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Tourism Demand in Northern and Southern Norway: A Survival Analysis Approach

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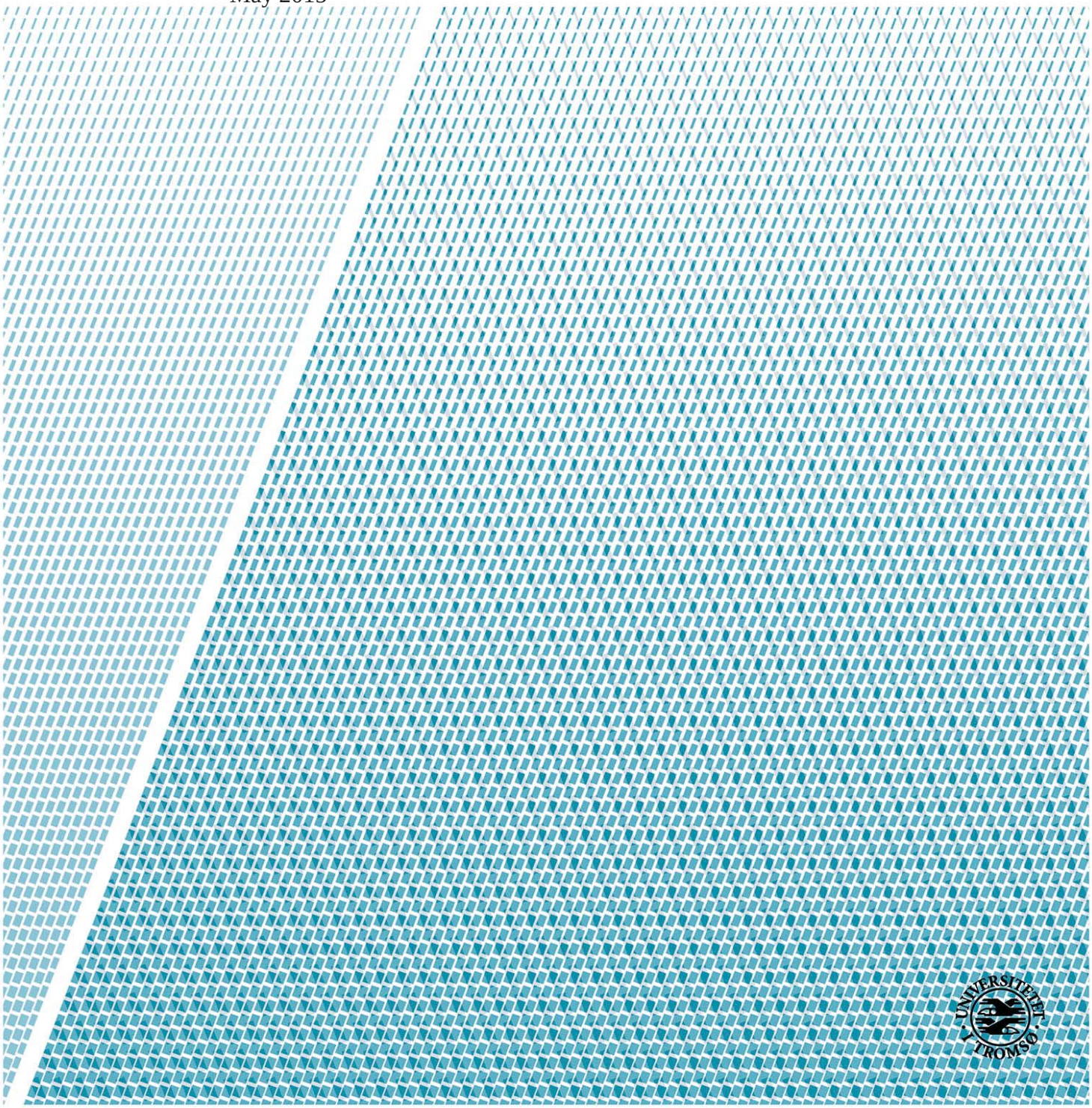

To Masoud

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Abstract

The twentieth century is a golden era for technology and transportation boost, which facilitates taking journey all over the world. Traveling for any purpose such as leisure, meetings, conferences, conventions, business, educational and medical trips is considered to be one the most profitable industries in the world and the cornerstone of many economies. Norway has a great reputation among overseas visitors for being safe and having an abundance of diverse touristic sites. However, like any other country, Norway needs to make appropriate policies to increase its income in the tourism sector. In this regard, research is required to estimate the tourism demand in order to provide the policy makers with solid foundations for their decision-making processes.

The aim of this research is to identify the factors, including economic and demographic, which can affect the international tourism demand in Norway. To achieve this aim, the present study uses a probabilistic approach in order to estimate the length of stay of tourists in Northern and Southern Norway. As tourist-attraction differs from North to South, investigating the tourism demand and analyzing how different covariates affect the demand provides a basis for recognizing the area that has a higher investment turnover.

The findings of this study show that the tourism demand differs in Southern and Northern Norway and tourists in general have the tendency to stay longer in Northern Norway. The extent of such difference is modeled as a function of time and a set of explanatory variables, for instance tourist gender, age, purpose of trip, total cost, geographical area, preference of accommodation and transportation type. This means that the effects of the covariates on the probabilistic representation (using survival analysis) of tourism demand vary from one region to other. Such findings can be used to make appropriate regional and national policies to have a well-organized plan to promote tourist flow to Norway.

Keywords: Tourism industry, Northern and Southern Norway, Survival analysis, Probabilistic approach, Policy-making.

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Chapter 1. Introduction

Tourism industry can be considered an economic engine, which acts like an invisible export. In other words, the primary and pivotal benefit of this sector is foreign currency flow into the destination country. Norwegian tourism industry has been an international business for more than a century. Although tourism industry in Norway has grown in recent decades and its revenue from this has tripled since 1970 (Jacobsen and Espelien, 2011), Norway has not managed to considerably strengthen its international competitive position. Therefore, while many countries have acted to recognize and support the role of traveling in their economies and consequently acquire massive revenue and notable benefits, Norway has neglected competing in the tourism market and thus has captured small proportions of this lucrative industry. Some studies report that the Norwegian tourism industry has a relatively undesirable level of value creation per employee and suffers from lack of major investments. Besides, Norwegian tourism industry has a low educational, talent, research, and innovation attractiveness (Norwegian Ministry of Trade and Industry, 2012, Haukeland, 1984, Mei, 2014, Jacobsen and Espelien, 2011, Reve and Sasson, 2012). This implies that the economic importance of the tourism industry is underestimated in Norway.

On the other hand, the high level of income in Norway and its tendency to increase, motivate Norwegians to take to international traveling more frequently than ever (Haug et al., 2006). Growing disposable income diminishes the price elasticity of traveling and persuades Norwegians to take long-haul travels. In addition, Norwegians have become more and more interested in purchasing durable goods such as holiday homes abroad. For example, Norwegians have built a so-called “little Norway” in Spain (Haug et al., 2006), which promotes Spanish foreign investment and contributes to the Spanish economy. Not only does this mean that Norway is performing at a relatively undesirable level with respect to attracting tourists, but it is also among the nations that export considerable number of tourists to other countries. As a result, this worsens the loss of currency and makes disorderliness in trade balance. For instance, according to the International Monetary Fund, the travel balance in 2007 and 2008 was -9.2 and -11.3 billion US dollar (Culiuc, 2014). To cope with such shortcomings in the tourism industry, Norwegian government passed a sustainable tourism bill in 2012 called “Destination Norway” to promote the tourist sector utilizing the potential of natural beauty and landscape, the Arctic, as well as modern and traditional fishery and marine industry (Norwegian Ministry of Trade and Industry, 2012).

According to the International Monetary Fund, over one million international trips took place in 2012 (Culiuc, 2014). Considering the magnitude of tourism flow and subsequently the importance of income generated for the economy, it is of crucial importance for the governments and the agents of the industry to identify what determines the tourist flow.

Despite the economic importance of the tourism industry, there are only a few studies, which have analyzed the universe of international tourist flow in Norway. In this regard, this study is organized as follows. The first and main purpose of this study is to investigate how selected socio-economic covariates affect the probability of length of stay (LOS) of tourists in Norway. Second, this study aims to identify the differences in tourism demand in Northern and Southern Norway. Moreover, several explanatory variables are tested to analyze their effects on the probabilistic measures of LOS of the tourists in Northern and Southern Norway. This is done in order to find the responsiveness of travelers to various determinant factors. The probabilistic nature of the analysis can aid to estimate the probability that a tourist stays in Norway for a certain number of nights, or the probability that tourists leave Norway given that they have spent a certain number of nights. Separating Northern and Southern Norway tourism demand helps to answer which of the two geographical areas in Norway is more favorable for investment in the tourism industry.

The selection of the dependent and explanatory variables, the choice of the functional form, the model specification, and the estimation procedure have significant effects on the precision of the outcomes. Various researchers have studied the tourism industry in different destinations in order to model and predict tourism demand using different approaches. The Log-linear model is one of the most commonly used models in tourism demand studies as it provides an easy interpretation of the model coefficients (Li et al., 2004, Lim, 1997, Syriopoulos and Thea Sinclair, 1993). However, this model follows a deterministic approach, and thus does not give a probabilistic explanation for the number of tourists or the period of time they stay in the destination country.

In this study the concept of survival model, often represented as a duration model, is used to develop a probabilistic model for the tourism demand estimation in Norway. Duration models have been applied in various economic fields such as health economy (Etzioni et al., 1999, Lindeboom and van der Klaauw, 2014), business and innovation (Luoma and Laitinen, 1991, Giovannetti et al., 2011), labor economics (Ciuca and Matei, 2010, Diebold and Rudebusch, 1990, Hoffman, 1991) and political economics (Kennan, 1985). Several

researchers have applied duration models to tourism demand studies. For instance, Gokovali et al. (2007) used duration model to analyze tourism demand and to examine the microeconomic determinants of LOS in Bodrum, Turkey. Martínez-Garcia and Raya (2008) analyzed to what extent the personal characteristics of low-cost tourism are significant in determining the travel duration.

The most commonly used dependent variables are tourist arrival, tourist departure, and tourist expenditure (Lim, 1997, Li et al., 2004). Although the period that a tourist stays at the destination country is considered as one of the most important holiday characteristics, it has received little attention in the literature (Culiuc, 2014). Choosing LOS as the dependent variable is of interest as it provides a closer proxy for tourism revenues, and it is possible that tourists adjust their behavior in terms of which country they should travel to and how long they should stay. Moreover, LOS is more sensitive to real exchange rate movements in the destination country (Culiuc, 2014). In addition, using tourist arrival as a dependent variable may be deceptive. High tourist arrival does not guarantee more money generation because of reduction in the length of stay (Alegre and Pou, 2006). In this regard, this study considers the LOS as the dependent variable, which is a random variable in the context of duration models.

The explanatory variables in this study are constructed based on a conducted survey by Innovation Norway covering tourism information in 2012 in Norway for international tourist category. In this regard, tourist gender, age, geographical area (North or South), purpose of trip, preference of accommodation and transportation, and total cost are chosen as explanatory variables. The aforementioned survey is also used for extracting detailed data for tourism demand analysis. Since traveling is a social activity, both economic and demographic covariates are included in the model such as gender and age are of interest for the model. For example, elderly people may not tend to stay for long stretches of time or female tourists may not be willing to take trip to destinations with lower social safety (Alegre and Pou, 2006). Some of the tourism demand studies have applied macro data (Dritsakis, 2004, Garín Muñoz, 2007). However, since tourism demand is a subset of consumer theory and thus has a micro economic base, this study uses micro data as this provides a better empirical estimation for consumer models (Deaton, 1997).

In order to have a comprehensive prospect of tourism demand in Norway, this study will also explore and answer the following research questions:

- Does Norway achieve its potential in tourism industry?

- What are the challenges in Norwegian tourism industry?
- What are the parameters that have statistically significant effects on the LOS?
- Given a set of known covariates, what is the probability of “leaving Norway” as a function of LOS?
- How and to what extent do the changes in the covariates affect the LOS probability?
- Is there any significant difference in tourism demand in Northern and Southern Norway?
- Do the covariates and their significance vary in tourism demand estimation for Northern and Southern Norway?

The results of this study can be used to ensure progressive cooperation, innovation and investment in the Norwegian tourism sector. Undoubtedly, better understanding of tourist preferences plays an important role in formulating broad policies to maintain and expand tourism industry, and thus maximize its associated revenues. The rest of this study is organized as follows. Chapter 2 reviews the tourism industry, its history, and its contribution to Norway’s economy. Some key concepts in tourism industry as well as a review of various tourism demand models are also discussed in this chapter. Chapter 3 is devoted to an overview of duration analysis and proportional hazard model (PHM). It further describes the methodology and model specification used in this study. The results of the study and further discussion are presented in Chapter 4. Chapter 5 presents the concluding remarks and recommendations for future research.

Chapter 2. An overview on tourism

This chapter is devoted to presenting an overview of tourism industry. The first section of this chapter discusses tourism chronology from ancient to modern era and briefly outlines the key concepts associated with the tourism industry that will be used in this study. The next section examines the importance of tourism industry and its contribution to Norwegian economy. The last section extends to tourism demand modeling.

2.1. Tourism history

Very little historical research has pervaded the core of tourism studies. Similarly, a handful of studies on tourism, which have adopted an historical prospect, have been written by authors whose field of expertise was not history (Towner and Wall, 1991). Furthermore, these studies focused mostly on the history of tourism in Great Britain, as the authors believed that the elite class in Britain had the main impact on the emergence of the current form of tourism industry (Towner and Wall, 1991, Towner, 1995, Towner, 1988). In the case of Norway, tourism phenomenal growth over a long time period including history of leisure and entertainment is poorly developed. Thus, very few studies are available about the history of tourism industry in Norway (Østby, 2013).

Historically, tourism activities have changed various aspects of a destination's economy, politics, and culture. At its early stages, traveling took place not because of entertainment, but people migrated to find food and escape from danger. Such migrations where mostly limited to small geographical vicinities (Holloway and Taylor, 2006). Historians believe that the primitive form of traveling traced back the empire era, which started with the Egyptian Empire. Egyptians traveled for leisure, trade, religious, educational and military purposes. Such traveling became more popular due to advancements in ship building and the organization of cruises off the coast of the Nile. Building the pyramids and celebrating festivals increased the popularity of recreational journeys in Egypt (Bagnall, 2006).

However, most historians believe that tourism history began by the elites of ancient Greece and Rome (Towner, 1995), as Greeks took progressive and creative actions to facilitate the journey. Building advanced ships, organizing regular cruises, establishing a common language all over the empire, and passing a bill of accepting foreign currencies all over the Greek Empire are examples of such travel-facilitating policies that made Athens a very popular destination for people by the 5th Century (Swarbrooke and Horner, 2007).

Traveling was further developed by the Romans, as they built roads all over the territory. The domination of the middle class in Roman Empire prompted travel growth. As a result the second-home phenomenon was first introduced in the Roman Empire around the Bay of Naples for entertaining purposes (Towner, 1995). The popularity of traveling made necessary the construction of rest houses along the roads. Later, the Persians invented markers to measure the distances among different places (Swarbrooke and Horner, 2007, Friedländer, 2010).

The Middle Ages, on the other hand, is known as the dark ages for traveling. In this period safety diminished and thus monasteries along the roads played a great role as accommodation. During this period, the purpose of traveling was not pleasure anymore. Transportation, united language and currency exchange was fragmented. In spite of all such constraints for traveling, Marco Polo's excursion occurred in this period along the Silk Road (Swarbrooke and Horner, 2007) .

Renaissance is considered as rebirth of traveling after the dark ages. In this period, the merchants restarted to trade goods and services with people both inside and outside of their political territory. The establishment of kingdoms in Europe, together with increasing trends of trades, helped the development of roads, social safety, and means of transportation. The history of tourism proclaims the contiguous relations between the development of tourism and transport systems (Holloway and Taylor, 2006, Candela and Figini, 2012).

In tourism studies, the United Kingdom is considered as the pioneer for the development of modern tourism industry. In 1548, the United Kingdom provided ecclesiastical passport for British pilgrims to protect them from being arrested because of vagrancy (Holloway and Taylor, 2006). Moreover, during the 16th century new types of tourists emerged who were interested in broadening their knowledge about other countries (Candela and Figini, 2012). The Industrial revolution in Great Britain brought economic development and subsequently modern tourism was introduced. In 1825, building the first passenger railway in the UK helped to cover the high demand of traveling. In this regards, the 1820s and 1830s are known as an important transition period, after which the new phase for tourist industry began (Holloway and Taylor, 2006). In 1840s, the middle class started demanding different types of transportation for their journeys (Towner, 1985). In this period, traveling became a part of British culture and some entrepreneurs started exploiting the economic profits from traveling. In 1841, Thomas Cook, who had the most considerable effect on the early tourism industry, decided to organize a group of 570 tourists in Great

Britain from Leicester to Loughborough. He employed the new railway technology to create inexpensive trips for the middle-class. His marketing success led him to expand his business and consequently he represented the idea of package tour. In 1855, Thomas Cook organized a full packaged tour from England to Paris. Well-known tourism companies were established in this period such as Dean and Dawson, Polytechnic Touring Association and American Express (Holloway and Taylor, 2006). The high traveling demand necessitated the development of accommodation, spas, seaside resorts, social safety, and publication of guidebooks (Holloway and Taylor, 2006).

During the 1840s and 1860s, the enthusiasm of the British for traveling and having healthy outdoor activities during their journeys, made mountainous zone of Switzerland, Austria and Norway popular destinations for them (Holloway and Taylor, 2006, Swarbrooke and Horner, 2007, Lovelock, 2007). British people started renting or buying a second home in Norway, and thus hunting reindeer, moose, red deer, and ptarmigan, as well as catching salmon and trout in Norway became regular among the British. Finally, this phenomenon commercialized and the "Scandinavian Sport Tour" emerged (Lovelock, 2007). The British would hire Norwegians as boatmen and this brought income for Norwegians. This also built a great friendship and mutual respect between the British and Norwegian populations (Towner, 1988, Lovelock, 2007). Traveling became a part of European culture after the "Grand Tours", established by British people, were publicized and spread all over the Europe. Finally the opening of the Suez Canal in 1869 introduced a new phase of traveling for British people that led to further traveling from the West to East with both political and recreational purposes (Towner, 1985, Holloway and Taylor, 2006, Towner and Wall, 1991).

The 20th century is the starting point of mass tourism phenomenon. First waves of mass tourism were started by Northern Europeans who went to Mediterranean coasts for leisure (Swarbrooke and Horner, 2007). However, the destructive situation in Europe after World War I and the great depression of 1930 caused a lot of obstacles for the tourism industry. In this period, political inconsistency brought chaotic currency exchange rates, so that governments limited foreign exchanges. Moreover, the low standard of public health and social safety in the big cities, as well as visa requirements lessen international tourism significantly among European countries. Lack of money and the above-mentioned constraints even affected the upper class. Under such conditions, pioneers in tourism industry and economists held a conference called as "Creative Tourist Agents" to fight against depression and retrieve the tourism industry. They considered policies such as providing discounts for

bulk purchases of railway transportation and special rail charter for popular destinations in Europe (Holloway and Taylor, 2006, Swarbrooke and Horner, 2007).

The modern era is classified from 1945 to the present. After World War II, Europe became politically stable and provided an impetus to international travel. Economic growth and growing disposal income among the middle class brought new patterns of consumption and lifestyle. Moreover, advances in vehicle technology and availability, promotion in educational level and awareness of people contributed to the rapid growth of tourism of all kinds. People started to allocate part of their free time to recreation. This, consequently, resulted in emergence of specialist tour operators. International travels were not restricted to the upper class anymore. In 1950, commercial air transportation became popular and cheaper. In the 1950s, mass tourism became widespread in industrialized economies, which brought remarkable profit to the regional and local economies. Although the pre-mass tourism phase had comparatively less economic benefits, it had brought significant achievements in cultural, social, and technological scopes and contributed to reputable success for mass tourism (Garay, 2011).

In 1975, the World Trade Organization (WTO) was founded with the purpose of supervising and dealing with international trade. In 1985, tourism industry entered a new phase with the introduction of Boing the 707 jets. The fall of the Berlin Wall in 1989 marked the end of communism in Europe. This brought economic openness, such that former communist countries such as Russia and Czech Republic became tourist generating countries (Swarbrooke and Horner, 2007). As tourism industry expanded, hotels had to elevate their safety and security levels by installing smoke detectives, peepholes and lockers in order to bring more satisfaction for the tourists. In the 1990s, promotion in technology eliminated the unnecessary costs for service suppliers, such as introducing electronic tickets. In the 20th century, governments, scientists and economics became aware of economic benefits of tourism industry. Thus, in order to develop a model for tourism demand they needed to agree on some key definitions in this field. Modeling the tourism demand helps to acquire high quality information to create statistic-base knowledge. As a result, widely accepted concepts should be defined.

2.2. Key definitions in the tourism industry

The term “tourist” appeared for the first time in Great Britain in the early 19th century. Generally-speaking, tourists are travelers or visitors looking for leisure-based experiences

(Candela and Figini, 2012). There are various controversies about the period and purpose of traveling that makes precisely defining the term “tourist” a challenging task. This, consequently has brought great difficulty in collecting tourist-related statistics and different results in empirical research (Hall et al., 2008). In some literature the term “tourist”, “travelers”, “excursionists” and “visitors” are used interchangeably. In contrast, some researchers differentiate these concepts. In 1937 the League of Nations defined the tourist as a person who travels to a country, which he does not usually reside in at least for 24 hours for pleasure, health, business or any other reasons (Holloway and Taylor, 2006). Unlike the League of Nations, the United Nation World Trade Organization (UNWTO) distinguishes between tourist and visitor based on the length of stay. Tourists or over-night visitors stay at the destination at least for 24 hours but visitors or excursionists refer to the people whose traveling lasts less than 24 hours (Holloway and Taylor, 2006). Later in 1963, the United Nation broadened the tourist definition and included the trips and movements less than 24 hours like cruise tours or any other excursion (Holloway and Taylor, 2006, Candela and Figini, 2012).

In tourism economy studies the field of interest is the economic effect of tourism, thus in economic field the term “tourist” is defined as an individual who abandons his place of residence temporarily for any purposes and contributes to the beneficial economic effects of the destination country, which are worth discussing. In the economic study of tourism this means that the length of stay is not the issue, as economists believe that the economic benefits and income generation of visiting less than 24 hours cannot be disregarded (Candela and Figini, 2012). For instance, many small destinations such as the Republic of San Marino or Andorra do not require overnight accommodation but their popularity among the tourists and the economic benefits are of major concern (Candela and Figini, 2012). In this study, the above-mentioned definition is adopted.

According to the given definition, one may classify tourists into several categories. This study divides tourists into international and national:

- International tourists: People who cross the borders of their country and stay in the destination a minimum of 24 hour (or at least one night) and a maximum of 1 year. In the definition of international tourism, we focus on the length of stay (Candela and Figini, 2012, Hall et al., 2008). However, this study disregards the condition of “minimum of 24 hours” according to adoption of the tourist definition in economic fields.

- National tourists: This refers to travelers who move inside the political boundary of their country of origin. Unlike its international counterpart, national tourist is not that much of interest, as it does not contribute to the cash flow of foreign currency. National tourists do not have any hindrance of language, exchanging currency or visa application (Candela and Figini, 2012, Hall et al., 2008).

Another important concept is “tourism”. Traveling creates tourism, which is a very comprehensive and complex phenomenon. It is considered a temporary movement of people and it is the subset of mobility (Hall et al., 2008). Various researchers define tourism in different ways with nuances. Mathieson and Wall (1982) define tourism as a collective term including all activities that people do during traveling to certain destinations for pleasure and enjoyment, as well as the facilities that cover the needs of the tourists. McIntosh and Goeldner (1990), however, distinguish between tourism and recreation. They define tourism as “traveling a distance from home”, while recreation is referred to the activities undertaken during leisure time. This study accepts the definition given by Hall et al. (2008), who define tourism as a range of voluntary travels which tourists make from home to their destination for a specific period of time and then return.

To discuss the economic effects of tourism, one may refer to “tourism product”. The economics of tourism considers all the economic facets derived from the activity of a tourist. Tourism market, like any other market consists of buyers and sellers who are closely interrelated to each other. The characteristic of an industry is that it cannot survive without cooperation of consumers. This means that when there is demand for traveling there should be suppliers and operators to provide and cover the needs of the tourists. In this regard, the shape of tourism industry is built by consumers (i.e tourists), suppliers and governments acting as policy-makers (Candela and Figini, 2012, Hall et al., 2008).

From the viewpoint of the suppliers, tourism industry is considered as a combination of service-based activities, and thus it is not studied as a unique and independent industry. In other words, tourism industry is encompassed by a variety of other industries such as hotels, transportation, hospitality services, and food and drink service, which serve different consumers with different income level, expectations and preferences (Hall et al., 2008). Considering such interactions, the “tourism product” includes all types of transportation, accommodation and lodging, catering, and entertainment and tourist attractions. In other words, the combination of the above-mentioned industries to service the traveler and provide for a holiday is called a “tourism product” (Hall et al., 2008). Figure 1 shows the embedded

nature of a tourism product and lists some of the important industries and services (Candela and Figini, 2012, Hall et al., 2008, Holloway and Taylor, 2006, Mathieson and Wall, 1982, McIntosh and Goeldner, 1990) that are in collaboration with the tourism industry within the context of tourism product.

Two separate factors namely, motivator factors and determinant factors are influential in purchasing the tourism product. Motivator factors motivate the tourists to buy a tourism product and determinant factors show to what extent the tourists are able to buy various elements to promote their satisfaction with their trip (Swarbrooke and Horner, 2007). For example, the highly equipped ski resort is a motivator factor for ski-lovers while time and income are determinant factors. Since determinant factors differ from one traveler to another, it is rational to expect different tourism products with different qualities. This shows the close relationship between tourism product and consumer behavior. The existence of various products gives the consumer the opportunity to choose. The different qualities of service, and tourists' preferences and tastes differentiate the demand for products (Candela and Figini, 2012, Hall et al., 2008). As a result, a tourism product becomes a combination of heterogeneous services provided by suppliers, based on which tourists try to maximize their trip satisfaction (George and Varghese, 2007, Candela and Figini, 2012, Holloway and Taylor, 2006).

Within the context of tourism product, the services and the elements are complementary. This refers to the multi-dimensionality of tourism industry. Purchasing tourism services is an indispensable part of traveling. For example, while a tourist uses air transportation, he or she needs to take a taxi or a bus to get to the accommodation. From this perspective one can argue that, for instance, the decrease in tourist arrival in some unstable Middle Eastern countries such as Egypt and Syria results in the fall of transportation, accommodation, food consumption, and overall reduction in the income of local businesses (Swarbrooke and Horner, 2007).

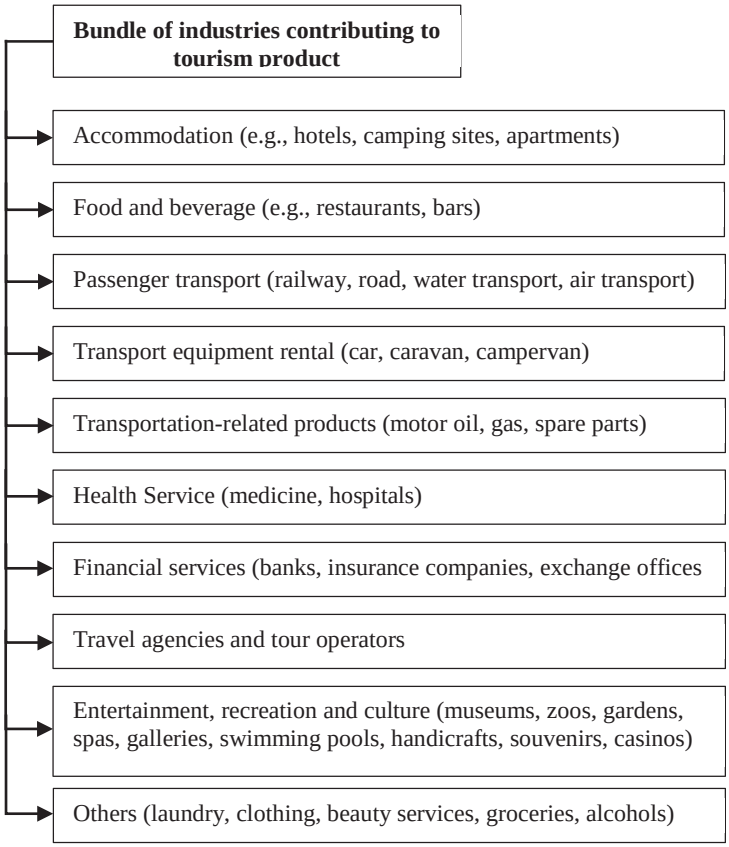


Figure 1. Tourism products

2.3. Importance of tourism industry

Despite a lot of instability in the world such as wars, political chaos, diseases, natural catastrophes, terrorist attacks, petroleum crises, and economy bankruptcies, tourism industry is steadily growing. Since tourism is a multifaceted industry and an integrated disciple, the effects from tourism industry on economy, human and socio-cultural activities, environmental changes, geography, history, linguistics, information technology, marketing and, and law is undeniable. In order to obtain a higher benefit from this industry and to act appropriately towards the promotion of both tourist attractions and tourism products, organizations and governments need to obtain a wide range of knowledge on such effects. In this section, the importance of tourism industry is discussed from three perspectives: economic effects, social effects, and environmental effects.

2.3.1. Economic effects

Tourism industry is one of the most vital sources of development and money injection into the economy of world countries. (Hall et al., 2008) indicate that the tourism industry has the largest value among world's industries and it is more effective in expanding business and income than by any other sectors. According to UNWTO in 2012, over one billion

international tourist arrival with a total expenditure of more than 1 trillion USD was recorded (Blanke and Chiesa, 2013). Tourism industry functions as an invisible export that generates considerable amount of money, which directly is contributed to the balance of payment, production, account deficit and employment. For instance, in 2010, tourism industry created 8% of overall employment in the world (Candela and Figini, 2012).

For tourism dependent economies such as the United States of America, France and Turkey, it is a key factor to investigate and ensure long-run economic growth. However, some economists refer to the tourism –led growth hypothesis and state that higher rates of tourist arrivals do not necessarily indicate higher economic benefits from tourism industry. Tourism –led growth hypothesis postulates that expansion in international tourism can contribute the economic growth of countries (Tang and Tan, 2015). For example this hypothesis is satisfied in Turkey but does not hold for South Korea case (Proença and Soukiazis, 2008).

Moreover, tourism industry and the international revenue as a conditional factor for economic growth, has the power to improve the host population's standard of living, known as "Welfare" (George and Varghese, 2007). Such improvements can be analyzed by converge process hypothesis, which indicates that tourism can act as a distributive tool to spread the benefits away from high-demanded areas to the less-demanded ones and help to lessen regional economic disparities (Williams and Shaw, 1991). Based on this hypothesis, a comprehensive study about the tourism industry in Western Europe including Scandinavian countries by Williams and Shaw (1991) shows that the cash flow can generate the net distribution of wealth throughout destination country and help the converge process.

Generally, the total economic effects from tourism industry are categorized in three groups: direct, indirect, and induced effects (see Figure 2) (Stynes, 1997, Cooper et al., 2007, McIntosh and Goeldner, 1990, Eadington and Redman, 1991, Budeanu, 2007). The combination of all these categories contributes to employment. Tourism industry has a labor-intensive nature, and hence it is a great source to reduce unemployment. In addition, tourism industry contributes to income generation at the national, local and regional level and consequently in the Gross Domestic Product (GDP) growth. Moreover, multiplier economic effect which takes place when foreigners spend money, the recirculation of money can stimulate the whole economy (Stynes, 1997).

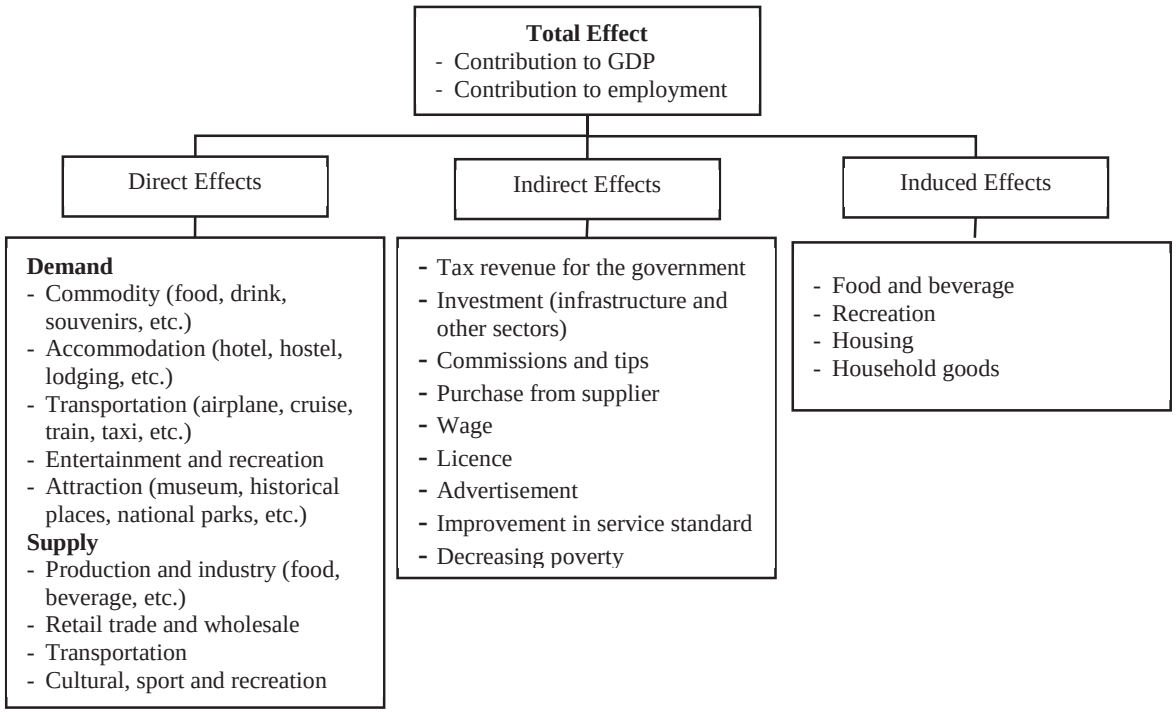


Figure 2. Various effects of tourism industry on economy

Direct effects refer to the initial spending by visitors on the goods and services they want to consume. Such impacts are called direct or immediate as they are directly related to tourism industry and include only immediate effects of additional demand in the host country. The immediate effects of tourism industry on economy are in association with demand and supply stimulation in the economy. As the number of tourists increases in the destination country, demand for accommodation, transportation, entertainment and attraction will increase as well. When demand increases, supply will shift up to support the increased level in the demand. For example, an increase in the number of tourist arrivals directly increases demand for restaurants, food and drink, transportation such as airlines, bus, railway and cruise ship, hotels and car rental companies, etc. Tourism consumption of the services at the destinations results in cash flow, which in turn generates revenue and jobs for people who are directly involved in the tourism industry. The additional restaurants' sales and associated changes in restaurant payments for wages, salaries, taxes, supplies and services are direct effects of traveler spending. That means this industry stimulate the whole economy (Eadington and Redman, 1991, Budeanu, 2007, Stynes, 1997).

In addition to direct effects, tourism industry can affect the economy through several channels beyond the direct income from tourist purchase. Indirect impacts refer to additional spending by suppliers as they purchase additional inputs in order to increase their production

to cover tourist demands. Indirect effects include growth in tax revenue for the government, job creation, innovation, and investment in the tourism-related industries. An example can be the agriculture sector, which provides food for hotels. Moreover, changes in sales, jobs and incomes in the tourism-related industries are categorized as indirect economic effects of tourism industry.

On the other hand, indirect effects may increase the price level (i.e., inflation) for local housing and retail. Unavoidably, a dramatic increase in price level will alter the quantity and quality of goods and services. Similarly, tax collection from tourist flow can adversely or positively affect the local service tax. Locals may pay less tax than before for schools, roads, etc., or they may pay more tax to finance the government to develop more infrastructures to cover additional tourists' needs and service costs (Stynes, 1997).

The last category includes induced effects, which are related to the consumers and their welfare. Tourist expenditure at the destination country creates income in the forms of households as wage or salary. Production, income, and employments resulting from spending such extra wages and salaries are included in the induced effects. More precisely, induced effects change economic activities resulting from household spending of income, which is earned directly, or indirectly as a result of tourism spending in destination (Stynes, 1997).

2.3.2. Social effects

In addition to the economic effect, one can also consider the effects of tourism industry on society. Traveling intermingles people from different countries with distinct cultures. Similarly, it is a potent tool for promoting dialogue and mutual tolerance among diverse nationalities by providing channels within which the streams of cross-culture exchange could be met. Social impact help travelers to understand and respect different cultures, develop positive attitudes among people, and change traditions (Spanou, 2007). Apart from positive impact, sometimes, strong tourism industries can cause illegal labor flow to the country, child labor (e.g. Malaysia) (Tang and Tan, 2015) and prostitution (e.g. Dubai, and Amsterdam). Consequently, the illegal flow of labor (such as the flow of Syrians and Iraqis to Turkey) produces cheap labor forces, accommodated in squalid places and given very low wages. Such negative social impacts of tourism industry result in the violation of human rights that in turn may cause gender discrimination, sexual abuse of female employees, commercial sexual exploitation of children, violation of labor standards, low wages and inadequate social protection (George and Varghese, 2007). A study by George and Varghese (2007) indicates

that consideration of human right in relevant sectors is prerequisite for having sustainable development in tourism industry.

Additionally, cultural and religious differences between tourists and locals can give way to blasphemy, quarrel, violence and hostility. Local people may think that satisfaction of tourist in the destination, deprive their own satisfaction (George and Varghese, 2007). The social disruption between travelers and the locals has a power to move the tourists to tourist-dense areas in the country (Budeanu, 2007). In the case of Norway, tourists primarily come from neighboring countries (Sweden, Denmark, Germany) with similar social and cultural behaviors as Norwegians, and thus Norway is not expected to be the witness of social disturbance because of tourism industry (Gössling and Hultman, 2006).

2.3.3. Environmental effects

Tourism industry has its own negative and positive effects on the destination environment. The negative effects of tourism industry, which are to certain extent inventible, have raised the concern of authorities, governments, and international organizations (Kaltenbron and Emmelin, 1993). For instance, in Southern European counties along the Mediterranean Sea environmental risks were observed because of tourist over-crowding (Kaltenbron and Emmelin, 1993, Spanou, 2007, Budeanu, 2007).

From the perspective of increased activities in tourism-related industries, the tourist flow to Europe has increased congestion, air, water and noise pollution, waste generation, loss of green belts and landscape changes, threats against endangered species of both animals and plants and smuggling endangered species. The increase in related industrial activities can also have effect on climate change, anthropogenic warming and sea level rise (Gössling and Hultman, 2006, Budeanu, 2007).

One of the major concerns about tourism-related activities is the transportation service from home to the destination and local transports in the host country. Such activities can result in considerable damage to the environment of the host country from the viewpoint of energy consumption, waste generation and environmental pollution (Hille et al., 2007, Høyer, 2000). For instance, in Norway, national tourism is responsible for 6.8% of energy use and it tends to grow (Hille et al., 2007). Similarly, in Sweden, tourist activities, especially transportation, are responsible for 10% of all CO_2 emissions while tourism industry has a contribution of only 2.8% to the GDP (Gössling and Hultman, 2006).

Apart from transportation, tourism industry activities provide facilities for tourists such as accommodation, restaurants, resorts, which is destructive for nature. The negative impact of tourism on environment is highlighted for Norway as it has a diversified and fragile environment from North to South (Bauer and Fischer Bogason, 2011). Norwegians have a very close relationship with nature and their environment. They live, harvest and spend their free time in the intact nature. The Norwegian government has been fully aware of the adverse impact of tourism on the environment for a long time. Hence, several countermeasures have been taken. For example, after World War II, the Norwegian authorities have discouraged land-based tourism expansion due to preservation of the environment (Gössling and Hultman, 2006). Moreover, considerable amount of environmental treaties have been ratified. The total number of environmental treaties in Norway is 24, which is the highest among other developed countries. In this regard, the Norwegian government insists on becoming a carbon-neutral country by 2050. This demonstrates the considerable care about protecting and preserving the environment in Norway (Blanke and Chiesa, 2013). In spite of such considerations, Norwegian tourism researchers admit that tourist travel is a major source of destructive environmental problems as Norway is mainly a natural-based destination (Høyer, 2000)

Yet such negative impacts can be minimized by developing a sustainable and efficient tourist industry within the limits of national and international environmental regulations and standards. The Norwegian Ministry of Trade and Industry (2012) describe sustainable tourism industry in the context of protection of the environment, social development and economic value creation. In addition, new concepts in tourism industry such as “responsible tourism” developed due to the increase in mass tourism in the 20th and 21st century, have highlighted the impacts of tourism on environment of the host country. For instance, Budeanu (2007) reports that responsible tourists do not demand products from endangered species. The consequences of responsible tourism are new phenomenon in tourism industry such as eco-labeled goods and services with high environmental standards that tend to preserve the environment and promote social awareness.

Tourism industry, on the other hand, may have positive effects on the environment of the host country. Optimistic researchers believe that tourist flow elevates the motivation for constructing artificial landscapes and preserving fragile ecosystem such as Everglades National Park in Florida (Davies & Cahill, March 2000).

2.4. Contribution of tourism industry in Norwegian Economy

Quantification of the economic contribution of tourism industry to the national economy is quite complicated. The UNWTO releases and forecasts the data and statistics for contribution of tourism industry to the GDP and employment for most of the countries. In order to evaluate the performance of industry one needs to discuss these statistical data.

A comparison among Norway and selected European countries and the world average, as presented in Table 1, reveals that Norway's performance in the tourism sector is lower in comparison to its rivals, especially two Scandinavian courtiers namely; Iceland and Sweden. For instance, in 2013 while in Iceland, the relative contribution of tourism industry to the GDP was 21.6%, in Norway that contribution was just 6.4%. The same trend is present for the relative contribution of tourism industry to the employment in Norway in 2013. While tourism industry has contributed 8.5% to the Norwegian employment sector, Iceland and Sweden were respectively 21.9% and 11.9%.

Table 1. Comparison of tourism industry relative contribution to economy in Norway and selected countries in Europe in 2013 (World Travel and Tourism Council, 2014)

Tourism industry and travel	**Relative contribution to GDP**	**Relative contribution to employment**
World average	**9.5%**	**8.9%**
Europe average	**8.7%**	**8.5%**
Iceland	21.6**%**	21.9**%**
Sweden	10.4**%**	11.9**%**
France	9.5**%**	10.5**%**
Denmark	7.2**%**	8.3**%**
Finland	6.8%	7.1%
Norway	**6.4%**	**8.5%**
Belgium	5.8 %	6%
Russian Federation	5.8%	5.5%
Poland	5.3%	5.1%
Germany	4.7%	5%

The contributions of tourism industry to the economy are classified into two areas: GDP and employment. Figure 3 depicts the proportion of overall Norway's GDP from 2004 to 2014 that stems from tourist activities. As can be seen, the portion of tourism industry in Norwegian

GDP is almost constant from 2004 to 2014. This may indicate that during 10 years no serious policy has been taken to utilize the tourist attraction potentials.

Figure 4 shows the portion of the GDP allocated to investment in tourism sector in Norway over the period from 2004 to 2014. As shown in this figure, the predicted amount of investment in 2024 will be even smaller in this sector in comparison to recent years. Low investment shows low enterprise development. The importance of investment in a specific industry is because investment is a component of aggregate demand. Therefore, any increase in investment boosts aggregate demand, which consequently causes economy to grow. The potential of economic growth is heavily dependent on its capital investment. According to the amount of investment in tourism industry and its trend, one can conclude that Norway has not recognized the potential impact of this industry on its economic growth.

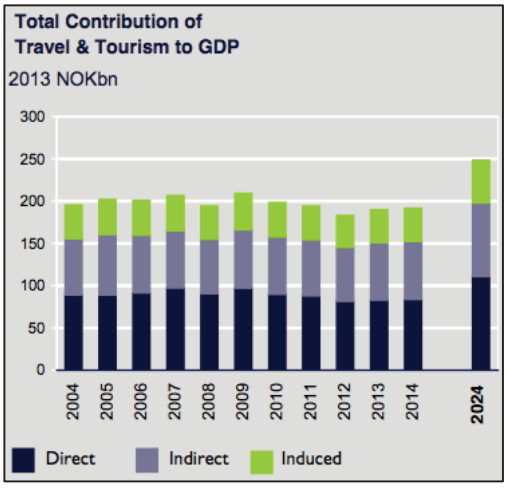


Figure 3. Total contribution of tourism industry to GDP in Norway (World Travel and Tourism Council, 2014: p 1)

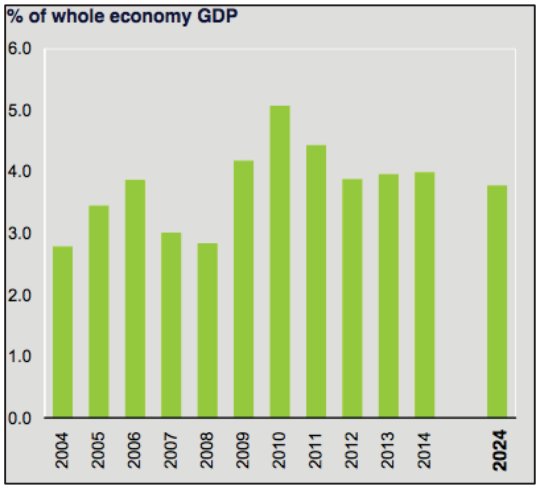


Figure 4. Relative capital investment in tourism industry in Norway (World Travel and Tourism Council, 2014: p 5)

To analyze the effect of tourism industry on the labor market, one may refer to the number of jobs created in tourism sector. Figure 5 shows the number of jobs related to the tourism industry in 2013 and 2014 and its forecasted value for 2024. Although tourism industry is a labor-intensive sector, as can be seen in Figure 5, the number of jobs in this sector in 2024 will be almost the same as in 2013 and 2014. In other words, no considerable job creation in this sector is detectable. The Norwegian Labour and Welfare Service (2013) reports that tourism sector suffers deeply from lack of both skilled and unskilled workers, such as chiefs and cooks, head waiters and bartenders, front desk staff, spa therapists, guides, cleaners and kitchen assistant.

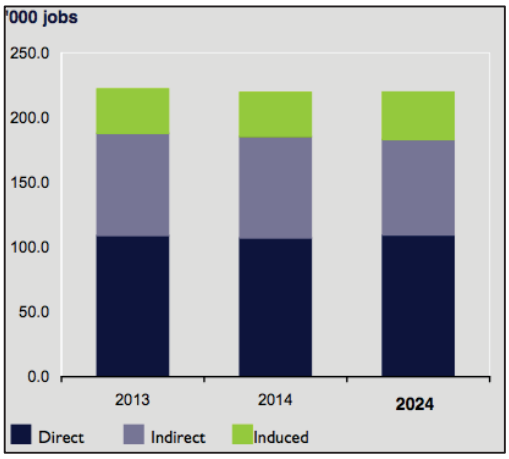


Figure 5. Total contribution of tourism industry to employment (World Travel and Tourism Council, 2014: p 4)

In addition to statistics, both Mei (2014) and Haukeland (1984) have discussed the low performance of tourism industry in Norwegian economy. By comparing the research dates, we can conclude that during thirty years mass tourism has not yet earned a significant part in the Norwegian economy. The only exception is the development of tourism industry in well-known regions, especially Lofoten.

To improve the contribution of tourism to the economy, one should note that the positive effects of tourism depend on the attractions, characteristics, capacity, and potential of the host destination to generate tourist flow (Mathieson and Wall, 1982, Lew, 1987). Investigating how the destination attracts tourists is helpful for future research and policy-making. The more attractions a destination can offer, the more probable it is to become a strong tourism market.

Lew (1987) states “in essence, tourist attractions consist of all those elements of a non-home place that draw discretionary travelers away from their homes”. Furthermore, he believes that without tourist attractions, the destination does not have any tourist flow. Every destination shares classes of unique characteristics. These characteristics are classified into the natural and environmental, social, cultural and attitudinal, political, economic, and technological features (Song et al., 2010, Lew, 1987, Dritsakis, 2004, Candela and Figini, 2012). Quality and the magnitude of such features can either encourage or hinder the development of tourism industry. For instance, from the viewpoint of natural and environmental features (e.g., wildlife, forests, lakes, mountains, beaches, deserts etc.), while in some countries winter and snow-covered mountains are the key tourist attraction elements, warm beaches, water sports, tropical forests, and historical places are key elements in other countries. In this regard, one needs to identify the elements that can influence on the

Norwegian tourism sector. While Norway competes in fishery, oil and gas industry, technology and other sectors with its rivals, competition in tourism industry should not be neglected. Due to shortage in literature on Norwegian tourism industry, the attractions are rarely mentioned in scientific works. Based on a literature review (Song et al., 2010, Lew, 1987, Dritsakis, 2004, Candela and Figini, 2012, Lovelock, 2007, Holloway and Taylor, 2006, Blanke and Chiesa, 2013), Figure 6 lists the most important categories of tourist attractions.

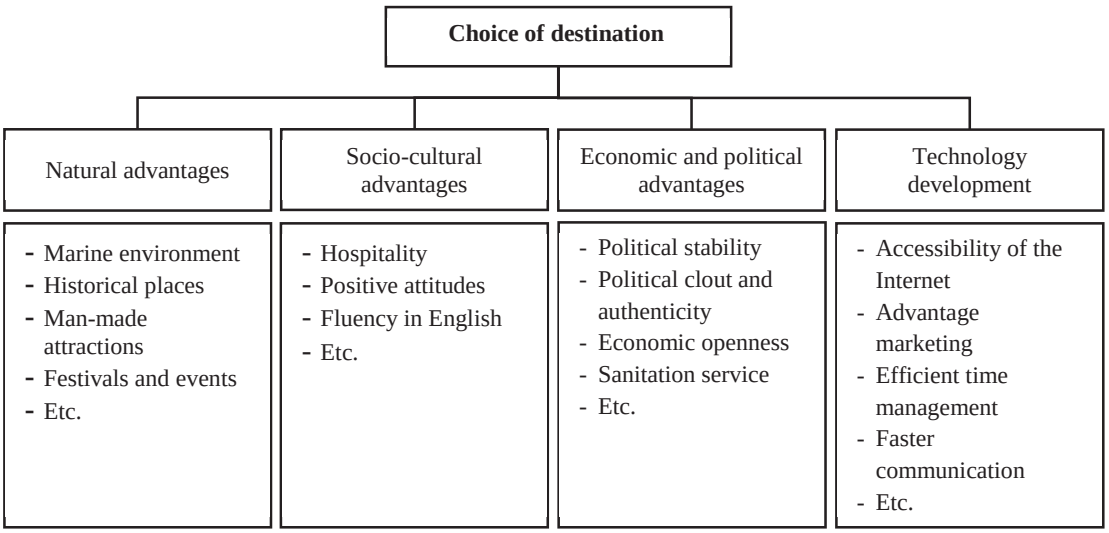


Figure 6. Factors influencing formation of tourism

Norway is a country full of adventures in terms of nature perspectives that can be used as a great potential to boost its tourism industry. For instance, Norway has a rich diversity of natural attractions such as fantastic wildlife, variety of coasts, over a thousand rivers, outstanding fjords, national parks and magnificent archipelagos. A study by Rønningen (2001) shows that a significant proportion of tourists are inspired by the unspoiled and clean Norwegian nature. Tourists, nowadays, are becoming more informed and more sensitive to pollution. Hence, they prefer to travel to the destination with high environmental quality and less contamination. For example, sea contamination in the Adriatic has considerably declined tourist arrival in that region (Buckley, 2011). According to the World Economic Forum report, Norway's quality of environment ranked 6 among 140 countries (Blanke and Chiesa, 2013). In addition, extensive coastline, world-class beaches, proximity to shore and consequently rich marine environment provide a great condition for doing a variety of aqua sports and enjoying fresh seafood.

Moreover, travelers have the opportunity to experience recreational and non-commercial

fishing. Unfortunately, however, the importance of marine tourism is underappreciated in Norway due to inadequate knowledge in tourism business (Lovelock, 2007). Since the marine environment is a natural resource, it needs smaller initial investments compared to other tourist attractions that might need their own infrastructure developments. For instance, in the United States, marine fishery tourism plays a crucial role in income generation and job creation especially for the locals. Among marine fishery tourism lovers in Norway, Lofoten is a preferred destination for upper socio-economic class travelers (Lovelock, 2007, Kaltenbron and Emmelin, 1993).

Regarding natural features, Southern and Northern parts of Norway have their own differences and beauties. Northern Norway is situated at the same latitude as Alaska and Siberia but it has moderate climate because of the Golf Stream phenomenon. This gives a potential for tourist attraction in this district. In Northern Norway, tourists have chance to visit Tromsø, known as the Arctic Gate, located above the Arctic Circle. The travelers, who seek variety in recreation, have the opportunity to get familiar with Sami culture and experience the Northern Lights, polar nights, the midnight sun, marine environment, and whale watching.

Apart from natural heritage, man-made and event attractions, both cultural and sport events, play crucial roles in tourist arrival (Candela and Figini, 2012). The Oslo Opera House, Flåm railway, Marathon events, Vikings festivals, and film festivals, are examples of the aforementioned attractions.

During the travel, social, cultural, and hospitality experiences are also perceived. George and Varghese (2007) imply that tourism is a psychosocial phenomenon. From the cultural and social perspective, the behavior and attitude of people towards travelers have a considerable impact on the tourist flow. A warm welcome and good behavior from locals makes the trip even more enjoyable to the travelers and they feel like home in the destination. In contrast, unfriendly and impolite behavior will result in hostility and social disturbance (Budeanu, 2007). According to the World Economic Forum, Norwegian attitude toward tourists are is of the best among other nations (Blanke and Chiesa, 2013). This can be highlighted in terms of Norwegian hospitability, approachability, politeness and fluency in English that all can act as positive elements in attracting tourists.

In terms of political features, one can argue that diplomatic relations between the host and the origin country, and stability in the host country's political condition can affect the tourist flow. Long-term political stability will make the destination relatively more attractive both for the investors and tourists (Holloway and Taylor, 2006, Burger et al., 2001). The

impact of political instability, strikes, terrorism, and ethnic wars in countries such as Syria, Iraq, and Ukraine (in the time of this study) on reduction of tourism demands in such countries is an unquestionable fact. Safety is a major concern for tourists. High safety, gives the travelers the chance to camp out in a tent freely, move and travel without concerns and experience an adventurous trip (Gössling and Hultman, 2006). Moreover, economic stability follows political stability. Stability in money value, low fluctuating exchange rate and economic openness are important factors in selecting a destination. In addition to this, the more stable a country is, the more the government can provide amenities and facilities in different aspects.

Norway has a considerable international reputation, political clout and authenticity, as well as political and economic openness with high social safety, low crime rate, and comparatively low theft rate. Good economic condition in Norway provides well-developed infrastructures such as railways cruise lines, harbors, airports and airlines, as well as coastal developments, which facilitate human intermingling and interaction. Moreover, the strong economy in Norway provides high sanitation conditions and health systems (Blanke and Chiesa, 2013).

Nowadays, travelers prefer to purchase tourism products such as tour tickets directly from the suppliers on the Internet rather than travel agencies. The accessibility of Internet to search for information and make reservations can positively affect tourists' satisfaction levels. In this regard, Norway is a country with high technology transfer that plays crucial roles in attracting tourists (Blanke and Chiesa, 2013).

Considering the above-mentioned discussion, the barriers that stop or reduce the tourist arrivals in Norway are quite rare. However, Norway has not yet been able to exploit its full potential in tourism industry and its consequent contribution to labor market and business (Mei et al., 2010, Reve and Sasson, 2012, Norwegian Ministry of Trade and Industry, 2012, Mei, 2014, Jacobsen and Espelien, 2011, Haukeland, 1984).

Some researchers (Mei et al., 2010, Reve and Sasson, 2012, Norwegian Ministry of Trade and Industry, 2012, Mei, 2014, Jacobsen and Espelien, 2011, Haukeland, 1984, The Norwegian Labour and Welfare Service, 2013) discuss the elements that stop Norway from competing in tourism industry resulting in low effectiveness of marketing in this sector. Such elements are discussed as follows.

- Heavy dependency on oil and gas industry may prevent Norway from paying attention to tourism sector. Hence, tourism industry in Norway has not been a serious scholarly field. Second, high salaries make this labor-intensive industry less profitable for the business managers.
- In Norway, while on average 30% of tourism revenues go to salary payments, this is about 14% of revenue in other businesses and financial sectors. This, as a result, may encourage the companies and business managers to invest in industries that are more beneficial. Those who remain in this industry are small or medium size enterprises (SME) that emphasize innovation and the high quality of their service. They offer fragmented sales with limited resources. The amateur labor force in this industry is prevalent in comparison to skilled employees; hence lack of professionalism is tangible in this industry.
- Considering shortage in labor force in Norwegian tourism industry, the labor-intensive nature of tourism industry limits the rate of substitution of labor and capital. That means, only capital accumulation and investment cannot improve the condition.
- High cost in Norway makes traveling less affordable for foreigners to utilize. However, Rønningen (2001) states that only a small proportion of travelers in Norway care about Norwegian price level.
- Moreover, weak cluster attributes, disconnection among the related businesses, lack of persuasive advertisement, inadequate knowledge, unprofessional business planning, and poor decisions are other obstacles in this industry. Disunity of the business sector and mismanagement can steer discontinuity of tourist plans. A combination of these factors can cause low effectiveness of marketing to attract tourists.
- Travelers tend to travel toward warmer destinations. Limited and short warm seasons as well as lack of year-round temperate climate may reduce the tourist arrivals.

In spite of the above-mentioned shortcomings, Norwegian authorities have tried to improve tourism industry. Norway's revenue from tourism industry has tripled since 1970 (Jacobsen and Espelien, 2011). In addition, the Norwegian government is fully aware of the importance of innovation in tourism industry and supports the innovation in small and medium size (SME) enterprises, networking, collaboration, and funding (Mei et al., 2010). Planning to increase the tourist flow to the destination at all levels needs accurate strategies. Various tourism policies have been ratified over the years in Norway. A summary of such policies is listed in Table 2.

Table 2. Tourism-related policies, strategies and programs in Norway

Year	Policy, Strategy, Program	Reference
1868	Foundation of Norwegian tourist organization	(Gössling and Hultman, 2006)
1888	Proposition of the alternation in law of salmon and trout catching by foreigners in order to preserve the natural resources, made by Norwegian Inspector of Fishery, Mr. Landmark	(Lovelock, 2007)
1893	Imposition of having license for hunting upon British sportsmen	(Lovelock, 2007)
1912	Foundation of The Norwegian School of Hotel Management, as the second oldest hotel school after Ecole Hoteliere in Lausanne, Switzerland (1893), aiming at educating and training talented students in tourism business	(www.uis.no)
1957	Permission of free movement of anybody in uncultivated nature of Norway. This is known as law of "Friluftsloven"	(Gössling and Hultman, 2006)
1961	Becoming a member of Organization for Economic Cooperation and Development (OECD) countries aiming at developing economic and social policies, including tourism policies	(www.oecd.org)
1980	Releasing the first document relating tourism policies and strategies at national level was; (1980 is known as the starting year for tourism analysis)	(Mei et al., 2010)
1985	Foundation of "Western Norway Research Institute" or "Vestlandforsking" that focuses on broad range of fields including tourism studies	(Mei et al., 2010)
1994	"Tourism Plan": Development of tourism plans in Svalbard; It Applies the "Social learning planning model" of Friedman to promote the tourism marketing through a planning process	(Gössling and Hultman, 2006)
1997	"Tourism Strategy" referring to best protection of Svalbard	(Gössling and Hultman, 2006)
1998	"Common Sense Rule" project, aiming at promoting business culture and train the tourism firms to follow nature guide program	(Gössling and Hultman, 2006)
2001	Accepting the Schengen agreement to facilitate free movement of people	(www.europa.eu)
2002	Implementing regulations related to the use of motor vehicles in Svalbard by Ministry of Climate and Environment to protect the environment in Svalbard	(www.government.no)
2004	Establishment of Innovation Norway, which is a government-owned organization; This organization helps Norwegian government to make innovation and progress in Norwegian enterprises.	(Mei et al., 2010)

Table 2. Continued		
Year	**Policy, Strategy, Program**	**Reference**
2005	Soria Moria Deflation: Cooperation of Arbeiderparti Sosialistisk Ventreparti and Senterpartiet (Labor party, Center party and Socialist Left party) which resulted in gaining more attention from the government to a variety of industries including tourism industry.	(Mei et al., 2010)
2006	"High North strategy"; This strategy tries to take advantage of the opportunities in the High North, including the promotion in tourism industry in Northern Norway as well as other fields.	(Norwegian Ministry of Foreign Affairs, 2006)
2006	Implementing regulation related to an environmental fee for tourist visiting Svalbard; Each visitor should pay 150 NOK to take a journey to Svalbard. The goal of this regulation is to maintain Svalbard's unique wilderness environment and cultural heritage. The collected fee will be donated to the Svalbard Environmental Protection Fund.	(www.government.no)
2007	Lunching the strategy so called "Valuable Experience" by Ministry of Trade and Industry; The outcome of this strategy is more wealth creation, job creation and achievement of sustainable tourism industry in Norway	(Organization for Economic Cooperation and Development, 2012, Mei et al., 2010)
2008	Norway joined the Schengen agreement and start participation in the Schengen cooperation	(www.europa.eu)
2008	Publishing the first paper on national innovation policy in 2008; although the main focus of paper was not innovation in tourism, but contributed to recognizing the importance of innovation in tourism in order to have strong competition in this sector.	(Mei et al., 2010)
2009	Introduction of "pilot destination" or "test-destination" strategy by Innovation Norway to commercialize particular areas; Pilot destinations refer to municipal areas with considerable tourism marketing. Innovation Norway employed this strategy for Vega, Trysil, Lærdal and Røros.	(www.regjeringen.no)
2012	Lunching the new version of "Valuable Experience" which includes new national strategies has launched	(Organization for Economic Cooperation and Development, 2012)

2.5. Tourism demand models

Tourism demand, which is a subset of consumer theory, shows the micro economic base of the tourist study. Frechtling (2001) defines tourism demand as “a measure of visitors’ use of a good or service”. The implication of tourism demand originates from the demand definition, which implies consumer’s desire and willingness to pay a price for a specific good or service uring a particular period. Particularly, tourism demand at the destination indicates the relationship between the number of overnight-stays and the daily price of the holiday. Therefore, the tourism phenomenon is consistent with the “law of demand” which satisfies the inverse relationship between quantity and price in tourism demand (Candela and Figini, 2012). Traveler’s choice of vacation is associated with the destination country, how long to stay, how much to spend, choice of transportation, and choice of accommodation. These factors can be analyzed econometrically.

Moreover, expectations and preferences play a notable role in tourism demand. The consumer has various options to choose host country with varying degrees of substitution. More precisely, destinations are weakly separable from each other. When travelers arrive in the host country, they start consuming goods and services subjected to income and time constraints. These constraints change the pattern of holidays among the people. Tourists obtain utility and satisfaction from spending time and consuming tourism services at their destination according to its features such as climate, landscape and scenery, social safety and cultural aspects. The tourist’s utility function exposes the preferences for national or international traveling and other goods and services such as foods, transportation, accommodation, etc. Given the importance of elasticity in the economics of tourism industry, own price elasticity, cross price elasticity, elasticity related to available money, income elasticity of tourism expenditure should be taken into consideration. In this regard, tourism demand estimation gains more concerns.

On the other hand, suppliers of tourism demand also need to specify the optimal allocation to determine how much to invest (Eadington and Redman, 1991, Candela and Figini, 2012). In this regard, evaluation of tourism demand has a crucial role in decision-making for businesses and governments to formulate and make appropriate policies in marketing, production, financial planning and short, medium, and long-run investments to avoid shortages or surpluses in tourism products. However, unpredictability of economic trends and outside events make forecasting a challenging task.

Until the 20th century, there was no systematic measurement of tourism as the governments and the experts had not discovered the importance of tourism industry. Since the second half of the 1980s, research in tourism with scientific techniques has started to develop in academic journals and research centers (Towner, 1988, Sinclair and Stabler, 1997).

In order to develop a model to describe tourism demand, one needs to measure tourist flow. Preparing questionnaires to acquire required data from tourists is a common method of data gathering in tourism demand studies. There are various kinds of surveys such as enterprise surveys, accommodation surveys, household surveys and frontier surveys. In order to get more reliable estimates, sometimes it is suggested to use the combination of these surveys (Candela and Figini, 2012). Other techniques are measuring arrivals, overnight stays, average length of stay, and tourism expenditure in the host country. Arrival implies the number of visitors reaching the destination, regardless of the duration of their visit (Song et al., 2010). Overnight stay refers to the total number of nights that the traveler spends in the destination. Average length of stay refers to the average number of nights that visitors spend in the destination. Tourism expenditure is the amount of money paid by tourists in order to purchase goods and services before traveling (such as visa application fee) and expenditures during holiday (such as meal and sightseeing expenditure) (Candela and Figini, 2012, Song et al., 2010).

There are different techniques, using different explanatory variables to model the tourism demand that is reviewed and discussed by several researchers (Witt and Witt, 1995, Lim, 1997, Song et al., 2010). Methods such as multiple regression, genetic regression, single exponential smoothing, neural network, Almost Ideal Demand System (AIDS), vector autoregressive (VAR) model, error correction model (ECM) and survival models are used to estimate tourism demand in different countries (Burger et al., 2001, Law and Au, 1999, Li et al., 2004).

The most commonly used explanatory variables are income, exchange rate, and relative prices (Song et al., 2010). The research indicates that various factors such as data frequencies (e.g., annual, monthly and quarterly) and the length of the forecasting horizons result in variations in the performance of the forecasting models. Thus, no single model has the power to consistently outperform the other models.

Chapter 3. Survival analysis

3.1. Introduction to survival models

The history of an individual, a government and a machine can be described by a sequence of events. This history includes, for instance, people graduating from university, finding a job, getting married, having children and retiring, a government is being formed, passing new bills, facing steep budget deficits, etc. Such events can also refer to the failures and repairs of a machine that runs in order to produce (Van den Berg, 2001, Thrane, 2012). Survival analysis answers questions such as why some patient suffering from a particular type of cancer live longer than other patients, why some tourists tend to stay shorter at a specific destination in comparison to other travelers, why some governments experience lengthy strikes than other countries, and why a machine's life span is longer than another one.

Survival data are generated by "failure time process" of units such as individuals, governments, and machines, which are observed at some specific time and are at risk of transitioning to a new state at any given point in time (Van den Berg, 2001, Lancaster, 1992). Appropriately, survival analysis is a useful tool to understand how a set of explanatory variables can cause variations in the time at which an event may occur. An event in survival models refers to a change or transition from one state to another. For example, an event is time that a state at war transitions to peace, hospitalized person takes to be discharged, and true to this study, the time a tourist takes to leave the destination country and returns home.

In Biomedicine, the application of survival analysis deals with estimation and observation of time it takes for lab animals to die due to specific diseases, time for a woman to give birth, and length of life, which all experience transitioning to a new state (Van den Berg, 2001). In engineering, survival analysis is known as "reliability analysis" or "failure time analysis", which models the time it takes for machines or equipment to break down (Murthy et al., 2004). For example, reliability engineers employ duration models to estimate the cost of oil spills by a specific set of explanatory variables such as climate condition, proximity to shore, the availability of facilities.

Social sciences is a different field, which employs survival analysis to identify the duration of mortality, fertility, life expectancy, unemployment, business cycles, inflation, war, strike and so forth. Recently empirical analysis of survival models, also known as duration models, has become very popular among econometricians, when time is the variable of interest. In tourism studies, researchers are interested in the time spent in a specific

destination and the effect of socio-economic variables on length of stay at the destination (Barros and Machado, 2010, Martínez-Garcia and Raya, 2008, Thrane, 2012, Gokovali et al., 2007)

The core of survival analysis is time. Hence this method is the best suited for modeling and analyzing the duration events such as length of stay (Thrane, 2012, Barros and Machado, 2010). Applying standard techniques such as linear regression to data, which generated under the "failure time process", can cause severe problems such as bias and the inadequacy in information. The reasons behind such problems are discussed in the following section.

Survival analysis data have some notable specifications which make them incompatible with traditional multiple linear regression techniques such as Ordinary Least Square. First specification is related to censored data in duration models which Ordinary Least Square method is not able to distinguish between censored and uncensored data (Cleves et al., 2010). Survival data analysis is based on following the subject over time until "the change in state" of the subject of interest during the observation time is noticed. If the subject does not experience the change in state, this will be considered right-censored data. Left censoring occurs when one does not observe the start of the event. That means censored data embarks insufficient and incomplete information (Cleves et al., 2010, Lindeboom and van der Klaauw, 2014). To illustrate, for instance, right-censored data, suppose that a survey is conducted to observe the LOS for a number of tourists during a selected time period. In some cases, a tourist is not sure when he or she will leave the destination. The observer may also lose track of some tourists and get incomplete information. In such cases, the observer knows the arrival date and time of such tourists, but does not when they have left the country (Thrane, 2012, Lancaster, 1992, Van den Berg, 2001).

Second, applying regression models to survival data only gives the mean duration (Lindeboom and van der Klaauw, 2014), while one may be interested in the effects of socio-economic variables on probability of leaving the destination country.

Besides, Ordinary Least Square may produce negative predicted values, which has no meaning for the LOS. Duration models do not predict negative values for the dependent variables, which show the duration until the occurrence of event. More precisely, time-to-state-transition is always positive in survival data while the linear regression can predict negative values (Cleves et al., 2010, Thrane, 2012).

In this dissertation, we adopt the terminology of survival analysis (Cleves et al., 2010, Van den Berg, 2001, Lancaster, 1992, Gokovali et al., 2007) listed in Table 3.

Table 3. Terminologies in tourism demand survival analysis

Terminology in survival analysis	**Terminology in tourism demand concept**	**Description**
Event	Event	The event of interest is leaving Norway.
Survival state	Survival state	The state referring to staying in Norway.
Failed state	Left state	The state referring to leaving Norway.
Time-to-failure (survival time)	Time-to-leave (staying time)	The time during which a tourist stays in Norway. In this study, survival time is denoted by LOS, i.e., length of stay
Survival probability	Staying probability	The probability that a tourist stays in Norway for a certain time under a given set of explanatory variables.
Failure probability	Leaving probability	The probability that a tourist leaves Norway before a certain time under a given set of explanatory variables.
Hazard rate (instantaneous risk)	Leaving rate (instantaneous risk of leaving)	The probability that a tourist leaves Norway slightly after the time he or she has spent in Norway. In other words, the probability that a tourist leaves Norway before time t_2 on the condition that he or she has stayed in Norway for the time t_1 in such a way that $\lim (t_2 - t_1) \to 0$
Mean time to failure	Mean time to leave	The average time that tourists stay in Norway, also known as mean survival time.

It should be noted that all the aforementioned terms are discussed considering the effects of explanatory variables. The following sections discuss the underlying concepts of survival analysis from a mathematical viewpoint.

3.2. Survival function

Suppose T is a non-negative continuous random variable with a stochastic behavior, expressing the spells experienced by a certain subject in a certain state. In this study, T is referred to LOS in Norway. If we denote the realizations of T by t, the cumulative distribution function of T can be written as (Van den Berg, 2001, Lancaster, 1992),

$$F(t) = \Pr(T \leq t) = \int_0^t f(u)du \tag{1}$$

where $f(t)$ is the probability density function of T. In Equation (1), $F(t)$ is the probability that the subject changes its states before time t. From tourism study viewpoint, thus $F(T)$ denotes the probability that a tourist exits from its current state (i.e. staying state) and enters a new state (i.e. left state) before time t. In other words, $F(t)$ gives the probability that a tourist leaves Norway before time t.

The survival function of T is defined as $S(t) = 1 - F(t)$, or (Van den Berg, 2001, Lancaster, 1992)

$$S(t) = \Pr(T > t) = \int_t^{\infty} f(u)du \tag{2}$$

which is the probability that a tourist stays in Norway at least until time t. More precisely, the survival function reports the probability that there is no failure prior to t. When $t = 0$, the survival function is equal to 1. As time goes to infinity survival function approaches to zero. As a result, survival function is non-increasing monotone function of t.

3.3. Hazard function

Another fundamental concept in duration model is hazard function or hazard rate, denoted by $\lambda(t)$ that refers to the instantaneous probability that the subject leaves its current state at time t, conditional upon that it has been staying in that state by that time. In tourism demand context the hazard rate gives the probability that a tourist leaves Norway at time t, given that he or she has been staying from time zero until time t. Mathematically speaking the hazard rate is given by (Van den Berg, 2001, Lancaster, 1992).

$$\lambda(t) = \lim_{dt \to 0} [\Pr(T \in [t, t + dt] | \, T \geq t)/dt] \tag{3}$$

It can be proved that hazard rate can be rewritten as,

$$\lambda(t) = f(t)/[1 - F(t)] = f(t)/S(t) \tag{4}$$

According to Equation (1), the probability density function can be obtained by differentiating the cumulative distribution function with respect to time, $f(t) = d(F)/dt = -d(S)/dt$. By introducing this relationship into Equation (4), and then integrating both sides of the equation, one can develop the survival function as,

$$S(t) = \exp\left[-\int_0^t \lambda(u)du\right] \tag{5}$$

The hazard function can obtain the conditional probability that tourist will leave the destination on any “next day”. The hazard function value can vary between zero and infinity. When hazard function is zero that means there is no risk at all. In contrast, when hazard function approaches infinity the failure is certain at that time. Over time, hazard rates can take

different trends such as increasing, decreasing or even constant. For instance, when the hazard rate is decreasing, the longer the tourist stays in Norway, the less probable it is that the tourist will leave Norway at that time. That means that the tourist with a shorter stay in Norway, leaving the destination is more likely in comparison to the tourist who stays longer (Lindeboom and van der Klaauw, 2014). It is logical to assume that with high hazard rates, fewer tourists stay in Norway while low hazard rate will steer more tourists staying in Norway. This shows the relation between survival function and hazard function.

3.4. Proportional Hazard model

In duration models, one can also include a number of explanatory variables or covariates that affect the behavior of the random variable T. The proportional hazard (PH) model is one of the most popular models that can be used to account for the effects of the explanatory variables on the survival probability of an individual and its other important characteristics, such as hazard rate, mean-time-to-failure, etc. The term "proportional" refers to the underlying assumption that the ratio of the hazard rates for any two individuals of the same population remain constant over time (Cleves et al., 2010) i.e.,

$$\lambda(t, \boldsymbol{x_1})/\lambda(t, \boldsymbol{x_2}) = constant \tag{6}$$

where $\lambda(t, \boldsymbol{x_1})$ and $\lambda(t, \boldsymbol{x_2})$ are the hazard rates of two individuals under given sets of explanatory variables $\boldsymbol{x_1}$ and $\boldsymbol{x_2}$, respectively.

In PH models, the covariates are assumed to be time-independent. If such covariates are functions of time, alternative models such as time-varying covariate models or accelerates life models should be used (Cleves et al., 2010, Martínez-Garcia and Raya, 2008). In this study, the covariates are treated as time-independent. Some of them, such as gender have a time-independent nature. For the rest of them, the changes over time are negligible, as the length of the periods spent in the host country is in the range of days. For instance, the age of a tourist can be considered constant during his or her visit.

In presence of time invariant covariates, hazard function at time t is conditional on the explanatory variables, and thus is given by (Lancaster, 1992, Van den Berg, 2001),

$$\lambda(t, \boldsymbol{x}) = \lim_{dt \to 0} [\Pr(T \in [(t, \boldsymbol{x}), (t + dt, \boldsymbol{x})] | \, T \geq t)/dt] \tag{7}$$

where $\boldsymbol{x}$ is the vector describing a set of covariates. In PH models the hazard function is defined as the multiplication of a base hazard rate $\lambda_0(t)$ and a term describing the effects of explanatory variables, which is often given using an exponential function, $\exp(\boldsymbol{\alpha x})$. The hazard function in PHM is given by (Van den Berg, 2001, Lindeboom and van der Klaauw, 2014),

$$\lambda(t, \boldsymbol{x}) = \lambda_0(t) \exp[\boldsymbol{\beta x}] = \lambda_0(t) \exp(\textstyle\sum_{i=1}^{n} \beta_i x_i) \tag{8}$$

where the $\boldsymbol{\beta}$ is a vector expressing the coefficients of explanatory variables vector $\boldsymbol{x}$ and $\lambda_0(t)$ is baseline hazard which has some functional form. Using Equation (5), survival function can be defined as a function of time and covariates,

$$S(t, \boldsymbol{x}) = \exp\left[-\textstyle\int_0^t \lambda(u, \boldsymbol{x}) du\right] = \exp\left[-e^{\sum_{i=1}^{n} \beta_i x_i} \textstyle\int_0^t \lambda_0(u) du\right] \tag{9}$$

If β_i is positive, an increase in x_i rises the hazard rate and thus reduces the survival probability. Similarly, for a negative β_i an increase in x_i reduces the hazard rate and thus increases the survival probability.

The covariates may have different types. One classification is observable and non-observable covariates. An observable covariate refers to the one that can be measured and described quantitatively. A mixed proportional hazard (MPH) model is a subset of PH models that characterizes the hazard function by a finite number of observed and unobserved explanatory variables. Unobserved explanatory variables can be shown by the heterogeneity term v which measures errors in both T and $\boldsymbol{x}$ (Van den Berg, 2001, Lancaster, 1992). The hazard function for this model is multiplicative and can be written as below:

$$\lambda(t, \boldsymbol{x}) = \lambda_0(t) \exp(\boldsymbol{\beta x})\, v = \lambda_0(t) v \exp(\textstyle\sum_{i=1}^{n} \beta_i x_i) \tag{10}$$

For instance, Mei (2014) argues that Norway is a boring and expensive country, and thus, tourists my not be encouraged to consider it as a destination for pleasure. Such bored feelings affecting the decision of the tourists, and thus the probability of staying in Norway can be considered an unobservable covariate. In social and humanity sciences, defining an unobservable covariate is a challenging task. Hence, this study only deals with the observable covariates.

Another classification of the covariates refers to being categorical or continuous. For instance, the total amount of money that a tourist spends for his or her travel is continuous, while the gender of the tourist or the transportation types are categorical.

To analyze the effects of the covariates on the hazard function and survival probability, one needs to estimate the set of coefficients $\boldsymbol{\beta}$**.** From the viewpoint of parameter estimation technique, PH models can be divided into semi-parametric and parameter categories, depending on the estimation technique of baseline hazard rate.

3.4.1. Semi-parametric models

In semi-parametric PH models, the baseline hazard $\lambda_0(t)$ functional form may not follow a specific distribution such as Exponential or Weibull. In this case, the maximum likelihood procedure will not give a consistent estimation, as it requires full specification of the baseline hazard rate. Hence, in order to develop semi-parametric models, binary analyses should be performed based on the rank order in which an individual leaves its current state. During such an analysis, the unspecified $\lambda_0(t)$ will be cancelled from calculations at each failure times. The most commonly used semi-parametric model is cox's partial likelihood that estimates the coefficient β_i (Lindeboom and van der Klaauw, 2014, Cleves et al., 2010). Using a semi-parametric approach, one can estimate the cumulative hazard and smoothed hazard corresponding to the set of available observations. The effects of the covariates cannot be analyzed directly on the hazard function or survival probability. Instead, their effects are expressed in terms of changes in the ratios of hazard rates. In other words, semi-parametric models compare subjects at the times when failures occur (Cleves et al., 2010).

3.4.2. Parametric models

In parametric PH methods, a specific distribution is assumed for the baseline hazard function, $\lambda_0(t)$. The advantage of parametric models is that they can exploit rich information in the data in comparison to semi-parametric models (Cleves et al., 2010). By applying parametric methods, one can directly analyze the effects of covariates on the hazard rate or survival probability. For instance, it is possible to estimate the hazard rate or survival probability for a given set of covariates or analyze the sensitivity of the survival probability with respect to a certain covariate. One may also report the quantiles of the estimated probabilities or hazard rates, such as 5^{th}, 50^{th}, and 95^{th} quantiles. The most common distributions used in parametric models are exponential, Weibull, and Gompertz distributions. The coefficients of the covariates and the parameters of the assumed distribution can be obtained using maximum likelihood estimation (MLE) (Cleves et al., 2010, Lindeboom and van der Klaauw, 2014).

Exponential distribution: In exponential distribution, baseline hazard function $\lambda_0(t)$ is constant, i.e. $\lambda_0(t) = \lambda_0$ (Cleves et al., 2010, Liu, 2012). In this case, the duration until the event occurs has an exponential distribution. Thus,

$$\lambda(t, \boldsymbol{x}) = \lambda_0 e^{\sum_{i=1}^{n} \beta_i x_i} \tag{11}$$

Substituting Equation (11) into Equation (9) gives,

$$S(t, \boldsymbol{x}) = \left[e^{-\int_0^t \lambda_0(u)du}\right]^{e^{\sum_{i=1}^{n} \beta_i x_i}} = e^{-\left(\lambda_0 e^{\sum_i^n \beta_i x_i}\right)t} \tag{12}$$

However, it is more convenient to add another term in $\sum_i^n \beta_i x_i$, as $\beta_0 x_0$ that represents the constant failure rate of λ_0. In the case of exponential distribution, $x_0 = 1$, and $\beta_0 = \ln \lambda_0$, and thus, Equations (11) and (12) can be simplified into,

$$\lambda(t, \boldsymbol{x}) = e^{\sum_{i=0}^{n} \beta_i x_i} \tag{13}$$

$$S(t, \boldsymbol{x}) = e^{-\left(e^{\sum_{i=0}^{n} \beta_i x_i}\right)t} \tag{14}$$

Having a constant hazard rate means the probability that an individual leaves the current state is constant, on the condition that it has experienced the current state for a certain period. However, this assumption does not hold in tourism studies because the longer the tourist stays in the destination country, the higher the probability that he or she will leave the country the next day. This issue is demonstrated later in this chapter in the section "testing the PHM assumptions".

Gompertz distribution: Gompertz distribution is one of the most widely used distributions to describe human mortality and survival by mathematical biologists and demographers (Liu, 2012). Considering the explanatory variables, Gompertz hazard rate is given by (Lenart, 2014, Cleves et al., 2010)

$$\lambda(t, \boldsymbol{x}) = a e^{bt \sum_{i=1}^{n} \beta_i x_i} \tag{15}$$

where a and b are scale and shape parameters, respectively. Note that if $b = 0$, Gompertz distribution changes into an exponential one. Substituting Equation (15) into Equation (9) gives,

$$S(t,\boldsymbol{x}) = e^{-\frac{a\sum_{i=1}^{n}\beta_i x_i}{b}(e^{bt}-1)} \tag{16}$$

By defining $x_0 = 1$, and $\beta_0 = a$, Equations (15) and (16) can be rewritten as,

$$\lambda(t,\boldsymbol{x}) = e^{bt}e^{\sum_{i=0}^{n}\beta_i x_i} \tag{17}$$

$$S(t,\boldsymbol{x}) = e^{-\frac{e^{bt}-1}{b}\sum_{i=0}^{n}\beta_i x_i} \tag{18}$$

Depending on its scale parameter a, Gompertz hazard rate can be increasing, decreasing, or constant.

Weibull distribution: The hazard rate of a Weibull distribution can either increase or decrease monotonically by time. The hazard rate of a Weibull distribution with the shape and scale parameters of p and η is given by (Liu, 2012, Cleves et al., 2010, Murthy et al., 2004).

$$\lambda(t,\boldsymbol{x}) = \frac{p}{\eta^p}\, t^{p-1}e^{\sum_{i=1}^{n}\beta_i x_i} \tag{19}$$

Note that Weibull shape parameter is dimensionless, and η has a time unit. According to Equation (11), an exponential distribution is a special case of Weibull distribution when $p = 1$. Substituting Equation (19) into Equation (9) gives,

$$S(t,\boldsymbol{x}) = e^{-\left(\frac{t}{\eta}\right)^p e^{\sum_{i=1}^{n}\beta_i x_i}} \tag{20}$$

By defining $x_0 = 1$, and $\beta_0 = \ln(1/\eta^P)$, Equations (19) and (20) can be rewritten as,

$$\lambda_0(t,\boldsymbol{x}) = pt^{p-1}e^{\sum_{i=0}^{n}\beta_i x_i} \tag{21}$$

$$S(t,\boldsymbol{x}) = e^{-t^p e^{\sum_{i=0}^{n}\beta_i x_i}} \tag{22}$$

Weibull hazard rate can take different forms based on its shape factor. Figure 7 shows hazard rates of Weibull, Exponential, and Gompertz distributions for different values of their parameters. As can be seen Weibull and Gompertz distributions are able to model decreasing, increasing and constant failure rates. Weibull distribution, however, can take three different types of increasing rate: constant, increasing, and decreasing slope. Murthy et al. (2004)

discusses a verity of Weibull distributions and concludes that Weibull is one of the most flexible distributions and widely used in different concepts being able to map a variety of failure rate types.

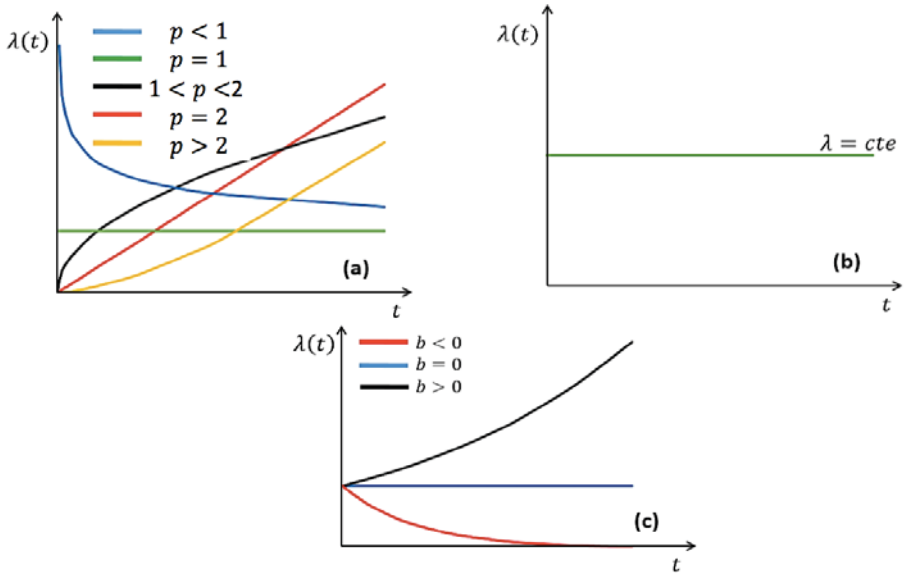


Figure 7. Hazard rates of (a) Weibull, (b) exponential, and (c) Gompertz distribution for different values of parameters

3.5. Testing proportional hazard model assumption

Most of the previous studies on application of duration models in economic-related topics do not verify the proportionality assumptions (Burger et al., 2001). In duration models, testing PH model assumptions can help to achieve a more proper model, and serves the same concept as model specification examination. By testing PH model assumption, one investigates that whether there is any evidence supporting that the model suffers from any misspecification or not (Cleves et al., 2010).

PH models assume that the hazard ratio of two individuals are constant over time (Cleves et al., 2010).

$$\frac{\lambda(t,\boldsymbol{x_1})}{\lambda(t,\boldsymbol{x_2})} = \frac{e^{\sum_{i=1}^{n}\beta_i \hat{x}_{1,i}}}{e^{\sum_{i=1}^{n}\beta_i \hat{x}_{2,i}}} = e^{\sum_{i=1}^{n}\beta_i(\hat{x}_{1,i}-\hat{x}_{2,i})} = constant \tag{23}$$

Equation (23) implies that $\partial\beta_i/\partial t = 0, i = 1,2,\dots,n$. If Equation (23) does not hold, the proportionality assumption is said to be rejected, and thus alternative methods should be sought after. The rest of this section discusses different proportionality tests that are used in this study.

3.5.1. Kaplan-Meier curves

A Kaplan-Meier curve is based on determining the number of tourists that are at risk of leaving Norway at a certain time, and the number of those who actually leave Noway. When explanatory variables are independent of time, plotting Kaplan-Meier curves is very helpful to see if the proportional hazard model assumption holds or not. For this purpose, the Kaplan–Meier predicted survival function is compared to the Cox predicted curves, as shown in Figure 8. The closer the predicted curves to observed curves, the better the model fits the data resulting in holding the proportionality assumption.

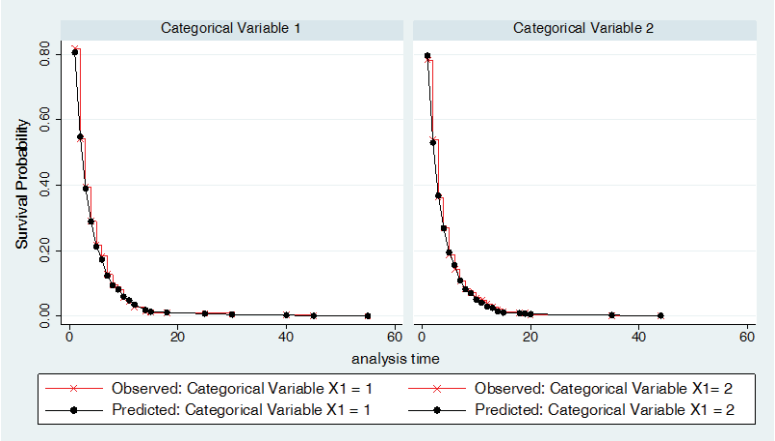


Figure 8. An illustration of Kaplan-Meier curves for a categorical variable

3.5.2. Schoenfeld residuals

Proportionality assumption can be also tested using Schoenfeld residuals. Schoenfeld residuals are estimated by subtracting the expected values of the covariates from their corresponding observed ones at each failure time. Therefore, Schoenfeld residuals are not defined for censored data. Diagnostic scatterplot and smoothed plot of scaled Schoenfeld residuals for each covariate versus time contributes to checking proportional hazard model assumptions (see Figure 9). A non-zero slope of the plot is an indication of the violation of the proportionality assumption (Schoenfeld, 1982, Grambsch et al., 1995, Arjas, 1988, Cleves et al., 2010).

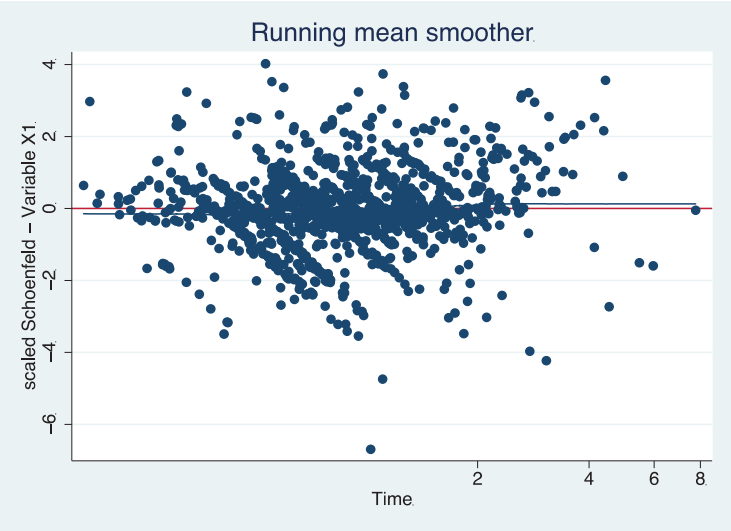


Figure 9. An illustration of Schoenfeld residuals at each failure time over time

In additional to visual confirmation of proportionality assumption, one can confirm the proportionality statistically. This can be performed for individual covariates and overall model. Under the null hypothesis of the model being correctly specified, p-values more than 5% confirm that the proportionality holds.

3.5.3. Martingale and deviance residuals

Martingale residual is another tool that determines the functional form of the covariates. Martingale residuals show the difference between the estimated cumulative hazard and its observed values. As shown in Figure 10 a smoothed diagnostic plot of predicted values versus Martingale residuals suggests whether the covariates and their functional forms are properly selected. If the plot is linear then the functional form is accepted. In contrast, if the plot is not linear for small or large values of the predictor, then one should transform the variable into alternative forms to obtain a linear plot. Such transformation can be performed by, for instance, substituting a covariate with its natural logarithm (Grambsch et al., 1995, Therneau et al., 1990, Cleves et al., 2010).

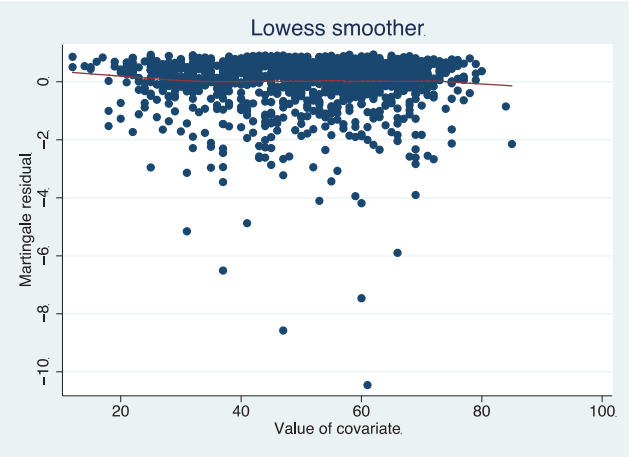


Figure 10. An illustration of scatter and smoothed plot of Martingale residuals versus the values of a covariate

3.6. Choice of baseline hazard function

Choice of the baseline distribution function is a prerequisite for survival analysis. This plays a great role in the accuracy and validity of the empirical results. The most common approaches to compare different distributions for the baseline hazard are likelihood ratios and Akaike information criterion (AIC). It should be noted that likelihood ratios are applicable only if the models are nested. Nested models refer to a set of models that some of them are special cases of more complex ones in that set (Akaike, 1974, Cleves et al., 2010).

In this study, Exponential, Weibull, and Gompertz distributions are used as the three most popular distributions. The model selection is performed using AIC. Comparing several models, the one with the smaller AIC fits the data better than those with larger AIC. The AIC relationship for parametric models is given by (Liang and Zou, 2008)

$$AIC = -2\ln L + 2(k + c) \tag{24}$$

where $\ln L$ is the maximized log-likelihood of the model, and k, N, and c respectively denote the number of covariates, sample size, and number of distribution parameters.

3.7. Goodness-of-fit measurements

Goodness-of-fit measurements assess the overall fitness of the model. They show how the observed values differ from real data. In ordinary linear regression models, the most popular goodness of fit criteria is R^2 which shows the variation in dependent variable with respect to explanatory variables. R^2 is based on residual sum of squares and results from decomposition of sums of squares (Hill et al., 2010).

In survival models, due to the presence of censored observations, it is a complicated task to define the residuals, and thus R^2 may not be an applicable assessment. Thus, proper and convenient measurements for goodness-of-fit in the duration models should be taken into account (Cleves et al., 2010). The Stata software provides the commands to evaluate the goodness-of-fit both graphically and statistically using Cox-Snell residuals. If the Cox regression model fits the data, then the true cumulative hazard function conditional on the covariate vector has an exponential distribution with a hazard rate of 1. The Cox-Snell residuals are given by (Cleves et al., 2010, Cox and Snell, 1968)

$$csr_i = \widehat{H}_0(t_i)\exp(\boldsymbol{x_i\beta}) = -\log \hat{S}_i(t_i) \tag{25}$$

where $\widehat{H}_0(\cdot)$ is the cumulative hazard rate. Both the $\widehat{H}_0(\cdot)$ and coefficient vector $\boldsymbol{\beta}$ are obtained using Cox model fit.

If the predicted values and cumulative baseline hazard are the same as true values of $\boldsymbol{\beta}$ and cumulative baseline hazard function, then Cox-Snell residuals will be exponentially distributed with a hazard rate of 1. Thus, as shown in Figure 11, if the plot of the cumulative hazard versus Cox-Snell residuals approximate a straight line with a slope of 1, then the selected distribution is acceptable (Cleves et al., 2010, Cox and Snell, 1968, Grambsch et al., 1995). Figure 11 shows the Cox Snell residuals against cumulative hazard.

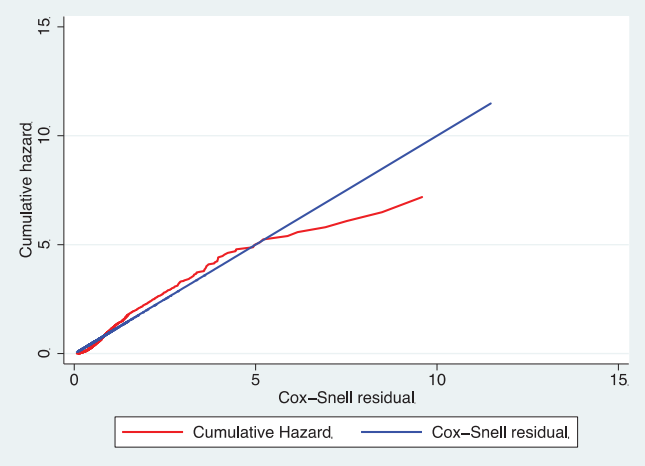


Figure 11.Cox-Snell residuals

Cox-Snell gives a visual evolution of the overall model fit. Harrell's C concordance statistic is proposed by Harrell et al. (1982) as a measure of the predictive power and discrimatory ability in survival analysis. This measurement has been adapted widely to distinct survival distributions. The value of Harrell's C concordance statistic is between 0 and

1. The closer the statistic to 1, the better the model fit the data (Harrell et al., 1982, Cleves et al., 2010, Hermansen, 2008). Values of Harrell's C statistic close to 0.5 indicate that the explanatory variables are no better than a coin-flip in determining which tourist will stay longer at the destination (Hermansen, 2008). Harrell's C statistic can be obtained in a data set with or without censored data.

Chapter 4. Empirical results

4.1. Data and variables

The micro data used in this study was obtained from a survey conducted by Innovation Norway in 2012 in Norway (see Appendix A). The use of micro data in consumer studies has two advantages. First, the use of micro data in building consumer models gives better outcome than macro data (Deaton, 1997). Second, it allows us to take the heterogeneity of tourists into account (Martínez-Garcia and Raya, 2008). The questionnaire targeted the tourists who completed their vacation throughout the whole period of observation. Hence, censored data is not included in the analysis. In total, 2848 tourists were interviewed. Respondents with missing information and incomplete fields for study variables were discarded. The final sample includes 1321 respondents. Since the tourists who responded to the survey had already chosen Norway as their destination, Norway is weakly separable than other tourist destinations.

The survey asks information about the tourists' socio-demographic features, and requests their motivation for choosing Norway as the destination. The survey contains two types of variables: continuous and qualitative variables, both of which include the explanatory variables used in this study. Continuous variables of "tourist age" and "natural logarithm of cost" of traveling to Norway, as well as the length of stay (LOS) are presented in Table 4. Regarding the cost of the visit, the survey includes information about the total cost of traveling to Norway. However, after performing further analyses and tests (Harrell's C statistics and Martingale residuals), it is concluded that the natural logarithm of total cost is superior to the total cost model better. It should also be noted that all the covariates are time invariant. Since all the covariates are observable, heterogeneity is not discussed in this study.

The minimum, mean, and maximum values of each continuous variable, as well as the standard deviations are also given in Table 4. For instance, while the total cost changes from 14.3 NOK to 58755 NOK with an average and standard deviation of 5467 NOK and 5222 NOK, respectively, the natural logarithm of total cost has a minimum and maximum of 8.21 and 10.98, respectively with an average of 8.21 and standard deviation of 0.95.

Table 4. Characterization of the continuous variables selected for further analyses

Description	Variable	Min	Max	Mean	Std
Length of stay in nights	LOS	1	55	4	4.12
Logarithm of total cost	Ltotcost	2.65	10.98	8.21	0.95
Tourist age	Age	12	85	51.38	13.8

Table 5 lists the categorical variables “purpose of the trip”, “type of accommodation”, “type of transportation”, “tourist gender” and “area” (i.e., South or North). In addition, the interaction between the natural logarithm of total cost and visited area, North/South, is added as another explanatory variable. By including the interaction variable, it is possible to see if visiting Northern or Southern Norway affects the total cost. The frequency of each categorical variable is also presented in Table 5. Finally, 18 explanatory variables are selected for the analysis. It should be noted that the values of 1, 2, 3, and 4, which are assigned to the categorical variables, just indicate that such variables are treated as dummy variables (i.e., not numeric).

Table 5. Characterization of the categorical explanatory variables selected for further analyses

Description	Variable	Frequency	Percent	Cumulative Frequency
Purpose of traveling	Visit = 1 Pleasure = 2 Transit = 3	49 1236 36	3.71 93.56 2.73	3.71 97.27 100
Type of accommodation	Hotel = 1 Holiday center = 2 Camping site = 3	1102 61 158	83.42 4.62 11.96	83.42 88.04 100
Transportation	Air = 1 Road = 2 Rail = 3 Sea = 4	704 544 19 54	53.29 41.18 1.44 4.09	53.29 94.47 95.91 100
Tourist gender	Male = 1 Female = 2	725 596	54.88 45.12	54.88 100
Destination area in Norway	South = 1 North = 2	850 471	64.35 35.65	64.35 100
Interaction variable between the destination area (i.e., Northern or Southern Norway) and logarithm of total cost (i.e., Area#Ltotcst)	South#Ltotcost North#Ltotcost	-		

According to the raw data, on average, each tourist stays in Norway for 4 nights and spends 5467 NOK. About 64.35% of the tourists choose Southern Norway for their visit and 33.65% travel to Northern Norway. However, the average number of nights that a tourist stays

in Northern Norway is 5.7, while it is 3 nights in Southern Norway. On average, a tourist spends 7534.72 NOK and 4316 NOK in Northern and Southern Norway, respectively.

About 93.56% of tourists visit Norway for entertainment and pleasure. In contrast, only 2.7% stop in Norway on their way to their final destination. Around 83.42% of the travelers prefer to be accommodated in hotels, 4.6% in holiday centers and 12% in camping sites. Two most popular transportation means for tourists to come to Norway is air transport (53.3%) and road transport including cars, caravans, coaches, buses and motorcycles (totally 41.2%). In contrast, rail (1.44%) and sea (4.09%) transportation are the least popular types of transportation. In terms of gender and age, male tourists with an average age of 51.38 years old make the higher proportion of tourists in Norway (about 54.88%).

To develop the model we require selecting a reference individual, also known as base individual for each categorical variable. Considering the explanatory variables used in this study, the reference individuals in categorical variables are “visiting family and friends”, “hotel”, “air transportation”, “male”, and “South”. Such reference individuals are specified by a value of 1 as presented in Tables 5. Regarding the interaction between the natural logarithm of total cost and visited region, the reference individual is the interaction between natural logarithm of total cost and Southern Norway. The survival analysis and required tests are performed using Stata 13.1, which is a statistical analysis package. The commands used in this study are given in Appendix B.

4.2. Baseline model validation

The Akaike’s Information Criteria (AIC) is used to justify the choice of parametric model for the baseline hazard rate, as discussed in Chapter 3. Table 6 lists three distribution types, which are used widely in survival analysis, and their corresponding AIC values. According to the AIC values listed in Table 6, the Weibull distribution has the minimum AIC. Therefore, the Weibull distribution is chosen as the baseline parametric hazard model as it better suited to account for the data in comparison to the Exponential and Gompertz distributions.

Table 6. Baseline hazard distribution types

Distribution	AIC
Exponential	3073.308
Weibull	2477.933
Gompertz	2967.071

After choosing the baseline hazard function, it is necessary to check the validity of PHM assumption. Cox proportional hazard models are constrained to have constant hazard ratio over time. In this regard, relevant tests are done to examine the forecasting accuracy. By using the Stata software its validity is evaluated both graphically and statistically.

First, a graphical approach is chosen, following which a graphical approach the Kaplan-Meier survival and cox functions are plotted for all the variables. Since for all explanatory variables the observed and predicted survival probabilities are considerably close, one can conclude that the PHM assumption holds. Figure 12 shows the result of this test for the variable area, which has two subsets of South and North. The corresponding plots for the rest of explanatory variables are presented in Appendix C.

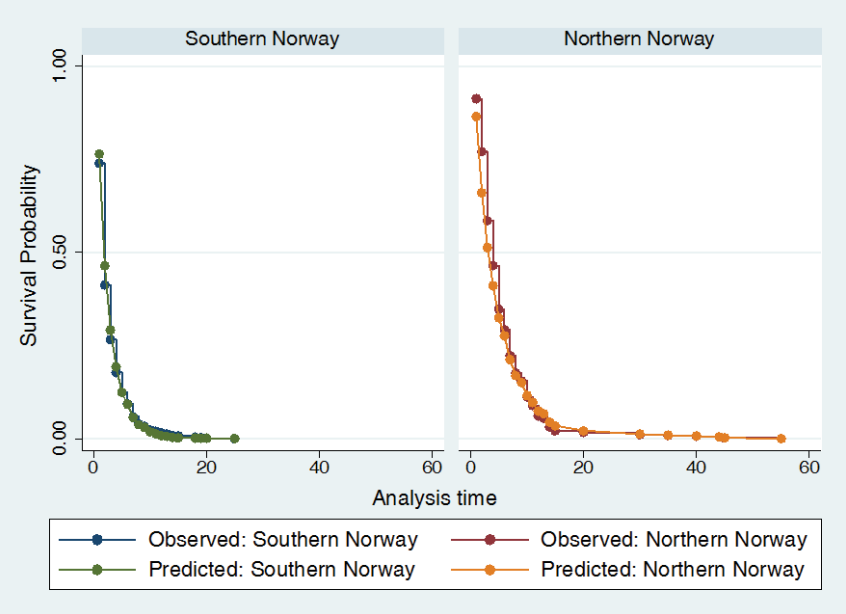


Figure 12. Testing proportional hazard model assumption for the explanatory variable of area

Considering that the graphical methods provide subjective and visual outcome, one can also apply a formal test to have estimations that are more accurate. The test of nonzero-slop based on the Schoenfeld residuals with the null hypothesis of the model is adequate is a useful tool to identify whether the proportional hazard assumption holds. Table 7 presents the test result for each covariate separately. It also provides the result of global test, which shows whether the whole model meets the proportional hazards assumption. The $p - values$ in Table 7 confirm that there is no evidence for the violation of the proportional hazards assumption.

Moreover, to ensure that the model is suitable, goodness-of-fit measurement is reported both statistically and graphically. Harrell's C concordance value of 0.7985 denotes

that model has high predictive power. The graphical representation of Cox-Snell goodness-of-fit test is depicted in Figure 13.

Table 7. Testing proportional hazard model assumption using Schoenfeld residuals

Variable	Rho	Chi-squared	$p-value$
Ltotcost	0.0462	1.78	0.1817
Purpose of traveling:			
Visit = 1	-	-	-
Pleasure = 2	-0.0184	0.45	0.5
Transit = 3	-0.0242	0.8	0.3725
Type of accommodation:			
Hotel = 1	-	-	-
Holiday center = 2	0.023	0.72	0.3951
Camping site = 3	-0.0051	0.03	0.8528
Type of transportation:			
Air = 1	-	-	-
Road = 2	-0.0469	3.12	0.0772
Rail = 3	0.0068	0.06	0.8044
Sea = 4	-0.0106	0.15	0.6991
Age	-0.0315	1.39	
Gender group:			
Male = 1	-	-	-
Female = 2	-0.00825	0.09	0.7618
Destination area:			
South = 1	-	Base parameter	-
North = 2	0.0244	0.5	0.481
Area#Ltotcost interaction:			
South#Ltotcost	-	-	-
North#Ltotcost	-0.0146	0.18	0.6731
Overall test	**-**	**16.20**	**0.182**

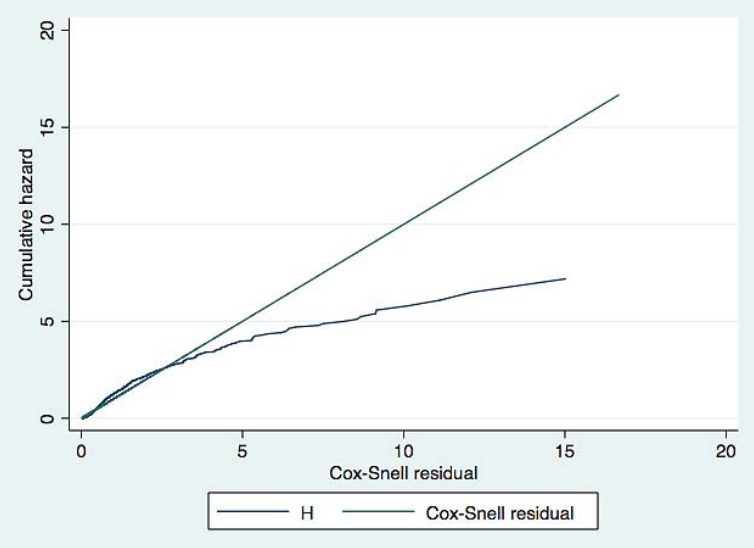


Figure 13. Cox-Snell goodness-of-fit measurement

Furthermore, the multicollinearity among the explanatory variables is checked. The correlation matrix shows that the model does not suffer from the collinearity problem. The correlation matrix is presented in Appendix D.

4.3. Analysis results

The number of tourists that leave Norway after spending a certain number of nights can be used to obtain the Kaplan-Meier survival function for the whole population. Table 8 presents the number of tourists that have left Norway after spending a certain number of nights. The two left columns of Table 8 list the number of nights that tourists have stayed in Norway, and the number of tourists corresponding to each over-night staying (i.e. the number of tourists at risk at the beginning of each night). At the beginning, since all the tourists are at staying state, the survival function has a value of 1. The failure column in Table 8 presents the number of tourists that have left Norway after spending a certain number of nights. For instance, at the beginning, there are 1321 tourists, of which 262 leave Norway after staying 1 night. The rest stay for another night. In other words, at the beginning of the second day, the number of tourists at risk is 1059. As time goes on, tourists leave Norway at random times. The last tourist has left Norway after staying 55 nights. The survival probability in the right-most column of Table 8 gives the probability that a tourist stays for a certain number of nights. For example, the probability that tourist stays in Norway for 4 nights is 28.01%. Such Kaplan-Meier estimations are plotted in Figure 14. The decreasing trend of survival function shows that as time goes by the probability that a tourist will stay in Norway decreases.

Table 8. Survival function list

Over-night staying	Sample in each night	Failure	Survivor probability
1	1321	262	0.8017
2	1059	345	0.5405
3	714	212	0.38
4	502	132	0.2801
5	370	100	0.2044
6	270	52	0.165
7	218	63	0.1173
8	155	38	0.0886
9	117	16	0.0765
10	101	28	0.0553
11	73	14	0.0447
12	59	17	0.0318
13	42	5	0.028
14	37	15	0.0167
15	22	6	0.0121
18	16	3	0.0098
19	13	1	0.0091
20	12	3	0.0068
25	9	1	0.006
30	8	3	0.0038
35	5	1	0.003
40	4	1	0.0023
44	3	1	0.0015
45	2	1	0.0008
55	1	1	0.0000

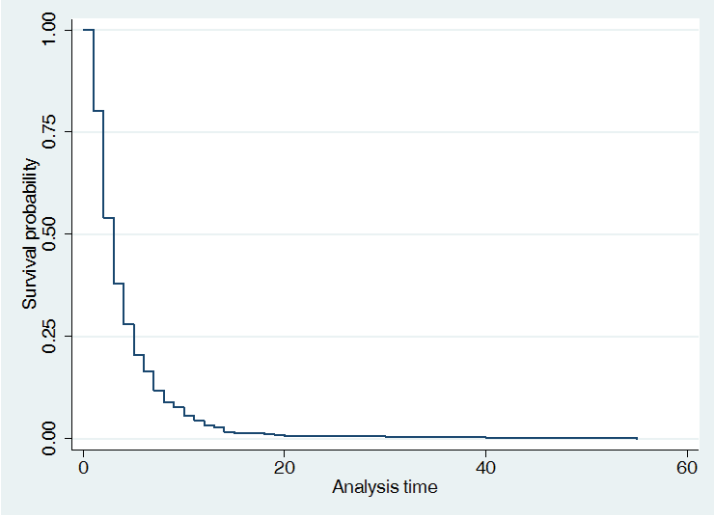


Figure 14. Kaplan-Meier survival probability function

Figure 14 can be used to have a probabilistic estimation of the number of nights that tourist spend in Norway. The empirical Kaplan-Meier probabilities can be fit to a parameteric model such as Weibull distribution. The parameters of a Weibull distribution fitted to the data can be obtained using a least square method described in (Murthy et al., 2004). The Weibull failure probability function is given by (Murthy et al., 2004),

$$F(t) = 1 - \exp\left[-\left(\frac{t}{\eta}\right)^{p}\right] \tag{26}$$

Taking the natural logarithm of Equation (26) twice gives,

$$\ln\left[-\ln\left(1 - F(t)\right)\right] = p \ln t - p \ln \eta \tag{27}$$

which is the linearized form of a Weibull failure probability function. The empirical data are plotted in as shown in Figure 15. According to the equation of the straight line, one can obtain the distribution parameters as, $p = 0.8428$, and $\eta = 3.1387$. The R-squared of 0.9359 illustrates a reasonably accepted estimation. The goodness-of-fit of the model is schematically illustrated in Figure 16 that shows the Weibull model fitted to the tourist survival data and the corresponding Kaplan-Meier survival probabilities.

Having fitted the data with a parametric model, one can determine the other important characteristics of the data such as hazard rate or mean-time-to-failure (MTTF). The MTTF of a Weibull distribution can be obtained using (Murthy et al., 2004),

$$MTTF = \eta \Gamma\left(\frac{1}{p} + 1\right) \tag{28}$$

which gives an indication about the average time-to-failure. Using estimated values for the parameters p and η, the MTTF of 3.43 nights is the average number of nights that tourists stay in Norway.

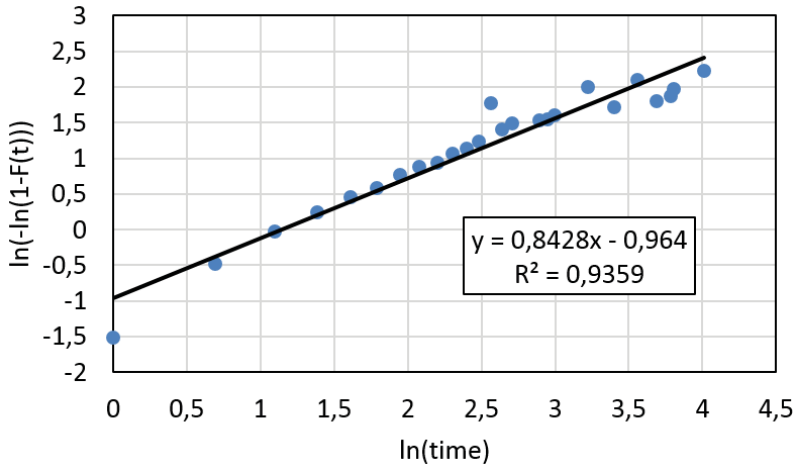


Figure 15. Plot of linearized form of a Weibull distribution for estimating distribution parameters

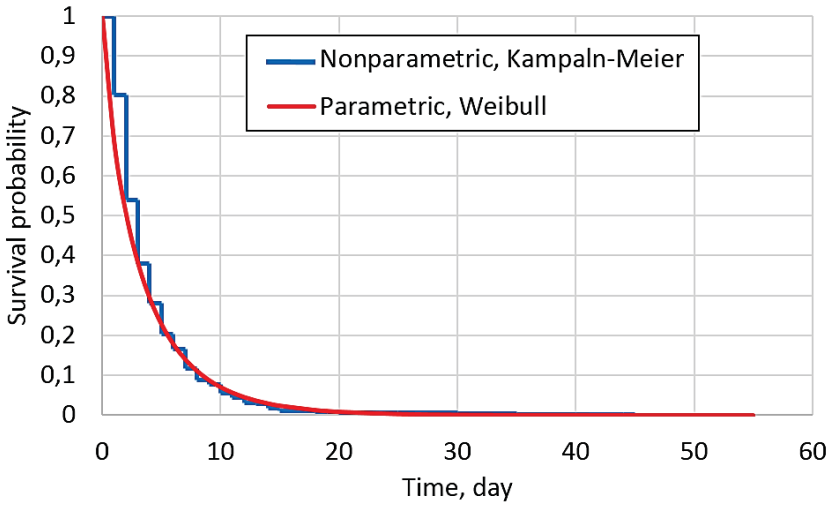


Figure 16. Weibull and Kaplan-Meier survival probability functions

The aforementioned approach, however, does not include the effects of covariates on the survival probability of the tourists. To illustrate such effects, the data are fitted to a proportional hazard model, whose baseline failure rate has a Weibull form. The general form of such a model is discussed in Chapter 3, given by Equation (22),

$$S(t, \boldsymbol{x}) = e^{-t^p e^{\Sigma_{i=0}^{n} \beta_i x_i}} \tag{29}$$

The detailed results of the Weibull model estimation are presented in Table 9. Those covariates, which have a statistically significant effect on the hazard rate or survival probability functions are specified according to their estimated p-values. The ancillary (shape) parameter of the Weibull distribution, p, is 1.75 indicating that length of stay increases with

the experiencing the event. The Weibull scale parameter can be obtained using the constant term as,

$$\beta_0 = \ln(1/\eta^P) = 2.82 \tag{30}$$

Thus, $\eta = 0.1659$.

Table 9. Duration model estimations

Variable, x_i	Coefficient, β_i	$p - value$
Constant	2.82	0.000
Ltotcost	-0.6776	0.000
Purpose of traveling:		
Visit = 1	-	-
Pleasure = 2	0.5536	0.000
Transit = 3	0.5284	0.019
Type of accommodation:		
Hotel = 1	-	-
Holiday center = 2	-1.2773	0.000
Camping site = 3	-2.013	0.000
Type of transportation:		
Air = 1	-	-
Road = 2	0.2234	0.001
Rail = 3	-0.1485	0.525
Sea = 4	-0.005	0.973
Age	0.006	0.004
Gender group:		
Male = 1	-	-
Female = 2	-0.025	0.646
Destination area:		
South = 1	-	-
North = 2	-1.6737	0.000
Area#Ltotcost interaction:		
South#Ltotcost	-	-
North#Ltotcost	0.1209	0.010
p (ancillary parameter)	1.7502	

Having estimated the coefficients, Equation (22) can be used to estimate the probability of survival for a tourist under a given set of explanatory variables. Moreover, it is of interest to analyze the effects of explanatory variables on the hazard rate and the probability of staying in Norway for a given set of covariates. As presented in Table 9, two types of variables influence the hazard and survival probability: continuous variables and categorical variables with specified base individuals.

In order to analyze the effect of one continuous explanatory variable on hazard and survivability one needs to find the derivative of hazard (Equation (21)) or survival function

(Equation (22)) with respect to that covariate. Let x_j be a continuous covariate, thus the derivatives of $\lambda(t, \boldsymbol{x})$ and $S(t, \boldsymbol{x})$ with respect to x_j are respectively given by,

$$\frac{\partial \lambda(t,\boldsymbol{x})}{\partial x_j} = pt^{p-1}\beta_j e^{\sum_{i=0}^{n}\beta_i x_i} \tag{31}$$

$$\frac{\partial S(t,\boldsymbol{x})}{\partial x_j} = -t^p \beta_j e^{-t^p e^{\sum_{i=0}^{n}\beta_i x_i}} \tag{32}$$

According to Equations (31) and (32), an increase in a covariate with a positive coefficient increases the hazard rate and thus reduces the survival probability.

With regard to age, which is a continuous covariate, a positive coefficient indicates that with an increase in tourist age, the hazard rate increases, and thus the probability of staying in Norway decreases. In other words, a positive coefficient indicates a certain trend towards a decreased probability of staying in Norway among older tourists. The corresponding coefficient refers to the increase in the logarithm of hazard for one-year increase in age. As a result, the risk of leaving Norway increases by a factor of $\exp(0.006) = 1.006$ if the tourist is one year older. This trend can be justified, to some extent, based on the adventurous characteristics of nature-based activities such as aqua and winter sports, as well as climbing and camping out, which suit young people better than the elderly.

To analyze the effect of cost on the hazard rate and probability of staying in Norway, the same approach can be chosen, as the natural logarithm of total cost is a continuous variable. The amount of money that a tourist spends while staying in Norway is included in the hazard rate and survival probability through two different variables: natural logarithm of total cost, and the interaction between the natural logarithm of total cost and the destination area in Norway (i.e., the variable $North\#Ltotcost$ in Table 9). Thus, according to Equations (31) and (32), the negative sign of $\beta_{Ltotcost} + \beta_{North\#Ltotcost} = -0.5567$ indicates a decreasing trend in hazard rate, and thus an increasing trend in survival probability, if the total cost increases. To determine to what extent an increase in the total cost can change the hazard rate, one can write,

$$\frac{\lambda(t,\boldsymbol{x})|_{Ltotcost_2}}{\lambda(t,\boldsymbol{x})|_{Ltotcost_1}} = \frac{e^{\beta_{Lntotcost}\times Ltotcost_2 + \beta_{North\#Ltotcost}\times(Ltotcost_2\times 1)}}{e^{\beta_{Lntotcost}\times Ltotcost_1 + \beta_{North\#Ltotcost}\times(Ltotcost_1\times 1)}} =$$

$$e^{\beta_{Lntotcost}\times(Ltotcost_2 - Ltotcost_1) + \beta_{North\#Ltotcost}\times(Ltotcost_2 - Ltotcost_1)}$$

If $Ltotcost_2 - Ltotcost_1 = 1$,

$$\frac{\lambda(t,\boldsymbol{x})|_{Ltotcost_2}}{\lambda(t,\boldsymbol{x})|_{Ltotcost_1}} = e^{(\beta_{Lntotcost}+\beta_{North\#Ltotcost})\times 1} = \exp(-0.5567) = 0.5731$$

This means if the natural logarithm of total cost (expenditure), $Ltotcost$ is increased by one, the hazard rate reduces by a factor of 0.5731. In terms of changes in the total cost, an increase in $Ltotcost$ by unity, is equivalent to an increase in $Cost$ by a factor of $\exp(1) = 2.718$, as given by,

$$\frac{Cost_2}{Cost_1} = \frac{\ln Cost_2}{\ln Cost_1} = \frac{1+\ln Cost_1}{\ln Cost_1} = \frac{\ln[Cost_1 \times \exp(1)]}{\ln Cost_1} = \exp(1) = 2.718$$

In other words, if the total cost, or tourist expenditure, is increased by a factor of 2.718, the hazard rate reduces by a factor of 0.5731. This means that tourists who spend less tend to stay shorter in Norway compared to high-spending tourists. This conclusion is also compatible with the budget constraint concept.

In case of a categorical variable, the effect of covariate x_j on the hazard and survival functions are respectively given by,

$$\Delta\lambda(t,\boldsymbol{x})|_{x_j} = \lambda\left(t,\boldsymbol{x}|_{x_j=1}\right) - \lambda\left(t,\boldsymbol{x}|_{x_j=0}\right)$$

or

$$\Delta\lambda(t,\boldsymbol{x})|_{x_j} = pt^{p-1}\left(e^{\beta_j+\sum_{\substack{i=0\\ i\neq j}}^{n}\beta_i x_i} - e^{\sum_{\substack{i=0\\ i\neq j}}^{n}\beta_i x_i}\right) \tag{33}$$

and

$$\Delta S(t,\boldsymbol{x})|_{x_j} = S\left(t,\boldsymbol{x}|_{x_j=1}\right) - S\left(t,\boldsymbol{x}|_{x_j=0}\right)$$

or

$$\Delta S(t,\boldsymbol{x})|_{x_j} = e^{-t^p}\left(e^{e^{\beta_j+\sum_{\substack{i=0\\ i\neq j}}^{n}\beta_i x_i}} - e^{e^{\sum_{\substack{i=0\\ i\neq j}}^{n}\beta_i x_i}}\right) \tag{34}$$

Based on Equations (33) and (34), the effects of a categorical covariate on tourist's staying probability can be interpreted in terms of their effects of hazard rate or survival probability function. According to Table 9, the following categorical variables are statistically significant: purpose of traveling, type of accommodation, type of transportation (road transportation), destination area, and the interaction between the destination area and natural logarithm of total cost.

The purpose of the trip indeed has significant effects on the expected value of the trip duration. Different purposes have different impacts on the duration of the trip. The coefficient of the transit and pleasure purposes is positive. Thus, a tourist with a purpose of transit or pleasure has a higher hazard rate compared to the one whose purpose of traveling is visiting friends and family. For instance, the hazard rate of a tourist with a purpose of pleasure is higher than the hazard rate of a tourist with a purpose of visiting family and friends by a factor of $\exp(0.5536) = 1.74$. In other words, for the trips with a purpose of pleasure increases hazard rate by $100(1.74 - 1) = 74\%$ compared to the trips for visiting purpose. Similarly, the probability that tourists stay in Norway with purpose of pleasure is higher than of the ones whose purpose is transit.

The type of accommodation is another categorical variable that can affect the probability of staying in Norway. Choosing holiday centers or camping sites results in lower hazard rates compared to choosing the base accommodation category (i.e., hotel) due to their negative coefficients. That means if tourists stay in a camping site, the probability that they leave Norway after a certain number of nights is lower than the probability of leaving Norway for the ones staying in a hotel. Similarly, those who stay in a camping site, have a higher chance of staying in Norway compared to the ones staying in holiday centers. This conclusion is also justified according to the cheaper price of camping sites and holiday centers than hotels in Norway.

With regard to the type of transportation, road transportation is a relevant parameter, which positively affects the hazard rate. Considering the positive coefficient of road transportation, one can conclude that tourists tend to stay in Norway for a longer time compared to those who take a flight (i.e., air transportation category). In addition, rail and sea transportations do not have explanatory power to describe the variation in length of stay.

The p −values of gender category indicates that tourists' gender does not statistically affect the duration of stay in Norway.

With regard to the destination area, one can estimate the hazard ratio of North over South for a given set of covariates, as given by Equation (35),

$$\frac{\lambda(t,\boldsymbol{x})|_{north}}{\lambda(t,\boldsymbol{x})|_{south}} = \exp(-1.6737 + 0.1209 \times \ln Cost) \tag{35}$$

Thus to identify in which region the hazard rate has a higher value, one needs to determine for what values of total cost the fraction $\frac{\lambda(t,\boldsymbol{x})|_{north}}{\lambda(t,\boldsymbol{x})|_{south}}$ is greater or smaller than 1. For this purpose, we should solve the following equation for $Cost$,

$$\exp(-1.6737 + 0.1209 \times \ln Cost) = 1$$

or

$$-1.6737 + 0.1209 \times \ln Cost = 0 \rightarrow Cost = 1{,}028{,}600 \text{ NOK}$$

In other words, theoretically, at the total cost of greater than 1,028,600 NOK the hazard rate corresponding to the North is greater than in the South, implying a less probability of stay in the North compared to the South. However, the total cost of 1,028,600 NOK is obtained theoretically, and is far beyond the range of the data set. Therefore, one can conclude that the hazard rate in the North is always smaller than in the South, and thus for a given set of covariates, the probability that tourists stay in Northern Norway is higher than in the Southern Norway. Such difference is illustrated by the Kaplan-Meier survival probability plots depicted in Figure 17. As shown in Figure 17, the probability of staying in Norway is strictly higher in the North than in the South.

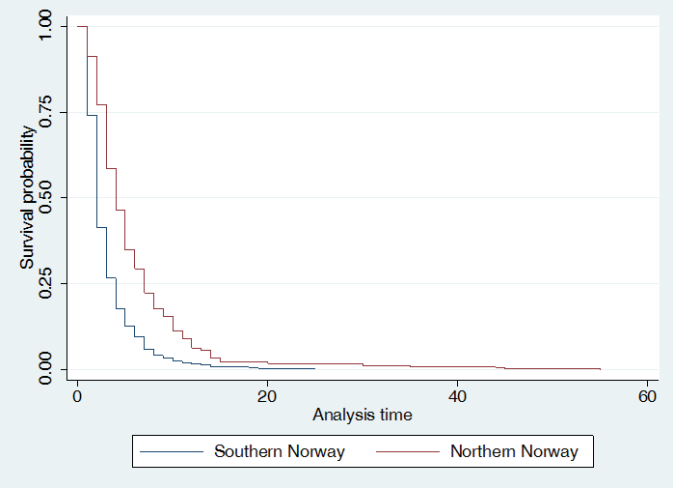


Figure 17. Kaplan-Meier survival estimate for tourists staying in Southern and Northern Norway

Chapter 5. Discussion and Conclusions

The micro-econometric analysis shows that the duration of the trip to Norway is influenced by characteristics of destination (i.e., Southern or Northern Norway), tourist age, logarithm of total expenditure and tourism products (i.e., accommodation and transportation). These sets of information can be used for informed decision-making.

According to the results of this study, the destination area in Norway plays a key role in the number of nights that a tourist stays in Norway. That is, the tourists who travel to the Northern parts of Norway tend to stay for a longer period compared to the ones visting Southern parts of Norway. This can be considered valuable information for the authorities and officials to prioritize tourism development in Northern Norway rather than South. Since length of stay is in a close relation with money generation, job creation, occupancy rate, and retail growth, making efficient policies to attract great proportion of tourists to Northern Norway is undeniable. In order to maximize the benefits from tourism industry, policies aimed to foster longer average length of stay should be taken into account.

Several strategies can be chosen to boost the tourism industry in Northern Norway such as tax reduction of tourism-involved businesses, developing entrepreneurship opportunities, and persuading investors to collaborate and participate directly or indirectly in tourism industry. Local investors can be offered financial support such as subsidy, long terms credits with low interest rates, and external public funds. Moreover, identifying and zoning the most attractive areas, as well as providing educational and occupational support for investors and labor force can contribute to developing the tourism industry in Northern Norway.

On the other hand, due to the tendency of the young to spend a longer time in Norway, offering cheaper tourism products is appraised. Youth traveling to Norway is of utmost importance and can be considered a path towards a sustainable tourism. Their willingness to experience new opportunities can connect the relevant sectors in tourism industry and promote the added value. As a result, studying the existing market of tourism related to the young can provide valuable information related to the motivations and preferences of young tourists to visit Norway. This can suggest discouraging package tours and luxury tourism, because of their high cost, which may not be afforded by young tourists. In connection with this point, the government can play a great role in rising awareness to inform the existing stakeholders and investors about the great potential of youth tourism. Informing the

entrepreneurs about the importance of youth tourism will strengthen the partnership in tourism-connected businesses and collaborative development among suppliers and the travelers. Once the structure of the joint development has been built, the role of the government is further highlighted. The government can promote the tourism industry effectiveness by reducing institutional barriers, final bureaucratic and administrative hurdles to allow the free flow of trade in travel services and facilitate the visa application process and entry of legitimate travelers at land or sea borders.

Moreover, according to the results of the study, one can conclude that paying attention to the elements of tourism products such as accommodation and transportation is necessary. In case of accommodation, providing high quality camping sites with comforting facilities can prolong the duration of stay considerably. Due to the low price of camping sites in comparison to hotels, camping sites are expected to be more in demand by young tourists. Similarly providing high quality tourism products for affluent and high-spending travelers should not be neglected. Once tourism flow is stimulated, wider development of other tourism products and infrastructures will improve domestic and international tourism industry. Service suppliers should ensure a good experience for travelers to persuade them to repeat the visitation. In this regard, the government should make such policies to encourage national and foreign investments. The multi-disciplinarity of tourism and its multiplier effects contributes to adding value to other relevant sectors.

As discussed in Chapter 2, small- and medium-size entrepreneurs (SME) manage Norwegian tourism industry. In this regard, development of rural tourism can be an effective policy to promote tourist flow. Rural tourism promotion is less expensive as it involves small firms and chains, as well as lower investments in funds, capital, and training. Moreover, it is easier to develop tourism industry in small district in comparison to major cities as local people and businesses have the incentive to support this promotion because of earning secondary income (Wilson et al., 2001). In this regard, developing a policy such as indigenizing the economy in particular small areas will encourage the native inhabitants to participate in the national economy of Norway. The ”Pilot Destination Strategy” follows development in rural and small areas but most of these areas are situated in Southern Norway, where tourists do not tend to stay long. Hence, in order to exploit the maximum benefit from tourism industry this approach needs to be applied in Northern Norway where the length of stay is considerably higher than in the South. On this subject, the competitive advantage of Norway in natural resource and marine environment is highlighted. For instance, special

events and festivals or sport tournaments can be sponsored to stimulate the tourist flow to Northern Norway.

Another area of concern for Norwegian tourism industry is seasonality. Hence, tourism industry is active during a short time of a year. This problem indicates the underutilization of productive capacity in Norway. In this regard, developing low-seasonal activities such as establishing conferences, congresses and seminars should be held, as traveling for business purposes is not expected to be a seasonal function. Authorizing trade fairs and exhibitions, winter sport competition and tournaments may appeal tourists to visit Norway. Moreover, the government and related organizations can make policies to revive and encourage domestic tourism to compensate shortage of international tourist-arrivals.

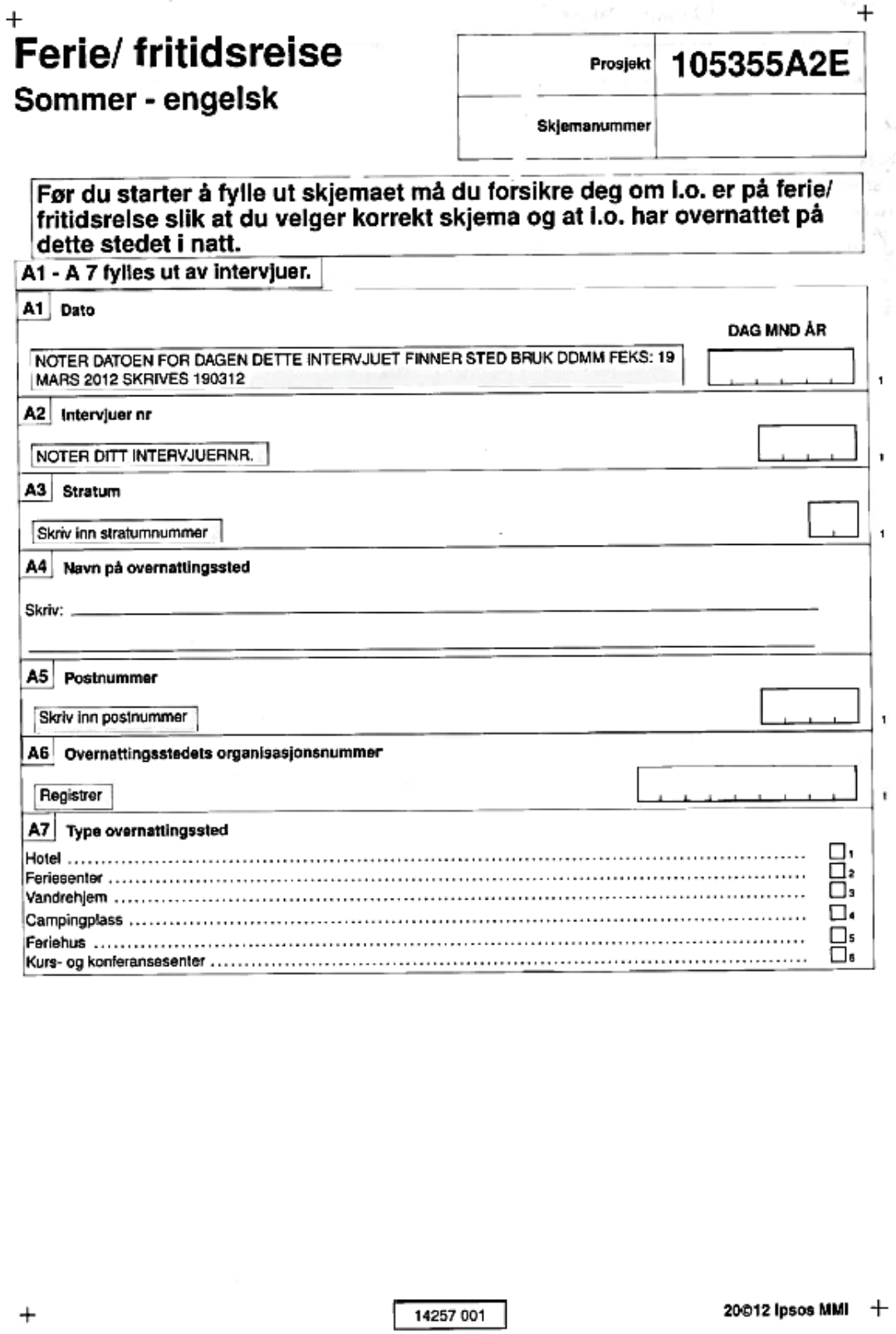
Furthermore, the multi-disciplinarity of tourism ensures an intertwined relation between tourism sector and other relevant industries to have a successful performance. To do this, Eadington and Redman (1991) suggest creating associated entrepreneurship opportunities and then letting individuals and businesses compete in market. From this perspective, the role of the government and the legal organizations is to connect different sectors along with entrepreneurial skills and SME businesses. Hence, success can be obtained when the private sectors along with the public ones are performing jointly to promote tourism industry by following the objectives of the policies and plans.

Availability and reliability of concrete data is the cornerstone of management, business decision-making, strategic planning and policymaking for both national and international tourism. Providing broad and comprehensive data including visitors' origin country, profiles, activities and preferences, trip plans, motivators, cities visited, length of stay, and spending patterns will be of great help to identify the opportunities for improving tourism industry. Some criteria are then required to monitor the impacts of the developed policies and strategies on boosting tourism industry.

Finally, it is worth mentioning that multi-laterality of tourism industry necessitates the development of policies in other relevant fields such as geography, politics, etc. All these policies should be in correspondence with sustainable tourism development.

Appendices

Appendix A: Innovation Norway 2012 tourist survey



Ferie/ fritidsreise
Sommer - engelsk

Prosjekt	105355A2E
Skjemanummer	

Før du starter å fylle ut skjemaet må du forsikre deg om i.o. er på ferie/ fritidsrelse slik at du velger korrekt skjema og at i.o. har overnattet på dette stedet i natt.

A1 - A 7 fylles ut av intervjuer.

A1 Dato

DAG MND ÅR

NOTER DATOEN FOR DAGEN DETTE INTERVJUET FINNER STED BRUK DDMM FEKS: 19 MARS 2012 SKRIVES 190312

A2 Intervjuer nr

NOTER DITT INTERVJUERNR.

A3 Stratum

Skriv inn stratumnummer

A4 Navn på overnattingssted

Skriv: _____

A5 Postnummer

Skriv inn postnummer

A6 Overnattingsstedets organisasjonsnummer

Registrer

A7 Type overnattingssted

Hotel 1
Feriesenter 2
Vandrehjem 3
Campingplass 4
Feriehus 5
Kurs- og konferansesenter 6

14257 001

Start interview here:

Q1 In which country do you have permanent residence?

Norway (⇒ Q2)	☐ 01
Sweden (⇒ Q2B)	☐ 02
Denmark (⇒ Q2C)	☐ 03
Germany (⇒ Q2D)	☐ 04
The Netherlands (⇒ Q3A)	☐ 05
Great Britain (⇒ Q3A)	☐ 06
USA (⇒ Q3A)	☐ 07
France (⇒ Q3A)	☐ 08
Spain (⇒ Q3A)	☐ 09
Poland (⇒ Q3A)	☐ 10
Italy (⇒ Q3A)	☐ 11

(⇒ Q3A) Other, note: _____

_____ (⇒ Q3A)

FOR NORWEGIANS

Q2 What is the zip code where you live?

Register zip code ☐☐☐☐

If resident in Sweden

Q2B What region do you live in?

	☆
Stockholms	☐ 01
Uppsala	☐ 02
Södermanlands	☐ 03
Östergötlands	☐ 04
Örebro	☐ 05
Västmanslands	☐ 06
Jönköpings	☐ 07
Kronobergs	☐ 08
Kalmar	☐ 09
Gotlands	☐ 10
Blekinge	☐ 11
Skåne	☐ 12
Hallands	☐ 13
Västra Götalands	☐ 14
Värmlands	☐ 15
Dalarnas	☐ 16
Gävleborgs	☐ 17
Västernorrlands	☐ 18
Jämtlands	☐ 19
Västerbottens	☐ 20
Norrbottens	☐ 21

If resident in Denmark

Q2C What region do you live in?

	☆
Region Nordjylland	☐ 1
Region Midtjylland	☐ 2
Region Syddanmark	☐ 3
Region Sjælland	☐ 4
Region Hovedstaden	☐ 5

If resident in Germany

Q2D What region do you live in?

	☆
Baden-Württemberg	☐ 01
Bayern	☐ 02
Berlin	☐ 03
Bremen	☐ 04
Brandenburg	☐ 05
Hamburg	☐ 06
Hessen	☐ 07
Mecklenburg-Vorpommern	☐ 08
Niedersachsen	☐ 09
Nordrhein-Westfalen	☐ 10
Rheinland-Pfalz	☐ 11
Saarland	☐ 12
Sachsen-Anhalt	☐ 13
Sachsen	☐ 14
Schleswig-Holstein	☐ 15
Thüringen	☐ 16

FOR ALL

Q3A Did you stay here last night?

Yes	☐ 1
No (⇒ Avslutt)	☐ 2

Q3AA On this trip, how many nights will you spend at this location in total?

Number of nights. ☐☐

Q3B What is the main purpose of your trip to Norway?

Visiting friends, acquaintances, family	☐ 1
Other holiday or pleasure trip	☐ 2
En route to a holiday in another country/transit trip	☐ 3

Q4A In total, how many nights will you spend in Norway on this trip?

Total number of nights. ☐☐

14257 002

Q4B SHOW CARD

Could you please specify the number of nights in the following types of accommodation?

THE SUM MUST BE THE TOTAL NUMBER OF ACCOMMODATION IN Q4A

Number of nights in a hotel, guest house		1
Number of nights in a hostel		2
Number of nights in a camping lodge at a camp site		3
Number of nights in a tent/caravan/camper at a camp site		4
Number of nights in a tent/caravan/camper outside a camp site		5
Number of nights in a rented cabin		6
Number of nights in a borrowed cabin		7
Number of nights in own cabin		8
Number of nights with family, friends, acquaintances		9
Number of nights on Hurtigruten (Norwegian Coastal Expresa)		10
Number of nights in other types of private accommodation		11
Number of nights in other types of commercial accommodation		12

Q5 SHOW MAP

How many nights have you (and your travel companions) spent/will you (and your travel companions) spend in different parts of Norway on this trip?

Northern Norway		1
Central Norway (Trøndelag)		2
Fjord Norway (Western Norway)		3
Eastern Norway		4
Southern Norway		5
Oslo		6

For foreigners

Q6 **How often do you (and your travel companions) travel to Norway?**

Several times a year	1
Approximately once a year	2
Every two/three years	3
Less often	4
I am in Norway for the first time	5

For foreigners

Q7A **What primary mode of transportation did you (and your travel companions) use to come to Norway?**

Please select one mode of transport

Air	01
Car	02
Train	03
Car with caravan/motor caravan	04
Coach	05
Bus service	06
Ferry	07
Cruise	08
Motorcycle	09
Other	10
Don't know	11

For all

Q7B **What primary mode of transportation did you (and your travel companions) use going on vacation?**

Please select one mode of transport

Air	01
Car	02
Train	03
Car with caravan/motor caravan	04
Coach	05
Bus service	06
Ferry	07
Cruise	08
Motorcycle	09
Other	10
Don't know	11

14257 003

FOR ALL

Q8 **Including yourself, how many people are in your personal travel party/group?**

Please only include persons for whom you privately pay for, or who privately pay for you - without subsequently undertaking settlements.

Number of people

Total number of people:	☐☐	1
Number of adults (over 18):	☐☐	2
Number of children aged 0-6:	☐☐	3
Number of children aged 7-12:	☐☐	4
Number of children aged 13-18:	☐☐	5

Q9 **Have you or your travel companions bought a package tour including at least two of the following elements: I) Transportation II) Accommodation III) Meals (full-board or half-board) IV) Activities**

Yes	☐1
No ..... (⇒ Q11A)	☐2
Don't know ..... (⇒ Q11A)	☐3

IF BOUGHT A PACKAGE TOUR

Q10A **What was the total cost of the package holiday?**

Write amounts in the correct currency. Do not know = blank

NOK (Norske kroner)	☐☐☐☐☐☐	1
SEK (Svenske kroner)	☐☐☐☐☐☐	2
DKK (Danske kroner)	☐☐☐☐☐☐	3
EUR (Euro)	☐☐☐☐☐☐	4
GBP (Britiske pund)	☐☐☐☐☐☐	5
PLN (Polske Zloty)	☐☐☐☐☐☐	6
RR (Russiske Rubler)	☐☐☐☐☐☐	7
USD (Amerikanske Dollar)	☐☐☐☐☐☐	8
JPY (Japanske Yen)	☐☐☐☐☐☐	9
Other currency, note:_____	☐☐☐☐☐☐	10

IF BOUGHT A PACKAGE TOUR

Q10B SHOW CARD

What is included in the package tour?

MARK ALL INCLUDED

Transportation to and from Norway	☐1.
Local transportation during your stay	☐2.
Accommodation during your stay	☐3.
Food during your stay (half-board or full-board) ...	☐4.
Activities and excursions	☐5.
Other (for example car hire, admission tickets, guiding, etc.)	☐6.
Don't know	☐7.

IF BOUGHT A PACKAGE TOUR

Q10C **Excluding package tour expenses, what is the approximate amount you and your travel companions spent yesterday?**

Write amounts in the correct currency. Do not know = blank

NOK (Norske kroner)	☐☐☐☐☐☐	1
SEK (Svenske kroner)	☐☐☐☐☐☐	2
DKK (Danske kroner)	☐☐☐☐☐☐	3
EUR (Euro)	☐☐☐☐☐☐	4
GBP (Britiske pund)	☐☐☐☐☐☐	5
PLN (Polske Zloty)	☐☐☐☐☐☐	6
RR (Russiske Rubler)	☐☐☐☐☐☐	7
USD (Amerikanske Dollar)	☐☐☐☐☐☐	8
JPY (Japanske Yen)	☐☐☐☐☐☐	9
Other currency, note:_____	☐☐☐☐☐☐	10

14257 004

FOR THOSE WHO DO NOT HAVE / DO NOT KNOW IF THEY HAVE BOUGHT A PACKAGE TOUR (Q9). THOSE WHO HAVE BOUGHT PACKAGE TOUR -> Q13.

Q11A **How much money will you and your travel companions spend on transportation from your home to this destination and back again? If multiple destinations are involved, what did you spend on transportation from home – first destination, last destination – home?**

Write amounts in the correct currency. Do not know = blank

	*	
NOK (Norske kroner)		1
SEK (Svenske kroner)		2
DKK (Danske kroner)		3
EUR (Euro)		4
GBP (Britiske pund)		5
PLN (Polske Zloty)		6
RR (Russiske Rubler)		7
USD (Amerikanske Dollar)		8
JPY (Japanske Yen)		9
Other currency, note:_____		10

Q11B **How much will you and your travel companions spend in total on accommodation in Norway on this trip?**

Write amounts in the correct currency. Do not know = blank

	*	
NOK (Norske kroner)		1
SEK (Svenske kroner)		2
DKK (Danske kroner)		3
EUR (Euro)		4
GBP (Britiske pund)		5
PLN (Polske Zloty)		6
RR (Russiske Rubler)		7
USD (Amerikanske Dollar)		8
JPY (Japanske Yen)		9
Other currency, note:_____		10

Q11B **If you have a permanent place for caravan / mobile home at a camping site, note the entire annual fee you pay in the field below.**

Write amounts in the correct currency. Do not know = blank

	*	
NOK (Norske kroner)		1
SEK (Svenske kroner)		2
DKK (Danske kroner)		3
EUR (Euro)		4
GBP (Britiske pund)		5
PLN (Polske Zloty)		6
RR (Russiske Rubler)		7
USD (Amerikanske Dollar)		8
JPY (Japanske Yen)		9
Other currency, note:_____		10

Q11C How much did you and your travel companions spend on last night's accommodation?

Write amounts in the correct currency. Do not know = blank

NOK (Norske kroner)	1
SEK (Svenske kroner)	2
DKK (Danske kroner)	3
EUR (Euro)	4
GBP (Britiske pund)	5
PLN (Polske Zloty)	6
RR (Russiske Rubler)	7
USD (Amerikanske Dollar)	8
JPY (Japanske Yen)	9
Other currency, note:_____	10

Q11D Apart from expenses for transport and overnight accommodation expenses, what is the approximate amount you and your travel companions spent yesterday?

Write amounts in the correct currency. Do not know = blank

NOK (Norske kroner)	1
SEK (Svenske kroner)	2
DKK (Danske kroner)	3
EUR (Euro)	4
GBP (Britiske pund)	5
PLN (Polske Zloty)	6
RR (Russiske Rubler)	7
USD (Amerikanske Dollar)	8
JPY (Japanske Yen)	9
Other currency, note:_____	10

FOR THOSE WHO KNOW THE AMOUNT OF SPM Q10C AND Q11D

Q13 SHOW CARD

Can you please itemize this amount in the following categories? Please use the same currency as in the preceding question.

Groceries	1
Fuel	2
Restaurant, café, night club or disco	3
Attractions and culture (museums, activities, experiences)	4
Local transportation during your stay (flight, train, bus, ferry, taxi, tolls, car hire, etc.)	5
Other goods	6
Other services	7

FOR ALL

Q14 How long before departure did you make the first booking/reservation in connection with this trip?

Number of week. Don't know = blank. 1

14257 006

Q16 SHOW CARD

Which of the following activities are you planning to do most often on this trip?

Kayaking/ canoeing	☐ 01
Go to concerts/ festivals	☐ 02
Sports activities (climbing, kite surfing, paragliding, etc.)	☐ 03
Experiencing the night life	☐ 04
Eating and drinking local food & beverages	☐ 05
Sightseeing	☐ 06
Shopping	☐ 07
Enjoying nature	☐ 08
Relaxing	☐ 09
Hiking (more than 2 hours)	☐ 10
Visiting amusement parks	☐ 11
Visiting historic buildings/places	☐ 12
Visiting art exhibitions/museums	☐ 13
Going to restaurants	☐ 14
Going on peak tours (summit)	☐ 15
Working out at fitness centres	☐ 16
Go to the theater, ballet or opera performances	☐ 17
Visiting national parks	☐ 18
Experiencing traditions and national festivals	☐ 19
Experiencing local history and legends	☐ 20
Experiencing local culture and way of life	☐ 21
Other cultural experiences	☐ 22
Saltwater fishing	☐ 23
Freshwater fishing	☐ 24
Experiencing the mountains	☐ 25
Experiencing the fjords	☐ 26
Cycling	☐ 27

Q17 **How satisfied are you with your holiday trip so far? Please use a scale of 1 to 5, where 1 means "Very dissatisfied" and 5 means "Very satisfied"**

1 Very dissatisfied	☐ 1
2	☐ 2
3	☐ 3
4	☐ 4
5 Very satisfied	☐ 5
Don't know	☐ 6

Q18 How satisfied are you with the following aspects of your stay so far? Please answer in relation to your current location. Please use the same scale of 1 to 5, where 1 means "Very dissatisfied" and 5 means "Very satisfied"

	1 Very dissatisfied	2	3	4	5 Very satisfied	Don't know	
	1	2	3	4	5	6	
Accommodation	☐	☐	☐	☐	☐	☐	1
Service	☐	☐	☐	☐	☐	☐	2
Attractions and sights	☐	☐	☐	☐	☐	☐	3
Information and signage	☐	☐	☐	☐	☐	☐	4
Eating places	☐	☐	☐	☐	☐	☐	5
Opportunities for activities in the local area	☐	☐	☐	☐	☐	☐	6
Price in relation to quality	☐	☐	☐	☐	☐	☐	7

FOR FOREIGNERS

Q19 Would you recommend Norway as a holiday destination?

	*
Yes	☐1
No	☐2
Don't know	☐3

FOR ALL

CCL1 SHOW CARD

In previous interviews we have talked with other consumers about how they experience different kinds of holiday. Based on these interviews we have collected a set of statements expressing various feelings and needs. Can you tell me which feelings and needs you ideally expect from this holliday?

Select at least 3 answers

1 Allows me to broaden my knowledge	☐01,
2 Allows me to come to my senses	☐02,
3 Enriches my view on the world	☐03,
4 Helps me to meet new people	☐04,
5 Makes me feel completely liberated	☐05,
6 Allows me to intensify the relationship with my loved one(s)	☐06,
7 Allows me to immerse myself in the local life	☐07,
8 Allows me to keep everything under control	☐08,
9 Allows me to show my superior lifestyle	☐09,
10 Avoids too much surprises	☐10,
11 Allows me to let go without restrictions	☐11,
12 Gives me a sense of being well cared for	☐12,
13 Allows me to pamper myself	☐13,

CCL2 SHOW CARD

How would you describe the character which you would ideally expect from this holiday?

Select at least 3 answers

1 Adventurous	☐01,
2 Outgoing	☐02,
3 Soothing	☐03,
4Unique	☐04,
5 Predictable	☐05,
6 Explorative	☐06,
7 Active	☐07,
8 Open-minded	☐08,
9 Authentic	☐09,
10 Sociable	☐10,
11 Fresh	☐11,
12 Caring	☐12,
13 Structured	☐13,
14 Generous	☐14,
15 Superior	☐15,
16 Cultivated	☐16,
17 Extravagant	☐17,
18 Contemporary	☐18,

FOR ALL

Q20 Gender

Registrer

Male	☐1
Female	☐2

Q21 How old are you?

Age ☐☐ 1

14257 008

Q22 **Do you have children under 18 living at home?**

No	☐ 1.
Yes, children aged 0-6	☐ 2.
Yes, children aged 7-12	☐ 3.
Yes, children aged 13-18	☐ 4.
Don't know	☐ 5.

Intervjuers signatur:

Intervjuet er gjennomført etter Ipsos MMIs retningslinjer

14257 009

Appendix B: Stata codes for this study

```
*Define Area dummy variable
gen South = Area==0
*Generate logarithm of total cost
gen ltotcost= ln(totcost)
*Define time variable as length of stay and the event is leaving Norway
global time los
global event leaving Norway
*Define the explanatory variables:
global xlist i.purpose ltotcost  i.accommodation i.gendergrp agegrp i.transport i.Area
c.ltotcost#i.Area
*Set the data as survival data
stset  $time, failure ($event)
stdescribe
summarize $time $event $xlist
stsum
* Obtain survival, hazard and Akaike's information crietion
streg $xlist, nohr dist(exponential)
streg $xlist, dist(exponential)
estat ic
streg $xlist, nohr dist(weibull)
streg $xlist, nohr dist(weibull)
estat ic
streg $xlist, nohr dist(gompertz)
streg $xlist, nohr dist(gompertz)
estat ic
*Obtain the graphs
sts graph
sts graph, hazard
sts graph, cumhaz
sts graph, survival
sts list, survival
*Obtain the Kplan-Meier suvirval graph to compare the subsets of the categorical variable
sts graph, by(transport)
sts graph, by(accommodation)
sts graph, by(purpose)
sts graph, by(gendergrp)
sts graph, by(Area)
*Test proportional hazard model assumption graphically
stcoxkm, by(accommodation) separat
stcoxkm, by(transport) separat
stcoxkm, by(purpose) separat
stcoxkm, by(gendergrp) separat
stcoxkm, by(Area) separate
*Test proportional hazard model assumption base on Schoenfeld residuals
stcox ltotcost agegrp i.gendergrp i.purpose i.accommodation i.transport i.Area
c.ltotcost#i.Area
estat phtest
estat phtest, detail
*Obtain martingale residuals
predict mg,mgale
lowess mg agegrp
*Obtain Cox Snell graph
predict A, csnell
```

```
stset A, failure(event)
sts generate KM = s
generate H =-ln(KM)
line H A A, sort ytitle(" ") clstyle(. refline)
*Obtain Harrel's Concardence
estat concordance
*Obtain the correlation between the variables
pwcorr Area accommodation
```

Appendix C: Testing proportional hazard model

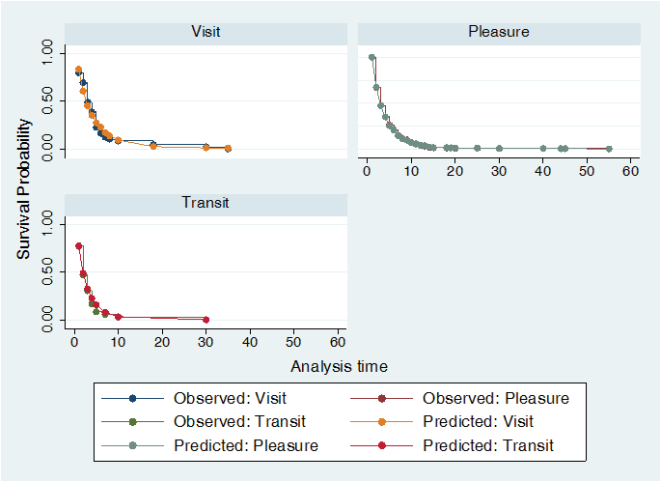


Figure C.1. Testing proportional hazard model assumption for the explanatory variable of purpose

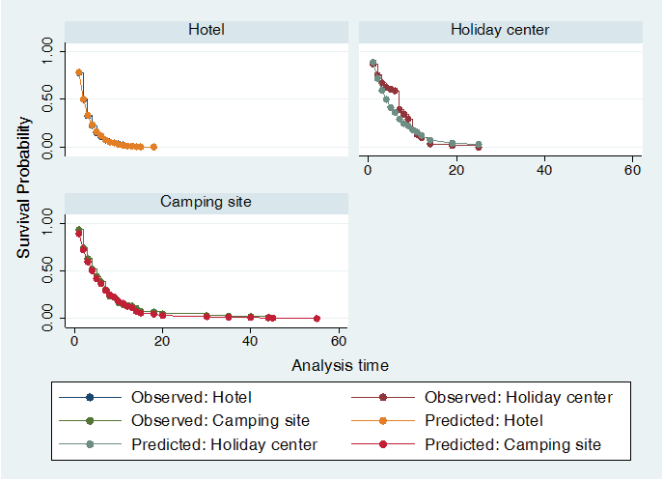


Figure C.2. Testing proportional hazard model assumption for the explanatory variable of accommodation

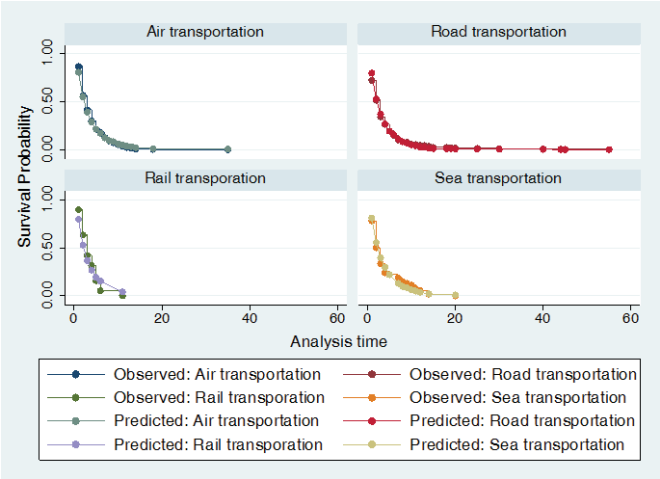


Figure C.3. Testing proportional hazard model assumption for the explanatory variable of transportation

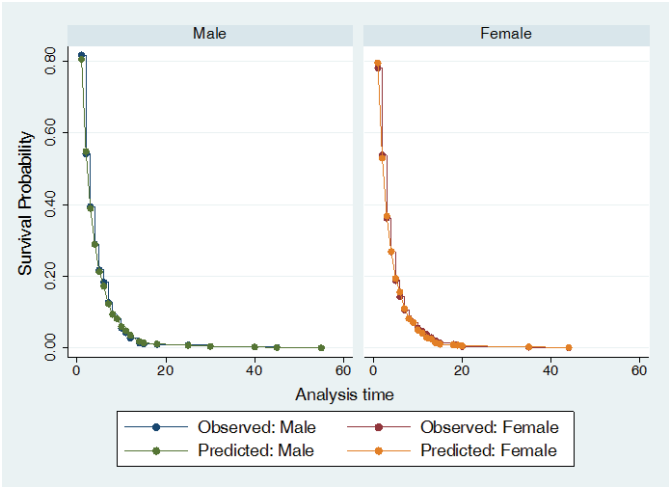


Figure C.4. Testing proportional hazard model assumption for the explanatory variable of gender

Appendix D: Correlation matrix

Table D.1. Correlation matrix

Variables	**Ltotcost**	**Purpose**	**Accommodation**	**Transportation**	**Age**	**Gender**	**Area**
Ltotcost	1	-0.0214	-0.2851	-0.2569	0.0713	0.0224	0.2953
Purpose	-0.0214	1	-0.0103	0.0552	0.0532	-0.0488	0.0476
Accommodation	-0.2851	-0.0103	1	0.2754	-0.0769	-0.0528	0.0489
Transportation	-0.2569	0.0552	0.2754	1	0.0323	0.0155	0.0155
Age	0.0713	0.0532	-0.0769	0.0323	1	-0.0444	0.057
Gender	0.0224	-0.0488	-0.0528	0.0155	-0.0444	1	-0.007
Area	0.2953	0.0476	0.0489	0.0155	0.057	-0.0079	1

References

Akaike, H. (1974). A new look at the statistical model identification. *Automatic Control, IEEE Transactions on, 19*(6), 716-723.

Alegre, J., & Pou, L. (2006). The length of stay in the demand for tourism. *Tourism management, 27*(6), 1343-1355.

Arjas, E. (1988). A graphical method for assessing goodness of fit in Cox's proportional hazards model. *Journal of the American Statistical Association, 83*(401), 204-212.

Bagnall, R. S. (2006). *Hellenistic and Roman Egypt: sources and approaches*. Hamsphire: Ashgate Publishing.

Barros, C. P., & Machado, L. P. (2010). The length of stay in tourism. *Annals of Tourism Research, 37*(3), 692-706.

Bauer, B., & Fischer Bogason, R. (2011). *Voluntary Agreements and Environmental Labelling in the Nordic Countries*. Copenhagen: Nordic Council of Ministers.

Blanke, J., & Chiesa, T. (2013). The Travel & Tourism Competitiveness, Reducing barriers to economicgrowth and job creation. Geneva: World Economic Forum.

Buckley, R. (2011). Tourism and environment. *Annual Review of Environment and Resources, 36*, 397-416.

Budeanu, A. (2007). Sustainable tourist behaviour–a discussion of opportunities for change. *International Journal of Consumer Studies, 31*(5), 499-508.

Burger, C. J. S. C., Dohnal, M., Kathrada, M., & Law, R. (2001). A practitioners guide to time-series methods for tourism demand forecasting — a case study of Durban, South Africa. *Tourism management, 22*(4), 403-409.

Candela, G., & Figini, P. (2012). *The economics of tourism destinations*. Heidelberg: Springer.

Ciuca, V., & Matei, M. (2010). *Survival analysis for the unemployment duration.* Paper presented at the Proceedings of the 5th WSEAS International Conference on Economy and Management Transformation, Timisoara.

Cleves, M., Gould, W., Gutierrez, R. G., & Marchenko, Y. V. (2010). *An Introduction to Survival Analysis Using Stata*. Texas: Stata Press.

Cooper, C., Wanhill, S., John, F., Gilbert, d., & Fyall, a. (2007). *Tourism: Principles and Practice* (4rd ed.). Harlow: Pearson Education.

Cox, D. R., & Snell, E. J. (1968). A general definition of residuals. *Journal of the Royal Statistical Society. Series B (Methodological), 30*(2), 248-275.

Culiuc, A. (2014). Determinants of International Tourism - IMF Working Paper No. 14/82. Washington: International Monetary Fund.

Deaton, A. (1997). *The analysis of household surveys: a microeconometric approach to development policy*. Washington: World Bank Publications.

Diebold, F. X., & Rudebusch, G. D. (1990). A nonparametric investigation of duration dependence in the American business cycle. *Journal of Political Economy, 98*(3), 596-616.

Dritsakis, N. (2004). Cointegration analysis of German and British tourism demand for Greece. *Tourism management, 25*(1), 111-119.

Eadington, W. R., & Redman, M. (1991). Economics and tourism. *Annals of Tourism Research, 18*(1), 41-56.

Etzioni, R. D., Feuer, E. J., Sullivan, S. D., Lin, D., Hu, C., & Ramsey, S. D. (1999). On the use of survival analysis techniques to estimate medical care costs. *Journal of health economics, 18*(3), 365-380.

Frechtling, D. C. (2001). *Forecasting Tourism Demand: Methods and Strategies*. Oxford: Butterworth Heinemann.
Friedländer, L. (2010). *Roman Life and Manners Under the Early Empire* (Vol. 4). New York: Nabu Press.
Garay, L. (2011). Life Cycle, Stages and Tourism Hisrtory The Catalonia (Spain) Experienc. *Annals of Tourism Research, 38*(2), 651-671.
Garín Muñoz, T. (2007). German demand for tourism in Spain. *Tourism management, 28*(1), 12-22.
George, B. P., & Varghese, V. (2007). Human Rights in Tourism: Conceptualization and Stakeholder Perspectives. *Electronic Journal of Business Ethics and Organization Studies, 12*(2), 40-48.
Giovannetti, G., Ricchiuti, G., & Velucchi, M. (2011). Size, innovation and internationalization: a survival analysis of Italian firms. *Applied economics, 43*(12), 1511-1520.
Gokovali, U., Bahar, O., & Kozak, M. (2007). Determinants of length of stay: A practical use of survival analysis. *Tourism management, 28*(3), 736-746.
Gössling, S., & Hultman, J. (2006). *Ecotourism in Scandinavia: Lessons in theory and practice* (Vol. 4). Wallingford: CABI.
Grambsch, P. M., Therneau, T. M., & Fleming, T. R. (1995). Diagnostic plots to reveal functional form for covariates in multiplicative intensity models. *Biometrics, 51*(4), 1469-1482.
Hall, C. M., Muller, D. K., & Saarinen, J. (2008). *Nordic tourism: Issues and cases*. Bristol: Channel View Publications.
Harrell, F. E., Califf, R. M., Pryor, D. B., Lee, K. L., & Rosati, R. A. (1982). Evaluating the yield of medical tests. *Journal of the American Medical Association, 247*(18), 2543-2546.
Haug, B., Dann, G. M. S., & Mehmetoglu, M. (2006). Little Norway In Spain From Tourism to Migration. *Annals of Tourism Research, 34*(1), 202-222.
Haukeland, J. V. (1984). Sociocultural impacts of tourism in Scandinavia: Studies of three host communities. *Tourism management, 5*(3), 207-214.
Hermansen, S. W. (2008). *Evaluating predictive models: computing and interpreting the c statistic.* Paper presented at the SAS Global Forum 2008, Cary.
Hill, R. C., Griffiths, W. E., & Lim, G. C. (2010). *Principles of econometrics*. Mississauga: Wiley Hoboken, NJ.
Hille, J., Aall, C., & Klepp, I. G. (2007). Miljøbelastninger fra norsk fritidsforbruk–en kartlegging. Oslo: Vestlandsforsking and SIFO.
Hoffman, E. P. (1991). Estimation of length of job search by survival analysis. *Eastern Economic Journal, 17*(4), 393-401.
Holloway, J. C., & Taylor, N. (2006). *The business of tourism*. Harlow: Prentice Hall.
Høyer, K. G. (2000). Sustainable tourism or sustainable mobility? The Norwegian case. *Journal of Sustainable tourism, 8*(2), 147-160.
Jacobsen, E. W., & Espelien, A. (2011). Et kunnskapsbasert reiseliv. Oslo: MENON Business Economics. .
Kaltenbron, B. P., & Emmelin, L. (1993). Tourism in the High North: Management Challenges and RecreationOpportunity Spectrum Planningin Svalbard, Norway. *Environmental Managemen, 17*(1), 41-50.
Kennan, J. (1985). The duration of contract strikes in U.S. manufacturing. *Journal of Econometrics, 28*(1), 5-28.

Lancaster, T. (1992). *The econometric analysis of transition data*. Cambridge: Cambridge university press.
Law, R., & Au, N. (1999). A neural network model to forecast Japanese demand for travel to Hong Kong. *Tourism management, 20*(1), 89-97.
Lenart, A. (2014). The moments of the Gompertz distribution and maximum likelihood estimation of its parameters. *Scandinavian Actuarial Journal, 2014*(3), 255-277.
Lew, A. A. (1987). A framework of tourist attraction research. *Annals of tourism research, 14*(4), 553-575.
Li, G., Song, H., & Witt, S. F. (2004). Modeling tourism demand: A dynamic linear AIDS approach. *Journal of Travel Research, 43*(2), 141-150.
Liang, H., & Zou, G. (2008). Improved AIC selection strategy for survival analysis. *Computational statistics & data analysis, 52*(5), 2538-2548.
Lim, C. (1997). Review of international tourism demand models. *Annals of Tourism research, 24*(4), 835-849.
Lindeboom, M., & van der Klaauw, B. (2014). Models for Durations: A Guide to Empirical Applications in Health Economics. In A. J. Culyer (Ed.), *Encyclopedia of Health Economics* (pp. 317-324). San Diego: Elsevier.
Liu, X. (2012). *Survival Analysis: Models and Applications*. West Sussex: Higher Education Press.
Lovelock, B. (2007). *Tourism and the consumption of wildlife: Hunting, shooting and sport fishing*. New York: Routledge.
Luoma, M., & Laitinen, E. K. (1991). Survival analysis as a tool for company failure prediction. *Omega, 19*(6), 673-678.
Martínez-Garcia, E., & Raya, J. M. (2008). Length of stay for low-cost tourism. *Tourism management, 29*(6), 1064-1075.
Mathieson, A., & Wall, G. (1982). *Tourism: Economic, Physical and social impact*. London: Longman.
McIntosh, R. W., & Goeldner, C. R. (1990). *Tourism: Principles, Practices, Philosophies* (6th ed.). New York: Wiley.
Mei, X. Y. (2014). Boring and expensive: The challenge of developing experience-based tourism in the Inland region, Norway. *Tourism Management Perspectives, 12*(October), 71-80.
Mei, X. Y., Arcodia, C., & Ruhanen, L. (2010). *A national government's tourism innovation initiatives: A review of tourism development policies in Norway.* Paper presented at the The 21st Council for Australian University Tourism and Hospitality Education annual conference (CAUTHE 2011), Sydney.
Murthy, D. N. P., Xie, M., & Jiang, R. (2004). *Weibull Models*. New Jersey: John Wiley & Sons.
Norwegian Ministry of Foreign Affairs. (2006). The Norwegian government's high North strategy. Oslo: Norwegian Ministry of Foreign Affairs.
Norwegian Ministry of Trade and Industry. (2012). Destination Norway, National strategy for the tourism industry. Oslo: Ministry of Trade and Industry.
Organization for Economic Cooperation and Development. (2012). OECD Tourism Trends and Policies 2012. Paris: Economic Cooperation and Development (OECD) Publishing.
Østby, P. (2013). Car mobility and camping tourism in Norway, 1950–1970. *Journal of Tourism History, 5*(3), 287-304.
Proença, S., & Soukiazis, E. (2008). Tourism as an economic growth factor: a case study for Southern European countries. *Tourism Economics, 14*(4), 791-806.

Reve, T., & Sasson, A. (2012). *Et kunnskapsbasert Norge*. Oslo: Universitetsforlaget.
Rønningen, M. (2001). Norges-image blant utenlandske turister. Lillehammer: Høgskolen i Lillehammer.
Schoenfeld, D. (1982). Partial residuals for the proportional hazards regression model. *Biometrika, 69*(1), 239-241.
Sinclair, M. T., & Stabler, M. (1997). *The Economics of Tourism*. London: Routledge.
Song, H., Li, g., Witt, S. F., & Fei, B. (2010). Tourism demand modelling and forecasting: how should demand be measured. *Tourism Economics, 16*(1), 63-81.
Spanou, E. (2007). The impact of tourism on the sociocultural structure of Cyprus. *Tourismos: An International Multidisciplinary Refereed Journal of Tourism, 2*(1), 145-162.
Stynes, D. J. (1997). Economic impacts of tourism: a handbook for tourism professionals. *Urbana, IL: University of Illinois, Tourism Research Laboratory*, 1-32.
Swarbrooke, J., & Horner, S. (2007). *Consumer behaviour in tourism*. New York: Routledge.
Syriopoulos, T. C., & Thea Sinclair, M. (1993). An econometric study of tourism demand: the AIDS model of US and European tourism in Mediterranean countries. *Applied economics, 25*(12), 1541-1552.
Tang, C. F., & Tan, E. C. (2015). Does tourism effectively stimulate Malaysia's economic growth? *Tourism management, 46*, 158-163.
The Norwegian Labour and Welfare Service. (2013). Working in the tourism industry in Norway. Norway: The Norwegian Labour and Welfare Service (NAV).
Therneau, T. M., Grambsch, P. M., & Fleming, T. R. (1990). Martingale-based residuals for survival models. *Biometrika, 77*(1), 147-160.
Thrane, C. (2012). Analyzing tourists' length of stay at destinations with survival models: A constructive critique based on a case study. *Tourism management, 33*(1), 126-132.
Towner, J. (1985). The Grand Tour, A Key Phase in the History of Tourism. *Annals of Tourism Research. , 12*(3), 297-333.
Towner, J. (1988). Approaches to tourism history. *Annals of Tourism Research, 15*(1), 47-62.
Towner, J. (1995). What is tourism' s history? *Tourism Managemen, 16*(5), 339-343.
Towner, J., & Wall, G. (1991). HISTORY AND TOURISM. *Annals of Tourism Research 18*(1), 71-84.
Van den Berg, G. J. (2001). Chapter 55 - Duration models: specification, indetification and multiple durations. In J. J. Heckman & E. Leamer (Eds.), *Handbook of econometrics* (Vol. 5). Amsterdam: Elsevier.
Williams, A. M., & Shaw, G. (1991). *Tourism & economic development: Western European experiences*. London: Belhaven Press.
Wilson, S., Fesenmaier, D. R., Fesenmaier, J., & Van Es, J. C. (2001). Factors for success in rural tourism development. *Journal of Travel Research, 40*(2), 132-138.
Witt, S. F., & Witt, C. A. (1995). Forecasting tourism demand: A review of empirical research. *Interational journal of forecasting, 11*(3), 447-475.
World Travel and Tourism Council. (2014). Travel & Toursim Economic Impact 2014 Norway. United kingdom: World Travel & Tourism Council.