenon is not immediately explainable, one plausible interpretation could be linked to the restrictions implemented at the onset of the pandemic, which suddenly stopped all trips. As a result, many residents likely had to stay longer in a place away from their usual home while waiting to return to their home region.

In contrast, Spain appears to have avoided a similar pattern, demonstrating greater stability in average stay even during the lockdown period.

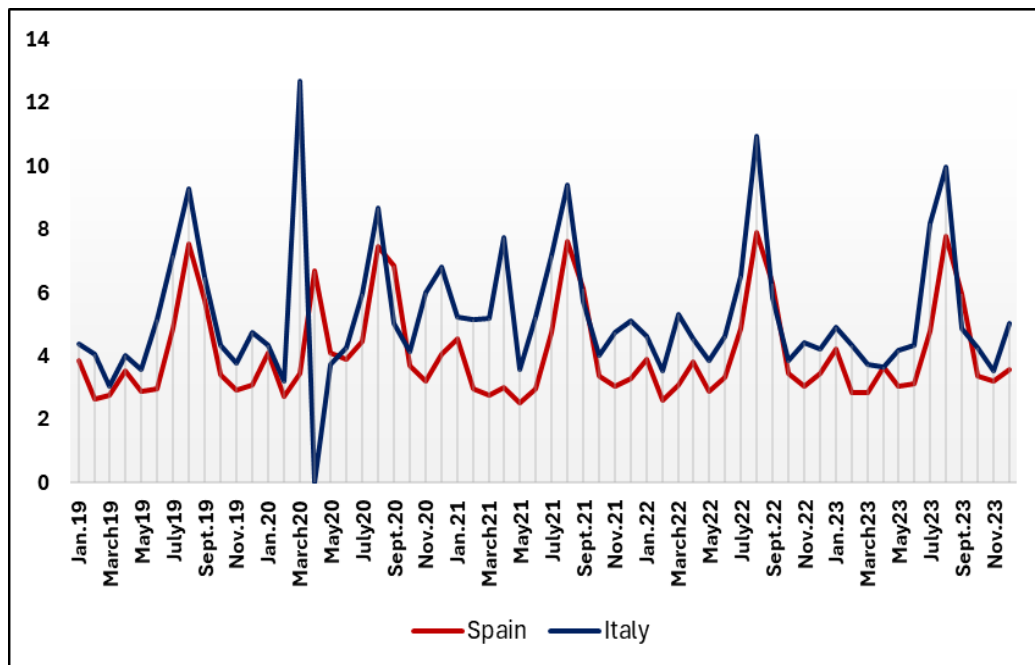
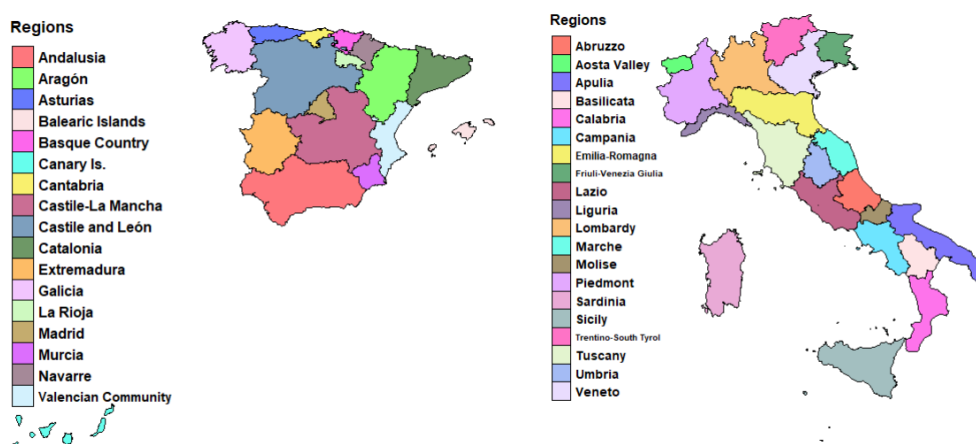


Figure 3.5: Italian and Spanish length of stays 2019-2023

### 3.6 Net Balance Rate

Since our goal is to measure proximity and assess its presence during the COVID-19 period, it is essential to become familiar with the Spanish and Italian regions. In particular, it is important not only to know the regions but also to identify which ones are the main originators of trips and which ones receive the highest number of trips, both from other regions and from abroad. For this reason, a ranking of regions is carried out based on incoming and outgoing flows for both destinations. The consistency of the results will be tested using the Spearman index (Gálvez, et al., 2014). Below is a map of Italy and one of Spain, each showing their respective regional subdivisions.



**Figure 3.6:** Maps of Spain and Italy, regional division

The tables below (Table 3.7), as mentioned above, show which are the top three regions with the highest number of incoming and outgoing trips for the 5 years under analysis. On the left, we find the ranks for Italy, and on the right for Spain.

**Table 3.7:** First three Italian and Spanish regions for incoming and outgoing flows

Position	Italy		Spain		
	Outgoing	Incoming	Outgoing	Incoming	
2019	1°	Lombardy ( <b>16.5%</b> )	Tuscany ( <b>8.2%</b> )	Madrid ( <b>18.2%</b> )	Andalusia ( <b>16.9%</b> )
	2°	Emilia-Romagna ( <b>13.4%</b> )	Emilia-Romagna ( <b>7.8%</b> )	Catalogna ( <b>17.3%</b> )	Catalogna ( <b>13%</b> )
	3°	Veneto ( <b>11.3%</b> )	Latium ( <b>6.7%</b> )	Andalusia ( <b>15.3%</b> )	Valencian Community ( <b>10.2%</b> )
2020	1°	Lombardy ( <b>22%</b> )	Tuscany ( <b>10.4%</b> )	Madrid ( <b>17.2%</b> )	Andalusia ( <b>18.6%</b> )
	2°	Emilia-Romagna ( <b>15.8%</b> )	Emilia-Romagna ( <b>10%</b> )	Andalusia ( <b>16.4%</b> )	Catalogna ( <b>13.3%</b> )
	3°	Latium ( <b>10.7%</b> )	Trentino A.Adige ( <b>9.1%</b> )	Catalogna ( <b>16.1%</b> )	Valencian Community ( <b>11.4%</b> )
2021	1°	Lombardy ( <b>19.8%</b> )	Tuscany ( <b>10.1%</b> )	Catalogna ( <b>17.6%</b> )	Andalusia ( <b>18.2%</b> )
	2°	Latium ( <b>10.7%</b> )	Emilia-Romagna ( <b>9.9%</b> )	Madrid ( <b>16.7%</b> )	Catalogna ( <b>14.4%</b> )
	3°	Emilia-Romagna ( <b>10.6%</b> )	Lombardy ( <b>6.6%</b> )	Andalusia ( <b>15.8%</b> )	Valencian Community ( <b>11.7%</b> )
2022	1°	Lombardy ( <b>24%</b> )	Tuscany ( <b>8.9%</b> )	Madrid ( <b>18.4%</b> )	Andalusia ( <b>16.4%</b> )
	2°	Emilia-Romagna ( <b>10.7%</b> )	Emilia-Romagna ( <b>8.5%</b> )	Catalogna ( <b>17.6%</b> )	Catalogna ( <b>14.1%</b> )
	3°	Latium ( <b>9.6%</b> )	Veneto ( <b>7.5%</b> )	Andalusia ( <b>14.6%</b> )	Valencian Community ( <b>10.5%</b> )
2023	1°	Lombardy ( <b>25.4%</b> )	Tuscany ( <b>9.2%</b> )	Madrid ( <b>17.8%</b> )	Andalusia ( <b>17.1%</b> )
	2°	Emilia-Romagna ( <b>10.6%</b> )	Emilia-Romagna ( <b>7.9%</b> )	Catalogna ( <b>16.4%</b> )	Catalogna ( <b>12.8%</b> )
	3°	Veneto ( <b>10.5%</b> )	Lombardy ( <b>7.3%</b> )	Andalusia ( <b>15.6%</b> )	Valencian Community ( <b>9.9%</b> )

The table above (Table 3.7) is based on the ranking of travel frequencies in descending order, and it reveals a certain consistency in the regional hierarchy.

For Italy, Lombardy, Emilia Romagna, and Latium consistently rank among the top regions for outgoing trips. Conversely, Tuscany, Emilia Romagna, and Latium emerge as the leading regions for incoming travel. While minor variations in rankings are observed in the Spanish data, these distinctions are almost absent in the Italian case. For Spain, Madrid, Catalonia, and Andalusia consistently dominate as the regions with the highest outgoing trips, while Andalusia, Catalonia, and the Valencian Community consistently attract the largest incoming flows.

Examining percentages for Italy, Lombardy consistently ranks first for outbound trips, with its share generally increasing year by year, except in 2021, when a slight decrease is observed. Tuscany leads in incoming flows, with the share of trips to the region consistently ranging between 8% and 10%. For Spain, Madrid emerged as the leading region for outgoing trips in 2019, 2020, 2022, and 2023, while Andalusia consistently tops the list for incoming trips across all five years.

This coherence of ranking position is also demonstrated by the Spearman coefficient. This was calculated considering the year intervals 2019-2020, 2020-2021, 2022-2023 for both countries.

The results show that for Italy and Spain, this consistency is very strong. Spearman coefficient was calculated for the incoming and outgoing flows series for both

countries and the  $\rho$  value never went below 0.92. For the Spanish data in particular, sometimes, it acquired a value of 1 demonstrating a perfect consistency over the years.

It is worth noting that while the previous analysis identifies the regions that generate and receive the highest number of trips, the following analysis of the net balance will provide an estimation of their net flows (Gálvez et al., 2014). Specifically, the next section will present the Net Balance Rates for both destinations.

The formula for the Net Balance Rate is the following:

$$\text{Net Balance}_i = x_i - y_i + e_i$$

Where:

- $i = 1, 2, 3, \dots, n$ ;
- $x_i$  = Trips received by the community  $i$
- $y_i$  = Trips originated by the community  $i$
- $e_i$  = Trips originated by the community  $i$  and abroad

The interpretation of these results suggests that a negative net balance rate indicates that the region originates more trips than it receives, whereas a positive net balance rate signifies that the region receives more trips than it originates.

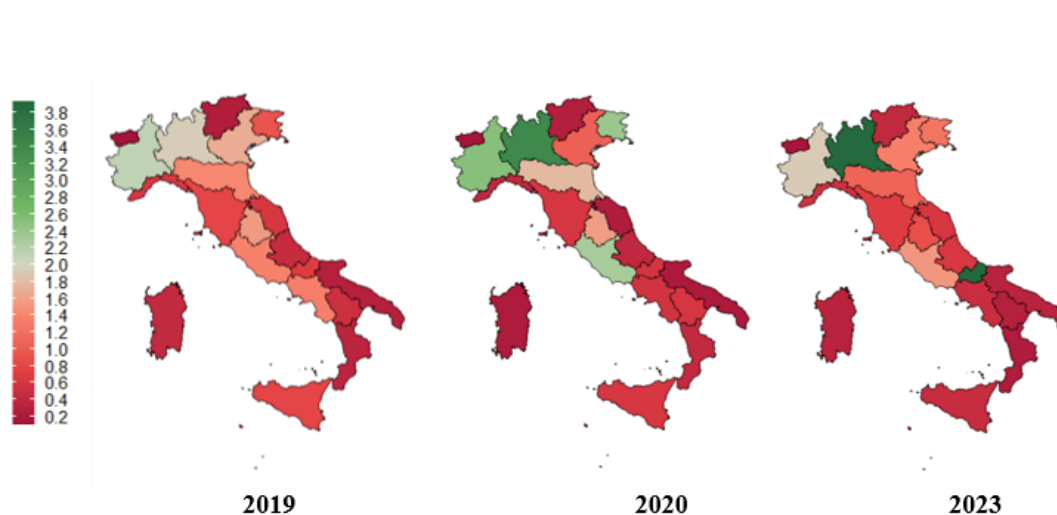
Examining the net balance rate, it emerges that regions such as Piedmont, Lombardy, and Latium consistently show a negative net balance over the five-year period, indicating that they generate more trips than they receive. Conversely, regions with a consistently positive net balance include Trentino, Liguria, Apulia, and Calabria, destinations widely recognized for their strong tourism reputation.

Other regions also exhibit a positive net balance across all five years, notably Aosta Valley, Tuscany, Marche, Abruzzo, Basilicata, Sicily, and Sardinia, where incoming trips consistently exceed outgoing trips.

Finally, certain regions display fluctuating net balance rates, varying from year to year. Examples include Veneto, Emilia-Romagna, Umbria, Molise, and Campania. To provide a more intuitive visualization of the results, heat maps were chosen as the preferred method of presentation. In this case, the focus was shifted from

representing absolute values to highlighting the departures/arrivals ratio. It is important to note that these ratios have been calculated to exclude trips made by residents within their own region. This approach ensures a clear depiction of incoming and outgoing flows for each region individually.

Figure 3.7 illustrates the ratio of departures on arrivals in Italy for the three years 2019-2020-2023.



**Figure 3.7:** *Italian Ratio Departure on Arrivals 2019-2023*

Regions highlighted in green represent areas where more tourists depart than arrive. This trend is evident across the three years for regions such as Piedmont and Lombardy.

In particular, Piedmont experienced an increase in its ratio in 2020 compared to 2019, followed by a decline in 2023, reflecting a reduction in departures to other regions. Conversely, Lombardy shows a consistent year-on-year increase in its ratio, with a notable reduction in arrivals in 2020, marking its transition into a predominant travel-exporting region by 2023. It is worth noting that Lombardy was the epicentre of the initial COVID-19 outbreak in Italy, which likely influenced the perceived risk of contagion among tourists in 2020. The continued increase in the ratio by 2023 could suggest a persistent perception of the region as less attractive for tourism.



Friuli-Venezia Giulia exhibits a different pattern: after a sharp rise in departures in 2020, the ratio decreases in 2023, signaling a gradual return to pre-pandemic dynamics.

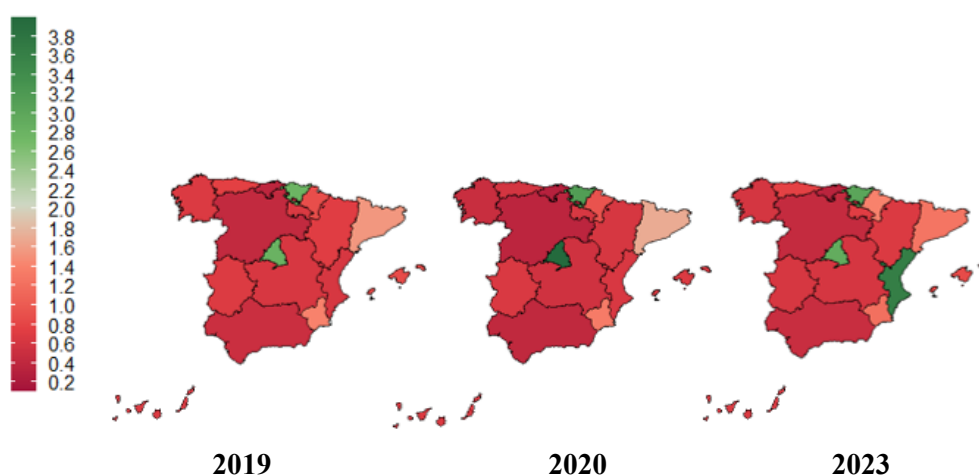
Latium, on the other hand, presents an intriguing trend. Before the pandemic, departures slightly outnumbered arrivals, indicating a stable balance between inflows and outflows. However, in 2020, the ratio rose, likely driven by a sharp decline in tourist arrivals to Rome, a premier tourist destination. In 2023, the ratio decreases but still remains above pre-pandemic levels, reflecting an incomplete recovery.

Finally, the islands (Sicily and Sardinia) show a steady increase in their ratios from 2019 to 2023. This consistent growth points to a reduction in departures to other regions, suggesting a shift in travel patterns.

This analysis highlights how regional tourism dynamics were profoundly shaped by the pandemic, with varying degrees of recovery and adaptation across different areas.

As concerns the Spanish regions, the same analysis was performed for them, and by examining the Net Balance Rate some key observations emerge.

In particular, what is possible to observe through the ratios representation is a positive trend in the three-year period for many regions. The regions with negative net balance rates in all three years are Madrid, Basque Country, Catalonia, and Murcia.



**Figure 3.8:** Spanish Ratio Departure on Arrivals 2019-2023

The analysis of the Ratios highlights several key trends. In the Madrid region, the ratio increased in 2020, indicating either a rise in departures or a decline in arrivals. Given Madrid's status as a major tourist destination, the latter explanation appears more likely. Furthermore, in 2023, the ratio partially returns to pre-pandemic levels, reflecting a gradual recovery.

The Basque Country also shows an increase in the ratio in 2020 compared to 2019, and it remains elevated in 2023, suggesting a sustained shift in travel dynamics.

Similarly, the Valencian Community experiences a sharp increase in its ratio in 2023, which could signify a notable rise in departures to other regions, potentially as a result of changes in post pandemic travel behaviors. In contrast, regions such as Galicia, Asturias, Aragon, and Cantabria appear to have been less affected by the pandemic, maintaining relatively stable ratios over the years. Lastly, the islands (Canary Islands and Balearic Islands) show ratios in 2023 that are close to their 2019 levels, indicating a return to pre-pandemic patterns.

### **3.7 The Coefficient of Attraction**

Up to this point, the analysis has focused on the transformations observed in the five-year period 2019–2023 concerning incoming and outgoing tourist flows across Italian and Spanish regions. The examination has identified the primary regions of origin for these flows and the major recipient areas. The extended timeframe has revealed that, in the last year, some departure-to-arrival ratios have begun to return to pre-pandemic levels, while others, having shifted after 2019, have maintained these changes through 2023.

However, this overview provides limited insight into proximity-based dynamics, offering no information on movements between neighboring regions or within individual regions. Consequently, there is a lack of detailed understanding regarding both inter-regional and intra-regional trips.

The second part of this study will address this gap by investigating proximity patterns and assessing the impact of the COVID-19 pandemic and its associated restrictions on domestic tourism within Italy and Spain.

It is important to emphasize that, from this point onward, outgoing trips will no longer be considered, as the focus will shift exclusively to domestic tourism.

Origin-Destination (O-D) matrices were utilized to gather insights into proximity-based movements, applying an attraction coefficient to them (Gálvez et al., 2014). Specifically, O-D matrices represent origin-destination flows, indicating movements originating from a region towards itself and all other regions. The matrix considered in this analysis takes the following shape:

$$\text{Origin-Destination Matrix} = \begin{matrix} & \begin{matrix} x_{11} & x_{12} & \cdots & x_{1j} & \cdots & x_{1J} \end{matrix} & \begin{matrix} X_1 \\ X_2 \\ \vdots \\ X_i \\ \vdots \\ X_I \end{matrix} \\ \begin{matrix} x_{21} & x_{22} & \cdots & x_{2j} & \cdots & x_{2J} \\ \cdots & \cdots & \cdots & \cdots & \cdots & \cdots \\ x_{i1} & x_{i2} & \cdots & x_{ij} & \cdots & x_{iJ} \\ \cdots & \cdots & \cdots & \cdots & \cdots & \cdots \\ x_{I1} & x_{I2} & \cdots & x_{Ij} & \cdots & x_{IJ} \end{matrix} & \begin{matrix} Y_1 \\ Y_2 \\ \cdots \\ Y_j \\ \cdots \\ Y_J \\ T \end{matrix} \end{matrix}$$

Where:

$x_{ij}$  = the number of trips originated in the region  $i$  towards the region  $j$

$X_i$  = the total number of outgoing flows from region  $i$

$Y_j$  = the total number of incoming flows to region  $j$

$T$  = the sum of all flows in the matrix

For this analysis, first of all, the variables "origin regions" and "destination regions" were organized in our database. Initially, the categories (corresponding to the names of the regions) lacked geographical order. Establishing such an order was essential for the analysis, as arranging the regions by proximity was crucial to capturing the effects of geographic closeness.

For both origins and destinations, the regions were ordered sequentially from north to south.

The outcome consisted of 10 trip matrices expressed in absolute numbers: five matrices corresponding to Spain over the five years (Table C.1-C.5) and another five representing Italy for the same period (Table D.1-D.5).

An attraction coefficient, previously applied by Gálvez et al. in 2014 to Spanish travel matrices for the period 2004–2008, was utilized for these absolute travel matrices.

The attraction coefficient is defined as follows:

$$ca_{ij} = \frac{x_{ij}}{\sum_j x_{ij}} \cdot \frac{\sum_j y_j}{y_i}$$

Where:

$ca_{ij}$  = coefficient of tourist attraction between the autonomous communities  $i$  and  $j$

$X_i$  = number of trips made by the residents of the region  $i$

$Y_j$  = number of trips received by the region  $j$

$X_{ij}$  = number of trips originated in the region  $i$  whose destination is in the region  $j$

This coefficient quantifies the level of attraction in terms of travel between regions. A value less than or equal to 1 indicates a low degree of attraction between regions, while a value greater than 1 signifies a high degree of attraction.

The application of this attraction coefficient to the 10 matrices has resulted in an additional 10 matrices for both countries over the same period.

These matrices show the regions of origin in rows and the destination regions in columns. The main diagonal reflects intra-regional travel, where trips both originate and end within the same region. The numerical results from applying this coefficient show a notable increase in intra-regional trips, particularly in 2020. This trend reflects a rise in domestic trips as a response to pandemic-related restrictions. However, beyond this, our interest lies in understanding whether residents of a

region traveled to neighboring regions. To gain clearer insights, we chose to visualize the results for a more immediate interpretation.

Starting from the case of Italy, the heatmaps related to the 3 years are the following:

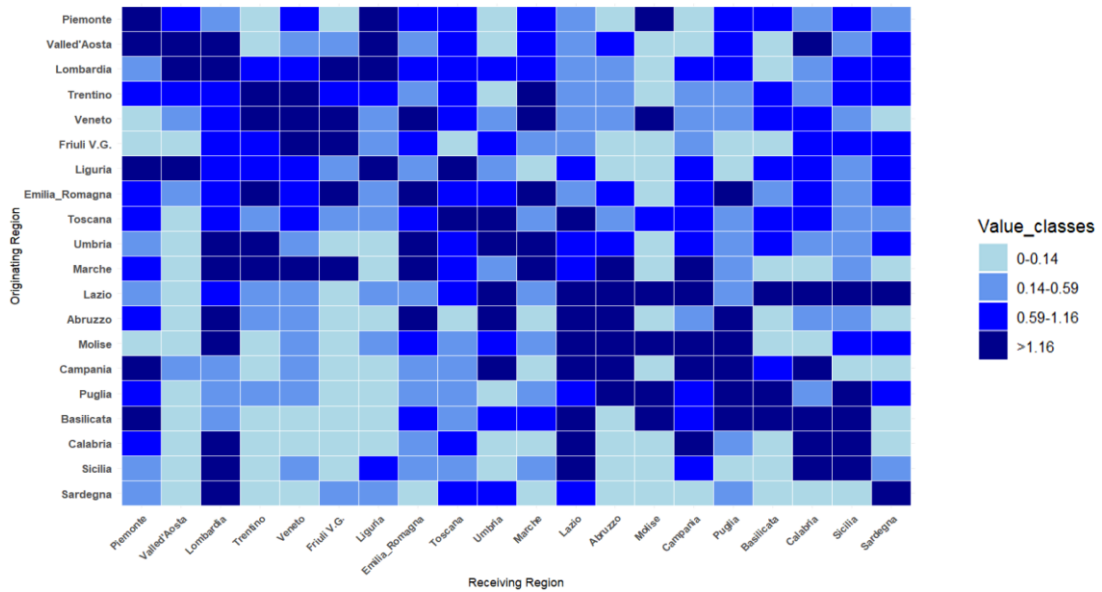


Figure 3.9: Italian Origin-Destination Matrix, year 2019

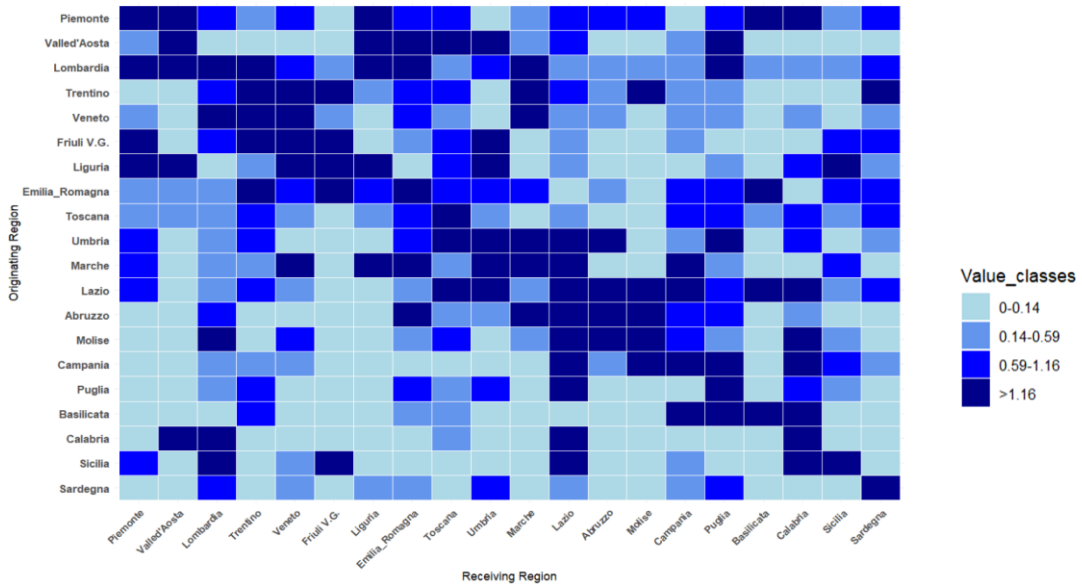
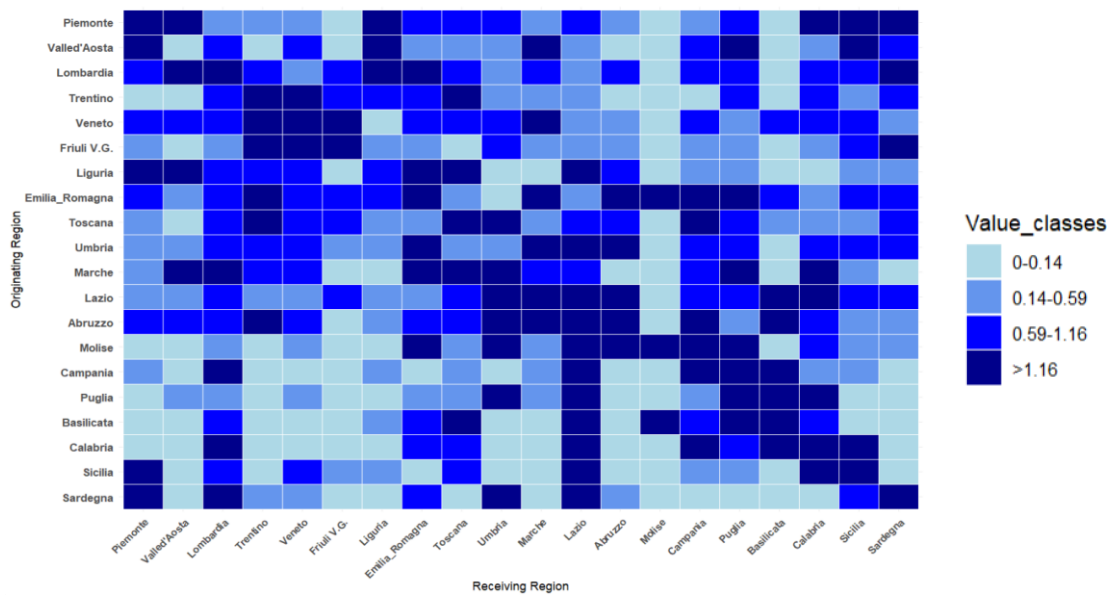


Figure 3.10: Italian Origin-Destination Matrix, year 2020



**Figure 3.11:** *Italian Origin-Destination Matrix, year 2023*

The previous heatmaps (Figures 3.9, 3.10, and 3.11) were constructed using the quartiles of the 2019 distribution to enhance comparability across the maps. As mentioned earlier, the regions are ordered geographically from north to south. In all three years maps, the concentration of trips along the main diagonal indicates a strong presence of intra-regional trips.

In particular, in 2020, there is an even greater concentration of values along the main diagonal, with fewer intermediate values visible on the map. This reflects a shift toward delimited areas, likely influenced by pandemic-related restrictions. By contrast, the 2023 heatmap exhibits a distribution of values that closely aligns with the patterns observed in 2019, suggesting a recovery of inter-regional trip dynamics and a “normalization” of tourist behaviors to pre-pandemic conditions.

Finally, the analysis of the macro-regions reveals distinct areas of concentration in tourism flows, reflecting well-defined patterns across the different parts of the country. Specifically, it is possible to observe a concentration between the north and west regions, as well as a connection among the north-east regions. Similarly, the central and southern areas exhibit their concentrated areas.

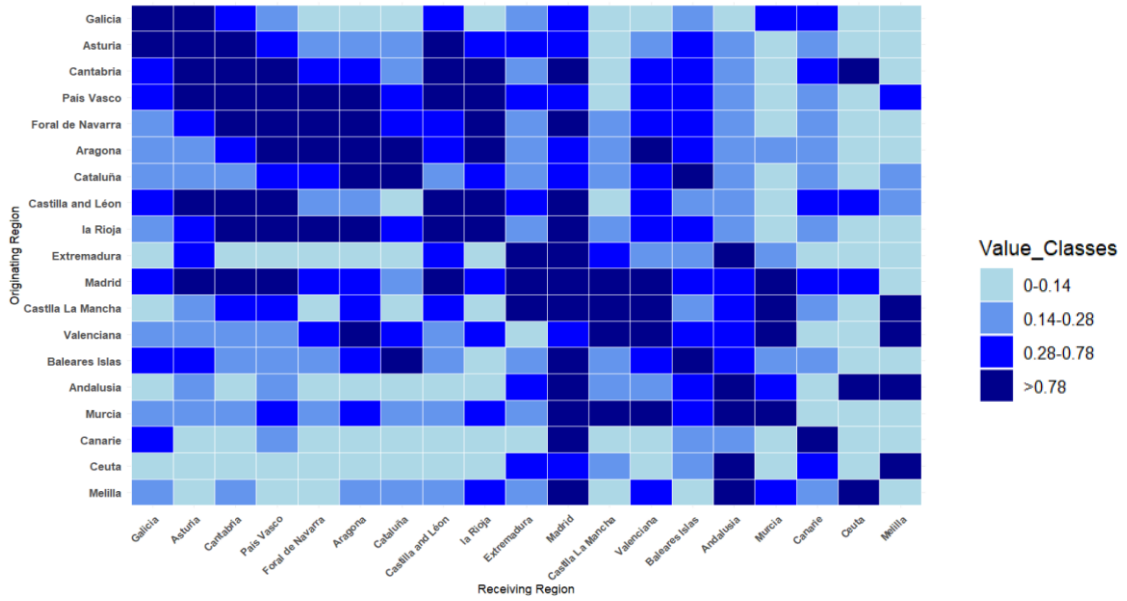


Figure 3.12: Spanish Origin-Destination Matrix, year 2019

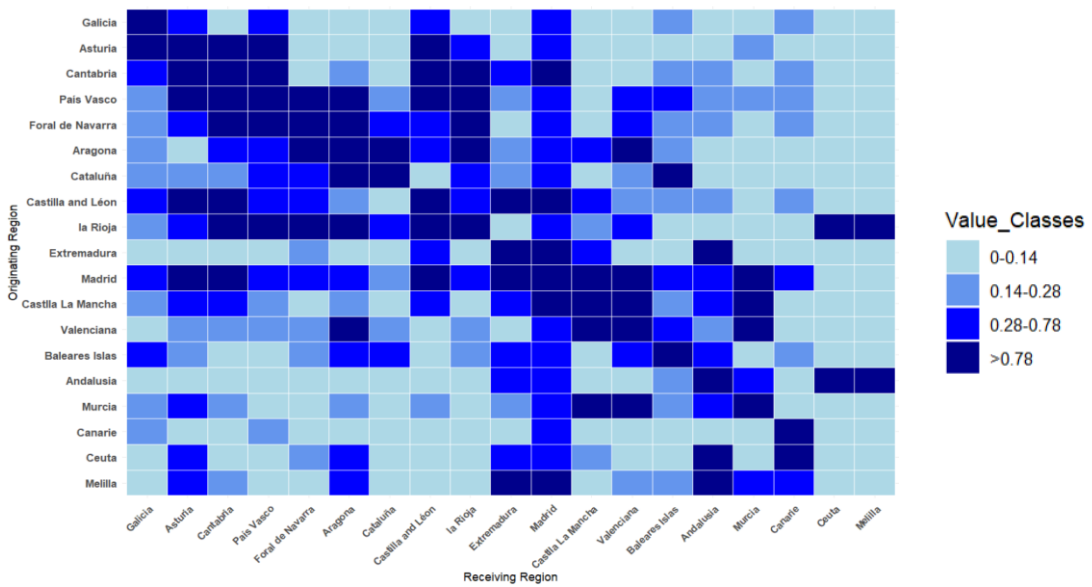
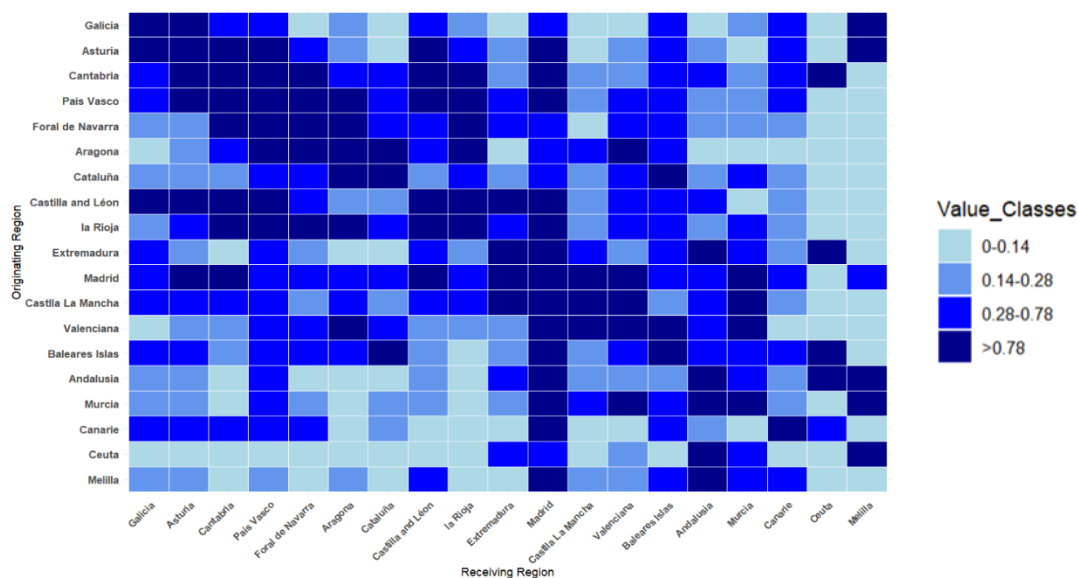


Figure 3.13: Spanish Origin-Destination Matrix, year 2020



**Figure 3.14:** *Spanish Origin-Destination Matrix, year 2023*

The three previous heat maps display the Spanish regions arranged geographically from north to south, offering a clear visual representation of the spatial distribution of tourism flows across the country. As in the case of Italy, the reference value classes for these maps are derived from the quartiles of the 2019 distribution, ensuring a consistent comparative framework. A similar pattern emerges in Spain: in 2020, values are increasingly concentrated along the main diagonal, which represents intraregional tourism or exchanges between geographically adjacent regions. This shift likely reflects the impact of the COVID-19 pandemic, which imposed restrictions on long-distance trips, thereby amplifying the role of local or short-distance movements.

Furthermore, across all three years analyzed, there is a marked intensification of tourism activity in the northern regions. This trend is especially evident when contrasted with the decrease in tourism flows involving the southern regions in 2020. Notably, the region of Madrid stands out consistently, demonstrating a strong ability to attract tourists from its neighboring areas. However, this capacity appears to have diminished in 2020, possibly due to the stricter restrictions or heightened risk perceptions associated with urban centres during the pandemic.



### 3.8 Results and Conclusions

This chapter examined a new travel behavior that emerged in response to the pandemic crisis. Proximity tourism, defined as visits to locations near one's place of residence, played a crucial role during the pandemic years, marked by a dramatic collapse in international tourism. This type of tourism, which experienced a less severe decline, offered an opportunity to discover nearby destinations previously unknown or overshadowed by foreign tourists.

This study, specifically, focused on two destinations characterized by strong tourism flows: Italy and Spain. Both countries, located in the Mediterranean basin, exhibit similar travel patterns and also present similarities in terms of government-imposed restrictions. The immediate changes in travel behavior were analyzed, paying particular attention to length of stay, accommodation choices, transportation modes, and primary motivations. While some differences emerged in these choices, certain common trends were also identified, such as the increased preference for alternative accommodations over hotels in 2020.

Furthermore, through a monthly analysis, a more detailed picture was provided of the pandemic's impact on the number of trips, the number of overnight stays, and the average trip duration. Beyond these analyses, there were no significant changes in either Italy or Spain regarding the origin and destination regions with the highest volume of trips. However, certain regions, more than others (such as Lombardy, Latium, and Madrid) experienced a marked loss of attractiveness in 2020 or saw higher numbers of departures compared to arrivals. For some of these regions, trends in 2023 appear to be returning to 2019 levels (e.g., Piedmont and Madrid), while for others, such as Lombardy, this recovery seems less evident.

Finally, the last analysis aimed to determine whether proximity tourism truly increased during 2020. To achieve this, origin-destination matrices were constructed for both countries, and an attraction coefficient (Gálvez et al., 2014) was applied.

The results of the analysis, shown through heat maps, clearly support the identification of this emerging trend. As seen in Figures 3.10 (Italy) and Figure 3.13

(Spain), the values along the main diagonals are more concentrated compared to previous years. This suggests that in both countries, there is a clear shift towards pre-pandemic patterns, indicating a recovery in "non-proximal" trips, where people are beginning to travel beyond their immediate surroundings again.

In conclusion, the analysis shows that proximity tourism increased during the pandemic period. While some trends have not yet fully returned to pre-pandemic levels, the proximity maps show that they are getting closer to that point, suggesting a recovery in the broader tourism landscape.

This chapter is based on the following work:

1. Sciortino, C., Venturella, L., De Cantis, S., (2022). *COVID-19 pandemic and tourism demand: a comparison between Spain and Italy*. In A. Balzanella, M.Bini, C.Cavicchia, R.Verde (Eds.) *Book of the Short Paper: SIS* (pp. 1902-1907.) Pearson. ISBN 9788891932310.
2. Sciortino, C., Venturella, L., & De Cantis, S. (2023). *Measuring proximity tourism in Spain after the pandemic. An origin-destination matrix approach*. *Turistica-Italian Journal of Tourism*, 32(1), 110-127. ISSN (print): 1974 2207.
3. Venturella, L., Sciortino, C., & De Cantis, S. (2024, January). *The Impact of COVID-19 Crisis on Italian Proximity Tourism: An Origin-Destination Matrix Approach*. In *DIEM: Dubrovnik International Economic Meeting* (Vol. 9, No. 1, pp. 105-120). Sveučilište u Dubrovniku. DOI:10.17818/DIEM/2024/1.7.

## Chapter 4

# Tourism in the Age of Fear: Travel Choices Shift in Denmark

### Abstract

*This chapter explores the changes in tourism demand in Denmark after the COVID-19 pandemic. Specifically, it delves into the role that the fear of COVID-19 played in shaping travel choices during 2022.*

*In the first part of this chapter, a dataset coming from VisitDenmark will be described, and some descriptive analyses will be implemented to provide an overview of the data.*

*Later, the focus will shift to three travel variables: type of accommodation, length of stay, and a variable associated with activity at the destination, specifically spending time outdoors. Through the implementation of different logit models, the relationship between these three travel variables and the interest variable “fear of COVID-19” will be investigated. This variable will be recoded multiple times to observe how the model outputs change.*

*The findings suggest that, in 2022, the year immediately following the pandemic, travel behavior is still linked with the fear of contagion, which inevitably leads tourists to prefer certain trip modalities over others.*

## 4.1 Introduction

The previous chapter identified new trends, particularly proximity tourism, coinciding with the onset of the pandemic. This chapter, although in a different way, will also focus on travel choices specifically in Denmark country.

This study aims to examine the relationship between the fear of COVID-19 and travel decisions to understand if the fear of contagion has some effects on travel choices. Indeed, the dataset, derived from the Danish tourist survey, allows for identifying a group of travelers for whom fear of COVID-19 and concerns about infection were important factors in their travel choices. By linking this variable with the main travel-related variables, it is possible to identify interesting relationships and travel trends specific to this group of travelers.

As the dataset comes from the year 2022, this study will give an overview of the medium-term effects of the pandemic on tourism. In particular, this will be possible thanks to the implementation of a logit model, following descriptive analyses to provide a clearer understanding of the dataset.

This analysis focuses on domestic tourism, specifically on trips made by Danes in Denmark. The choice of this territory is justified by its status as a Nordic country, which is potentially characterized by a type of tourism different from that of Mediterranean countries.

The descriptive analyses are presented in the first part of the study, and these will consider the following variables:

- Accommodation Type
- Transportation
- Length of Stay (LOS)
- Travel Group Companions

Furthermore, socio-demographic characteristics will also be examined, including:

- Gender
- Education level
- Annual Gross Income
- Age of travelers

Regarding descriptive statistics, frequency tables will be provided for trip motivations, along with cross-tabulations that focus on the type of accommodation chosen in relation to other travel variables, such as length of stay, annual gross income, and travel companions.

Regarding the logit model, the aim was to determine whether individuals who fear COVID-19 exhibit different travel preferences compared to those who do not. The analysis links the variable representing the fear of COVID-19 with the type of accommodation, length of stay, and spending time in nature. Additionally, all models included socio-demographic control variables such as age (categorized into groups), gender, and employment status. The results proved to be quite interesting and will be presented in the following sections.

In summary, the chapter will first provide an overview of the tourism dynamics characterizing the Danish territory in a post-pandemic period.

Secondly, it will present information on the COVID-19 situation in Denmark considering the measures adopted to combat it, and the initiatives taken to sustain the tourism sector.

Following this, the dataset will be introduced, accompanied by initial descriptive statistics, and by the logit model.

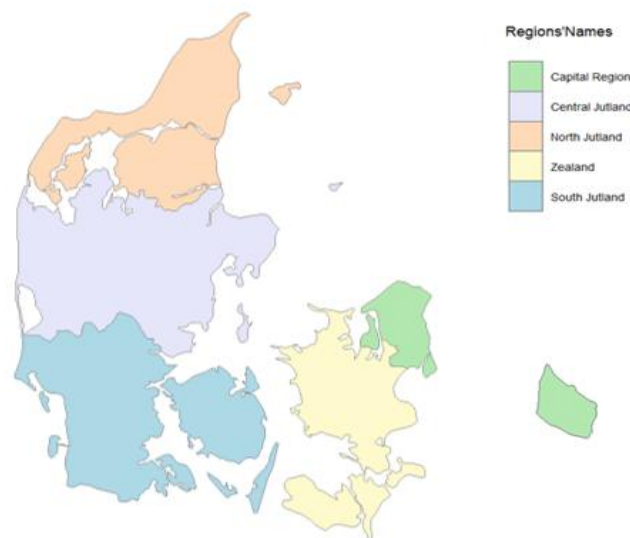
Finally, the sections on results and conclusions will showcase the outcomes of the analysis and will provide an overview of how tourists who feared COVID-19 traveled in Denmark in the year 2022.

## 4.2 Study Context

Before exploring the Danish context of the COVID-19 pandemic, it is essential to understand the country's regional division and acknowledge the geographical uniqueness of each area. This is important because the distinctive characteristics of each region could, in turn, influence the type of tourism experienced there.

Denmark is a country in Northern Europe surrounded by water. It is part of the Scandinavian peninsula, together with Sweden, Norway, Iceland, and Faroe Island. The Danish territory is divided into five regions which are named:

1. Capital Region/ *Region Hovedstaden*
2. Zealand Region/*Region Sjælland*
3. Southern Denmark/ *Region Syddanmark*
4. Central Jutland/ *Region Midtjylland*
5. North Jutland/ *Region Nordjylland*



**Figure 4.1:** *Regions of Denmark*

Since each region presents some geographical peculiarities, different forms of tourism are offered by the destinations, furthermore, some of the most popular destinations are chosen by international tourists, while others mainly host domestic tourists who travel from one place to another within the country. The most popular

destination in Denmark is Copenhagen, situated in the capital region. This destination hosts a multitude of tourists from different parts of the world each year. The different forms of tourism offered by this country include coastal, natural, cultural, and urban. The first two typologies of tourism are mainly diffused in North Jutland and in Bornholm, an island included in the Capital region. In particular, North Jutland features several beaches that attract tourists, including Lokken Beach and the Grenen peninsula, which is the northernmost point where the Baltic Sea and the North Sea meet each other.

The most famous beach in Bornholm is Dueodde Beach. Bornholm hosts many tourists each year who are captivated by the center of Rønne, the village of Gudhjem, and the Ertholmene islands.

Undoubtedly, the city that stands out for cultural and urban tourism is the capital. The most visited places in Copenhagen and Denmark in 2022 include Tivoli Park, with 3,854,000 visitors. Tivoli is the second most ancient amusement park after Dyrehavsbakken which is located within the Jægersborg Dyrehave nature park. In 2022, Dyrehavsbakken was the second attraction for the number of visitors and it hosted around 1,806,000 visitors. Finally, the third most visited place was Copenhagen Zoo which hosted approximately 1,332,500 tourists in 2022 (VisitDenmark, 2023).

Before the onset of the pandemic, the number of international trips in Denmark appeared to be steadily increasing. In fact, in 2019, "16.4 million individuals took an international flight from a Danish airport," marking a 33.2% increase compared to 2010 (Larsen et al., 2023, p.1).

The number of visitors to Danish attractions, and more generally to attractions across the territory, has experienced a drastic decline following the outbreak of the COVID-19 crisis.

The first lockdown period was announced in Denmark in March 2020 (13<sup>th</sup>), such as in other European countries people having nonessential roles in the work field, were forced to stay at home (Soested & Munkholm, 2020). Denmark was "among the first countries in Europe, to act and act firmly against the virus by declaring a national lockdown" (Olagnier & Mogensen, 2020, p.11). The measures aimed at

limiting contagion prohibited gatherings among groups of people, seen as a means for spreading the virus. This crisis has altered tourism demand, especially in the short term, following the subsequent decline in infections and the gradual reopening and return to unrestricted life.

In May 2022, Denmark ordered the full reopening of its borders to international tourists. Indeed, in February of the same year, Denmark removed its pandemic restrictions since COVID-19 was officially declared a non-critical disease (Wonderful Copenhagen, 2022).

To understand the importance of COVID-19's impact on Danish tourism, it is essential to consider the contribution of tourism to GDP. In Denmark, and particularly in certain Danish regions, tourism represents a key resource for the economy. Before the onset of the pandemic, the tourism and travel sector accounted for 10.4% of global GDP, “supporting 334 million jobs globally” (WTTC, 2023, p.3). In 2020, there was a sharp decline of approximately 49.4% in tourism's contribution to GDP. Although this data improved in 2022, it still did not return to 2019 levels.

During the pandemic period, the number of both foreign and domestic visitors has decreased at many attractions. Data from VisitDenmark shows the reductions in visitor numbers at major Danish attractions. Considering the first ten attractions in terms of tourists, the following is the decline experienced in 2020 compared to 2019:

**Table 4.1:** *The ten most visited Attractions in Denmark 2019-2020*

Attractions	Years		Reduction
	2019	2020	
Tivoli	4.581.000	1.628.000	64%
Copenhagen Zoo	1.571.000	1.156.700	26%
Dyrehavsbakken	2.200.000	750.000	66%
Legoland	1.700.000	680.000	60%
Djurs Sommerland	781.000	450.600	42%
Alborg Zoo	459.300	412.400	10%
Knuthenborg SafariPark	310.000	410.000	-32%
Louisiana	758.000	403.000	47%
Faarup Sommerland	577.100	396.500	31%
CPH Botanical Garden	756.000	384.600	49%

*Note.* Attraktionlisten 2020, Danmarks Mest Besøgte Attraktioner, VisitDenmark, 2020



Among the ten most visited attractions according to VisitDenmark DMO, the only one that experienced an increase in terms of visits was Knuthenborg Safari Park with an increase of 32%. In the capital region, two of the most famous attractions in the city of Copenhagen also experienced a significant decline: the Botanical Garden and the Palm House of Copenhagen. These two charming attractions, rich in vegetation, were particularly affected with a decrease of nearly 50% in 2020 compared to the previous year. Also, the amusement park experienced a reduction in entrances of around 50%. Overall, there was a 39% decrease in Danish and foreign tourists visiting Danish attractions and museums in 2020. This amounted to around 1.8 million fewer visitors compared to 2019. As for zoos and aquariums, the number of Danish visitors dropped by 13% during the same period. Even the number of overnight stays decreased greatly. Indeed, as stated in a report published by VisitDenmark in 2021, from January to November 2020 there were 10 million fewer overnight stays compared to the same period the previous year. This essentially corresponds to a decrease of around 19%.

To have a clear overview of the decline in tourist flows during the pandemic period in the whole of Denmark, data coming from the OECD were collected in the following table (Table 4.2). What emerges from the data is that domestic tourism has been affected to a lesser extent than international one. In fact, over the three years, the total number of trips, as well as the number of tourists, has remained more or less constant. However, in 2021, there was an increase in the number of nights. In this year, it seems that domestic tourists spent a greater number of nights at the destination compared to previous years.

As for inbound travel, the effect of the restrictions is evident. A great decline is observed in total trips, the number of tourists, and overnight stays between 2019 and 2020, with the trend continuing through 2021. Among these categories, overnight stays appear to have recovered more effectively than the others. Additionally, the number of outbound tourists experienced a substantial reduction, decreasing by 65% from 2019 to 2021.

**Table 4.2:** Domestic, Inbound, and Outbound Tourism Trips (Thousand)

Types of Flows		Years			Variation	
		2019	2020	2021	2020-2019	2021-2019
Domestic Trips	Total Trips	67901	64215	65643	-5%	-3%
	Number of Tourists	17794	19341	23414	9%	32%
	Number of Overnights	68025	89266	108032	31%	59%
Inbound Trips	Total Trips	30089	15594	15883	-48%	-47%
	Number of Tourists	14763	5935	7047	-60%	-52%
	Number of Overnights	57847	31464	34813	-46%	-40%
Outbound Trips	Number of Tourists	9088	4230	3182	-53%	-65%

Note. *Tourism Trends and Policies 2020*. Adapted from OECD, 2022.

Regarding tourism expenditure, the decline was stronger for the international rather than the domestic one. Indeed, from 2020 to 2019 there was a slight decline in domestic expenditure (from 76,9 to 76,1) and, on the contrary, a great decline in international expenditure in Denmark (from 60.1% to 26.4%).

Starting from 2021, both international and domestic tourism expenditure increased thanks to the easing of travel restrictions decided by the Danish government. Considering only the destination of Copenhagen, the tourist expenditure in 2019 was around 6,1 billion, while in 2020 it declined to 3,04 billion euros.

The lack of tourists in the Danish capital due to the pandemic has also worried the residents themselves, who generally accept their presence without issues. In fact, according to a report published by Wonderful Copenhagen, (a Copenhagen DMO), some citizens state that tourists enrich the city financially and culturally. However, the decrease in the number of tourists and the depopulation of the most visited places have allowed the citizens to rediscover parts of their city that are often overlooked due to the overwhelming flow of visitors.

With the advent of the pandemic, tourism has suffered different changes that were immediate and without notice. Danish government and parliament answered the COVID-19 crisis with *Denmark's Recovery and Resilience Plan*. The plan aims to boost the economy after the pandemic and to accelerate the green transition. The objectives included in this plan should be reached through seven initiatives (Ministry of Finance, 2021):

1. Resilience of the Health Care System: to ensure that the healthcare system is better prepared for potential future crises;
2. Green Transition of Agriculture and Environment: to assure the decrease of carbon footprint from the agricultural sector;
3. Energy Efficiency, Green Heating, and Carbon Capture and Storage: to spread the “energy renovation in public and private buildings”;
4. Green Tax Reform: the tax will be applied to reduce the emission of greenhouse gasses;
5. Sustainable Road Transport: to enhance a more sustainable road transportation system;
6. Digitalisation: to promote the digitalization of public and private services;
7. Green Research and Development: to maintain the leader position on green solutions.

This recovery plan thus aims to accelerate a process of change towards sustainability and green initiatives that were already underway.

Furthermore, it covers a series of initiatives aimed at economic recovery which include the tourism sector. Specifically, the tourism-related objectives aim to follow a tourism model based on sustainability and low environmental impact, attract more tourists, and ensure their satisfaction with the city visit experience. Through the implementation of the recovery plan, the goal is to bring back international tourism, ensure the recovery of urban tourism, establish Denmark as an attractive destination for business tourism, capitalize on potential opportunities, and adapt to changes in tourist preferences (OECD, 2022).

As regards the capital, the Copenhagen DMO Wonderful Copenhagen in collaboration with the Ministry of Industry, Business and Financial Affairs, the city of Copenhagen, and the tourism industry, has set the initiative *Comeback Copenhagen*. This initiative aims to allow tourism recovery and to prepare the tourism industry for the international competition that will recover after the period of pandemic (Wonderful Copenhagen, 2021). This recovery plan is based on four themes and twelve initiatives. Among these, the recovery plan aims to invest mostly

in tourism marketing to sustain leisure, business, and cruise tourism. In addition to this, the other initiatives are related to:

- Promoting Copenhagen as a safe destination from COVID-19;
- Encouraging sustainable choices by both travelers and the industry;
- Fostering interaction between urban, coastal, and nature-based tourism;
- Promoting Copenhagen as a cultural attraction;
- Developing Danish cruise tourism with a focus on sustainability and specifically, the focus on air pollution and climate impact.

These are the main initiatives implemented to drive the recovery of the tourism sector.

One of the key objectives of this recovery plan is undoubtedly the transition towards green initiatives. Indeed, Copenhagen and Denmark in general are very attentive to environmental issues. For instance, in the capital region, there is the most eco-friendly waste-to-energy plant in the world, which is also a major tourist attraction. This plant is called *Copenhill* or *Amager Bakke*, and it allows visitors to snowboard at the top with a breathtaking view of the city. This extraordinary facility, created in 2017, functions as a sports facility while producing zero-emission energy inside. Copenhill<sup>1</sup> represents a cutting-edge environmental venue that combines fun and sustainability.

The country is working to recover from the pandemic's impact on tourism and it is evident that efforts are being made to boost its attractiveness as a travel destination. At the same time, there is a focus on promoting a model of green tourism that supports economic recovery while prioritizing environmental sustainability.

However, according to a report published by VisitDenmark in January 2024, international arrivals are only expected to return to 2019 levels this year (2024), highlighting a gradual recovery from the devastating effects of the pandemic on the tourism sector.

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<sup>1</sup> <https://www.copenhill.dk/en>

### 4.3 Data and Methods

Obtaining data on Danish tourism presents important challenges, particularly when studying a crisis period. The forced closure of numerous businesses and the likely suspension of some surveys have further complicated access to data that could offer a clear temporal overview of the pre-, during-, and post-pandemic periods, essential for attributing tourism changes to the pandemic. Nevertheless, the available data have made it possible to identify links between certain changes in travel behavior in 2022 and the onset of the COVID-19 crisis.

The data used in this analysis are derived from a Danish tourism survey, referred to in its original language as *Turistundersøgelse* (VisitDenmark, n.d.). The survey is conducted by VisitDenmark and includes approximately 3,000 interviews with city tourists, 2,500 with business tourists, and 7,500 with tourists engaging in coastal and nature trips. The collected data are used to publish reports on the VisitDenmark website. This survey is undoubtedly valuable for the development of potential tourism policies and to better manage the destination. Furthermore, it can be used to construct indicators that provide information on the travel habits and tourism behavior of the Danish population.

Indeed, the dataset encompasses various trips-related variables, such as number of trips, travel motivation, length of stay, main destination, and average expenditure. The statistical unit consists of trips made by both Danish residents and foreign visitors in commercial forms of accommodation, including hotels, hostels, campsites, rented holiday homes, and holiday centers. However, the focus of this work is restricted to trips undertaken by Danish residents domestically. The reason behind this lies in maintaining continuity with previous studies and in the fact, as mentioned earlier, that domestic tourism tends to play a key role during times of crisis. Additionally, Denmark is a country characterized by strong domestic tourism, particularly during the summer months (Falk et al., 2022).

The commitment to the sustainable goals mentioned earlier is also evident in this case. The dataset includes several sustainability-related variables designed to assess how much sustainability matters to tourists and how it influences their travel choices.

Since the analysis aimed to identify travel behavior preferences during the pandemic period, particular attention has been given to a variable related to COVID-19. Specifically, this is a categorical variable that investigates the degree of concern tourists have regarding the virus when traveling. It examines how this concern has influenced travel decisions, ranging from a low to a high degree. Linking this variable with others and studying their relationship seemed to be an interesting way to understand if some travel preferences occurred. Specifically, what was done was to distinguish between tourists who fear COVID-19 and believe it influenced their travel choices and those who, on the contrary, claim that the fear of the virus did not affect their travel decisions.

This variable consists of ordinal modalities that are:

- Crucial importance
- Great importance
- Some meaning
- Minor Importance
- No meaning

These are responses to a question about the role of fear of COVID-19 in influencing travel choices.

Additionally, other variables were recoded to make them easier to interpret. Among these variables, age was initially numeric but was later categorized according to an economic framework that defines four stages of an individual's working life:

- 15-29 age group: generally, it includes students or young individuals entering the workforce;
- 30-49 age group: it includes people typically in a phase of income growth;
- 50-64 age group: individuals who have already established their income over the years and may have reached the peak of their careers;
- 65+: retirement and old age.

Another variable that was recoded was the *Travel Group Composition*. As shown in Table 4.7, the dataset includes ten different travel groups, which were simplified into three categories for easier interpretation.

Specifically, in the model, solo travelers were used as the baseline category, while the other two groups consisted of those traveling as a couple and those traveling with others (in a group).

In the logit model, the interest variable was categorized two times. The first categorization assigns a value of 0 to those who do not fear COVID, including only one category, and a value of 1 is assigned to travelers who fear COVID-19, incorporating four categories from the original variable. It was decided to name this variable COVID2.

The second categorization, represented by the variable COVID3, adopts a 3-2 classification, broadening the group of those who do not fear COVID. In this case, travelers in this group are assigned a value of 0, now encompassing the first two categories of the original variable. The category of travelers who fear COVID-19, on the other hand, includes the last three categories.

Finally, for each dependent variable, the last models will consider the interest variables without any categorization.

### **4.3.1 Logistic Model**

The most appropriate instrument for the analyses was the logistic model. In this analysis, a set of logit models was implemented, considering the various recodes of the *COVID* variable and different dependent variables.

The application of these models produced several intriguing results, which, on multiple occasions, not only aligned with but also further reinforced our hypotheses regarding travel choices.

Below is the formula of the Logit Model (1):

$$\text{logit}[\pi(x)] = \left( \log \frac{\pi x}{1-\pi x} \right) = \beta X \quad (1)$$

Where:

- X is the vector of the explanatory variable
- $\pi$  is the probability of success of the variable x.
- $\beta$  is the vector of the parameter of the logit model that explains the tax at which the curve increases or decreases for  $\pi(x)$ .

In particular, this formula indicates that the log odds increase by  $\beta$  for each one-unit increase in x. Indeed:

$$\beta = \left( \frac{\pi | x=j / (1-\pi) | x=j}{\pi | x=base / (1-\pi) | x=base} \right) \quad (2)$$

The logarithm argument is called *Odds Ratio* which is obtained from the exponential of  $\beta$ ; it is helpful to interpret the model.

The odds ratio provides the extent to which the probability of success compared to failure is greater when x equals j than when x equals the baseline category.

Furthermore, the probability for each individual taking a trip is:

$$\pi(x) = \frac{\exp(\beta x)}{1 + \exp(\beta x)} \quad (3)$$

However, for the following analysis and for the interpretation, the odds ratio will be considered. Indeed, through the odds, it is possible to understand the relationship among some trip-related variables.



## 4.4 Analysis

As mentioned earlier, this chapter aims to investigate the relationship between the travel preferences of Danish tourists who fear COVID-19. Specifically, it explores travel choices and examines whether these choices are influenced by the tourists' fear of the pandemic.

Before proceeding with the implementation of the logit model, an exploratory analysis was conducted.

### 4.4.1 Descriptive Statistics

Specifically, the frequency distributions of the following travel and socio-demographic variables were examined:

- Accommodation Type
- Transportation
- Nights spent
- Gender
- Highest Complete Education
- Annual Gross Income
- Age in class
- Travel Group

From the analysis of the table below (Table 4.3), it can be observed that hotels, campsites, and holiday homes are the three most favored types of accommodation among Danish tourists. In contrast, other options, such as holiday centers and hostels, appear to be less frequently chosen and therefore less popular.

When examining the modes of transport utilized by travelers, a clear trend arises. Air travel shows a relatively low frequency, which is consistent with the fact that the data pertains to domestic flows. In contrast, cars and trains stand out as the most used modes of transport, reflecting their common use for such trips.

Other options, while not as prevalent, include vehicles with caravans, buses, and campers, which still play a role in domestic travel choices.

Regarding the length of stay, the variable was initially presented in a quantitative format. However, it was subsequently recoded into categories short vacation (1-3 nights), long vacation (4 or more nights).

The recoded data reveal that most trips taken by Danish travelers in 2022 were of long duration, with these trips accounting for almost 62% of the total, highlighting a strong preference for long travel experiences.

Regarding the gender distribution of travelers, the percentages are quite similar, with a slightly higher proportion of women.

In terms of education, the majority of travelers have either completed a long-term higher education program (3-4 years) or a vocational education.

Additionally, 50% of trips are made by individuals with a middle income.

The age groups with the highest percentage of tourists are those between 31-46 and 47-62 years old.

Finally, most travelers either travel as a couple without children or as parents with children under the age of 18.

**Table 4.3: Main Travel Variable Frequency Distribution**

Covariate		Frequency	Percentage	Cumulative Percentage
Type of Accommodation	Hotel	1259	32.7	32.7
	Holidaycenter	393	10.2	42.8
	Hostel	190	4.9	47.8
	Campsite	1075	27.9	75.6
	Holiday Home	939	24.4	100
	Total	3856	100	
Mean of Transportation used	Plaine	37	1	1
	Car	2869	74.4	75.4
	Car with Caravan	316	8.2	93.6
	Camper	74	1.9	85.5
	Ferry	55	1.4	86.9
	Train	329	8.5	95.5
	Bus	92	2.4	97.9
	Bike	33	0.9	98.7
	Motorcycle	30	0.8	99.5
	Other Means	19	0.5	99.9
	Missing	2	0.1	100
	Total	3856	100	
Nights Spent	1-3 Nights	2379	38.3	38.3
	4 + Nights	1477	61.7	61.7
	Total	3856	100	
Gender	Man	1818	47.1	47.1
	Female	2038	52.9	100
	Total	3856	100	
Highest Complete Education	Primary School	224	5.8	5.8
	High School	245	6.4	12.2
	Vocational Education	896	23.2	35.4
	Short Higher education (-3years)	596	15.5	50.9
	Long term higher education (<3-4 years)	1204	31.2	82.1
	Long Higher education (>4 years)	629	16.3	98.4
	Don't want to answer	62	1.6	100
Total	3856	100		
Annual Gross Income	Low end	236	6.1	6.1
	2	544	14.1	20.2
	3	1933	50.1	70.4
	4	844	21.9	92.2
	High End	299	7.8	100
	Total	3856	100	
Age in class	15-30	411	10.7	10.7
	31-46	1181	30.6	41.3
	47-62	1186	30.8	72
	>62	1078	28	100
	Total	3856	100	
Travel Group	Travel in a larger travel company	231	6	6
	Traveling alone	283	7.3	13.3
	Parents and children under 18	827	21.4	34.8
	Parents, children and grandchildren under 18	156	4	38.8
	Several families with children under 18	69	1.8	40.6
	Grandparents with grandchildren under 18	123	3.2	43.8
	Friends without children	325	8.4	52.2
	Couple without children	1561	40.5	92.7
	Several couples traveling together	136	3.5	96.2
	Other things	145	3.8	100
	Total	3856	100	

**Table 4.4:** *Trips Motivation*

Variables	Frequency	Percent	Cumulative Percent
<b>To Visit Family and Friends/Special private event</b>			
Not at all	1330	34.5	34.5
To a lesser Degree	446	11.6	46.1
Somewhat	568	14.7	60.8
Greatly	586	15.2	76
To a decisive extent	754	19.6	95.5
Don't know	172	4.5	100
Total	3856	100	
<b>To Relax and Recharge</b>			
Not at all	143	3.7	3.7
To a lesser Degree	127	3.3	7
Somewhat	436	11.3	18.3
Greatly	1117	29	47.3
To a decisive extent	1944	50.4	97.7
Don't know	89	2.3	100
Total	3856	100	
<b>Culture and arts and historical experiences/sights</b>			
Not at all	1011	26.2	26.2
To a lesser Degree	596	15.5	41.7
Somewhat	941	24.4	66.1
Greatly	764	19.8	85.9
To a decisive extent	375	9.7	98.6
Don't know	169	4.4	100
Total	3856	100	
<b>The local city life and experiences</b>			
Not at all	619	16.1	16.1
To a lesser Degree	530	13.7	29.8
Somewhat	1102	28.6	58.4
Greatly	1009	26.2	84.5
To a decisive extent	458	11.9	96.4
Don't know	138	3.6	100
Total	3856	100	
<b>Hiking and longer walks in nature</b>			
Not at all	882	22.9	22.9
To a lesser Degree	521	13.5	36.4
Somewhat	821	21.3	57.7
Greatly	860	22.3	80
To a decisive extent	623	16.2	96.1
Don't know	149	3.9	100
Total	3856	100	

Table 4.4 shows the frequencies of 5 travel motivations from 20 provided within the dataset. As can be observed, each variable represents a different motivation, and its categories are expressed on an ordinal scale. The actual question posed to tourists in the survey was: "To what extent are there reasons why you have chosen to take a holiday in Denmark?".

The modalities are in ascending order, from "Not at all" to "To a decisive extent."

Among the reasons for traveling to Denmark, visiting friends and relatives is included, although it does not seem to be the primary motivation for most Danish travelers. It appears that a significant portion of trips are undertaken "to a decisive extent" for "relaxing and recharging." Additionally, some trips are made "somewhat" to visit cultural and artistic sites or for historical experiences (24%). Lastly, only a few trips are taken "to a decisive extent" to experience the local city life or to enjoy walks in nature.

These variables, presented in the table, generally identify tourism types such as "leisure" and "cultural," except for VFR (Visiting Friends and Relatives). Among all 20 travel motivations, work-related reasons are not included. This indicates that the survey does not consider business trips but focuses exclusively on leisure ones.

**Table 4.5:** *Distribution of Nights Spent by Type of Accommodation*

Covariate		Nights Spent		
		Short vacation	Long Vacation	Total
Type of Accommodation	Hotel	1160	99	1259
	%	92	8	100
	Holidaycenter	289	104	393
		74	27	100
	Hostel	161	29	190
		85	15	100
	Campsite	428	647	1075
		40	60	100
	Holiday Home	341	598	939
		36	64	100
Total	2379	1477	3856	
	62	38	100	

What also seemed interesting for understanding the dataset was the relationship between the type of accommodation and other travel or socio-demographic variables. Specifically, considering the length of the stay (Table 4.5), it emerges that hotels, holiday centers, and hostels are preferred for short trips, whereas campsites and holiday homes are chosen for longer stays. It also appears that hotels are preferred by those with a medium-range annual gross income (Table 4.6). In general, higher frequencies are observed in the middle-income range for all types of accommodations.

**Table 4.6:** *Distribution of Annual Income by Type of Accommodation*

Covariate		Annual Gross Income					Total
		Low End	2	3	4	High End	
Type of Accommodation	Hotel	38	126	635	342	118	1259
	%	3	10	50	27	9	100
	Holidaycenter	16	39	195	95	48	393
		4	10	50	24	12	100
	Hostel	10	31	102	39	8	190
		5	16	54	21	4	100
	Campsite	109	186	540	181	59	1075
		10	17	50	17	6	100
	Holiday Home	63	162	461	187	66	939
		7	17	49	20	7	100
Total	236	544	1,933	844	299	3856	
	6	14	50	22	8	100	

A contingency table was created to analyze the composition of travel groups (Table 4.7). It was observed that hotel accommodations are generally preferred by couples without children, accounting for 47% of trips in such establishments. In contrast, holiday centers appear to be favored by parents with children under 18, likely due to the availability of services tailored to this type of clientele.

Hostels are mostly chosen by individuals traveling within large travel groups, though it remains unclear whether they travel alone or as part of a group. Holiday homes tend to be selected by couples without children, although a notable 23% of parents with children under 18 also opt for this type of accommodation.

**Table 4.7:** *Distribution of Travel Group Composition by Type of Accommodation*

Covariate		Traveling in a larger travel company	Traveling alone	Parents and children under 18	Parents, children and grandchildren under 18	Several families with children under 18	Grandparents with grandchildren under the age of 18	Friends without children	Couple without children	Couples traveling together	Other things	Total
Type of Accommodations	Hotel	101	141	268	38	15	19	113	737	85	68	1585
	%	6%	9%	17%	2%	1%	1%	7%	46%	5%	4%	100%
	Holidaycenter	49	24	202	56	30	19	24	89	4	10	507
		10%	5%	40%	11%	6%	4%	5%	18%	1%	2%	100%
	Hostel	43	28	38	4	3	3	12	38	21	22	212
		20%	13%	18%	2%	1%	1%	6%	18%	10%	10%	100%
	Campsite	33	61	164	28	14	43	51	383	17	11	805
		4%	8%	20%	3%	2%	5%	6%	48%	2%	1%	100%
	Holiday Home	46	33	170	28	14	16	114	275	25	25	746
		6%	4%	23%	4%	2%	2%	15%	37%	3%	3%	100%
Total	272	287	842	154	76	100	314	1522	152	136	3855	
	7%	7%	22%	4%	2%	3%	8%	39%	4%	4%	100%	

As previously mentioned, after a brief description of the dataset and its travel variables, several logit models were implemented. The goal is to examine whether fear of COVID-19 is linked to travel variables and if tourists fearing the virus exhibit different travel behaviors compared to those who do not.

Furthermore, control variables are included to test if other variables could influence this relationship.

### 4.4.2 Logit Model for Type of Accommodation

The first model considers the type of accommodation as the dependent variable. This variable is divided into two categories, where 0 represents "hotel accommodations" and 1 represents "extra-hotel accommodations." The covariate of interest is the fear of COVID, categorized into 4-1 categories. Other covariates are also included, such as socio-demographic variables and travel group composition. Table 4.8 (below) shows how the model changes before including all control variables (Mod6). Each model also includes the AIC (Akaike Information Criterion) to test the model's goodness of fit.

**Table 4.8: Logit Model for Hotel Classification and COVID2 (4-1 Categorization)**

Reference category	Mod1	Mod2	Mod3	Mod4	Mod5	Mod6
Constant	1.830*** (0.046)	2.094*** (0.151)	4.339*** (0.223)	3.557*** (0.249)	4.096*** (0.255)	2.460*** (0.288)
<b>COVID2</b>						
Not Afraid of Covid	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
Afraid of Covid	1.32*** (0.070)	1.322*** (0.071)	1.337*** (0.072)	1.334*** (0.072)	1.335*** (0.072)	1.330*** (0.075)
<b>Education</b>						
Primary School		Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
High school or vocational high school		1.034 (0.206)	1.078 (0.209)	1.162 (0.216)	1.179 (0.216)	1.098 (0.227)
Vocational education		1.091 (0.167)	1.243 (0.170)	1.228 (0.170)	1.196 (0.171)	1.155 (0.177)
Short higher education-less than 3 years		1.08 (0.175)	1.184 (0.178)	1.176 (0.180)	1.213 (0.180)	1.178 (0.186)
Long-term higher education-under 3-4 years		0.764* (0.160)	0.953 (0.165)	0.912 (0.167)	0.941 (0.167)	0.91 (0.173)
Long-term higher education		0.616*** (0.170)	0.855 (0.178)	0.809 (0.180)	0.820 (0.180)	0.759 (0.187)
<b>Total Annual Gross Income</b>						
Low End			Base outcome	Base Outcome	Base outcome	Base outcome
2° Quintile			0.639** (0.212)	0.646** (0.213)	0.636** (0.213)	0.622** (0.220)
3° Quintile			0.390*** (0.192)	0.398*** (0.194)	0.387*** (0.194)	0.36*** (0.200)
4° Quintile			0.299*** (0.200)	0.306*** (0.204)	0.295*** (0.204)	0.271*** (0.210)
High End			0.328*** (0.225)	0.334*** (0.227)	0.324*** (0.228)	0.329*** (0.235)
<b>Age Classes</b>						
15-29				Base outcome	Base outcome	Base outcome
30-49				1.396** (0.140)	1.377** (0.140)	1.241 (0.146)
50-64				1 (0.141)	0.991 (0.141)	1.089 (0.148)
65+				1.389** (0.147)	1.361** (0.147)	1.604*** (0.155)
<b>Gender</b>						
Male					Base outcome	Base outcome
Female					0.811*** (0.073)	0.803*** (0.076)
<b>Travel Group Composition</b>						
Traveling Alone						Base outcome
Traveling in Group						1.424** (0.141)
Traveling in Couple						2.497*** (0.142)
	AIC: 4729.4	AIC:4634.8	AIC:4579.5	AIC:4566.3	AIC:4560.2	AIC: 4320.2

Standard error are displayed in parenthesis under the odds Ratio.  $p < 0.10$  \*  $p < 0.05$  \*\*  $p < 0.01$  \*\*\*

What can be observed from the complete model with all control variables (Mod6) is that the variable "COVID2" is significant. This means that individuals who fear

COVID are more likely than those who do not stay in extra-hotel accommodations. This significance appears in all models. However, the model reveals also significance for each modality of the "total annual gross income" variable. It seems that the entrance of this variable in the model nullifies the significance of the education level variable that was significant in Model 2. However, it was decided to maintain these variables also in the following models.

The "total annual gross income" is significant across all income classes and is also significant in all models. However, since the odds ratios are less than 1 this indicates that as income increases, tourists tend to prefer hotels over extra-hotel accommodations. This may be because tourists with higher incomes prefer the comfort and services offered by hotels rather than more affordable or less structured options like extra-hotel accommodations.

Regarding the age classes, it appears that the last age group including those over 65 prefers the extra-accommodation establishment. This result is not intuitive, as it could be hypothesized that with increasing age, individuals might prefer hotel accommodation, which offers all the necessary comforts, but the results show the opposite trend.

The last two variables include "Gender" and "Travel Group Composition."

As concern gender, it seems that females are more likely to go to hotel accommodations compared to males and those who travel in couples and groups have more probability of choosing extra-accommodation establishments instead of the hotel.

The AIC decreases with the inclusion of each control variable, suggesting that the best-fitting model is Mod 6.

What was subsequently done was to repeat the same model with the COVID3 variable classified differently.

In the model below (see Table 4.9), the COVID variable takes the value 0 for those who do not fear COVID, but this time this modality includes two categories from the original variable such as: "Minor Importance" and "No Meaning" while in the first model only "No Meaning" was included.



This categorization, as previously mentioned, broadens the category of individuals who do not fear COVID, while reducing the size of the group that does. Through the implementation of this model is possible to test the robustness of the results obtained with the first model.

By implementing this second model, it is observed that the results remain largely consistent with those of the previous models. The COVID variable continues to demonstrate a consistent level of significance, which now extends to the second model (Mod2). Furthermore, as concerns COVID variable, it is possible to observe a slight increase in the odds ratio compared to the previous model. Regarding the education variable, its significance is noted in model 2; however, it is no longer significant in model 3. Significant values persist for the total annual gross income and the age class variables, with levels of significance that are comparable across the models. Similarly, the variables related to gender and travel companions continue to show significant values, which are in line with those reported in the previous models.

In this second model as well, the lowest AIC value is observed in the final model, indicating that, once again, Model 6 is the best-performing one. This finding further confirms the robustness of the results across different models, as the AIC consistently identifies the same model as the most suitable. This suggests that Model 6 provides the best fit to the data compared to the other models evaluated.

**Table 4.9: Logit Model for Hotel Classification and COVID3 (3-2 Categorization)**

Reference category	Mod1	Mod2	Mod3	Mod4	Mod5	Mod6
Constant	1.899*** (0.040)	2.129*** (0.150)	4.342*** (0.223)	3.583*** (0.249)	4.150*** (0.255)	2.507*** (0.288)
<b>COVID3</b>						
Not Afraid of Covid	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
Afraid of Covid	1.376*** (0.080)	1.383*** (0.080)	1.395*** (0.081)	1.389*** (0.081)	1.401*** (0.082)	1.372*** (0.084)
<b>Education</b>						
Primary School		Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
High school or vocational high school		1.057 (0.206)	1.1 (0.209)	1.183 (0.216)	1.202 (0.216)	1.119 (0.227)
Vocational education		1.113 (0.166)	1.266 (0.170)	1.249 (0.171)	1.215 (0.171)	1.175 (0.177)
Short higher education-less than 3 years		1.115 (0.175)	1.217 (0.178)	1.204 (0.180)	1.244 (0.180)	1.209 (0.186)
Long-term higher education-under 3-4 years		0.779 (0.160)	0.97 (0.165)	0.926 (0.166)	0.957 (0.167)	0.925 (0.173)
Long-term higher education		0.626*** (0.170)	0.872 (0.178)	0.822 (0.180)	0.835 (0.180)	0.774 (0.187)
<b>Total Annual Gross Income</b>						
Low End			Base outcome	Base outcome	Base outcome	Base outcome
2° Quintile			0.658** (0.212)	0.663* (0.213)	0.653** (0.213)	0.641** (0.220)
3° Quintile			0.399*** (0.191)	0.406*** (0.193)	0.394*** (0.194)	0.367*** (0.200)
4° Quintile			0.305*** (0.200)	0.312*** (0.203)	0.300*** (0.205)	0.277*** (0.210)
High End			0.325*** (0.225)	0.331*** (0.227)	0.321*** (0.228)	0.327*** (0.235)
<b>Age Classes</b>						
15-29				Base outcome	Base outcome	Base outcome
30-49				1.400** (0.140)	1.379** (0.140)	1.244 (0.147)
50-64				1 (0.141)	0.989 (0.142)	1.09 (0.149)
65+				1.377** (0.147)	1.345** (0.148)	1.59*** (0.155)
<b>Gender</b>						
Male					Base outcome	Base outcome
Female					0.802*** (0.073)	0.795*** (0.076)
<b>Travel Group Composition</b>						
Traveling Alone						Base outcome
Traveling in Group						1.413** (0.141)
Traveling in Couple						2.48*** (0.142)
	AIC:4728.3	AIC:4633.5	AIC:4578.6	AIC:4565.6	AIC:4558.8	AIC:4320.4

Standard error are displayed in parenthesis under the odds Ratio. **p<0.10 \* p<0.05\*\* p<0.01\*\*\***

In the final model related to the variable "type of accommodation," the variable COVID4 was considered. This variable was not categorized but instead displays all its modalities. The aim here is to examine whether there is any significance and thus a relationship with specific modalities of the COVID variable. The results are quite interesting. Specifically, as shown in the table below (Table 4.10), significance is present but only for certain modalities of the variable. In particular, individuals who exhibit mild or moderate fear of COVID seem to have a higher probability of staying in extra-hotel accommodations compared to those who do not fear COVID at all.

Significance is stronger for the category "some importance" and weaker for "minor importance." However, it is important to highlight that there is no significance for the first two categories, "crucial" and "great importance." This result suggests that

there is indeed a relationship between the fear of COVID and the choice of accommodation. Nevertheless, this relationship does not appear to strengthen as the level of fear increases, nor does it seem particularly strong overall.

In this model as well, no significance is observed for the education variable, while significance is noted for all income classes and the 65+ age group. Lastly, significance continues to appear for gender and group composition with an odds ratio less than one for the first.

Also, in this case, the AIC is lower for model 6 than for the others. So, this model is confirmed to be the most appropriate compared to the others in Table 4.10.

**Table 4.10: Logit Model for Hotel Classification and COVID4 (Extended)**

Reference category	Mod1	Mod2	Mod3	Mod4	Mod5	Mod6
Constant	1.830*** (0,046)	2,099*** (0.151)	4.431*** (0.224)	3.649*** (0.250)	4.19*** (0.255)	2.525*** (0.289)
<b>COVID4</b>						
No Meaning	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
Minor Importance	1.168 (0.096)	1.163 (0.097)	1.177* (0.098)	1.178* (0.099)	1.168 (0.099)	1.189* (0.102)
Some Importance	1.624*** (0.105)	1.631*** (0.105)	1.677*** (0.107)	1.68*** (0.107)	1.68*** (0.107)	1.687*** (0.110)
Great Importance	1.232 (0.132)	1.235 (0.133)	1.240 (0.135)	1.226 (0.135)	1.243 (0.135)	1.188 (0.138)
Crucial Importance	1.194 (0.18)	1.200 (0.183)	1.152 (0.185)	1.138 (0.186)	1.160 (0.187)	1.127 (0.190)
<b>Education</b>						
Primary School		Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
High school or vocational high school		1.034 (0.206)	1.071 (0.210)	1.152 (0.217)	1.171 (0.217)	1.087 (0.228)
Vocational education		1.093 (0.167)	1.244 (0.170)	1.227 (0.171)	1.197 (0.172)	1.154 (0.177)
Short higher education-less than 3 years		1.074 (0.176)	1.174 (0.179)	1.163 (0.180)	1.202 (0.181)	1.163 (0.187)
Long-term higher education-under 3-4 years		0.762* (0.161)	0.95 (0.165)	0.907 (0.167)	0.936 (0.167)	0.902 (0.173)
Long-term higher education		0.613*** (0.170)	0.85 (0.179)	0.801 (0.180)	0.814 (0.180)	0.752 (0.187)
<b>Total Annual Gross Income</b>						
Low End			Base outcome	Base outcome	Base outcome	Base outcome
2° Quintile			0.63** (0.212)	0.629** (0.213)	0.629** (0.214)	0.611** (0.220)
3° Quintile			0.383*** (0.192)	0.389*** (0.194)	0.38*** (0.195)	0.351*** (0.200)
4° Quintile			0.295*** (0.200)	0.301*** (0.204)	0.291*** (0.205)	0.267*** (0.211)
High End			0.320*** (0.225)	0.325*** (0.227)	0.316*** (0.228)	0.32*** (0.235)
<b>Age Classes</b>						
15-29				Base outcome	Base outcome	Base outcome
30-49				1.399** (0.140)	1.38** (0.140)	1.246 (0.146)
50-64				1 (0.142)	0.989 (0.142)	1.088 (0.149)
65+				1.388** (0.148)	1.357** (0.148)	1.606*** (0.155)
<b>Gender</b>						
Male					Base outcome	Base outcome
Female					0.811*** (0.074)	0.806*** (0.076)
<b>Travel Group Composition</b>						
Traveling Alone						Base outcome
Traveling in Group						1.423** (0.141)
Traveling in Couple						2.493*** (0.143)
	AIC:4727.6	AIC:4632.8	AIC:4576.3	AIC:4563	AIC:4557	AIC:4317.1

Standard error are displayed in parenthesis under the odds Ratio. p<0.10 \* p<0.05\*\* p<0.01\*\*\*

#### **4.4.3 Logit Model for Length of Stay**

The following analysis was conducted taking into account the variable “length of stay”. As previously described, this variable was originally expressed in days, as is typically the case in most travel-related datasets. The variable was first recoded by distinguishing between “short vacations” (1–3 days) and “long vacations” (4 or more days). The model incorporates the same control variables as those used in prior analyses. In this instance, however, the aim is to assess potential relationships between length of stay and fear of COVID-19, while also considering the other control variables.

The initial model, which includes vacation length (Table 4.11), integrates the variable COVID2, where a value of 0 represents individuals without fear of COVID-19, and a value of 1 represents those with such fear. The variable length of stay is coded as 0 for short vacations and 1 for long vacations.

**Table 4.11: Logit Model for Length of Stay and COVID2 (4-1 Categorization)**

Reference category	Mod1	Mod2	Mod3	Mod4	Mod5	Mod6
Constant	0.760*** (0,044)	0.967 (0,140)	1.573** (0,186)	0.86 (0,216)	0.877 (0,222)	0.518** (0,258)
<b>COVID2</b>						
Not afraid of covid	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
Afraid of covid	1,774*** (0,066)	1,789*** (0,067)	1,803*** (0,068)	1,769*** (0,068)	1,769*** (0,068)	1,798*** (0,070)
<b>Education</b>						
Primary School		Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
High school or vocational high school		0,713* (0,190)	0,726* (0,192)	0,956 (0,200)	0,958 (0,200)	0,897 (0,208)
Vocational education		0,927 (0,154)	1,015 (0,156)	1,002 (0,158)	0,999 (0,158)	1,001 (0,163)
Short higher education-less than 3 years		0,866 (0,162)	0,92 (0,164)	0,946 (0,166)	0,95 (0,166)	0,948 (0,170)
Long-term higher education-under 3-4 years		0,726** (0,150)	0,853 (0,153)	0,839 (0,156)	0,842 (0,156)	0,846 (0,160)
Long-term higher education		0,600*** (0,160)	0,781 (0,168)	0,76 (0,170)	0,762 (0,170)	0,76 (0,175)
<b>Total Annual Gross Income</b>						
Low End			Base outcome	Base outcome	Base outcome	Base outcome
2° Quintile			0,762 (0,169)	0,774 (0,172)	0,773 (0,172)	0,753 (0,175)
3° Quintile			0,520*** (0,151)	0,541*** (0,155)	0,539*** (0,156)	0,517*** (0,159)
4° Quintile			0,448*** (0,163)	0,473*** (0,168)	0,471*** (0,169)	0,449*** (0,172)
High End			0,389*** (0,193)	0,405*** (0,197)	0,403*** (0,197)	0,397*** (0,201)
<b>Age Classes</b>						
15-29				Base outcome	Base outcome	Base outcome
30-49				1,783*** (0,136)	1,779*** (0,136)	1,799*** (0,141)
50-64				1,667*** (0,138)	1,664*** (0,138)	1,816*** (0,144)
65+				2,278*** (0,141)	2,271*** (0,142)	2,591*** (0,149)
<b>Gender</b>						
Male					Base outcome	Base outcome
Female					0,971 (0,069)	0,99 (0,071)
AIC:4980						
<b>Travel Group Composition</b>						
Traveling Alone						Base outcome
Traveling in Group						1,52*** (0,143)
Traveling in Couple						1,862*** (0,143)
	AIC:5136.3	AIC:5044.9	AIC: 5009.2	AIC:4979	AIC:4980.8	AIC:4778

Standard error are displayed in parenthesis under the odds Ratio. p<0.10 \* p<0.05\*\* p<0.01\*\*\*

What can be observed through this model is that the variable COVID2 is highly significant, and this holds across all six models. This indicates the presence of a relationship, specifically suggesting that individuals who fear the virus are more likely to take longer vacations compared to those who do not fear it. The reasons behind this choice might be more or less rational. A possible hypothesis is that those who fear COVID-19 travel less frequently but spend more days traveling when they do.

Additionally, an interesting observation arise from the model regarding income. While income does not appear significant for the second quantile, it becomes significant for the following. Strangely, this suggests that individuals with higher incomes are more likely to spend fewer days traveling compared to those in the lower income bracket. This result does not align with the hypothesis, which assumes

that individuals with greater financial resources would spend more days at the destination. This could be mainly due to the fact that the trips under consideration are domestic and those with a higher income prefer traveling abroad rather than within Denmark. However, it could also be hypothesized that those with higher incomes may indeed spend fewer days on vacation but opt for higher-quality services during their trips.

Finally, all age groups are found to be significant, indicating a relationship between vacation length and age. Conversely, no relationship appears to exist with gender or level of education. Lastly, the final variable shows that those traveling in groups or as a couple are more likely to spend more days traveling compared to solo travelers. Additionally, it can be observed that the AIC decreases progressively from one model to the next, indicating that the best-performing model is the last one, Mod 6.

**Table 4.12: Logit Model for Length of Stay and COVID3 (3-2 Categorization)**

Reference category	Mod1	Mod2	Mod3	Mod4	Mod5	Mod6
Constant	0.848*** (0,038)	1.038 (0.139)	1,619*** (0,185)	0.888 (0,216)	0.914 (0,221)	0.544*** (0,257)
<b>COVID3</b>						
Not afraid of covid	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
Afraid of covid	1,722*** (0,073)	1,712*** (0,074)	1,728*** (0,074)	1,680*** (0,075)	1,683*** (0,075)	1,683*** (0,076)
<b>Education</b>						
Primary School		Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
High school or vocational high school		0.740 (0,190)	0.751 (0,192)	0.988 (0,200)	0.991 (0,200)	0.929 (0,208)
Vocational education		0.969 (0,154)	1.056 (0,156)	1.039 (0,158)	1.033 (0,158)	1.036 (0,162)
Short higher education-less than 3 years		0.932 (0,161)	0.982 (0,163)	1.003 (0,166)	1.01 (0,166)	1.009 (0,170)
Long-term higher education-under 3-4 years		0.759* (0,150)	0.885 (0,153)	0.866 (0,155)	0.872 (0,156)	0.875 (0,160)
Long-term higher education		0.622** (0,160)	0.813 (0,168)	0.788 (0,170)	0.79 (0,170)	0.79 (0,175)
<b>Total Annual Gross Income</b>						
Low End			Base outcome	Base outcome	Base outcome	Base outcome
2° Quintile			0.813 (0,168)	0.823 (0,171)	0.821 (0,171)	0.804 (0,174)
3° Quintile			0,548*** (0,151)	0,567*** (0,155)	0,564*** (0,155)	0,543*** (0,158)
4° Quintile			0,472*** (0,162)	0,496*** (0,167)	0,492*** (0,168)	0,472*** (0,172)
High End			0,388*** (0,193)	0,401*** (0,196)	0,399*** (0,197)	0,394*** (0,200)
<b>Age Classes</b>						
15-29				Base outcome	Base outcome	Base outcome
30-49				1,801*** (0,135)	1,796*** (0,136)	1,817*** (0,141)
50-64				1,686*** (0,138)	1,679*** (0,138)	1,839*** (0,144)
65+				2,268*** (0,141)	2,257*** (0,141)	2,585*** (0,148)
<b>Gender</b>						
Male					Base outcome	Base outcome
Female					0.956 (0,069)	0.974 (0,071)
<b>Travel Group Composition</b>						
Traveling Alone						Base outcome
Traveling in Group						1,5*** (0,142)
Traveling in Couple						1,85*** (0,142)
	AIC:5156.5	AIC:5067.2	AIC:5031.1	AIC:5001.5	AIC:5003.1	AIC: 4803.2

Standard error are displayed in parenthesis under the odds Ratio. p<0.10 \* p<0.05\*\* p<0.01\*\*\*

The next step involved re-running the model, this time considering the variable COVID3 categorized. This was done to verify the robustness of the results, and indeed, the significance of the COVID variable is maintained.

The results are largely similar, with the odds for income less than one as in the previous model.

Furthermore, education and gender remain not significant even in this model and finally, travel group composition is significant even in this model with the odds ratio greater than one.

**Table 4.13: Logit Model for Length of Stay and COVID4 (Extended)**

Reference category	Mod1	Mod2	Mod3	Mod4	Mod5	Mod6
Constant	0.759*** (0.044)	0.966 (0.140)	1.587** (0.186)	0.875 (0.217)	0.891 (0.221)	0.528** (0.258)
<b>COVID4</b>						
No Meaning	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
Minor Importance	1.561*** (0.090)	1.591*** (0.091)	1.597*** (0.092)	1.595*** (0.092)	1.594*** (0.092)	1.642*** (0.095)
Some Importance	2.038*** (0.094)	2.061*** (0.095)	2.112*** (0.096)	2.073*** (0.097)	2.072*** (0.097)	2.147*** (0.099)
Great Meaning	1.805*** (0.124)	1.801*** (0.125)	1.802*** (0.125)	1.743*** (0.126)	1.747*** (0.126)	1.689*** (0.128)
Crucial Importance	1.735*** (0.169)	1.677*** (0.170)	1.637*** (0.172)	1.543** (0.173)	1.548** (0.173)	1.517** (0.176)
<b>Education</b>						
Primary School		Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
High school or vocational high school		0.716* (0.191)	0.727* (0.193)	0.952 (0.201)	0.956 (0.20)	0.89 (0.209)
Vocational education		0.930 (0.154)	1.019 (0.156)	1.003 (0.158)	0.999 (0.158)	1.001 (0.163)
Short higher education-less than 3 years		0.866 (0.162)	0.919 (0.164)	0.940 (0.166)	0.944 (0.166)	0.938 (0.171)
Long-term higher education-under 3-4 years		0.727** (0.150)	0.854 (0.153)	0.837 (0.156)	0.840 (0.156)	0.841 (0.160)
Long-term higher education		0.6*** (0.161)	0.781 (0.168)	0.757 (0.170)	0.759 (0.170)	0.756 (0.176)
<b>Total Annual Gross Income</b>						
Low End			Base outcome	Base outcome	Base outcome	Base outcome
2 <sup>nd</sup> Quintile			0.757 (0.169)	0.767 (0.172)	0.766 (0.172)	0.741* (0.176)
3 <sup>rd</sup> Quintile			0.514*** (0.152)	0.533*** (0.155)	0.531*** (0.156)	0.507*** (0.160)
4 <sup>th</sup> Quintile			0.445*** (0.163)	0.469*** (0.168)	0.466*** (0.168)	0.443*** (0.173)
High End			0.383*** (0.193)	0.397*** (0.197)	0.396*** (0.197)	0.388*** (0.201)
<b>Age Classes</b>						
15-29				Base outcome	Base outcome	Base outcome
30-49				1.784*** (0.136)	1.78*** (0.136)	1.804*** (0.141)
50-64				1.666*** (0.138)	1.661*** (0.138)	1.818*** (0.144)
65+				2.273*** (0.141)	2.266*** (0.141)	2.599*** (0.150)
<b>Gender</b>						
Male					Base outcome	Base outcome
Female					0.972 (0.069)	0.994 (0.071)
<b>Travel Group Composition</b>						
Traveling Alone						Base outcome
Traveling in Group						1.514*** (0.143)
Traveling in Couple						1.857*** (0.143)
	AIC:5136.8	AIC:5045.7	AIC:5009	AIC:4979.2	AIC:4981	AIC:4777.3

Standard error are displayed in parenthesis under the odds Ratio. p<0.10 \* p<0.05\*\* p<0.01\*\*\*

In this case, as in the previous one, the variable COVID4 with all four extended categories was considered (Table 4.13). This time, significance is observed for all four categories of COVID4.

Regarding age groups, gender, and travel companions, there do not appear to be substantial differences in significance compared to the previous model. Summarizing the results obtained from the model implementations, it can be concluded that fear of COVID-19 has a strong relationship with travel length. It appears that those who are afraid tend to take longer vacations compared to those who are not afraid.



### 4.4.4 Logit Model for Spending Time in Nature

**Table 4.14: Logit Model for Spending Time in Nature and COVID2 (4-1 Categorization)**

Reference category	Mod1	Mod2	Mod3	Mod4	Mod5	Mod6
Constant	2.464*** (0.050)	2.895*** (0.172)	2.530*** (0.213)	2.704*** (0.249)	3.334*** (0.255)	2.126*** (0.289)
<b>COVID2</b>						
Not afraid of covid	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
Afraid of covid	1.863*** (0.081)	1.856*** (0.082)	1.839*** (0.082)	1.851*** (0.082)	1.858*** (0.083)	1.863*** (0.084)
<b>Education</b>						
Primary School		Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
High school or vocational high school		0.601** (0.222)	0.593** (0.222)	0.573** (0.230)	0.586** (0.231)	0.54** (0.241)
Vocational education		0.682** (0.187)	0.671** (0.189)	0.662** (0.189)	0.633** (0.189)	0.577*** (0.197)
Short higher education-less than 3 years		1.16 (0.202)	1.127 (0.204)	1.086 (0.205)	1.134 (0.206)	1.051 (0.213)
Long-term higher education-under 3-4 years		0.916 (0.184)	0.914 (0.187)	0.891 (0.189)	0.933 (0.189)	0.877 (0.197)
Long-term higher education		0.869 (0.196)	0.89 (0.204)	0.87 (0.205)	0.890 (0.205)	0.82 (0.213)
<b>Total Annual Gross Income</b>						
Low End			Base outcome	Base outcome	Base outcome	Base outcome
2° Quintile			1.364 (0.191)	1.324 (0.192)	1.300 (0.192)	1.355 (0.197)
3° Quintile			1.157 (0.166)	1.095 (0.170)	1.056 (0.170)	1.098 (0.172)
4° Quintile			1.117 (0.181)	1.041 (0.185)	0.989 (0.186)	0.998 (0.188)
High End			1.071 (0.214)	1.010 (0.216)	0.968 (0.217)	1.028 (0.220)
<b>Age Classes</b>						
15-299				Base outcome	Base outcome	Base outcome
30-49				1.063 (0.155)	1.047 (0.154)	1.079 (0.159)
50-64				1.044 (0.158)	1.023 (0.158)	1.011 (0.163)
65+				0.885 (0.160)	0.860 (0.160)	0.836 (0.166)
<b>Gender</b>						
Male					Base outcome	Base outcome
Female					0.73*** (0.083)	0.75*** (0.085)
<b>Travel Group Composition</b>						
Traveling Alone						Base outcome
Traveling in Group						1.836*** (0.152)
Traveling in Couple						1.563*** (0.152)
	AIC:3929.1	AIC:3859.2	AIC:3863.7	AIC:3866.4	AIC:3853.8	AIC:3701.1

Standard error are displayed in parenthesis under the odds Ratio. p<0.10 \* p<0.05\*\* p<0.01\*\*\*

The final analysis focuses on the variable “spending time in nature”. The selection of this variable is justified by the changes the pandemic has triggered in various destinations. Specifically, after the onset of COVID-19, many tourists have sought to rediscover the authenticity of places, preferring open spaces for their activities and paying greater attention to sustainability.

This model aims to explore the potential relationship between fear of COVID-19 and the tendency to visit natural areas during trips. The dependent variable takes a value of 0 when the tourist does not spend time outdoors and a value of 1 when the tourist does spend time outdoors (visiting nature places). The COVID variable,

recoded into categories 4-1, is highly significant across all six models. This suggests the existence of a relationship between the two variables.

Moreover, in this model, unlike the others, education appears significant in categories “High School or vocational high school” and “Vocational High School”, which correspond to the lower levels of education. The odds for the education variable are less than one, it seems that education is not so important and that travelers with lower education levels have less probability to spend time in nature. In this model, for the first time, income and age groups are not significant, indicating the absence of a relationship between these variables and the dependent one. Conversely, the last two variables, gender and travel companions, are significant.

Women, compared to men, are less likely to spend time in nature, furthermore, those traveling in groups or couples, are likely to spend time in nature.

Also in this case, according to AIC, the best model is the last one including the majority of interest variables.

**Table 4.15: Logit Model for Spending Time in Nature and COVID3 (3-2 Categorization)**

Reference category	Mod1	Mod2	Mod3	Mod4	Mod5	Mod6
Constant	2.847*** (0.045)	3.207*** (0.170)	2.678*** (0.212)	2.81*** (0.247)	3.484*** (0.254)	2.242*** (0.287)
<b>COVID3</b>						
Not afraid of covid	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
Afraid of covid	1.556*** (0.092)	1.529*** (0.09)	1.525*** (0.093)	1.541*** (0.093)	1.564*** (0.093)	1.575*** (0.095)
<b>Education</b>						
Primary School		Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
High school or vocational high school		0.617** (0.221)	0.605** (0.222)	0.591** (0.230)	0.604** (0.230)	0.555** (0.240)
Vocational education		0.718* (0.186)	0.7* (0.188)	0.69** (0.188)	0.66** (0.188)	0.602*** (0.196)
Short higher education-less than 3 years		1.261 (0.201)	1.208 (0.203)	1.164 (0.204)	1.217 (0.205)	1.13 (0.212)
Long-term higher education-under 3-4 years		0.955 (0.183)	0.944 (0.187)	0.92 (0.187)	0.963 (0.188)	0.907 (0.196)
Long-term higher education		0.897 (0.195)	0.923 (0.203)	0.901 (0.204)	0.922 (0.205)	0.851 (0.212)
<b>Total Annual Gross Income</b>						
Low End			Base outcome	Base outcome	Base outcome	Base outcome
2° Quintile			1.464** (0.190)	1.419* (0.190)	1.395* (0.191)	1.463** (0.193)
3° Quintile			1.225 (0.165)	1.158 (0.168)	1.117 (0.169)	1.166 (0.171)
4° Quintile			1.175 (0.180)	1.093 (0.184)	1.040 (0.185)	1.058 (0.187)
High End			1.063 (0.213)	1.000 (0.215)	0.960 (0.216)	1.022 (0.219)
<b>Age Classes</b>						
15-29				Base outcome	Base outcome	Base outcome
30-49				1.086 (0.153)	1.066 (0.154)	1.09 (0.158)
50-64				1.069 (0.157)	1.040 (0.157)	1.025 (0.162)
65+				0.904 (0.159)	0.874 (0.160)	0.848 (0.166)
<b>Gender</b>						
Male					Base outcome	Base outcome
Female					0.723*** (0.082)	0.741*** (0.084)
<b>Travel Group Composition</b>						
Traveling Alone						Base outcome
Traveling in Group						1.811*** (0.152)
Traveling in Couple						1.551*** (0.151)
	AIC 3965.7	AIC:3895.6	AIC:3863.7	AIC:3900.9	AIC:3887.3	AIC:3733

Standard error are displayed in parenthesis under the odds Ratio. p<0.10 \* p<0.05\*\* p<0.01\*\*\*

In this case as well, the same model was implemented, considering the variable COVID3. The results obtained are quite similar to those of the previous model. The significance related to education remains unchanged. However, this time, a significance for income also emerges, which was not present in the previous model. This significance, however, does not extend to the subsequent income categories and is limited to income category 2. No significance is detected for the age groups. Once again, gender and both categories of travel companions are significant. The last model considers the COVID variable this time without any categorization (Table 4.16). In this case, there does not appear to be any significance for “crucial importance” category of the variable, while the other categories show high levels of significance.

“Education” remains significant, with odds ratio less than one, while “income” is no longer significant across all its categories. Age classes continue to show no significance, whereas “gender” and “travel companions” remain significant. In conclusion, there appears to be a relationship between COVID and the choice of spending time outdoors among Danish travelers, although this relationship does not seem significant for those who consider COVID-19 to be of crucial importance in their travel decisions.

**Table 4.16: Logit Model for Spending Time in Nature and COVID4 (Extended)**

Reference category	Mod1	Mod2	Mod3	Mod4	Mod5	Mod6
Constant	2.464*** (0.050)	2.946*** (0.172)	2.633*** (0.214)	2.78*** (0.248)	3.399*** (0.255)	2.172*** (0.289)
<b>COVID4</b>						
No Meaning	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome	Base outcome
Minor importance	1.979*** (0.117)	2.007*** (0.119)	1.981*** (0.119)	1.978*** (0.119)	1.958*** (0.120)	1.947*** (0.122)
Some importance	1.968*** (0.120)	1.937*** (0.121)	1.92*** (0.122)	1.935*** (0.122)	1.935*** (0.122)	1.983*** (0.126)
Great Meaning	1.903*** (0.160)	1.887*** (0.161)	1.883*** (0.161)	1.9*** (0.162)	1.945*** (0.162)	1.908*** (0.164)
Crucial Importance	1.184 (0.196)	1.169 (0.198)	1.178 (0.199)	1.203 (0.199)	1.242 (0.200)	1.245 (0.203)
<b>Education</b>						
High school or vocational high school		Base outcome 0.586** (0.222)	Base outcome 0.58** (0.223)	Base outcome 0.564** (0.231)	Base outcome 0.578** (0.231)	Base outcome 0.532*** (0.242)
Vocational education		0.673** (0.187)	0.667** (0.188)	0.66** (0.189)	0.631** (0.190)	0.576*** (0.197)
Short higher education-less than 3 years		1.134 (0.203)	1.109 (0.204)	1.074 (0.205)	1.122 (0.206)	1.039 (0.213)
Long-term higher education-under 3-4 years		0.9 (0.184)	0.904 (0.187)	0.884 (0.188)	0.926 (0.189)	0.87 (0.196)
Long-term higher education		0.850 (0.196)	0.874 (0.204)	0.856 (0.205)	0.877 (0.205)	0.808 (0.213)
<b>Total Annual Gross Income</b>						
Low End			Base outcome 1.321 (0.191)	Base outcome 1.287 (0.192)	Base outcome 1.270 (0.193)	Base outcome 1.319 (0.196)
2° Quintile			1.118 (0.167)	1.064 (0.170)	1.030 (0.170)	1.067 (0.173)
3° Quintile			1.083 (0.181)	1.015 (0.185)	0.969 (0.186)	0.974 (0.189)
4° Quintile			1.057 (0.214)	1.001 (0.216)	0.961 (0.217)	1.018 (0.221)
High End						
<b>Age Classes</b>						
15-29				Base outcome 1.064 (0.155)	Base outcome 1.049 (0.155)	Base outcome 1.083 (0.159)
30-49				1.049 (0.158)	1.029 (0.158)	1.017 (0.163)
50-64				0.897 (0.160)	0.870 (0.161)	0.847 (0.167)
65+						
<b>Gender</b>						
Male					Base outcome 0.734*** (0.083)	Base outcome 0.755*** (0.085)
Female						
<b>Travel Group Composition</b>						
Traveling Alone						Base outcome 1.837*** (0.153)
Traveling in Group						1.56*** (0.152)
Traveling in Couple						
	AIC:3929.3	AIC:3859.1	AIC:3864.1	AIC:3867.2	AIC:3855.3	AIC:3702.7

Standard error are displayed in parenthesis under the odds Ratio. p<0.10 \* p<0.05\*\* p<0.01\*\*\*

#### 4.5 Results and Conclusion

The pandemic has affected countries worldwide; Northern European nations are no exception. Although Denmark promptly implemented effective containment measures and provided substantial subsidies to facilitate economic recovery, Danish tourism suffered significantly. The decline in tourist arrivals was considerable, and consequently, tourist spending also decreased strongly. This study aims to investigate the effects of the COVID-19 pandemic on Danish tourism by analyzing the relationship between the fear of infection and travel behavior. The data comes from the survey *Turistundersøgelse* conducted by VisitDenmark, a Danish DMO. An exploratory analysis of the dataset on key travel variables showed that the most frequently used accommodations in Denmark in 2022 are hotels, campsites, and holiday homes. Additionally, the most commonly used means of transportation include cars and trains, and the predominant length of stay is long. The descriptive statistics also consider some sociodemographic variables, which are later used to implement the subsequent logit models. A specific variable within the dataset was selected to study the potential relationships between COVID-19 and travel behavior. This variable, in particular, reflects the importance travelers assign to COVID-19 in their travel choices. For simplicity, this variable has been labeled as "Fear of COVID." Nine logit models were implemented and divided into three groups. The first group considered the dependent variable "type of accommodation," categorized into hotels and extra-hotels and then it was related to the COVID variable classified three times. The same procedure was applied to the variable "length of stay" and "spending time in nature." The models revealed a strong significance for the COVID-19 variable across all three dependent variables. Furthermore, regarding accommodation choices, it appears that as income increases, the likelihood of staying in extra-hotel accommodations decreases. Finally, women are more likely than men to prefer hotels, while those traveling as a couple or in a group tend to choose extra-hotel accommodations compared to solo travelers. The second group of logit models (see Figures 4.11, 4.12, and 4.13) examines the length of stay, categorized into short and long vacations. It seems that individuals who fear COVID are more likely to prefer a long vacation compared to

those who do not. Another result related to this dependent variable concerns the significant relationship with income. Surprisingly, it appears that individuals with higher incomes are more likely to spend less time at destinations. Finally, the last dependent variable, spending time in nature, showed significant relationships with the COVID variable. There are also notable results related to gender; specifically, women are more likely than men to spend time in nature.

From this analysis, some important considerations arise.

First of all, COVID-19 continues to have an impact in 2022 in Denmark. In fact, although the state of emergency officially ended in the first months of this year, it appears that, for some travelers, the fear of infection still plays an important role in travel-related decisions.

Secondly, the choice of accommodation, particularly extra-hotel options, can be important and strategic for avoiding shared spaces.

At the same time, an extended stay in a single vacation location might be preferred over visiting multiple destinations, as it reduces the need for continuous trips.

Finally, it is no secret that COVID-19 has pushed destinations toward sustainability. Taking long walks in nature and spending time outdoors has become a favored activity among those most fear the contagion.

Certainly, some travel behaviors do not depend exclusively on COVID-19, as multiple factors can influence them. However, the changes brought by COVID-19 in the short and medium term are tangible and evident. By studying the changes and preferences of tourists following COVID-19 and, more broadly, following crises it becomes possible to better plan for future crises.

This approach could enable destinations to better respond to tourist demand, as much as possible, in these extraordinary contexts.

## Conclusions

This work aims to provide an overview of the main changes in travel behavior that occurred during the COVID-19 pandemic.

Specifically, the study aimed to investigate the nature of these changes by identifying which travel variables were most affected. At the same time, it aimed to determine whether new travel trends had emerged in response to the pandemic, and, more importantly, whether these trends endured years after the crisis began or disappeared with the easing of restrictions and the return to normality.

To achieve this, an initial overview of European tourism statistics was provided to better comprehend the following studies. Specifically, as a first step, four European countries (Italy, Spain, France, and Germany) were chosen for the first goal, and the key information from the surveys was gathered. These information were related to the data collection method, reference unit, number of units surveyed, data dissemination, and others.

Although Eurostat offers a lot of data on European tourism statistics, it is often necessary to consult each national statistical website to find specific details that are otherwise missing.

This study attempts to fill this gap by compiling integrated and detailed information for the selected four countries, making it easier to access and analyze.

Furthermore, an overview of the main models used to study travel behavior was provided. In addition, this work highlights the importance of key travel variables, as these are crucial in defining travel behavior and enable the study of emerging trends.

A review of the effects that the pandemic has had on these variables is also offered. Indeed, numerous studies focus on the impact of COVID-19 on travel determinants, showing how the pandemic crisis rapidly influenced these key factors.

In line with what is also highlighted in other studies (Ioannides & Gyimóthy, 2020), chapter 2 reveals that the onset of COVID-19 has driven the demand for increasingly green and sustainable vacation solutions. Additionally, domestic

tourism appears to have gained more attention compared to previous years. Indeed, some studies have focused on it, considering it a potential driver for a quicker recovery (OECD, 2020).

Chapter three, on the other hand, focused on studying the trends that emerged during the COVID-19 pandemic. Specifically, two countries were considered (Italy and Spain). Both belong to the Mediterranean area and are characterized by strong tourism flows. The chapter provides a descriptive overview of the main travel variables over five years (2019–2023) to understand what changes occurred. In particular, the variables considered include length of stay, accommodation choice, means of transportation, and motivation.

From this exploratory analysis, some common trends between the two countries seem to emerge. For instance, tourists in both countries preferred extra accommodation establishments over hotels, particularly in 2020. This chapter also presents an analysis of the Italian and Spanish regions, aimed at identifying the regions contributing the most to incoming and outgoing flows and whether these patterns changed with the onset of the pandemic.

What was observed is that no significant changes occurred in either country. However, in some regions, the volume of outgoing trips exceeded that of incoming, especially in 2020. This trend seemed to weaken over time, with a gradual return to pre-pandemic patterns.

Finally, an attempt was made to confirm whether, in 2020, there was an increase in proximity tourism in these two countries as well. The focus was on assessing the attractiveness of each region within each country to determine whether a trend of attraction between neighboring regions had developed in the years following the pandemic. Specifically, an attraction coefficient (Gálvez et al., 2014) was applied to five origin-destination matrices of trips in absolute numbers (one for each year) for both countries. The result was the creation of five additional matrices containing the corresponding attraction coefficients.

The results clearly show the existence of this trend, especially in 2020. Indeed, it is possible to observe not only a concentration of values along the main diagonal in both countries but also a clustering of values around it. Additionally, areas of



particularly concentrated values can be identified based on the macroregion classification. Finally, it appears that both countries experienced a return to normality by 2023, as the diagonals became more dispersed and less concentrated. The last study focused on assessing the impact of COVID-19 in Denmark. The choice of this country lies in the fact that Denmark is a Nordic country potentially characterized by different tourism from those of the Mediterranean countries analyzed earlier. Specifically, the study aimed to understand whether fear of COVID-19 influenced the travel behavior of Danes traveling within Denmark.

Initially, a descriptive analysis was conducted on the main travel variables, revealing that in 2022, the most commonly used types of accommodation were hotels, campsites, and holiday homes. The primary modes of transport include cars and trains, which seems reasonable for domestic trips. Additionally, three logit models were implemented on three variables: accommodation choice, length of stay, and the decision to spend time in nature. The results of these models are quite interesting. Specifically, it was found that fear of COVID-19 continued to have an effect even in 2022, despite all pandemic containment restrictions having already been lifted. Furthermore, all three dependent variables appeared to have a significant relationship with fear of COVID-19.

In particular, the findings suggest that those who fear COVID tend to prefer extra-hotel accommodation, favoring longer vacations over shorter ones, and are more likely to spend time in nature.

This analysis demonstrated that even in 2022, travel behavior in Denmark was still associated with the fear of the pandemic.

Looking at the entirety of the study, it is possible to confirm that certain changes in travel behavior occurred immediately during and after the pandemic and persisted in the medium term. However, the case study in Chapter 3 highlights a return to normality, which, although slow in some cases, appears achievable.

Finally, this work, by examining how travel behavior changes during the pandemic, could serve as a valuable resource for addressing future crises. Specifically, it can help anticipate tourists' needs and minimize the impact of crises on the tourism sector.

## Limitations and Future Research

This section will identify some of the study's limitations and potential future developments. First, the thesis provides an overview of the effects of COVID-19 on tourism demand, however, it does not offer any insight into the tourism supply. Exploring its evolution during the pandemic would have added completeness to the study. Moreover, another limitation is related to the introductory section, indeed this considers only the main European countries, overlooking some countries where tourism plays an important role.

Finally, when studying the effects of COVID-19 on travel behavior, it is important to analyze a long-time frame, as is done in the chapter related to proximity.

Unfortunately, the last analysis lacks this long-time frame as it considers only the year 2022 and it doesn't give information on the previous or the following years.

This would have allowed for a more comprehensive comparison of trends over a longer period, enriching the understanding of changes in tourism patterns. As for the future developments of the thesis, one of them is to expand the introductory chapter by including additional countries to provide greater completeness to the study. For example, it could be expanded to include knowledge of the statistical sources on demand and supply in Denmark (mentioned in the final chapter). In this chapter, regarding the methodological section, alternative methodologies could be applied. For example, implementing Random Forest and Gradient Boosting algorithms and comparing the results would allow for evaluating differences in terms of accuracy, interpretability, and modeling complex relationships between variables. In addition, another possible future development could involve incorporating a section dedicated to the supply side of tourism. This would be particularly valuable, as it could offer deeper insights into how Destination Management Organizations (DMOs) and key players in the tourism sector responded to the challenges posed by the pandemic, shedding light on their strategies implemented during this unprecedented crisis.

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## CRediT Author Statement

**Chapter 1** – *Ludovica Venturella*: conceptualization, resources, data curation, writing-original draft, visualization. *Stefano De Cantis*: conceptualization, supervision, writing-review, project administration.

**Chapter 2** – *Ludovica Venturella*: conceptualization, resources, data curation, writing-original draft, visualization. *Stefano De Cantis*: conceptualization, supervision, writing-review, project administration.

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Table C.1 Spanish Origin-Destination Matrix, 2019

	Galicia	Asturias	Cantabria	Basque Country	Navarre	Aragon	Catalonia	Castile and León	La Rioja	Extremadura	Madrid	Castilla La Mancha	Valencian Community	Balearic Islands	Andalusia	Murcia	Canary Islands	Ceuta	Melilla	Total Destination
Galicia	6,752,703	262,765	68,354	71,635	19,851	19,661	161,177	451,287	7,440	38,757	446,995	50,644	144,968	46,740	167,416	85,088	127,698	0	0	8,930,189
Asturias	340,189	2,120,671	178,850	82,051	14,384	31,083	98,845	689,875	14,163	55,705	205,342	13,831	87,272	34,511	159,048	6,561	43,444	0	0	4,175,825
Cantabria	53,324	141,361	730,359	88,887	9,580	37,666	46,357	373,169	24,615	10,868	204,514	14,919	67,015	16,301	87,137	2,829	35,022	2,883	0	1,946,806
Basque Country	252,752	284,306	1,053,108	2,272,983	1,079,070	477,649	451,415	1,718,318	566,259	108,288	499,921	61,181	405,263	66,928	279,977	8,857	80,119	0	2,880	9,669,274
Navarre	30,000	27,315	65,057	272,160	1,007,292	237,221	219,930	140,997	121,534	13,880	169,022	35,563	186,161	16,547	113,028	2,724	19,854	0	0	2,678,385
Aragon	59,998	26,016	68,393	205,946	98,954	3,095,997	900,681	232,911	69,234	28,514	289,168	77,494	636,443	45,495	291,210	34,573	35,469	0	0	6,216,496
Catalonia	313,143	116,978	112,636	366,568	173,483	1,287,906	20,364,155	435,388	90,252	127,326	1,248,220	423,664	987,341	546,662	1,100,264	61,805	196,408	0	3,261	27,955,460
Castile and León	423,486	498,971	747,716	275,369	45,724	126,663	209,364	5,504,625	80,924	210,624	1,182,172	76,428	438,897	45,503	528,883	29,213	117,137	1,499	891	10,544,089
La Rioja	15,148	19,226	72,531	104,982	49,906	96,958	110,812	113,706	332,431	5,453	104,442	15,289	75,531	9,062	57,336	3,228	7,487	0	0	1,193,528
Extremadura	21,865	49,873	9,803	12,053	1,274	18,051	42,622	131,061	2,312	1,624,015	442,810	156,464	60,468	11,419	936,756	20,292	16,453	0	0	3,587,591
Madrid	1,047,390	903,103	634,769	763,359	232,810	906,012	882,615	6,612,456	223,097	1,397,801	3,904,330	5,360,820	3,647,270	298,575	3,682,312	616,211	420,835	6,911	0	31,530,676
Castilla La Mancha	60,299	53,364	105,214	63,746	6,913	128,145	89,421	346,362	5,554	201,809	1,352,182	2,627,111	1,441,821	30,751	950,054	320,088	66,571	0	9,588	7,868,993
Valencian Community	169,579	98,657	62,203	101,408	87,053	719,879	695,936	289,490	60,495	47,439	737,902	1,362,646	10,101,877	181,294	943,976	344,118	65,513	0	8,430	16,077,885
Balearic Islands	76,720	36,194	13,370	23,712	10,646	62,957	424,778	49,298	555	18,260	240,325	42,745	147,964	1,632,168	210,880	10,901	31,032	0	0	3,062,505
Andalusia	187,348	155,494	83,665	134,965	52,412	92,899	330,463	286,590	11,010	550,673	1,854,884	340,947	536,453	226,122	21,843,535	329,385	143,577	68,049	55,526	27,283,997
Murcia	46,506	30,171	20,899	36,101	16,526	59,985	94,520	89,009	16,773	23,122	288,040	310,039	719,537	26,189	863,885	1,654,142	15,888	0	0	4,311,332
Canary Islands	141,454	19,014	10,227	50,544	7,621	24,970	129,898	66,159	5,617	3,991	490,803	34,797	86,795	20,477	228,970	11,455	5,084,115	0	0	6,416,907
Ceuta	501	490	0	597	0	971	2,635	1,855	0	2,715	8,141	2,446	2,798	806	167,128	555	2,794	0	16,396	210,828
Melilla	1,633	567	501	311	0	1,216	4,121	2,690	840	677	13,339	1,211	5,743	270	105,742	1,669	1,459	211	0	144,200
Total Origin	10,001,038	4,844,536	4,037,655	4,927,377	2,913,499	7,425,909	25,259,745	17,555,246	1,633,105	4,469,917	13,684,542	10,998,239	19,779,617	3,275,920	32,717,537	3,543,694	16,510,875	79,553	96,972	173,754,976

Table C.2 Spanish Origin-Destination Matrix, 2020

	Galicia	Asturias	Cantabria	Basque Country	Navarre	Aragon	Catalonia	Castile and León	La Rioja	Extremadura	Madrid	Castilla La Mancha	Valencian Community	Balearic Islands	Andalusia	Murcia	Canary Islands	Ceuta	Melilla	Total Destination
Galicia	3,811,515	70,598	15,783	75,327	6,412	16,876	51,529	180,916	498	17,134	115,672	22,129	42,015	18,985	63,837	0	41,232	0	0	4,550,458
Asturias	143,169	1,265,695	63,731	57,574	930	6,628	29,481	363,754	10,465	8,065	76,600	8,777	31,929	5,291	48,389	6,926	7,967	0	0	2,135,371
Cantabria	24,641	81,045	484,743	77,049	733	8,323	16,917	174,294	8,784	9,585	93,216	4,821	17,401	5,189	34,647	0	8,092	0	0	1,049,480
Basque Country	72,975	188,065	669,665	1,496,608	489,802	180,094	188,446	899,744	288,303	30,596	165,134	24,524	229,634	47,100	207,730	25,328	56,628	0	0	5,260,376
Navarre	22,280	19,975	69,871	136,464	659,947	122,365	124,561	109,044	131,316	4,222	69,465	2,538	78,076	8,150	56,860	1,869	14,687	0	0	1,631,690
Aragon	31,093	12,375	32,875	58,883	83,734	1,860,339	361,202	116,090	25,972	19,267	110,129	65,827	303,951	11,360	81,382	7,761	9,532	0	0	3,191,772
Catalonia	201,218	76,284	74,211	141,500	116,422	781,617	11,428,350	181,809	55,691	84,235	327,742	122,768	425,873	314,378	420,625	36,075	84,591	0	0	14,873,389
Castile and León	135,961	249,235	275,044	93,206	31,254	51,466	69,026	3,838,618	38,926	130,702	421,887	110,185	143,549	25,840	192,844	10,567	43,977	0	0	5,662,287
La Rioja	7,071	6,310	52,498	55,663	26,895	48,274	30,013	86,731	220,963	980	28,532	8,855	45,806	1,930	17,002	0	1,987	220	408	640,138
Extremadura	2,236	6,211	4,430	8,332	6,832	8,317	26,011	70,978	479	1,229,078	270,195	39,164	20,165	1,715	370,378	5,464	0	0	0	2,070,025
Madrid	627,868	587,897	527,609	322,593	200,570	398,741	515,122	3,010,139	71,337	599,827	2,508,423	2,804,628	1,888,827	200,947	1,888,349	334,561	213,684	0	0	16,701,122
Castilla La Mancha	42,331	46,713	31,258	20,504	7,557	40,215	33,066	194,717	4,436	67,332	688,424	1,882,368	765,006	17,845	324,485	110,226	6,994	0	0	4,283,477
Valencian Community	48,068	59,649	41,524	70,595	44,235	366,782	242,805	100,057	20,956	16,433	333,747	721,338	6,941,402	108,257	489,001	311,169	18,575	0	0	9,934,593
Balearic Islands	36,527	12,897	5,932	15,49	5,270	27,776	147,201	18,158	2,930	17,252	75,742	14,385	81,557	1,160,472	101,460	4,792	16,238	0	0	1,730,138
Andalusia	88,917	31,517	21,548	45,379	20,442	65,748	119,674	150,262	0	271,579	530,331	148,284	166,347	72,033	14,040,076	111,179	78,830	13,024	5,448	15,960,618
Murcia	19,016	22,617	14,494	7,623	2,814	15,607	30,990	43,029	1,529	11,548	111,047	265,440	399,038	8,936	329,610	1,050,475	8,537	0	0	2,342,350
Canary Islands	42,806	1,642	2,797	21,433	6,318	1,975	37,330	42,601	2,336	7,024	138,080	7,556	22,862	5,084	74,962	2,990	3,614,650	0	0	4,032,446
Ceuta	0	1,270	0	0	366	1,532	1,380	0	0	959	1,916	1,247	76	0	86,798	0	5,233	0	0	100,777
Melilla	146	1,198	440	0	77	1,121	145	677	0	1,710	7,132	703	2,667	317	60,807	478	1,274	0	0	78,892
Total Origin	5,357,858	2,741,193	2,388,453	2,690,282	1,710,610	4,003,796	13,453,249	19,581,618	884,921	2,527,528	6,073,414	6,255,537	11,606,201	2,013,829	18,889,242	2,019,660	4,232,708	13,244	5,856	96,449,999

Table C.3 Spanish Origin-Destination Matrix, 2021

	Galicia	Asturias	Cantabria	Basque Country	Navarre	Aragon	Catalonia	Castile and León	La Rioja	Extremadura	Madrid	Castilla La Mancha	Valencian Community	Balearic Islands	Andalusia	Murcia	Canary Islands	Ceuta	Melilla	Total Destination
Galicia	5,774,858	129,597	65,248	57,274	7,809	4,359	86,231	224,792	5,966	43,418	289,505	34,354	64,070	40,129	125,182	4,407	73,729	0	1,750	7,032,678
Asturias	258,936	1,363,435	153,172	57,582	4,587	18,823	47,322	451,139	3,204	20,483	157,332	5,193	79,735	19,791	113,279	6,122	37,745	1,030	0	2,798,910
Cantabria	42,170	96,823	863,214	63,292	12,714	17,909	26,554	261,316	28,416	15,188	163,203	9,034	36,053	19,137	62,223	3,926	14,941	0	0	1,736,113
Basque Country	192,974	162,324	953,966	1,406,380	430,076	233,802	296,403	1,102,984	569,467	127,221	402,038	75,071	344,139	86,921	291,432	9,917	56,393	0	0	6,741,498
Navarre	40,817	13,316	46,823	208,977	962,705	145,543	232,696	155,221	26,378	10,926	109,508	10,058	121,414	15,167	69,673	20,270	14,742	0	0	2,204,234
Aragon	42,749	14,665	42,822	70,050	94,219	2,640,969	656,050	145,218	37,680	13,102	167,016	56,509	438,240	61,098	118,760	19,214	33,540	0	0	4,651,901
Catalonia	239,607	94,123	78,098	377,102	117,591	1,378,115	16,716,168	304,810	98,804	100,047	684,056	175,874	959,477	595,015	864,544	127,050	189,936	0	0	23,100,417
Castile and León	329,894	288,546	379,296	155,344	19,083	45,168	158,894	4,511,907	53,805	117,593	840,125	137,927	311,463	60,750	331,236	18,457	35,009	0	0	7,794,497
La Rioja	22,365	13,771	52,808	65,611	48,280	105,944	78,555	83,669	332,294	6,638	57,805	6,094	65,393	6,548	38,734	10,763	4,007	0	0	999,299
Extremadura	45,829	23,964	18,124	15,599	3,790	35,129	34,123	155,699	1,818	1,277,240	337,287	88,600	22,603	27,256	660,506	4,150	4,107	0	1,125	2,756,949
Madrid	784,532	663,034	458,423	356,229	140,044	467,450	854,634	4,439,552	121,674	1,089,997	3,246,877	3,957,758	2,725,472	245,429	2,393,193	336,138	288,569	10,264	5,092	22,584,361
Castilla La Mancha	83,120	66,219	59,955	36,548	12,854	104,190	97,466	255,725	612	174,539	620,290	2,443,760	982,163	27,719	642,671	204,626	35,849	562	0	5,848,868
Valencian Community	116,367	61,927	38,574	128,860	26,487	533,498	760,931	83,057	21,918	37,268	481,118	907,508	9,357,234	169,841	785,114	255,665	62,018	0	0	13,827,385
Balearic Islands	40,992	7,959	4,046	13,266	10,794	15,672	199,870	20,967	0	10,310	206,019	27,854	150,966	2,187,388	161,308	10,574	23,891	0	0	3,091,866
Andalusia	199,870	99,520	35,900	80,641	17,868	70,053	185,412	197,637	22,612	400,425	828,147	266,018	383,648	142,675	18,448,860	203,257	125,880	16,948	7,670	21,734,041
Murcia	38,357	24,819	26,379	14,411	15,363	62,032	73,006	48,275	0	8,893	301,987	268,234	592,605	35,361	517,749	1,490,422	23,236	0	0	3,541,129
Canary Islands	66,032	32,189	5,183	26,654	5,696	14,944	86,702	67,950	0	4,073	285,052	18,672	60,668	8,791	98,880	10,543	4,134,041	0	0	4,926,070
Ceuta	430	344	297	0	0	265	1,384	2,871	0	4,309	7,041	526	2,048	322	154,687	3,975	2,290	0	0	180,789
Melilla	3,308	0	1,301	96	0	1,477	1,547	530	0	2,592	7,713	3,070	4,643	503	99,645	5,234	4,632	406	0	136,697
Total Origin	8,323,227	3,156,575	3,283,629	3,133,916	1,929,960	5,895,342	20,593,948	12,513,309	1,324,648	3,464,262	9,192,119	8,492,114	16,702,034	3,749,841	25,978,676	2,744,710	5,164,545	29,210	15,637	135,687,702

Table C.4 Spanish Origin-Destination Matrix, 2022

	Galicia	Asturias	Cantabria	Basque Country	Navarre	Aragon	Catalonia	Castile and León	La Rioja	Extremadura	Madrid	Castilla La Mancha	Valencian Community	Balearic Islands	Andalusia	Murcia	Canary Islands	Ceuta	Melilla	Total Destination
Galicia	5,761,739	323,618	75,711	113,871	8,936	40,678	95,770	388,952	27,008	69,863	436,756	58,715	119,736	47,045	207,957	22,802	161,530	0	0	7,960,687
Asturias	439,791	1,404,443	134,299	108,977	11,946	31,891	71,472	611,216	5,012	37,856	185,136	20,006	109,896	49,711	109,128	5,252	60,057	0	0	3,396,089
Cantabria	58,857	172,750	756,880	83,807	7,963	27,493	53,211	247,572	23,482	4,698	193,806	13,636	53,771	16,115	64,606	9,572	19,201	0	0	1,809,420
Basque Country	197,908	208,920	1,086,183	1,374,116	463,418	279,288	519,970	1,316,169	599,289	102,048	412,330	48,356	351,412	94,930	310,545	11,843	147,228	0	0	7,523,953
Navarre	32,660	14,551	77,390	271,927	814,117	479,918	239,010	119,555	82,096	22,773	107,280	18,567	153,239	15,165	86,735	13,612	26,572	0	0	2,575,167
Aragon	69,715	35,029	43,868	109,331	151,956	2,851,619	894,090	220,830	87,446	14,974	276,101	129,512	546,651	64,465	151,727	11,841	41,410	0	10,068	5,710,633
Catalonia	399,956	122,748	33,295	346,206	108,146	1,411,022	18,888,350	477,058	71,422	130,960	907,117	231,580	1,000,599	465,237	795,584	88,204	187,701	0	0	25,665,085
Castile and León	538,556	427,229	540,756	189,971	24,041	95,532	157,463	4,261,325	54,499	190,629	850,496	135,304	426,192	98,335	481,665	54,306	102,208	0	0	8,628,507
La Rioja	39,825	19,025	73,156	103,294	48,035	125,010	94,860	80,092	491,308	13,157	87,935	16,570	98,178	7,308	42,200	6,094	11,178	0	0	1,357,225
Extremadura	40,206	29,109	15,794	27,154	6,640	17,755	32,373	171,011	2,043	1,155,682	343,832	72,036	66,119	24,854	908,324	15,797	37,710	0	0	2,966,439
Madrid	1,133,489	862,576	481,128	558,994	198,636	784,854	1,013,325	6,248,738	144,063	1,543,191	3,206,646	4,882,864	3,059,918	250,029	3,240,633	598,526	443,667	0	0	28,651,497
Castilla La Mancha	119,937	53,515	89,863	75,447	14,055	118,898	245,559	262,781	13,604	245,593	952,960	2,210,990	1,150,820	56,077	715,856	195,472	33,521	0	0	6,554,848
Valencian Community	133,240	126,353	114,037	154,670	106,556	884,163	897,990	240,327	49,274	71,189	987,393	1,116,362	9,409,025	230,515	996,067	499,371	87,023	0	0	16,103,555
Balearic Islands	49,424	18,158	8,398	52,987	12,503	37,398	357,209	62,797	5,891	11,563	238,074	18,488	167,769	2,234,801	259,901	30,932	48,349	0	0	3,614,642
Andalusia	244,382	118,045	66,633	155,166	39,736	143,965	382,089	292,555	28,677	429,927	1,113,218	479,012	428,386	114,991	18,677,583	233,754	137,532	56,789	53,653	23,196,113
Murcia	62,141	53,787	3,643	17,354	12,519	80,954	84,774	27,511	3,336	32,293	262,506	290,871	713,984	64,979	1,676,702	1,676,702	13,399	0	0	3,948,354
Canary Islands	124,607	61,343	6,772	85,700	17,781	53,168	131,278	59,545	19,307	41,404	388,810	38,600	65,803	24,042	240,932	8,044	3,882,635	0	0	5,249,771
Ceuta	1,216	1,202	426	1,104	912	566	1,871	299	0	3,122	9,088	986	3,110	255	174,717	0	1,908	0	0	200,782
Melilla	2,635	175	1,501	818	0	587	1,108	496	0	747	9,971	463	7,403	0	108,521	2,510	2,057	1,272	0	140,264
Total Origin	9,450,084	4,052,576	3,609,733	3,830,914	2,047,896	7,464,759	24,161,772	15,088,829	1,707,777	4,121,669	10,969,655	9,782,918	17,932,011	3,860,854	28,120,282	3,484,634	5,444,886	58,061	63,721	155,253,031

Table C.5 Spanish Origin-Destination Matrix 2023

	Galicia	Asturias	Cantabria	Basque Country	Navarre	Aragon	Catalonia	Castile and León	La Rioja	Extremadura	Madrid	Castilla La Mancha	Valencian Community	Balearic Islands	Andalusia	Murcia	Canary Islands	Ceuta	Melilla	Total Destination
Galicia	5,943,845	364,237	83,915	120,486	916	65,727	163,008	399,650	13,389	19,024	460,586	73,748	128,471	86,611	181,617	34,142	167,902	0	9,405	8,285,879
Asturias	464,366	1,833,378	154,080	89,607	25,409	35,031	68,183	620,844	15,763	32,518	293,623	19,293	123,067	44,669	188,103	4,281	57,807	0	1,324	4,071,556
Cantabria	69,465	129,337	425,622	90,090	25,601	36,778	148,857	312,915	19,490	12,023	167,245	29,000	51,363	16,793	102,334	7,159	42,112	4,722	0	1,690,046
Basque Country	283,671	239,243	1,341,912	1,419,084	488,012	497,200	606,320	1,812,455	511,965	125,960	527,055	85,050	359,929	93,629	405,352	34,930	119,142	0	0	8,950,909
Navarre	36,599	21,658	60,196	277,528	849,704	410,572	292,796	137,069	123,634	31,134	140,002	16,047	207,890	22,377	114,101	15,501	24,811	0	0	2,783,609
Aragon	46,200	26,877	65,546	110,323	121,969	2,875,118	1,003,809	280,952	98,344	17,878	309,490	127,062	523,550	40,638	148,843	16,184	31,002	0	0	5,843,785
Catalonia	359,798	207,094	155,978	315,460	169,314	1,111,213	17,347,089	420,242	103,005	132,766	1,167,942	286,640	1,462,599	676,935	1,088,634	178,611	266,481	1,652	0	25,463,453
Castile and León	546,186	459,843	696,109	218,455	78,106	112,142	218,494	4,548,134	136,604	309,510	991,160	134,269	538,730	88,463	581,678	29,882	82,554	0	0	9,740,319
La Rioja	12,867	21,577	103,168	73,801	83,697	155,215	109,985	117,418	335,250	10,642	97,499	15,496	73,507	8,628	53,803	8,989	10,052	0	0	1,291,794
Extremadura	62,755	21,757	12,133	28,551	12,359	11,166	41,795	134,568	7,632	1,594,565	397,296	132,873	82,718	23,735	879,102	29,631	27,273	2,547	0	3,502,456
Madrid	1,131,781	875,739	791,543	540,250	167,465	742,094	1,221,947	6,289,775	202,123	1,653,887	2,657,828	5,267,960	3,233,464	366,502	3,532,329	638,990	410,539	0	2,749	29,726,695
Castilla La Mancha	145,321	112,964	82,342	64,616	22,368	161,329	238,451	424,191	26,138	247,135	953,557	2,816,902	1,284,626	31,733	792,708	230,276	65,887	0	0	7,700,334
Valencian Community	135,685	121,412	83,876	173,762	75,857	913,263	1,103,664	346,417	28,561	83,244	1,098,847	1,221,240	8,934,624	311,208	1,196,626	498,203	98,467	0	0	16,425,156
Balearic Islands	102,957	61,431	23,006	47,392	20,746	48,011	503,040	69,920	1,191	19,579	299,683	47,244	172,201	1,534,838	251,980	26,311	41,506	1,421	0	3,272,457
Andalusia	235,909	156,584	66,943	239,000	43,033	95,362	404,335	399,295	24,372	343,292	1,588,882	369,167	514,789	156,363	20,938,403	251,862	254,465	66,505	3,925	26,153,406
Murcia	59,758	31,771	3,389	42,570	8,605	25,714	94,557	69,264	5,414	30,567	324,106	201,303	736,947	31,025	743,938	1,908,740	40,103	0	3,907	4,361,698
Canary Islands	190,072	72,393	52,022	56,984	33,453	31,164	190,743	41,638	8,052	13,851	472,581	31,167	38,673	51,000	235,032	15,732	5,367,481	2,576	0	6,904,614
Ceuta	1,248	701	0	775	399	1,465	3,635	1,250	0	3,963	13,120	1,072	4,443	0	215,886	2,338	766	0	2,316	253,377
Melilla	2,182	800	0	838	0	1,316	2,614	8,304	0	544	14,785	2,175	5,932	2,422	146,349	2,474	2,352	0	0	193,087
Total Origin	9,832,595	4,758,796	4,201,780	3,909,572	2,227,033	7,329,880	23,763,022	16,401,601	1,662,927	4,682,102	11,945,287	10,877,708	18,477,733	3,589,989	31,796,818	3,934,236	7,110,502	79,423	23,626	166,604,630

Table C.6. Indices of attraction for Spanish Regions, 2019

	Galicia	Asturias	Cantabria	Basque Country	Navarre	Aragon	Catalonia	Castile and León	La Rioja	Extremadura	Madrid	Castilla La Mancha	Valencian Community	Balearic Islands	Andalusia	Murcia	Canary Islands	Ceuta	Melilla
Galicia	13.15	1.06	0.33	0.28	0.13	0.05	0.12	0.50	0.09	0.17	0.64	0.09	0.14	0.28	0.10	0.47	0.38	0.00	0.00
Asturias	1.42	18.21	1.84	0.69	0.21	0.17	0.16	1.64	0.36	0.52	0.62	0.05	0.18	0.44	0.20	0.08	0.28	0.00	0.00
Cantabria	0.48	2.60	16.14	1.61	0.29	0.45	0.16	1.90	1.35	0.22	1.33	0.12	0.30	0.44	0.24	0.07	0.48	3.23	0.00
Basque Country	0.45	1.05	4.69	8.29	6.66	1.16	0.32	1.76	6.23	0.44	0.66	0.10	0.37	0.37	0.15	0.04	0.22	0.00	0.53
Navarre	0.19	0.37	1.05	3.58	22.43	2.07	0.56	0.52	4.83	0.20	0.80	0.21	0.61	0.33	0.22	0.05	0.20	0.00	0.00
Aragon	0.17	0.15	0.47	1.17	0.95	11.65	1.00	0.40	1.18	0.18	0.59	0.20	0.90	0.39	0.25	0.27	0.15	0.00	0.00
Catalonia	0.19	0.15	0.17	0.46	0.37	1.08	5.01	0.15	0.34	0.18	0.57	0.24	0.31	1.04	0.21	0.11	0.19	0.00	0.21
Castile and León	0.70	1.70	3.05	0.92	0.26	0.28	0.14	5.17	0.82	0.78	1.42	0.11	0.37	0.23	0.27	0.14	0.30	0.31	0.15
La Rioja	0.22	0.58	2.62	3.10	2.49	1.90	0.64	0.94	29.63	0.18	1.11	0.20	0.56	0.40	0.26	0.13	0.17	0.00	0.00
Extremadura	0.11	0.50	0.12	0.12	0.02	0.12	0.08	0.36	0.07	17.74	1.58	0.69	0.15	0.17	1.40	0.28	0.12	0.00	0.00
Madrid	0.58	1.03	0.87	0.85	0.44	0.67	0.19	2.08	0.75	1.72	1.57	2.68	1.02	0.50	0.62	0.96	0.36	0.48	0.00
Castilla La Mancha	0.13	0.24	0.58	0.29	0.05	0.38	0.08	0.44	0.08	1.00	2.18	5.28	1.61	0.21	0.64	2.00	0.23	0.00	2.19
Valencian Community	0.18	0.22	0.17	0.22	0.32	1.05	0.30	0.18	0.40	0.11	0.58	1.34	5.52	0.60	0.31	1.05	0.11	0.00	0.94
Balearic Islands	0.44	0.43	0.19	0.27	0.21	0.48	0.96	0.16	0.02	0.23	1.00	0.22	0.43	28.71	0.37	0.18	0.27	0.00	0.00
Andalusia	0.12	0.20	0.13	0.17	0.11	0.08	0.08	0.10	0.04	0.78	0.86	0.20	0.17	0.44	4.25	0.59	0.14	5.45	3.65
Murcia	0.19	0.25	0.21	0.30	0.23	0.33	0.15	0.20	0.41	0.21	0.85	1.14	1.47	0.32	1.06	18.81	0.10	0.00	0.00
Canary Islands	0.38	0.11	0.07	0.28	0.07	0.09	0.14	0.10	0.09	0.02	0.97	0.09	0.12	0.17	0.19	0.09	21.14	0.00	0.00
Ceuta	0.04	0.08	0.00	0.10	0.00	0.11	0.09	0.09	0.00	0.50	0.49	0.18	0.12	0.20	4.21	0.13	0.35	0.00	139.35
Melilla	0.20	0.14	0.15	0.08	0.00	0.20	0.20	0.18	0.62	0.18	1.35	0.13	0.35	0.10	3.89	0.57	0.27	3.20	0.00

Table C.7 Indices of attraction for Spanish Regions, 2020

	Galicia	Asturias	Cantabria	Basque Country	Navarre	Aragon	Catalonia	Castile and León	La Rioja	Extremadura	Madrid	Castilla La Mancha	Valencian Community	Balearic Islands	Andalusia	Murcia	Canary Islands	Ceuta	Melilla
Galicia	15.08	0.55	0.14	0.59	0.08	0.09	0.08	0.40	0.01	0.14	0.40	0.07	0.08	0.20	0.07	0.00	0.21	0.00	0.00
Asturias	1.21	20.86	1.21	0.97	0.02	0.07	0.10	1.71	0.53	0.14	0.57	0.06	0.12	0.12	0.12	0.15	0.09	0.00	0.00
Cantabria	0.42	2.72	18.65	2.63	0.04	0.19	0.12	1.67	0.91	0.35	1.41	0.07	0.14	0.24	0.17	0.00	0.18	0.00	0.00
Basque Country	0.25	1.26	5.14	10.20	5.25	0.82	0.26	1.72	5.97	0.22	0.50	0.07	0.36	0.43	0.20	0.23	0.25	0.00	0.00
Navarre	0.25	0.43	1.73	3.00	22.80	1.81	0.55	0.67	8.77	0.10	0.68	0.02	0.40	0.24	0.18	0.05	0.21	0.00	0.00
Aragon	0.18	0.14	0.42	0.66	1.48	14.04	0.81	0.37	0.89	0.23	0.55	0.32	0.79	0.17	0.13	0.12	0.07	0.00	0.00
Catalonia	0.24	0.18	0.20	0.34	0.44	1.27	5.51	0.12	0.41	0.22	0.35	0.13	0.24	1.01	0.14	0.12	0.13	0.00	0.00
Castile and León	0.42	1.50	1.89	0.57	0.30	0.21	0.08	6.59	0.72	0.85	1.14	0.29	0.20	0.21	0.17	0.09	0.17	0.00	0.00
La Rioja	0.20	0.35	3.31	3.12	2.37	1.82	0.34	1.36	37.62	0.06	0.71	0.21	0.59	0.14	0.14	0.00	0.07	2.50	10.50
Extremadura	0.02	0.11	0.09	0.14	0.19	0.10	0.09	0.35	0.03	22.66	2.07	0.29	0.08	0.04	0.91	0.13	0.00	0.00	0.00
Madrid	0.68	1.24	1.28	0.69	0.68	0.58	0.22	1.81	0.47	1.37	2.39	2.59	0.94	0.58	0.58	0.96	0.29	0.00	0.00
Castilla La Mancha	0.18	0.38	0.29	0.17	0.10	0.23	0.06	0.46	0.11	0.60	2.55	6.78	1.48	0.20	0.39	1.23	0.04	0.00	0.00
Valencian Community	0.09	0.21	0.17	0.25	0.25	0.89	0.18	0.10	0.23	0.06	0.53	1.12	5.81	0.52	0.25	1.50	0.04	0.00	0.00
Balearic Islands	0.38	0.26	0.14	0.03	0.17	0.39	0.61	0.11	0.18	0.38	0.70	0.13	0.39	32.12	0.30	0.13	0.21	0.00	0.00
Andalusia	0.10	0.07	0.05	0.10	0.07	0.10	0.05	0.09	0.00	0.65	0.53	0.14	0.09	0.22	4.49	0.33	0.11	5.94	5.61
Murcia	0.15	0.34	0.25	0.12	0.07	0.16	0.09	0.18	0.07	0.19	0.75	1.75	1.42	0.18	0.72	21.41	0.08	0.00	0.00
Canary Islands	0.19	0.01	0.03	0.19	0.09	0.01	0.07	0.11	0.06	0.07	0.54	0.03	0.05	0.06	0.09	0.04	20.43	0.00	0.00
Ceuta	0.00	0.44	0.00	0.00	0.20	0.37	0.10	0.00	0.00	0.36	0.30	0.19	0.01	0.00	4.40	0.00	1.18	0.00	0.00
Melilla	0.03	0.53	0.23	0.00	0.06	0.34	0.01	0.09	0.00	0.83	1.44	0.14	0.28	0.19	3.94	0.29	0.37	0.00	0.00

Table C.8 Indices of attraction for Spanish Regions, 2021

	Galicia	Asturias	Cantabria	Basque Country	Navarre	Aragon	Catalonia	Castile and León	La Rioja	Extremadura	Madrid	Castilla La Mancha	Valencian Community	Balearic Islands	Andalusia	Murcia	Canary Islands	Ceuta	Melilla
Galicia	13.39	0.79	0.38	0.35	0.08	0.01	0.08	0.35	0.09	0.24	0.61	0.08	0.07	0.21	0.09	0.03	0.28	0.00	2.16
Asturias	1.51	20.94	2.26	0.89	0.12	0.15	0.11	1.75	0.12	0.29	0.83	0.03	0.23	0.26	0.21	0.11	0.35	1.71	0.00
Cantabria	0.40	2.40	20.55	1.58	0.51	0.24	0.10	1.63	1.68	0.34	1.39	0.08	0.17	0.40	0.19	0.11	0.23	0.00	0.00
Basque Country	0.47	1.04	5.85	9.03	4.49	0.80	0.29	1.77	8.65	0.74	0.88	0.18	0.41	0.47	0.23	0.07	0.22	0.00	0.00
Navarre	0.30	0.26	0.88	4.10	30.71	1.52	0.70	0.76	1.23	0.19	0.73	0.07	0.45	0.25	0.17	0.45	0.18	0.00	0.00
Aragon	0.15	0.14	0.38	0.65	1.42	13.07	0.93	0.34	0.83	0.11	0.53	0.19	0.77	0.48	0.13	0.20	0.19	0.00	0.00
Catalonia	0.17	0.18	0.14	0.71	0.36	1.37	4.77	0.14	0.44	0.17	0.44	0.12	0.34	0.93	0.20	0.27	0.22	0.00	0.00
Castile and León	0.69	1.59	2.01	0.86	0.17	0.13	0.13	6.28	0.71	0.59	1.59	0.28	0.32	0.28	0.22	0.12	0.12	0.00	0.00
La Rioja	0.37	0.59	2.18	2.84	3.40	2.44	0.52	0.91	34.06	0.26	0.85	0.10	0.53	0.24	0.20	0.53	0.11	0.00	0.00
Extremadura	0.27	0.37	0.27	0.24	0.10	0.29	0.08	0.61	0.07	18.15	1.81	0.51	0.07	0.36	1.25	0.07	0.04	0.00	3.54
Madrid	0.57	1.26	0.84	0.68	0.44	0.48	0.25	2.13	0.55	1.89	2.12	2.80	0.98	0.39	0.55	0.74	0.34	2.11	1.96
Castilla La Mancha	0.23	0.49	0.42	0.27	0.15	0.41	0.11	0.47	0.01	1.17	1.57	6.68	1.36	0.17	0.57	1.73	0.16	0.45	0.00
Valencian Community	0.14	0.19	0.12	0.40	0.13	0.89	0.36	0.07	0.16	0.11	0.51	1.05	5.50	0.44	0.30	0.91	0.12	0.00	0.00
Balearic Islands	0.22	0.11	0.05	0.19	0.25	0.12	0.43	0.07	0.00	0.13	0.98	0.14	0.40	25.60	0.27	0.17	0.20	0.00	0.00
Andalusia	0.15	0.20	0.07	0.16	0.06	0.07	0.06	0.10	0.11	0.72	0.56	0.20	0.14	0.24	4.43	0.46	0.15	3.62	3.06
Murcia	0.18	0.30	0.31	0.18	0.31	0.40	0.14	0.15	0.00	0.10	1.26	1.21	1.36	0.36	0.76	20.81	0.17	0.00	0.00
Canary Islands	0.22	0.28	0.04	0.23	0.08	0.07	0.12	0.15	0.00	0.03	0.85	0.06	0.10	0.06	0.10	0.11	22.05	0.00	0.00
Ceuta	0.04	0.08	0.07	0.00	0.00	0.03	0.05	0.17	0.00	0.93	0.57	0.05	0.09	0.06	4.47	1.09	0.33	0.00	0.00
Melilla	0.39	0.00	0.39	0.03	0.00	0.25	0.07	0.04	0.00	0.74	0.83	0.36	0.28	0.13	3.81	1.89	0.89	13.80	0.00



Table C.9 *Indices of attraction for Spanish Regions, 2022*

	Galicia	Asturias	Cantabria	Basque Country	Navarre	Aragon	Catalonia	Castile and León	La Rioja	Extremadura	Madrid	Castilla La Mancha	Valencian Community	Balearic Islands	Andalusia	Murcia	Canary Islands	Ceuta	Melilla
Galicia	11.89	1.56	0.41	0.58	0.09	0.11	0.08	0.50	0.31	0.33	0.78	0.12	0.13	0.24	0.14	0.13	0.58	0.00	0.00
Asturias	2.13	15.84	1.70	1.30	0.27	0.20	0.14	1.85	0.13	0.42	0.77	0.09	0.28	0.59	0.18	0.07	0.50	0.00	0.00
Cantabria	0.53	3.66	17.99	1.88	0.33	0.32	0.19	1.41	1.18	0.10	1.52	0.12	0.26	0.40	0.20	0.24	0.30	0.00	0.00
Basque Country	0.43	1.06	6.21	7.40	4.67	0.77	0.44	1.80	7.24	0.51	0.78	0.10	0.40	0.51	0.23	0.07	0.56	0.00	0.00
Navarre	0.21	0.22	1.29	4.28	23.97	3.88	0.60	0.48	2.90	0.33	0.59	0.11	0.52	0.24	0.19	0.24	0.29	0.00	0.00
Aragon	0.20	0.23	0.33	0.78	2.02	10.39	1.01	0.40	1.39	0.10	0.68	0.36	0.83	0.45	0.15	0.09	0.21	0.00	4.30
Catalonia	0.26	0.18	0.06	0.55	0.32	1.14	4.73	0.19	0.25	0.19	0.50	0.14	0.34	0.73	0.17	0.15	0.21	0.00	0.00
Castile and León	1.03	1.90	2.70	0.89	0.21	0.23	0.12	5.08	0.57	0.83	1.40	0.25	0.43	0.46	0.31	0.28	0.34	0.00	0.00
La Rioja	0.48	0.54	2.32	3.08	2.68	1.92	0.45	0.61	32.91	0.37	0.92	0.19	0.63	0.22	0.17	0.20	0.23	0.00	0.00
Extremadura	0.22	0.38	0.23	0.37	0.17	0.12	0.07	0.59	0.06	14.67	1.64	0.39	0.19	0.34	1.69	0.24	0.36	0.00	0.00
Madrid	0.65	1.15	0.72	0.79	0.53	0.57	0.23	2.24	0.46	2.03	1.58	2.70	0.92	0.35	0.62	0.93	0.44	0.00	0.00
Castilla La Mancha	0.30	0.31	0.59	0.47	0.16	0.38	0.24	0.41	0.19	1.41	2.06	5.35	1.52	0.34	0.60	1.33	0.15	0.00	0.00
Valencian Community	0.14	0.30	0.30	0.39	0.50	1.14	0.36	0.15	0.28	0.17	0.87	1.10	5.06	0.58	0.34	1.38	0.15	0.00	0.00
Balearic Islands	0.22	0.19	0.10	0.59	0.26	0.22	0.63	0.18	0.15	0.12	0.93	0.08	0.40	24.86	0.40	0.38	0.38	0.00	0.00
Andalusia	0.17	0.19	0.12	0.27	0.13	0.13	0.11	0.13	0.11	0.70	0.68	0.33	0.16	0.20	4.45	0.45	0.17	6.55	5.64
Murcia	0.26	0.52	0.04	0.18	0.24	0.43	0.14	0.07	0.08	0.31	0.94	1.17	1.57	0.66	0.77	18.92	0.10	0.00	0.00
Canary Islands	0.39	0.45	0.06	0.66	0.26	0.21	0.16	0.12	0.33	0.30	1.05	0.12	0.11	0.18	0.25	0.07	21.09	0.00	0.00
Ceuta	0.10	0.23	0.09	0.22	0.34	0.06	0.06	0.02	0.00	0.59	0.64	0.08	0.13	0.05	4.80	0.00	0.27	0.00	0.00
Melilla	0.31	0.05	0.46	0.24	0.00	0.09	0.05	0.04	0.00	0.20	1.01	0.05	0.46	0.00	4.27	0.80	0.42	24.25	0.00

Table C.10 Indices of attraction for Spanish Regions, 2023

	Galicia	Asturias	Cantabria	Basque Country	Navarre	Aragon	Catalonia	Castile and León	La Rioja	Extremadura	Madrid	Castilla La Mancha	Valencian Community	Balearic Islands	Andalusia	Murcia	Canary Islands	Ceuta	Melilla
Galicia	12.15	1.54	0.40	0.62	0.01	0.18	0.14	0.45	0.16	0.08	0.78	0.14	0.14	0.49	0.11	0.17	0.47	0.00	8.00
Asturias	1.93	15.76	1.50	0.94	0.47	0.20	0.12	1.55	0.39	0.28	1.01	0.07	0.27	0.51	0.24	0.04	0.33	0.00	2.29
Cantabria	0.70	2.68	9.99	2.27	1.13	0.49	0.62	1.88	1.16	0.25	1.38	0.26	0.27	0.46	0.32	0.18	0.68	5.86	0.00
Basque Country	0.54	0.94	5.94	6.76	4.08	1.26	0.47	2.06	5.73	0.50	0.82	0.15	0.36	0.49	0.24	0.17	0.31	0.00	0.00
Navarre	0.23	0.27	0.86	4.25	22.84	3.35	0.74	0.50	4.45	0.40	0.70	0.09	0.67	0.37	0.21	0.24	0.21	0.00	0.00
Aragon	0.13	0.16	0.44	0.80	1.56	11.18	1.20	0.49	1.69	0.11	0.74	0.33	0.81	0.32	0.13	0.12	0.12	0.00	0.00
Catalonia	0.24	0.28	0.24	0.53	0.50	0.99	4.78	0.17	0.41	0.19	0.64	0.17	0.52	1.23	0.22	0.30	0.25	0.14	0.00
Castile and León	0.95	1.65	2.83	0.96	0.60	0.26	0.16	4.74	1.41	1.13	1.38	0.21	0.50	0.42	0.31	0.13	0.20	0.00	0.00
La Rioja	0.17	0.68	3.17	2.43	4.85	2.73	0.60	0.92	26.00	0.29	1.05	0.18	0.51	0.32	0.22	0.29	0.18	0.00	0.00
Extremadura	0.30	0.22	0.14	0.35	0.26	0.07	0.08	0.39	0.22	16.20	1.58	0.58	0.21	0.31	1.32	0.36	0.18	1.53	0.00
Madrid	0.65	1.03	1.06	0.77	0.42	0.57	0.29	2.15	0.68	1.98	1.25	2.71	0.98	0.57	0.62	0.91	0.32	0.00	0.65
Castilla La Mancha	0.32	0.51	0.42	0.36	0.22	0.48	0.22	0.56	0.34	1.14	1.73	5.60	1.50	0.19	0.54	1.27	0.20	0.00	0.00
Valencian Community	0.14	0.26	0.20	0.45	0.35	1.26	0.47	0.21	0.17	0.18	0.93	1.14	4.90	0.88	0.38	1.28	0.14	0.00	0.00
Balearic Islands	0.53	0.66	0.28	0.62	0.47	0.33	1.08	0.22	0.04	0.21	1.28	0.22	0.47	21.77	0.40	0.34	0.30	0.91	0.00
Andalusia	0.15	0.21	0.10	0.39	0.12	0.08	0.11	0.15	0.09	0.47	0.85	0.22	0.18	0.28	4.19	0.41	0.23	5.33	1.06
Murcia	0.23	0.26	0.03	0.42	0.15	0.13	0.15	0.16	0.12	0.25	1.04	0.71	1.52	0.33	0.89	18.53	0.22	0.00	6.32
Canary Islands	0.47	0.37	0.30	0.35	0.36	0.10	0.19	0.06	0.12	0.07	0.95	0.07	0.05	0.34	0.18	0.10	18.21	0.78	0.00
Ceuta	0.08	0.10	0.00	0.13	0.12	0.13	0.10	0.05	0.00	0.56	0.72	0.06	0.16	0.00	4.46	0.39	0.07	0.00	64.46
Melilla	0.19	0.15	0.00	0.18	0.00	0.15	0.09	0.44	0.00	0.10	1.07	0.17	0.28	0.58	3.97	0.54	0.29	0.00	0.00

Table D.1 Italian Origin-Destination Matrix, 2019

	Piedmont	Aosta Valley	Lombardy	Trentino A. Adige/Sud tirol	Veneto	Friuli-Venezia Giulia	Liguria	Emilia-Romagna	Tuscany	Umbria	Marche	Lazio	Abruzzo	Molise	Campania	Apulia	Basilicata	Calabria	Sicily	Sardinia	Total Destination
Piedmont	940,905	45,180	201,894	19,474	219,284	0	1,146,750	490,037	518,101	0	191,747	129,625	0	33,482	32,651	240,397	53,275	50,729	148,308	57,549	4,499,388
Aosta Valley	10,797	5,733	20,226	0	2,605	1,096	16,954	4,630	6,235	0	2,453	3,687	2,503	0	4,159	4,159	0	4,791	1,776	2,922	90,567
Lombardy	218,772	359,882	920,562	593,768	654,954	287,650	1,216,497	884,803	543,781	126,740	212,115	382,314	100,330	0	271,049	587,507	0	89,908	378,874	219,733	8,049,239
Trentino A. Adige/Sudtirol	30,179	14,018	91,744	222,731	165,469	27,286	44,593	57,736	108,591	0	66,740	45,923	12,601	0	20,612	21,895	8,081	7,600	52,428	32,388	1,030,615
Veneto	37,760	39,099	482,457	831,729	1,556,977	217,278	84,448	954,480	581,571	14,756	288,724	228,952	60,719	61,572	106,050	172,081	79,523	214,122	103,086	15,919	6,131,303
Friuli-Venezia Giulia	8,166	0	100,076	88,410	286,217	371,868	24,300	88,948	13,638	13,407	20,062	63,634	0	0	35,096	0	0	28,526	35,114	34,015	1,211,477
Liguria	263,447	229,080	142,592	119,216	132,281	26,510	381,122	107,422	424,837	12,464	11,496	128,251	9,450	0	107,026	16,834	29,415	55,835	35,726	80,287	2,313,291
Emilia-Romagna	211,939	18,808	566,936	973,046	428,730	264,346	122,414	1,295,480	547,603	88,629	591,655	314,768	210,432	0	261,667	819,589	31,667	223,980	148,927	174,176	7,294,792
Tuscany	149,938	0	320,031	164,048	240,410	41,156	101,117	482,608	1,580,361	142,741	104,439	730,301	48,294	29,753	258,872	136,478	36,725	167,110	97,201	77,181	4,908,764
Umbria	15,599	0	132,616	126,810	38,972	0	0	283,729	127,864	30,507	195,271	130,720	30,952	0	75,583	38,978	9,078	12,088	8,770	24,174	1,281,721
Marche	44,252	0	145,332	115,381	174,079	34,476	0	183,519	148,810	5,821	80,019	66,725	42,940	0	147,014	38,042	0	0	12,912	0	1,239,322
Lazio	118,229	0	488,652	161,230	167,027	14,164	121,580	175,929	762,823	174,333	113,860	1,229,358	501,624	92,244	473,234	228,942	176,979	267,034	568,103	296,463	6,131,708
Abruzzo	30,082	0	150,678	25,037	34,003	0	0	97,820	12,140	33,497	0	123,025	157,192	0	16,780	76,873	0	11,609	20,980	0	789,716
Molise	0	0	33,869	0	4,178	0	3,864	13,678	8,190	2,018	2,420	25,992	39,751	20,583	29,981	18,868	0	0	6,364	6,098	215,844
Campania	350,518	17,454	169,512	0	102,620	0	23,120	217,035	136,871	174,760	0	496,036	305,328	0	682,958	561,470	29,368	340,227	0	14,065	3,621,342
Apulia	41,250	0	20,327	50,062	44,278	0	0	60,421	77,322	0	26,911	117,962	69,888	45,660	68,403	492,482	109,481	22,988	72,618	39,321	1,359,074
Basilicata	43,834	0	11,399	0	0	0	0	30,718	11,419	4,425	12,743	45,566	0	16,962	10,765	62,588	53,493	16,409	21,399	0	341,720
Calabria	25,392	0	71,342	0	0	0	0	32,453	48,028	0	0	186,946	0	158,523	10,140	0	81,957	58,314	0	0	673,095
Sicily	59,678	0	366,956	0	32,004	0	130,688	73,365	78,804	0	39,649	256,743	0	0	101,110	8,537	0	226,629	696,930	23,964	2,095,057
Sardinia	17,944	0	181,207	0	0	4,118	11,090	0	94,741	13,160	0	97,830	0	0	32,832	0	0	0	0	522,195	975,117
Total Origin	2,618,881	729,254	4,618,408	3,490,942	4,284,088	1,289,948	3,423,537	5,524,811	5,831,730	837,258	1,950,304	4,804,358	1,591,704	300,256	2,857,374	3,568,582	617,085	1,821,552	2,467,830	1,620,450	54,253,152

Table D.2 Italian Origin-Destination Matrix, 2020

	Piedmont	Aosta Valley	Lombardy	Trentino A. Adige/ Sudtirolo	Veneto	Friuli-Venezia Giulia	Liguria	Emilia-Romagna	Tuscany	Umbria	Marche	Lazio	Abruzzo	Molise	Campania	Apulia	Basilicata	Calabria	Sicily	Sardinia	Total Destination
Piedmont	416,410	134,000	253,400	72,245	153,578	0	549,627	169,295	205,793	0	46,477	119,390	59,873	15,004	9,789	109,228	32,240	111,642	44,411	72,208	2,574,610
Aosta Valley	1,182	1,338	0	0	0	0	8,569	20,081	7,816	1,177	1,183	2,369	0	0	1,399	8,375	0	0	0	0	53,489
Lombardy	332,378	132,683	1,221,912	971,940	486,231	37,769	489,976	1,051,173	414,281	108,617	586,415	243,450	32,026	17,854	182,875	566,122	15,795	80,673	186,447	305,653	7,474,270
Trentino A. Adige/ Sudtirolo	4,966	0	85,467	178,665	239,041	31,662	27,939	107,394	74,788	0	56,232	43,915	12,742	35,240	19,265	17,853	0	3,819	2,547	75,379	1,016,914
Veneto	40,528	0	308,063	514,587	867,008	6,359	18,419	237,080	181,925	0	264,373	43,856	28,122	0	57,965	72,992	0	26,913	7,092	48,519	2,723,821
Friuli-Venezia Giulia	58,167	0	69,028	108,837	77,688	225,019	0	15,266	79,324	13,498	0	24,795	0	0	22,972	0	0	0	36,541	27,923	759,058
Liguria	109,563	73,671	0	31,311	111,111	23,289	153,478	10,283	70,591	62,235	0	7,385	0	0	0	16,552	0	24,497	66,782	16,001	776,749
Emilia-Romagna	82,023	16,066	208,756	913,505	454,641	93,333	289,675	1,396,232	642,649	60,114	174,119	41,338	61,158	3,119	361,383	240,354	57,959	12,986	294,368	214,672	5,618,450
Tuscany	52,226	9,835	154,261	219,500	86,087	0	76,511	260,780	1,510,985	20,545	7,617	77,662	8,869	0	163,946	109,171	8,805	49,602	50,162	96,637	2,963,301
Umbria	28,306	0	31,253	68,364	7,209	0	4,720	89,351	108,989	53,621	132,008	64,988	88,356	0	11,559	55,712	0	24,089	0	6,798	775,323
Marche	7,787	0	4,829	10,869	37,940	0	39,931	99,266	10,869	21,250	17,375	40,553	0	0	27,441	6,803	0	0	15,326	0	340,239
Lazio	94,920	0	169,275	239,711	50,472	0	13,691	80,728	491,691	151,774	57,408	568,453	439,802	132,442	579,032	222,252	38,268	131,122	116,767	92,619	3,670,427
Abruzzo	0	0	36,102	3,813	3,926	0	0	80,938	29,695	2,793	31,961	52,426	134,718	6,874	22,466	24,609	0	7,066	0	0	437,387
Molise	0	0	15,698	0	9,020	0	0	7,938	9,719	0	3,198	29,161	31,369	3,241	6,927	1,994	0	10,803	3,434	0	132,502
Campania	0	0	40,356	23,472	29,282	0	0	17,868	0	0	0	177,148	21,754	11,284	486,836	170,316	0	287,548	71,015	23,895	1,360,774
Apulia	0	0	27,101	50,313	0	0	0	74,150	26,399	8,415	0	124,402	0	0	0	282,405	0	14,048	8,696	0	615,929
Basilicata	0	0	0	11,652	0	0	0	3,022	7,378	0	0	0	0	0	23,662	29,918	34,780	16,366	0	0	126,798
Calabria	0	37,509	182,411	0	0	0	0	0	14,537	0	0	124,926	0	0	0	0	0	89,508	0	0	448,891
Sicily	42,986	0	191,754	0	35,141	31,505	0	0	20,971	0	0	129,361	0	0	38,496	0	0	58,890	1,037,349	0	1,586,453
Sardinia	0	0	52,746	0	23,754	0	18,102	43,582	0	9,700	0	7,137	0	0	13,106	40,224	0	0	0	0	465,825
Total Origin	1,271,442	405,202	3,052,432	3,418,784	2,672,129	448,936	1,690,638	3,764,427	3,908,400	513,739	1,388,366	1,922,715	918,789	225,058	2,029,139	1,974,880	187,847	949,572	1,940,937	1,446,129	34,129,561

Table D.3 Italian Origin-Destination Matrix, 2021

	Piedmont	Aosta Valley	Lombardy	Trentino A.Adige/S udtirol	Veneto	Friuli-Venezia Giulia	Liguria	Emilia-Romagna	Tuscany	Umbria	Marche	Lazio	Abruzzo	Molise	Campania	Apulia	Basilicata	Calabria	Sicily	Sardinia	Total Destination
Piedmont	307,510	61,283	77,441	42,085	81,321	12,985	448,179	282,517	217,838	12,175	120,093	72,505	25,635	0	109,102	172,678	20,803	111,112	238,635	158,770	2,572,667
Aosta Valley	5,952	2,254	5,797	0	3,501	1,057	7,143	6,711	4,391	0	3,810	2,277	0	0	2,391	5,149	0	1,063	2,241	3,795	57,532
Lombardy	449,563	67,130	1,059,290	512,086	311,318	65,143	772,952	987,914	500,702	21,840	286,883	276,113	116,275	0	490,165	502,118	70,463	75,577	434,424	382,562	7,392,508
Trentino A.Adige/Sud tirol	22,433	5,414	44,146	148,956	269,170	0	13,618	81,315	180,498	7,781	31,262	21,126	8,326	0	28,797	9,021	0	2,689	30,932	83,250	988,734
Veneto	30,432	0	340,946	518,270	940,905	142,760	179,301	312,832	250,596	85,023	148,938	142,492	17,275	0	117,262	93,726	33,930	0	194,356	71,651	3,620,695
Friuli-Venezia Giulia	0	0	43,485	85,193	303,127	286,276	21,455	71,249	35,121	38,966	27,318	5,990	0	12,954	34,741	22,389	37,765	0	43,046	68,592	1,137,667
Liguria	72,356	108,905	78,327	128,857	75,247	4,252	106,068	19,819	215,571	11,567	57,946	52,282	0	0	0	23,769	13,652	14,062	35,155	177,923	1,195,758
Emilia-Romagna	117,529	10,255	228,964	472,527	284,612	58,194	148,740	1,343,041	337,458	102,261	129,462	96,219	41,924	58,862	183,603	203,011	24,638	129,135	92,460	73,088	4,136,163
Tuscany	67,422	27,129	175,641	224,276	66,562	33,170	32,166	277,324	1,380,544	10,919	15,592	225,997	32,697	27,941	288,945	190,192	0	103,241	44,119	204,154	3,428,031
Umbria	25,200	15,421	33,007	26,447	40,808	4,556	4,045	191,582	75,761	0	115,486	79,697	108,421	0	35,621	84,624	39,383	30,711	41,381	10,520	962,671
Marche	0	0	22,284	77,404	9,613	5,923	9,527	76,043	163,772	18,939	97,159	34,132	24,414	9,527	38,242	44,019	10,875	0	38,389	41,978	722,240
Lazio	54,849	27,634	133,228	196,065	76,438	11,703	48,106	120,658	535,667	237,712	134,756	826,354	422,787	13,524	417,071	363,418	18,446	86,280	187,290	258,070	4,172,056
Abruzzo	22,614	0	17,751	0	29,845	0	5,217	57,346	36,576	19,194	23,655	55,934	28,787	16,363	80,181	60,479	7,529	9,342	51,083	27,423	549,319
Molise	0	0	3,170	8,905	7,955	0	0	19,644	12,028	0	7,953	15,350	38,157	6,488	16,809	0	0	4,224	0	3,272	143,955
Campania	50,956	0	136,310	48,568	29,763	0	0	8,927	130,983	52,870	0	111,561	175,796	0	324,482	196,477	25,008	221,108	103,434	84,470	1,700,713
Apulia	0	0	130,288	0	9,263	50,834	0	122,247	0	37,458	29,156	26,891	102,985	0	237,842	580,469	0	7,267	0	0	1,334,700
Basilicata	3,834	0	11,684	0	0	0	0	41,935	0	17,135	0	4,190	0	0	37,621	28,173	45,285	7,613	0	0	197,470
Calabria	0	0	30,435	0	0	0	0	8,664	16,850	0	0	56,294	0	0	10,978	15,279	0	54,150	7,149	0	199,799
Sicily	96,886	0	98,712	0	6,146	87,649	0	43,015	110,513	27,555	56,782	74,452	0	0	0	120,274	0	37,905	1,083,490	0	1,843,379
Sardinia	23,417	0	81,278	28,386	22,003	0	26,069	58,760	0	25,456	0	48,357	0	0	0	35,046	0	10,880	12,026	455,497	827,175
Total Origin	1,350,943	325,425	2,752,184	2,518,025	2,569,597	764,502	1,822,586	4,131,543	4,204,889	726,851	1,286,251	2,228,213	1,143,479	145,659	2,453,853	2,750,311	347,977	906,359	2,639,610	2,115,015	37,183,252

Table D.4. Italian Origin-Destination Matrix, 2022

	Piedmont	Aosta Valley	Lombardy	Trentino A.Adige/Su dirol	Veneto	Friuli-Venezia Giulia	Liguria	Emilia-Romagna	Tuscany	Umbria	Marche	Lazio	Abruzzo	Molise	Campania	Apulia	Basilicata	Calabria	Sicily	Sardinia	Total Destination
Piedmont	414,278	208,339	209,456	52,886	205,935	48,947	703,571	225,254	351,719	20,193	155,949	111,238	36,229	10,230	192,234	307,727	25,023	119,450	160,906	155,603	3,715,167
Aosta Valley	8,633	1,654	4,729	3,405	2,342	0	26,855	13,281	8,173	0	0	5,931	2,290	0	2,246	7,179	0	7,569	0	7,502	101,989
Lombardy	609,061	475,896	1,289,995	609,288	1,174,560	212,219	818,691	1,541,636	884,591	54,230	273,351	145,274	165,624	0	563,182	508,372	37,822	243,499	403,697	447,806	10,428,994
Trentino A.Adige/Sudtir ol	33,502	0	57,156	129,394	268,359	6,560	55,424	204,161	71,034	18,081	28,346	76,778	41,273	0	24,488	66,303	15,289	40,681	56,224	3,841	1,196,914
Veneto	16,613	0	461,589	333,794	1,454,398	116,797	106,081	160,982	278,964	92,756	16,466	165,348	0	0	130,955	76,530	12,568	82,089	259,461	66,503	3,831,894
Friuli-Venezia Giulia	9,082	0	100,903	135,314	176,854	209,943	46,912	51,927	58,655	13,249	0	125,422	0	0	66,502	16,120	0	10,135	37,818	42,759	1,101,795
Liguria	261,005	122,714	155,519	80,784	171,693	0	271,742	52,639	245,216	0	23,010	74,792	16,802	0	44,814	11,966	0	15,442	30,604	41,607	1,620,369
Emilia-Romagna	209,587	31,766	221,173	449,575	202,388	83,732	155,636	1,153,783	355,759	76,602	205,718	188,932	50,014	0	293,609	419,242	56,637	27,586	177,712	190,782	4,560,213
Tuscany	122,810	20,334	333,863	224,408	83,987	27,393	61,119	317,591	1,503,226	147,166	37,026	342,663	22,614	6,464	231,555	36,285	40,444	47,512	211,202	131,694	3,949,356
Umbria	46,144	0	55,652	9,490	47,482	18,447	0	78,204	59,838	26,493	190,417	139,916	66,351	0	46,453	29,849	0	42,190	29,553	9,668	916,147
Marche	6,378	0	96,488	55,655	19,995	13,789	3,992	98,611	68,125	73,384	7,864	110,443	11,468	0	52,787	48,147	0	0	8,797	42,262	718,185
Lazio	86,162	15,264	125,634	479,189	51,093	25,366	169,372	266,690	651,223	229,561	145,555	691,063	461,629	0	294,584	296,851	14,966	151,942	229,552	125,109	4,500,805
Abruzzo	58,733	0	45,479	16,794	30,141	0	5,526	45,202	15,333	7,280	50,069	150,920	44,152	0	45,668	100,872	13,535	0	13,426	0	643,130
Molise	2,498	0	11,684	0	1,981	0	9,097	34,418	8,116	3,404	10,662	9,115	23,995	9,200	27,454	14,950	5,579	3,093	1,516	0	176,762
Campania	53,592	0	117,888	0	87,154	11,675	9,022	61,097	76,452	19,755	114,959	506,485	134,095	0	588,862	178,110	78,642	50,407	33,064	25,424	2,146,663
Apulia	47,884	13,254	104,210	0	18,818	0	8,912	124,599	0	0	16,258	193,946	0	0	47,924	138,454	38,427	107,517	76,448	0	936,651
Basilicata	0	0	21,127	8,795	27,014	0	0	32,397	3,615	0	0	31,217	14,444	0	68,002	64,677	28,081	13,204	18,661	0	331,424
Calabria	0	0	122,238	0	12,735	8,838	0	13,288	76,925	6,699	0	94,906	0	0	11,250	19,906	0	64,473	14,386	0	444,844
Sicily	44,303	0	345,207	0	0	76,125	16,987	125,861	76,686	0	6,265	213,361	6,265	0	52,559	16,883	28,228	91,902	605,707	0	1,706,339
Sardinia	13,888	0	75,383	55,216	59,120	13,092	0	62,715	95,716	0	0	4,300	18,674	0	13,853	0	0	0	19,331	536,845	968,133
Total Origin	2,044,333	889,221	3,935,373	2,643,987	4,096,049	882,943	2,486,939	4,654,326	4,899,566	789,053	1,281,915	3,382,050	1,136,119	25,694	2,769,981	2,357,443	395,261	1,118,671	2,369,265	1,827,405	43,965,794

Table D.5 Italian Origin-Destination Matrix, 2023

	Piedmont	Aosta Valley	Lombardy	Trentino A.Adige/S udtirol	Veneto	Friuli-Venezia Giulia	Liguria	Emilia-Romagna	Tuscany	Umbria	Marche	Lazio	Abruzzo	Molise	Campania	Apulia	Basilicata	Calabria	Sicily	Sardinia	Total Destination
Piedmont	291,165	120,029	55,972	36,085	139,270	0	742,664	263,459	201,280	63,616	14,832	156,805	22,344	0	97,708	119,002	0	136,845	203,355	138,350	2,802,781
Aosta Valley	14,144	0	9,295	0	9,930	0	21,520	4,189	7,253	1,257	21,563	2,439	0	0	5,594	8,967	0	2,314	6,799	3,042	118,306
Lombardy	469,109	470,337	1,403,065	564,059	529,627	194,338	1,136,890	1,360,865	1,216,707	143,359	187,557	430,227	281,138	0	444,447	399,792	19,091	476,261	572,878	574,647	10,874,414
Trentino A.Adige/Sudtir ol	2,445	0	123,699	237,465	259,637	17,566	49,608	78,477	198,803	10,828	13,243	21,351	2,981	0	2,152	43,292	0	40,001	21,210	30,737	1,153,495
Veneto	135,997	62,766	366,866	519,714	1,054,797	124,620	35,213	325,230	507,906	124,038	152,307	178,655	26,135	0	190,165	125,701	60,767	103,749	144,562	62,517	4,301,775
Friuli-Venezia Giulia	23,461	0	31,652	103,860	219,056	354,027	17,973	62,638	14,554	30,073	10,474	25,323	7,563	0	39,489	22,258	0	15,797	34,822	56,114	1,069,134
Liguria	222,142	81,559	109,016	62,292	122,191	0	98,284	167,355	229,492	0	0	154,752	28,223	0	30,069	44,085	0	0	34,171	15,945	1,399,576
Emilia- Romagna	103,023	16,253	329,371	470,343	422,761	95,108	199,899	935,796	160,232	0	113,407	116,428	157,909	24,011	395,095	398,655	45,717	79,218	134,901	169,892	4,368,019
Tuscany	74,908	0	257,245	331,416	217,645	54,813	103,672	216,226	1,195,453	112,888	40,897	216,968	71,194	0	351,921	122,055	19,936	72,765	77,289	153,251	3,690,542
Umbria	10,961	4,742	81,693	36,757	47,009	4,390	16,319	213,704	54,402	6,478	49,573	106,755	101,766	0	43,924	32,992	0	34,889	26,859	27,621	900,894
Marche	10,877	14,594	55,147	22,859	35,015	0	0	71,408	77,845	27,927	6,279	40,174	0	0	37,087	66,635	0	23,439	7,140	0	496,426
Lazio	76,817	19,265	379,237	66,795	194,924	81,070	46,077	214,994	522,981	294,204	140,013	584,783	261,421	0	318,107	213,076	69,351	297,674	127,310	182,119	4,090,218
Abruzzo	15,874	11,211	54,551	82,281	43,652	0	20,460	67,036	50,838	32,967	26,120	54,703	40,950	0	62,893	12,319	29,168	19,392	10,233	11,686	646,334
Molise	0	0	6,786	0	4,015	0	0	27,988	5,593	8,254	1,819	41,750	7,526	1,708	15,416	31,639	0	5,118	2,144	1,778	161,534
Campania	11,273	0	193,559	0	11,276	0	20,445	23,370	93,789	0	13,087	305,735	0	0	630,206	139,270	160,067	32,162	37,681	0	1,671,920
Apulia	0	8,541	24,271	0	26,937	0	0	15,059	35,221	131,762	6,042	138,927	0	0	35,356	449,649	44,484	109,332	0	0	1,025,481
Basilicata	0	0	10,586	0	0	0	3,180	15,051	24,802	0	0	42,132	0	16,703	10,992	19,117	4,676	0	0	0	154,013
Calabria	0	0	100,390	0	0	0	0	31,669	29,246	0	0	43,202	0	0	52,730	17,891	32,709	43,446	29,616	0	381,099
Sicily	61,644	0	100,879	0	89,590	7,134	15,789	0	157,321	0	0	132,208	0	0	41,219	20,191	0	55,670	481,267	0	1,162,912
Sardinia	77,779	0	133,144	18,950	17,078	0	0	44,718	3,743	44,904	0	87,235	3,743	0	0	0	0	0	28,037	251,913	711,244
Total Origin	1,601,589	809,297	3,826,424	2,552,876	3,444,410	933,066	2,527,993	4,139,452	4,787,361	1,032,555	797,213	2,890,652	1,012,913	42,422	2,800,352	2,278,461	500,407	1,562,748	1,990,274	1,679,612	41,180,077

Table D.6 Indices of attractions for Italian regions, 2019

	Piedmont	Aosta Valley	Lombardy	Trentino A.Adige/Sud tirol	Veneto	Friuli-Venezia Giulia	Liguria	Emilia-Romagna	Tuscany	Umbria	Marche	Lazio	Abruzzo	Molise	Campania	Apulia	Basilicata	Calabria	Sicily	Sardinia
Piedmont	4.33	0.75	0.53	0.07	0.62	0.00	4.03	1.05	1.07	0.00	1.12	0.33	0.00	1.34	0.14	0.81	1.04	0.34	0.72	0.43
Aosta Valley	2.47	4.71	2.62	0.00	0.36	0.51	2.96	0.50	0.64	0.00	0.75	0.46	0.94	0.00	0.00	0.70	0.00	1.58	0.43	1.08
Lombardy	0.56	3.33	1.34	1.15	1.03	1.50	2.39	1.08	0.63	1.02	0.73	0.54	0.42	0.00	0.64	1.11	0.00	0.33	1.03	0.91
Trentino A.Adige/Sud tirol	0.61	1.01	1.05	3.36	2.03	1.11	0.68	0.55	0.98	0.00	1.80	0.50	0.42	0.00	0.38	0.32	0.69	0.22	1.12	1.05
Veneto	0.13	0.47	0.92	2.11	3.22	1.49	0.22	1.53	0.88	0.16	1.31	0.42	0.34	1.81	0.33	0.43	1.14	1.04	0.37	0.09
Friuli-Venezia Giulia	0.14	0.00	0.97	1.13	2.99	12.91	0.32	0.72	0.10	0.72	0.46	0.59	0.00	0.00	0.55	0.00	0.00	0.70	0.64	0.94
Liguria	2.36	7.37	0.72	0.80	0.72	0.48	2.61	0.46	1.71	0.35	0.14	0.63	0.14	0.00	0.88	0.11	1.12	0.72	0.34	1.16
Emilia-Romagna	0.60	0.19	0.91	2.07	0.74	1.52	0.27	1.74	0.70	0.79	2.26	0.49	0.98	0.00	0.68	1.71	0.38	0.91	0.45	0.80
Tuscany	0.63	0.00	0.77	0.52	0.62	0.35	0.33	0.97	3.00	1.88	0.59	1.68	0.34	1.10	1.00	0.42	0.66	1.01	0.44	0.53
Umbria	0.25	0.00	1.22	1.54	0.39	0.00	0.00	2.17	0.93	1.54	4.24	1.15	0.82	0.00	1.12	0.46	0.62	0.28	0.15	0.63
Marche	0.74	0.00	1.38	1.45	1.78	1.17	0.00	1.45	1.12	0.30	1.80	0.61	1.18	0.00	2.25	0.47	0.00	0.00	0.23	0.00
Lazio	0.40	0.00	0.94	0.41	0.34	0.10	0.31	0.28	1.16	1.84	0.52	2.26	2.79	2.72	1.47	0.57	2.54	1.30	2.04	1.62
Abruzzo	0.79	0.00	2.24	0.49	0.55	0.00	0.00	1.22	0.14	2.75	0.00	1.76	6.78	0.00	0.40	1.48	0.00	0.44	0.58	0.00
Molise	0.00	0.00	1.84	0.00	0.25	0.00	0.28	0.62	0.35	0.61	0.31	1.36	6.28	17.23	2.64	1.33	0.00	0.00	0.65	0.95
Campania	2.01	0.36	0.55	0.00	0.36	0.00	0.10	0.59	0.35	3.13	0.00	1.55	2.87	0.00	3.58	2.36	0.71	2.80	0.00	0.13
Apulia	0.63	0.00	0.18	0.57	0.41	0.00	0.00	0.44	0.53	0.00	0.55	0.98	1.75	6.07	0.96	5.51	7.08	0.50	1.17	0.97
Basilicata	2.66	0.00	0.39	0.00	0.00	0.00	0.00	0.88	0.31	0.84	1.04	1.51	0.00	8.97	0.60	2.78	13.76	1.43	1.38	0.00
Calabria	0.78	0.00	1.25	0.00	0.00	0.00	0.00	0.47	0.66	0.00	0.00	3.14	0.00	0.00	4.47	0.23	0.00	3.63	1.90	0.00
Sicily	0.59	0.00	2.06	0.00	0.19	0.00	0.99	0.34	0.35	0.00	0.53	1.38	0.00	0.00	0.92	0.06	0.00	3.22	7.31	0.38
Sardinia	0.38	0.00	2.18	0.00	0.00	0.18	0.18	0.00	0.90	0.87	0.00	1.13	0.00	0.00	0.00	0.51	0.00	0.00	0.00	17.93



Table D.7 Indices of attractions for Italian regions, 2020

	Piedmont	Aosta Valley	Lombardy	Trentino A.Adige/Su dtiroi	Veneto	Friuli-Venezia Giulia	Liguria	Emilia-Romagna	Tuscany	Umbria	Marche	Latium	Abruzzo	Molise	Campania	Apulia	Basilicata	Calabria	Sicily	Sardinia
Piedmont	4.34	4.38	1.10	0.28	0.76	0.00	4.31	0.60	0.70	0.00	0.44	0.82	0.86	0.88	0.06	0.73	2.28	1.56	0.30	0.66
Aosta Valley	0.59	2.11	0.00	0.00	0.00	0.00	3.23	3.40	1.28	1.46	0.54	0.79	0.00	0.00	0.44	2.71	0.00	0.00	0.00	0.00
Lombardy	1.19	1.50	1.83	1.30	0.83	0.38	1.32	1.28	0.48	0.97	1.96	0.58	0.16	0.36	0.41	1.31	0.38	0.39	0.44	0.97
Trentino A.Adige/Su dti	0.13	0.00	0.94	1.75	3.00	2.37	0.55	0.96	0.64	0.00	1.36	0.77	0.47	5.26	0.32	0.30	0.00	0.13	0.04	1.75
ro																				
Veneto	0.40	0.00	1.26	1.89	4.07	0.18	0.14	0.79	0.58	0.00	2.39	0.29	0.38	0.00	0.36	0.46	0.00	0.36	0.05	0.42
Friuli-Venezia Giulia	2.06	0.00	1.02	1.43	1.31	22.54	0.00	0.18	0.91	1.18	0.00	0.58	0.00	0.00	0.51	0.00	0.00	0.00	0.85	0.87
Liguria	3.79	7.99	0.00	0.40	1.83	2.28	3.99	0.12	0.79	5.32	0.00	0.17	0.00	0.00	0.00	0.37	0.00	1.13	1.51	0.49
Emilia-Romagna	0.39	0.24	0.42	1.62	1.03	1.26	1.04	2.25	1.00	0.71	0.76	0.13	0.40	0.08	1.08	0.74	1.87	0.08	0.92	0.90
Tuscany	0.47	0.28	0.58	0.74	0.37	0.00	0.52	0.80	4.45	0.46	0.06	0.47	0.11	0.00	0.93	0.64	0.54	0.60	0.30	0.77
Umbria	0.98	0.00	0.45	0.88	0.12	0.00	0.12	1.04	1.23	4.59	4.19	1.49	4.23	0.00	0.25	1.24	0.00	1.12	0.00	0.21
Marche	0.61	0.00	0.16	0.32	1.42	0.00	2.37	2.65	0.28	4.15	1.26	2.12	0.00	0.00	1.36	0.35	0.00	0.00	0.79	0.00
Latium	0.69	0.00	0.52	0.65	0.18	0.00	0.08	0.20	1.17	2.75	0.38	2.75	4.45	5.47	2.65	1.05	1.89	1.28	0.56	0.60
Abruzzo	0.00	0.00	0.92	0.09	0.11	0.00	0.00	1.68	0.59	0.42	1.80	2.13	11.44	2.38	0.86	0.97	0.00	0.58	0.00	0.00
Molise	0.00	0.00	1.32	0.00	0.87	0.00	0.00	0.54	0.64	0.00	0.59	3.91	8.79	3.71	0.88	0.26	0.00	2.93	0.46	0.00
Campania	0.00	0.00	0.33	0.17	0.27	0.00	0.00	0.12	0.00	0.00	0.00	2.31	0.59	1.26	6.02	2.16	0.00	7.59	0.92	0.41
Apulia	0.00	0.00	0.49	0.82	0.00	0.00	0.00	1.09	0.37	0.91	0.00	3.59	0.00	0.00	0.00	7.92	0.00	0.82	0.25	0.00
Basilicata	0.00	0.00	0.00	0.92	0.00	0.00	0.00	0.22	0.51	0.00	0.00	0.00	0.00	0.00	3.14	4.08	49.84	4.64	0.00	0.00
Calabria	0.00	7.04	4.54	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	4.94	0.00	0.00	0.00	0.00	0.00	7.17	0.00	0.00
Sicily	0.73	0.00	1.35	0.00	0.28	1.51	0.00	0.00	0.12	0.00	0.00	1.45	0.00	0.00	0.41	0.00	0.00	1.33	11.50	0.00
Sardinia	0.00	0.00	0.87	0.00	0.45	0.00	0.54	0.59	0.00	0.96	0.00	0.19	0.00	0.00	0.33	1.03	0.00	0.00	0.00	16.31

Table D.8. Indices of attractions for Italian regions, 2021

	Piedmont	Aosta Valley	Lombardy	Trentino A. Adige/South tirol	Veneto	Friuli-Venezia Giulia	Liguria	Emilia-Romagna	Tuscany	Umbria	Marche	Lazio	Abruzzo	Molise	Campania	Apulia	Basilicata	Calabria	Sicily	Sardinia
Piedmont	3.29	2.72	0.41	0.24	0.46	0.25	3.55	0.99	0.75	0.24	1.35	0.47	0.32	0.00	0.64	0.91	0.86	1.77	1.31	1.08
Aosta Valley	2.85	4.48	1.36	0.00	0.88	0.89	2.53	1.05	0.67	0.00	1.91	0.66	0.00	0.00	0.63	1.21	0.00	0.76	0.55	1.16
Lombardy	1.67	1.04	1.94	1.02	0.61	0.43	2.13	1.20	0.60	0.15	1.12	0.62	0.51	0.00	1.00	0.92	1.02	0.42	0.83	0.93
Trentino A. Adige/South tirol	0.62	0.63	0.60	2.22	3.94	0.00	0.28	0.74	1.61	0.40	0.91	0.36	0.27	0.00	0.44	0.12	0.00	0.11	0.44	1.48
Veneto	0.23	0.00	1.27	2.11	3.76	1.92	1.01	0.78	0.61	1.20	1.19	0.66	0.16	0.00	0.49	0.35	1.00	0.00	0.76	0.35
Friuli-Venezia Giulia	0.00	0.00	0.52	1.11	3.86	12.24	0.38	0.56	0.27	1.75	0.69	0.09	0.00	2.91	0.46	0.27	3.55	0.00	0.53	1.06
Liguria	1.67	10.41	0.88	1.59	0.91	0.17	1.81	0.15	1.59	0.49	1.40	0.73	0.00	0.00	0.00	0.27	1.22	0.48	0.41	2.62
Emilia-Romagna	0.78	0.28	0.75	1.69	1.00	0.68	0.73	2.92	0.72	1.26	0.90	0.39	0.33	3.63	0.67	0.66	0.64	1.28	0.31	0.31
Tuscany	0.54	0.90	0.69	0.97	0.28	0.47	0.19	0.73	3.56	0.16	0.13	1.10	0.31	2.08	1.28	0.75	0.00	1.24	0.18	1.05
Umbria	0.72	1.83	0.46	0.41	0.61	0.23	0.09	1.79	0.70	0.00	3.47	1.38	3.66	0.00	0.56	1.19	4.37	1.31	0.61	0.19
Marche	0.00	0.00	0.42	1.58	0.19	0.40	0.27	0.95	2.01	1.34	3.89	0.79	1.10	3.37	0.80	0.82	1.61	0.00	0.75	1.02
Lazio	0.36	0.76	0.43	0.69	0.27	0.14	0.24	0.26	1.14	2.91	0.93	3.31	3.30	0.83	1.51	1.18	0.47	0.85	0.63	1.09
Abruzzo	1.13	0.00	0.44	0.00	0.79	0.00	0.19	0.94	0.59	1.79	1.24	1.70	1.70	7.60	2.21	1.49	1.46	0.70	1.31	0.88
Molise	0.00	0.00	0.30	0.91	0.80	0.00	0.00	1.23	0.74	0.00	1.60	1.78	8.62	11.51	1.77	0.00	0.00	1.20	0.00	0.40
Campania	0.82	0.00	1.08	0.42	0.25	0.00	0.00	0.05	0.68	1.59	0.00	1.09	3.36	0.00	2.89	1.56	1.57	5.33	0.86	0.87
Apulia	0.00	0.00	1.32	0.00	0.10	1.85	0.00	0.82	0.00	1.44	0.63	0.34	2.51	0.00	2.70	5.88	0.00	0.22	0.00	0.00
Basilicata	0.53	0.00	0.80	0.00	0.00	0.00	0.00	1.91	0.00	4.44	0.00	0.35	0.00	0.00	2.89	1.93	24.50	1.58	0.00	0.00
Calabria	0.00	0.00	2.06	0.00	0.00	0.00	0.00	0.39	0.75	0.00	0.00	4.70	0.00	0.00	0.83	1.03	0.00	11.12	0.50	0.00
Sicily	1.45	0.00	0.72	0.00	0.05	2.31	0.00	0.21	0.53	0.76	0.89	0.67	0.00	0.00	0.00	0.88	0.00	0.84	8.28	0.00
Sardinia	0.78	0.00	1.33	0.51	0.38	0.00	0.64	0.64	0.00	1.57	0.00	0.98	0.00	0.00	0.00	0.57	0.00	0.54	0.20	9.68

Table D.9 Indices of attractions for Italian regions, 2022

	Piedmont	Aosta Valley	Lombardy	Trentino A. Adige/Su dtiro	Veneto	Friuli-Venezia Giulia	Liguria	Emilia-Romagna	Tuscany	Umbria	Marche	Lazio	Abruzzo	Molise	Campania	Apuilia	Basilicata	Calabria	Sicily	Sardinia
Piedmont	2.40	2.77	0.63	0.24	0.60	0.66	3.37	0.57	0.65	0.30	1.44	0.39	0.38	4.68	0.82	1.55	0.75	1.26	0.80	1.01
Aosta Valley	1.86	0.80	0.52	0.56	0.25	0.00	4.69	1.23	0.72	0.00	0.00	0.76	0.87	0.00	0.35	1.31	0.00	2.92	0.00	1.77
Lombardy	1.26	2.26	1.36	0.97	1.21	1.01	1.40	1.40	0.76	0.29	0.90	0.18	0.62	0.00	0.84	0.91	0.40	0.92	0.71	1.03
Trentino A. Adige/Sudtir ol	0.60	0.00	0.53	1.80	2.41	0.27	0.63	1.61	0.53	0.84	0.81	0.63	1.34	0.00	0.32	1.03	1.42	1.34	0.87	0.08
Veneto	0.09	0.00	1.35	1.45	4.08	1.52	0.49	0.40	0.66	1.35	0.15	0.56	0.00	0.00	0.54	0.37	0.37	0.84	1.25	0.42
Friuli-Venezia Giulia	0.18	0.00	1.02	2.04	1.72	9.49	0.76	0.45	0.48	0.67	0.00	1.48	0.00	0.00	0.95	0.27	0.00	0.36	0.63	0.93
Liguria	3.47	3.75	1.07	0.63	1.14	0.00	2.99	0.31	1.36	0.00	0.49	0.60	0.40	0.00	0.44	0.14	0.00	0.37	0.35	0.62
Emilia- Romagna	0.99	0.34	0.54	1.64	0.46	1.02	0.61	2.39	0.70	0.94	1.55	0.54	0.42	0.00	1.02	1.72	1.38	0.24	0.72	1.01
Tuscany	0.67	0.25	0.95	0.95	0.23	0.35	0.28	0.76	3.42	2.08	0.32	1.13	0.22	2.78	0.92	0.17	1.14	0.47	0.99	0.80
Umbria	1.08	0.00	0.68	0.17	0.56	1.00	0.00	0.61	0.59	1.61	7.13	1.99	3.65	0.00	0.80	0.61	0.00	1.81	0.59	0.25
Marche	0.19	0.00	1.50	1.29	0.30	0.96	0.10	1.30	0.65	5.70	0.38	2.00	0.62	0.00	1.16	1.25	0.00	0.00	0.23	1.42
Lazio	0.41	0.17	0.31	1.77	0.12	0.28	0.67	0.54	1.30	2.84	1.11	2.00	3.97	0.00	1.03	1.23	0.37	1.33	0.94	0.67
Abruzzo	1.97	0.00	0.79	0.43	0.50	0.00	0.15	0.66	0.21	0.63	2.67	3.05	2.66	0.00	1.12	2.93	2.34	0.00	0.38	0.00
Molise	0.30	0.00	0.74	0.00	0.12	0.00	0.92	1.84	0.41	1.07	2.07	0.67	5.26	88.43	2.45	1.58	3.51	0.69	0.16	0.00
Campania	0.54	0.00	0.61	0.00	0.44	0.27	0.07	0.27	0.32	0.51	1.84	3.07	2.42	0.00	4.33	1.55	4.08	0.92	0.28	0.29
Apuilia	1.10	0.70	1.24	0.00	0.22	0.00	0.17	1.26	0.00	0.00	0.60	2.69	0.00	0.00	0.81	2.76	4.57	4.51	1.50	0.00
Basilicata	0.00	0.00	0.71	0.44	0.88	0.00	0.00	0.92	0.10	0.00	0.00	1.23	1.69	0.00	3.24	3.64	9.43	1.57	1.05	0.00
Calabria	0.00	0.00	3.07	0.00	0.31	0.99	0.00	0.28	1.56	0.86	0.00	2.78	0.00	0.00	0.40	0.79	0.00	5.70	0.60	0.00
Sicily	0.56	0.00	2.26	0.00	0.00	2.22	0.18	0.70	0.40	0.00	0.13	1.63	0.14	0.00	0.49	0.18	1.84	2.12	6.54	0.00
Sardinia	0.31	0.00	0.87	0.95	0.66	0.67	0.00	0.61	0.89	0.00	0.00	0.06	0.75	0.00	0.23	0.00	0.00	0.00	0.37	13.35

Table D.10 Indices of attractions for Italian regions, 2023

	Piedmont	Aosta Valley	Lombardy	Trentino A. Adige/Sudtirolo	Veneto	Friuli-Venezia Giulia	Liguria	Emilia-Romagna	Tuscany	Umbria	Marche	Lazio	Abruzzo	Molise	Campania	Apulia	Basilicata	Calabria	Sicily	Sardinia
Piedmont	2.67	2.18	0.21	0.21	0.59	0.00	4.32	0.94	0.62	0.91	0.27	0.80	0.32	0.00	0.51	0.77	0.00	1.29	1.51	1.21
Aosta Valley	3.07	0.00	0.85	0.00	1.00	0.00	2.96	0.35	0.53	0.42	9.41	0.29	0.00	0.00	0.70	1.37	0.00	0.52	1.20	0.63
Lombardy	1.11	2.20	1.39	0.84	0.58	0.79	1.70	1.24	0.96	0.53	0.89	0.57	1.05	0.00	0.60	0.66	0.14	1.16	1.10	1.30
Trentino A. Adige/Sudtirolo	0.05	0.00	1.15	3.32	2.69	0.67	0.70	0.68	1.48	0.37	0.59	0.26	0.11	0.00	0.03	0.68	0.00	0.92	0.38	0.65
Veneto	0.81	0.74	0.92	1.95	2.93	1.28	0.13	0.75	1.02	1.15	1.83	0.59	0.25	0.00	0.65	0.53	1.16	0.64	0.70	0.36
Friuli-Venezia Giulia	0.56	0.00	0.32	1.57	2.45	14.61	0.27	0.58	0.12	1.12	0.51	0.34	0.29	0.00	0.54	0.38	0.00	0.39	0.68	1.29
Liguria	4.08	2.97	0.84	0.72	1.04	0.00	1.14	1.19	1.41	0.00	0.00	1.58	0.82	0.00	0.32	0.57	0.00	0.00	0.51	0.28
Emilia-Romagna	0.61	0.19	0.81	1.74	1.16	0.96	0.75	2.13	0.32	0.00	1.34	0.38	1.47	5.34	1.33	1.65	0.86	0.48	0.64	0.95
Tuscany	0.52	0.00	0.75	1.45	0.71	0.66	0.46	0.58	2.79	1.22	0.57	0.84	0.78	0.00	1.40	0.60	0.44	0.52	0.44	1.02
Umbria	0.31	0.27	0.98	0.66	0.62	0.22	0.30	2.36	0.52	0.29	2.84	1.69	4.59	0.00	0.72	0.66	0.00	1.03	0.62	0.75
Marche	0.56	1.50	1.20	0.74	0.84	0.00	0.00	1.43	1.35	2.24	0.65	1.16	0.00	0.00	1.10	2.43	0.00	1.25	0.30	0.00
Lazio	0.48	0.24	1.00	0.26	0.57	0.87	0.18	0.52	1.10	2.87	1.77	2.04	2.60	0.00	1.14	0.94	1.40	1.93	0.65	1.09
Abruzzo	0.63	0.88	0.91	2.05	0.81	0.00	0.52	1.03	0.68	2.03	2.09	1.21	2.58	0.00	1.43	0.34	3.71	0.80	0.33	0.44
Molise	0.00	0.00	0.45	0.00	0.30	0.00	0.00	1.72	0.30	2.04	0.58	3.69	1.89	10.26	1.40	3.54	0.00	0.84	0.28	0.27
Campania	0.17	0.00	1.25	0.00	0.08	0.00	0.20	0.14	0.48	0.00	0.40	2.61	0.00	0.00	5.54	1.51	7.88	0.51	0.47	0.00
Apulia	0.00	0.42	0.25	0.00	0.31	0.00	0.00	0.15	0.30	5.12	0.30	1.94	0.00	0.00	0.51	7.92	3.57	2.83	0.00	0.00
Basilicata	0.00	0.00	0.74	0.00	0.00	0.00	0.34	0.97	1.39	0.00	0.00	3.91	0.00	105.28	0.65	1.29	10.21	0.81	0.00	0.00
Calabria	0.00	0.00	2.83	0.00	0.00	0.00	0.00	0.83	0.66	0.00	0.00	1.62	0.00	0.00	2.03	0.85	7.06	3.02	1.62	0.00
Sicily	1.36	0.00	0.93	0.00	0.92	0.27	0.22	0.00	1.16	0.00	0.00	1.63	0.00	0.00	0.52	0.31	0.00	1.27	8.61	0.00
Sardinia	2.81	0.00	2.01	0.43	0.29	0.00	0.00	0.63	0.05	2.52	0.00	1.75	0.21	0.00	0.00	0.00	0.00	0.00	0.82	8.68