DISCRETE CHOICE MODELS FOR TOURISM DESTINATION CHOICE: INTEGRATING THE ROLE OF PAST TRAVEL EXPERIENCE

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Discrete Choice Models for Tourism Destination Choice: Integrating the Role of Past Travel Experience

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Certificate of Originality

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Abstract

Tourist destination is one essential component in analyzing tourism-related activities. The complexity underlying the tourist destination choice has prompted abundant research from various academic disciplines. Over the decades, many researchers dedicated to the investigation of the factors that influence the tourist destination choice process. By the integration of the typical travel experience of tourists into a model for destination choice of long-haul leisure tourists, this thesis analyzes the preference of tourists towards various aspects of a tourist destination.

The concept of "typical travel experience" is defined to represent the ideal pattern of a tourist enjoying the long-haul leisure trip and adopted as the reference that a tourist would refer to while choosing tourist destinations. The conceptualization of "typical" refines the characterization of the past travel experience of the tourists in the sense that it extracts the aspects of destination that tourists enjoy and eliminates the aspects of destination that tourists dislike. Therefore, the "typical travel experience" provides better understanding on the preference of the tourists towards various aspects of a tourist destination. The results of the current thesis consolidate the concept of reference-dependent behavior in the context of tourist destination choice. A new reference-related behavioral bias, namely reference-level bias, is introduced in capturing an inertia of tourists for the quality level of destination attributes they have experienced in their past travels. In addition, distinguished from the existing destination choice literature, where the studies on reference-related behavior are largely limited to the investigation of price and travel time, the current thesis extends the research to a wider variety of destination attributes. This extension further enhances the conceptualization of the two reference-related behavioral biases.

Theoretically, the research findings of the current thesis suggest a significant role of behavioral biases in the process of tourist destination choice. The long-haul leisure tourists are found to exhibit significant loss aversion as well as an inertia for the reference-level. The observation of both behavioral biases put an emphasis on the role of (past) typical travel experience in the destination choice process of tourists. Not only the travel history of tourists reveal

their preference towards tourist destinations, but also the places that the tourists has been to shape their tastes. It is also acknowledged that, the preference of tourists between new and previously visited destinations varies in terms of the destination attributes. Some tourists look back to their travel experience and search for the things they like, while others deliberately avoid the lands they have stepped on. The literature of tourist heterogeneity is further enriched by the findings of the current thesis. While the tourists attach different preference weights on various destination attributes, they also exhibit heterogeneous behavioral biases. For example, younger and sensation seeking tourists are more likely to reveal lower degree of loss aversion, whereas the tourists who have more stable travel patterns would be more biased towards reference-levels.

The research findings also provide significant implications in managerial perspective. The importance of the way that a destination product is described and the value of the establishment of a unique branding are discussed. The individual-specific preference is also analyzed according to the individual characteristics so that tailor-made promotion strategies could be developed by practitioners.

Keywords

destination choice, discrete choice model, reference-dependent behavior, reference-level bias, long-haul leisure travel

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To my lovely family!

Chapter 1

Introduction

The modern tourism industry, since its establishment in the 1840s, has grown rapidly over the decades (Brendon, 1991). From a macroeconomic perspective, expenditure by international tourists counts as exports for the destination country, and as imports for the source markets. As a worldwide export category, tourism nowadays surpasses automobile and food production, and ranks the third after chemicals and oil industry (UNWTO, 2017). Tourist destinations, as one fundamental unit of the industry, attract tremendous attention from both practitioners and academia. They serve as the basis for the development and delivery of tourism products by industry stakeholders and for the implementation of tourism policy by governments.

A large number of studies are conducted on tourist destinations every year, including the studies on destination images (Pike, 2002), destination life cycle (Butler, 2006), destination choices (Sirakaya & Woodside, 2005), and more. Among all these aspects of tourist destination, destination choice receives great attention. This stream of studies usually focuses on why tourists choose certain tourist destination, as well as the importance of various factors in tourist destination choice process. These studies can help practitioners and academia to gain more knowledge about the process of tourist destination choices and develop strategies to better serve public demands. The current thesis, following the main theme of this stream of studies, investigates the relative importance of influential factors on the preference of tourists towards various aspects of tourist destination. Prospect theory, a behavioral economic theory that describes the way people choose between alternatives based on potential value of losses

and gains, is integrated into the destination choice model to further study the role of past travel experiences in the tourist destination selection process.

The rest of this chapter is structured as follows: Section 1.1 briefly introduces the background on both tourism industry and tourist destinations; Section 1.2 and Section 1.3 states research questions and demonstrates objectives of the current thesis, respectively; Section 1.4 discusses the contribution of the current thesis from both theoretical and practical perspective.

1.1 Background

Modern tourism is usually considered to initiate around the beginning of Victorian Era (1837-1901) when Thomas Cook (1808-1892) started his first all-inclusive holiday in 1841 (Brendon, 1991). With further development of travel agencies, such as Rominger (in Stuttgart, 1842), Schenker & Co. (in München, 1889) and the Stangen Brothers (in Breslau, 1863), in the 1860s, traveling became a popular movement throughout the society (Gyr, 2010). After two stagnation periods during two world wars, and a "developmental phase" in between (Freyer, 1990), tourism industry embraces rapid growth and becomes one of the largest and fastest-growing industries in the world (UNWTO, 2015). With virtually uninterrupted growth over time, tourism industry outperforms world trade in terms of growth in the past five years (UNWTO, 2017).

1.1.1 Tourism industry.

The tourism industry is described as "key to development, prosperity and well-being" by the United Nations World Tourism Organization (UNWTO) (UNWTO, 2017). According to UNWTO (2017), total international tourist arrivals of overnight visitors reached 1,235 million in 2016, along with an approximation of 5 to 6 billion of domestic tourists. This large movement of tourists generates direct and indirect receipts of US$ 1.2 trillion in 2016, together with a revenue of international passenger transport services of US$ 216 billion. International tourism, considered as an export of goods and services provided by destination

countries, accounts for 30% of world's overall exports of services and 7% of world's total exports of goods and services. In 2016, the contribution of the tourism industry to global GDP is estimated at US$ 7.6 trillion, representing 10.2% of world GDP, and the industry supports 292 million jobs, approximately 1 in 10 jobs on earth (WTTC, 2017).

1.1.2 Tourist destinations.

Tourist destinations provide one basic element for analyzing tourism-related activities. Tourism products, in most occasions, have to be purchased or consumed within tourist destinations. Although tourist destinations are physical in nature, it is also intangible to some extent. Academic studies are conducted, and business strategies are implemented on the intangible aspect of tourist destination, such as destination image (e.g. Telisman-Kosuta, 1989), destination branding (e.g. Morgan, Pritchard, & Pride, 2007; Qu, Kim, & Im, 2011), destination identity(e.g. Lin, Pearson, & Cai, 2011), and destination personality (e.g. Ekinci & Hosany, 2006; Hosany, Ekinci, & Uysal, 2006). A better understanding of tourist destination in these aspects not only promotes the competitiveness of the destination itself but also reinforces multidisciplinary and inter-sectoral strategy developments. Tourist destinations can be framed at the national level as well as the regional level (Hall, 2008). In the current thesis, the term "tourist destination" is referred as a country.

1.2 Problem Statement

Studies on tourist destination choices develop tools for destination management organizations (DMOs) to improve destination image and therefore attract more tourists. Knowledge of the preferences of tourists provides essential information to cost-benefit analysis in destination development strategies. Tourist destination choice process can be described as a process of evaluating tradeoffs among various aspects of tourist destinations (Papatheodorou, 2001, 2002; Stabler, Papatheodorou, & Sinclair, 2009), including bundles of tourism products, engagement of tourism activities, emotional attachment to tourist destinations, total budget

of trips, and so forth. The final decision on a choice implies that the benefits of visiting the chosen tourist destination exceed the benefits of visiting any other alternatives. Minority cases, where only one aspect of tourist destinations dominates all other aspects, may occur but still fit in the framework. The dominating aspect simply outweighs all other aspects.

By deepening the understanding of tourist destination choice process, DMOs or governments can facilitate limited resources in the most efficient aspect and achieve best economic outcome and social welfare. Studies on tourist destination choices can also provide benefit to the tourists. Relying on the results of tourist destination choice studies, destination recommendation systems can be developed. The recommendation system can help the practitioners, travel agencies, for example, to provide tailored information to the potential tourists, reducing the information search cost and improving travel destination selection experience. With benefits to both suppliers and consumers, rigorous studies on tourist destination choices are needed and the implementation of advanced frameworks and estimation methods may provide a better understanding of tourist destination choice process.

Among all destination choice studies existing in the field, normative and prescriptive models are more appropriate due to their power of prediction. Expected utility theory typically reflects the mainstream perspective adopted by economists in approaching the tourist destination choice problem, though prospect theory has been recently proved to be superior in measuring individuals' utility. Expected utility theory evaluates utility by assessing the absolute level of wealth. On the contrary, prospect theory evaluates utility by assessing the gains and the losses of wealth relative to a reference point. The investigation of the properties of prospect theory on selected tourist destination attributes has received some attention (Nicolau, 2008, 2011a, 2013). A complete integration of prospect theory into tourist destination choice process requires the investigation of several additional aspects.

Throughout the literature of choice and behavior of tourists, it is well recognized that past travel experience have significant influence in the selection of a travel destination. The general trend of the literature tends to recognize that the history of prior visitation to a specific destination positively associated with the level of satisfaction (e.g. Konenik & Ruzzier, 2006).

There are also some observations that suggest weak but negative correlation between the general travel experience (number of countries visited) and the likelihood of a return visit (e.g. Weaver, Weber, & McCleary, 2007). Either way, the past travel experience of the tourist is usually considered as one factor, among others, that determine the intention of visit.

While both the adoption of prospect theory and the investigation of past travel experience have been investigated in tourism literature, the full integration of the two elements in the tourist destination choice literature remains unexplored. In the current thesis, the tourist destination choice is investigated under the framework of prospect theory with past travel experience treated as a reference point. In particular, the concept of past travel experience in the current thesis is defined as the typical way of the tourists experiencing destinations. That is, tourists refer to their typical way of travel when evaluating and choosing tourist destinations. Instead of being treated as one factor that influences destination choice, in the current thesis, the past travel experience of the tourists works as the backbone of the choice behavior: a benchmark (reference) in the destination evaluation and choice process. Furthermore, the current thesis also acknowledge that, at the individual level, the past travel experience of a tourist plays a very important role in shaping the preference towards destinations.

It is also well recognized that distinctive patterns are observed among different types of tourists. For example, in comparing with the business and visiting friends and relative travelers, leisure tourists are more flexible in terms of their choices and expenditures (e.g. Lehto, Cai, O'Leary, & Huan, 2004). In the meanwhile, short- and long-haul tourists are observed to have distinctive behavioral pattern in many aspects, including demand elasticity (Crouch, 1994; IATA, 2007), visitor profile and behavior (Bao & McKercher, 2008), and activity expenditure (McKercher, 2008). In contrast with the studies on decision making regarding short-haul destination, the literature of long-haul destination choice is limited (Harrison-Hill, 2001). However, due to higher costs and lower frequency generally associated with long-haul travels in comparing with short-haul travels, according to the theory of bounded rationality (Simon, 1957), in terms of evaluating and choosing tourist destinations, more attention and higher involvement could be expected from the tourists who face long-haul

travel decisions. The current thesis focuses on the investigation of *destination choice faced by long-haul leisure tourists*. In this investigation, the past travel experience acts as a reference point that determines the evaluation of potential destinations.

1.3 Research Objectives

The current thesis focuses on the formulation of a theoretical framework for the long-haul leisure tourist destination choices. In particular, the following objectives are proposed

- to investigate relevant attributes affecting destination choice for long-haul leisure travels by proposing a stated choice experiment and estimating a discrete choice model,
- to explore the influence of past travel experience on the destination choice of long-haul leisure tourists through reference-dependent model specifications,
- to determine individuals' preference weight and willingness to accept/willingness to pay measure for relevant attributes of tourist destination, and
- to assess marketing and managerial implications for tourist destinations.

1.4 Contribution of Current Thesis

The current thesis explores the influence of past travel experience on the destination choice of tourists by integrating prospect theory into a destination choice framework. Extending the researches done by Nicolau (2008, 2011a, 2013), where the reference-dependent behavior is analyzed in terms of the price and the traveling time, the reference-dependent concept in the current thesis is applied on the whole past travel experience. The influences of both non-monetary and monetary factors are investigated. The effects of various tourist characteristics, especially the travel history and the personality of the tourists, are also examined. Inferences on the destination choice of long-haul leisure tourists can be drawn from the results of the current thesis as the model estimates reflect the trade-offs among various destination attributes faced by the tourists.

Theoretically, the research findings of the current thesis consolidate the concept of reference-dependent behavior in long-haul leisure destination choice context. Loss aversion, a feature which is closely related to the concept of reference-dependent behavior, is generally verified in the tourist destination choice process. At a destination-level, tourists have the tendency to select destinations according to the profile of their usual way of enjoying a long-haul leisure travel. The influence of past experience on destination choice is also extended from the destination-level to the destination attribute-level. A new concept, namely reference-level bias, is introduced describing an inertia of the tourists in which case they bias towards a typical quality level of destination attributes that they have experienced in their past travels. The significance of the two behavioral biases (loss aversion and reference-level bias) put an emphasis on the role of past travel experience in the analysis of long-haul leisure destination choice. The preferences of long-haul leisure tourists on the quality of various destination attributes highly depend on individual traveling experience. Furthermore, this dependence is different for varies destination attributes and heterogeneous across the population.

With parameters estimated by the model, measurements of willingness to pay (WTP) and willingness to accept (WTA) are derived. Willingness to pay provides a measure of the maximum price the individual is willing to pay for the acquisition of a particular product or service. Willingness to accept, on the opposite side, gives the minimum compensation the individual would require in giving up the rights to a particular product or service. The two measurements provide important information for practitioners in their revenue management strategies. According to the WTA and WTP, the potential benefits of different business options can be evaluated and compared. Meanwhile, DMOs can also develop and price new tourism products in accordance with their tourism endowments and the WTA and WTP of their potential customers.

The current thesis also generates estimates of preference parameters at the individual level. Heterogeneity across tourists is captured and analyzed. Specific marketing strategies can be developed based on the investigation of individual preference on destination attributes. The results of the analysis can provide the practitioners with the needs of their customers

facilitating the development of tailor-made products.

Chapter 2

Literature Review

This chapter reviews the literature related to the current thesis. Section 2.1 shows the frameworks adopted by tourism studies in describing destination choice of the tourists. Section 2.2 elaborates the role of past travel experience in tourist destination choice process and introduces prospect theory as one way of incorporating past travel experience into tourist destination choice model. Section 2.3 explains different types of tourism market segmentation in order to gain further understanding of tourist heterogeneity. Section 2.4 illustrates the evolvement and application of discrete choice modeling and its potentials in the current thesis. Section 2.5 summarizes and discusses the position of the current thesis in the literature.

2.1 Destination Choice Frameworks

> "Without the possibility of choice and the exercise of choice a man is not a man but a member, an instrument, a thing."
>
> Archibald MacLeish, 1892 - 1982

Choices are essential and elementary components of the daily life of human beings. Scientific studies on choices, in various disciplines, never stopped ever since humans started to question ourselves why and how we make certain choices. Product choices in marketing, occupational choices in economics, strategy choices in business administration, course choices in education,

mate choices in sociology, and many other choice studies in many other fields, all provide inspiring and interesting insights about choices we make.

The choice among tourist destinations is a major topic in tourism research. The understanding of the reason and process of tourist destination choice leads not only to profitable marketing strategy from supply side but also to more efficient recommendations of consulting agencies for the benefit of tourists. The complexity underlying the decision-making process, associated with the selection of a tourist destination, has led to numerous studies that rely on different theories from different disciplines. Abelson and Levi (1985) described three different types of categorization of decision-making literature: process versus structure oriented models, normative versus descriptive models, and risk-free versus risky models. Destination choice literature, as one stream of decision-making literature, naturally falls into these categories. The first two categorizations are further elaborated in the following subsections, while the discussion of the third categorization, the risk-free versus risky models, is beyond the scope of the current thesis. While uncertainty or riskiness definitely interfere with the tourist destination choice, the influence is beyond the preference of the tourists on various destination attributes.

2.1.1 Process-oriented versus structure-oriented frameworks in destination choice.

2.1.1.1 Frameworks focus on processes.

Some studies, on one hand, taking the process-oriented approach, consider the destination choice as a dynamic process, notably the behavioral approach (Mansfeld, 1992; van Raaij & Francken, 1984) and choice-set approach (Crompton, 1992; Crompton & Ankomah, 1993; Decrop, 2010; Um & Crompton, 1990). These studies are more concerned with the process of how destination choices are made, focusing on the characteristics of different stages in destination choice process and emphasizing the role of various factors in each stage.

The behavioral approach suggests that a tourist faces a series of choices, defined as "vacation sequence" (van Raaij & Francken, 1984), in deciding their vacation destination. Tourists

are initially motivated to go on vacation due to some "push factors" (e.g., to escape from routinely life, to explore cultural resources, to relax). The initial arousal then leads to an information gathering on the potential tourist destinations, following up by the comparison and elimination of alternatives, and the selection of final tourist destination (Mansfeld, 1992). The purpose of the behavioral approach is to distinguish different decision stages that tourists pass through and identify the internal and external factors influencing the process (Sirakaya & Woodside, 2005). In addition to the decision made prior to or during the trip, stages such as "traveling back" and "recollection of experiences" are also considered to be relevant to the destination choice process (Clawson & Knetsch, 1966). While having no influence on decisions of the current trip, post-trip experiences play a significant role in future decisions (Crouch, Huybers, & Oppewal, 2016; Lehto, O'Leary, & Morrison, 2004).

Choice-set approach, similar to the behavioral approach in terms of identifying stages in destination choice process, illustrates the destination choice process by differentiating the treatment of alternative destinations (Crompton, 1992; Crompton & Ankomah, 1993; Decrop, 2010). It is suggested that destination choices are sequential in nature with different set structures in each stage (Crompton, 1992). The concept of choice-set was first developed in the consumer behavior literature (Howard, 1963) and further extended and elaborated by Howard and Sheth (1969), Narayana and Markin (1975), Brisoux and Laroche (1981), and Spiggle and Sewall (1987). Woodside and Sherrell (1977) introduced the concept of choice-set into tourist destination choice literature. The authors assert that the tourist destination choice process consists of the evolvement of four distinct sets: awareness-available set, evoked set, inert set, and inept set. Awareness-available set[1] is defined as all destinations that are known and believed to be available to the tourists. Evoked set[2] is comprised of destinations that tourists have some positive likelihood of visiting within some period of time. Inert set encompasses the destinations that tourists have a neutral evaluation. An inept set is made up of destinations that tourists have rejected from their consideration. Um and Crompton (1990) further formulated the destination choice process into three stages including the composition

[1]The awareness-available set is also addressed as early consideration set (Crompton & Ankomah, 1993)

[2]The evoked set is also addressed as relevant set (Crompton, 1992; Decrop, 2010; Um & Crompton, 1990) and late consideration set (Crompton, 1992; Crompton & Ankomah, 1993).

of awareness set, the narrowing down to the evoked set, and the selection of the final tourist destination. An extensive information search on the destinations in evoked set is also identified, before tourists make the final tourist destination selection. Crompton (1992) adopts a more detailed sets classification by dividing the evoked set into action set and inaction set, the action set into interaction set and quiet set, the inert set into foggy set and hold set, and the inept set into unpleasant past experience set and negative external feedback set. Action set is defined as all destinations in the evoked set toward which tourists search information. Inaction set, on the other hand, comprises all destinations in the evoked set without the information searching action. Destinations in the action set on which tourists allow themselves to be exposed to personal selling (e.g. by a travel agency) form the interaction set. The remaining destinations in the action set become elements of quiet set. Foggy set composes destinations toward which tourists have insufficient information to form an evaluation and are unwilling to conduct an additional information search. Other destinations toward which tourists have sufficient information and neutral evaluations comprise the hold set. The most up-to-date version of destination choice-set framework is summarized in Karl, Reintinger, and Schmude (2015) as presented in Figure 2.1.

The formation and evolution of the destination choice set were tested qualitatively through a longitudinal study (Decrop, 2010). Karl et al. (2015) and Woodside and Lysonski (1989) tested the same framework quantitatively, but with a predetermined set structure. This deterministic nature is one criticism that can be levied against the destination choice-set framework (Ben-Akiva & Boccara, 1995). Model specifications that do not pose restrictions on the structure of possible choice-set are needed to further test the evolvement of destination choice-set (Thill, 1992).

2.1.1.2 Frameworks focus on influential factors.

A distinctively different stream of literature, in contrast to the studies employ process-oriented frameworks, considers destination choice as a static problem adopting the structure oriented approach (e.g. Ajzen & Driver, 1992; Beerli & Martín, 2004; Crouch, 2010; Guillet, Lee,

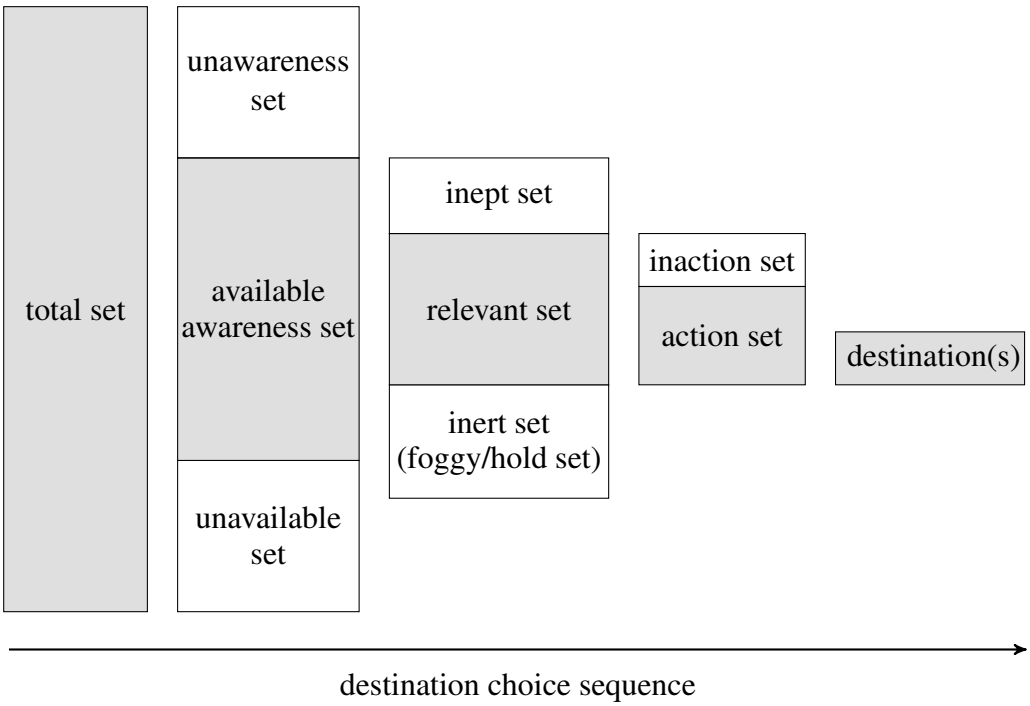


FIGURE 2.1: Destination choice set structure (Karl, Reintinger, & Schmude, 2015, p. 49)

Law, & Leung, 2011; Ng, Lee, & Soutar, 2007). Neglecting the process of the choice, these studies focus on the structure or the elements of a decision. They examine the trade-off among influential factors and evaluate the value associated with each alternative.

Ajzen and Driver (1992) adopted the theory of planned behavior in leisure choice situation. The theory of planned behavior was initially proposed by Ajzen (1985), as an extension of the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), in order to describe and predict human behavior. The theory suggests that visiting intention of the tourists is influenced by the attitude of the tourists towards the destination, the subjective norm perceived by the tourist about the destination, and the behavioral control perceived by the tourists over the trip. The visiting behavior can then be predicted by the visiting intention of the tourists and actual control by tourists over the trip. Since behavior control perceived by the tourists over the trip is a good proxy of actual control by tourists over the trip, the model can, therefore, be illustrated as in Figure 2.2. Ajzen and Driver (1992) show reasonable predictive power of the attitudes, the subjective norm, and the perceived behavioral control on leisure intentions, and reasonable predictive power of the intentions and perceived behavioral control

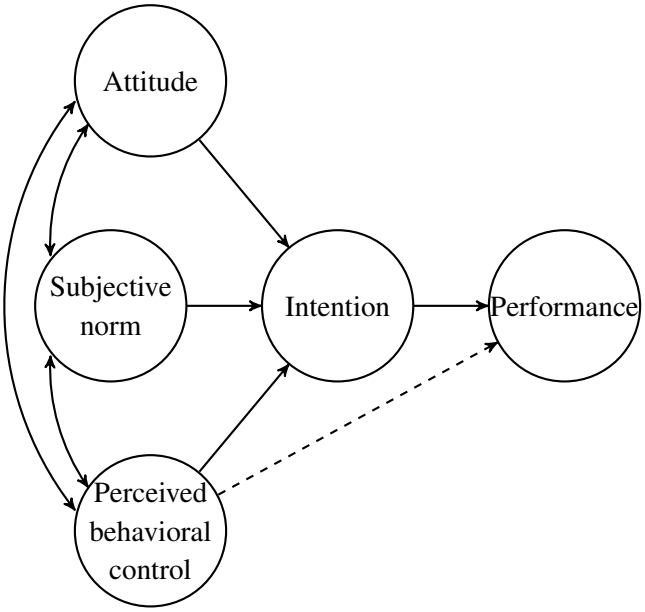


FIGURE 2.2: Theory of planned behavior (Ajzen & Driver, 1992, p. 210)

on leisure behavior. The interactions among three constructs (the attitudes, the subjective norm, and the perceived behavioral control) are also found to be significant. Lam and Hsu (2004, 2006) test and extend the framework by introducing the influence of past behavior on current behavior. The influences are proven to be significant in the context of tourist destination choice of Mainland China travelers (Lam & Hsu, 2004) as well as Taiwanese travelers (Lam & Hsu, 2006). Jalivand and Samiei (2012) investigates the direct and indirect (through the attitude, the subjective norm, and the perceived behavioral control) influence of electronic word of mouth on visiting intention. While the theory of planned behavior and its extensions show significant predictive power in predicting visiting intention and destination choice, it is argued that the three constructs, to the essence, are a summary of many essential elements contained in other tourism decision studies (Sirakaya & Woodside, 2005).

Gorman (1957, 1980) and Lancaster (1966, 1971) develops a *Gorman/Lancaster characteristics framework* that describes one consumption good as a package of different characteristics (attributes). The utility gained from consuming the good is the weighted summation of utility provided by each characteristic. Tourist destination can therefore be considered as the combination of various destination attributes (Papatheodorou, 2001, 2002; Stabler et al., 2009). Wu, Zhang, and Fujiwara (2011) classified three categories of destination attributes

that influence the destination choice of the tourists. Two of them, namely alternative-specific factors and situational factors, are related to attributes of a destination.

Alternative-specific factors include the natural attributes of a destination (e.g. tourism resources, facility fare, service quality) and the accessibility of a destination (e.g. available travel mode, travel distance, travel fare). The price is the most commonly discussed attributes among alternative-specific factors. The price associated with a destination can be facility fare associated with activities (e.g. Awaritefe, 2004; Eymann & Ronning, 1997; Eymann, Ronning, & Zimmermann, 1992) or travel fare between home and the tourist destination (e.g. Morey, Shaw, & Rowe, 1991; Seddighi & Theocharous, 2002; Siderelis & Moore, 1998; Train, 1998). Consistent with the law of demand in economic theory, the increase in price, with all other things remaining unchanged, will have a negative impact on the visiting intention of the tourists. Travel distance and travel time, similar to price, negatively influence the visiting intention of the tourists as well (e.g. Huybers, 2003; Nicolau & Más, 2006; Wu et al., 2011). Tourism resources, or activities available at the destination, are another group of important factors influencing the tourist destination choice (e.g. Moscardo, Morrison, Pearce, Lang, & O'Leary, 1996). Number of tourist spots available at the destination (e.g. Wu et al., 2011), type of activities available at the destination (e.g. Huybers, 2003), attractiveness of activities (e.g. Awaritefe, 2004; Wu et al., 2011), reputation of the attractions (e.g. Eymann et al., 1992), and ranking of the activities at the destination (e.g. Train, 1998) are all proved to be influential factors in tourist destination choice process. With a higher number of tourist spots and more types of activities available, tourists are more flexible in choosing the appropriate activities to satisfy their needs. Better reputation and ranking of the activities at the destination also enhance the confidence of the tourists in receiving a satisfying trip. While being considered as one of the attributes of destination, tourism resource is also a combination of various activities. The activity-based approach, in which travel is viewed as the demand deriving from the need of pursuing activities distributed in the destination, is suggested to be more appropriate than the trip-based approach in the context of transportation (Bhat & Koppelman,

1999) and recreation participation (Fesenmaier, 1988). It has also been proved that disaggregating a destination into activities provides a better understanding of tourist destination choice (Moscardo et al., 1996). Quality services offered at the destination, associated with various activities, are asserted to be important for choosing tourist destinations (Awaritefe, 2004; Siderelis & Moore, 1998). Good service quality improves overall satisfaction and therefore enhances visit intention over a destination (Tian-Cole & Crompton, 2003).

In contrast to the alternative-specific factors, the situational factors are more trip-specific and include factors associated with the trip that can vary across time. Crowdedness with seasonal differences (e.g. Font, 2000; Huybers, 2003), climate and weather conditions (e.g. Hamilton, 2004; Stemerding, Oppewal, & Timmermans, 1999), and social and political situations (e.g. Fuchs & Reichel, 2006; Seddighi, Nutall, & Theocharous, 2001; Sönmez & Graefe, 1998b) are all suggested to have significant influence on tourist destination choice. Utility gain from the destination is relatively low if the destination has a high degree of crowdedness (Huybers, 2003). Bad weather conditions (Stemerding et al., 1999) and unstable political situation (Seddighi et al., 2001) may lead to a change in tourist destination selection as well. Since the situational factors, in most of the cases, are temporary, tourists may choose to defer their trip to the certain destination until the situation alters. Another group of situational factors is associated with the travel party. The size and composition of travel party have a significant impact on destination choice (e.g. Nichols & Snepenger, 1988; Ritchie & Filiatrault, 1980; Thornton, Shaw, & Williams, 1997). To some extent, the concern about travel party takes the destination choice problem from the individual level to the family level. Children, in particular, are found to significantly influence the tourism decision and behavior of a family (Thornton et al., 1997).

The third category of factors that influence the destination choice of the tourists, decision maker-specific factors, is associated with the characteristics of the tourists, such as age, gender, personality and travel motivation. These factors formatively influence the preference of the tourists on various aspects of the tourist destination and are typically used to identify distinct market segments. Therefore, the decision maker-specific factors will be elaborated in details

in Section 2.3 which discusses tourist heterogeneity.

2.1.2 Normative, prescriptive, and descriptive frameworks in destination choice.

Normative decision theory and prescriptive decision theory are similar in the sense that they both try to identify the best decision for an agent, except normative decision theory deals with an ideal agent (a perfectly rational agent with infinite information computing power, etc.) whereas the prescriptive decision theory deals with a non-ideal agent (i.e. human). A substantial amount of literature treats the two types of theory the same and a considerable amount of studies that claim using normative models are indeed adopting prescriptive models. In the current thesis, the term "normative models" is used to feature the models that identifies the best decision.

2.1.2.1 Expected utility theory.

The core difference between normative and descriptive models in destination choice literature is their conceptualization of what tourists do when selecting a tourist destination. Normative models search for an optimal decision while descriptive models simply accept a satisfying solution (Sirakaya & Woodside, 2005). Numerous destination choice studies using structure oriented frameworks are normative, in which they predict a rational choice of destination of the tourist (Clawson & Knetsch, 1966; Wahab, Crampon, & Rothfield, 1976). Expected utility theory, one of the earliest and the most widely adopted theory in measuring utility, is the major tool used in formulating normative choice models. The initialization of expected utility theory can be traced back to Bernoulli (1738), but the explicit calculation of expected utility was not systematically established until von Neumann and Morgenstern (1947). Two laws were proposed in Bernoulli (1738), namely diminishing marginal return and utility maximization. More specifically, the utility that individuals gain from consuming one particular good or service increases at a decreasing rate and the decision that individuals make would be the one that maximizes the (expected) utility. von Neumann and Morgenstern (1947) proposed the formulation regarding how rational individuals calculate the utility, under the assumption of

von Neumann-Morgenstern axioms[3]. With the framework developed by Gorman (1957, 1980) and Lancaster (1966, 1971), as mentioned in Subsection 2.1.1.2, the utility associated with a tourist destination can be formulated as a weighted summation of the utility that individuals attach to each attribute of the tourist destination. This formulation is widely implemented in tourist destination choice literature (e.g. Scarpa & Thiene, 2005; Seddighi & Theocharous, 2002).

2.1.2.2 Theories describing "irrational" behavior.

It is noticed by the academia that most human decisions are not perfectly rational (Bettman, Luce, & Payne, 1998). Observations are frequently found violating the predictions of expected utility theory (e.g. Allais, 1953; Ellsberg, 1961; Friedman & Savage, 1948; Keynes, 1921). Various descriptive decision-making frameworks, such as bounded rationality (Mathieson & Wall, 1982; Mayo & Jarvis, 1981), contingent decision-making (Moutinho, 1987), garbage can model (Woodside & MacDonald, 1994; Woodside, MacDonald, & Burford, 2004), and naturalistic decision-making (Decrop, 2006; Woodside et al., 2004), are adopted in tourism literature, all of which describe the fact that various factors relating to tourist destination choice may constrain or motivate tourists to act irrationally. Variations of expected utility theory were also developed to formulate these "irrational" behaviors, including regret theory, rank-dependent model, security-potential/aspiration (SP/A) theory, prospect theory, and cumulative prospect theory.

Regret theory describes the situation where individuals choose the alternative that minimizes the anticipated regret (Bell, 1985; Fishburn, 1982; Loomes & Sugden, 1982). By overweighing the unlikely (low probability) extreme outcomes (e.g. winning a lottery), rank-dependent model (Quiggin, 1982, 1992) explains the behavior described in Allais paradox (Allais, 1953), in which, inconsistent with the independent axiom of expected utility theory, identical outcomes within a gamble are relevant to the final choice. SP/A theory asserts that an

[3]There are four axioms of expected utility theory, namely completeness, transitivity, independence, and continuity (von Neumann & Morgenstern, 1947).

individual's choice in risky environments is the balanced result between fear and hope, consisting of a general concern about avoiding low levels of wealth (Security, S) while maximizing the wealth (Potential, P) and a general desire to reach certain goals (Aspiration, A) (Lopes, 1987). Prospect theory suggests that individual choices are based on the relative position of a potential outcome and reference status, instead of an absolute value of the potential outcome (Kahneman & Tversky, 1979). Both SP/A theory and prospect theory can address the observation of Friedman and Savage (1948) where an individual who purchases insurance (risk-averse) is also interested in the lottery (risk-seeking). Cumulative prospect theory, as an extended version of prospect theory, overcomes the intransitivity problem of the original prospect theory by adopting the probability weighting feature in the rank-dependent model (Tversky & Kahneman, 1992).

2.2 Prospect theory and Past Travel Experience

Regarding the objective of the current thesis, among all the descriptive models discussed in the previous section, prospect theory stands out for its formulation of reference-dependence feature. This section describes prospect theory in detail and further discusses the way in which it helps in exploring the role of past travel experience in the destination choice process.

2.2.1 Prospect theory

Prospect theory was initially developed in a risky context and describes the decision process of an individual in facing probabilistic alternatives (Kahneman & Tversky, 1979). The theory was later extended to the analysis of choices in the risk-free environment (Tversky & Kahneman, 1991). In contrast to the "reference independence" feature implicitly assumed in the standard expected utility theory, a "reference structure" is defined in prospect theory as the indexed preference relations depending on a reference state. That is, the preference of individual between two alternatives depends on a reference state and may change when the reference state shifts. The dependency of the preference on the "reference structure" formulates the

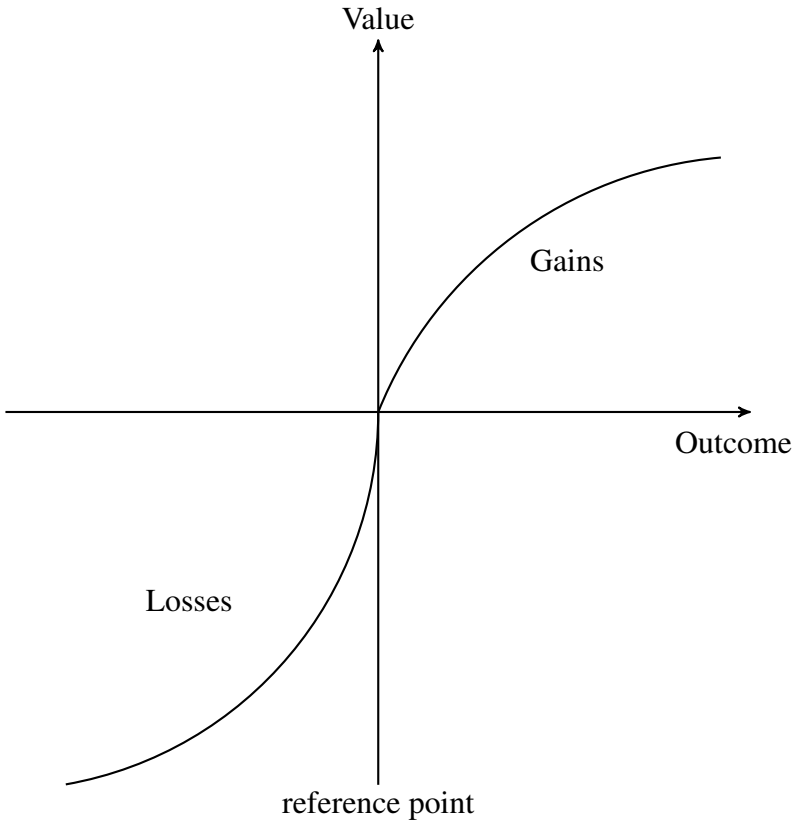


FIGURE 2.3: A hypothetical value function (Kahneman & Tversky, 1979, p. 279)

reference-dependence feature of the prospect theory. The reference state may correspond to the current status of the individual, as well as some expected state the individual would anticipate. In addition to reference-dependence, two behavioral features regarding human choices are described in prospect theory, namely loss aversion and diminishing sensitivity. Loss aversion refers to the unbalanced preference of individual towards gains and losses relative to the reference point. It is argued that "losses looms larger than corresponding gains" (Tversky & Kahneman, 1991, p. 1039). Diminishing sensitivity concerns the decreases in the marginal values in both gains and losses domain. That is, individuals are more sensitive to the change in gains or losses that are closer to the reference point. The value function of outcome in prospect theory is captured in Figure 2.3.

2.2.2 Reference-dependent behavior in other disciplines

Prospect theory was initially developed in an economic environment regarding choices among prospects. As shown in the previous subsection, it is further developed and widely adopted in many other research fields such as environmental economics, psychology, and political science. Reference dependency is one of the core concepts in prospect theory, yet the idea of reference dependency can be found in other disciplines under names other than prospect theory.

Ratchet effect is proposed in the relative income hypothesis in economics by Duesenberry (1949) and Smithies (1957). It described a situation where the choice of current consumption or investment level of the individual highly depends on the consumption or investment level in the previous period (consumption or investment habit formation). The effect was further extended into sociology, where the target of next year of a "*central controller*" would be based on the performance of the previous year (Bevan & Hood, 2006).

Glasser's choice theory is a psychology theory proposed by (Glasser, 1998). Despite all other psychological concepts Glasser's theory provided to the psychology community, the theory proposed a concept of "Quality World". The Quality World for each individual is an unconscious framework built with all the people, things, and ideas that an individual has encountered. The Quality World reflects the role model of an individual's "perfect" world. Glasser (1998) posits that human choices are driven by the comparison between reality and Quality World, that is, a reference-dependent behavior with the Quality World being the reference point.

2.2.3 Applications of prospect theory

Prospect theory was empirically tested and applied in various contexts. Barberis (2013) provides an extensive review of studies adopting prospect theory, in the fields of finance, insurance, consumer behavior, and industrial organization.

Since the origin of the prospect theory was a decision-making model in the risky environment, its application in finance comes naturally. Barberis and Huang (2008) and its follow up, Bali, Cakici, and Whitelaw (2011), Boyer, Mitton, and Vorkink (2010), and Conrad, Dittmar, and Ghysels (2013), investigate the heterogeneous stock pricing by modeling the price on the skewness of stocks within the framework of prospect theory. In another strand of studies, Benartzi and Thaler (1995) and De Giorgi and Legg (2012) aims to explain the well-known *equity premium puzzle* with loss aversion utility. In the third strand of studies, Genesove and Mayer (2001) and Meng and Weng (2017) provide an explanation of disposition effect. That is, with value function proposed by prospect theory (Figure 2.3), the investor is risk-seeking in the "Loss" domain and holds the "falling" stock in the hope of breaking even. Similarly, the investor will sell the "rising" stock to avoid additional risks.

Another major field that employs prospect theory is the choice of insurance. Sydnor (2010) and Barseghyan, Molinari, O'Donoghue, and Teitelbaum (2013) discuss the individual's choice of insurance with loss aversion and probability weighting. Hu and Scott (2007) explains the unattractiveness of annuity products by assuming individuals are loss averse and probability weighting.

In a risk-free environment, related to consumer behavior, Kahneman, Knetsch, and Thaler (1991) examine the exchange asymmetries and the willingness to accept/willingness to pay gaps, where individuals require higher compensation for losses than what they would pay for gains. Kszegi and Rabin (2009) proposed an intertemporal consumption choice model with prospect theory embedded. The results provide a promising reason for precautionary saving. Pagel (2014) extends the model of Kszegi and Rabin (2009) and discusses the possible explanation of overconsumption and excessive smoothness.

While all of above studies adopted prospect theory in terms of money, it has been shown in many other studies that the prospect theory can be extended to concepts other than money. Camerer, Babcock, Loewenstein, and Thaler (1997), Crawford and Meng (2011), and Kszegi and Rabin (2006) provide insights on an individual's choices on working hour by adopting prospect theory. Fiegenbaum (1990) studies the organizational performance of 3,300 firms in

85 industries and finds observations that are consistent with the prediction of prospect theory. Hardie, Johnson, and Fader (1993) shed light on brand choices in terms of quality and price by employing prospect theory. Masiero and Hensher (2010) discuss the choice of freight transportation by examining the gains and losses in terms of cost, travel time, and punctuality. Nicolau (2011b) tests prospect theory in the context of airline demand.

2.2.3.1 Applications of prospect theory in tourism literature.

In tourism context, by investigating the cost associated with the trip, Nicolau (2008, 2011a) confirm the existence of loss aversion and diminishing sensitivity in the tourist destination choice process. Nicolau (2011a) further discovers that the negative influence of a higher than expected price diminishes for the tourists with a cultural interest. Nicolau (2013) also discusses the weakening of loss aversion in the purchase of tourism packages when intermediaries are involved. In the development of a long-term global tourism transportation model, Peeters (2013) adopts prospect theory, instead of linear utility, in modeling the psychological value of travel cost and distance. Kim and Canina (2015) find evidences of reference dependence and loss aversion in the satisfaction scores of tourists, where tourists use average quality of the product as the reference point and evaluate negative deviations more than positive ones. Masiero, Pan, and Heo (2016) discuss the phenomenon that hotel guests choose a hotel room based on their experience of the previous stay. More specifically, hotel guests would place more value on the hotel room features that are worse than their previous hotel stay. Similarly, Román and Martín (2016) finds that the hotel guests give a higher weight to hotel features that are below their expectancy than the features beyond expectancy. In an investigation of the online reviews of restaurant, Park and Nicolau (2015) illustrates the loss aversion feature in terms of the usefulness of the online reviews. That is, negative reviews are usually considered more than positive ones. The results of Wolff and Larsen (2017) shed light on the risk perceptions of the tourists, which is also in line with prospect theory.

One of the objectives of the current thesis is the exploration of the role of past travel experience

in the destination choice process of tourists. The reference-dependent behavior featured in prospect theory fit very well for this purpose. In expected utility theory, the past travel experience of the tourists is usually treated, among all others, as a group of important factors that influences the final selection of the tourist destination. Prospect theory, to be distinguished from the expected utility theory, allows the emerging of another treatment of past travel experience in the destination choice process: a reference point tourists would refer to while comparing potential tourist destinations. The following subsections review the literature on past travel experience and further discuss the logic behind using the past travel experience of the tourists as the reference in evaluating the gains and losses in the tourist destination choice process.

2.2.4 Past travel experience and status quo

Mazursky (1989) asserts that past experiences are more influential than external information on the choices in the current trip. Beerli and Martín (2004) confirm that, in addition to other information sources, experience gained from the previous visitation changes the subjective interpretation of the current trip and therefore influence the perceived image on the current destination. Studies also find the important role of satisfied past travel experience in establishing destination loyalty (Huang & Hsu, 2009; Oppermann, 1999; Oppewal, Huybers, & Crouch, 2010), resulting in repeat visitation. In the choice of recreational activities, Schreyer, Lime, and Williams (1984) describe a strong correlation between the "Experience Use History" and the current status at the destination, including motivation, behavior, subjective evaluation, and satisfaction. The concept of "Experience Use History" is defined as "the amount and types of events in which the individual has participated" in their paper (Schreyer et al., 1984, p. 34). Crouch et al. (2016) suggest a significant relationship between past experience and future preference, moderated by the socio-demographic and psychographic characteristics of the tourists. Hong, Lee, Lee, and Jang (2009) argue that, at the group level, past travel experience may not directly affect the final selection of the tourist destination, satisfied past trips may, however, influence the formation of an "early consideration set" and the development of "late

consideration set" from which the final tourist destination was chosen. Li, Cheng, Kim, and Petrick (2008) and McKercher and Wong (2004) illustrate that, in additional to its influence on the destination choice of tourists, the past travel experience has a significant impact on activity participation of the tourists. Lehto, O'Leary, and Morrison (2004) further suggest a significant correlation between the past travel experience and the expenditure pattern. It is sometimes argued that habit formation bridges the relationship between past experience and current (future) behavior. The argument is demonstrated in both general consumption behavior context (Havranek, Rusnak, & Sokolova, 2017) and tourism context (Massidda & Etzo, 2012; Nordström, 2005). Gitelson and Crompton (1984) and Sönmez and Graefe (1998a) both identify past travel experiences as a mechanism that the tourists use to reduce the risk of a potentially unsatisfying trip.

While the past travel experience is summative in terms of describing the travel history of the tourists, it is also formative in terms of shaping the current status of the travel career of the tourists. *Status quo*, a Latin phrase meaning the existing state of affairs, is commonly referred to in many choice-related problems. In the tourism context, status quo can refer to the collective description of the past travel experience of the tourists. It is well documented that individuals tend to prefer the current status in various context (Kahneman et al., 1991; Knetsch, 1989; Knetsch & Sinden, 1984). *Status quo bias*, introduced by Samuelson and Zeckhauser (1988), refers to the phenomena that the current status is preferred even if it is not objectively superior to other alternatives. The concept of status quo bias provides an intuitively and theoretically sound definition of reference point: the current status. Indeed, the status quo is used as reference point in many studies on decision-making (e.g. Hardie et al., 1993; Loewenstein & Prelec, 1992; Quattrone & Tversky, 1988).

2.2.5 Proposed reference point and framework in the current thesis

The discussion of the prospect theory and past travel experience provides a perspective on the formulation of reference point in the current thesis. While choosing tourist destination for the next trip, it is natural to assume that the tourists use their past travel history as a reference point.

Moreover, there must exist some common aspects that the tourists like to experience in their travel. The above assumption advocates the conceptualization of "typical travel experience" which describes the ideal and usual way of the tourists to enjoy the long-haul leisure trip. The idea of "typical travel experience" can be considered as parallel to the "typical travel mode" or the "habitual travel mode" concepts frequently adopted in transportation literature (e.g. Aarts & Dijksterhuis, 2000; Schlich & Axhausen, 2003) as well as the Quality World concept in *Glasser's choice theory'* (Glasser, 1998), all of which characterize the ideal and usual pattern as the reference.

Following the Gorman/Lancaster characteristics framework (Gorman, 1957, 1980; Lancaster, 1966, 1971), the current thesis considers the decomposition of the tourist destination into various destination attributes, including attractions, quality services, and price. The formulation of reference point also follows this disaggregation. Therefore, in the current thesis, the reference point that a tourist would refer to while choosing tourist destinations is defined as

> *the typical combination of attractions, quality services, and travel budget that a tourist have experienced in his/her past long-haul leisure trips.*

In accordance with prospect theory (Kahneman & Tversky, 1979), while assessing a potential tourist destination, the tourists are assumed to evaluate the deviations in the attributes of the potential destinations with respect to the attributes from the typical travel experience. Gains and losses are defined depending on whether the attributes of the potential destination, respectively, outperforms or underperforms the attributes of the typical travel. The choice of the tourist destination is based on the overall assessment of gains and losses. In the decision-making process, loss-aversion is assumed, should losses weight more than corresponding gains.

As tourists attach different weights to gains and the losses, it is possible that they attach a specific weight to the reference point, too. This assumption, corresponding to the *status quo bias* observations (e.g. Kahneman et al., 1991; Knetsch, 1989; Knetsch & Sinden, 1984), leads to the formulation of a new reference-related behavioral bias. That is, the tourists perceive the destination attribute as experienced in their typical travel differently than any other destination

attribute-levels. The concept is introduced here as *reference-level bias* and can be considered as a parallel extension of status quo bias from the consumption good (i.e. tourist destination) level to the characteristic (i.e. destination attribute) level. Following the logic behind status quo bias, it is assumed here that the tourists attach a higher weight to the reference point.

The two reference-related behavioral biases are summarized below:

> ***Loss-aversion**: tourists choose destinations by evaluating the gains and the losses in destination attributes, while the losses are regarded more severe than the corresponding gains*;
>
> ***Reference-level bias**: tourists ascribe a relative higher value to the destination attribute as experienced in their typical travel in comparison to any other destination attribute-levels.*

A framework is proposed in accordance with these two reference-related behavioral biases (Figure 2.4). The experience at the typical travel destinations serve as the basis for the two behavioral biases and, therefore, play an important role in shaping the preference of tourists on destination attributes. A set of destination attributes, which serves as a similar role of "attitude towards the destination" as in the theory of planned behavior, is evaluated by the preference and the final choice of a tourist destination is reached based on the evaluation.

2.3 Tourist Heterogeneity

The above section discussed frameworks in describing how tourist destination choices are processed. However, the magnitude of the weights attached to destination attributes vary across individuals. In fact, the heterogeneity of tourists is well documented in the literature (Dolnicar, 2002). Revealing the heterogeneity in the preference of tourists allows more accurate understanding of the choices of tourists. Tourist typologies (referred to as decision maker-specific factors in Subsection 2.1.1.2), destination categories, and various kinds of interaction between tourist and destinations, can all be regarded as the sources of tourist heterogeneity. Market segmentation in the tourism industry, as a major tool used in capturing

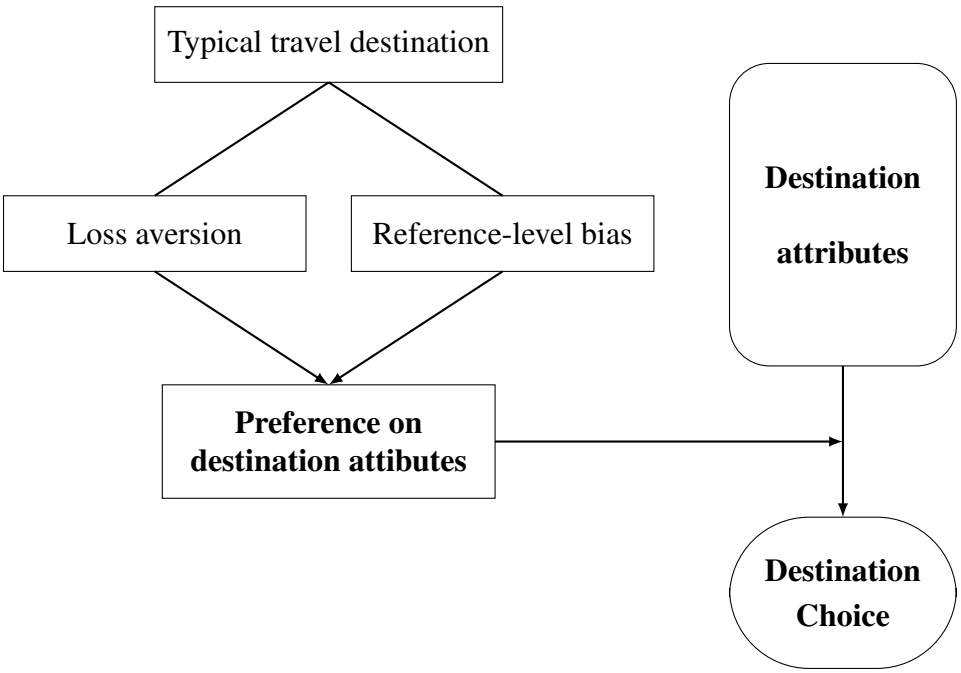


FIGURE 2.4: Proposed framework of tourist destination choice

tourist heterogeneity, has been proven to be an efficient tool for both academic and practical purposes (Dolnicar, 2008; Swarbrooke & Horner, 2007). Different types of tourism market segmentation were developed for the purpose of academic analysis, business strategies, marketing operations, destination selection, and pricing (Coccossis & Constantoglou, 2008).

2.3.1 Market segmentation based on tourists' profile

Tourists, similar to consumers in other markets, can be classified into different segments based on different criteria. Common criteria for consumer classification includes geographics, demographics, socioeconomics, behavioristics, and psychographics (Wedel & Kamakura, 2012). These criteria can be applied separately or in combination (Long & O'Leary, 1997).

2.3.1.1 Geographical, demographical, socio-economic, and behavioral factors.

Geographical factors, such as country of residence and place(s) of usual environment, demographic factors, such as age, gender, and religion, and socio-economic factors, such as income, education, occupation, and family characteristics, are frequently used in tourism

studies controlling heterogeneity across tourists. In particular, during their trip to South Korea, tourists from Mainland China are found to be different from the tourists from Taiwan, in terms of behavior and spending (Kim, Wan, & Pan, 2015). In the study of a regional ski resort in New England, Bojanic and Warnick (1996) reveal preference differences on tourism activities among travelers from different regions. Age cohort (generations) is found to be closely related to individual preference on tourist activities, where Baby Boomers seek stimulation, excitement, and adventure, whereas the Silent Generation pursues static experiences (Lehto, Jang, Achana, & O'Leary, 2008). Anderson and Langmeyer (1982) also demonstrate significant difference in terms of preference on activity engagement and expenditure between under- and over-50 tourists. The religious tourists forms a distinctive market segment due to their desire for the sense of duty and obligation (Swarbrooke & Horner, 2007). Kim, Cheng, and OLeary (2007) discuss the positive association between educational level and tourists' interest in cultural attractions. Family composition, especially the existence of children, is considered to have significant influence on decision making process and activity engagement (Fodness, 1992; Swarbrooke & Horner, 2007).

Behavioral factors, such as activity engagement, expenditure pattern, and travel frequency, are also adopted by certain studies for segmenting the tourism market. By investigate the participation of 47 different activities among tourists to Hong Kong, Hsieh, O'Leary, and Morrison (1992) identified five distinct group of travelers who have different activity engagement. These groups also have different socio-demographics and travel characteristics. Similarly, Moscardo et al. (1996) developed activity-based traveler segments which provide valuable insights in investigating the vacation benefits tourists seek as well as in designing destination marketing strategy. Spotts and Mahoney (1991) examine the behavior of heavy spending tourists and find out that they not only have an expenditure remarkably higher than other tourists, but also have a longer stay, visit more attractions, and patronize a wide variety of facility. Woodside, Cook, and Mindak (1987) focus on the heavy travel segment and emphasis the necessity of loyalty programs, such as frequent flyer and frequent hotel guest.

TABLE 2.1: Tourist Typologies

Studies	*Tourist types*						
	Seeking familiarity						*Seeking novelty*
Cohen (1972)	Organized mass tourists		Individual mass tourists		Explorers		Drifters
	(Institutional tourists)				(Non-institutional tourists)		
Plog (1974)	Psychocentrics		Near-psychocentrics		Midcentrics	Near-allocentrics	Allocentrics
Plog (2001)	Dependable	Near-dependable		Centric-dependable	Centric-venturers	Near-venturers	Venturers
BTC[a] (2018)	Traditionals	Sightseers		Journeyers	Voyagers	Pioneers	Venturers
Smith (1989)	Charter tourists	Mass tourists	Incipient mass	Unusual tourists	Off-beat tourists	Elites	Explorers
Sharpley (1994)	Tourists					Travelers	

a. The typology in BTC (www.besttripchoices.com) follows and extends the work of Plog (2001). Dr. Plog (1930-2011) was one of the co-founders of the website.

2.3.1.2 Travel personality.

The most attention-attracting topic in tourist typology is the segmentation based on psychographic factors. Since the psychographic factors, such as personality and motivation, are unobservable, the typologies differ from study to study (Basala & Klenosky, 2001). Table 2.1 shows some important studies on tourist typologies based on psychographic factors.

Cohen (1972) discusses a psychographic typology of tourists based on the desire of tourists for novelty and familiarity. "Organized mass tourists", in one extreme, buy a packaged trip to popular and mature travel destinations. They prefer to travel with a big group of tourists and a predetermined itinerary. "Drifters", to the other end, demand the highest level of novelty but almost no familiarity. "Individual mass tourists", the weaker form of "organized mass tourists", and "explorers", the weaker form of "drifters", lay between the two extremes. "Organized mass tourists" and "individual mass tourists" are further referred to as "institutional tourists", while "drifters" and "explorers" being "non-institutional tourists". Although Cohen (1972) did not provide any empirical evidence in supporting his typology, the idea of psychographic typology initiated a strand of research.

Plog (1974) pioneered the study on travel personality by purposing the tourist psychographics system. Tourists are classified along a continuum into five types, namely "psychocentric",

"near-psychocentric", "mid-centric", "near-allocentric", and "allocentric". Plog (1974) suggested that "psychocentric" tourists would prefer familiar and mature tourist destinations, while "allocentric" type is the "first people to discover' a new area". The types in Plog (1974)'s typology changed their name into "dependable", "near dependable", "midcentric", "near-venturers", and "venturers" (Plog, 1995). The middle type, "midcentric", was later divided into two types as "Journeyers" and "Voyagers", with rename of other four types, namely "Traditionals", "Sightseers", "Pioneers", "Venturers" (Best Trip Choices, 2018).

Smith (1989) describes tourists in seven types. "Charter tourists" have little interest in the destination itself while almost all their enjoyment comes from being entertained during holidays. "Mass tourists" expect similar things that they have in their usual environment. "Incipient mass" tourists prefer destinations where tourism is not yet dominant. "Unusual tourists" deviate from the trip of organized tours to experience local culture. "Off-beat tourists" aim to avoid other tourists and explore on their own. "Elites" are frequent travelers and experienced enough to tailor their own trip. "Explorers" are the small group of traveler who travels as anthropologists.

Sharpley (1994) adopts an easy classification of tourists by dividing them into "tourists", the individual who buy a package from the tour operator, and "travelers", the individual who arrange their own vacation.

Dr. Stanley Plog, in his response to Smith's review (Smith, 1990), argued that the instrument should be "personality-based (psychographic) questions" (Plog, 1990). His instrument, however, does not use psychological personality scales directly from psychology literature. Griffith and Albanese (1996) tests Plog's travel personality against three major psychological personality scales: Interaction Anxiousness Scale (Leary, 1983), Locus of Control Scale (Rotter, 1966), and Sensation Seeking Scale (Form V) (Zuckerman, 1971, 1979; Zuckerman, Kolin, Price, & Zoob, 1964). Their results confirm the consistency between Plog's travel personality and the tested psychological personality scales. Jani (2014) performs the comparison between Plog's travel personality and another popular psychological personality scale, Big Five Factors (BFF) of personality, and found similar results as Griffith and Albanese (1996).

Further studies test tourist typologies directly using psychological personality scales. Gilchrist, Povey, Dickinson, and Povey (1995), Lepp and Gibson (2008), and Pizam, Reichel, and Uriely (2001) all illustrate that Sensation Seeking Scale (SSS) is effective in identifying the group of tourists who seek for sensation during their vacation. Sensation seeking tourists, suggested by these authors, enjoy adventurous holidays in (riskier) international destinations. Lee and Crompton (1992) establishes a "Novelty Seeking Scale" (NSS) based on items from various psychological personality scales such as Leisure Boredom Scale (Iso-Ahola & Weissinger, 1990), Arousal Seeking Scale (Mehrabian & Russell, 1973), Novelty Seeking (Maddi, Charlens, Maddi, & Smith, 1962; Pearson, 1970; Wentworth & Witryol, 1986), and Sensation Seeking Scale (Zuckerman, 1971, 1979; Zuckerman et al., 1964). The developed scale is proven to be effective in segmenting tourists into novelty seeking group and familiarity seeking group.

The use of SSS and NSS involves a large number of psychological personality testing items. In some situations, the feature is undesirable due to limited space in questionnaires. Hoyle, Stephenson, Palmgreen, Lorch, and Donohew (2002) assert that SSS with a reduced number of items preserves reasonable reliability and validity. Brief Sensation Seeking Scale (BSSS) employed in Hoyle et al. (2002) contains eight items out of 40 original items in SSS and yields results that would be expected from a full SSS. The eight-item-scale is often adopted in marketing and advertising occasions and surveys for its small questionnaire space requirement (e.g. Allen, Vallone, Vargyas, & Healton, 2009). In the tourism context, Eachus (2004) shows significant predictive power of BSSS on holiday preferences and suggests that tourists choose holiday destination types that "reflects certain aspects of their personality", in which sensation seeking plays a major role.

2.3.1.3 Travel motivation.

Travel personalities, reflecting the human nature of tourists, to some extent, are presumed stable within a steady period of life (McCrae & Costa, 1994). Another type of psychographic factors, travel motivations, in contrast, are usually trip specific. The concept of motivation in

tourism is commonly classified into two forces. The push factor, on one hand, "deals with tourist motivation per se" (Dann, 1981, p. 190), can be described as the motive that drives tourist away from home. The pull factor, on the other hand, "represents the specific attractions of the destination which induces the traveler to go there" (Dann, 1981, p. 191), is the factor that drives tourist towards the destination (Dann, 1977). Other classifications of travel motivation, such as "sunlust - wanderlust" (Gray, 1970) and "anomie - ego-enhancement" (Dann, 1977), can all fit into the push-pull framework. The push factors are usually linked with emotional or internal aspects of tourists, while the push factors are commonly connected to cognitive or external aspects of tourists (Yoon & Uysal, 2005).

Following the push-pull framework, empirical studies were conducted in the effort to link travel motivations to destination image perception and destination selection. Chen and Chen (2015), Hsu, Tsai, and Wu (2009), Jang and Cai (2002), and Uysal and Jurowski (1994) all suggest a significant linkage between push-pull motivations and the destination or activity choice. Moscardo et al. (1996), with results from cluster analysis, asserts that activity choice at the destination plays a critical role in linking travel motivation and the destination choice. Kozak (2002) investigates travel motivation with different nationalities and concludes that culture and usual environment have a significant influence on travel motivation.

Travel personality and travel motivation can all serve as criteria for tourist segmentation, the nature of the two factors should be distinguished. Confusion between the two is considerably common:

> "typically confuse a number of different level of analysis combining what would be referred to as motives in sociology and psychology, with expression of personality variables such as novelty seeking and extraversion" (Moscardo, Dann, & McKercher, 2014, p. 85)

2.3.2 Market segmentation based on travel profile

Tourist typologies based on geographics, demographics, socioeconomics, behavioristics, and psychographics criteria are market segmentation purely based on tourist characteristics. Market segmentation, other than simple tourist typology, are also used in academic studies and practitioner's strategies.

2.3.2.1 Leisure, business, and visiting friends and relatives.

Based on travel motivation, specifically the push factors, tourists can be classified into tourists for leisure, tourists for business, and tourists for visiting friends and relatives (VFR). Different purposes make tourists differ in terms of their perception of destinations and their activity engagement at destinations. While business tourists and VFR tourists, to some extent, have their travel destination predetermined, studies related to business tourists and VFR tourists, therefore, focus more on behavioral and preference differences in activity engagement and expenditure pattern. Huse and Evangelho (2007) investigate the preferences on airline service for business tourists. Lo, Cheung, and Law (2002) compare information search processes between business and leisure tourists. Kellerman (2010) compares the goal, relative magnitude, and spatial patterns between business and leisure tourists, while Jang, Yu, and Pearson (2003) examine the differences of socio-demographical structure and behavior pattern between business and VFR tourists. Expenditure patterns are compared and discussed among business, leisure and VFR tourists (Lehto, Cai, et al., 2004), as well as within the VFR tourist group (Backer, 2007). Trip characteristics are investigated within VFR tourist group (Hu & Morrison, 2001), further comparisons between sub-groups of VFR tourists, such as "VFR as primary purpose" versus "VFR as secondary purpose" and "commercial accommodation" versus "home stay with friends and relatives", are also conducted (Lehto, Morrison, & O'Leary, 2001; Moscardo, Pearce, Morrison, Green, & O'Leary, 2000). Further classification of leisure traveler, such as "honeymoon tourists", "fraternal association tourists" "sports tourists", and "rest and relaxation tourists", are compared along with business and VFR

tourists (Kim & Agrusa, 2008). In most cases, business tourists and VFR tourists have their travel destination predetermined, the tourist destination choice literature, therefore, focusses mainly on leisure tourists.

2.3.2.2 Travel distance.

Another type of segmentation, quite related to geographical segmentation, is the segmentation by travel distance. Tourist destinations, in this context, are commonly divided into a long-haul destination and short-haul destination. This type of segmentation, unlike most of the other types, is not well-defined since "long-haul" and "short-haul" are relative terms. U.K. government considers a flight over 2,000 miles as long-haul (HMRC, 2017). European Organization for the Safety of Air Navigation (EuroControl) defines long-haul flight as an airport-to-airport of more than 4,000 km (i.e. approximately 2485 miles, as stated in EUROCONTROL, 2005). International Airline Transportation Association (IATA) adopts a definition of travel time above 5 hours (IATA, 2012). Etzel and Woodside (1982) identify the difference between near-home and distant travelers in terms of travel-related behavior and benefit seeks. Harrison-Hill (2001) finds evidence indicating different perceptions of travel distance among different cultures. Tourists visit a long-haul destination will be identified as long-haul tourists, while tourists in the short-haul destination are short-haul tourists. Bao and McKercher (2008) investigates the differences in socio-demographical structures between long-haul and short-haul tourists in Hong Kong and finds distinctive patterns. Lim, Min, and McAleer (2008) examine the income elasticity of long-haul and short-haul tourists from Japan. Crouch (1994), in addition to income elasticity, also examines the price, exchange rate, transportation cost, and promotional expenditure elasticity of demand by meta-analysis of 80 studies. Lo and Lam (2004) discuss the different choices of tour package between long-haul and short-haul tourists. Ho and McKercher (2014) compares long-haul and short-haul tourists in business travel context and finds substantial differences in terms of profile and behaviors. Some studies show the volume of tourist decreases as the distance between home and the tourist destination increases (McKercher, 2008; McKercher, Chan, & Lam, 2008). The results

from McKercher (2008) further indicate that the decrease in volume can be attributed to the disappearance of a whole segment instead of universal decrease in all segments. In other words, certain tourists, when choosing a tourist destination, would not consider destinations out of a distance range.

2.3.2.3 Stopover, hub, and secondary destinations.

Along with the distance segmentation, nature of destinations is also studied. The roles of stopover destinations, hub destinations[4], and secondary destinations are investigated (Oppermann, 1995). While perceiving a tourist destination differently in nature, tourists tend to behave differently (McKercher, 2001). The accessibility and quality of secondary destination, while choosing a primary tourist destination, are also important factors for tourists (King & Choi, 1997; Tang & Weaver, 2013).

2.3.2.4 Cultural distance.

In addition to geographical distance, the cultural distance can also serve as one segmentation criteria. Instead of differentiating the tourists across countries of origin, cultural distance classifies tourists into several distinct cultural groups. Ahn and McKercher (2015), McKercher and du Cros (2003), Ng et al. (2007), and Kim, Im, and King (2015) all discuss the influence of cultural or religious differences on tourism behavior and preferences. The differences in cultural habit and religious belief will affect not only the behavior pattern of the tourists but also their perceptions of the destination. In particular, in the tourism context, Ng et al. (2007) and Yang, Liu, and Li (2016) investigate different cultural measures, such as Hofstede (1980)'s *National Cultural Dimensions*, Clark and Pugh (2001)'s *cultural clusters*, and West and Graham (2004)'s *linguistic distances*. They conclude that cultural difference is an important factor in influencing tourist behavior and found a high correlation among the difference cultural measures.

[4]Stopover destination refers to the destination offering a brief stay in the course of a journey. Hub destination refers to the destination working as a hub in a region that further distributes tourists to their target.

2.3.2.5 Past travel experience.

Past experience associated with a particular destination provides another significant segmentation criterion. First-time visitors and repeat visitors are identified to be different in terms of activity engagement, where first-time visitors intend to participate in a wide range of activities while repeat visitors focus mainly on recreational activities (Lau & McKercher, 2004; Li et al., 2008). First-time visitors enjoy shorter stays at the destination with higher daily expenditure (Litvin, 2007), while repeat visitors intend to stay longer and have a relaxed behavioral pattern (McKercher, Shoval, Ng, & Birenboim, 2012). The level of satisfaction and source of satisfaction are found to be different between two groups of tourists (Fallon & Schofield, 2003; McKercher & Wong, 2004). Oppermann (1996, 1997) also identify differences in destination composition in travel itineraries between the first-time and repeat visitors. Repeat visitors, despite their longer stay, will consider fewer destinations and attractions during their journey.

In addition to the distinction between first-time and repeat visitors (i.e. the previous travel experience associated with one particular destination), the past travel experience in general is also an effective tool in segmenting tourists. While the individual preference can be revealed by the travel history of the tourists, the past travel experience also play an crucial role in forming the future trip intention (Crouch et al., 2016). Pearce and Caltabiano (1983) explore the concept of "motivational career" in travel and suggest that tourists with richer travel experience (in terms of number of countries visited) tend to pursue higher rank of needs than travelers who are less experienced. For tourists visiting Hong Kong, Weaver et al. (2007) find a weak and negative correlation between the number of countries the tourists visited and their revisit intention to Hong Kong.

One important caveat can be draw from the market segmentation literature: the tourists are heterogeneous in terms of preference from various perspectives. It is crucial to feature this heterogeneity while modeling the destination choice of tourists. Under the specific framework as proposed in Figure 2.4, the heterogeneity of the preference of the tourists on destination

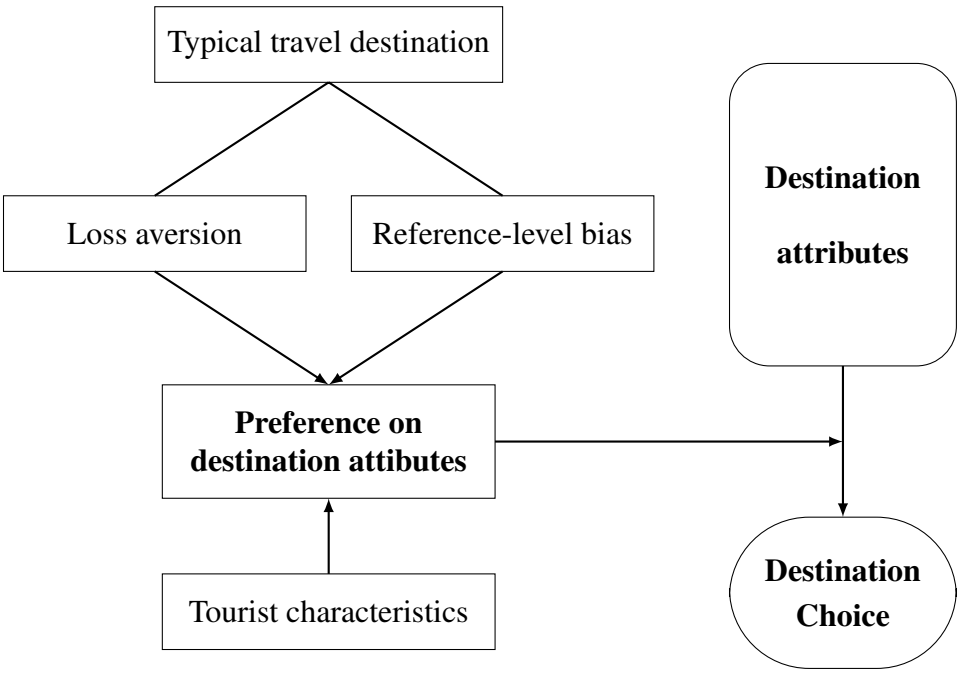


FIGURE 2.5: Proposed framework of tourist destination choice with tourist heterogeneity

attributes should be captured. More specifically, in the current thesis, while the preferences of the tourist on destination attributes are modeled and estimated under the framework of prospect theory, the source of preference heterogeneity is further explained using tourist characteristics. For example, it is reasonable to believe that the tourists with wide variety of travel experience and high degree of sensation seeking, due to their inclination of novelty and sensation, are less likely to be reference-level biased, while the tourists with a steady travel pattern tend to be the opposite. Similarly, sensation seeking tourists are less likely to be loss averse, while the elder generation tend to be the opposite. To reflect the connection between heterogeneous tourist characteristics and heterogeneous preference of tourists on destination attributes, the framework of the current thesis is further completed as in Figure 2.5.

2.4 Discrete Choice Modeling

Discrete choice modeling is considered as a major tool in estimating tourist destination choices (Nicolau & Más, 2006).

2.4.1 Multinomial logit model

Since tourist destination choices are discrete in nature, reflecting the selection of a destination from a set of alternatives, the linearity assumption (linear dependent variable) of traditional linear regression is violated. Therefore, in the early ages, before the 1960's, the consumer behavior theory on choices are mostly used as a logical tool to explore conceptually the properties of alternatives (McFadden, 2001). Starting with the study of psychophysical discrimination, Thurstone (1927) introduced "law of comparative judgment". It states that an alternative is perceived as the combination of a "stimulus" and a normal error. The probability of choosing an alternative will, therefore, be a function of the different "stimuli" among alternatives. The form of choice probability introduced by Thurstone (1927) is called binomial probit model today. Marschak (1974) used the concept of "utility" to interpret "stimuli" in Thurstone (1927) and proposed a "Random Utility Maximization" (RUM) model in the economic literature. RUM model describes choice as a discrete event where utility towards alternatives varies across individuals as a random variable. Luce (1959) introduced "independence from irrelevant alternatives" (IIA) axiom in psychological literature. The IIA axiom states that the choice probability for alternative a being chosen in choice set M, $\Pr(a \mid M)$, is equal to the choice probability for alternative a being chosen in choice set N, $\Pr(a \mid N)$ divided by the probability of choice set M being chosen from choice set N, for all $a \in M \subseteq N$. This feature implies that choice probability $\Pr(a \mid M)$ is a conditional probability of $\Pr(a \mid N)$ conditional on a choice set M being chosen from the choice set N. The IIA axiom implies that the ratio of choice probabilities for alternatives a and b is the same for every choice set that includes both a and b. This feature allows the simplification of inferring multinomial choice probabilities from binomial choice experiments. McFadden (1976) developed a conditional logit model based on Marschak (1974) and Luce (1959), and further elaborated the idea in McFadden (1974). The conditional logit model built in McFadden (1974) is commonly called a multinomial logit (MNL) model today.

MNL provides a model empirically estimating the choice among multiple alternatives. It is widely used in empirical studies that describe human choice behaviors, including tourist

destination choices. Haider and Ewing (1990) employ an MNL model in investigating the factors in tourist destination choice in the Caribbean area and find price and distance to beach constituting the most influential factors. Huybers and Bennett (2000) study the willingness to pay associated with environmental changes on choosing Tropical North Queensland as a holiday destination. Using an MNL model, the authors assert that lower quality of the environment will lead to a fall in the willingness to pay of tourists for a trip to the region. Morley (1994) adopts an MNL model in examining the effect of price factors on destination choices of tourists from Kuala Lumpur and suggests that airfares, compared to hotel tariffs and exchange rates, are more important. Schroeder and Louviere (1999) discuss the influence of increasing a fee charge on the public choice of recreation sites using an MNL model and show different impacts in different market segments.

Although MNL models are widely used in estimating tourist destination choices, some potential limitations can be drawn from the model assumptions. As mentioned above, IIA axiom is one of the fundamental assumptions for MNL models. It requires the choice probabilities for alternatives to be independent. In other words, the ratio of choice probabilities for two alternatives should not change when one additional alternative destination is provided to the tourist. This axiom is sometimes unrealistic and undesirable. Decoy effect was found to be strong in travel destination choice between Las Vegas, Nevada, and Walt Disney World in Orlando, Florida (Josiam & Hobson, 1995). The introduction of a decoy package significantly influenced the choice of travel destination of the tourists.

The random heterogeneity across tourists is another issue sabotaging the validity of MNL model estimations. Segment-specific heterogeneity can be specified with segmentation in MNL model, however, it is not possible for the MNL model to capture the random and unobserved heterogeneity in the preference of tourists.

Correlation among alternatives brings up another potential source of bias in MNL model estimations. Since the tourist destinations are located in different areas, it is common that the alternatives have certain correlations, such as spatial correlation (Bhat & Zhao, 2002). The error terms in the model are therefore correlated, which violate the i.i.d. (independent and

identically distributed) assumption of the error terms.

2.4.2 Variation of the multinomial logit model

Due to the limitations of MNL model, other models in the generalized extreme value (GEV) model family[5] (McFadden, 1978a) were developed and adopted in destination choice studies, including nested multinomial logit (NMNL) model and mixed multinomial logit (MXL) model[6].

NMNL model allows a hierarchical choice process. A tourist will first choose a subset of destinations from the choice set and then choose a tourist destination from the subset. For example, a tourist may first consider Asian destinations, and then choose Hong Kong as the final tourist destination. Or, a tourist may first consider coastal destinations, and then choose Hong Kong as the final tourist destination. Dividing the choice process into multiple layers can relax the IIA assumption from the global level to subset level. That is, IIA is not assumed for the whole process but assumed for each selection. For example, (Hong, Kim, Jang, & Lee, 2006) adopt an NMNL model in the context of national park choices of Korean tourists. The first layer of the choice is the category of the parks, namely mountainous, coastal, historical, and exotic. The second layer of choice is the final selection of park within the chosen category.

MXL model allows the coefficients associated with attributes to be random. This enables the estimation of random heterogeneity across tourists. For example, Nicolau and Más (2006) adopt MXL model in investigating the influence of prices, travel distance, and travel time on tourist destination choice of Spanish tourists. The random coefficients feature captures the random heterogeneity among decision makers (tourists). In addition to the random coefficient feature, MXL also allows different correlation patterns among non-independent alternatives. For example, Nicolau and Más (2008) revisit the destination choice process of Spanish tourists and find different layers in the tourist destination choice process, such as "going on holiday or

[5] MNL model can be derived as a special case of GEV model, where IIA assumption is strictly assumed.

[6] Other models based on GEV theory were also developed including cross-nested logit (CNL) model, paired combinatorial logit (PCL) model, generalized nested logit (GNL) model, spatially correlated logit (SCL) model, and network GEV model. The utilization of these models in tourism destination choice literature, however, is rare.

not", "coastal versus inland", and "village versus city", as well as preference heterogeneity across tourists.

2.5 Summary of Literature Review

This chapter reviewed literature related to tourist destination choice and the behavior of the tourists. Among all frameworks discussed in Section 2.1, process-oriented frameworks focus on the characteristics of the decision-making process, while structure oriented frameworks emphasize the role of influential factors on tourist destination choice. Normative and prescriptive frameworks intend to predict destination choices of tourists, whereas descriptive frameworks explain real-life destination choices made by tourists. One of the objectives of the current thesis is to investigate the influential factors on tourist destination choice and to estimate the willingness to pay for gains and willingness to accept for losses. A structure oriented prescriptive framework is, therefore, most appropriate. Among other potentially influential factors, tourism resources in term of attractions available, quality rating of available attractions, service quality, and the price are chosen to be investigated. A pseudo-attraction based approach is adopted in which the tourist destination is captured by various categories of attractions. Similar to the tourism resources, the service quality at the tourist destination is also divided into different aspects. Price of the trip includes both facility fare and transportation fare.

Prospect theory and related literature are reviewed in Section 2.2. As one step forward from expected utility model, the current thesis adopts prospect theory in measuring the utility of tourists from visiting tourist destinations. The typical combination of attractions, quality services, and travel budget that the tourist have experienced in the past long-haul leisure trips is adopted as the reference point in evaluating gains and losses. Two reference-related behavioral biases, namely loss-averse and reference-level bias, can be investigated within this framework. More specifically, the tourists are expected to weight losses more than corresponding gains as well as weight the quality level of destination attributes at reference point more than other quality levels.

Literature on tourism market segmentation is reviewed in Section 2.3. The differences in the preference of tourists are repeatedly observed in the reviewed studies, which put an emphasis on the importance of capturing tourist heterogeneity in tourist destination choice models. In the current thesis, the random heterogeneity in terms of the preference of tourists on destination attributes are modeled by MXL model, which is reviewed in Section 2.4 and further elaborated in Chapter 4.

Several research gaps can be identified throughout the reviewed literature. Destination choice studies on the preference of long-haul tourists are limited despite the rapid growth of the market segment. The past travel experience of the tourists, although frequently mentioned in the literature, is usually incorporated into the model as one factor. Therefore, by using either a summarized "number of countries visited" (e.g. Weaver et al., 2007) or a dummy variable capturing the prior visitation (e.g. Lau & McKercher, 2004), the studies in the current literature merely provide a summative evaluation of the impact of past travel experience on current destination choice. The potentially different influence from different aspects of past travel experience cannot be distinguished from the results of the current literature. In addition, the utilization of prospect theory in destination choice literature is limited to several easily measurable aspects, such as price and travel time.

The current thesis addresses these gaps by investigate the tourist destination choice of long-haul leisure tourists and extends the prospect theory to a wider variety of destination attributes. The past travel experience is conceptualized as the "typical travel experience" to further emphasize on the typical pattern in which the tourists enjoy long-haul destinations. Multiple aspects of the tourist destination are adopted in constructing the "typical travel experience" and they are utilized not only as reference points that tourists refer to in evaluating tourist destinations, but also as explanatory variables in understanding the heterogeneity of individual preference. The random heterogeneity in terms of the preference of tourists is captured by random coefficients in MXL model and is explained by tourist characteristics in regression analysis.

Chapter 3

Data Collection Method

In this chapter, the method of data collection is elaborated upon. Section 3.1 introduces the data source and survey population. Section 3.2 presents the data collection process and some additional information on the sample. Section 3.3 discusses the questionnaire used in data collection, where information about the typical long-haul leisure travel experiences of the respondents is collected in the first part, the tourist destination choices of the respondents are elicited by a stated choice experiment in the second part, and characteristic variables describing the respondents from tourism-related aspect and other aspects are extracted in the third part and the forth part, respectively. Section 3.4 concludes the chapter.

3.1 Data Source and Survey Population

The current thesis focuses on the tourist destination choices of long-haul leisure tourists. The three chosen source markets, namely the US, the UK, and Australia, are not only the major tourism source markets in terms of expenditure but also fast expanding source markets for international tourism. In 2016, tourists from the three aforementioned countries spent US$ 123.6 billion, US$ 63.6 billion, and US$ 24.9 billion, respectively, on international tourism. In comparison to 2015, they each scored an annual growth rate of 7.8%, 13.8%, and 6.0%, respectively (UNWTO, 2017). The respondents are randomly selected among the online population of the source markets who have had at least one long-haul leisure trip during the past five years.

In a pioneer study as the current thesis, the choice of three English speaking countries may limit the generalizability of the research findings. On the other hand, however, this choice provides a more confined cultural context, so that the investigation of the current thesis can focus on the evaluation of other aspects of the tourists, such as their travel experiences. Indeed, in the investigation of the preference heterogeneity among three source markets (see Chapter 6 for more details), country of residence are found to be an insignificant factor in influencing individual preferences on destination attributes. Future research on how individual preferences on destination attributes varies across difference cultures can be conducted as an extension of the current thesis with a more diverse choice of source markets.

3.2 Data Collection

A web-based survey is implemented on the survey population and the data collection process is administered by a specialized market research company. The questionnaire (as described in details in Section 3.3) is delivered in English, which is the first language in all three source markets. Money related questions, such as questions about price and income, are expressed in local currency for each source market.

A pilot test had been conducted with 153 respondents from the three source markets in December 2016. It tests the questionnaire and obtains preliminary information about the choice preferences of the respondents. The results of the pilot test were used to generate an efficient experimental design (Rose & Bliemer, 2009, and detailed discussion in Section 3.3.2.6) with Ngene (Version 1.1.2, ChoiceMetrics, 2014). The main survey was then conducted at the beginning of 2017. There were 1,417 effective responses collected from the US (472), the UK (465), and Australia (480).

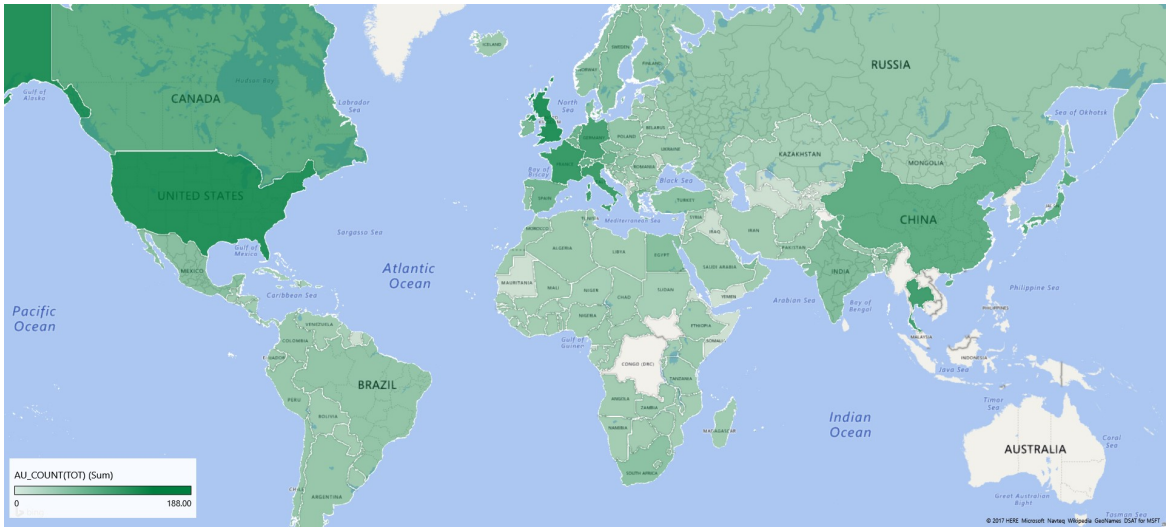
The following section will discuss the design of the questionnaire as well as the sample information for each part of the questionnaire.

3.3 Questionnaire Design and Sample Information

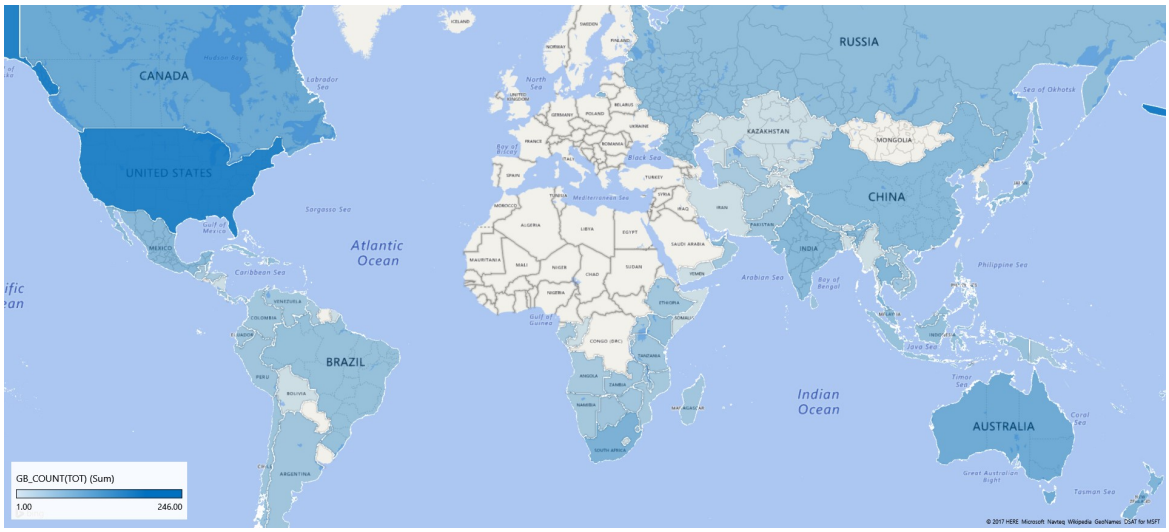
3.3.1 Typical long-haul leisure travel experience.

The questionnaire comprised four parts. Before collecting the preferences of the respondents on tourist destination alternatives, information on the past travel experience of the respondents is collected. Long-haul leisure destinations that the respondents have been visited are identified among all the potential long-haul destinations of the source market (Question 1-1, Appendix A). The three panels of Figure 3.1 presents the long-haul leisure travel history of all respondents from three source markets, respectively. Darker colors in Figure 3.1 represents a higher number of visitation to the destination. It can be concluded that, in spite of the wide-spread footprints these respondents have, the popularity of long-haul destinations within a specific source market is quite distinct. North America (Canada and the US), Western and Southern Europe, East Asia (especially China), and Australia stand out to be the most popular destinations, while Africa and South America are off the beaten track.

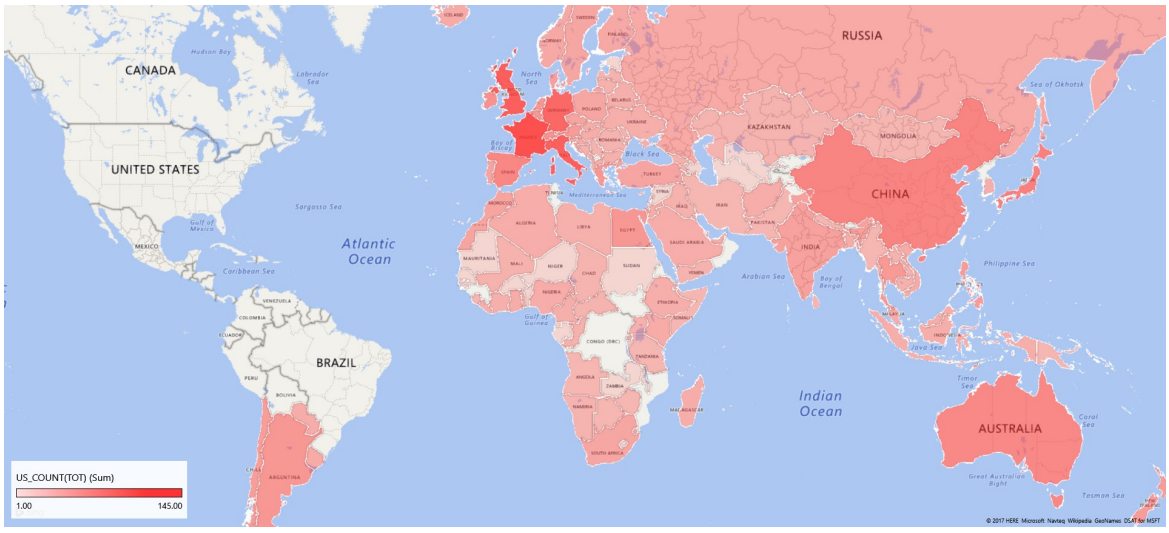
Among all long-haul destinations visited, the respondents are asked to identify those destinations that they have visited in the past 10 years (Question 1-2, Appendix A) and the destinations that they considered to provide similar combination and quality of leisure activities (Question 1-3). The latter set of destinations are framed with the word "typical" which represents the typical way of enjoying long-haul leisure travels by the respondents. Figure 3.2 shows the frequency of the destinations that are selected into the typical destination group. Similar to the overall travel history, a distinct group of countries are selected as members of the typical destination group: the US for the Australian and British respondents, European countries (especially France and the UK) for the Australian and American respondents, Australia for the British and American respondents, and Asian countries (especially China and Japan) for all the respondents appear at the top of the typical destination lists. The upper panel of Table 3.1 summarizes the information on the travel history of all respondents. On average, the respondents visited 4.5 long-haul destinations but with a significant heterogeneity (ranging from 1 to 51 destinations visited). The majority (2.9 out of 4.5) of these trips took



(A) Footprints of the respondents from Australian



(B) Footprints of the respondents from UK



(C) Footprints of the respondents from US

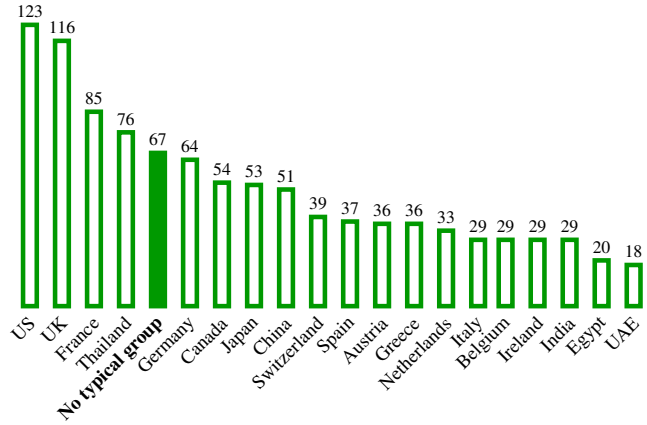
FIGURE 3.1: All long-haul destinations visited

TABLE 3.1: Sample travel history and typical destinations

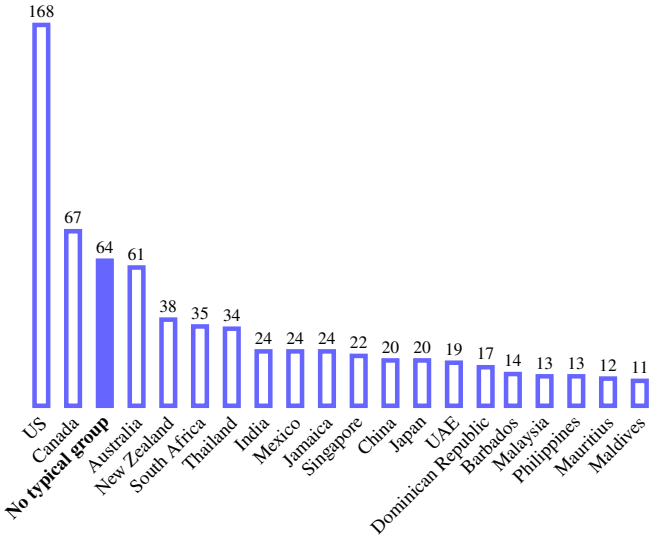
	Mean	Std.Dev.	Median	Min	Max
Overall travel history					
Number of countries visited					
Overall	4.50	5.48	2	1	51
During past 10 years	2.94	3.44	2	1	26
Size of "typical destination" group	2.23	2.80	1	0	25
Most recent typical destination visit					
Length of stay	16.62	16.08	14	3	180
Travel party size	2.10	1.57	3	1	10
Activity engagement at different attractions					
Cultural attractions	3.37	0.77	4	1	4
Natural attractions	3.39	0.74	4	1	4
Outdoor recreational attractions	2.72	1.04	3	1	4
Entertainment attractions	2.98	0.95	3	1	4
Quality of attractions/services					
Cultural attractions	4.22	0.98	4	1	5
Natural attractions	4.29	0.93	5	1	5
Outdoor recreational attractions	3.46	1.38	4	1	5
Entertainment attractions	3.73	1.25	4	1	5
Hospitality services	4.30	0.81	4	1	5
Food & Dining services	4.21	0.90	4	1	5
Transportation services	3.86	0.98	4	1	5
Budget per person per day (US$)	283	213	217	20	1771

place over the past 10 years, and 91.3% of the respondents acknowledged the existence of the typical destination group in terms of the combination and quality of attractions and services. More specifically, the respondents have visited an average of 2.2 destinations according to a typical pattern which corresponds to 70% of the total number of destination visited.

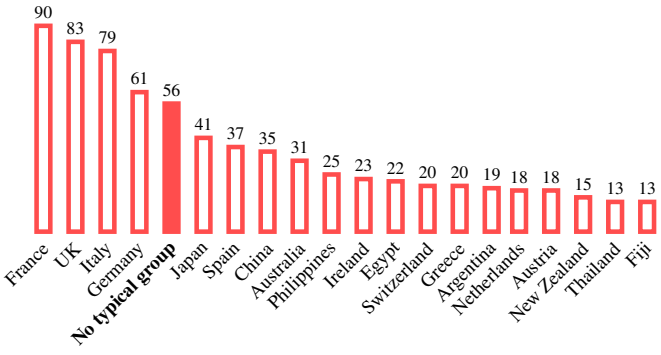
The detailed information regarding the trip to the most recently visited typical destination (the most recent visited destination if "no typical group can be identified" is selected) is collected (Question 1-5 to 1-10, Appendix I). The most recent trip is chosen as it consists of fresher memories and better reflects the current profile of the respondents. The information collected on the most recent typical long-haul leisure trip includes the length of stay, travel party size, the total budget of the trip, activity engagement, and quality of attractions and services. The lower panel of Table 3.1 summarizes the information. The length of stay at the destination ranges from 3 days to 3 months with a median of 14 days and an average of 16.6 days. The group size of the travel party is 2.1 people on average. A four-point scale (*not at all*, *not really*, *somewhat*, and *very much*) was utilized in measuring the activity engagement of the



(A) Australia



(B) The UK



(C) The US

FIGURE 3.2: "Typical destinations"

respondents at the destination. Four categories of the attractions, including cultural attractions, natural attractions, outdoor recreational attractions, and entertainment attractions, are chosen to represent the attraction combination of a destination. On average, the respondents spend more time in cultural attractions (3.4) and natural attractions (3.4) than in outdoor recreational attractions (2.7) and entertainment attractions (3.0). The quality of each type of the engaged attractions is rated by the respondents along with the services they received at the destination. The quality of attractions and services are rated with a five-point measurement scale (i.e., 1 - *poor*, 2 - *fair*, 3 - *good*, 4 - *very good*, and 5 - *excellent*) which largely follows the study of Spector (1976) and is further validated by a dyadic repertory grid investigation. The details regarding the choice of the category of attractions and services and their measurement scale are further elaborated in Subsection 3.3.2.2 and Subsection 3.3.2.3, respectively.

The information on the most recent typical long-haul trip of the respondents serves three roles in the current thesis. In terms of questionnaire design, the typical long-haul trip is provided to the respondents as one of the alternative as it is usually done in choice experiment. In addition, the attribute-levels of the typical long-haul trip, reflecting the real choices the respondents have made on previous occasions, also provide a standard for creating the appropriate attribute levels for the price of the trip (the pivoted stated choice experiment, see Section 3.3.2.4). In terms of model estimation, the attribute-levels of the typical long-haul trip are treated as the reference point in evaluating gains and losses of various destination attributes.

At the end of part one of the questionnaire, respondents are presented with two filtering questions (Question 1-11 and Question 1-12, Appendix A), asking if they would consider visiting same/different destinations for a future long-haul leisure trip. The answers to the filtering questions help in formulating the choice set of the respondents in the stated choice experiment. For instance, the respondents receive a choice set consisting of two tourist destinations that they have not visited if they indicate that they would not consider the same destination in the future, while the other respondents who would consider repeat visitation have their typical long-haul trip as an additional alternative. The filtering questions also serve as internal consistency check for each respondents. The answers of the respondents

to the filtering questions and the choices made by the respondents in the experiment are cross-checked to ensure the internal consistency of each respondents.

3.3.2 Stated choice experiment.

The second part of the questionnaire consist of a stated choice experiment. The development of the experiment is elaborated in detail in this subsection.

3.3.2.1 Revealed preference versus stated preference.

Information on the preferences and behavior of the tourists can be useful in forecasting market demand for both new and modified products. Revealed preference (RP) methods and stated preference (SP) techniques are two major methods in eliciting this information quantitatively. RP refers to the choices observed in real life and SP is the hypothetical choices observed in experiments. Describing tourism behavior using RP has a long history. The actual preferences revealed by RP are clearly the most appropriate tool for deriving utilities and estimating models of tourism behavior. The RP methods, however, have limitations that restricted its generalizability (Kroes & Sheldon, 1988). In the real-world context, influential factors, or explanatory variables of interest, are often correlated. The estimated trade-off ratios, calculated by the ratios of model parameters, may, therefore, be biased. The chosen alternative will always be observed but little information can be revealed about alternatives that are considered but not chosen. For example, in the context of tourist destination choice, the potential alternatives, all available tourist destinations, are numerous but the alternatives that tourists truly considered are usually limited (Crompton & Ankomah, 1993; Decrop, 2010). Therefore, it is difficult to identify, among all available alternatives, the considered but unchosen alternatives. Another limitation of RP methods relates to the nature of RP. Since the preferences have to be revealed from actual choices, RP methods cannot be directly applied to alternatives that do not yet exist.

Addressing these limitations, Green and Rao (1971) from marketing and Davidson (1973) from transportation economics brought SP techniques, which were argued to be initiated by Thurstone (1931) to the attention of academia (as cited in Fowkes, 1998). In comparison with RP methods, SP techniques provide more reliable estimates of trade-off ratios among influential factors. Alternatives or attribute-levels that are unavailable in the market can be investigated. Furthermore, SP techniques allow the examination of intra-individual heterogeneity in addition to inter-individual heterogeneity by eliciting multiple choices from one individual. Stated choice experiments (SCE), or discrete choice experiments, are the most popular form of SP techniques (Hensher, 1994) and widely used in tourism studies (Crouch & Louviere, 2001; Louviere & Timmermans, 1990).

Stated choice experiment offers a series of menus of alternatives, usually referred as choice tasks, which are compiled with different levels of attributes. Respondents are asked to select the most preferred alternative from each menu. The whole experiment mimics the experiences of the respondents in realistic markets, where consumers are provided with competing alternatives and one alternative is chosen for final consumption. In tourist destination choice context, respondents (potential tourists) will be provided with several tourist destinations in each menu. The tourist destinations will be presented in the form of a combination of various destination attributes. Attribute-levels vary across tourist destinations. Respondents will be asked to identify the destination that they would choose for their next vacation in each choice task.

3.3.2.2 Choosing the attributes.

Following the framework of Gorman (1957, 1980) and Lancaster (1966, 1971), as introduced in Subsection 2.1.1.2, tourist destinations can be represented as combinations of different attributes. As discussed in Subsection 2.1.1.2 and Section 2.3, relevant attributes include price, travel distance and time, activity and attraction associated factors (amount, types, attractiveness, reputation, and ranking of activities), service quality, crowdedness, climate and weather conditions, social and political situations, travel party size and composition, tourist

types, travel purposes, and past travel experiences. The SCE proposed in the current thesis focuses on alternative-specific factors, including price, attraction associated factors, and service quality. Situational factors, such as crowdedness, climate and weather conditions, social and political situations, and travel party size and composition, are fixed in the experiment to eliminate the impacts of temporary shocks. Other situational factors, such as travel party size and composition, as well as decision maker (tourists)-specific factors, for instance, the characteristics of the tourists, are used to further explain tourist heterogeneity.

Since the current thesis focuses on the tourist destination choices of long-haul leisure tourists, the travel distance and time are fixed in the SCE. Tourists with travel purposes other than leisure (e.g. business or VFR) are excluded from the survey population. The attributes included in the SCE are attraction associated factors, service quality, and the price. Two standards should be considered while choosing the attributes: 1) the attributes selected should be detailed and representative enough so that a complete description of the destination can be provided to the respondents; 2) in the meanwhile, the attributes selected should be broad and general so that the resulted number of attributes is reasonable small to incorporate into the SCE.

Goeldner and Ritchie (2012, p. 205) categorize the tourist attractions into five categories, namely "cultural attractions", "natural attractions", "event", "recreation", and "entertainment attractions" (Figure 3.3). In the current thesis, the category "event" is omitted for its (potentially) temporary feature. The remaining four attraction categories, denoted as cultural attractions, natural attractions, outdoor recreational attractions, and entertainment attractions, are adopted to characterize a tourist destination.

The categories of service quality mainly follow the construct of Tourism Service Quality Index (Song, van der Veen, Li, & Chen, 2012). Six key service sectors are considered to be relevant to the tourism industry, namely "hotels", "restaurants", "retail shops", "attractions", "transportation", and "immigration" (Song et al., 2012, p. 464). The categories "attractions" and "retail shops" are overlapped with the quality ratings of attractions in general and entertainment attractions in specific, respectively, and hence excluded in the SCE. The

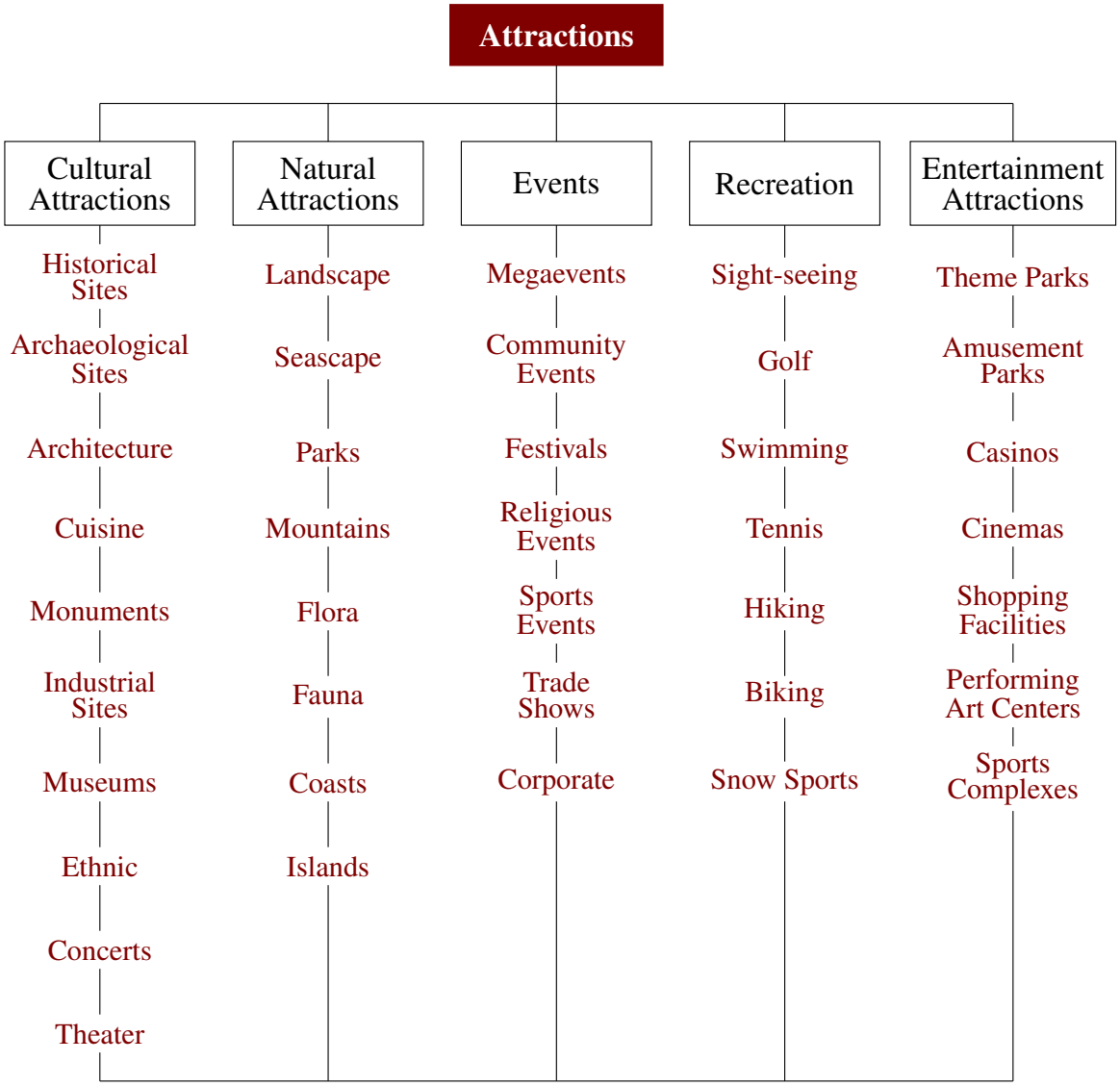
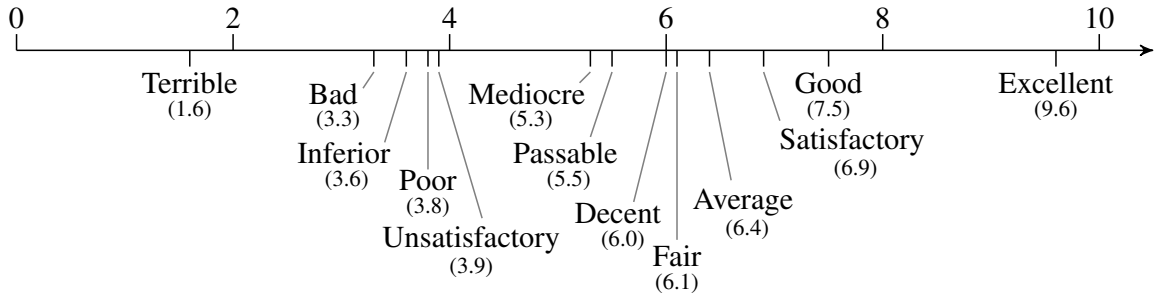
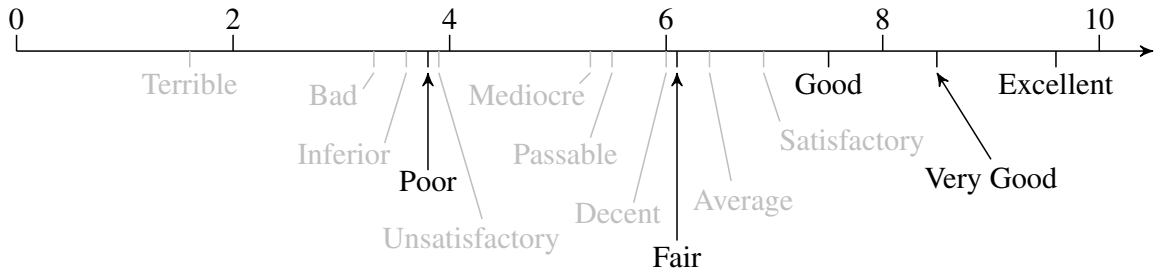


FIGURE 3.3: Overview of attractions (Goeldner & Ritchie, 2012, p. 205)

category "immigration" is neglected due to the powerful passports of three source markets investigated in the current thesis. According to the Global Passport Power Rank 2018 (Passport Index, 2018), 158, 159, and 156 countries and regions grant Visa-free-entry or Visa-on-arrival to the citizens of the US, the UK, and Australia, respectively. Hence, three service quality related destination attributes are employed in the SCE of current thesis, including hospitality, food & dining, and transportation. The attributes associated with attractions and services are presented in terms of "the rating of quality". The price factor is described as the total budget of the trip, including the cost on the transportation between home and the destination as well as the expenses at the destination.



(A) Evaluation scale values from Spector (1976, p. 375)



(B) Selected evaluation scale values in the current thesis

FIGURE 3.4: Attribute-levels of the current thesis

3.3.2.3 Defining scale measurement for attribute levels.

In order to elicit the preferences of the respondents on the eight aforementioned destination attributes, the attributes will be presented at different levels in the SCE. The measurement scale discussed by Spector (1976) are examined and chosen to represent the attribute-levels in the current thesis. In Spector (1976), thirteen evaluation scale values are summarized ranging from "Terrible" to "Excellent". The upper panel of Figure 3.4 shows the names of these evaluation scale values with the values in the brackets.

It is noticed in the pilot study that respondents tend to evaluate the destination attributes towards the positive end of the scale (i.e. good quality). This positive skewness in the destination attribute evaluation can be very well explained by the careful selection of long-haul leisure destination of the respondents. In the current thesis, four levels from the original Spector (1976)'s scale, namely "Poor", "Fair", "Good", and "Excellent", are selected as attribute-levels. One additional attribute-level is added between "Good" and "Excellent" and named "Very Good". The resulting scale, as presented in lower panel of Figure 3.4, covers the whole evaluation continuum with a skewness towards to positive end.

A qualitative investigation was conducted to further validate the scale of attribute levels to ensure free of ambiguity. The process partially followed the dyadic repertory grid technique, a technique that is used in various contexts to elicit attributes and measurements (Easterby-Smith, 1980).

The investigation took place in May 2016 among 10 respondents (7 females and 3 males, aged between 25 and 35). Each respondent independently participated in the investigation according to following steps. The respondents were sampled among Ph.D. students in tourism field with long-haul travel experience. Their knowledge in academic literature and experiences in long-haul travel are valuable in determining the appropriate attribute levels.

- The respondents were first presented with 40 tourist attractions (Appendix D). They were asked to eliminate those attractions on which they have no knowledge. 8 tourist attractions, out of the remaining ones, were randomly chosen for the next step.
- An empty repertory grid table (Appendix E) was provided to each of the respondents. 8 chosen tourist attractions were recorded in the first row of the table under the "Elements" column.
- Two random numbers were drawn between 1 and 8, representing two tourist attractions. The respondents were asked to write down the rating of the quality of the two drawn activities based on their own description. The description of lower (worse) rating was recorded under the "Pole 1 (Construct 1)" column and the description of higher (better) rating was recorded under the "Pole 2 (Construct 2)". In the case that respondents perceive the two attractions identical, the two tourist attractions were drawn again.
- The attraction with a lower (worse) rating ("worse attraction") receives a score of 1 and the attraction with a higher (better) rating ("better attraction") receives a score of 3. The scores were recorded under the tourist attractions in the first row of "Pair". Other 6 attractions were compared with the two chosen attractions. The tourist attraction rated even worse than the "worse attraction" receives a score of 0; the tourist attraction rated the same as the "worse attraction" receives a score of 1; the tourist attraction rated

between the "worse attraction" and the "better attraction" receives a score of 2; the tourist attraction rated the same as the "better attraction" receives a score of 3; and the tourist attraction rated better than the "better attraction" receives a score of 4.

- Without replacement, the comparisons were done three times with other random pairs of attractions. The round finished when all 8 tourist attractions have served as the pole once (four comparisons). Multiple rounds were conducted if respondents considered the first round as a learning process which did not fully represent their rating scheme.

It took 20 to 40 minutes for the respondents to complete the exercise. 7 out of 10 respondents adopted scores (e.g., 0 to 100, 0 to 10, and 0 to 5) in rating the quality of activities, while the other three respondents used words such as "bad" to "good", "not worth to visit" to "worth to visit". Among four comparisons in each round, respondents who adopted scores are more consistent in terms of preference than respondents who used words. One respondent, who adopted score scale, mentioned that "when rating the quality of an attraction, the whole process consists of many aspects, which is hard to describe using just one word or a phrase".

Combining the result of Spector (1976) and the results of the qualitative investigation, a rating scale of one star (worst) to five stars (best) coupled with the words (*poor*, *fair*, *good*, *very good*, and *excellent*) is adopted in current thesis. The stars rating scale is consistent with the rating scale in many major travel-related websites, such as Trip Advisor, Expedia, and Booking.com. Since the respondents' evaluations of the quality of attractions and services are significantly skewed towards the positive end, the one-star rating (poor) is excluded in the SCE to make the experiment more realistic.

3.3.2.4 Pivoting attribute levels.

While it has advantages compared to RP, SP techniques also have limitations. Hypothetical bias is one major criticism levied against SP. In the SCE context, the respondents have no real economic commitment associated with their choices and, therefore, have no direct incentive to reveal the true preferences (Fifer, Rose, & Greaves, 2014).

TABLE 3.2: Attributes and levels

Quality of attractions	
Cultural Attractions Natural Attractions Outdoor Recreational Attractions Entertainment Attractions	Fair (★★☆☆☆); Good (★★★☆☆) Very good (★★★★☆); Excellent (★★★★★).
Quality of services	
Hospitality Food & Dining Transportation	Fair (★★☆☆☆); Good (★★★☆☆) Very good (★★★★☆); Excellent (★★★★★).
Price	
Total budget	Total budget most recent (typical) trip (−40%; −20%; same; +20%; +40%)

Pivoting procedure is a frequently used technique to reduce hypothetical bias (Train & Wilson, 2008). The attribute levels in SCE, according to pivoting procedure, are created by changing the attributes of observed choices. Application of pivoting procedure can be found in Caussade, Ortúzara, Rizzi, and Hensher (2005), Hensher (2004, 2006), Hensher and Greene (2003), and more recently in Fifer et al. (2014), Hensher (2010), and Hensher and Ho (2016).

In the current thesis, the ratings of the quality of attractions and services are presented with measurement scales covers all reasonable levels. The budget of the trip, on the other hand, is presented with the absolute amount of money. Therefore, the budget attribute in the SCE is pivoted around the budget of the typical long-haul leisure trip which is collected from the respondents (Question 1-5 to Question 1-10, see Section 3.3.1). The pivoting procedure of the budget attribute can improve the credibility of the SCE and reduce hypothetical bias.

Table 3.2 summarizes the discussion of Section 3.3.2.2 to Section 3.3.2.4 and presents the attributes and their levels adopted in the SCE of the current thesis.

3.3.2.5 Labeled alternatives versus unlabeled alternatives.

Two options are available to researchers in terms of the names (or labels) of the alternatives in experimental design, namely labeled alternatives and unlabeled alternatives. In tourist destination choice context, the labeled alternative approach uses the real names of tourist destinations as the name of alternatives, while unlabeled alternative approach uses phrases such

as "Destination 1" or "Alternative A". The labeled alternative approach makes the alternatives more realistic to the respondents as well as enhances the predictive validity of the experiment. The labeled alternatives, however, may introduce several problems, including endogeneity and dominant alternatives. Huybers (2005) investigates the difference between labeled alternatives and unlabeled alternatives in the destination choice context. The results indicate that the labeled alternatives may serve better in estimating actual market share, while the unlabeled alternatives provide a more efficient estimation of preferences and implicit prices (WTP and WTA). This results mainly concerns the potential emotional attachments the respondents may have on specific alternatives. A setting with labeled alternatives capture these emotional attachments and generate more accurate predictions on market shares. The experiments with unlabeled alternatives, on the other hand, deliberately remove such attachments and deliver unbiased estimations on preferences.

The current thesis focuses on the preference of the tourists on the quality of various destination attributes, rather than the market shares of specific tourist destinations. An experiment design with unlabeled alternatives was therefore preferred. Nevertheless, it is also common in the pivoted SCEs to include the typical alternative. The inclusion of typical long-haul leisure trip in the current thesis allows the analysis of the preference heterogeneity of the tourists in terms of new and typical destinations. Hence, three alternative destinations, namely "New Destination 1", "New Destination 2", and "Typical Destination", are provided to the respondents in the SCE of the current thesis. For the respondent who states that she would not consider the same destination in the future (Question 1-11, Appendix A), the "Typical Destination" is presented for comparison purpose but not available for choice. A sample choice task of the SCE is presented in Question 2-1, Appendix A.

3.3.2.6 Experimental design.

The above subsections determine the alternatives to be presented in the SCE of the current thesis, it is essential to choose the appropriate experimental design to construct SCE with these alternatives.

Experimental design, ever since its first appearance in James Lind (1716-1794)'s clinical trial (Bhatt, 2010), has been extensively developed by Fisher (1992, 1935), Box and Wilson (1992), Taguchi (1986), and many others (Iman & Conover, 1980; Sacks, Welch, Mitchell, & Wynn, 1989; Taguchi, Elsayed, & Hsiang, 1989). Experimental design can be naturally categorized into two types, one-factor-at-a-time (OFAT) design, in which the influence of one attributes is tested at each time, and factorial design, in which the influence of multiple attributes is tested simultaneously. The latter is asserted to be more efficient and optimal (Fisher, 1992).

A full factorial design presents all possible choice tasks to the respondents. The current SCE consists of seven attributes with four discrete levels each and one attribute with five discrete levels. With three alternatives in each choice task, over 550 trillion possible choice tasks ($4^{3\times7}5^3$) can be compiled. A full factorial design is therefore infeasible for the current thesis. A fractional factorial design is adopted, in which merely a fraction of all possible choice tasks is presented to the respondents.

Orthogonal designs are one type of fractional factorial design frequently adopted in experiments. It allows the evaluation of one attribute independent of all other attributes. Estimations from an orthogonal design are usually straightforward since the main effects[1] and interaction effects[2] of attributes can be carried out independently. Efficient designs (Rose & Bliemer, 2009), in contrast to orthogonal designs, not only provide straightforward estimations of main effects and interaction effects but also generate estimations with the smallest standard errors.

With the prior knowledge of the value of the parameters, the asymptotic variance-covariance (AVC) matrix, which contains the square of the standard errors of the parameters, can be calculated by the negative inverse of Fisher information matrix. Two types of efficient designs, namely D-efficient design and A-efficient design, can be developed based on the AVC matrix. The D-efficient design minimizes the determinant of AVC matrix (the D-error), whereas the A-efficient design minimizes the trace of AVC matrix (the A-error). In the current thesis, a

[1] In experimental design, main effect measures the influence of one attribute on outcome, averaged over all possible levels of other attributes.

[2] In experimental design, interaction effect measures the change of influence of one attribute on outcome when the level of another attribute changes.

D-efficient design is developed based on the results of the pilot study using Ngene (Version 1.1.2, ChoiceMetrics, 2014).

Each respondent was provided with ten choice tasks in the SCE of the current thesis. The final design of the SCE is presented in Appendix B. The total budgets are presented in terms of percentage of the reference price, and the "Typical Destination" alternatives are individual specific according to the typical travel experience of each respondents.

3.3.2.7 Sample size.

It is also essential for a statistical analysis to determine an appropriate sample size (Cohen, 1962). Analysis with small sample size may generate unreliable results and, therefore, misleading predictions. On the other hand, however, a sample size beyond the reasonable range has little marginal benefit with considerable cost increase. Determining the minimum sample size requirement according to specific experimental design is useful in guaranteeing the statistical power of the experiment as well as reducing the research cost.

In the discrete choice experiment context, Orme (1998) and Johnson and Orme (2003) suggests that the sample size required for the estimation of main effects depends on the number of choice tasks, the number of alternatives, and the number of analysis cells. A rule of thumb is proposed according to the following equation:

$$N > 500c/(t \times a) \tag{3.1}$$

where N is the minimum sample size required; c is the number of analysis cells; t is the number of choice tasks; and a is the number of alternatives (Orme, 1998; Johnson & Orme, 2003).

According to Equation 3.1, approximately 1,100 respondents are required in the current thesis for the analysis of tourists' preference on various destination attributes as well as the two behavioral biases. With the consideration of the available funds, the current thesis targeted 1,500 respondents from three source markets, as discussed in Section 3.2.

3.3.3 Tourist characteristics.

Tourists with different characteristics reveal different preferences in their choices (see Section 2.3). These characteristics are, therefore, essential for interpreting the results from the SCE. Part three and part four of the questionnaire collect the tourism-related characteristics and socio-demographical information of the respondents, respectively.

Information on the travel pattern and trip planning habit of the respondents are extracted (Question 3-1 to 3-3, Appendix A). The importance of various activities is assessed in Question 3-4. The usual travel motivation is recorded in Question 3-5. The personality of the respondent is evaluated in Question 3-6, according to BSSS, with 8 items from updated SSS-V (Zuckerman, 1996).

Social-demographical characteristics, such as age, gender, marital status, family composition, educational background, employment status, and household income, are collected in Question 4-3 to 4-8.

Table 3.3 summarizes the characteristics of respondents. Around 44% of the respondents have the membership of one or more airline alliance. 58% of the respondents usually plan their trip with their family, compared with 28% of whom plan by themselves and 14% of whom plan with their friends. The majority (64%) of the respondents prefer independent travel, while 13% and 23% chose a packaged tour and customized packaged tour, respectively. The usual motivation of the respondents to undertake a trip covers some commonly used "Pull" factors. The measurement scale includes four points ranging from 1 (*very unimportant*) to 4 (*very important*). Safety is the primary concern (3.7) among all respondents, followed by peaceful environment (3.4) and reliable weather (3.2). Travel personality was measured using a five-point scale (1 - *strongly disagree* to 5 - *strongly agree*) and follows the construct of BSSS by Hoyle et al. (2002). With regards to socio-demographical characteristics, the respondents are widely spread across different age cohort and balanced in terms of gender, educational level, and employment status. Note that a big proportion of the respondents (69%) have no child which makes it more convenient to undertake a long-haul leisure trip.

TABLE 3.3: Descriptive statistics of respondents' characteristics

	Mean	Std.Dev.	Median	Min	Max
Motivation					
The destination has exotic atmosphere.	3.05	0.75	3	1	4
The destination is peaceful.	3.38	0.66	3	1	4
The destination is lively.	2.95	0.82	3	1	4
The destination has reliable weather.	3.19	0.75	3	1	4
I feel safe and secure at the destination.	3.67	0.57	4	1	4
The destination and surrounding regions are politically stable.	3.05	0.65	4	1	4
Personality					
I like to explore a strange city or section of town by myself, even if it means getting lost.	3.60	1.18	4	1	5
I get very restless if I have to stay around home for any length of time.	3.46	1.11	4	1	5
I sometimes like to do things that a little frightening.	3.29	1.15	3	1	5
I like "wild" uninhibited parties.	2.75	1.34	3	1	5
I would like to take off on a trip with no pre-planned or definite routes, or timetable.	3.33	1.23	4	1	5
I prefer friends who are excitingly unpredictable.	3.15	1.17	3	1	5
I would like to try parachute jumping.	2.92	1.47	3	1	5
I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal.	2.99	1.34	3	1	5
Age	41	14.9	37	19	87

	Share		Share
Frequent flyer membership	44.0 %	*Usual tour type*	
Gender (female)	57.2 %	Package tour	23.0 %
Without child	69.0 %	Independent travel	64.0 %
Usual plan method		Customized package tour	13.0 %
Self-planned	28.1 %	*Employment status*	
Together with family	57.7 %	Employed (self or for wages)	68.1 %
Together with friends	14.2 %	Out of work	9.0 %
Educational status		Others	22.9 %
High school or below	26.7 %	*Marital status*	
Various trainings	22.7 %	Single, never married	32.9 %
Bachelor's degree	34.9 %	Married/Domestic partnership	57.6 %
Postgraduate	15.8 %	Divorced/Separated/Widowed	9.5 %

3.4 Summary of the Data Collection Method

This chapter describes the sampling frame and elaborates the questionnaire design in detail.

The respondents are sampled randomly among the online population of three English-speaking source markets, namely Australia, the UK, and the US. 1,417 effective responses were collected. The entire data collection process was administrated by a professional market research company.

Questions about the typical long-haul leisure travel experience of the respondents are asked in the first part of the questionnaire. It is followed by an SCE, pivoted on the collected typical travel experience, as the method to collect information of the preference of the respondents on the tourist destinations. Among other influential factors, rating of quality on four types of tourist attractions, namely cultural attractions, natural attractions, outdoor recreational attractions, and entertainment attractions, ratings of service quality from three aspects, namely hospitality, food & dining, and transportation, and the total budget of the whole trip are included as the attributes of SCE. The attribute levels are adopted from Spector (1976) and further developed through a repertory grid investigation and a rating system of five-star score coupled with word descriptions is adopted for all the attributes except the total budget. The total budget is presented in absolute monetary terms. The alternatives in SCE are presented to the respondents without real names of tourist destinations. The three destination alternatives are marked as "New Destination 1", "New Destination 2", and "Typical Destination", respectively. A pilot study using orthogonal design is implemented. The estimation results of the pilot study are then used in developing the D-efficient design for the main survey. Questions on the characteristics of the respondents, including the travel behavior patterns, usual travel motivations, personalities, and social-demographical characteristics, are included in the third and fourth part of the questionnaire.

The data collection process resulted in a rich dataset containing both RP and SP on long-haul leisure travel destinations of the respondents. The dataset can be analyzed by evaluating the preference of respondents among various destination attributes of a long-haul leisure

destination. WTA and WTP measures can also be derived based on the estimation results. The next chapter will explain the model and estimation method in detail.

Chapter 4

Model and Estimation Method

This chapter elaborates the model and discusses the estimation method. Section 4.1 elaborates the Mixed Multinomial Logit model, which is used in estimating the influences of various factors on the long-haul leisure destination choices of the respondents. Section 4.2 explains the estimation of individual preferences based on the results of Section 4.1. Section 4.3 concludes the chapter with a summary.

4.1 Mixed Multinomial Logit Model

With the information extracted from the four parts of the survey, influences of various factors on the long-haul leisure destination choices of the respondents can be estimated. In order to capture tourist heterogeneity and potential correlation among alternatives, as well as relax the IIA assumption, an MXL model will be utilized for the parameter estimation.

4.1.1 Utility specification.

As one fundamental concept in the buildup of the MXL model, the utility has to be measured appropriately. The utility associated with alternative a of respondent i, $U_{a,i}$, is specified as the sum of a systematic component, $V_{a,i}$, and a disturbance element, $\varepsilon_{a,i}$,

$$U_{a,i} = V_{a,i}(\boldsymbol{X}_a \mid \boldsymbol{\beta}_i) + \varepsilon_{a,i}, \tag{4.1}$$

where $k = 1, \ldots, K$ is the index of attributes; $V_{a,i}$ is a value function of the attribute matrix of alternative a, $\boldsymbol{X}_a$, conditional on the vector representing the preference on these attributes of respondent i, $\boldsymbol{\beta}_i$, and $\varepsilon_{a,i}$ is the i.i.d error term. The mixture feature of the MXL model is introduced by allowing heterogeneity in the individual preference over various attributes, that is, individual specific preference vector, $\boldsymbol{\beta}_i$.

The most basic formulation of MXL model specifies the value function as the weighted summation of all destination attributes. For instance, the attribute-level of each destination attribute is multiplied by the corresponding preference weight of the respondent and all the preference-weighted attribute-levels are summed up together. This formulation follows the expected utility theory and can be described as

$$\begin{cases} V_{ND1,i} = \boldsymbol{X}_{ND1} \cdot \boldsymbol{\beta}_i, \\ V_{ND2,i} = \boldsymbol{X}_{ND2} \cdot \boldsymbol{\beta}_i, \text{and} \\ V_{REF,i} = ASC_{REF} + \boldsymbol{X}_{REF} \cdot \boldsymbol{\beta}_i, \end{cases} \tag{4.2}$$

where the subscripts "$ND1$" and "$ND2$" represent the attributes of the alternatives "New Destination 1" and "New Destination 2", respectively; the subscript "REF" represents the attributes of the alternative "Typical Destination"; and ASC_{REF} is the alternative specific constant correspond to the alternative "Typical Destination". The alternative specific constant describes the value that the tourists attached to the alternative rather than to the attributes. In the current thesis, since unlabeled alternatives are adopted, the value that the tourists attached to the two "New Destinations" are naturally the same, whereas they are different from the value associated with the "Typical Destination". In the classical discrete choice modeling context, only the differences in values among alternatives can be identified through estimation (Train, 2009, p. 19). Therefore, ASC_{REF} describes the extra value that the tourists attached to the alternative "Typical Destination" in comparing with the two "New Destinations". The preference-weight vector, $\boldsymbol{\beta}_i$, is assumed to follow a joint density function, $f(\boldsymbol{\beta}_i \mid \boldsymbol{\theta})$, with $\boldsymbol{\theta}$ being a set of distributional parameters. This value function specification is denoted as Model M1 and is used as a benchmark model to be compared with other specifications.

Model M1 describes a typical value function setting in the discrete choice modeling literature. Coefficient associated with each variable can be estimated to represent the preference-weight of corresponding destination attribute. Nevertheless, the value function specification of Model M1 exhibits hidden assumptions on the preference of the tourists on various destination attributes. For example, with one coefficient specified for each variable, the preference-weight of one particular tourist on one specific destination attribute is assumed to be constant. That is, the preference of the tourists is symmetric around a reference point for each destination attribute. This "symmetric assumption" contradicts with the frequently observed asymmetric preference described by prospect theory. Hence, a second model (Model M2) is specified following the prospect theory. The value of visiting a destination is derived from the deviations from the reference point,

$$\begin{cases} V_{ND1,i} = \mid \boldsymbol{X}_{ND1} - \boldsymbol{X}_{REF} \mid \cdot \left(\boldsymbol{\beta}_{i,G} \circ \mathbb{1}_{\{G\}} + \boldsymbol{\beta}_{i,L} \circ \mathbb{1}_{\{L\}} \right), \\ V_{ND2,i} = \mid \boldsymbol{X}_{ND2} - \boldsymbol{X}_{REF} \mid \cdot \left(\boldsymbol{\beta}_{i,G} \circ \mathbb{1}_{\{G\}} + \boldsymbol{\beta}_{i,L} \circ \mathbb{1}_{\{L\}} \right), \text{and} \\ V_{REF,i} = ASC_{REF}, \end{cases} \tag{4.3}$$

where $\boldsymbol{\beta}_{i,G}$ and $\boldsymbol{\beta}_{i,L}$ are the preference-weight vectors associated with the gains and the losses, respectively. $\mathbb{1}_{\{G\}}$ ($\mathbb{1}_{\{L\}}$) is an indicator vector with its k^{th} element takes the value of one if attribute k is identified as a gain (loss) and zero otherwise. For all attributes except the budget, an increase in the attribute level is identified as a gain while a decrease in the attribute level is identified as a loss. The case of the budget is the opposite. Since the alternative "Typical Destination" resembles the reference point (i.e. the typical long-haul leisure trip), by definition, the deviations of its attribute-levels from the reference point are all zero. Therefore, the value that the tourists attached to the "Typical Destination", $V_{REF,i}$, is equal to the alternative specific constant, ASC_{REF}.

Model M2 advances Model M1 by allowing asymmetric preference of the tourists around the reference point. The value function specification of Model M2 consists of the gains and the losses of various destination attributes relative to the reference points. In comparing with its counterpart in Model M1 ($\boldsymbol{X}_{ND}$), this specification ($\mid \boldsymbol{X}_{ND} - \boldsymbol{X}_{REF} \mid$) is in accordance with the

conceptual idea of prospect theory: "the carriers of value are changes in wealth or welfare, rather than final states" (Kahneman & Tversky, 1979, p. 277).

The value function specification of Model M2 captures the reference-dependent feature in destination choice process of the tourists. It is, however, not possible for the specification to evaluate the marginal utility at the reference-level. Whenever the attribute-level equals to the reference-level, the deviation ($\mid \boldsymbol{X}_{ND} - \boldsymbol{X}_{REF} \mid$) is zero and the corresponding marginal utility is unidentified. The third model specification (Model M3) advances Model M1 from a different perspective than Model M2, separating the marginal utility at the reference-level from the marginal utility at any other attribute-levels:

$$\begin{cases} V_{ND1,i} = \boldsymbol{X}_{ND1} \cdot \left[\boldsymbol{\beta}_{i,ND} \circ \left(\mathbf{1} - \mathbb{1}_{\{REF\}}\right) + \boldsymbol{\beta}_{i,REF1} \circ \mathbb{1}_{\{REF\}}\right], \\ V_{ND2,i} = \boldsymbol{X}_{ND2} \cdot \left[\boldsymbol{\beta}_{i,ND} \circ \left(\mathbf{1} - \mathbb{1}_{\{REF\}}\right) + \boldsymbol{\beta}_{i,REF1} \circ \mathbb{1}_{\{REF\}}\right], \text{and} \\ V_{REF,i} = ASC_{REF} + \boldsymbol{X}_{REF} \cdot \boldsymbol{\beta}_{i,REF2}, \end{cases} \tag{4.4}$$

where $\boldsymbol{\beta}_{i,ND}$ is the preference-weight vector associated with the attributes of the "New Destinations" of which have the levels different from the reference point, $\mathbb{1}_{\{REF\}}$ is an indicator vector with its k^{th} element takes the value of one if the level of attribute k is the same as that of the reference point, and zero otherwise, $\boldsymbol{\beta}_{i,REF1}$ is the preference-weight vector associated with the attributes of the "New Destinations" of which have the same attribute levels as the reference points, and $\boldsymbol{\beta}_{i,REF2}$ is the preference-weight vector associated with the attributes of the "Typical Destination".

While Model M3 isolates the marginal utility of the reference-level from that of any other attribute-levels, the specification fails to capture the asymmetric preference of the tourists around the reference point. A fourth model specification (Model M4) can be developed that simultaneously captures the isolation of marginal utility of the reference-level and the

asymmetric preference around the reference point:

$$\begin{cases} V_{ND1,i} = \boldsymbol{X}_{ND1} \cdot \left[\boldsymbol{\beta}_{i,G} \circ \mathbb{1}_{\{G\}} + \boldsymbol{\beta}_{i,L} \circ \mathbb{1}_{\{L\}} + \boldsymbol{\beta}_{i,REF1} \circ \mathbb{1}_{\{REF\}}\right], \\ V_{ND2,i} = \boldsymbol{X}_{ND2} \cdot \left[\boldsymbol{\beta}_{i,G} \circ \mathbb{1}_{\{G\}} + \boldsymbol{\beta}_{i,L} \circ \mathbb{1}_{\{L\}} + \boldsymbol{\beta}_{i,REF1} \circ \mathbb{1}_{\{REF\}}\right], \text{and} \\ V_{REF,i} = ASC_{REF} + \boldsymbol{X}_{REF} \cdot \boldsymbol{\beta}_{i,REF2}, \end{cases} \tag{4.5}$$

where all the notations are the same as the previous three models. Note here in Model M4, in comparison with Model M2, the gains and the losses are introduced in absolute levels ($\boldsymbol{X}_{ND}$) instead of the deviations from the reference points as they were in Model M2 ($\mid \boldsymbol{X}_{ND} - \boldsymbol{X}_{REF} \mid$). This change is necessary for the identification of both $\boldsymbol{\beta}_{i,REF1}$ and $\boldsymbol{\beta}_{i,REF2}$. The way that Model M4 isolates the marginal utility of the reference-level is essentially the same as it was in Model M3.

4.1.2 Distributional assumption

One key element to enable the heterogeneity of $\boldsymbol{\beta}_i$ is its joint density, $f(\boldsymbol{\beta}_i \mid \boldsymbol{\theta})$. Parametric estimation of MXL model requires prior assumption on the distributional form of $f(\boldsymbol{\beta}_i \mid \boldsymbol{\theta})$. Normal distribution is frequently adopted for its simplicity. Log-normal distribution can be utilized when the parameters demand a support on only one side of zero (Revelt & Train, 1998; Train, 1998). Johnson's S_b distribution (Hess, Bierlaire, & Polak, 2005; Train & Sonnier, 2005), triangular distribution (Train, 2009), or uniform distribution (Revelt & Train, 2000) can be employed when bounds are necessary on the support of the parameter space. In the current thesis, $\boldsymbol{\beta}_i$ is assumed to follow a normal distribution with the joint density function specified as $N_k\left(\bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)$ with $\bar{\boldsymbol{\beta}}$ and $\boldsymbol{\Sigma}$ represents the mean vector and the variance-covariance matrix of $\boldsymbol{\beta}_i$, respectively. Furthermore, to reduce the number of coefficients to be estimated, the off-diagonal entries of $\boldsymbol{\Sigma}$, representing the correlations among different elements of $\boldsymbol{\beta}_i$, are assumed to be zero. That is, the preference of tourists on various destination attributes are assumed to be independent.

The empirical distributions of $\boldsymbol{\beta}_i$ can be approximated to determine and consolidate the distributional assumption in the current thesis (Hensher & Greene, 2003, p. 151). An MNL estimate of the parameter can be obtained with the i^{th} respondent left out of the sample, denoted as $\hat{\boldsymbol{\beta}}_{-i}$. For all n respondents, the empirical probability density function (EPDF) of $\boldsymbol{\beta}_i$ can be derived from the series $\left(\hat{\boldsymbol{\beta}}_{-1},\ldots,\hat{\boldsymbol{\beta}}_{-n}\right)$ as

$$\hat{f}_n(\boldsymbol{t}_j) = \frac{1}{n}\sum_{i=1}^{n}\frac{K\left[\left(\boldsymbol{t}_j - \hat{\boldsymbol{\beta}}_{-i}\right)\Big/\boldsymbol{h}\right]}{\boldsymbol{h}}, \tag{4.6}$$

where $\hat{f}_n(\boldsymbol{t}_j)$ represents the EPDF of the parameter $\boldsymbol{\beta}_i$, $K[\cdot]$ is a kernel function, $\boldsymbol{h}$ is defined by

$$\boldsymbol{h} = 0.9 \times \min\left\{\sigma\left(\hat{\boldsymbol{\beta}}_{-i}\right), \text{range}\left(\hat{\boldsymbol{\beta}}_{-i}\right)\Big/1.5\right\}, \tag{4.7}$$

$\boldsymbol{t}_j$ is defined by

$$\boldsymbol{t}_j = \min\left(\hat{\boldsymbol{\beta}}_{-i}\right) - \boldsymbol{h} + j \times \left[\left(\max\left(\hat{\boldsymbol{\beta}}_{-i}\right) - \min\left(\hat{\boldsymbol{\beta}}_{-i}\right) + 2\boldsymbol{h}\right)\Big/M\right], \tag{4.8}$$

and M is the number of bins used in approximating the EPDF. The current thesis adopts a normal kernel with M equal to 1,000 in approximating the EPDF of random parameters. Figure 4.1 presents the EPDF of all parameters in the gains domain. The EPDF of parameters in other domains are included in Appendix F. The dashed curve is a normal distribution with the same mean and standard deviation of the EPDF for comparison purpose. It can be concluded that the normality assumption on the distributional form of the random parameters has a reasonable fit.

Note here that the EPDF of the parameters provides merely a rough approximation of the parameter distribution. The location of individual parameter on the distribution is determined by the contribution of a specific individual to the overall sample mean of the parameter estimates, which is approximated by the difference between the parameter mean of the overall sample and the parameter mean of the subsample omitting the i^{th} respondent. The process mimics the "jackknife" procedure in variance and bias estimation and works as "rough and

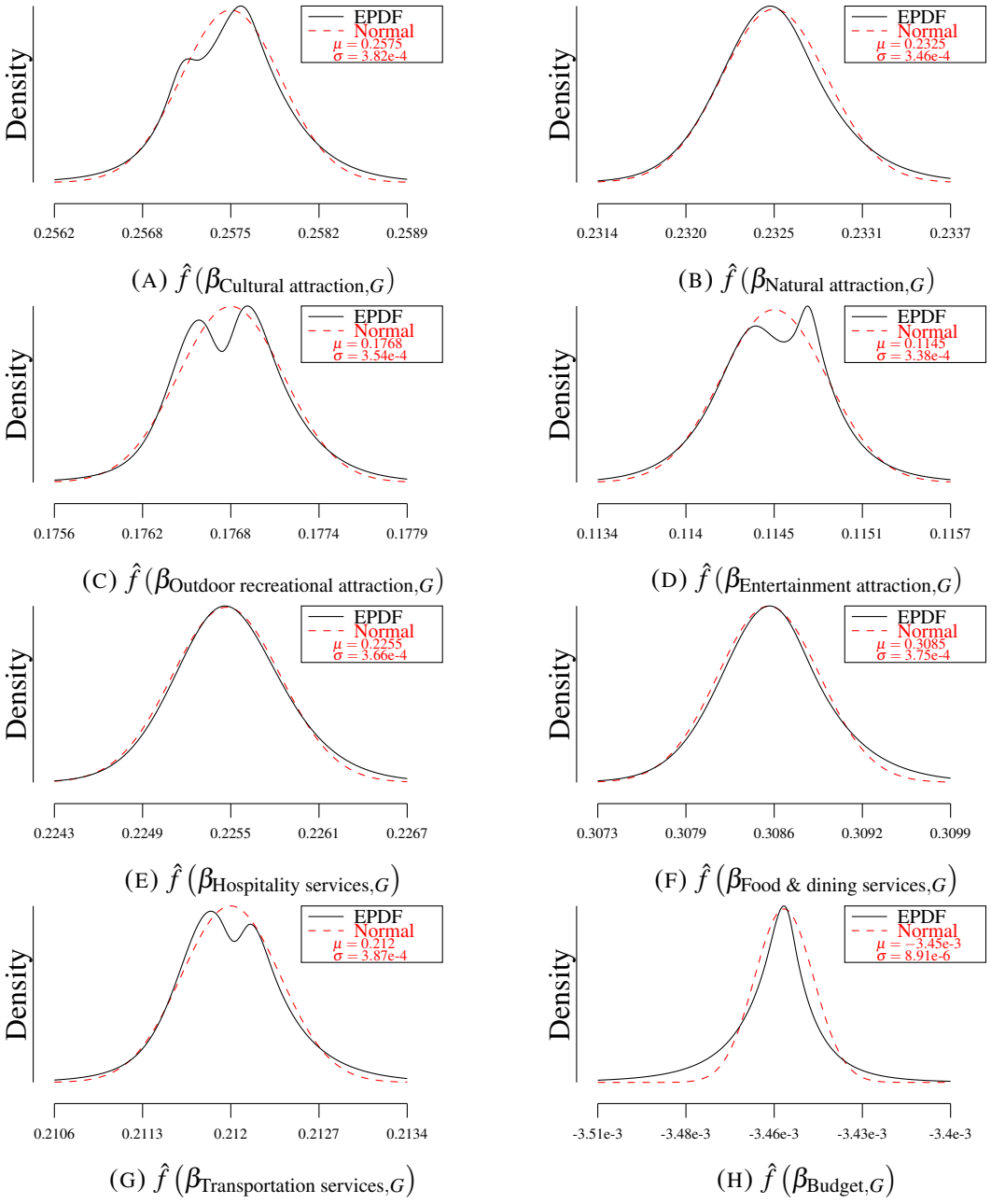


FIGURE 4.1: EPDF of parameters in the gain domain

ready" tool with less efficiency (Cameron & Trivedi, 2005, p. 375). Hence, the EPDF derived in this chapter can only provide distributional information from empirical perspective rather than serve as the estimation of the parameter distribution.

4.1.3 Likelihood formulation

Likelihood functions can be formulated in accordance with the value function specifications and distributional assumption discussed above.

The conditional choice probability of respondent i choosing alternative A follows a logistic functional form:

$$P_i(A \mid \boldsymbol{\beta}_i) = \frac{e^{V_{A,i}(\boldsymbol{X}_A|\boldsymbol{\beta}_i)}}{\sum_{a=1}^{A} e^{V_{a,i}(\boldsymbol{X}_a|\boldsymbol{\beta}_i)}}. \tag{4.9}$$

Since $\boldsymbol{\beta}_i$ is unknown and follow the density $N_k\left(\bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)$, the unconditional choice probability of respondent i choosing alternative A can only be integrated over the domain of $\boldsymbol{\beta}_i$,

$$P_i(A) = \int_K \cdots \int \left(\frac{e^{V_{A,i}(X_A|\boldsymbol{\beta}_i)}}{\sum_{a=1}^{A} e^{V_{a,i}(X_a|\boldsymbol{\beta}_i)}} \right) N_k\left(\bar{\boldsymbol{\beta}}_i, \boldsymbol{\Sigma}_i\right) \mathrm{d}\beta_{1,i} \ldots \mathrm{d}\beta_{K,i}. \tag{4.10}$$

Such integral is impossible to solve analytically. Numerical simulation is needed in approximating the integral. Following Train (2009), given a set of $\left(\bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)$, one $\boldsymbol{\beta}_i$ can be drawn from $N_k\left(\bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)$, denoted as $\boldsymbol{\beta}_i^m$. The choice probability can be simulated by multiple draws of $\boldsymbol{\beta}_i$:

$$\breve{P}_i(A) = \frac{1}{M} \sum_{m=1}^{M} \left(\frac{e^{V_{A,i}(X_A|\boldsymbol{\beta}_i^m)}}{\sum_{a=1}^{A} e^{V_{a,i}(X_a|\boldsymbol{\beta}_i^m)}} \right), \tag{4.11}$$

where M is the number of draws; $\breve{P}_i(A)$ is the simulated unconditional choice probability, which is an unbiased estimator of $P_i(A)$. Since $\breve{P}_i(A)$, by construction, is strictly positive and twice differentiable in both parameter set $\left(\bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)$ and the attribute matrix, $\boldsymbol{X}_a$, a simulated

log-likelihood (*SLL*) function can be set as

$$SLL = \sum_i \sum_a \mathbb{1}_{\{a,i\}} \ln \breve{P}_i(a), \tag{4.12}$$

where $\mathbb{1}_{\{a,i\}}$ is an indicator function takes the value of one if the alternative a is chosen by the respondent i and zero otherwise. A maximum simulated likelihood estimator (MSLE) of the parameters, $\left(\bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)$, can be derived by maximizing the *SLL*.

4.1.4 Random draw generation

The simulation of *SLL* involves random draws. Conventional methods include the use of the pseudo-random numbers and varieties of the Halton sequence. The pseudo-random numbers are series of numbers generated by computer programs approximating truly random sequence of numbers, whereas the Halton sequence is based on prime numbers. In the simulation process, the adoption of the Halton sequence can improve the effectiveness of the random draws for its superior coverage and the negative correlation over observations (Train, 2009). In his mixed logit model, Bhat (2001) found that 100 Halton draws provided more precise results than 1000 pseudo-random draws.

However, the benefit of the Halton sequence is not universal. Problem arises when the Halton sequence is used in high dimensions. As the number of parameters increases, the dimension of the integral in Equation 4.10 grows with it. Halton sequence formed with larger prime numbers are, therefore, needed for the simulation. However, as described in Bhat (2003), Halton draws obtained with large prime numbers are periodically synchronized. Figure 4.2 illustrates the situation with dimensions 16 (prime number 53) and 17 (prime number 59). The left panel of Figure 4.2 presents 500 Halton draws based on prime numbers 2 and 3, in which case no correlations can be detected between sequences. In contrast, the right panel of Figure 4.2 displays 500 Halton draws based on prime numbers 53 and 59, in which case almost perfect correlation is observed.

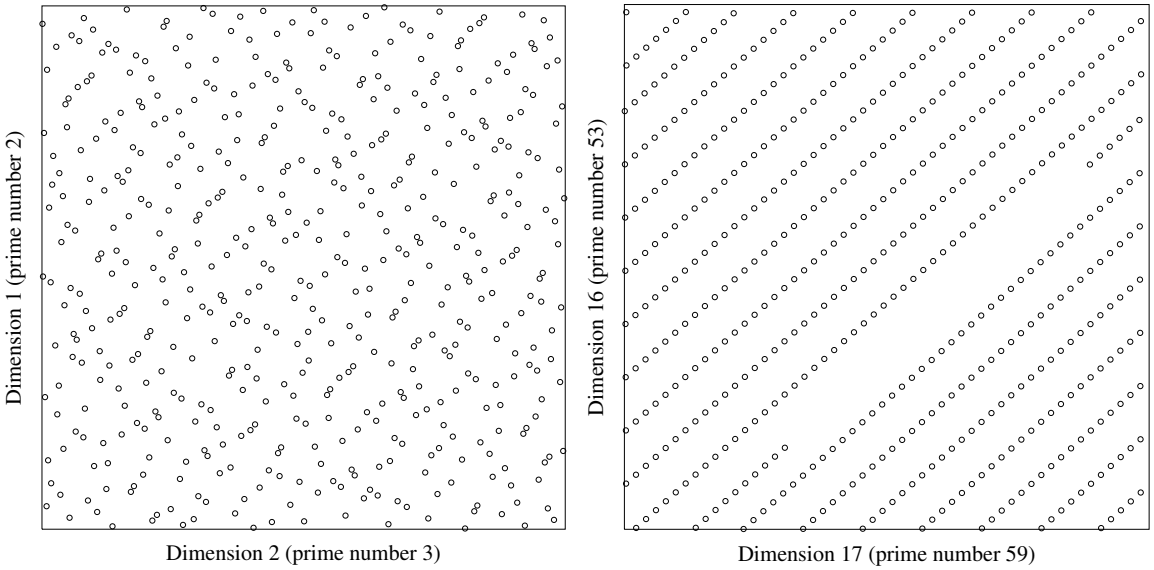


FIGURE 4.2: Correlations between Halton sequences

In the current thesis, the numbers of parameters are 17, 33, 49, and 65 for the four models, respectively. The use of Halton sequence in the simulation process is, therefore, problematic. The current thesis adopts pseudo-random draws in the simulation process. Other alternatives include varieties of the (t, m, s)-net (Sándor & Train, 2004) and scrambled Halton sequence (Bhat, 2003).

4.1.5 Optimization algorithms

As discussed in Section 4.1.3, the likelihood maximization of the MXL model is usually lack of analytical solution. Several line search methods can be utilized in this situation, including the Newton-Raphson (NR) method and Quasi-Newton method (e.g. BHHH and BFGS). The NR method is an iteration method used for finding the stationary point of a twice-differentiable function. In optimization, the NR method is adopted in finding the maximum of the log-likelihood function by iterating

$$\boldsymbol{\beta}_{n+1} = \boldsymbol{\beta}_n - H^{-1}(\boldsymbol{\beta}_n) \cdot g(\boldsymbol{\beta}_n), \tag{4.13}$$

where $\boldsymbol{\beta}_n$, $g(\boldsymbol{\beta}_n)$, and $H(\boldsymbol{\beta}_n)$ are the parameter vector, the gradient vector, and the Hessian matrix, respectively. With a proper guess of an initial parameter vector and enough iterations,

the series of $\{\boldsymbol{\beta}_n\}$ converges to the solution to the optimization problem.

One drawback of the NR method is the high computational cost in calculating $H(\boldsymbol{\beta}_n)$. In high dimensional problems, this calculation can be extremely costly, and the method is, therefore, undesirable. Quasi-Newton methods use approximations of $H(\boldsymbol{\beta}_n)$ and replicate the process of the NR method. The BHHH algorithm (Berndt, Hall, Hall, & Hausman, 1974) improves the NR method in this aspect by using the cross product of $g(\boldsymbol{\beta}_n)$ to approximate $H(\boldsymbol{\beta}_n)$. The BFGS algorithm (Broyden, 1970; Fletcher, 1969; Goldfarb, 1970; Shanno, 1970) approximates $H(\boldsymbol{\beta}_n)$ in each iteration by updating

$$H(\boldsymbol{\beta}_n) = H(\boldsymbol{\beta}_{n-1}) - \frac{\boldsymbol{w}\boldsymbol{g}^T H(\boldsymbol{\beta}_{n-1}) + H(\boldsymbol{\beta}_{n-1})\boldsymbol{g}\boldsymbol{w}^T}{\boldsymbol{g}^T\boldsymbol{w}} + \left(1 + \frac{\boldsymbol{g}^T H(\boldsymbol{\beta}_{n-1})\boldsymbol{g}}{\boldsymbol{g}^T\boldsymbol{w}}\right)\frac{\boldsymbol{w}\boldsymbol{w}^T}{\boldsymbol{w}^T\boldsymbol{g}}, \tag{4.14}$$

where $\boldsymbol{w}$ is the difference between parameter vectors, $\boldsymbol{\beta}_n$ and $\boldsymbol{\beta}_{n-1}$, and $\boldsymbol{g}$ is the difference between the gradient vector, $g(\boldsymbol{\beta}_n)$ and $g(\boldsymbol{\beta}_{n-1})$. The BFGS algorithm is currently the most popular optimization algorithm adopted in various statistical software. The current thesis adopts BFGS algorithm in searching for the parameter vector that maximizes the *SLL* constructed in Section 4.1.3.

4.1.6 WTA and WTP measurement

In economics, the measure of willingness to accept (WTA) is the minimum compensation an individual would require to give up a desirable attribute. Conversely, the measure of willingness to pay (WTP) is the maximum payment an individual would offer in order to obtain a desirable attribute. The gap between two measurements is negligible under the standard context of economics. It is, however, observed to be significant in some real-world context (e.g. Horowitz & McConnell, 2002). The Model M2 and Model M4 in the current thesis differentiate the gains and the losses from a reference level. It is, therefore, possible to generate different measures of WTA and WTP.

TABLE 4.1: Distributional forms of WTA and WTP

		$f(\beta_k), \forall k \neq budget$	
		Fixed point	Normal
$f(\beta_{budget})$	Fixed point	Fixed point	Normal distribution
	Normal	Reciprocal normal distribution	Gaussian ration distribution

In the current thesis, the WTA refers to the minimum amount of money a tourist would demand facing a deterioration of a destination attribute,

$$WTA_{k,i} = -\frac{\beta_{k,i,L}}{\beta_{budget,i,G}}, \forall k \neq budget, \tag{4.15}$$

whereas the WTP is defined as the maximum amount of money a tourist would pay for the improvement in a destination attribute,

$$WTP_{k,i} = -\frac{\beta_{k,i,G}}{\beta_{budget,i,L}}, \forall k \neq budget. \tag{4.16}$$

In accordance with prospect theory, $\beta_{k,i,L}$ is expected to have a greater magnitude than $\beta_{k,i,G}$ because of loss aversion. Hence, the measurement of WTA is expected to be greater than WTP. This disparity is frequently found in academic studies, ranging from 1.4 to 61 (Brown & Gregory, 1999).

At the aggregate level, as the parameters are estimated randomly, the measurement of WTA and WTP follow distributions depending on the nature of the estimated parameters. Four scenarios can be identified depending on the distributional assumptions (random versus non-random) of the budget and non-budget parameters.

Table 4.1 summarizes the distributional forms of WTA and WTP in different scenarios. The WTA and WTP measurements are deterministic distributions and take only fixed values if both budget and non-budget parameters are fixed point estimates. In the case that the budget parameter is estimated non-randomly and non-budget parameters are estimated randomly, the WTA and WTP measurements follow the Normal distribution. If the budget parameter is estimated following the Normal distribution while assuming the non-budget parameters fixed, the WTA and WTP measurements follow the Reciprocal normal distribution with the density

function

$$f(t) = \frac{\bar{\beta}_k}{t^2\sqrt{2\pi\Sigma_{budget}}} e^{-\frac{\left(\frac{\bar{\beta}_k}{t} - \bar{\beta}_{budget}\right)^2}{2\Sigma_{budget}}}, \tag{4.17}$$

where $\bar{\beta}_k$ is the estimate of the coefficient of attribute k, $\bar{\beta}_{budget}$ and Σ_{budget} are the estimated mean and variance of the parameter of the total budget, respectively. When both budget and non-budget parameters are assumed to follow the Normal distribution, the WTA and WTP measurements follow the Gaussian ratio distribution. In the current thesis, with the assumption of $\boldsymbol{\beta}_i \sim N_k\left(\bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)$ and $\text{cov}\left(\boldsymbol{\beta}_i, \boldsymbol{\beta}_j\right) = 0$, the probability density function of the Gaussian ratio distribution can be described as in Hinkley (1969):

$$f(t) = \frac{b(t)\cdot d(t)}{a^3(t)} \frac{1}{\sqrt{2\pi\Sigma_k\Sigma_{budget}}} \left[\Phi\left(\frac{b(t)}{a(t)}\right) - \Phi\left(-\frac{b(t)}{a(t)}\right)\right] + \frac{1}{a^2(t)\cdot\pi\sqrt{\Sigma_k\Sigma_{budget}}} e^{-\frac{c}{2}}, \tag{4.18}$$

where

$$\begin{aligned} a(t) &= \sqrt{\frac{t^2}{\Sigma_k} + \frac{1}{\Sigma_{budget}}}, \\ b(t) &= \frac{\bar{\beta}_k t}{\Sigma_k} + \frac{\bar{\beta}_{budget}}{\Sigma_{budget}}, \\ c &= \frac{\bar{\beta}_k^2}{\Sigma_k} + \frac{\bar{\beta}_{budget}^2}{\Sigma_{budget}}, \\ d(t) &= e^{\frac{b^2(t) - ca^2(t)}{2a^2(t)}}, \end{aligned}$$

$\Phi(\cdot)$ is the cumulative distribution function of the Normal distribution, $\bar{\beta}_k$ and $\bar{\beta}_{budget}$ are the mean of the parameters of attribute k ($\forall k \neq budget$) and the budget, respectively, and Σ_k and Σ_{budget} are the variance of the parameters of attribute k ($\forall k \neq budget$) and the budget, respectively.

4.1.7 Model fit assessment

Four models are considered in the current thesis to examine the validity of reference-dependent behavior and reference-level bias in the tourist destination choice context. It is necessary to identify one (or several) good measurement(s) of the goodness of fit in order to draw the conclusion.

Various pseudo R^2 indices and likelihood ratio test are frequently adopted and reported in academic studies. The most straightforward pseudo R^2, as McFadden (1974) outlines, is the McFadden's R^2,

$$R^2_{MF} = 1 - \frac{LL_{alt}}{LL_{null}}, \tag{4.19}$$

where LL_{alt} and LL_{null} are the likelihood under the alternative model and the null model, respectively. In its adjusted version, the likelihood under alternative model is penalized for the number of predictors in the model. McFadden states in the book he contributed, "values of 0.2 to 0.4 for rho-squared [McFadden's R^2] represent excellent fit" (McFadden, 1978b, p. 306). Other pseudo R^2s have similar properties and interpretations as McFadden's R^2 (Smith & McKenna, 2013).

Likelihood ratio test are similar to McFadden's R^2 in the sense that it also calculates the ratio between LL_{alt} and LL_{null},

$$LR = 2\ln\left(\frac{LL_{alt}}{LL_{null}}\right). \tag{4.20}$$

The probability distribution of LR is approximately a χ^2 distribution with degrees of freedom equal to $df_{alt} - df_{null}$, where df_{alt} and df_{null} are number of free parameters of models *alt* and *null*, respectively. Empirical p-values can be computed allowing the significance of improvement of the alternative model to be determined.

One weakness of pseudo R^2 indices and likelihood ratio test is the nested condition the associated models must satisfy. That is, one of the models (usually the null model) must be a special case of the other model (usually the alternative model). In the current thesis, Model M3 and Model M4 are nested on Model M1, whereas Model M2 is non-nested with respect

to the other three model specifications. Pseudo R^2 indices or the likelihood ratio test cannot fully compare all the model specifications and assess all the hypotheses in the current thesis.

Another family of model assessment criteria is various information criteria. Found in information theory, Akaike (1974) showed that the information loss of using a specific model to represent the true data generating process can be estimated with Akaike Information Criteria (AIC) in the way of

$$AIC = 2k - 2LL, \tag{4.21}$$

where k is the number of parameters estimated in the model and LL is the natural logarithm of the maximum value of the likelihood function. Hence, different models can be compared with their AIC measurements. Other information criteria are developed following the idea of AIC with a correction for finite sample size (AICc, Sugiura, 1978) and a larger penalty on model dimensions (BIC, Schwarz, 1978). Comparing with pseudo R^2 indices and likelihood ratio test, one advantage of various information criteria is the relaxation of the nested condition. Models with different structures can be compared and assessed. Nonetheless, information criteria provide a standard for selecting the best model (the model with minimum ICs), while it is not assessed by how much the selected model outperforms the other models.

Bayes factor, a concept initially introduced by Sir Harold Jeffrey in his paper and book (Jeffreys, 1935, 1961), received more attention from the academia in recent years. Instead of considering merely the extremeness of the data under the null hypothesis, as the frequentist approach hypothesis testing would do, Bayes factor compares the evidence under both null and alternative hypotheses:

$$BF_{01} = \frac{\Pr(Data \mid H_0)}{\Pr(Data \mid H_1)}, \tag{4.22}$$

where BF_{01} represents Bayes factor for the null hypothesis (H_0) against the alternative hypothesis (H_1). It suggests how many times more likely that the data would occur under H_0 rather than under H_1. In this sense, Bayes factor offers a way of evaluating evidence in favor either hypotheses (Kass & Raftery, 1995). As discussed by Kass and Raftery (1995) and further

elaborated in Jarosz and Wiley (2014), Bayes factor can be approximated by BIC:

$$BF_{01} = e^{\frac{1}{2}\left(BIC_{H_1} - BIC_{H_0}\right)}, \tag{4.23}$$

where *BIC* is calculated by

$$BIC = \ln(n)\,k - 2LL, \tag{4.24}$$

with n and k being the sample size and the number of parameters estimated, respectively, and LL being the natural logarithm of the maximum value of the likelihood function. The current thesis adopts Bayes factor as the comparing tool in assessing the hypotheses that are represented by Model M1 to Model M4.

4.2 Individual Preference Estimates

The estimation process discussed in Section 4.1 results in the estimations of $\left(\bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)$, which is the unconditional distribution of the respondents' preference over various destination attributes. The estimates $\left(\bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)$ can be used in inferring the properties of the whole population. For the individual with specific choice observed, the conditional choice probability can be derived from the distribution of $\boldsymbol{\beta}_i$. The conditional choice probabilities provide an inference of individual-specific preferences over various destination attributes.

4.2.1 Individual-specific preferences

By Bayes' rule, the choice probability of $\boldsymbol{\beta}_i$ conditional on observed individual choices, $\boldsymbol{y}_i$, can be expressed as

$$q\left(\boldsymbol{\beta}_i \mid \boldsymbol{y}_i, \boldsymbol{X}_a, \bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right) = \frac{\Pr\left(\boldsymbol{y}_i \mid \boldsymbol{X}_a, \boldsymbol{\beta}_i\right) f\left(\boldsymbol{\beta}_i \mid \bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)}{\Pr\left(\boldsymbol{y}_i \mid \boldsymbol{X}_a, \bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)}. \tag{4.25}$$

Since the denominator is the integral of nominator and equal to one by the definition of the density function, the individual choice probability is, therefore, proportional to the probability of $\boldsymbol{y}_i$ is observed multiply by the density of $\boldsymbol{\beta}_i$ in the entire population.

The expectation of individual preference parameter, $\hat{\boldsymbol{\beta}}_i$, can be calculated with the integral

$$\hat{\boldsymbol{\beta}}_i = \int \cdots \int_K \boldsymbol{\beta}_i \cdot q\left(\boldsymbol{\beta}_i \mid \boldsymbol{y}_i, \boldsymbol{X}_a, \bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right) \mathrm{d}\beta_{1,i} \ldots \mathrm{d}\beta_{K,i}. \tag{4.26}$$

This integral does not have a closed form but can be easily simulated. Since $\left(\bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)$ is also estimated, the calculation of $\hat{\boldsymbol{\beta}}_i$ involves simulation within a simulation. A draw of $\left(\bar{\boldsymbol{\beta}}, \boldsymbol{\Sigma}\right)$ can first be generated, denoted as $\left(\bar{\boldsymbol{\beta}}^s, \boldsymbol{\Sigma}^s\right)$. A draw of $\boldsymbol{\beta}_i$, denoted as $\boldsymbol{\beta}_i^{s,r}$, can be generated randomly from $N_k\left(\bar{\boldsymbol{\beta}}^s, \boldsymbol{\Sigma}^s\right)$. The corresponding likelihood with choices $\boldsymbol{y}_i$ being observed can be calculated as

$$LL\left(\boldsymbol{\beta}_i^{s,r} \mid \boldsymbol{y}_i\right) = \sum_{a=1}^{A} \mathbb{1}_{a,i} \ln \left(\frac{e^{V_{a,i}\left(\boldsymbol{X}_A \mid \boldsymbol{\beta}_i^{s,r}\right)}}{\sum_{a=1}^{A} e^{V_{a,i}\left(\boldsymbol{X}_a \mid \boldsymbol{\beta}_i^{s,r}\right)}} \right). \tag{4.27}$$

With enough draws, the simulated individual preference parameter, $\breve{\boldsymbol{\beta}}_i^s$, can be calculated using $LL\left(\boldsymbol{\beta}_i^{s,r} \mid \boldsymbol{y}_i\right)$ as the relative weightings

$$\breve{\boldsymbol{\beta}}_i^s = \frac{\sum_{r=1}^{R} \boldsymbol{\beta}_i^{s,r} LL\left(\boldsymbol{\beta}_i^{s,r} \mid \boldsymbol{y}_i\right)}{\sum_{r=1}^{R} LL\left(\boldsymbol{\beta}_i^{s,r} \mid \boldsymbol{y}_i\right)}. \tag{4.28}$$

The average of $\breve{\boldsymbol{\beta}}_i^s$ over S draws of $\left(\bar{\boldsymbol{\beta}}^s, \boldsymbol{\Sigma}^s\right)$ is the mean of the sampling distribution of $\hat{\boldsymbol{\beta}}_i$ and the standard deviation of $\breve{\boldsymbol{\beta}}_i^s$ gives the asymptotic standard error of $\hat{\boldsymbol{\beta}}_i$.

4.2.1.1 Individual-specific WTA and WTP.

The process described in Section 4.1.6 provides the derivation of the WTA and WTP distributions at the aggregate level. Regarding the measurement of WTA and WTP at individual level,

the value of WTA and WTP can be calculated according to Equation 4.15 and Equation 4.16, respectively. Since all the $\beta_{k,i}$s are estimates with standard errors, the calculated WTA and WTP also have standard errors. The standard errors of WTA and WTP can be approximated by the estimates of $\beta_{k,i}$ and the standard errors of $\beta_{k,i}$ using the delta method:

$$
\begin{aligned}
SE^2\left(WTA_{k,i}\right) = \frac{1}{n} & \left[-\frac{1}{\beta_{budget,i,G}} \quad \frac{\beta_{k,i,L}}{\beta^2_{budget,i,G}} \right] \\
& \cdot \begin{bmatrix} \text{var}\left(\beta_{k,i,L}\right) & \text{cov}\left(\beta_{k,i,L}, \beta_{budget,i,G}\right) \\ \text{cov}\left(\beta_{k,i,L}, \beta_{budget,i,G}\right) & \text{var}\left(\beta_{budget,i,G}\right) \end{bmatrix} \cdot \begin{bmatrix} -\frac{1}{\beta_{budget,i,G}} \\ \frac{\beta_{k,i,L}}{\beta^2_{budget,i,G}} \end{bmatrix}, \\
SE^2\left(WTP_{k,i}\right) = \frac{1}{n} & \left[-\frac{1}{\beta_{budget,i,L}} \quad \frac{\beta_{k,i,G}}{\beta^2_{budget,i,L}} \right] \\
& \cdot \begin{bmatrix} \text{var}\left(\beta_{k,i,G}\right) & \text{cov}\left(\beta_{k,i,G}, \beta_{budget,i,L}\right) \\ \text{cov}\left(\beta_{k,i,G}, \beta_{budget,i,L}\right) & \text{var}\left(\beta_{budget,i,L}\right) \end{bmatrix} \cdot \begin{bmatrix} -\frac{1}{\beta_{budget,i,L}} \\ \frac{\beta_{k,i,G}}{\beta^2_{budget,i,L}} \end{bmatrix}, \\
& \forall k \neq budget. \qquad (4.29)
\end{aligned}
$$

4.2.2 Individual characteristics

In the current thesis, the individual estimation of the marginal utilities that the tourists attached to various destination attributes ($\hat{\boldsymbol{\beta}}_i$), as well as the individual measurements of WTA and WTP ($\boldsymbol{WTA}_i$ and $\boldsymbol{WTP}_i$) are regressed on individual characteristics for the investigation of why tourists have different sensitivities among various destination attributes.

According to the discussion on tourist heterogeneity literature (Section 2.3), 16 factors that describe different aspects of individual-specific characteristics are collected from the survey[1]. In multivariate linear regressions, these factors are regressed on individual marginal utilities ($\hat{\boldsymbol{\beta}}_i$), individual WTA and WTP ($\boldsymbol{WTA}_i$ and $\boldsymbol{WTP}_i$), and individual WTA-WTP disparity ($\boldsymbol{WTA}_i/\boldsymbol{WTP}_i$) in the attempt to explain individual preference heterogeneity. Among

[1]The 16 factors include country of residence, gender, generation, number of child, marital status, education level, employment status, income level, personality (sensation seeking), frequent flyer membership, usual travel motivation, trip planning habit, usual type of trip, concentration of typical travel experiences, linguistic travel distance (LTD) index, number of countries visited. Some factors enter the regression with multiple dummy variables.

TABLE 4.2: PAF results of BSSS personality test

	Item	Loading
1.	I like to explore a strange city or section of town by myself, even if it means getting lost.	0.562
2.	I get very restless if I have to stay around home for any length of time.	0.542
3.	I sometimes like to do things that are a little frightening.	0.787
4.	I like "wild" uninhibited parties.	0.756
5.	I would like to take off on a trip with no pre-planned or definite routes, or timetable.	0.637
6.	I prefer friends who are excitingly unpredictable.	0.772
7.	I would like to try parachute jumping.	0.651
8.	I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal.	0.785
	Variance explained **48.0%** ***Cronbach's alpha*** **0.876**	

the 16 factors, according to the significance of their influences, four individual characteristics, namely generation, personality, the concentration of typical travel experiences, and the linguistic travel distance (LTD) index, are chosen to be explanatory variables. More specifically, the two general characteristics represent the formative experiences (generation dummy variables) and personality (BSSS personality scores) of the respondents, whereas the two travel-experience-related characteristics represent the central tendency (the concentration of typical travel experiences) and dispersion tendency (LTD index) of the past travel experience of the respondents. Among the insignificant factors, it should be noted that, in the current thesis, the countries of residence of the respondents are three English speaking countries, which share similar cultural context. It is very likely that the country of residence will become an important factor in future studies with diverse culture.

The generation character is captured by individual's age (Mannheim, 1952), with people who were born before 1960 as Baby Boomers, people who were born in the period of 1960 to 1980 as Generation X, and people who were born after 1980 as Generation Y.

The personality of the respondent is approximated by BSSS. The choice of items in BSSS follows Hoyle et al. (2002), in which two items are randomly chosen from each of the four traits of SSS-V (Zuckerman, 1996). The eight scores are integrated into one BSSS score using principal axis factoring (PAF). Higher BSSS scores would indicate more sensation seeking individual. Table 4.2 presents the result of the PAF.

The concentration of typical travel experience ($TyDest_i$) of an individual is captured by the ratio of the number of typical destination visited over the total number of destination visited. That is,

$$TyDest_i = \frac{\text{Size of the “typical destination” group}}{\text{Total number of destinations visited}}. \tag{4.30}$$

A LTD index is developed to proxy the cultural variety that the individual has traveled through. Language is described as “the most immediate manifestation of cultural diversity” (UNESCO, 2009, p. 81). Furthermore, in comparing with other cultural distance indices, the language proxy can be applied to any origin-destination pair. Since all three origin countries, Australia, the UK, and the US, are English-speaking countries, English is used as the focal language in the measure of linguistic distances.

The linguistic distance of one country, G, from English-speaking country is calculated by

$$LDI_G = \sum_{l=1}^{L} p_{l,G} LD_l, \tag{4.31}$$

where $l = 1, \ldots, L$ is the index of all languages, $p_{l,G}$ is the percentage of the population that speaks language l in country G, and LD_l is the measure of linguistic distances of language l from English. Information on percentages and mixes of languages used in different countries were gathered from CIA World Factbook (CIA, 2017). Languages with a speaking population less than 5% of the total population are disregarded for simplification purpose. The measures of linguistic distance between languages are adopted from Chen, Sokal, and Ruhlen (2012, p. 602). For languages that are not contained in the 130 languages list of Chen et al. (2012), their closest language family are used instead.

The LTD index for respondent i is, therefore,

$$LTDI_i = \frac{1}{G} \sum_{g=1}^{G} LDI_g, \tag{4.32}$$

where $g = 1, \ldots, G$, is the index of countries visited by respondent i. The weighting of $1/G$ prevents the respondents from scoring a high LTD index by visiting small-linguistic-distance

TABLE 4.3: Descriptive Statistics of Individual Characteristics

	Mean	Std.Dev	Median	Min	Max
Linguistic travel distance	10.41	11.55	6.17	0	56.50
Typical travel concentration	0.65	0.38	0.75	0	1.00
Personality (BSSS)	17.37	5.13	17.40	5.49	27.47
		Counts			(Percentage)
Generation					
Baby Boomers		273			(19.3%)
Generation X		473			(33.3%)
Generation Y		671			(47.4%)

countries for multiple times.

The descriptive statistics of each one of the characteristics are listed in Table 4.3.

A linear model is proposed as,

$$\boldsymbol{Pref}_i = \boldsymbol{\alpha} + \boldsymbol{\gamma}_1 \ln LTDI_i + \boldsymbol{\gamma}_2 TyDest_i + \boldsymbol{\gamma}_3 D_{GenY,i} + \boldsymbol{\gamma}_4 D_{GenX,i} + \boldsymbol{\gamma}_5 BSSS_i + \boldsymbol{\xi}_i, \quad (4.33)$$

where $\boldsymbol{Pref}_i$ is the dependent variable that takes the form of either $\hat{\boldsymbol{\beta}}_i$, $\boldsymbol{WTA}_i$, or $\boldsymbol{WTP}_i$ and reflects the preference-weight vector of respondent i; $LTDI_i$ is the linguistic travel distance index of individual i; $TyDest_i$ is the concentration of typical travel experience of individual i; $D_{GenY,i}$ and $D_{GenX,i}$ are dummy variables that take value of one if individual i belongs to Generation Y and Generation X, respectively; $BSSS_i$ is the BSSS score of individual i, and $\boldsymbol{\xi}_i$ is a vector of the i.i.d. error term.

The estimated parameter vectors, $\boldsymbol{\gamma}_1$ to $\boldsymbol{\gamma}_5$, represent the influence of associated individual characteristic on the preference of the individual on various destination attributes.

4.3 Summary of the Model and Estimation Method

This chapter described the model estimation method adopted in the current thesis.

Section 4.1 discussed the estimation of the MXL model. Four different utility specifications were introduced to assess the properties of reference related behaviors. The distributional assumption on the preference of the respondents on various destination attributes, the detailed

estimation process, including random draw generation, likelihood construction, and the optimization algorithm, are elaborated. The measurements of WTP and WTA are calculated as the ratios of coefficients of non-price factors to coefficients of the price factor. The goodness-of-fit measurements were compared and selected for the current thesis.

Section 4.2 explained the estimation of individual preference from the results of the MXL model. Measurements of individual characteristics from different aspects were examined and a linear model was proposed in investigating the relationship between individual characteristics and individual preference on various destination attributes.

Chapter 5

Findings of the Stated Choice Experiment

This chapter presents and discusses the results of the stated choice experiment. Four different model specifications are estimated and compared in assessing the preference of tourists on various destination attributes. Section 5.1 presents the estimation results of four model specifications, along with the comparisons and discussions of these results. Section 5.2 shows the estimation of WTA and WTP measurements and discusses the WTA-WTP disparity. Section 5.3 concludes the chapter with a brief summary and some discussion on the results.

5.1 Estimates of Mixed Logit Model

The MXL model with four specifications is estimated according to the steps described in Chapter 4. The simulations are conducted with 1000 pseudo-random draws and the BFGS optimization algorithm. The resulting coefficients provide inference on the preferences of tourists on various destination attributes. The comparison of the model specifications provides an assessment of the two reference-related behavioral bias introduced in Chapter 2.

TABLE 5.1: Estimation results of Model M1

	Coefficients	(SE)	Std.Dev	(SE)
ASC_{REF}	−0.058 **	(0.0280)		
Culture	0.323 ****	(0.0156)	0.411 ****	(0.0240)
Nature	0.285 ****	(0.0156)	0.393 ****	(0.0239)
Outdoor	0.130 ****	(0.0125)	0.336 ****	(0.0211)
Entertainment	0.132 ****	(0.0131)	0.375 ****	(0.0220)
Hospitality	0.190 ****	(0.0148)	0.313 ****	(0.0248)
Food & Dining	0.438 ****	(0.0170)	0.480 ****	(0.0227)
Transport	0.145 ****	(0.0139)	0.319 ****	(0.0248)
Budget	−0.009 ****	(0.0002)	0.012 ****	(0.0004)
log-likelihood	**−12688.67**		***BIC***	**25499.84**

****: significant at 5‰level; **: significant at 5% level;

5.1.1 Estimation results of Model M1

Model M1 represents a standard specification in discrete choice modeling. It is also a standard procedure to generate and use the results as the base in comparing with other specifications. Table 5.1 presents the estimation results of Model M1. The estimates are all statistically significant, and their signs are consistent with the expectation of positive coefficients for the (desirable) attraction and service attributes and negative coefficients for the (undesirable) monetary attribute. The statistical significance of standard deviation indicates a significant source of unobserved heterogeneity for all the attributes in the model. The negative ASC_{REF} reflects a slight preference towards the "New Destinations" of the respondents.

5.1.2 Estimation results of Model M2

The estimation results of Model M1 does not reflect the asymmetry of preference around the reference point. In order to explore the preference asymmetry on the gains and the losses of various destination attributes, Model M2 is estimated and the results are presented in Table 5.2.

In comparing with Model M1, 16 additional coefficients are estimated in order to differentiate the preferences in the gains and the losses domains. In general, Model M2 outperforming Model M1 verifies the first reference-related behavioral bias regarding loss aversion. With

TABLE 5.2: Estimation results of Model M2

	Coefficients	(SE)	Std.Dev	(SE)
ASC_{REF}	−1.020 ****	(0.0731)		
Gain domain				
Culture	0.089 ****	(0.0308)	0.305 ****	(0.0609)
Nature	0.066 *	(0.0341)	0.394 ****	(0.0617)
Outdoor	0.072 ****	(0.0209)	0.320 ****	(0.0312)
Entertainment	0.042 *	(0.0238)	0.321 ****	(0.0391)
Hospitality	0.211 ****	(0.0353)	0.228 ****	(0.0765)
Food & Dining	0.265 ****	(0.0319)	0.353 ****	(0.0537)
Transport	0.083 ****	(0.0272)	0.283 ****	(0.0487)
Budget	0.008 ****	(0.0004)	0.018 ****	(0.0006)
Loss domain				
Culture	−0.470 ****	(0.0242)	0.451 ****	(0.0296)
Nature	−0.443 ****	(0.0239)	0.454 ****	(0.0299)
Outdoor	−0.218 ****	(0.0252)	0.342 ****	(0.0383)
Entertainment	−0.291 ****	(0.0253)	0.490 ****	(0.0352)
Hospitality	−0.253 ****	(0.0221)	0.312 ****	(0.0320)
Food & Dining	−0.573 ****	(0.0268)	0.629 ****	(0.0318)
Transport	−0.224 ****	(0.0251)	0.324 ****	(0.0366)
Budget	−0.014 ****	(0.0007)	0.023 ****	(0.0009)
log-likelihood	**−12108.14**		$\boldsymbol{BF_{21}}$	$\mathbf{1.68 \times 10^{210}}$

****: significant at 5‰level; *: significant at 10% level;

a value far above the standard discussed by Raftery (1995)[1], BF_{21} suggests that the data are 1.68×10^{210} times more likely to occur under Model M2 than under Model M1. This provides a very strong evidence in supporting the existence of loss aversion in destination choice process of the tourists.

All coefficients are statistically significant and their signs are in line with the expectations of marginal utility for gains and marginal disutility for losses. Loss aversion, a feature implied by reference-dependent behavior, is verified by the statistically larger absolute values of the coefficients in the losses domain in comparing with those in the gains domain. For instance, the loss aversion feature across the destination attributes shall be consolidated with $\mid \bar{\boldsymbol{\beta}}_L \mid$ being greater than $\mid \bar{\boldsymbol{\beta}}_G \mid$.

[1] A Bayes Factor for Model M2 against Model M1 (BF_{21}) between 1 and 3 suggests weak evidence in favor of Model M2; BF_{21} between 3 and 20 suggests positive evidence in favor of Model M2; BF_{21} between 20 and 150 suggests strong evidence in favor of Model M2; BF_{21} above 150 suggest very strong evidence in favor of Model M2 (Raftery, 1995, p. 139).

TABLE 5.3: Wald test of Model M2

Attributes	Loss domian	Gain domain	t-statistics	P-value
Culture	−0.470	0.089	11.64	0.0000
Nature	−0.443	0.066	10.71	0.0000
Outdoor	−0.218	0.072	5.42	0.0000
Entertainment	−0.291	0.042	8.76	0.0000
Hospitality	−0.253	0.211	1.18	0.1182
Food & Dining	−0.573	0.265	8.63	0.0000
Transport	−0.224	0.083	4.76	0.0000
Budget	−0.014	0.008	8.60	0.0000

In the current thesis, the comparisons of the coefficient estimates are done by Wald tests:

$$c\left(\bar{\beta}_k\right)^T \cdot \left[c'\left(\bar{\beta}_k\right) \cdot \left(\hat{V}_n/n\right) \cdot c'\left(\bar{\beta}_k\right)^T\right]^{-1} \cdot c\left(\bar{\beta}_k\right) \xrightarrow{\mathscr{D}} \chi^2_1, \tag{5.1}$$

where $c\left(\bar{\beta}_k\right)$ is the restriction equation of the Wald test, with $c'\left(\bar{\beta}_k\right)$ being the derivative, $\hat{V}_n$ is the asymptotic variance-covariance matrix approximated by the inverse of negative hessian matrix at convergence. The result is obtained using the delta method for the first order approximation of the variance.

For Model M2, $c\left(\bar{\beta}_k\right)$ takes the form $\mid \bar{\beta}_{k,L} \mid - \mid \bar{\beta}_{k,G} \mid$. The corresponding Wald test results are shown in Table 5.3. All destination attributes exhibit loss aversion except the service quality in terms of hospitality. In particular, the absolute ratios between the coefficients in the losses domain and the coefficients in the gains domain range from 1.83 to 6.85, indicating a significant higher preference-weight on the losses.

The fourth column of Table 5.2 presents the standard deviation of the coefficients (i.e. the square root of the diagonal entries of $\mathbf{\Sigma}$). The significance of all the standard deviations of the coefficients reveals the random heterogeneity of tourist preference on the quality of various attractions, the quality of services, and the budget.

5.1.3 Estimation results of Model M3

Model M2 improves Model M1 by introducing asymmetric preference of the tourists on various destination attributes around the reference point. The specification of Model M3 takes

a different perspective in advancing that of Model M1: separating the marginal utility of the reference-level from the marginal utility of any other attribute-levels. In comparison with Model M1, 32 additional coefficients are estimated to separately evaluate the marginal utility of the reference-level in both new destinations and typical destination". Table 5.4 presents the estimation results followed by the results of the Wald test on the coefficients in Table 5.5. In general, the Bayes factor BF_{31} suggests that the data are 3.83×10^{269} times more likely to occur under Model M3 than under Model M1, supporting the assumption that the tourists put different preference-weight on reference-level than other attribute-levels. In addition, Model M3 outperforming Model M2, with a BF_{32} of 2.29×10^{59}, indicates that the effect of the reference-level bias is greater than that of the loss aversion in the tourist destination choice context.

In Model M3, all the coefficient estimates have the expected signs, through the coefficient on outdoor recreational attractions in the typical destination is not statistically significant. Regarding the destination attributes of new destinations, in the comparison of the coefficients associated with non-reference levels, the coefficients associated with reference-levels ($\boldsymbol{\beta}_{i,REF1}$) are statistically larger in terms of the quality of cultural attractions, natural attractions, entertainment attractions, and food & dining services (upper panel of Table 5.5). This finding indicates that, even when the tourists are visiting a new destination, they give a relatively higher preference-weight to a level of quality they have experienced in their typical travel pattern. The inertia is defined as reference-level bias, which is verified for four out of eight destination attributes investigated in the experiment. Figure 5.1 further illustrates this finding with a numeric example. The rectangles display the utility gains (disutility in the case of the budget) at each attribute level. The illustration adopts the median of reference attribute-levels as the reference points, which is represented with the shaded rectangles in the figure. The plain rectangles represent the non-reference-levels with the solid trend line showing its linear trend. Therefore, reference-level bias is verified whenever the level of a shaded rectangle lies above the level of the trend line (below the trend line in the case of budget), indicating that the marginal utility at the reference-level is higher than that at the non-reference levels.

TABLE 5.4: Estimation results of Model M3

	Coefficients	(SE)	Std.Dev	(SE)
ASC_{REF}	0.232	(0.2784)		
New Destination: Non-reference levels				
Culture	0.233 ****	(0.0141)	0.054	(0.0347)
Nature	0.219 ****	(0.0143)	0.051	(0.0386)
Outdoor	0.178 ****	(0.0126)	0.004	(0.0714)
Entertainment	0.117 ****	(0.0128)	0.016	(0.0659)
Hospitality	0.197 ****	(0.0141)	0.017	(0.0706)
Food & Dining	0.321 ****	(0.0139)	0.020	(0.0638)
Transport	0.172 ****	(0.0131)	0.001	(0.0809)
Budget	−0.005 ****	(0.0002)	0.004 ****	(0.0002)
New Destination: Reference level				
Culture	0.271 ****	(0.0127)	0.106 ****	(0.0194)
Nature	0.246 ****	(0.0124)	0.035	(0.0411)
Outdoor	0.181 ****	(0.0133)	0.010	(0.0814)
Entertainment	0.137 ****	(0.0129)	0.049	(0.0389)
Hospitality	0.180 ****	(0.0125)	0.022	(0.0552)
Food & Dining	0.333 ****	(0.0130)	0.085 ****	(0.0229)
Transport	0.178 ****	(0.0137)	0.017	(0.0660)
Budget	−0.005 ****	(0.0003)	0.003 ****	(0.0005)
Typical Destination: Reference level				
Culture	0.101 ****	(0.0305)	0.119 **	(0.0592)
Nature	0.273 ****	(0.0347)	0.133 **	(0.0553)
Outdoor	−0.014	(0.0211)	0.080	(0.0650)
Entertainment	0.135 ****	(0.0246)	0.151 ****	(0.0511)
Hospitality	0.203 ****	(0.0408)	0.135 **	(0.0595)
Food & Dining	0.331 ****	(0.0392)	0.318 ****	(0.0362)
Transport	0.164 ****	(0.0319)	0.162 ***	(0.0603)
Budget	−0.003 ****	(0.0002)	0.001 ****	(0.0003)
log-likelihood	**−11894.99**		$\boldsymbol{BF_{31}}$	$\mathbf{3.83 \times 10^{269}}$

****: significant at 5‰level; ***: significant at 1% level; **: significant at 5% level;

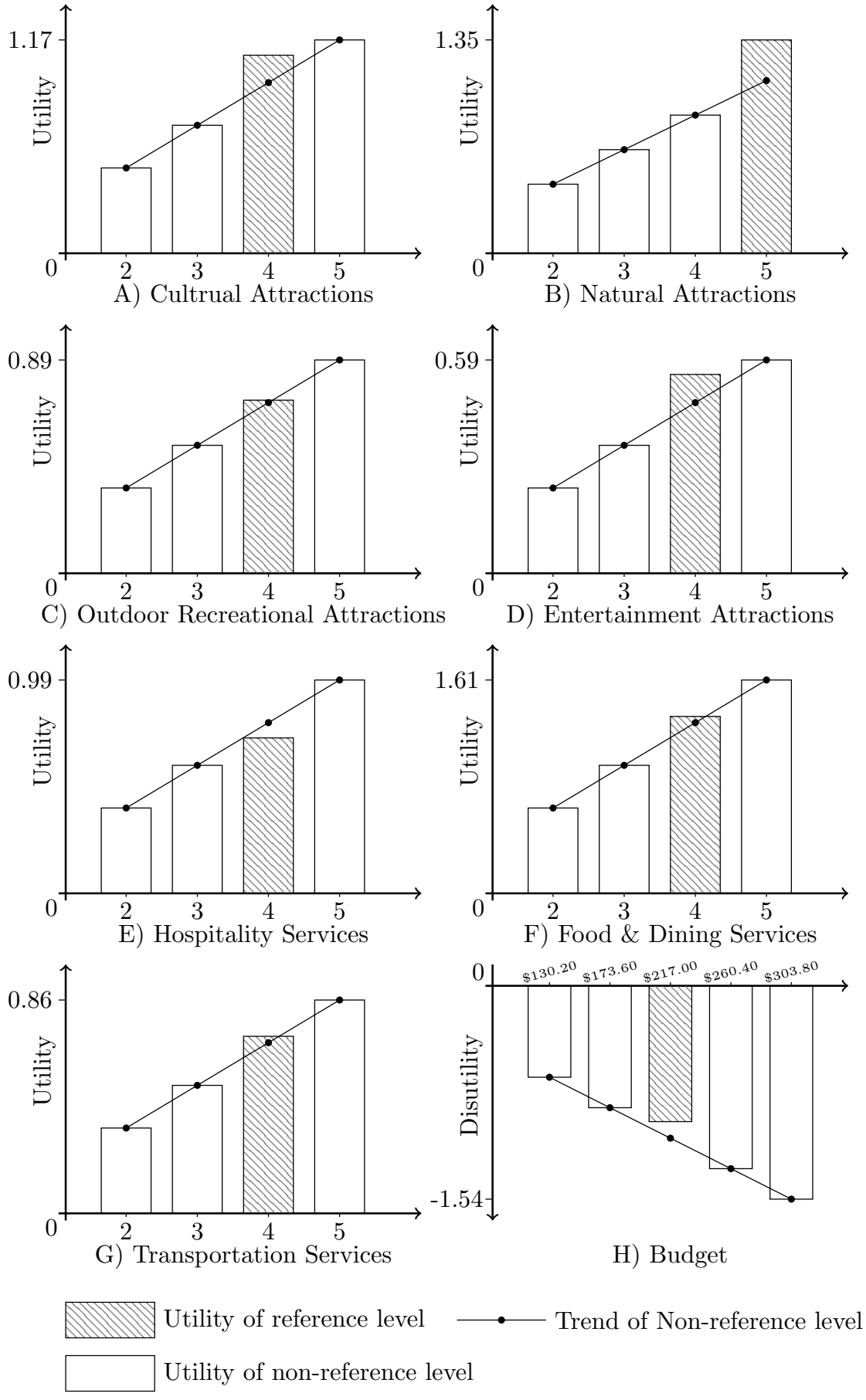


FIGURE 5.1: Representation of marginal (dis)utilities of Model M3

TABLE 5.5: Wald test of Model M3

Attributes	Reference-level	Non-reference	*t*-statistics	P-value
Culture	0.271	0.233	4.05	0.0000
Nature	0.246	0.219	2.90	0.0019
Outdoor	0.181	0.178	0.26	0.3957
Entertainment	0.137	0.117	2.02	0.0217
Hospitality	0.180	0.197	−1.93	0.9729
Food & Dining	0.333	0.321	1.31	0.0955
Transport	0.178	0.172	0.68	0.2480
Budget	−0.005	−0.005	−2.50	0.9938
Attributes	**New destination**	**Typical destination**	***t*-statistics**	**P-value**
Culture	0.271	0.101	5.23	0.0000
Nature	0.246	0.273	−0.75	0.7729
Outdoor	0.181	0.072	8.15	0.0000
Entertainment	0.137	−0.014	0.09	0.4657
Hospitality	0.180	0.203	0.56	0.7110
Food & Dining	0.333	0.331	0.06	0.4756
Transport	0.178	0.164	0.41	0.3427
Budget	−0.005	−0.003	6.21	0.0000

The lower panel of Table 5.5 compares the preference of tourists on the reference-level in new destinations with those in the typical destination. The comparison results vary across destination attributes. Given the same attribute-level, the tourists prefer the enjoyment from the destination attributes in a new destination in terms of the quality of cultural attractions, outdoor recreational attractions, and the total budget. The results are not unexpected since the first two associated destination attributes are highly related to exploration. From a recent online survey on US international travelers, 81% and 63% of the respondents indicate "visit a new place" and "experience a new culture" as their main reason of traveling, respectively (Statista, 2014). Regarding the total budget, tourists are less price sensitive at the typical destination due to familiarity. The situation is different for the preference on the quality of other destination attributes (i.e. natural, entertainment attractions, hospitality, food & dining, and transportation services), where no clear preference can be identified towards the new destinations or the typical destination. For these destination attributes, the findings suggest that being at a new destination does not increase the value of the corresponding destination attributes.

In comparison with Model M1 and Model M2, the parameters in Model M3 are further differentiated according to attribute levels. This specification can partially capture the unobserved heterogeneity, which results in several insignificant standard deviations of the parameters.

5.1.4 Estimation results of Model M4

Both Model M2 and Model M3 significantly advance the specification of Model M1 and reveal the important role of loss aversion and reference-level bias in the tourist destination choice process. The specification of Model M4 combines the feature of loss aversion (Model M2) and the reference-level bias (Model M3). As demonstrated in Model M3, the unobserved heterogeneity can partially be captured by differentiating parameters according to attribute levels. With more detailed differentiation introduced in Model M4, it is not necessary to specify every parameter as random. The parameters associated with the quality of cultural attractions, natural attractions, food & dining services, and the budget were selected to be random parameters upon the estimation of several specification forms. In comparison with the same specification with every parameter assumed random, the reduced form of Model M4 scored a Bayes factor of 1.62×10^{25}, which strongly supports the deduction of the number of random parameters in the model. Table 5.6 and Table 5.7 present the estimation results of Model M4 and the Wald tests on the coefficients of Model M4, respectively.

As discussed in Section 4.1.1, in order to identify the marginal utility of the reference-level attributes in both the new destinations and the typical destination (i.e. $\boldsymbol{\beta}_{REF1}$ and $\boldsymbol{\beta}_{REF2}$), the gains and the losses in Model M4 are specified in terms of absolute value of the attribute-levels, instead of the deviations from the reference-level as in Model M2. Hence, the signs of the coefficients in both gains and losses domains are expected to be positive for the quality of attractions and services (desirable) attributes and negative for the monetary (undesirable) attribute. All the significant coefficients in Model M4 are in line with the expectation, while the coefficients associated with outdoor recreational attractions and transportation services in the typical destination are not significant. The significant differences observed between the coefficients in gains and losses domains (as shown in the upper panel of Table 5.7) and

TABLE 5.6: Estimation results of Model M4

	Coefficients	(SE)	Std.Dev	(SE)
ASC_{REF}	0.631	(0.4993)		
New Destination: Gain domain				
Culture	0.225 ****	(0.0225)	0.001	(0.0442)
Nature	0.283 ****	(0.0184)	0.005	(0.0374)
Outdoor	0.141 ****	(0.0196)		
Entertainment	0.148 ****	(0.0173)		
Hospitality	0.227 ****	(0.0193)		
Food & Dining	0.357 ****	(0.0183)	0.056 *	(0.0289)
Transport	0.193 ****	(0.0189)		
Budget	−0.001	(0.0009)	0.003 ****	(0.0007)
New Destination: Loss domain				
Culture	0.267 ****	(0.0423)	0.110 ***	(0.0423)
Nature	0.401 ****	(0.0364)	0.035	(0.0862)
Outdoor	0.104 ***	(0.0382)		
Entertainment	0.194 ****	(0.0369)		
Hospitality	0.270 ****	(0.0378)		
Food & Dining	0.407 ****	(0.0358)	0.094 **	(0.0440)
Transport	0.274 ****	(0.0378)		
Budget	−0.004 ****	(0.0005)	0.003 ****	(0.0003)
New Destination: Reference level				
Culture	0.274 ****	(0.0274)	0.112 ****	(0.0202)
Nature	0.353 ****	(0.0229)	0.093 ****	(0.0189)
Outdoor	0.135 ****	(0.0254)		
Entertainment	0.179 ****	(0.0233)		
Hospitality	0.225 ****	(0.0234)		
Food & Dining	0.381 ****	(0.0228)	0.107 ****	(0.0184)
Transport	0.226 ****	(0.0251)		
Budget	−0.002 ****	(0.0007)	0.001	(0.0006)
Typical Destination: Reference level				
Culture	0.156 **	(0.0722)	0.230 ****	(0.0447)
Nature	0.445 ****	(0.0828)	0.125 *	(0.0668)
Outdoor	−0.079	(0.0551)		
Entertainment	0.213 ****	(0.0611)		
Hospitality	0.238 **	(0.0933)		
Food & Dining	0.356 ****	(0.0862)	0.361 ****	(0.0316)
Transport	0.090	(0.0739)		
Budget	−0.002 **	(0.0007)	0.002 ****	(0.0004)
log-likelihood	**−11734.55**		$\boldsymbol{BF_{41}}$	$\mathbf{1.82 \times 10^{339}}$
			$\boldsymbol{BF_{42}}$	$\mathbf{1.09 \times 10^{129}}$
			$\boldsymbol{BF_{43}}$	$\mathbf{4.76 \times 10^{69}}$

****: significant at 5‰level; ***: significant at 1% level; **: significant at 5% level;

*: significant at 10% level.

between the coefficients in gains domain and reference-level (as shown in the middle panel of Table 5.7) provide additional evidence on the existence of reference dependence in tourist destination choice process. However, with the model being estimated in absolute value of attribute-levels, the assessment on loss aversion becomes less obvious. By definition, the preference of the tourist exhibits loss aversion if and only if

$$\left[\bar{\beta}_{k,REF1}X_{k,REF} - \bar{\beta}_{k,L}\left(X_{k,REF} - D\right)\right] - \left[\bar{\beta}_{k,G}\left(X_{k,REF} + D\right) - \bar{\beta}_{k,REF1}X_{k,REF}\right] > 0, \quad (5.2)$$

where D represents the magnitude of deviation in losses and gains. The first term in Equation 5.2 measures the utility decrease in the case of losses, while the second term measures the utility increase in the case of gains. The condition is now relevant to $\bar{\beta}_{k,REF1}$, $\bar{\beta}_{k,L}$, $\bar{\beta}_{k,G}$, $X_{k,REF}$, and D, rather than solely depends on $\bar{\beta}_{k,L}$ and $\bar{\beta}_{k,G}$. Table 5.8 shows the value of Equation 5.2 for reasonable level of attribute-levels for each destination attribute. Positive number indicates an observation with loss aversion, while negative number shows the opposite. The statistical significance of the results is tested by the Wald test using Equation 5.2 as $c\left(\bar{\beta}_k\right)$. The reference levels ($X_{k,REF}$) and deviations ($D$) are chosen so that the losses and gains are still within the range between 2 and 5, which is the scale minimum and scale maximum in the current thesis, respectively.

As shown in Table 5.8, parallel with the results from Model M2, all attributes, except the service quality of hospitality, exhibit loss aversion. The presence of reference-level bias can be evaluated with the comparison between the coefficients from the gains domain and those at the reference-levels in the new destinations. That is, the preference of the tourists shows reference-level bias if they obtain higher marginal utility at the reference-level of the destination attributes. Similar to the results of Model M3, as presents in the middle panel of Table 5.7, the preference of the tourists reveals reference-level bias in six out of eight destination attributes, namely the quality of cultural attractions, natural attractions, entertainment attractions, food & dining services, transportation services, and the total budget. Figure 5.2 further illustrates the estimates of Model M4. The shaded rectangles represent the utility (disutility) at the reference-level, the dotted rectangles illustrate the utility of gains (i.e.

TABLE 5.7: Wald test of Model M4

Attributes	Losses domain	Gain domain	*t*-statistics	P-value
Culture	0.267	0.225	1.66	0.0481
Nature	0.401	0.283	4.99	0.0000
Outdoor	0.104	0.141	−1.53	0.9368
Entertainment	0.194	0.148	1.87	0.0305
Hospitality	0.270	0.227	1.79	0.368
Food & Dining	0.407	0.357	2.13	0.0165
Transport	0.274	0.193	3.12	0.0009
Budget	−0.004	−0.001	7.09	0.0000
Attributes	Reference-level	Gain domain	*t*-statistics	P-value
Culture	0.274	0.225	3.91	0.0000
Nature	0.353	0.283	5.65	0.0000
Outdoor	0.135	0.141	−0.48	0.6847
Entertainment	0.179	0.148	2.42	0.0078
Hospitality	0.225	0.227	−0.21	0.5838
Food & Dining	0.381	0.357	2.00	0.0229
Transport	0.226	0.193	2.58	0.0050
Budget	−0.002	−0.001	3.71	0.0001
Attributes	New destination	Typical destination	*t*-statistics	P-value
Culture	0.274	0.156	3.39	0.0003
Nature	0.353	0.445	−2.46	0.0070
Outdoor	0.135	−0.079	7.93	0.0196
Entertainment	0.179	0.213	−1.23	0.8912
Hospitality	0.225	0.238	0.30	0.6196
Food & Dining	0.381	0.356	0.62	0.2673
Transport	0.226	0.090	3.90	0.0000
Budget	−0.002	−0.002	1.43	0.0763

TABLE 5.8: Measure of loss aversion in Model M4

Reference level ($X_{k,REF}$) Deviation (D)	3 (±1)	4 (±1)
Culture	0.218 ****	0.276 ****
Nature	0.188 ****	0.212 ****
Outdoor	0.038 ****	0.063 ****
Entertainment	0.096 ****	0.113 ****
Hospitality	-0.100	-0.151
Food & Dining	0.050 ****	0.047 ****
Transport	0.042 ****	0.025 ****
Reference level ($X_{budget,REF}$) Deviation (D)	1 (±20%)	1 (±40%)
Budget	0.006 ****	0.007 ****

****: significant at 5‰level

at the attribute levels above the reference-level), and the plain rectangles represent the utility of losses (i.e. at the attribute levels below the reference-level). Similar as in Figure 5.1, the sample median of the reference-levels is adopted as the reference point in the illustration. The solid trend lines represent the linear trends of the gains. Loss aversion is verified when the difference between plain rectangle and shaded rectangle (the value of losses) is greater than the difference between shaded rectangle and dotted rectangle (the value of gains), whereas reference-level bias is verified when the level of the shaded rectangle lays above (below in the case of budget) the solid trend line. It should also be kept in mind that the illustration in Figure 5.2 merely presents one numerical example at the median level and does not provide conclusion globally.

In the comparison between the marginal utility of the destination attributes at the reference-level in the new destinations and those in the typical destination, tourists still have a preference towards the new destinations in terms of the quality of cultural attractions, outdoor recreational attractions, and the total budget (as shown in the lower panel of Table 5.7. In addition, in Model M4, tourists reveal a preference towards the new destinations in terms of the quality of transportation services as well. No significant disparity can be observed between the marginal utility in the new destination and typical destination in terms of the quality of entertainment attractions, hospitality services, and food & dining services. Interestingly, tourists are found to attach higher marginal utility to the quality level of natural attractions in the typical destination. This phenomenon may be caused by the familiarity seeking behavior associated with sun/sea/sand type of tourism. Repeated visitors are found to constitute a major proportion of all visitors in some archipelagos related tourism studies (e.g. 66.5% in Balearics, Aguiló, Alegre, & Sard, 2005, p. 223; 63% in Hawai'i, Bardolet & Sheldon, 2008, p. 906).

Overall, in Model M4, significant sources of unobserved heterogeneity in terms of the quality of cultural attractions, natural attractions, food & dining services, and the budget are depicted with the statistically significant estimates of standard deviations of these coefficients. Bayes factors BF_{41}, BF_{42}, and BF_{43} strongly support the coexistence of reference-dependent behavior

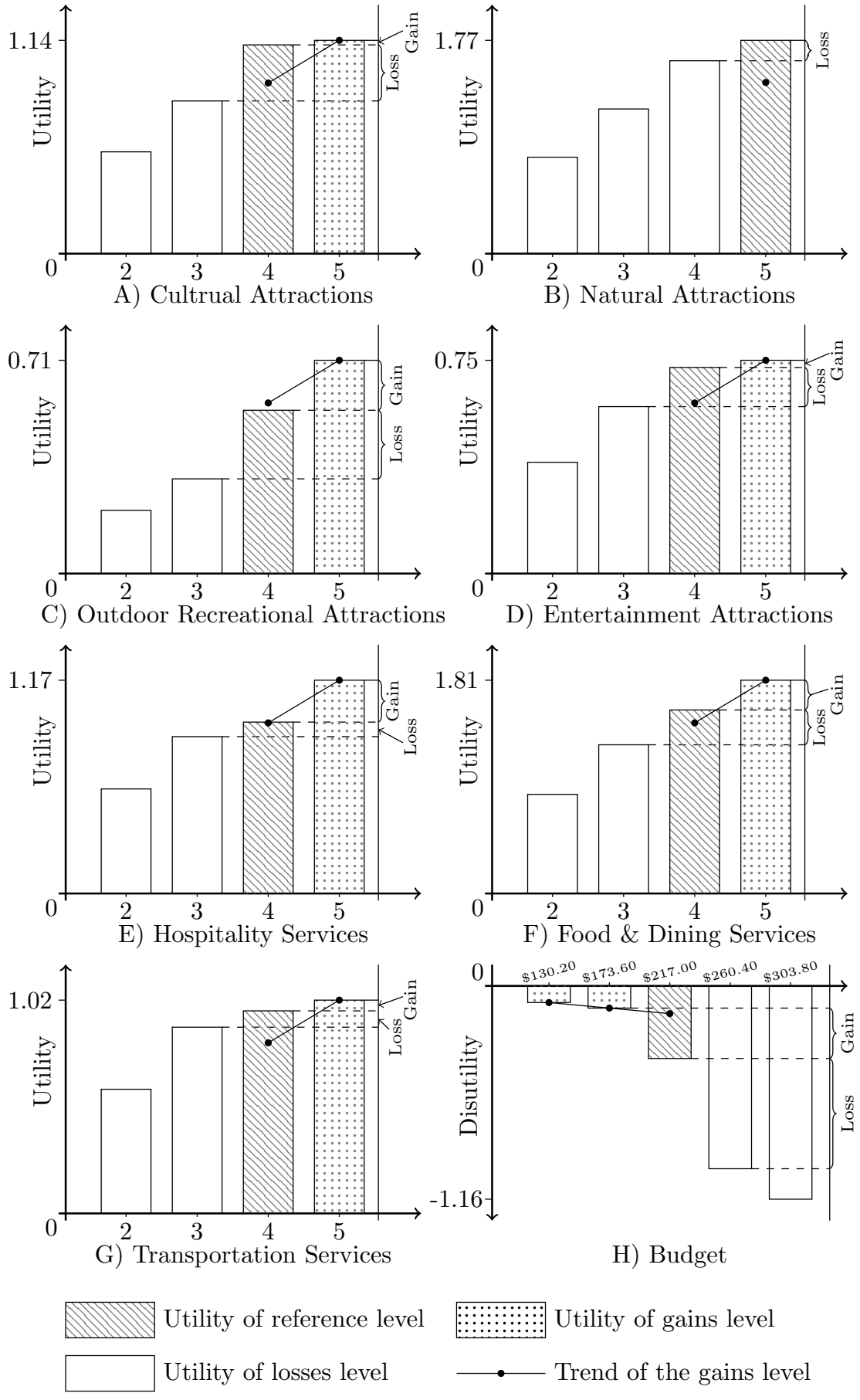


FIGURE 5.2: Representation of marginal (dis)utilities of Model M4

and reference-level bias in the tourist destination choice context. In particular, loss aversion is observed in terms of all destination attributes except the quality of outdoor recreational attractions, whereas the reference-level bias is observed in terms of all destination attributes except the quality of outdoor recreational attractions and hospitality services.

5.2 WTA and WTP Measurements and WTA-WTP Disparity

The measurements of WTA and WTP are derived from the estimation of Model M4 using the process described in Section 4.1.6. In the current thesis, the parameter of the budget is assumed to follow a normal distribution. Hence, all the seven pairs of WTA and WTP measurements are random variables instead of point estimates.

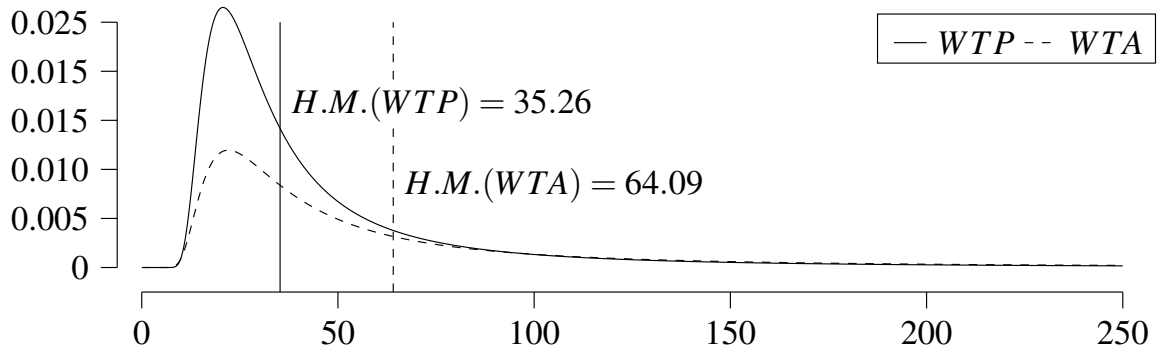
In the case of the quality of outdoor recreational attractions, entertainment attractions, hospitality services, and transportation services, where the associated parameters are estimated non-randomly, the WTA and WTP measurements are derived by the ratio between a scalar (the destination attributes) and a normally distributed random variable (the budget). The process results in reciprocal normal distributions with the density function described by Equation 4.17. Figure 5.3 presents the distributions of WTA with dashed curves and those of WTP with solid curves. The negative support and the origin point of the distribution are truncated due to the insignificant economic meanings of negative WTA and WTP measurements. Due to the larger coefficients associated with the destination attributes in the losses domain, the distributions of WTA spread more widely than those of WTP. Note that, in this case, since the integral $\int t f(t)\,\mathrm{d}t$ is not finite, the mean and variance of the WTA and WTP do not exist. Therefore, the harmonic mean is used in assessing the central tendency of WTA and WTP. The harmonic mean is calculated by simulation with the reciprocal of arithmetic mean of the reciprocals of the sampled observations:

$$H.M.(WTA) = \frac{1}{\frac{1}{N}\sum_{n=1}^{N}\frac{1}{WTA_n}}, \tag{5.3}$$

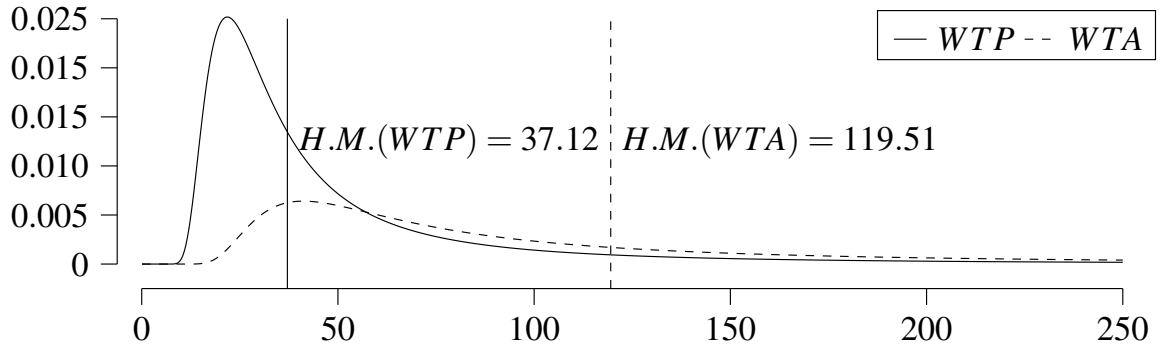
where $H.M.$ stands for harmonic mean; WTA_n is one sampled observation from the WTA distribution; and N is the number of draws in the simulation. 1000 draws are used in generating the harmonic means in Figure 5.3. Regarding the parameters that are assumed to be randomly distributed, including the parameters of the quality of cultural attractions, natural attractions, and food & dining services, the WTA and WTP measurement follows the Gaussian ratio distributions with the probability density function described as Equation 4.18. The three panels of Figure 5.4 present the distributions of WTP and WTA for the quality of cultural attractions, natural attractions, and food & dining services, respectively. Similar to Figure 5.3, the negative support of the distribution is truncated due to the insignificant economic meaning. In Figure 5.4, the distributions of WTA for random parameters also have wider spreads and fatter tails, which are consistent with those distributions for non-random parameters. Harmonic means are also adopted in Figure 5.4 so that the results can be compared with those in Figure 5.3. In the current thesis, the measurement of WTA (WTP) describes the amount of money the tourists would accept (pay) for giving up (acquiring) one additional star in the associated destination attributes. Since the "star" scale is not well defined in a real-world setting, the measurements alone have less economic implication. The ratio between the measurements of WTA and WTP, however, provides the WTA-WTP disparity in terms of various destination attributes. As presented in Table 5.9, the WTA-WTP disparity of various destination attributes range from 1.77 to 3.51 in the preference of tourists on various destination attributes. The average of WTA-WTP disparities is around 2.77. The tourists would demand a much higher (almost three times) amount of compensation (price cut) for a drop in the quality of destination attributes than the amount of price they would pay for a rise in the quality of destination attributes.

5.3 Summary of the Findings of Stated Choice Experiment

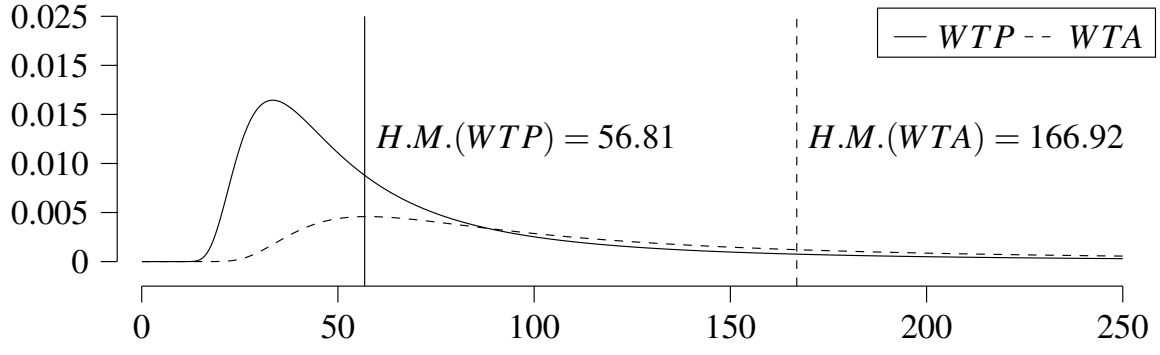
This chapter presents the estimation results of the SCE. On a population basis, the results infer the preference of the tourists on the levels of various destination attributes. In contrast with the individual estimates that will be covered in the next chapter, the inference on the population



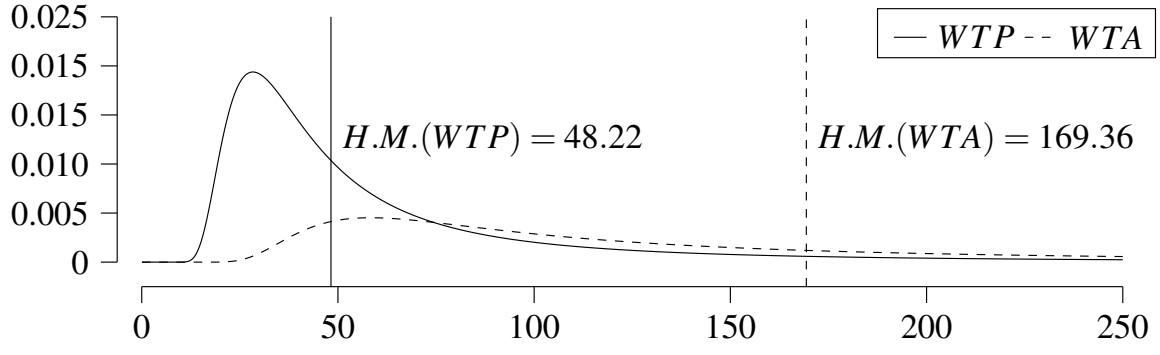
(A) Outdoor recreational attractions



(B) Entertainment attractions

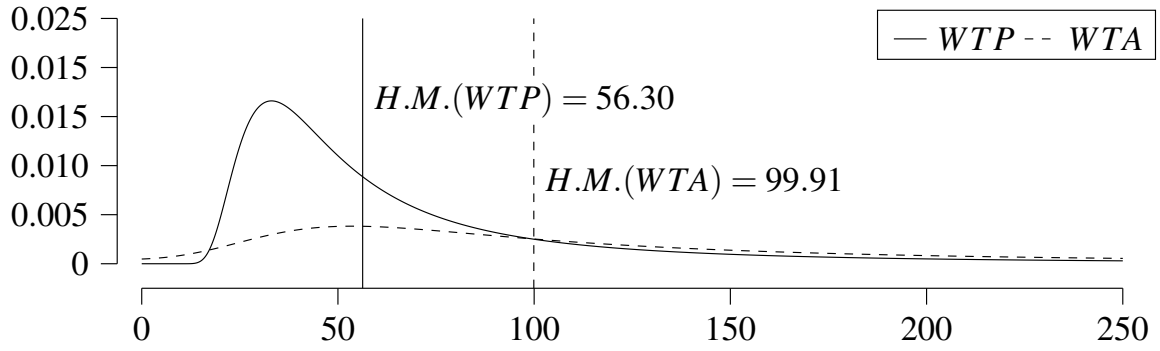


(C) Hospitality services

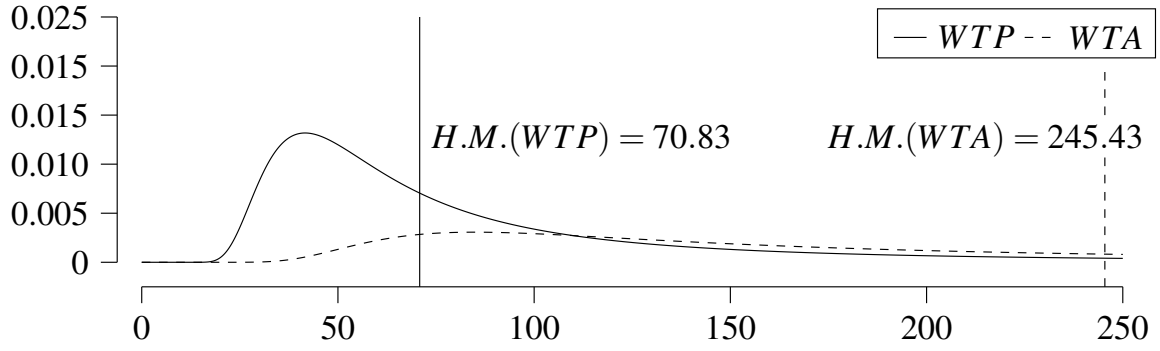


(D) Transportation services

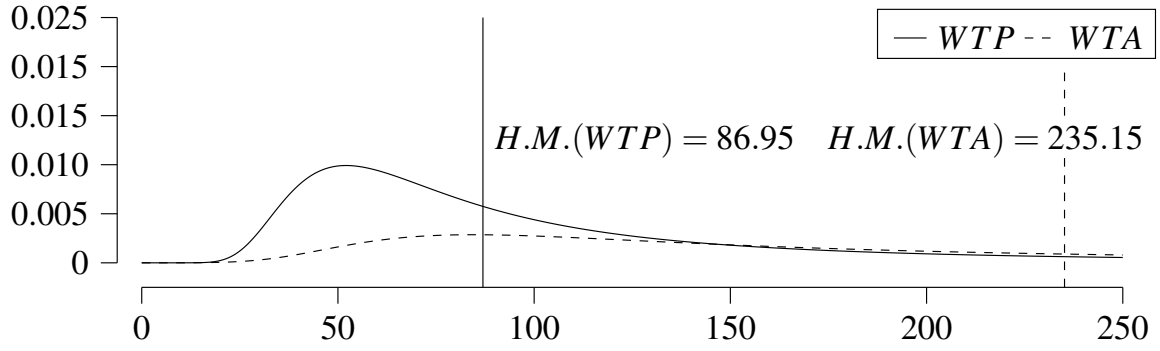
FIGURE 5.3: Density of WTA and WTP for non-random parameters (in US$)



(A) Cultural attractions



(B) Natural attractions



(C) Food & dining services

FIGURE 5.4: Density of WTA and WTP for random parameters (in US$)

TABLE 5.9: WTA-WTP disparity in various destination attributes

Attributes	WTA	WTP	WTA-WTP disparity
Culture	99.91	56.30	1.77
Nature	245.43	70.83	3.47
Outdoor	64.09	35.26	1.82
Entertainment	119.51	37.12	3.22
Hospitality	166.92	56.81	2.94
Food & Dining	235.16	86.95	2.70
Transport	169.36	48.22	3.51

characteristics provides an aggregate perspective. In general, tourists are heterogeneous in terms of their preferences on the quality of various destination attributes. They are found to be loss averse on seven destination attributes, namely the quality of cultural, natural, and entertainment attractions, the quality of hospitality, food & dining, and transportation services, and the total travel budget, out of eight destination attributes that are investigated in the current thesis. That is, the decreases in the quality of destination attributes are valued more than the increases in the same magnitude. In particular, on average, the losses in terms of the quality of attractions are weighted 30% more than the gains of the same magnitude. Outdoor recreational attractions, as an "adventurous" destination attribute, is an exceptional case. The gain in the quality of outdoor recreational attractions is weighted about 36% more than a similar loss. In terms of the quality of services, the losses are weighted 25% more than the gains of the same magnitude. Regarding the monetary attribute of the destination, the price rise is weighted about 520% more than the price cut in the same size. The asymmetric preference on various destination attributes is also consolidated by the measurements of WTA and WTP. A significant disparity is observed between the measurements of WTA and WTP. In general, the tourists would pay three times as much to avoid a decrease in the quality of destination attributes, in comparison with the amount of money they would pay to procure an increase in the same destination attributes.

The current thesis also suggests an inertia of tourists for the quality level of destination attributes they have experienced at their typical destination. More specifically, in terms of quality of attractions, tourists have a 22% higher marginal utility at the reference-level in comparing to the marginal utility at a quality level above the reference, with the exception of the quality of outdoor recreational attractions. This difference is reduced to around 12% in terms of the quality of services, except the services in hospitality.

In the comparison of the marginal utility generated from various destination attributes in new destinations and typical destinations, tourists reveal a bias towards the new destination in terms of the quality of cultural and outdoor recreational attractions, the quality of transportation services, and the total budget. The marginal utilities bring about by these destination

attributes in the new destination is significantly higher than those in the typical destination. In contrast, the disparity of the marginal utility is insignificant in terms of the quality of entertainment attractions, hospitality services, and food & dining services. The tourists' preference between new destination and the typical destination is reversed regarding the quality of natural attractions, where the typical destination is significantly preferred possibly due to familiarity seeking.

The aforementioned findings on the preferences of tourists on the quality of destination attributes suggest a very significant role of typical travel pattern in the tourist destination choice process. The evaluation of potential tourist destinations largely depends on the reference point, which is formulated with the typical travel history of the tourist. Practically, the destination management organizations should feature their attractions and services so that tourists will not perceive the quality of these attractions, services, and travel prices as a loss relative to what they have experienced in their typical destinations.

Chapter 6

Findings on Individual Preferences

This chapter discusses the findings related to the individual preferences on the quality of destination attributes. In contrast to the discussion from the aggregate perspective in Chapter 5, the discussion in this chapter focuses more on building the bridge between individual characteristics and individual preferences on the quality of destination attributes. The discussion in this chapter provides an understanding of the underlying logic beneath the individual preferences from an individual perspective. Section 6.1 presents the linear regression results of individual characteristics on their marginal utility of the quality of destination attributes. Section 6.2 discusses the linear regression results with respect to the individual WTA and WTP. Section 6.3 concludes the chapter with summary and discussions.

6.1 Linear Regressions on the Marginal Utilities

In the current thesis, the individual preferences on the quality of various destination attributes ($\hat{\beta}_{k,i}$) are estimated following the process described in Section 4.2.1 using the results of Model M4. Since the preferences on the quality of outdoor recreation attractions, entertainment attractions, hospitality services, and transportation services are estimated non-randomly, the associated individual preferences are not estimated (in these cases, $\hat{\beta}_{k,i}$ were assumed to be the same across all respondents).

The coefficients ($\hat{\beta}_{k,i}$) measure the individual marginal utility with regards to the changes in the quality of the corresponding destination attributes. The linear regressions using individual marginal utility as dependent variables aims to explain random heterogeneity with individual characteristics. The upper panel of Table 6.1 presents the results of the linear regressions using the individual marginal utility of the quality of various destination attributes at the reference level in the typical destination and the new destinations as dependent variables (the column "Typical" and "New" respectively), whereas the lower panel of Table 6.1 examines the individual marginal utility of the quality of various destination attributes in the losses and the gains domains. The coefficients that are statistically significant are highlighted in black. Excluding the intercepts of the linear regressions, the coefficients (γs) are mostly in the scale of 10^{-3} to 10^{-5}, which are seemingly small. Though it is expected due to the small scale of $\hat{\beta}_{k,i}$ (in the scale of 10^{-1} and 10^{-3} in the case of destination attributes and total budget, respectively). The ratio between the coefficients in the linear regression (γs) and the coefficients in Model M4 ($\bar{\beta}_k$) provides the marginal influence of individual characteristics on individual preferences. For example, the coefficient of log-linguistic travel distance on the preference on the quality of cultural attractions at reference level in a typical destination (-4.47×10^{-3}) would be interpreted as an average of 1.6% diminishment of the marginal utility once the LTD index of the individual is increased by 1%. The interpretation also varies across the explanatory variables. The coefficient on LTD index provides the changes in marginal utility with every 1% change in the LTD index; the coefficients on typical travel concentration or personality give the variation in marginal utility with every unit change in the concentration percentage or the BSSS score; and the coefficients on generation dummy variables measure the differences in the arithmetic mean of the marginal utility between the associated age group and the Baby Boomers.

In the meanwhile, the negative coefficients in Table 6.1 do not necessarily mean that the tourist dislikes certain destination attribute. It merely implies a decline in the marginal utility of the quality of destination attribute, as described in the previous example. Given the relative scale of the coefficients in Model M4 and the coefficients in the linear regressions, no preference

TABLE 6.1: Linear regression results on marginal utility

Reference-level	Culture		Nature		Food & Dining		Budget	
	Typical	New	Typical	New	Typical	New	Typical	New
Constant	2.09×10^{-1} ****	2.72×10^{-1} ****	4.59×10^{-1} ****	3.60×10^{-1} ****	4.77×10^{-1} ****	3.85×10^{-1} ****	-1.44×10^{-3} ****	-1.95×10^{-3} ****
	(1.10×10^{-2})	(4.07×10^{-3})	(3.33×10^{-3})	(2.99×10^{-3})	(2.67×10^{-2})	(3.70×10^{-3})	(4.08×10^{-5})	(1.01×10^{-5})
Linguistic travel distance	-4.47×10^{-3} **	-1.28×10^{-3}	-1.87×10^{-3} ***	4.80×10^{-4}	-1.25×10^{-2} **	-4.08×10^{-4}	-1.42×10^{-5} *	-6.09×10^{-7}
	(2.25×10^{-3})	(8.34×10^{-4})	(6.80×10^{-4})	(6.11×10^{-4})	(5.42×10^{-3})	(7.62×10^{-4})	(8.31×10^{-6})	(2.07×10^{-6})
Typical travel concentration	8.53×10^{-3}	1.56×10^{-3}	1.67×10^{-3}	-2.20×10^{-3}	1.87×10^{-2}	-1.25×10^{-5}	5.86×10^{-6}	-5.52×10^{-6}
	(6.74×10^{-3})	(2.49×10^{-3})	(2.03×10^{-3})	(1.83×10^{-3})	(1.63×10^{-2})	(2.28×10^{-3})	(2.50×10^{-5})	(6.23×10^{-6})
Generation Y	-2.87×10^{-2} ****	6.00×10^{-3} **	-7.32×10^{-3} ****	-2.80×10^{-3}	-6.19×10^{-2} ****	3.09×10^{-3}	-1.07×10^{-4} ****	1.48×10^{-5} **
	(7.14×10^{-3})	(2.64×10^{-3})	(2.16×10^{-3})	(1.92×10^{-3})	(1.72×10^{-2})	(2.39×10^{-3})	(2.63×10^{-5})	(6.53×10^{-6})
Generation X	-1.68×10^{-2} **	4.50×10^{-3} *	-4.39×10^{-3} **	-2.89×10^{-3}	-3.78×10^{-2} **	1.71×10^{-3}	-7.38×10^{-5} ***	5.78×10^{-6}
	(7.26×10^{-3})	(2.68×10^{-3})	(2.20×10^{-3})	(1.95×10^{-3})	(1.75×10^{-2})	(2.43×10^{-3})	(2.68×10^{-5})	(6.63×10^{-6})
Personality	-1.72×10^{-3} ****	-7.42×10^{-5}	-3.09×10^{-4} *	-2.99×10^{-4} **	-3.87×10^{-3} ****	-2.66×10^{-4}	-3.77×10^{-6} *	-5.49×10^{-8}
	(5.20×10^{-4})	(1.94×10^{-4})	(1.57×10^{-4})	(1.41×10^{-4})	(1.25×10^{-3})	(1.76×10^{-4})	(1.94×10^{-6})	(4.78×10^{-7})
New Destinaiton	Culture		Nature		Food & Dining		Budget	
	Losses	Gains	Losses	Gains	Losses	Gains	Losses	Gains
Constant	2.64×10^{-1} ****	2.25×10^{-1} ****	4.00×10^{-1} ****	2.83×10^{-1} ****	4.00×10^{-1} ****	3.57×10^{-1} ****	-5.07×10^{-3} ****	-2.34×10^{-4} *
	(2.79×10^{-3})	(5.34×10^{-6})	(4.32×10^{-4})	(4.35×10^{-5})	(2.10×10^{-3})	(8.39×10^{-4})	(2.16×10^{-4})	(1.34×10^{-4})
Linguistic travel distance	8.60×10^{-4}	4.89×10^{-7}	6.52×10^{-5}	1.38×10^{-5}	5.76×10^{-4}	1.82×10^{-4}	1.67×10^{-5}	3.95×10^{-5}
	(5.71×10^{-4})	(1.09×10^{-6})	(8.83×10^{-5})	(8.92×10^{-6})	(4.29×10^{-4})	(1.73×10^{-4})	(4.42×10^{-5})	(2.74×10^{-5})
Typical travel concentration	-1.46×10^{-3}	-2.92×10^{-6}	1.54×10^{-4}	-8.00×10^{-5} ****	4.57×10^{-4}	2.76×10^{-4}	-3.16×10^{-4} **	1.18×10^{-4}
	(1.71×10^{-3})	(3.28×10^{-6})	(2.65×10^{-4})	(2.68×10^{-5})	(1.29×10^{-3})	(5.22×10^{-4})	(1.32×10^{-4})	(8.20×10^{-5})
Generation Y	1.43×10^{-3}	1.59×10^{-6}	7.40×10^{-4} ***	4.19×10^{-5}	3.41×10^{-4}	7.57×10^{-4}	4.78×10^{-4} ****	-1.22×10^{-4}
	(1.80×10^{-3})	(3.44×10^{-6})	(2.79×10^{-4})	(2.80×10^{-5})	(1.36×10^{-3})	(5.47×10^{-4})	(1.40×10^{-4})	(8.66×10^{-5})
Generation X	-9.61×10^{-4}	-7.13×10^{-7}	4.18×10^{-4}	2.18×10^{-5}	-1.07×10^{-3}	3.80×10^{-4}	1.71×10^{-4}	8.72×10^{-5}
	(1.83×10^{-3})	(3.51×10^{-6})	(2.84×10^{-4})	(2.86×10^{-5})	(1.38×10^{-3})	(5.57×10^{-4})	(1.42×10^{-4})	(8.82×10^{-5})
Personality	6.31×10^{-5}	2.19×10^{-7}	3.76×10^{-5} *	-2.46×10^{-6}	2.68×10^{-4} ***	-8.75×10^{-5} **	6.57×10^{-5} ****	-3.40×10^{-5} ****
	(1.33×10^{-4})	(2.52×10^{-7})	(2.04×10^{-5})	(2.06×10^{-6})	(9.92×10^{-5})	(3.98×10^{-5})	(1.02×10^{-5})	(6.32×10^{-6})

(Standard errors are provided in brackets); **** significant at 5‰level; *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

reversal would be expected with a reasonable change in the individual characteristics.

In general, tourists with diversified cultural experiences are less likely to be tied up to the typical destinations (-4.47×10^{-3}, -1.83×10^{-3}, -1.25×10^{-2}, and -1.42×10^{-5} for the quality of cultural attractions, natural attractions, food & dining services, and the total budget, respectively). With a high variety of experiences in terms of cross-cultural encounters, these tourists reveal their spirit of exploration. In contrast, the diversified cultural experiences have no significant influences on their preferences in the losses and the gains domain. It should be noted that, the "new destination searching" behavior is also in line with reference dependent behavior: the "familiar" destinations are examined and deliberately avoided.

The concentration of typical travel experiences measures the extent to which the tourists stick to a typical pattern while traveling long-haul. The results of the linear regression revealed no significant bond between this inclination towards "typical" and the preferences on the quality of various destination attributes, except the preference on the quality of natural attractions in the gains domain and the preference on the budget in the loss domain. Tourists with a high concentration of typical travel experiences are slightly less sensitive to the gains in the quality of natural attractions (-8.00×10^{-5}) and more conservative with regard to price increases (-3.16×10^{-4}). That is, the tourists with steady "typical" travel pattern are more reference-level biased in terms of natural attractions and more loss averse in regards to travel budget.

Regarding the generations, older generations attach additional utility to the typical destination compared with younger generations (i.e. Baby Boomers versus Generations X and Y, and Generation X versus Generation Y). Generations X and Y assign more utility to the reference quality levels of cultural attractions in new destinations than Baby Boomers (6.00×10^{-3} and 4.50×10^{-3}, respectively). Younger people (Generation Y) are less sensitive to price rise (4.78×10^{-4}) in the new destinations.

Revealed by their nature, sensation-seeking tourists pursue changes in their lives. Hence, they attach less utility to the quality of various destination attributes in the typical destinations (-1.72×10^{-3}, -3.09×10^{-4}, -3.87×10^{-3}, and -3.77×10^{-6} for the quality of cultural

attractions, natural attractions, food & dining services, and the total budget, respectively). In particular, they reveal a lower degree of reference-level bias in terms of the preference on natural attractions. The sensation-seekers are also less loss averse on prices by revealing lower sensitivity to price rises (6.57×10^{-5}) and higher sensitivity to price cuts (-3.40×10^{-5}).

6.2 Linear Regressions on the WTAs and WTPs

Another set of variables derived from the results of Model M4 is the individual measurement of WTAs and WTPs. The individual WTAs and WTPs reveal the preferences of tourists on various destination attributes from a monetary perspective and are expected to match the individual marginal utility according to the classical economic theory. Nevertheless, the dissociation between the predicted utility and the monetary assessment is sometimes noticed by academia (e.g. Amir, Ariely, & Carmon, 2008).

In the current thesis, the individual WTA and WTP are derived following the process described in Section 4.1.6. The linear regressions using individual WTA and WTP as dependent variables further elaborate the channel through which the individual characteristics influence the individual preferences from a monetary perspective. Table 6.2 presents the estimation results of these linear regressions. In correspondence to Table 6.1, the statistically significant coefficients are highlighted in black. The way by which these coefficients are interpreted is also similar as they are for Table 6.1.

In contrast to its significant influence on the marginal utility of the quality of destination attributes in the typical destinations, the LTD index seems to have no contribution to the heterogeneity of individual WTA, WTP, or WTA-WTP disparity. On the contrary, the concentration of typical travel experiences, which is less influential in the linear regressions on marginal utilities, exhibits significantly negative influence on individual WTA. In other words, tourists who adapt to a typical travel pattern demand significantly less for accepting a downgrade in the quality of destination attributes ($58.76, $82.87, and $89.13 for the quality of cultural attractions, natural attractions, and food & dining services, respectively).

TABLE 6.2: Linear regression results on WTA and WTP

	Culture			Nature			Food & Dining		
	WTA	WTP	WTA-WTP Disparity	WTA	WTP	WTA-WTP Disparity	WTA	WTP	WTA-WTP Disparity
Constant	41.32	43.96****	−0.0493	70.83	55.33****	0.2368	62.03	70.06****	0.2000
	(43.94)	(2.853)	(0.795)	(65.93)	(3.592)	(0.959)	(66.50)	(4.518)	(0.773)
Linguistic travel distance	−5.01	0.03	0.0188	−3.14	0.03	−0.0683	−3.29	0.03	−0.0822
	(8.939)	(0.583)	(0.163)	(13.39)	(0.734)	(0.197)	(13.49)	(0.922)	(0.158)
Typical travel concentration	−58.76**	−2.15	−0.0744	−82.87**	−2.72	−0.1804	−89.13**	−3.05	−0.0527
	(26.93)	(1.769)	(0.490)	(40.38)	(2.226)	(0.59)	(40.80)	(2.800)	(0.475)
Generation Y	56.81**	6.51****	0.9424*	91.60**	8.20****	0.8349	97.18**	10.34****	0.6904
	(28.46)	(1.830)	(0.515)	(42.69)	(2.303)	(0.624)	(43.04)	(2.897)	(0.503)
Generation X	1.95	0.16	0.3675	17.19	0.20	0.1808	17.77	0.52	0.0747
	(28.92)	(1.863)	(0.527)	(43.37)	(2.344)	(0.637)	(43.77)	(2.948)	(0.513)
Personality	5.69***	0.68****	0.0607	7.04**	0.86****	0.0834*	7.57**	1.03****	0.0600*
	(2.033)	(0.136)	(0.037)	(3.054)	(0.172)	(0.045)	(3.080)	(0.216)	(0.036)

(Standard errors are provided in brackets); **** significant at 5‰level; *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

The average of WTA is significantly higher for Generation Y in comparison with that of Generation X and Baby Boomers ($56.81, $91.60, and $97.18 for the quality of cultural attractions, natural attractions, and food & dining services, respectively). Meanwhile, the average of WTP for Generation Y is slightly higher than that of Generation X and Baby Boomers ($6.51, $8.20, and $10.34 for the quality of cultural attractions, natural attractions, and food & dining services, respectively). The unbalanced impacts of formative experience on the WTA and WTP lead to an increase in WTA-WTP disparity for Generation Y. For instance, the disparity is about 53% (i.e. 0.94/1.77) wider for the quality of cultural attractions. The changes of the disparity are also plausibly positive for the quality of natural attractions and the quality of food & dining services with p-values of 18% and 17%, respectively.

The personality of sensation seeking works similarly as the formative experience in influencing the WTA and WTP. Sensation seeking tourists require more monetary compensation to accept a loss in the quality of destination attributes ($5.69, $7.04, and $7.57 for the quality of cultural attractions, the quality of natural attractions, and the quality of food & dining services, respectively), in the meantime, these tourists would also pay marginally more money to secure a gain in the quality of destination attributes ($0.68, $0.86, and $1.03 for the quality of cultural attractions, the quality of natural attractions, and the quality of food & dining services, respectively). The influence of sensation seeking on the WTA and WTP is not even. With every one score increase in the BSSS score of the tourist, a slightly wider WTA-WTP disparity would be observed (0.06, 0.08, and 0.06 for the quality of cultural attractions, the quality of natural attractions, and the quality of food & dining services, respectively).

6.3 Summary of the Findings of Individual Preferences

This chapter discusses the findings of individual preferences. Individual measurements are estimated and derived in terms of the marginal utility of the quality of cultural and natural attractions, the quality of food & dining services, and the total budget, as well as the WTAs and WTPs of the quality of cultural and natural attractions and the quality of food & dining

services. Unlike the descriptions of population properties in Chapter 5, the analysis in this chapter focuses on the influence of the individual characteristics on individual preferences.

In general, the heterogeneous preferences of the tourists can be significantly explained by the heterogeneity of individual characteristics. More specifically, four explanatory variables, namely the linguistic travel distance (LTD) index, typical travel concentration, generation dummy, and sensation seeking personality (BSSS) score, are adopted in the current thesis to capture the heterogeneity of individual. Two of the variables (the LTD index and typical travel concentration) characterize the tourists in terms of traveling, whereas the other two (generation dummy and BSSS score) represent individual characteristics in general.

Distinctive preference patterns are found for tourists with different characteristics. In particular, tourists with a variety of cross-cultural encounters ascribe less utility to the destinations they have visited. The same applies to the sensation-seeking tourists. Revealing their nature by their feet, the tourists with high LTD index or BSSS scores put behind the destinations they have conquered and move forward towards the new experiences. The tourist with a steady traveling pattern, on the other hand, reveals no significant preference between the new and typical destinations. They are, however, more sensitive to price rises while selecting a long-haul tourist destination. Younger generations attach less utility to the destinations that they have visited and more utility to the destinations that they have not. In addition, the Generation Y tourists and sensation seeking tourists are found to be less loss-averse while facing variations in the quality of destination attributes. While the tourists exhibit heterogeneous preference on destination attributes, they also reveal a significant heterogeneity in terms of reference-related behavioral biases. For example, the tourists with steady traveling pattern are more reference-level biased in natural attractions, whereas the sensation-seeking tourists, on the contrary, are less reference-level biased in natural attractions.

In terms of the monetary value attached to the changes in the quality of destination attributes, the tourists who have higher concentration of typical travel experiences would demand less compensation for a downgrade in the quality of destination attribute, while the Generation Y tourists and sensation seeking tourists would not only require a higher subsidy in compensating

such a decrease but also pay a higher premium in obtaining an increase in the quality of destination attributes.

The results in this chapter put an emphasis on the diversified needs a destination could face while dealing with the tourists from all over the world. Product customization is crucial to the sustained development of an industry, as emphasized in Da Silveira, Borenstein, and Fogliatto (2001) in general and highlighted by Benur and Bramwell (2015) and Poon (1994) in the tourism context. The DMOs and tour operators should not only acknowledge the diversified needs of the tourists but also develop customized strategies to accommodate this need. Customized tours and customized in-destination products should be considered in enhancing the featured image of a destination. The promotion strategy is another important factor in destination development. With the diversified and customized tourism products readily prepared, it is also essential how these products are delivered and promoted to the tourists.

Chapter 7

Concluding Remarks

This chapter summarizes the findings of the entire study and discusses their implications. Section 7.1 briefly summarizes the estimation results. Implications from theoretical and managerial perspective are discussed in Section 7.2 and Section 7.3, respectively. Section 7.4 concludes the chapter with a discussion of the limitations of the current thesis and the future directions of the research.

7.1 Summary of the Estimation Results

The current thesis investigates the long-haul tourist destination choice for leisure tourists. Prospect theory is integrated into the destination choice framework to examine the channel through which the relevant destination attributes influencing the tourist destination choice of the tourists. A stated choice experiment is proposed and estimated by the discrete choice modeling. Tourists preferences on various destination attribute in a population perspective as well as at an individual level are estimated. In addition, the WTA and WTP measures for relevant destination attributes are derived. The theoretical and managerial implications can be developed and assessed based on these results.

In general, long-haul leisure tourists exhibit loss averse on various destination attributes. In comparing with the gains in the same scale, the losses are about 30% more painful in terms of the quality of three types of attractions (i.e. culture, nature, and entertainment), roughly 25%

more painful in terms of the quality of three aspects of services (hospitality, food & dining, and transportation), and 520% more painful in terms of the total budget of the trip. The asymmetric preference on various destination attributes is further elaborated by the significant WTA-WTP disparity. In particular, the WTA-WTP disparity is around 2 for the quality of cultural attractions and outdoor recreational attractions, 3 for the quality of entertainment attractions, hospitality services, and food & dining services, and 3.5 for the quality of natural attractions and transportation services. That is, on average, the tourists would pay three times as much to avoid a decrease in the quality of destination attributes, in comparison with the amount of money they would pay to secure an increase in the same attributes. This finding consolidates the existence of reference-dependent behavior in the tourism context, as observed by Kim and Canina (2015), Masiero et al. (2016), and Nicolau (2008, 2011a).

A new behavioral bias is observed and conceptualized based on the results of the current thesis, namely the reference-level bias. It describes an inertia of tourists for the typical traveling experiences. That is, tourists attach a higher marginal utility to the quality level of destination attributes that they have experienced in the past and perceived as a typical pattern. The reference-level bias is verified for six out of eight destination attributes that are investigated in the current thesis, namely the quality of cultural attractions, natural attractions, entertainment attractions, the quality of food & dining services, transportation services, and the total budget of the trip. More specifically, in terms of the quality of attractions, tourists attach 22% additional marginal utility to the reference-level in comparing to the levels above. The differences are around 12% in terms of the quality of services and 264% regards the total budget of the trip. The existence of reference-level bias further demonstrates the significant role of typical travel pattern in the tourist destination choice process. Model M4, a model incorporates the features of both the reference-dependent behavior and the reference-level bias, empirically proved the coexistence of the two reference-level related biases by outperforming other model specifications considered in the current thesis.

The disparity of preference is also discovered between the new and typical destinations. In terms of the quality of cultural attractions, outdoor recreational attractions, transportation

services, and the total budget, tourists reveal a tendency towards the new destinations. In contrast, tourists tend to favor the enjoyment of natural attractions and entertainment attractions in a typical destination. The distinction between new and typical destinations regarding the preference on the quality of hospitality services and food & dining services is not obvious.

In the estimation of the discrete choice model, significant sources of heterogeneity are observed within the sample regarding the preference of tourists on various destination attributes. 12 out of 16 parameters have statistically significant standard deviation for the parameters which are estimated randomly in Model M4. In particular, the preference of tourists on the quality of cultural attractions has a reasonably large standard deviation, revealing very different ways in which tourists perceive cultural related attractions. The preference heterogeneity observed in the current thesis reinforced the literature of tourist heterogeneity and tourism market segmentation as discussed in Section 2.3. It also stresses the importance of tourism market segmentation, tourism product diversification, and tourism product customization.

Individual-specific estimates of the preference of tourists on various destination attributes are derived from the distribution of the population preference conditional on the observed individual choices in the SCE. Individual characteristics from four different aspects, namely the intensity of cultural encounters in the past travel experience, the concentration of typical trips, the generation, and the personality, are utilized to explain the heterogeneity of individual preference on the quality of destination attributes. In general, individual characteristics have significant influences on the individual preference on the quality of destination attributes. In particular, the tourists who collected high linguistic travel distances and the tourists who are more sensation seeking favor new destinations over the destinations they have visited. On the contrary, the tourists who exhibit a typical travel pattern show no significant preference between new and typical destinations. These tourists dislike changes and have high sensitivity to price rises at the destination. Tourists from younger generations (Generation X and Y) manifest a preference in favor of the lands they have not stepped on. The youngest generation in the sample (Generation Y) are also less loss-averse while facing variations in the quality of destination attributes.

In terms of the compensation the tourists would demand avoiding something undesirable and the premium the tourists would pay for procuring a good, the tourist who has a higher concentration of typical travels requires a smaller amount of compensation for a downgrade in the quality of destination attribute. In contrast, the younger and sensation seeking tourists demand a higher subsidy in compensating a decrease in the quality of destination attributes, as well as pay a higher premium in acquiring an increase.

The theoretical and practical implications of aforementioned results will be further discussed in the next two sections.

7.2 Theoretical Implications

The current thesis enriches the tourist destination choice literature from a theoretical perspective by integrating the features of prospect theory into the tourist destination choice framework. The tourist destination choice of long-haul leisure tourists is centered on the conceptualization of the typical travel experience. That is, the preference of tourists on the quality of various destination attributes highly depends on the quality level they perceived as typical and have experienced in the past. The findings of the current thesis not only consolidate the concept of reference-dependent behavior in the tourist destination choice context but also introduce another reference related behavior bias, namely the reference-level bias. While the tourists exhibit loss aversion in the trade-off of the quality of destination attributes, they also reveal an inertia for the typical level in terms of the quality of destination attributes in their long-haul trips. The coexistence of the two reference-related behavioral biases in one unique model support the hypothesis that long-haul leisure tourists manifest both reference-dependent behavior and reference-level bias.

One essential implication of this research finding is that it is crucial to consider the typical travel pattern of tourists in the studies of destination choice behaviors. The consideration of typical travel experiences also naturally categorizes all potential destinations into two groups: the group of destinations that the tourists considered as typical and the group of destinations

that the tourists have not visited and perceived as new destinations. Model estimations of the current thesis suggest a significant preference disparity between the two groups. For instance, even at the same quality level, tourists prefer to visit cultural and outdoor recreational attractions at a new destination, while engage in activities associated with natural attractions at a typical destination. This finding confirms the literature of first-time and repeat visitors and further extends the literature from the destination-level to destination attribute-level. Different behavioral biases could be expected on different types of attractions and quality services.

Significant tourist heterogeneity is also found within the sample of the current thesis. This observation is in concordance with the tourist segmentation literature discussed in Section 2.3. Influenced by their characteristics, tourists exhibit very different preference structures on the quality of destination attributes. To push the literature further, heterogeneity in terms of reference-related behavioral biases is examined. While one type of tourists reveal higher degree of reference-level bias or loss aversion on one specific type of destination attractions, the other type of tourists may exhibit lower. Studies fail to consider heterogeneity in these aspects may lead some potentially influential factors into oblivion.

To conclude, theoretically, the preferences of long-haul leisure tourists on the quality of various destination attributes are heterogeneous across the population and highly depends on individual traveling experience. The consideration of these two features is essential for accurately capturing the preference of long-haul leisure tourists on destination attributes. Cautions are needed when simplification assumptions are made from these aspects.

7.3 Practical Implications and Managerial Recommendations

Some practical implications also emerge from the research findings of the current thesis. The loss aversion feature and the significant WTA-WTP disparity of the tourists both suggest a strong emotion of the tourists against losses relative to the quality level of destination attributes perceived as typical. Therefore, the DMOs should make every effort to feature their destination product so that no aspect of the product will be recognized by the tourists as a

loss. On one hand, the description of the destination attributes plays a very important role. Numerous studies, theoretically or empirically, found a significant relationship between the framing of the alternatives and the choice behavior (Jin, He, & Song, 2012; Rahman, Crouch, & Laing, 2018; Tversky & Kahneman, 1981). For example, a tour framed as "upgrading" (i.e. a gain) is more appealing than the one that is framed as "downgrading" (i.e. a loss), even if they result in the same package (Jin et al., 2012, p. 273). Tourism product differentiation, on the other hand, provides another way out. Destination branding establishes the uniqueness of a destination, in which case, makes the contrast between the current alternative and the past experience less obvious. Film-induced advertising (e.g. Donald & Gammack, 2016) and theme related promotions (e.g. winery destinations, Gómez, Lopez, & Molina, 2015; ethnic tour, Luo & Xiao, 2014) are popular destination branding strategies in particular. The uniqueness of the attractions provides the destination with a distinctive selling position in the market, which can be channeled into incomparable advantages.

The loss aversion on the total budget of the trip is severer in comparison to other destination attributes (520% in contrast to 36% and 25% on the quality of attractions and the quality of services, respectively). This finding confirms the central role of price in the commodity market as usually stated in economic textbooks, even in the "experience economy" which is frequently emphasized nowadays. Eventually, the variation in economic consequence is far more direct and obvious than the change in the quality of attractions and services at tourist destinations. Hence, the change in the price of the destination product, especially the rises, should only be considered by practitioners cautiously.

While outperforming other destinations almost surely create competitive advantage, the marginal benefit may not be as big as expected. The reference-level bias suggests that the marginal utility of tourists is maximized at a quality level that the tourists perceived as typical (i.e. the reference-level). This makes the reference quality level of a destination attribute the most efficient level for managerial purposes. This research finding coincides with the basic economic concept of *diminishing marginal returns* and the behavioral observation of *status quo bias*. The bias has to be considered by the DMOs to assess the profitability of any

quality improvement project of the destination product. Given the tourism endowment of a destination, the improvement in the quality of attractions could be difficult to achieve. The benefit brought about by the improvement in the quality of attractions beyond the reference-level, however, are less effective. The marginal utility generated by the improvement in the quality of attractions beyond the reference-level has merely a size of 78% of the marginal utility generated at the reference-level. In contrast, in the case of the quality of services, the shrinkage is around 12%. Hence, with similar costs, a project aiming at the improvement in the quality of services would be more beneficial for the practitioners than a project targeted the quality of attractions.

The findings on the preference disparity between the new and typical destinations provide the DMOs with the primary targets in promoting various destination attractions. Long-haul leisure tourists tend to prefer the cultural and outdoor recreational attractions in a new destination to those in a typical destination, while they enjoy the natural and entertainment attractions in a more familiar environment (typical destination). Complex itineraries with different combinations of attractions should be designed so that the trips could include different elements and attract diverse types of tourists. Cooperation among destinations with diverse tourism endowments should be encouraged for their complementary advantages.

The discussion in Section 6.3 highlighted the heterogeneity of the tourists in terms of the preferences on the quality of destination attributes and emphasized the importance of product diversification, product customization, and product promotion in the tourism industry. In general, the DMOs should develop diversified tourism products and promote the attractions and services to the right group of people through the correct channel. To be more precise, in order to attract new visitors, a DMO should target tourists who are sensation seeking and young. Therefore, a good platform for the promotions would be online communities and social media, where the sensation seeking and young people are actively engaged (Sheldon, 2012; Wang, Jackson, Zhang, & Su, 2012). Nonetheless, the promotion of attractions that are labeled with relaxation and familiarity (e.g. “sun/sea/sand” type natural attractions) should target mainly the tourists who tend to follow typical travel patterns. The promotion of prices

should primarily target elderly people since they are more sensitive to price changes. The promotion of newly developed or improved tourism products should first and foremost target young and sensation seeking tourists for their highest willingness to pay in comparing with all other tourists.

With the marginal effects estimated in Section 6.1 and Section 6.2, destination recommendation system could be developed by DMOs in collaboration with travel agencies. With a small survey regarding the characteristics of the customers, the destinations/attractions associated with higher predicted utility could be recommended and such system would reduce the search cost for the tourists as well as the mismatching risk.

7.4 Concluding Remarks and Future Directions

The findings of the current thesis are not yielded without limitations. The sample used in the current thesis only includes three English-speaking source markets. The research findings are confined to a narrow cultural framework. This limitation weakens the practical implication in the sense that the preferences described in the current thesis merely represents a subgroup of the worldwide tourists. One immediate extension from this aspect will be to include additional source markets with diverse culture. The current thesis focuses on long-haul leisure tourists. Similar studies target different travel distances could enrich the research findings of the current thesis.

In the current thesis, the typical travel experience of a tourist is elicited by the tourists' description of the past trip to a typical destination. In order to advance the modeling of tourist destination choice, the conceptualization of the typical travel experience can to be refined by further investigations. More destination attributes, different type of destination attribute categorizations, methods other than self-reporting in collecting the information regarding typical travel experience of the tourists (e.g., real itinerary) can all be possible alternatives for future research in the direction of the current thesis.

Appendix A

Sample Questionnaire

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

School of HTM
Hotel & Tourism Management
酒 店 及 旅 遊 業 管 理 學 院

A Survey of Long-Haul Leisure Destination Choice

Dear Madam or Sir,
Thank you for participating in our survey about tourist experience for long-haul travels.
In this survey, long-haul travel is defined as a trip with an effective flight travel time of more than 8 hours. This survey is anonymous, and your name will never be revealed.

Part One.

[*Screening Question*] Would you please tell us your year of birth?

In the following part, please describe your ***typical long-haul trip*** referring to your past experiences. Please keep in mind that trips with the purpose of business, education or visiting family and/or friends should not be considered.

1-1 In the following lists, we have compiled all the countries that can be considered as long-haul destinations for your country of residence (Australia). Could you please identify all the countries that you have visited? Long-haul travels with other purposes (such as business, education, and visiting family and/or friends) should not be considered
[*Please refer to the specific lists in Appendix.C*]

1-2 According to your selection in 1-1, we have listed all the countries that you have visited. Could you please identify the country/countries you visited during the past 10 years?
[*list of countries based on the answer of 1-1*]

1-2b According to your selection in 1-2, we have listed all the countries that you visited during the past 10 years. Could you please identify the most recent country you have visited?
[*list of countries based on the answer of 1-2*]

1-3 According to your selection in 1-1, we have listed all the countries that you have visited. Now we would like you to focus on these travels that are representative of your typical way of experiencing long-haul leisure travels. Therefore, please select from the list below those countries for which you experienced similar combinations and quality of leisure activities (e.g. culture, nature, outdoor and entertainment, etc.)
[*list of countries based on the answer of 1-1*]

1-3b [*Skipped if No typical group can be identified option is selected in 1-3*] Within the typical group of countries you have visited (your choice in 1-3), could you please identify the most recent country you visited?
[*list of countries based on the answer of 1-3*]

In the following part, could you please describe your most recent long-haul leisure trip to [*Country name, the answer of 1-3b or 1-2b in the case that 1-3b is skipped, same hereinafter*]?

1-5 How long was your stay in [*Country name*]?
_____ days.

1-6 What was the organizing method of your most recent trip to [*Country name*]?

◯ independent trip. ◯ tour group trip.

1-7 What was the travel party composition of your most recent trip to [*Country name*]?

◯ with friends and/or families. ◯ travel alone.

1-7b [*Skipped if the option "travel alone" is selected in 1-7, the default answer is* **1**] Among these travel companions, how many people (including yourself) were you sharing the expenditure with?

_____

1-8 For your stay in [*Country name*], how much was the total expenditure inclusive of all expenses (including accommodation, international and local transport, tourist attractions, dining, and shopping, etc.)?

- ◯ Below A$1370.
- ◯ Between A$1371 and A$1480.
- ◯ Between A$1481 and A$1600.
- ◯ Between A$1601 and A$1720.
- ◯ Between A$1721 and A$1840.
- ◯ Between A$1841 and A$1960.
- ◯ Between A$1961 and A$2070.
- ◯ Between A$2071 and A$2190.
- ◯ Between A$2191 and A$2310.
- ◯ Above A$2311.

1-8b Based on 1-8, could you please specify the approximate expenditure of your stay?
A$_____[*This answer will be checked to validate the choice in 1-8*]

1-9 During your most recent trip in [*Country name*], to what extent did you engage in activities related to the following type of attractions?

	very much 4	somewhat 3	not really 2	not at all 1
Cultural attractions (e.g. historical sites, archaeological sites, architecture, cuisine, monuments, industrial sites, museums, ethnic, concerts, and theater.)	◯	◯	◯	◯
Natural attractions (e.g. landscape, seascape, parks, mountains, flora, fauna, coasts, islands, and beach.)	◯	◯	◯	◯
Outdoor recreational attractions (e.g. various sports including golf, swimming, tennis, hiking, biking, and snow sports.)	◯	◯	◯	◯
Entertainment attractions (e.g. theme parks, amusement parks, casinos, cinemas, performing arts centers, sports complexes, and shopping centers.)	◯	◯	◯	◯
	4	3	2	1

1-9b Based on what you experienced during the trip in [*Country name*], could you please rate the quality of following attractions? [*attractions with ratings of* **1** *in question 1-9 is omitted in this question*]

	excellent ★★★★★	very good ★★★★☆	good ★★★☆☆	fair ★★☆☆☆	poor ★☆☆☆☆
Cultural attractions	◯	◯	◯	◯	◯
Natural attractions	◯	◯	◯	◯	◯
Outdoor recreational attractions	◯	◯	◯	◯	◯
Entertainment attractions	◯	◯	◯	◯	◯
	★★★★★	★★★★☆	★★★☆☆	★★☆☆☆	★☆☆☆☆

1-10 Based on what you experienced during the trip in [*Country name*], could you please rate the quality of following services?

	excellent ★★★★★	very good ★★★★☆	good ★★★☆☆	fair ★★☆☆☆	poor ★☆☆☆☆
Hospitality	◯	◯	◯	◯	◯
Food & Dining	◯	◯	◯	◯	◯
Transportation	◯	◯	◯	◯	◯
	★★★★★	★★★★☆	★★★☆☆	★★☆☆☆	★☆☆☆☆

1-11 In general, when you plan a long-haul leisure trip, would you consider visiting a destination that you have already visited in the past?

◯ Yes. ◯ No. ◯ Not certain.

1-12 In general, when you plan a long-haul leisure trip, would you consider visiting a destination that you have not visited before?

◯ Yes. ◯ No. ◯ Not certain.

Part Two Scenario 1

In the following scenario, you will be given three alternative profiles. Each profile describes the characteristics of a hypothetical [*Answer of 1-5*] days [*Answer of 1-7b*] person long-haul trip. The total budget refers to the price you would be asked to pay for the whole travel party.

The third column is your typical destination and its description matches with your typical long-haul leisure trip to [*Country name*].

The ratings of attractions and services are expressed in terms of solid star, "★" , as follows:
★☆☆☆☆ = poor; ★★☆☆☆ = fair; ★★★☆☆ = good;
★★★★☆ = very good; ★★★★★ = excellent.

Cultural attractions include historical sites, archaeological sites, architecture, cuisine, monuments, industrial sites, museums, ethnic, concerts, and theater.
Natural attractions include landscape, seascape, parks, mountains, flora, fauna, coasts, islands, and beach.
Outdoor recreational attractions include various sports including golf, swimming, tennis, hiking, biking, and snow sports.
Entertainment attractions include theme parks, amusement parks, casinos, cinemas, performing arts centers, sports complexes, and shopping centers.

Characteristics	New Destination 1	New Destination 2	Typical Destination
Ratings of attractions			
Cultural attractions	★★☆☆☆	★★★★★	★★★☆☆
Natural attractions	★★★★★	★★☆☆☆	★★★★☆
Outdoor recreational attractions	★★★☆☆	★★★★☆	★★★☆☆
Entertainment attractions	★★★★★	★★★☆☆	★☆☆☆☆
Ratings of service quality			
Hospitality	★★★★☆	★★★★☆	★★★☆☆
Food & Dining	★★★★★	★★☆☆☆	★★★★☆
Transportation	★★☆☆☆	★★★★★	★★★★★
Total budget	A$30,000	A$20,000	A$25,000

2-1 Which alternative would you choose?

○ ○ ○

2-1b [*Skipped if option* **1** *or* **2** *is selected in 2-1*] Since you choose the typical destination could you please indicate your reference between New Destination 1 and New Destination 2

○ ○

[*9 more Scenarios with different attribute-levels are omitted here.*]

A stopover destination is defined as a place visited or stopped briefly in the course of a long-haul journey.

Now consider you are going on a long-haul journey with a flight longer than 8 hours and you are offered a deal:

Without any change of the cost, would you like to trade two days at the chosen destination with a 2-day-visit to a stopover destination?

2-11 Would you accept the deal if the stopover destination is a destination that *you have visited before*?

○ Yes. ○ No. ○ Not certain.

2-12 Would you accept the deal if the stopover destination is a destination that *you have never visited*?

○ Yes. ○ No. ○ Not certain.

2-13 [*Skipped if the option "No" are selected in both 2-11 and 2-12.*] How important are the following factors in driving you to choose a stopover destination?

	very important	important	unimportant	least important
	4	3	2	1
The stopover destination has attractions that I would like to visit.	◯	◯	◯	◯
The stopover destination has products that I would like to purchase.	◯	◯	◯	◯
The stopover destination offers a chance for me/my family to break from the long flight.	◯	◯	◯	◯
The stopover destination is safe.	◯	◯	◯	◯
The stopover destination has quick and reliable public transportation from and to the airport.	◯	◯	◯	◯
	4	3	2	1

Part Three

The following part will collect some additional information about your travel pattern. Again, this survey is anonymous, and your name will never be revealed.

3-1 Do you have frequent flyer membership with one or more international airline companies?

◯ Yes. ◯ No.

3-2 When you plan a trip, you usually plan

◯ by yourself. ◯ with your friends. ◯ with your family.

3-3 What types of trip you usually take?

◯ Package tour. ◯ Independent travel. ◯ Customized package tour.

3-4 In general, how important it for you to engage in activities related to the following type of attractions?

	very important	important	unimportant	least important
	4	3	2	1
Historical sites, monuments, archaeological sites, museums, and ethnic.	◯	◯	◯	◯
Architecture and industrial sites.	◯	◯	◯	◯
Concerts and theater.	◯	◯	◯	◯
Cuisine.	◯	◯	◯	◯
Landscape, parks, and mountains.	◯	◯	◯	◯
Flora and fauna.	◯	◯	◯	◯
Seascape, coasts and islands.	◯	◯	◯	◯
Beach.	◯	◯	◯	◯
City sight-seeing.	◯	◯	◯	◯
Hiking.	◯	◯	◯	◯
Various types of sports (e.g. golf, swimming, tennis, biking, and snow sports).	◯	◯	◯	◯
Theme parks and amusement parks.	◯	◯	◯	◯
Shopping centers.	◯	◯	◯	◯
Casinos and cinemas.	◯	◯	◯	◯
Performing arts centers and sports complexes.	◯	◯	◯	◯
	4	3	2	1

3-5 When you plan the trip, how important are the following factors?

	very important	important	unimportant	least important
	4	3	2	1
The destination has an exotic atmosphere.	◯	◯	◯	◯
The destination is peaceful.	◯	◯	◯	◯
The destination is lively.	◯	◯	◯	◯
The destination has reliable weather.	◯	◯	◯	◯
I feel safe and secure at the destination.	◯	◯	◯	◯
The destination and surrounding regions are politically stable.	◯	◯	◯	◯
	4	3	2	1

3-6 Please indicate your level of agreement with the following statements.

	strongly agree	agree	neither	disagree	strongly disagree
	5	4	3	2	1
I like to explore a strange city or section of town by myself, even if it means getting lost.	○	○	○	○	○
I get very restless if I have to stay around home for any length of time.	○	○	○	○	○
I sometimes like to do things that are a little frightening.	○	○	○	○	○
I like "wild" uninhibited parties.	○	○	○	○	○
I would like to take off on a trip with no pre-planned or definite routes, or timetable.	○	○	○	○	○
I prefer friends who are excitingly unpredictable.	○	○	○	○	○
I would like to try parachute jumping.	○	○	○	○	○
I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal.	○	○	○	○	○
	5	4	3	2	1

3-7 In the following part, three statements are listed in relation to attractions at the destination. Please rank the statements (from **1** to **3**) in terms of the importance you attach to them.

3-7a **Cultural attractions** (e.g. historical sites, archaeological sites, architecture, cuisine, monuments, industrial sites, museums, ethnic, concerts, and theater.)

	1	2	3
The destination has a broad variety of cultural attractions that I can choose from.	○	○	○
The cultural attractions at the destination are all easily accessible.	○	○	○
The cultural attractions at the destination are served with good quality of tourist facilities.	○	○	○
	1	2	3

3-7b **Natural attractions** (e.g. landscape, seascape, parks, mountains, flora, fauna, coasts, islands, and beach.)

	1	2	3
The destination has a broad variety of natural attractions that I can choose from.	○	○	○
The natural attractions at the destination are all easily accessible.	○	○	○
The natural attractions at the destination are served with good quality of tourist facilities.	○	○	○
	1	2	3

3-7c **Outdoor recreational attractions** (e.g. various sports including golf, swimming, tennis, hiking, biking, and snow sports.)

	1	2	3
The destination has a broad variety of outdoor recreational attractions that I can choose from.	○	○	○
The outdoor recreational attractions at the destination are all easily accessible.	○	○	○
The outdoor recreational attractions at the destination are served with good quality of tourist facilities.	○	○	○
	1	2	3

3-8 In the following part, five statements are listed in relation to services at the destination. Please rank the statements (from **1** to **5**) in terms of the importance you attach to them.

3-8a Services provided by the **hotel**.

	1	2	3	4	5
The employees of the hotel can provide promised services dependably and accurately.	○	○	○	○	○
The employees of the hotel are skillful and trustworthy in providing the services that I need.	○	○	○	○	○
The signs (e.g. directions, floor plans) in the hotel are easy to follow.	○	○	○	○	○
The hotel can provide personalized services.	○	○	○	○	○
The employees of the hotel are willing to help and can provide prompt services.	○	○	○	○	○
	1	2	3	4	5

3-8b Services provided by the **restaurant**.

	1	2	3	4	5
The employees of the restaurant can provide promised services dependably and accurately.	○	○	○	○	○
The employees of the restaurant are skillful and trustworthy in providing the services that I need.	○	○	○	○	○
The signs (e.g. directions, table numbers) in the restaurant are easy to follow.	○	○	○	○	○
The restaurant can provide personalized services.	○	○	○	○	○
The employees of the restaurant are willing to help and can provide prompt services.	○	○	○	○	○
	1	2	3	4	5

3-8c Services provided by the **transportation**.

	1	2	3	4	5
The transport infrastructure is modern.	◯	◯	◯	◯	◯
It is easy to find taxi	◯	◯	◯	◯	◯
The schedule of public transportation is frequent and reliable.	◯	◯	◯	◯	◯
The vehicles are clean, comfortable, and have enough space.	◯	◯	◯	◯	◯
The drivers or the staffs are available and friendly when I need additional information.	◯	◯	◯	◯	◯
	1	2	3	4	5

Part Four

The following part will collect some socio-demographical information about yourself. Again, this survey is anonymous, and your name will never be revealed.

4-1 Could you please tell us your nationality?

_____

4-2 In the past ten years, have you ever lived in other countries for more than one year?

◯ Yes. ◯ No.

4-2b [*Skipped if the option "**No**" is selected in 4-2*] Could you please tell us the name of the countries you lived in?

_____

4-3 Would you please tell us your gender?

◯ Female. ◯ Male.

4-4 Would you please indicate your marital status?

◯ Single, never married. ◯ Divorced. ◯ Separated.
◯ Married/Domestic partnership. ◯ Widowed.

4-5 Do you have children that are under 16?

◯ Yes. ◯ No.

4-5b [*Skipped if the option "**No**" is selected in 4-5*] How many child/children do you have who are under 16?

_____

4-6 Would you please indicate your highest level of education?

- ◯ Below high school.
- ◯ High school.
- ◯ Trade / technical / vocational training.
- ◯ Bachelor's degree.
- ◯ Postgraduate.

4-7 Please indicate your employment status.

- ◯ Employed for wages.
- ◯ Self-employed.
- ◯ Out of work (currently looking for work).
- ◯ Out of work (currently **NOT** looking for work).
- ◯ Military.
- ◯ Retired / renter.
- ◯ Student.
- ◯ Others.

4-8 Please indicate your household income level (A$, annually)

- ◯ Below A$45,000.
- ◯ Between A$45,000 and A$55,000.
- ◯ Between A$55,000 and A$65,000.
- ◯ Between A$65,000 and A$70,000.
- ◯ Between A$70,000 and A$75,000.
- ◯ Between A$75,000 and A$80,000.
- ◯ Between A$80,000 and A$85,000.
- ◯ Between A$85,000 and A$90,000.
- ◯ Between A$90,000 and A$95,000.
- ◯ Above A$95,000.

Appendix B

Experimental Design of the SCE

Scenario 1

Characteristics	New Destination 1	New Destination 2	Typical Destination
Ratings of attractions			
Cultural attractions	★★★★☆	★★★★☆	Individual specific
Natural attractions	★★★★★	★★☆☆☆	
Outdoor recreational attractions	★★★☆☆	★★★★★	
Entertainment attractions	★★☆☆☆	★★★★★	
Ratings of service quality			
Hospitality	★★☆☆☆	★★★★★	
Food & Dining	★★★☆☆	★★★★☆	
Transportation	★★★★★	★★☆☆☆	
Total budget	100%	100%	

Scenario 2

Characteristics	New Destination 1	New Destination 2	Typical Destination
Ratings of attractions			
Cultural attractions	★★☆☆☆	★★★★★	Individual specific
Natural attractions	★★★★★	★★☆☆☆	
Outdoor recreational attractions	★★★☆☆	★★★★☆	
Entertainment attractions	★★★★★	★★★☆☆	
Ratings of service quality			
Hospitality	★★★★☆	★★★★☆	
Food & Dining	★★★★★	★★☆☆☆	
Transportation	★★☆☆☆	★★★★★	
Total budget	120%	80%	

Scenario 3

Characteristics	New Destination 1	New Destination 2	Typical Destination
Ratings of attractions			
Cultural attractions	★★★★★	★★★☆☆	
Natural attractions	★★★★☆	★★★☆☆	Individual specific
Outdoor recreational attractions	★★★★☆	★★★☆☆	
Entertainment attractions	★★★★★	★★☆☆☆	
Ratings of service quality			
Hospitality	★★★★☆	★★★★☆	
Food & Dining	★★☆☆☆	★★★★★	
Transportation	★★★★☆	★★★☆☆	
Total budget	140%	60%	

Scenario 4

Characteristics	New Destination 1	New Destination 2	Typical Destination
Ratings of attractions			
Cultural attractions	★★★☆☆	★★★★★	
Natural attractions	★★☆☆☆	★★★★★	Individual specific
Outdoor recreational attractions	★★☆☆☆	★★★★★	
Entertainment attractions	★★★★☆	★★★★☆	
Ratings of service quality			
Hospitality	★★★★★	★★☆☆☆	
Food & Dining	★★★★☆	★★★★☆	
Transportation	★★★★★	★★★☆☆	
Total budget	120%	80%	

Scenario 5

Characteristics	New Destination 1	New Destination 2	Typical Destination
Ratings of attractions			
Cultural attractions	★★★★★	★★☆☆☆	
Natural attractions	★★★★★	★★★☆☆	Individual specific
Outdoor recreational attractions	★★★★☆	★★★★☆	
Entertainment attractions	★★☆☆☆	★★★★★	
Ratings of service quality			
Hospitality	★★★★★	★★☆☆☆	
Food & Dining	★★★★☆	★★★★☆	
Transportation	★★★☆☆	★★★★★	
Total budget	80%	120%	

Scenario 6

Characteristics	New Destination 1	New Destination 2	Typical Destination
Ratings of attractions			
Cultural attractions	★★★☆☆	★★★★☆	
Natural attractions	★★★★☆	★★★★☆	Individual specific
Outdoor recreational attractions	★★★★★	★★★☆☆	
Entertainment attractions	★★★★☆	★★★★☆	
Ratings of service quality			
Hospitality	★★★★★	★★★☆☆	
Food & Dining	★★★★★	★★★☆☆	
Transportation	★★★★★	★★☆☆☆	
Total budget	80%	120%	

Scenario 7

Characteristics	New Destination 1	New Destination 2	Typical Destination
Ratings of attractions			
Cultural attractions	★★★★☆	★★★★☆	
Natural attractions	★★★☆☆	★★★★☆	Individual specific
Outdoor recreational attractions	★★★★☆	★★★★☆	
Entertainment attractions	★★★☆☆	★★★★☆	
Ratings of service quality			
Hospitality	★★★★☆	★★★☆☆	
Food & Dining	★★☆☆☆	★★★★★	
Transportation	★★☆☆☆	★★★★★	
Total budget	100%	100%	

Scenario 8

Characteristics	New Destination 1	New Destination 2	Typical Destination
Ratings of attractions			
Cultural attractions	★★★★☆	★★★☆☆	
Natural attractions	★★☆☆☆	★★★★★	Individual specific
Outdoor recreational attractions	★★★★★	★★☆☆☆	
Entertainment attractions	★★★☆☆	★★★★★	
Ratings of service quality			
Hospitality	★★☆☆☆	★★★★★	
Food & Dining	★★★★★	★★☆☆☆	
Transportation	★★★☆☆	★★★★☆	
Total budget	140%	60%	

Scenario 9

Characteristics	New Destination 1	New Destination 2	Typical Destination
Ratings of attractions			
Cultural attractions	★★☆☆☆	★★★★★	
Natural attractions	★★★★☆	★★★★☆	
Outdoor recreational attractions	★★★★★	★★☆☆☆	
Entertainment attractions	★★★★☆	★★★☆☆	
Ratings of service quality			
Hospitality	★★★☆☆	★★★★☆	
Food & Dining	★★★☆☆	★★★★★	
Transportation	★★★★☆	★★★★☆	
Total budget	60%	140%	

Individual specific

Scenario 10

Characteristics	New Destination 1	New Destination 2	Typical Destination
Ratings of attractions			
Cultural attractions	★★★★★	★★☆☆☆	
Natural attractions	★★★☆☆	★★★★★	
Outdoor recreational attractions	★★☆☆☆	★★★★★	
Entertainment attractions	★★★★★	★★☆☆☆	
Ratings of service quality			
Hospitality	★★★☆☆	★★★★★	
Food & Dining	★★★★☆	★★★☆☆	
Transportation	★★★★☆	★★★★☆	
Total budget	60%	140%	

Individual specific

Appendix C

List of Long-haul Destinations

(A) The following destinations are included in the questionnaire as long-haul destinations for the Australian market.

Africa (56 countries)

Algeria	Angola	Benin
Botswana	Burkina Faso	Burundi
Cameroon	Cape Verde	Central African Republic
Chad	Comoros	Congo
Côte d'Ivoire	DR Congo	Djibouti
Egypt	Equatorial Guinea	Eritrea
Ethiopia	Gabon	The Gambia
Ghana	Guinea	Guinea-Bissau
Kenya	Lesotho	Liberia
Libya	Madagascar	Malawi
Mali	Mauritania	Mauritius
Mayotte	Morocco	Mozambique
Namibia	Niger	Nigeria
Réunion	Rwanda	Sao Tome and Principe
Senegal	Seychelles	Sierra Leone
Somalia	South Africa	Sudan
Swaziland	Tanzania (United Republic of)	Togo
Tunisia	Uganda	Western Sahara
Zambia	Zimbabwe	

Asia (34 countries)

Afghanistan	Armenia	Azerbaijan
Bahrain	Bangladesh	Bhutan
China	Cyprus	Georgia
India	Iran (the Islamic Republic of)	Iraq
Israel	Japan	Jordan
Kazakhstan	North Korea	The Republic of Korea
Kuwait	Kyrgyzstan	Lebanon
Mongolia	Nepal	Oman
Pakistan	Qatar	Saudi Arabia
Syrian Arab Republic	Tajikistan	Turkey
Turkmenistan	United Arab Emirates	Uzbekistan
Yemen		

America (41 countries)

Antigua and Barbuda	Argentina	Aruba
The Bahamas	Barbados	Belize
Bolivia	Brazil	Canada
Chile	Colombia	Costa Rica
Cuba	Dominica	The Dominican Republic
Ecuador	El Salvador	French Guiana
Grenada	Guadeloupe	Guatemala
Guyana	Haiti	Honduras
Jamaica	Martinique	Mexico
Netherlands Antilles	Nicaragua	Panama

Paraguay	Peru	Puerto Rico
Saint Kitts and Nevis	Saint Lucia	St. Vincent and the Grenadines
Suriname	Trinidad and Tobago	The United States of America
Uruguay	Venezuela	

Oceania (1 country)

French Polynesia

Europe (43 countries)

Albania	Andorra	Austria
Belarus	Belgium	Bosnia and Herzegovina
Bulgaria	The Channel Islands	Croatia
The Czech Republic	Denmark	Estonia
Finland	France	Germany
Greece	Hungary	Iceland
Ireland	Italy	Latvia
Lithuania	Luxembourg	Malta
Moldova (Republic of)	Montenegro	The Netherlands
Norway	Poland	Portugal
Romania	Russian Federation	San Marino
Serbia	Slovakia	Slovenia
Spain	Sweden	Switzerland
FYROM	Ukraine	The UK
Vatican City		

(B) The following destinations are included in the questionnaire as long-haul destinations for the British market.

Africa (28 countries)

Angola	Botswana	Burundi
Comoros	Congo	DR Congo
Djibouti	Eritrea	Ethiopia
Gabon	Kenya	Lesotho
Madagascar	Malawi	Mayotte
Mozambique	Namibia	Réunion
Rwanda	Sao Tome and Principe	Seychelles
Somalia	South Africa	Swaziland
Tanzania (United Republic of)	Uganda	Zambia
Zimbabwe		

Asia (36 countries)

Afghanistan	Bahrain	Bangladesh
Bhutan	Brunei Darussalam	Cambodia
China	India	Indonesia
Iran (the Islamic Republic of)	Japan	Kazakhstan
North Korea	The Republic of Korea	Kyrgyzstan
Laos	Malaysia	The Maldives
Mongolia	Myanmar	Nepal
Oman	Pakistan	Palau
The Philippines	Qatar	Singapore
Sri Lanka	Tajikistan	Thailand
Timor-Leste	Turkmenistan	United Arab Emirates
Uzbekistan	Viet Nam	Yemen

America (41 countries)

Antigua and Barbuda	Argentina	Aruba
The Bahamas	Barbados	Belize
Bolivia	Brazil	Canada
Chile	Colombia	Costa Rica
Cuba	Dominica	The Dominican Republic
Ecuador	El Salvador	French Guiana
Grenada	Guadeloupe	Guatemala
Guyana	Haiti	Honduras
Jamaica	Martinique	Mexico

Netherlands Antilles	Nicaragua	Panama
Paraguay	Peru	Puerto Rico
Saint Kitts and Nevis	Saint Lucia	St. Vincent and the Grenadines
Suriname	Trinidad and Tobago	The United States of America
Uruguay	Venezuela	

Oceania (14 countries)

Australia	Fiji	French Polynesia
Guam	Kiribati	The Marshall Islands
Micronesia	New Caledonia	New Zealand
Papua New Guinea	Samoa	Solomon Islands
Tonga	Vanuatu	

Europe (1 country)

Russian Federation

(C) The following destinations are included in the questionnaire as long-haul destinations for the US market.

Africa (56 countries)

Algeria	Angola	Benin
Botswana	Burkina Faso	Burundi
Cameroon	Cape Verde	Central African Republic
Chad	Comoros	Congo
Côte d'Ivoire	DR Congo	Djibouti
Egypt	Equatorial Guinea	Eritrea
Ethiopia	Gabon	The Gambia
Ghana	Guinea	Guinea-Bissau
Kenya	Lesotho	Liberia
Libya	Madagascar	Malawi
Mali	Mauritania	Mauritius
Mayotte	Morocco	Mozambique
Namibia	Niger	Nigeria
Réunion	Rwanda	Sao Tome and Principe
Senegal	Seychelles	Sierra Leone
Somalia	South Africa	Sudan
Swaziland	Tanzania (United Republic of)	Togo
Tunisia	Uganda	Western Sahara
Zambia	Zimbabwe	

Asia (48 countries)

Afghanistan	Armenia	Azerbaijan
Bahrain	Bangladesh	Bhutan
Brunei Darussalam	Cambodia	China
Cyprus	Georgia	India
Indonesia	Iran (Islamic Republic of)	Iraq
Israel	Japan	Jordan
Kazakhstan	North Korea	The Republic of Korea
Kuwait	Kyrgyzstan	Laos
Lebanon	Malaysia	The Maldives
Mongolia	Myanmar	Nepal
Oman	Pakistan	Palau
The Philippines	Qatar	Saudi Arabia
Singapore	Sri Lanka	Syrian Arab Republic
Tajikistan	Thailand	Timor-Leste
Turkey	Turkmenistan	United Arab Emirates
Uzbekistan	Viet Nam	Yemen

America (4 countries)

Argentina	Chile	Paraguay
Uruguay		

Oceania (14 countries)

Australia	Fiji	French Polynesia

Guam	Kiribati	The Marshall Islands
Micronesia	New Caledonia	New Zealand
Papua New Guinea	Samoa	Solomon Islands
Tonga	Vanuatu	

Europe (43 countries)

Albania	Andorra	Austria
Belarus	Belgium	Bosnia and Herzegovina
Bulgaria	The Channel Islands	Croatia
The Czech Republic	Denmark	Estonia
Finland	France	Germany
Greece	Hungary	Iceland
Ireland	Italy	Latvia
Lithuania	Luxembourg	Malta
Moldova (Republic of)	Montenegro	The Netherlands
Norway	Poland	Portugal
Romania	Russian Federation	San Marino
Serbia	Slovakia	Slovenia
Spain	Sweden	Switzerland
FYROM	Ukraine	The UK
Vatican City		

Appendix D

List of Tourism Activities

The following list of tourism activities are used in the qualitative investigation for attribute-level determination.

No.	Tourism Activities	City/Region	Country
1	Visiting Disneyland	Hong Kong	China
2	Kayaking in the sea	Culebra Island	Puerto Rico
3	Visiting American Museum of Natural History	New York	The U.S.
4	Great Wall tour	Beijing	China
5	Exploring the Forbidden City	Beijing	China
6	Visiting the Terracotta Army	Xi'an	China
7	Li River Cruise	Guilin	China
8	Mountain climbing	Mount Huang	China
9	Visiting Jiuzhai Valley	Sichuan	China
10	Boating on the West Lake	Hangzhou	China
11	Snorkeling and diving	Phi Phi Island	Thailand
12	Visiting the Grand Palace	Bangkok	Thailand
13	Visiting the Night Market	Patong Beach	Phuket Island
14	Joining jungle trekking	Chiang Mai	Thailand
15	Visiting the Taj Mahal	Agra	India
16	City tour	Varanasi	India
17	Exploring the Mulu Caves	Sarawak	Malaysia
18	Enjoying the sun and beach	Langkawi	Malaysia
19	Visiting the Petronas Twin Towers	Kuala Lumpur	Malaysia
20	Visiting the Stonehenge	Wiltshire	England
21	City tour	Bath	England
22	Exploring the Windsor Castle	Windsor	England
23	Visiting the Warwick Castle	Warwick	England
24	Visiting the Bordeaux Wine Regions	Bordeaux	France
25	Skiing	Chamonix Valley	France
26	Visiting the Eiffel Tower	Paris	France
27	Mountain climbing	Matterhorn Mountain	Switzerland
28	Visiting the Pompeii	Pompei	Italy
29	Visiting the Canals	Venice	Italy
30	Visiting the Sagrada Familia	Barcelona	Spain
31	Island excursions	Santorini	Greece
32	Visiting the Parthenon	Athens	Greece
33	Sightseeing	Cape of Good Hope	South Africa
34	Seafaring in the Kruger National Park	South Africa	South Africa
35	Visiting the Grand Canyon	Arizona	The U.S.
36	Gambling	Las Vegas	The U.S.

37	Visiting the Statue of Liberty	New York	The U.S.
38	Visiting the Metropolitan Museum of Art	New York	The U.S.
39	Walking through the Boston Freedom Trail	Boston	The U.S.
40	Visiting the Niagara Falls	Ontario	Canada

Appendix E

Repertory Grid Table

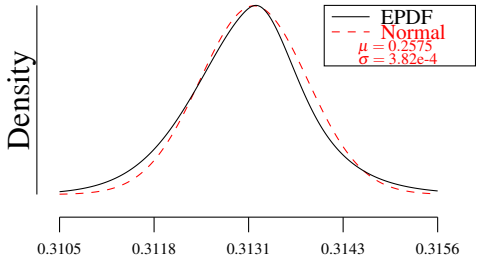
Repertory Grid Table

Round	Pair	Pole 1 (Construct 1)	Elements 1	2	3	4	5	6	7	8	Pole 2 (Construct 2)
1	1										
	2										
	3										
	4										
2	1										
	2										
	3										
	4										
3	1										
	2										
	3										
	4										

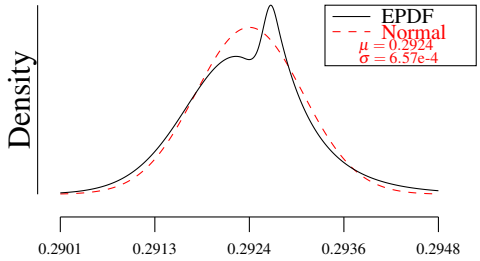
Appendix F

Empirical Probability Density Function

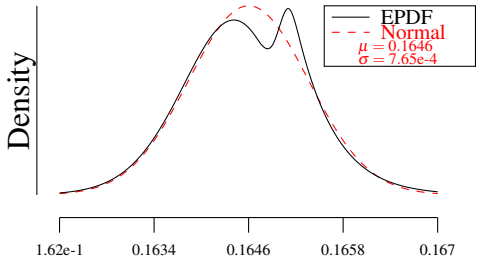
The following figures present the EPDF of parameters in domains other than the gain domain.



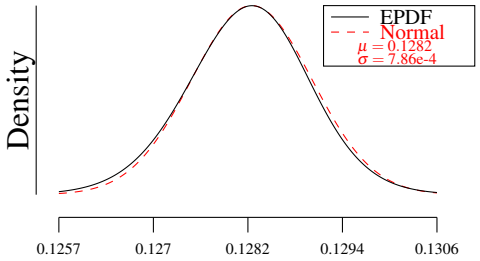
(A) $\hat{f}(\beta_{\text{Cultural attraction},L})$



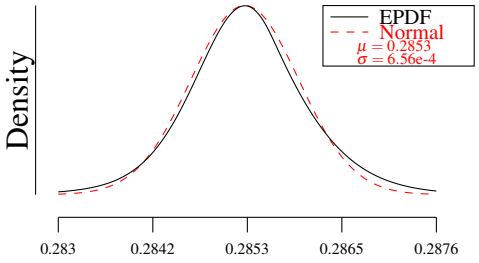
(B) $\hat{f}(\beta_{\text{Natural attraction},L})$



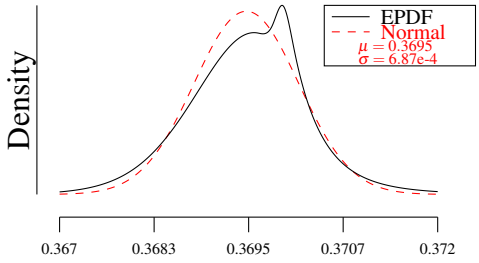
(C) $\hat{f}(\beta_{\text{Outdoor recreational attraction},L})$



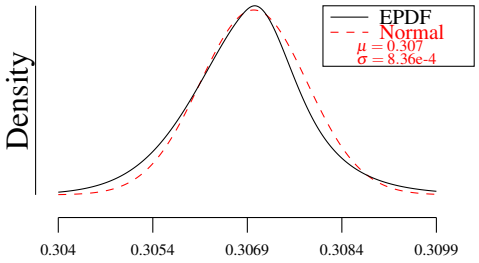
(D) $\hat{f}(\beta_{\text{Entertainment attraction},L})$



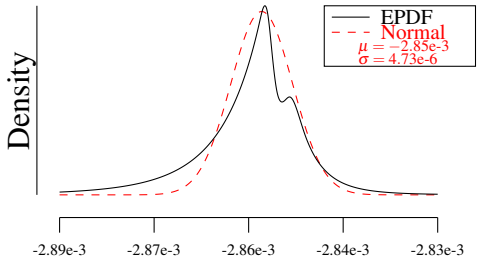
(E) $\hat{f}\left(\beta_{\text{Hospitality services},L}\right)$



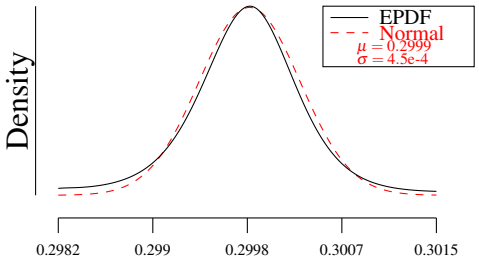
(F) $\hat{f}\left(\beta_{\text{Food \& dining services},L}\right)$



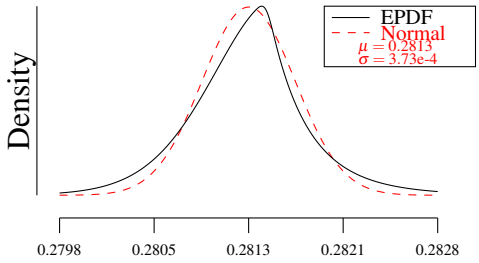
(G) $\hat{f}\left(\beta_{\text{Transportation services},L}\right)$



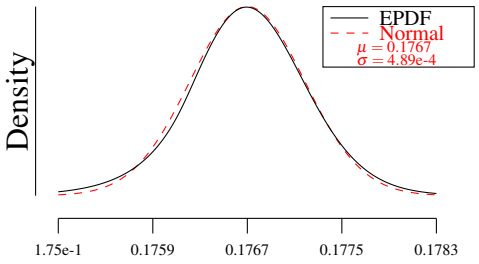
(H) $\hat{f}\left(\beta_{\text{Budget},L}\right)$



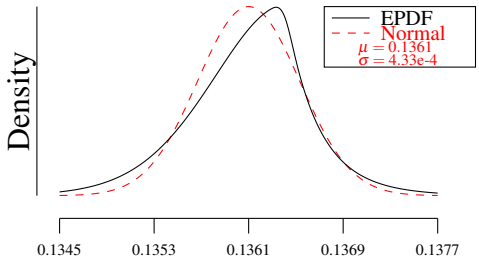
(I) $\hat{f}\left(\beta_{\text{Cultural attraction},REF1}\right)$



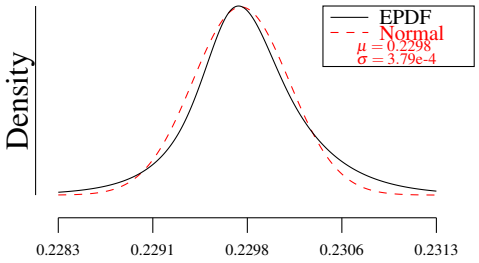
(J) $\hat{f}\left(\beta_{\text{Natural attraction},REF1}\right)$



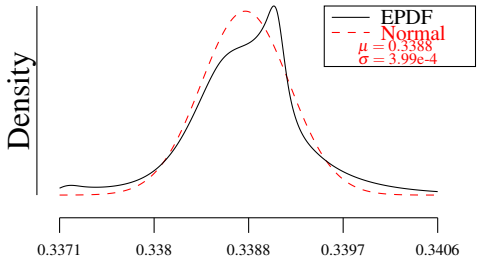
(K) $\hat{f}\left(\beta_{\text{Outdoor recreational attraction},REF1}\right)$



(L) $\hat{f}\left(\beta_{\text{Entertainment attraction},REF1}\right)$



(M) $\hat{f}\left(\beta_{\text{Hospitality services},REF1}\right)$



(N) $\hat{f}\left(\beta_{\text{Food \& dining services},REF1}\right)$

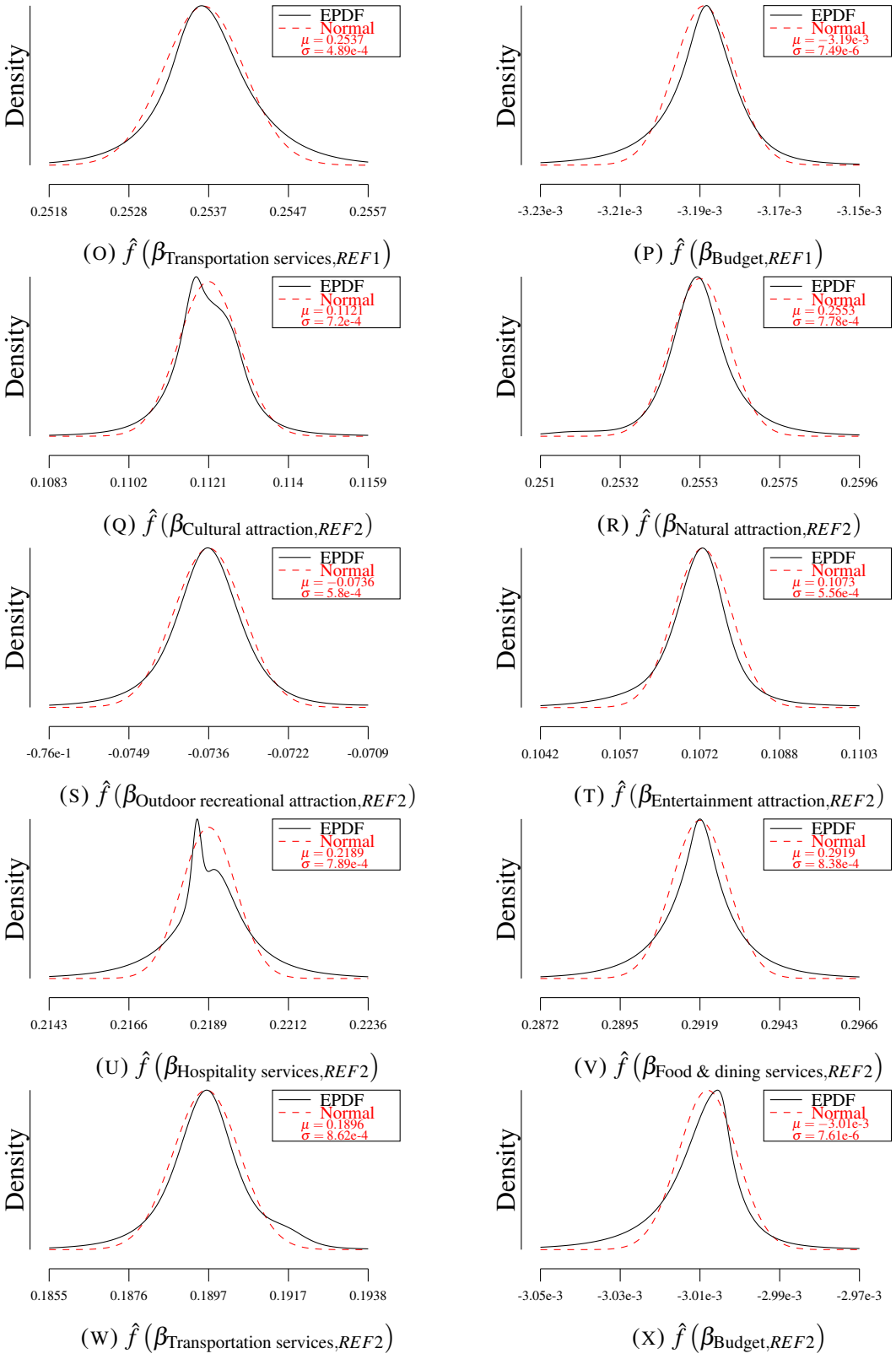


FIGURE F.1: EPDF of all parameters

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