Online Reviews: Understanding Cultural and Psychological Influences, and their Informational Value

by

Panagiotis Stamolampros

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Declaration

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To my wonderful family

Abstract

This thesis explores online reviews, a particular form of electronic Word-of-Mouth (eWOM), from different perspectives by presenting three empirical studies. These studies attempt to fill the knowledge gap and address several limitations in the extant research.

In the first study, the focus is on the effect of national culture on consumer evaluations (review valence) expressed through online reviews using an extensive dataset that consists of online reviews from customers for most of the countries. Moreover, since cultural differences between individuals and service providers can cause service conflicts due to culturally bound customer expectations and perceptions, the effect of cultural distance on the overall satisfaction score and the satisfaction with specific operational aspects is explored. The study involves a regression analysis on the numerical rating, as well as, a textual analysis to identify the topics that customers discuss more and how they change across the continuum of national culture dimensions. The results reveal that several dimensions influence both the way reviewers evaluate their experiences and the discussed topics. A further analysis showcases the information loss induced if culture is not taken into consideration highlighting significant managerial and theoretical implications.

Subsequently, this study tries to address limitations of existing approaches in this research area. Within a service-based context, the extant literature systematically explores the effect of customer culture, neglecting the impact of the service provider's culture or their joint effect. Even when the culture of the service provider is taken into consideration, this is done through the lens of difference score measures, a method

with inherent problems. Employing a response surface methodology, the focus of this study turns on examining the concomitant effect of customer and provider culture on service evaluations, as well as, non-linear relationships. The findings provide further insights into the true effect of national culture on service evaluations and the points where customer satisfaction is maximised and minimised. These findings have significant implications for online reviews explaining well-documented discrepancies in the extant literature and disagreement among scholars.

The second study sheds light on the existence of psychological factors that affect online ratings. Specifically, the aim of this study is to explore the concurrent effect of three psychological distances, namely the temporal, spatial, and social distance, on the review rating reviewers provide and on the way they describe their experiences. This is done with a battery of methodologies taking into account not only the numerical score but also the review narratives. The findings of the study suggest that psychological factors, and particularly how reviewers construct and recall their memories, explain a significant part of the variation on the way reviewers rate and describe their experience. In addition to services, a separate analysis considers the case of durable goods in order to test whether the temporal distance has also an effect on products' evaluations or the effect is eliminated due to embedded product characteristics. The findings of this study show the existence of a U-shaped relationship between failure rates and the time elapsed from the introduction of the product in the market to the point of purchase by a consumer. Importantly, the observed distribution of online reviews can be explained by the bathtub curve pattern, providing evidence that reviews can reflect quality characteristics embodied in the product.

The final study of this thesis considers the informational value or the value attributed to information extracted from online reviews. In particular, this study investigates the gains from coupling numerical and textual information derived from a novel and rather unexplored form of eWOM, that of employee online reviews. The

study presents how this information can be used and the insights for academic research and managerial practice. Specifically, using this information source, core themes in tourism and hospitality HR literature are discussed. This is done by investigating latent determinants of employee satisfaction and employee turnover that are revealed from the numerical and textual part of employee online reviews. Further evidence also supports the association between employee satisfaction and firm profitability establishing the beneficial impact of satisfied employees on firms.

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Abbreviations

WOM ..... Word-of-Mouth

eWOM ..... Electronic Word-of-Mouth

LDA ..... Latent Dirichlet Allocation

SERVQUAL ..... Service Quality

API ..... Application Programming Interface

STM ..... Structural Topic Model

POS ..... Part of Speech

NLP ..... Natural Language Processing

SMART ..... System for the Mechanical Analysis and Retrieval of Text

RSA ..... Response Surface Analysis

CLT ..... Construal Level Theory

SKU ..... Stock Keeping Unit

OLS ..... Ordinary Least Squares

ROA ..... Return on Assets

MSQ ..... Minnesota Satisfaction Questionnaire

JDI ..... Job Descriptive Index

CSR ..... Corporate Social Responsibility

OST ..... Organizational Socialization Tactics

VIF ..... Variance Inflation Factor

Papers Adapted from Thesis

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- Stamolampros, P., Korfiatis, N., Kourouthanassis, P., Symitsi, E. (2019). Flying to quality: Cultural influences on Online Reviews. Journal of Travel Research 58(3), 496-511

- Stamolampros, P., Korfiatis, N., Chalvatzis, K., Buhalis, D. (2019). Job satisfaction and employee turnover determinants in high contact services: Insights from Employees' Online reviews. Tourism Management 75, 130-147

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- Stamolampros, P., Korfiatis, N., Chalvatzis, K., Buhalis, D. (2020). Harnessing the Wisdom of Employees from Online Reviews. Annals of Tourism Research (Forthcoming)

Chapter 1

Introduction

1.1 Introduction

Every day individuals make thousands of decisions that result in their performed actions or inertia. This is also present in routine tasks involving decisions such as what time to wake up, what clothes to wear, what to eat or where to eat. To understand the magnitude of that mechanism Wansink and Sobal (2007) report that on average people make more than 200 daily decisions related only to food consumption. Most of those decisions are subconscious, but many others involve complex cognitive processes and rely on information retrieval and processing from different sources.

One of the most powerful sources of information and great influence of human decisions is the interaction with other people and the sharing of personal experiences. For several decisions, individuals rely on opinions expressed by other people. This involves choices for things individuals cannot directly observe or even choices for things they can observe, but they want to reduce their uncertainty and mitigate the risk of a wrong decision. The passing of information from person to person is also known as Word-of-Mouth. Academic literature has explored this process and the influence it exerts on people's decisions. The links are strong and well-established. One of the first discussions is traced to the work of Ryan and Gross (1943) who conducted a diffusion study of hybrid seed corn. Authors find that although commercial channels

(mainly salesmen) were the original source of knowledge, the most influential source in consumers' (farmers) decisions for acceptance were their neighbours. Katz and Lazarsfeld (1955) is one of the first studies arguing about the efficiency of WOM with a reference to surveys during the 1948 US presidential campaign which showed that the effect of radio and print on developing vote decisions were small compared to the role of personal influences.

The Bass diffusion model (Bass, 1969) and its subsequent streams offer a theoretical framework that describes the interaction between current (innovators) and potential adopters (imitators). Although the Bass model coins the term "imitation" to portray the interactive portion of the adoption, other terms like "word-of-mouth", "interpersonal communication" and "internal influence" are used interchangeably. That period coincides with a proliferation of scholarly thought that highlights the role of WOM to innovation diffusion (Arndt, 1967; Engel et al., 1969). In more recent times, several papers contribute to this area with theories ranging from herding behaviour presented by Banerjee (1992) and Banerjee (1993) to empirical studies that investigate the effect of social ties on WOM (Brown and Reingen, 1987; Granovetter, 1973), or the influence of Word-of-Mouth on both pre-purchase decisions and post-purchase product perceptions (De Matos and Rossi, 2008; Herr et al., 1991).

1.1.1 Motivation for this research

The impact of online reviews

Traditionally, WOM revolved around social interaction through personal contact. Nowadays, with the development of the internet, the emergence of Web 2.0, and the advent of social media and review aggregator platforms, new broad channels were created. In this new environment, people do not only receive information from acquaintances and their inner cycle of contacts, but also from individuals they do not

know. This source of information is described as electronic Word-of-Mouth (eWOM). Over the course of the last two decades, eWOM has profoundly changed the way consumers make decisions (Grewal and Levy, 2009) revitalising WOM studies. The main driver behind this transformation has been the emergence and proliferation of online feedback mechanisms that allow consumers to seek product opinions in the form of online reviews from other consumers before making a purchase decision (Dellarocas, 2003). Online reviews complement or even substitute the traditional forms of Word-of-Mouth and customer-to-business communication about the perceived product quality (Chevalier and Mayzlin, 2006).

A plethora of surveys confirm that online reviews are an indispensable decision tool for consumers, especially in online shopping environments in which the physical interaction with a product is only possible after purchase (e.g., see Häubl and Trifts, 2000). For example, according to Nielsen's "Global Trust in Advertising Survey", two-thirds of the 30,000 respondents in 60 countries around the world stated that they trust consumer reviews posted online and shape their purchase decisions accordingly.[1] In turn, this suggests a significant relationship between online reviews and product sales highlighting their importance for retailers. Numerous empirical studies argue that this is indeed the case (e.g., Berger et al., 2010; Chintagunta et al., 2010; Dellarocas et al., 2007; Forman et al., 2008; Zhu and Zhang, 2010) with both the valence (average rating) and volume (number) of online reviews having a significant effect on product sales. In a meta-analysis, Floyd et al. (2014) estimate a mean sales elasticity of review valence and volume of 0.69 and 0.35, respectively, a finding consistent with the meta-analysis of You et al. (2015) that considers not only online reviews, but electronic Word-of-Mouth in general, such as discussion in forums and social media platforms.

[1] https://www.nielsen.com/content/dam/nielsenglobal/se/docs/Global%20Trust%20in%20Advertising%20Report%20September%202015.pdf

As long as the question of what product or service to choose among a huge variety of almost identical offerings continues to puzzle customers, for several reasons the role of online reviews as a tool that influences purchase decisions remains vital. First, information seekers have time and cognitive constraints that regulate their decision process (Chatterjee, 2001). Second, customers' ability to directly evaluate product quality is limited when compared to conventional brick-and-mortar stores' transactions (Archak et al., 2011; Chen, 2008). To this end, past experiences from other individuals become helpful. Third, due to their intangible, heterogeneous, and inseparable nature (Berry and Parasuraman, 2004), services exhibit a level of difficulty for a customer to understand their quality on a pre-purchase context. Therefore, online reviews, by accumulating relevant consumption-related information by others expressed online, are expected to facilitate the decision process of individuals and mitigate their risk and uncertainty. Hennig-Thurau et al. (2004) report that elimination of risk and reduction of search time are the two main motives on why customers consult online articulation from previous customers.

1.1.2 Research Objectives

While the majority of the extant scholarly thought focuses on the effect of online reviews on sales and firm performance, or the effect of review characteristics on customer decisions, there is a significant asymmetry on the literature that examines the antecedents of online review characteristics. People consult and trust opinions shared by others online, but the question remains; Are those opinions a true reflection of product quality, or do they also reflect other factors? If the latter is valid, then the information content of online reviews is distorted, and those people who base their decisions on such anchors are misinformed. The underlying theory behind the online expression of customers' satisfaction or dissatisfaction is the expectation confirmation/disconfirmation paradigm (Oliver, 1980). When a consumer's a posteriori

evaluation is met, or even surpasses her pre-purchase expectation, then this should result in a positive rating and vice versa. However, there is a likelihood that both these processes (the formation of expectations and the subsequent judgement) are explained by other influences.

The drivers of online reviews

Whereas there is a consensus in the literature on the importance of online reviews in determining firm performance (e.g., product sales, product quality), what drives these ratings is not clear and the scientific evidence is limited (Godes and Silva, 2012). WOM characteristics, such as the volume of previous reviews (Liu, 2006), the ratings density (Dellarocas et al., 2006), merchant's post transaction behaviour (Qu et al., 2008) and the purchase process (Li and Hitt, 2008; Moon et al., 2010; Moe and Schweidel, 2012) have been examined as external antecedents of online reviews. Potential factors based on the personal characteristics of individuals are severely underexplored. For instance, Wu and Huberman (2008) and Moe and Schweidel (2012) argue that the expected impact of the review is a strong motive for online reviews. This thesis delves into the investigation of additional factors that may influence online reviews: (i) cultural, and (ii) psychological factors. Despite that, a distinct feature of online reviews compared to consumer evaluations is that they arrive indiscriminately from around the world, influences from national culture are not controlled. This feature is examined following a holistic approach that considers not only the culture of the reviewer but also the culture of the product or service provider. Psychological factors have been proposed by Huang et al. (2016) to impact online reviews. This thesis extends the findings of Huang et al. (2016) and, based on Construal Level Theory, models social distance, the third psychological distance, using the cultural distance between the two countries and the language of the review text as proxies. The intuition and the rationale behind exploring cultural and psychological influences

on online reviews are presented in Research Objectives A and B, respectively.

Research Objective A: What is the effect of national culture on online reviews?

It is not rational to assume that all individuals share the same expectations and desire the same attributes from a product or service. People's needs vary based on social, demographical or other personal characteristics. Consequently, one's online review expressing satisfaction is a noisy signal of quality for a reviewer with different expectations. National culture, as defined by Hofstede (Hofstede et al., 2010, p. 6) is "*the collective programming of the mind that distinguishes the members of one group or category of people from others*". The norms and beliefs that are induced by national culture shape people's perceptions, dispositions, and behaviours (Markus and Kitayama, 1991). Extant literature recognizes the effect of national culture on service expectations (Donthu and Yoo, 1998; Furrer et al., 2000; Gao et al., 2018; Malhotra et al., 1994; Mazanec et al., 2015), but the effect on online reviews is rather unexplored. This is a significant neglect as online reviews abolish national borders and reflect opinions of an international pool of reviewers so the effect and, as such, the bias induced to their informational content could be significant. Consequently, the first research objective of this thesis is to shed light on such influences considering the effect of the national culture on online reviews.

In particular, chapter 2 fills this research gap by unveiling the influence of national culture and the resulting information loss. At the same time, this thesis attempts to advance academic knowledge about the effect of culture on customers' satisfaction. This is done in two distinct ways: (i) by examining online reviews that arrive from almost all countries, addressing the single-country sample problem that challenges the veracity of previous research (Brouthers et al., 2016), (ii) by exploring the concomitant effect of service provider and reviewer national cultures on the resulted

satisfaction. Hitherto, the examination of cultural influences was done solely under the prism of customers' national culture.

Research Objective B: What is the effect of psychological factors on online reviews?

In addition to culture, an individual's post-consumption judgement of a product or service may also be influenced by other factors. Service or product judgement is a cognitive process which is based on the memory individuals have about the experienced events they evaluate. Consequently, dynamics that impact the recollection of those events are expected to have an effect on the filters individuals use for their evaluations. A second research objective of the thesis is to unmask the effect of such dynamics on post-consumption customer opinions expressed online. Specifically, to address this research objective, chapter 3 explores the effect of psychological distances, drawing on the theoretical framework of construal level theory of social psychology (Trope and Liberman, 2010), the effect of psychological distances is explored. This theory posits that dynamics such as the time or space among others alter the way people think and feel about events and objects. Examining both the numerical and textual part of the reviews, the thesis provides evidence that indeed such influences exist in service encounters. Such effects are eliminated when reviews for durable goods are considered. In this case, embedded quality characteristics are revealed through online reviews during a product's lifecycle. The value of online reviews lies in the product quality information they convey, with the prevalent view being that the mean of the review valence distribution accurately reflects a product's latent "true" quality (see, e.g., Hu et al., 2017; Li and Hitt, 2008). This finding provides evidence that online reviews convey valid information about the product quality.

In addition to exploring drivers of online reviews, this thesis empirically studies the potential benefits of online reviews that are not related to consumption-based experiences. The purpose of this analysis is to generalize the validity of this information source in answering questions and support managerial practices beyond customers. This perspective of online reviews is presented in Research Objective C.

Research Objective C: What is the information value of non-consumption based online reviews?

Although online reviews occupy a central position in the literature and have significant information value only a small portion of studies use them as a vehicle of important managerial information. Moreover, academic research focuses solely on consumption-based experiences and interactions between firms and customers neglecting other sources of information found online about the interactions between firms and other key stakeholders such as employees or investors. The proliferation of online platforms that extend the digital discussion beyond consumption-based experiences offers new opportunities for the study of eWOM as an information cue for managerial practices. The third research objective of the thesis is to explore the informational value of non-consumption-based eWOM. For that purpose, the thesis examines employee online reviews, a special case of Word-of-Mouth, that gains popularity as it contains firm internal information provided from employees across all levels of the hierarchy, ranging from managerial staff to rank-and-file employees. Platforms, such as Glassdoor, act as a valuable tool for job-seekers who lack internal connections to gain knowledge about the work conditions within a company. In so doing, job-seekers access information about the benefits, the culture, and the managerial practices of the company of interest. They also explore several other job-specific elements either through the provided structured (numerical ratings) or unstructured data (review text).

This novel form of Word-of-Mouth has received only limited attention from literature mainly as an alternative and higher frequency measurement of employee satisfaction (Huang et al., 2015; Symitsi et al., 2018). However, the possibilities that employee online reviews offer as a managerial tool for HR practices are unexplored (Holland et al., 2016), despite that the social media effects in selection and recruitment processes have been acknowledged in the literature (Roth et al., 2016; Van Iddekinge et al., 2016). The fourth chapter of this thesis discusses, explores, and presents the informational and practical value of employee online reviews. The analysis showcases how both the structured and unstructured data can be used to answer core HR questions such as the identification of employee satisfaction and employee turnover determinants. Evidence also presented that support its economic importance for firms by examining the link between employee satisfaction and firm profitability, quantifying the per satisfaction unit effect on Return-on-Assets (ROA). The representativeness in terms of companies and employees volume in online reviews allows for more general insights which are representative of the under examination industry (tourism and hospitality), addressing several limitations found in extant approaches.

Overall, this thesis contributes to the existing academic knowledge in two distinct ways. In particular, it extends the understanding of factors that affect the information entailed in online reviews. As aforementioned this is done by the examination of cultural and psychological determinants on both the numerical and textual part of this particular form of user-generated content. Further, the thesis examines the informational value of online reviews and how new variants of that information, such as in the case of employee online opinions about their employer, can be used for managerial practice.

The remainder of this thesis is organised as follows: In the next chapter, based on Hofstede framework, the effect of cultural influences on online reviews is examined. Chapter 3 provides the discussion and empirical analysis about the influence of the

psychological distances on the review valence and text. The fourth chapter introduces employee Word-of-Mouth and explores its informational value on the identification of employee satisfaction and employee turnover determinants. Finally, the thesis concludes by providing a summary of the contribution, as well as the limitations, of the studies presented.

Chapter 2

Cultural Influences on Online Reviews

2.1 Introduction

In this chapter of the thesis, the focus is on exploring the effect of national culture on consumer service evaluations expressed through online reviews. Specifically, this chapter examines how reviewers' cultural values influence their ratings and their provided textual justification. Put it simply, the question is whether inherent cultural traits systematically affect online rating behaviour. The effect of national culture on consumer preferences and evaluations has received significant attention in the extant literature mainly during the 90s and 00s (Malhotra et al., 1994; Donthu and Yoo, 1998; Furrer et al., 2000). Research embraces the view that customers from different countries have varying levels of service expectations, with studies attributing these differences in perceived service quality (Bianchi, 2001; Liu et al., 2001; Sichtmann and Micevski, 2018), service quality criteria (Ert et al., 2016; Sultan and Simpson Jr, 2000), and behavioural intentions (Liu et al., 2001; Stauss and Mang, 1999). However, cultural influences on eWOM are largely ignored.

In this study, this knowledge gap is addressed. In particular, the effect of national culture on eWOM is considered using a large pool of online reviews from the vast majority of countries that expand in the whole cultural dimensions' continuum. As such, the sample forms an unbiased representation of the whole population allowing

to iron out country-specific effects. Moreover, this represents a significant departure from the extant literature where existing empirical analyses are constrained solely to a small number of countries.

The empirical study is contextualised in the airline industry, and the analysis is based on a rich dataset of passengers' online reviews from TripAdvisor (557,208 reviews). Following Hofstede's 1984 framework as a theoretical anchor, the study captures passengers' cultural traits and examines how those traits are related to the provided review valence. The study also explores cultural incongruence as a factor that affects passengers' negative online ratings towards airlines by employing the cultural distance of Kogut and Singh (1988). The effect of national culture and cultural differences is explored based on the overall passengers' satisfaction but also on the individual service aspects, controlling for flight and passenger characteristics that may determine the level of satisfaction.

The analysis is, then, extended by considering the effect of national culture on how passengers describe their experiences with an airline carrier and the specific topics they refer to. This is done through the examination of the narratives that are disclosed alongside the review ratings, using an unsupervised topic modelling method to infer categories of interest for customers derived directly from the review text. Most importantly, it is shown how the distributions of these thematic categories change with regard to the cultural dimensions' continuum. To this end, the structural topic model methodology (Roberts et al., 2016) is introduced in the literature of online reviews. This method allows for the inclusion of review metadata as covariates and relaxes restrictive assumptions found in established topic modelling methods, such as the Latent Dirichlet Allocation (LDA). For the topic preprocessing the analysis follows the same workflow with recent studies in marketing research (Tirunillai and Tellis, 2014; Guo et al., 2017). Overall, the results document significant cultural effects.

An emerging question out of this analysis is how those cultural influences al-

ter the information content of online reviews. To this end, the study captures the information loss that is attributed to cultural differences, measuring the degree of informational content distortion caused by different response patterns. The estimation of this information loss is done by applying a within-culture standardization of passengers' overall satisfaction with a carrier. In that way, by taking into account the cultural influences, the study presents how this information changes and what a "free"-from-cultural bias ranking of service providers is.

The first part of the analysis follows established approaches found in the literature. However, those approaches come with limitations. One aspect that is strikingly common in the extant stream of scholarly thought is the examination of cultural influences solely under the prism of customers' national culture, without taking into consideration the national culture of the service provider. This is a critical neglect as the joint examination of both cultures may be important for a better understanding of their role in service evaluations. This is in line with academic research suggesting that the interaction between customer and provider is a critical determinant of the overall satisfaction (Haywood, 1990; Surprenant and Solomon, 1987). Ignoring the national culture of the service provider is a myopic approach and may explain discrepancies that appear in previous research (for example Donthu and Yoo, 1998, and Furrer et al., 2000 report conflicting results about the effect of power distance). The aim of the second part of this study is to fill this gap by exploring the joint effect of both cultures on customer satisfaction. Thus, findings are extended by examining the concomitant effect of the service provider's and customer's cultures. The online reviews employed in this study arrive from a pool of international passengers and airlines that represent the vast majority of countries, allowing sufficient variation for statistical inference and, ultimately, generalizations. By embracing this approach, the study also addresses the single-country sample problem that challenges the veracity of previous research (Brouthers et al., 2016).

A common approach in service evaluations literature is to examine the impact of cultural differences between two or more countries. Scholars usually study countries that lie in the extremes of one or more cultural dimensions (Han et al., 2014; Money and Crotts, 2003; Reisinger and Turner, 1997) and provide evidence in favour of or against their proposed hypotheses through group comparisons. Four main limitations arise from such an approach. First, variation in cultural dimensions is rarely used directly in explaining differences in the variable under investigation but is only applied to cluster countries in the extremes. Second, the difficulty of collecting primary data from different countries usually limits the examination to dyads or triads of countries. However, observed effects found in specific country pairs may be the result of other country characteristics, and as such, the external validity of the results is questioned. Third, the effect of cultural dimensions is assumed and examined under the prism of a linear relationship. Finally, previous studies neglect the service provider culture and its interaction with customer culture.

The second part of this study proposes a holistic interpretation of the relationship between cultural dimensions and service evaluations, addressing the four limitations described above. Using the civil aviation sector as a case study, the dataset employed represents online reviews that arrive from reviewers from 203 countries/cultures (and territories) for airlines domiciled in 147 countries. As such, the sample covers the vast majority of cultures and offers an unprecedented opportunity to study this relationship on 733 country pairs (reviewer country - airline country). Such representativeness is extremely difficult to be achieved having a measure other than online reviews, or in a different sector than that of airlines. In that part of the thesis, the analysis does not rely on cultural distance difference scores, an approach that comes with drawbacks (for a discussion see Edwards, 2002), but employs instead an alternative method that addresses such limitations, i.e., the polynomial regression with response surface analysis. Response surface analysis permits the investigation of the effect of agreement

(congruence) and discrepancy (incongruence) of predictors on the dependent variable, as well as, non-linear relationships and interactions between the two cultures. Also, there exists a battery of robustness checks to alleviate concerns related to passengers' or service providers' culture representativeness. In line with the first part of this study, the focus is also on service aspects that are affected by cultural traits, and, particularly, the satisfaction with customer service.

This study has multiple contributions to the current literature. First, this is the first study that explores the effect of cultural characteristics and cultural differences on online rating behaviour. Moreover, instead of focusing on the effect of culture on specific countries, this study is based on an extensive sample which increases the statistical power of the analysis. This is also the first study that explores the effect of service and customer culture confluence in the context of inquiry. This approach is fundamental for the development of much needed normative theory and for providing managerial implications that could work on ameliorating customer dissatisfaction in service encounters. Finally, online reviews are introduced as a proxy of airline quality. In the context of airline services, reviews can provide a more accurate and up-to-date information cue for airline quality, compared to standard research and industry practices. Hitherto, in studies that explore airline service quality per se, scholars usually rely on performance metrics (Suzuki et al., 2001), consumer satisfaction indices (Keiningham et al., 2014), and survey questionnaires (Bitner et al., 1990; Chang and Yeh, 2002). Nonetheless, information from passengers' online reviews is ignored.

2.2 Theoretical Framework

2.2.1 Conceptualising Culture: Hofstede's Cultural Framework

Culture reflects an archetypal understanding of how social behaviour is organised and can be defined as "the collective programming of the mind distinguishing the members of one group or category of people from others" (Hsu et al., 2013, p.6). Geert Hofstede is a Dutch social psychologist, known for his pioneering work in developing a cultural dimension theory during his employment on IBM. By conducting a worldwide survey with the participation of thousands of employees from subsidiaries of IBM around the world, the distinguished scholar proposed a cultural dimension framework that describes cross-cultural communication and the effect the culture and societal values have on its members. Initially, Geert Hofstede's work primarily explores national culture as traditional ideas attaching values through a framework of four distinctive dimensions which reflect cross-cultural interaction and the effect of societal values on the behaviour of its members (Hofstede, 1984). In particular, power distance, individualism (vs. collectivism), uncertainty avoidance and masculinity (vs. feminism) (Hofstede, 1984) were used to describe national cultures. Subsequently, (Hofstede et al., 2010) extend the framework and the original sample to incorporate two additional dimensions, namely, long-term orientation (vs. short-term orientation) and indulgence (vs. restraint) (Hofstede et al., 2010). Hofstede's work has received a lot of criticism and carries several limitations such as the assumption of cultural homogeneity or the generalisation of the results based on a specific company. Several alternative frameworks also have been developed such as those from the GLOBE study (House et al., 2004) or Trompenaars' model of national culture differences (Trompenaars and Hampden-Turner, 2011). However, yet Hofstede's dimensions are the most widely

used and cited proxies for measuring cultural traits on a national or individual scale. Moreover, Hofstede's framework enjoys universality and consensus and offers ease of comparability of the findings of this study with the extant literature. Therefore, Hofstede cultural dimensions form the basic framework of this study. A brief overview of the six Hofstede cultural dimensions is presented below.

Power Distance: Power distance is defined as "the extent to which less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally" (Hofstede et al., 2010, p. 61). Examples of countries that score high in this dimension are Iraq, Malaysia, and Saudi Arabia while countries that score low are Austria, Denmark, and New Zealand. In high power distance societies, individuals tend to be more respectful and obedient to hierarchy tolerating inequalities among its members. People from those countries expect and accept that some individuals have more power than others and the right to exert that power. Tam et al. (2016) describe individuals from power distant societies as people that accept power asymmetry, are respectful to seniors and eager to comply with their wishes. Cultures positioned lower in power distance present a more egalitarian philosophy where power is decentralised, the hierarchy is for convenience only, and control is disliked.

Individualism/Collectivism: This dimension is related with whether the self-image is defined in terms of "I" or "We". Individualism describes loose ties between the members of a society. Countries that are ranked high in individualism are Australia, the United Kingdom, and the United States while in the opposite extreme are countries including Colombia, Indonesia, and Venezuela. People from individualistic countries take care only of themselves and their families. On the contrary, the common interest is more important than the personal interest in collectivistic cultures which promote tightly-knit societal frameworks and in-group integration of individuals and value belonging, harmony, conformity, and forgiveness. In such societies,

consensus and harmony are perceived as the ultimate goals.

Uncertainty Avoidance: Uncertainty avoidance dimension deals with individuals' tolerance and comfort with ambiguity. High uncertainty avoidance cultures are found in Belgium, Portugal, and Russia. These societies are reported to have higher levels of stress and anxiety compared to low uncertainty cultures and are hesitant to adopt new technologies considering the "different" as dangerous. Societies that score high in this dimension endeavour to minimise "surprises" and deviation from the norms that impose specific rules and behavioural codes. Examples of countries with low uncertainty avoidance are Denmark, Hong Kong, and Sweden. Those societies are described as having lower levels of stress and anxiety, weaker superegos, and greater tolerance. Moreover, such individuals are comfortable with taking risks and adapt quickly to new situations.

Masculinity/Femininity: Masculinity refers "to the division of emotional roles between women and men" (Hofstede, 2011, p. 8). Countries that score high in masculinity are Hungary, Japan, and Slovakia while examples of countries that score low are Latvia, Norway, and Sweden. In masculine societies, "tough" values, such as assertiveness, success, competition, ambition, and excellence dominate "soft" values, such as solidarity and nurturance. Feminine societies, on the contrary, appreciate the resolution that comes from the willingness of members to negotiate and compromise.

Long-Term Orientation/Short-Term Orientation: Long-Term orientation is "*related to the choice of focus for people's efforts: the future or the present and past*" (Hofstede, 2011, p. 8). Long-term oriented societies have more perseverance, expect that effort creates slow/sustainable results, have respect for circumstances, and the distinction between what is right or wrong is subjective. People from these societies are concerned about their adaptability while they accept more than one truth in explaining situations. On the other hand, short-term oriented societies have a preference for quick results, believe that there are specific guidelines about what is right or

evil, and they accept only one truth as valid. Typical examples of countries that score high in long-term orientation are Japan, South Korea, and Taiwan while countries that score low in that dimension are Egypt, Ghana, and Mozambique.

Indulgence/Restraint: Indulgence is "related to the gratification versus control of basic human desires related to enjoying life" (Hofstede, 2011, p. 8). Societies that score high in indulgence are reported to have members with a more positive attitude, find it easier to express their feelings, be happier and more optimistic, and more likely to remember positive emotions. In contrast, members of restrained societies are described as having a less positive attitude, being more difficult to openly express emotions, and less likely to remember positive emotions. In this dimension, the paradox that people from poorer countries seem happier than people from wealthier countries is observed. Examples of countries that are ranked low in indulgence are Egypt, Latvia, and Pakistan while Venezuela, Mexico, and El Salvador are examples of countries that have a high score in that dimension.

2.2.2 Customer Satisfaction as a Cognitive-Affective Process and Quality

A customer's satisfaction represents a function of expectation-disconfirmation and the extent the perceived quality of a product or service deviates from pre-purchase expectations (Anderson and Sullivan, 1993). When a consumer's a posteriori knowledge meets or surpasses her pre-purchase expectations, this results in satisfaction and positive word-of-mouth (WOM). Conversely, negative disconfirmation leads to dissatisfaction, generating switching, complaining and negative WOM, three well-documented behavioural responses (e.g., see Oliver, 2014; Zeithaml et al., 1996; Knox and Van Oest, 2014). In particular, when consumers ascertain that the actual encounter is below expectations, they experience post-decision dissonance or post-decision regret. Both are important when consumers engage in post-choice eval-

uation of service encounters. The former has both cognitive and affective underpinnings, reflecting the feelings, emotions, and attitudes of consumers in post-purchase situations (Montgomery and Barnes, 1993). The latter generates either cognitive dissonance for a service relationship (Davvetas and Diamantopoulos, 2017) or, in a transactional setting, regret for an aspect of the experience (Voorhees et al., 2009) urging consumers to explore alternatives in the future.

Assuming that all individuals have identical expectations, desire the same attributes, and perceive the same quality for a product or service is a massive hypothesis. This view is in line with Parasuraman et al. (1985) who argue that consumers' level of satisfaction varies with quality. In the same spirit, norms and beliefs induced by national culture have been found to exert significant influence on shaping perceptions, dispositions, and behaviours (Markus and Kitayama, 1991). Most importantly, it has been shown that cultural values are more enduring than secondary beliefs (Hofstede, 1984) and impact the decision-making process of individuals (Kacen and Lee, 2002).

The perceived quality component, though, is determined by the actual product or service specifications established by firms (e.g., Parasuraman et al., 1985). This relates the actions of firms and the quality of the product or service delivered with the confirmation/disconfirmation process of customers' expectations. To this end, national culture is also expected to play a key role in the offered quality through its effect on business practices, which in turn could affect the perceived performance or even trigger a customer's affective disposition towards a firm or a brand. This affective response is in line with the research that recognises satisfaction as a cognitive-affective process and expands the expectation disconfirmation paradigm to include emotions (Caro and García, 2007; del Bosque and San Martín, 2008).

2.2.3 Cultural Effects on Customers' Evaluation

The importance of national culture and cultural differences on customers' service expectations and their subsequent experiences with service quality occupies a central theme in consumer behaviour literature (Donthu and Yoo, 1998; Furrer et al., 2000; Gao et al., 2018; Malhotra et al., 1994; Mazanec et al., 2015). Winsted (1997) investigates service encounters of American and Japanese consumers which are two "polar extremes" cultures. The author identifies determinants important for evaluating the service encounters and how they differ between these two cultures. He reveals differences not only on the perception of those determinants but also on the effect they have on the overall satisfaction. While many factors appear to be common and important in both countries, there are distinct differences in the behaviours that customers associate with these constructs. Friendliness, authenticity, promptness, and being personal are prevalent constructs for US customers, and those factors are highly associated with the individualistic dimension that governs the US culture. On the other hand, caring for the customer is a prevalent determinant for Japanese customers satisfaction, explained by the empathy that governs the Japanese culture.

In another study, Donthu and Yoo (1998) by employing Hofstede's (Hofstede, 1984) cultural dimensions lend further support to the idea that a customer's cultural orientation has a strong influence on her expectations for the overall service quality. This study is based on 281 questionnaires from demographically similar customers from the United States, the United Kingdom, Canada, and India and examines through the SERVQUAL scale (Parasuraman et al., 1988) the perceived quality of banking services. Authors' reported results reveal that several cultural dimensions affect customer satisfaction. Specifically, customers high in power distance had lower expectations for service quality, responsiveness, and reliability compared to customers that are found to be low in those cultural dimensions. On the other hand, customers

high in individualism are found to have higher expectations for service quality, empathy, and assurance compared to collectivist customers. Uncertainty avoidance also has an effect since respondents that are found high in this dimension are reported to have higher expectations for service quality than low uncertainty avoidance customers. Finally, long-term oriented respondents are found to have lower service quality expectations compared to short-term oriented counterparts.

Similar to this study, Crotts and Erdmann (2000) explore the effect of national culture and specifically of masculinity on airline travellers. The authors use data from the *In-flight Survey of Overseas Visitors to the United States* (now known as Survey of International Air Travellers) for 1996, 1997 and 1998. This is a survey conducted from the US Department of Commerce to overseas visitors on regularly scheduled flights. By focusing only on visitors originated from (country of birth) the United Kingdom, Germany, Japan, Brazil, and Taiwan, the authors segmented their sample in groups based on the relevant scores of these countries on the masculinity dimension. In their results, they report that in almost all categories there were statistically significant differences in both satisfaction with airport facilities and airline service quality. In particular, travellers from countries ranked high in masculinity were the most dissatisfied. Other studies report statistically significant effects for several cultural dimensions (e.g., see Liu et al., 2001; Voss et al., 2004; Kim et al., 2014).

Another plausible channel that associates the national culture with the way reviewers rate their experiences is the literature that reports cultural effects on survey response patterns. In that literature, one anomaly that disputes the validity of surveys is the extreme response style, which is the tendency of respondents to use (or not) the endpoints of a rating scale. For example, the results of De Jong et al. (2008) reveal that a positive relationship exists between extreme response values with individualism, uncertainty avoidance, and masculinity. Having that in mind, it is expected that those differences should also be reflected in online ratings providing the theoretical

ground for the specific study.

As aforementioned the effect of culture on service evaluation has been rigorously investigated in the past. However, the impact of cultural traits on online reviews is ignored. This is a significant neglect as review aggregators, such as Amazon and TripAdvisor, accumulate reviews from an international pool of reviewers, and it is known that consumers systematically base their decisions on past reviews. Not accounting for the effect (if any) of cultural traits could distort the informational content of online reviews and subsequently lead to wrong customer decisions.

2.2.4 Hypotheses Development

This section presents the development of hypotheses that theoretically associate each cultural dimension with customers' evaluations.

***Power Distance*:**

Power distance has been explored in several fields of research. Scholars unveil direct or moderating effects on areas such as organizational behaviour, for example, the effect on justice perception and evaluation of authorities (Lee et al., 2000) or job-related attributes (Bochner and Hesketh, 1994); on personal behaviour such as the effect on how people respond in insults (Bond et al., 1985); on ethical behaviour (Smith and Hume, 2005); on innovation (Rinne et al., 2012), and buying behaviour (Zhang et al., 2010).

There is evidence also that power distance affects individuals' service quality perceptions. Dash et al. (2009) report that consumers from countries that are ranked low in power distance have higher expectations for responsive and reliable service while customers from countries high in power distance consider as more critical the tangible service attributes. The findings of Tsoukatos and Rand (2007) support that power distance has an inverse relationship with reliability, responsiveness, assurance, and empathy. Kueh and Ho Voon (2007) also find that power distance is nega-

tively correlated with all dimensions of service quality. As aforementioned, in their study, Donthu and Yoo (1998) provide evidence of a significant effect of power distance reporting that consumers ranked low in power distance have higher overall service quality, responsiveness, and reliability expectations compared to consumers from countries ranked high in that dimension. Similar conclusions are derived from the study of Furrer et al. (2000) who exhibit that customers from countries high in power distance are more likely to tolerate service failures from the service providers perceived as more powerful. This is not the case for the low power distant cultures, where customers underestimate power asymmetries in their relationship with service providers.

It should be expected that service satisfaction expressed through online reviews to be influenced by power distance. This is based on the status and perceived power of the service provider. In the context of a service failure, customers from power distant oriented countries should display a thorough approach when evaluating situation, also considering other factors that may have resulted in that failure. As such, they will be less likely to blame the service employees and the firm for the event. Those customers, because they perceive the service provider as more dominant, are predisposed to accept the status differences. Furrer et al. (2000) discuss that the direction of the effect of power distance in service encounters depends on whether the customers are perceived as weak or powerful compared to the service provider. In this study, customers should be considered as the weak actors of that relationship. As Donthu and Yoo (1998) argue, with the exception of services that are based on labour and low-cost equipment which people can do or own, most of the service providers have some form of power. The authors describe that this power could have the form of knowledge and skills (e.g., accountants, lawyers), resources (e.g., retail stores) or a combination of both (e.g., hospitals, restaurants). Airlines are services that Donthu and Yoo (1998) explicitly refer to as service providers with power. Therefore, pas-

sengers from countries high in power distance should be expected to be less critical to airlines as they accept service providers' authority and expertise, and as such the following relationship is hypothesized:

$\mathbf{H_1}$: Power Distance has a positive effect on review valence.

***Individualism/Collectivism*:**

Similar to the power distance dimension, individualism has received attention from different disciplines. Among others, individualism has been used to explain organizational citizenship behaviours (Moorman and Blakely, 1995), entrepreneurship (Tiessen, 1997), group creativity (Goncalo and Staw, 2006) or even stock market behaviour (Chui et al., 2010). There is ample evidence of differences in service quality perceptions between individualists and collectivists. That evidence usually points out to higher product/service expectations for the individualistic societies. Passengers from individualistic countries are expected to prioritise their utility maximization. Furrer et al. (2000) state that due to higher self-responsibility of the individualism, customers from such countries will be more demanding than customers from more collectivist societies. Collectivist customers desire harmony and interdependence in social relationships (Hofstede and Hofstede, 2005) and as such avoid confrontation (Maiyaki, 2013). Therefore, those customers are more tolerant of errors displaying a lower level of expectation related to reliability but a greater need for empathy, assurance, and responsiveness (Kueh and Ho Voon, 2007). The positive link between individualism and higher service expectations is reported in several studies (Donthu and Yoo, 1998, Furrer et al., 2000, Laroche et al., 2005). Most of the evidence suggests that individualism is associated with higher service quality expectations as well as that customers originating from those countries are more likely to complain if the provided service quality fails to meet their expectations (Liu et al., 2001). This

behaviour should be also expected when individuals evaluate the service quality of airline companies through online reviews. Thus, the following relationship is assumed:

H_2: Individualism has a negative effect on review valence.

***Uncertainty Avoidance*:**

Uncertainty avoidance has been used in the literature to explain information search patterns (Money and Crotts, 2003), acceptance of new technologies (Hwang, 2005), product perceptions (Anne Lee et al., 2007) but also corporate risk decisions such as firm cash holdings (Ramirez and Tadesse, 2009) or takeovers (Frijns et al., 2013). Online reviews are perceived by customers high in that dimension as an instrument to reduce uncertainty in their expectations of service encounters (Filieri, 2015; Liu and Park, 2015).

Regarding consumer evaluations, there is evidence that people from societies that are ranked high in uncertainty avoidance compared to individuals from low uncertainty avoidance countries praise more the good service quality, but they are more critical to service failures (Groschl and Doherty, 2006; Tseng, 2017). In that way, those individuals alleviate the emotion of uncertainty and reduce post-purchase cognitive dissonance. Similar results are also reported in the study of Liu et al. (2001). Donthu and Yoo (1998) provide an alternative justification considering the risk-averse nature of the societies that are ranked high in uncertainty avoidance. The authors posit that customers with higher uncertainty avoidance have higher expectations because they search more about the attributes of the product and service. This is also in line with the results of Voss et al. (2004) who report a negative relationship between customer evaluations and uncertainty avoidance. Additionally, Reimann et al. (2008) find that the degree of uncertainty avoidance has a moderating effect on the customers' perceived service quality. Higher uncertainty avoidance customers are less

satisfied when their service expectations are not met. A possible explanation is the narrow zone of tolerance for customers from those countries. Having that in mind, the following relationship between that cultural dimension and the review valence is hypothesized:

H_3: Uncertainty Avoidance has a negative effect on review valence.

***Masculinity/Femininity*:**

Masculinity has been found to affect ethical decision making (Vitell et al., 1993), corrupt behaviour (Yeganeh, 2014), advertising strategy (De Mooij and Hofstede, 2010), and depression levels, among others (Arrindell et al., 2003). Fang et al. (2013) document a stronger motivation of individuals from masculine cultures to express their experiences with a service to others compared to individuals from feminine cultures (Fang et al., 2013). People from more masculine cultures also feel that they can confront the power of service providers and, as such, are more possible to voice their complaints about an unsatisfactory experience (Torres et al., 2014; Van Vaerenbergh et al., 2014). This is in line with the results of Yuksel et al. (2006) who find that customers of more masculine countries are more likely to complain to the management and third parties. Similar findings are also reported in the context of airline passengers from Crotts and Erdmann (2000). In their study, passengers from masculine societies are more likely to report defector attitudes. On the other hand, passengers from feminine societies are more loyal to specific airlines and less likely to complain. This is also in line with the findings of Huang et al. (1996). Having that in mind, travellers from masculine oriented cultures are expected to be more critical in their service evaluations. Thus, the following relationship is assumed:

H_4: Masculinity has a negative effect on review valence.

***Long-Term Orientation/Short-Term Orientation*:**

This dimension has been used in studies to explain international joint venture strategies (Buck et al., 2010), inter-organizational trust (Ryu and Moon, 2009) or even the demand for life insurance products (Park and Lemaire, 2011). Studies suggest that individuals from long-term oriented cultures compared to short-term oriented individuals are less likely to provide negative feedback regarding their service experience. This is explained by their unwillingness to uphold the risk of compromising their long-term relationships with the service provider (Liu et al., 2001; Ryu and Moon, 2009). Donthu and Yoo (1998) discuss that individuals from long term oriented countries are more tolerant, do not expect to have a perfect experience, and have the will to allow service providers time in order to get improved. To the contrary, short-term oriented customers are more interested in the present performance of a service provider (Kueh and Ho Voon, 2007). Those individuals have higher expectations, as such, are expected to be more critical (Mazaheri et al., 2011; Meng and Mummalaneni, 2011). In general, customers from long-term oriented countries value loyalty (Bartikowski et al., 2011; Li et al., 2011) and this behaviour should also be reflected in their online ratings. Thus, the following hypothesis is examined:

H_5: Long-Term Orientation has a positive effect on review valence.

***Indulgence/Restraint*:**

This dimension has been used in extant research for explaining differences in innovation (Khan and Cox, 2017; Prim et al., 2017), the relationship between corporate social performance and corporate financial performance (Sun et al., 2018), tourists' spending behaviours and travelling patterns (Hassan and Tajaddini, 2014), adoption and use of online social networks (Krishnan and Lymm, 2016; Stump and Gong,

2017).

Overall, indulgent cultures are reported as happier than the restraint ones (e.g., Park et al., 2014). As already discussed, individuals from those societies have a more positive attitude and are more likely to recall the positive memories compared to individuals from restrained societies who are reported as less happy and less likely to remember positive emotions. Therefore, as those individuals are more positive and more likely to recall positive aspects of the service experience, this attitude should be mirrored to the emotional valence of their reviews. Thus, the following hypothesis is formed:

H_6: Indulgence has a positive effect on review valence.

All the previous hypotheses suggest an influence of the individual cultural dimensions on a customer's service quality perceptions and expectations. However, as a service encounter is a point where often two cultures are met, that of the customer and the service provider, it is interesting to examine the effect of cultural similarities/dissimilarities between these two cultures. The literature supports the idea that cultural differences between those two groups may exert an effect. This could be the result of service conflicts, attributed to variations in their culturally biased standards (Li, 2014). A widely used proxy for the measurement of the degree of cultural dissimilarities is the "cultural distance" (Ye et al., 2013; Cheok et al., 2015). High cultural distance could lead to mismatches between service expectations and actual service performance due to service providers' neglect to account for various cultural standards (Laroche et al., 2004; Paswan and Ganesh, 2005). This is also reflected in the stronger loyalty ties that customers are found to develop towards service providers from their own country (Javalgi et al., 2001; Thelen and Shapiro, 2012). The latter is attributed to an increased comfort perception during the service encounter (Paswan

and Ganesh, 2005). Thus, there is an expectation that passengers from dissimilar cultures have different expectations from service practices (Kong and Jogaratnam, 2007) and those deviations are more likely to be perceived as negative. Therefore, the following research hypothesis is proposed:

H_7: The cultural distance between passenger's and airline country of origin has a negative effect on review valence.

2.3 Data and Methodology

2.3.1 Dataset Description

The dataset employed for this analysis has been collected from TripAdvisor. TripAdvisor is one of the most popular review aggregators and has been extensively used in the literature that studies electronic word-of-mouth (e.g., see Crotts et al., 2009; Pearce and Wu, 2016). While this platform has been mainly used to gather customer opinions about hotels, customers are also allowed to share and evaluate their experiences with airline carriers. Using this service domain, all publicly available reviews until August 2017 are collected. In particular, the data collected included the rating scores reviewers provided for their overall satisfaction with the specific flight (in an ordinal scale from 1 to 5) and the ratings for specific aspects of the flight such as legroom, seat comfort, customer service, value for money, cleanliness, check-in and boarding, food and beverage, and in-flight entertainment/Wi-Fi connectivity. In addition to the rating scores, reviews were accompanied by text where customers could voluntarily disclose any information related to their experience with the carrier. Several metadata were available and collected about passengers' and flights' characteristics, such as the country of residence, the number of the total posts the reviewers have posted in the platform (which is used as a proxy of reviewer experience), the date of the flight, the name of the air carrier, the route performed for the specific flight (which is used in order to compute the flight distance), and the cabin class (Economy, Economy Premium, Business Class, and First Class). The country of residence and the name of the air carrier are used to determine the nationality and the culture of the reviewer and the airline, respectively, while the rest of metadata is used as control variables.

In Table 2.1, there is a description of the dataset used in the analysis. There

Table 2.1 Sample description

Total Number of Airlines	489
Total Number of Reviews	557,208
Total Number of Users	376,519
Total Number of Countries (Reviewers)	203
Total Number of Countries (Airlines)	147
Number of reviews in English	254,424
Average Length of English Review Text (characters)	560.27

is a total of 557,208 passenger reviews posted from 376,519 unique customers (based on the reviewer's id) that provide rating scores for 489 airlines. Those airlines are domiciled in 147 countries, whereas the passengers are based on 203 countries and territories. Not surprisingly 254,424 reviews are written in the English language and the average review text length is 560 characters. The average overall rating for all the reviews in the sample is 3.68 with a standard deviation of 1.29. These figures are reported in Table 2.2 along with the average rating for all categories, which is above 3 in all cases. Specifically, the average (standard deviation) for seat comfort, customer service, cleanliness, food and beverages, legroom, in-flight entertainment, value for money, check-in and boarding are 3.46 (1.11), 3.75 (1.34), 3.94 (1.03), 3.32 (1.27), 3.45 (1.14), 3.01 (1.47), 3.66 (1.23), and 3.81 (1.25), respectively. In total, passengers seem to be more satisfied with the cleanliness and less satisfied with the in-flight entertainment. The average distance of the described flights is 4,215 Km, and on average a reviewer posts almost four reviews in the platform (this also includes reviews related to other services such as hotels). Finally, differences are observed between different categories of cabin class with a monotonic relationship with the associated cost, that is, that the larger the flight price, the larger the satisfaction.

Table 2.2 Descriptive statistics

Ratings per Service Category	*Mean*	*St.Dev*
Overall Score	3.68	1.29
Seat Comfort	3.46	1.11
Customer Service	3.75	1.34
Cleanliness	3.94	1.03
Food and Beverages	3.32	1.27
Legroom	3.45	1.14
In-flight Entertainment/Wi-Fi	3.01	1.47
Value for Money	3.66	1.23
Check-in and Boarding	3.81	1.25
Additional Variables		
Flight Distance (Kilometres)	4215.1	3784.09
Reviewer's Level of Contribution	3.83	1.88
Overall Score for Economy Class	3.64	1.29
Overall Score for Premium Economy	3.92	1.22
Overall Score for Business Class	3.98	1.21
Overall Score for First Class	4	1.26

Note: Rating scale is for 1 (minimum) to 5 (maximum) satisfaction.

2.3.2 Dependent and Control Variables

The dependent variable of the study, the review score, is an ordinal variable that takes values between one to five with one being the lowest satisfaction and five the highest. Given the nature of this variable, the appropriate econometric model is an ordered logistic regression. In the basic model, the overall satisfaction is employed as the primary dependent variable, but the analysis is also extended to include the separate rating categories as alternative dependent variables.

Based on the availability of the metadata in the dataset, there are several control variables that are expected to influence the overall rating. Specifically, passengers' expected and perceived service quality satisfaction is possibly influenced by other more observable factors, such as the scope of the travel (leisure or business). On the one hand, business travellers, who on average are more frequent and experienced customers compared to leisure travellers, may be more demanding and more prone to evaluate flights using their previous experiences. On the other hand, differences in the quality perception between these two types of customers may stem from the fact that business travellers do not pay for their travel as opposed to leisure passengers (Doganis, 2013). Consequently, business customers will be more interested in the quality of the provided service than the price. Davidson (2004) argues that the service quality is more important to business customers than the price. Ringle et al. (2011) also suggest that perceived safety has a significantly greater impact on the overall customer satisfaction of pleasure travellers than on that of business travellers.

An additional argument that may explain differences in perceived quality evaluations among different types of customers is the "stress" factor. Several studies document that business travellers carry more stress compared to those travelling for leisure (Liese et al., 1997; Striker et al., 1999). A more stressed passenger has a lower tolerance level and is less "forgivable". There are studies that have reported

differences between leisure and business passengers in airline studies (e.g., Ostrowski et al., 1994). For instance, a study by Harvey (1987) finds that in the airport selection, business travellers value higher airport access time and flight frequencies than leisure passengers. However, literature related to the differences between the two groups is more extensive in studies about hotel service satisfaction (Knutson, 1988; Lewis, 1984). Having that in mind, the study controls for the cabin class which is coded as a categorical variable with four levels (Economy, Economy Premium, Business Class, and First Class). This variable forms a proxy of the price differences and also helps to distinguish between leisure and business travellers. In a similar vein and based on the assumption that more experienced passengers have different expectations, a variable controlling for the reviewers' level of contribution is employed which is measured by the number of reviews posted from a passenger up to that time.

The study also presents a second group of factors associated with characteristics of the flight and, specifically, the length of the trip flight as a component that influences passenger satisfaction. Long-distance journeys (e.g., intercontinental flights) could lead to higher dissatisfaction among customers compared to short-haul flights because of either of fatigue, exhaustion, greater seat discomfort, and longer interaction with the personnel, or even because of higher cost. However, longer journeys are usually performed by bigger aircrafts and provide more services to passengers, which could offer greater satisfaction. Whether the positive or negative influence will dominate is not clear, but one should expect differences to passengers' evaluations between the two different types of flights. Having that in mind, the study controls for the flight distance which is measured by the geographical distance (in kilometres) between the departure and the destination airport. To estimate the flight distance, the Haversine method from the "geosphere" package in R language is employed. The Haversine method is defined as the shortest distance between two geographical points. The coordinates (latitude and longitude) used as input were obtained from the *geocode*

function that is based on Google's geocoding API.

2.3.3 Methodology

The main independent variables are related to the cultural dimensions of the Hofstede framework. The dimensions for each review are matched using the passengers' self-reported country of residence. Based on the work of Hofstede et al. (2010), the focus of the study is on examining the effect of the six cultural dimensions on passengers' ratings. To this end, the appropriate econometric method is an ordered logistic regression analysis, where the dependent variables are the reviewers' ratings controlling for the variables mentioned earlier. Consequently, the econometric specification for the $\boldsymbol{i^{th}}$ review of a customer originated from country $\boldsymbol{j}$ that rates a service category $\boldsymbol{c}$ has the following form:

$$\begin{aligned} r_{ij}^{c} = \beta_1 PowerDistance_j + \beta_2 Individualism_j + \beta_3 UncertaintyAvoidance_j + \\ \beta_4 Masculinity_j + \beta_5 LongTermOrientation_j + \beta_6 Indulgence_j + \\ \beta_{7m} \sum_{m=1}^{3} CabinClass_i + \beta_8 FlightDistance_i + \beta_9 ReviewerExpertise_i + \epsilon_{ij} \end{aligned} \tag{2.1}$$

2.4 The Effect of Cultural Dimensions on Passengers' Rating

Table 2.3 displays the coefficients along with standard errors in parentheses. Model (1) presents the effect of culture on the overall rating score, while models (2) - (9)

examine the effects on the various rating aspects. Regarding the first hypothesis, $\boldsymbol{H_1}$, that posits a positive effect of the power distance on the rating behaviour of reviewers, reported results are in agreement with the suggested direction. The coefficient for the overall satisfaction is positive and statistically significant ($\boldsymbol{\beta_1 = 0.003, p < 0.001}$). The same effects are also observed for all service categories/aspects that are evaluated in all models. As such, the first hypothesis is supported.

With regards to the second hypothesis, $\boldsymbol{H_2}$, the results are in line with the hypothesised effect. Individualism has a significant and negative effect ($\boldsymbol{\beta_2 = -0.003, p < 0.001}$) on the overall satisfaction and on four out of the eight service categories. Evidence in support of the hypothesised effects are also found for the negative influence of uncertainty avoidance ($\boldsymbol{\beta_3 = -0.001, p < 0.001}$) and masculinity ($\boldsymbol{\beta_4 = -0.001, p < 0.001}$). In addition, hypotheses $\boldsymbol{H_3}$ and $\boldsymbol{H_4}$ are supported by the results, while similar effects are also reported for the individual service factors.

Interestingly, the long-term orientation displays an opposite effect from the expected and proposed in hypothesis $\boldsymbol{H_5}$, though, this is significant at a lower level ($\boldsymbol{\beta_5 = -0.001, p < 0.05}$). Regarding the individual service factors, the relationships are not unidirectional as there is a positive association with the tangible aspects (i.e., seating and legroom) and a negative one with the more intangible aspects (customer service, check-in). However, this is in line with the findings of Furrer et al. (2000), who describe that in long-term oriented cultures, reliability, responsiveness, and empathy are extremely important, while tangibles are not so necessary. Finally, with regards to $\boldsymbol{H_6}$, although the effect on the overall rating is not significant ($\boldsymbol{\beta_6 = 0.000, p > 0.05}$), positive and statistically significant effects are found on most of the individual service aspects with the exemption of the food and beverage category and value for money category. Thus, the sixth hypothesis is only partially supported.

There are also several statistically significant effects for the control variables.

Specifically, both the flight distance ($\boldsymbol{\beta_8 = 0.104, p > 0.001}$) and the reviewer expertise ($\boldsymbol{\beta_9 = 0.061, p > 0.001}$) display a positive effect. The effect of the former can be attributed to the fact that long-distance flights are usually performed by bigger aircrafts and provide more services to passengers. On the other hand, reviewers that contribute less to TripAdvisor are likely to be those that post for retaliation to service failures, in contrast to those that are more active contributors to the platform. Lastly, as it was expected updated cabin classes result in a more positive rating probably due to the upgrade in the level of service. As such, First Class, Business Class, and Premium Economy passengers cast a more positive rating compared to Economy passengers.

Table 2.3 Ordered logistic regression of rating scores to the Hofstede dimensions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Power Distance	0.003***	0.008***	0.004***	0.007***	0.005***	0.008***	0.003***	0.003***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Individualism	-0.003***	-0.001***	0.000	0.000	-0.003***	0.000	-0.007***	-0.001***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Uncertainty Avoidance	-0.001***	-0.005***	0.000	-0.003***	-0.003***	-0.008***	-0.001***	-0.003***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Masculinity	-0.001***	-0.003***	-0.003***	-0.002***	-0.003***	-0.002***	0.001**	-0.001***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Long Term Orientation	-0.001*	0.003***	-0.001***	0.001**	-0.001**	0.004***	-0.005***	0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Indulgence	0.000	0.001***	0.002***	0.004***	0.000	0.002***	0.005***	0.000	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Flight Distance	0.104***	0.114***	0.112***	0.123***	0.316***	0.137***	0.603***	0.053***	0.099***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Reviewer Expertise	0.061***	0.026***	0.033***	0.002	0.009***	0.035***	0.049***	0.036***	0.016***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Premium Economy	0.416***	0.881***	0.424***	0.437***	0.476***	1.175***	0.607***	0.069***	0.381***
	(0.018)	(0.019)	(0.019)	(0.021)	(0.021)	(0.019)	(0.019)	(0.019)	(0.021)
Business Class	0.458***	1.460***	0.635***	0.644***	0.957***	1.939***	0.695***	0.160***	0.559***
	(0.011)	(0.012)	(0.012)	(0.014)	(0.013)	(0.013)	(0.012)	(0.012)	(0.014)
First Class	0.644***	1.811***	0.874***	0.690***	1.105***	2.174***	1.141***	0.182***	0.824***
	(0.024)	(0.026)	(0.027)	(0.029)	(0.029)	(0.027)	(0.026)	(0.025)	(0.030)
$\boldsymbol{McFadenR^2}$	0.36	0.38	0.36	0.35	0.36	0.39	0.39	0.36	0.34
AIC	1,042,181	938,963	952,187	696,674	763,882	932,399	907,991	966,501	748988
LL	-521,076	-469,467	-476,078	-348,322	-381,926	-466,184	-453,981	-483,236	-374,479
Observations	359,424	334,263	334,668	265,998	254,234	333,994	301,051	331,334	266,754

Note: Model specifications for dependent variable: (1) Overall Score, (2) Seat Comfort, (3) Customer Service, (4) Cleanliness, (5) Food and Beverage, (6) Legroom, (7) In-flight entertainment/Wi-Fi, (8) Value for Money, and (9) Check-in and Boarding. Standard errors are reported in parentheses. $*p < 0.05; **p < 0.01; ***p < 0.001$.

2.5 The Effect of Cultural Distance

In the previous subsection, the separate effects of each of the six cultural dimensions provided in the Hofstede framework were discussed. In this part, the analysis is extended by presenting the impact of cross-national differences on the overall score and the individual operational aspects. This is done by examining the cross-national differences based on the cultural distance formula of Kogut and Singh (1988) which is described as:

$$\boldsymbol{CD_{ij} = \frac{1}{6}\sum_{k=1}^{6} \frac{(hofstede_{i,k} - hofstede_{j,k})^2}{var(hofstede_k)}}, \tag{2.2}$$

where $\boldsymbol{hofstede_{i,k}}$ is the $\boldsymbol{k}$ index for the country $\boldsymbol{i}$, and $\boldsymbol{var(hofstede_k)}$ is the variance of the $\boldsymbol{k}$ index across all countries in the sample. The econometric model is estimated as before, replacing the individual Hofstede dimensions with the computed cultural distance. The results are found in Table 2.4, and they lend support to the hypothesis $\boldsymbol{H_7}$ with cultural differences displaying a strong negative association with the overall score ($\boldsymbol{\beta_7 = -0.027, p < 0.001}$). However, the effect on the individual aspects is not unidirectional as there exists a positive effect for legroom, seating, and value for money. Interestingly, service aspects that are more subject to cultural influences, such as the interaction with the personnel (customer service and check-in/boarding) and the in-flight entertainment receive a lower rating on average when the cultural distance between the passenger and the carrier increases. Food and beverage aspect has also a negative association with cultural distance, though, this is not statistically significant.

Table 2.4 Ordered logistic regression of rating scores to the cultural distance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cultural Distance	-0.027***	0.013***	-0.046***	-0.001	-0.001	0.016***	-0.069***	0.081***	-0.056***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Flight Distance	0.044***	0.035***	0.080***	0.066***	0.261***	0.067***	0.579***	-0.022***	0.072***
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Reviewer Expertise	0.059***	0.023***	0.029***	-0.003	0.007**	0.031***	0.048***	0.033***	0.012***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Premium Economy	0.467***	0.980***	0.452***	0.507***	0.539***	1.286***	0.642***	0.152***	0.418***
	(0.018)	(0.019)	(0.020)	(0.022)	(0.021)	(0.019)	(0.019)	(0.019)	(0.021)
Business Class	0.400***	1.409***	0.594***	0.597***	0.938***	1.900***	0.687***	0.102***	0.519***
	(0.012)	(0.013)	(0.013)	(0.015)	(0.015)	(0.014)	(0.013)	(0.013)	(0.015)
First Class	0.508***	1.703***	0.792***	0.618***	1.008***	2.112***	1.089***	0.147***	0.797***
	(0.025)	(0.027)	(0.028)	(0.030)	(0.029)	(0.028)	(0.027)	(0.026)	(0.031)
$\boldsymbol{McFadenR^2}$	0.42	0.43	0.41	0.40	0.41	0.43	0.44	0.41	0.40
AIC	961,026	864,056	878,645	644,736	703,765	860,972	833,048	888,949	692,672
LL	-480,503	-432,018	-439,313	-322,358	-351,872	-430,476	-416,514	-444,465	-346,326
Observations	328,281	305,263	305,618	243,539	232,060	305,026	272,793	302,648	244,223

Note: Model specifications for dependent variable: (1) Overall Score, (2) Seat Comfort, (3) Customer Service, (4) Cleanliness, (5) Food and Beverage, (6) Legroom, (7) In-flight entertainment/Wi-Fi, (8) Value for Money, and (9) Check-in and Boarding. Standard errors are reported in parentheses. $*\boldsymbol{p < 0.05; **p < 0.01; ***p < 0.001}$.

2.6 Cultural Effects on the Informational Content of Online Reviews

A limitation of the numerical ratings provided by passengers against a set of predefined aspects is that their information content is constrained by the availability of the measurement scales. As such, other service elements, which are not measured directly and may be of importance for passengers, are not captured. Online reviews have the advantage of coupling the numerical ratings with open-ended responses, where passengers can reflect on their experience with the service provider. This information allows the performance of qualitative analysis shedding further light on the topics of interest. Using recent advances in topic models, this study explores how the textual content of online reviews vary with passengers' cultural dimensions. As a tool to perform this analysis, a novel text mining method is used, which advances established topic models based on Bayesian inference, such as LDA (Blei et al., 2003).

Topic models, an unsupervised machine learning technique, identify and organise a textual corpus in groups of words that appear together deriving a topic-word distribution, based on hidden semantic structures. Moreover, documents can be grouped in a particular topic deriving a document-topic distribution. Those techniques have recently gained popularity in academic research (Guo et al., 2017; Tirunillai and Tellis, 2014) as methods that allow researchers to perform text analysis in large corpora offering at the same time reproducibility of the results. For this analysis, the structural topic model (STM) (Roberts et al., 2014, 2016) is employed. STM is a new methodology that extends established probabilistic topic models, such as LDA (Blei et al., 2003). The novelty of STM, compared to other probabilistic topic models, is that it allows the inclusion of document metadata (or covariates) in the prior of the document-topic and topic-word distribution. This relaxes the restrictive assumption

of exchangeability, where all authors are considered equally likely to write a document (Blei et al., 2003). As such, the probability of topic prevalence can be modelled, taking into account other covariates, while the change in this probability can be observed across the range of values for these covariates.

The analysis is performed in three steps: the first step considers the pre-processing of the text; the second step identifies the number of topics that explain better the variability of the corpus and the final step examines how the topics change with variations in cultural dimensions.

2.6.1 Text Preparation for Analysis

In accordance with the prior literature, a pre-processing workflow is used to prepare the text for the analysis (Guo et al., 2017; Tirunillai and Tellis, 2014). First, the analysis is constrained only to reviews written in English. From the initial sample of 557,208 reviews, there are 254,424 reviews in English, and those reviews comprise the initial corpus for the analysis. Then, the usual steps based on previous literature included; (a) word text tokenization which is the act of breaking up a sequence of strings into pieces (words in the specific case), (b) elimination of numbers and punctuation marks, (c) removal of English language stop words (using the SMART stop-word list), and (d) removal of context-specific stop words, such as the names of the airlines, cities etc.. The resulting corpus is tagged using part-of-speech (POS) tagging. Following the prior literature, token filtering is applied in order to keep only nouns, adverbs, and adjectives as these are the parts that contain information. For the step (d), the Stanford Natural Language Processing (NLP) parser is used. After pre-processing, the remaining words are lemmatised, and a filter is applied in order to keep only those terms appearing in at least 1% of the initial corpus. This process further reduces the final corpus to 184,502 reviews.

2.6.2 Estimating the Number of Topics

The topic solution is estimated in R with the STM package (Roberts et al., 2015). An iterative process is applied for the selection and evaluation of the number of topics. This process is based on three particular criteria: (a) held-out likelihood (b) exclusivity of topic words to the topic and (c) semantic coherence.

The estimation procedure is initialised with a spectral decomposition following the algorithm of Mimno and Lee (2014), and a seed vector of the possible values for the candidate number of topics (K) was constructed. Considering that the primary metadata associated with passengers' textual feedback is the numerical rating that captures the overall satisfaction, the ratings are considered as the primary prevalence covariates. For the topic solution, the seed vector of the number of topics has a range of $\boldsymbol{K_{min} = 8}$ topics which is the number of rating aspects that are provided by TripAdvisor, evaluating the held-out likelihood to a maximum of $\boldsymbol{K_{max} = 40}$ topics.

The candidate topic solutions with the highest held-out likelihood are then evaluated against the ratio of their semantic coherence and exclusivity. Roberts et al. (2016) proposed a combination of these measures through the FREX criterion, which considers a weighted harmonic mean of a word's rank in terms of exclusivity and frequency in a k-topic solution.

$$\boldsymbol{FREX_{k,u}} = \left(\frac{\boldsymbol{\omega}}{\boldsymbol{ECDF}(\boldsymbol{\beta_{k,u}} \sum_{\boldsymbol{j=1}}^{\boldsymbol{k}} \boldsymbol{\beta_{j,u}})} + \frac{\boldsymbol{1-\omega}}{\boldsymbol{ECDF}(\boldsymbol{\beta_{k,u}})}\right)^{\boldsymbol{-1}}, \tag{2.3}$$

where $\boldsymbol{k \in K}$ is the k-th topic, $\boldsymbol{u}$ is the word under consideration, $\boldsymbol{\beta}$ is the word distribution for this topic, and $\boldsymbol{\omega}$ a prior used to impose exclusivity (in the case it was equal to 0.7).

After considering the above criteria, a K=20 topic solution is found to describe the variability of the corpus given the relationship. The final corpus contains 184,502 reviews with a 413-word dictionary. The labelling of the topics is based on the FREX words as well as on representative reviews from each topic. The author also asked for the help of two experts with experience in dealing with airline customer service to provide their insights. Both experts agreed that the selected topic solution had a high degree of coherence in terms of the top loading reviews and the assigned labels.

In Table 2.5, the relevant topics are presented along with the group of the most representative words and their overall proportion to the corpus. Delays and staff praise are the two topics that have the highest prevalence. It is also evident that all the categories that receive a numerical rating in TripAdvisor are present in the discussion. However, other significant topics are observed, such as the topic that refers to service failure recoveries and issues like refunding and communication with the company. These topics are not measured directly from TripAdvisor, but the reviewers refer to them. This evidence provides further support to the idea of the topic modelling and the incremental information the passengers' review text provides.

Table 2.5 Topic solution

#	Topic Label	Prop. (%)	Top 7 FREX words
1	Delays	11.56	delay, minute, late, hour, due, connection, departure
2	Staff (Praise)	9.24	friendly, helpful, professional, efficient, clean, courteous, staff
3	Seating (Critique)	6.68	row, front, seat, uncomfortable, aisle, exit, window
4	Value for Money	6.59	good, overall, value, food, perfect, money, bit
5	Traveler Experience	5.97	many, best, domestic, past, job, need, possible
6	Staff (Critique)	5.94	attendant, water, stewardess, old, steward, terrible, passenger
7	Check-in/Boarding	5.91	check, luggage, hand, security, easy, queue, allowance
8	Mode of Travel	5.82	trip, return, direct, stop, family, home, non
9	In-flight Entertainment	5.42	entertainment, movie, screen, inflight, selection, average, quality
10	Service Failure/Response	5.22	phone, email, credit, call, agent, card, change
11	Staff Assistance	5.16	crew, cabin, holiday, special, child, nothing, much
12	Ticket Cost	5.01	low, price, budget, cheap, cost, cheaper, fare
13	Food/Beverage	4.86	coffee, snack, meal, drink, sandwich, free, tea
14	Baggage Policy	3.46	bag, carry, charge, line, checked, fee, item
15	Business Class	3.03	flat, lounge, business, class, bed, sleep, access
16	Wi-Fi Connectivity	2.64	wifi, free, board, duty, app, hassle, access
17	Economy Premium	2.16	economy, premium, comfort, upgrade, difference, section, worth
18	Legroom (Praise)	2.06	leg, plenty, extra, lot, comfortable, seating, bit
19	Legroom(Critique)	1.86	room, space, enough, tall, foot, amount, bit
20	Frequent Flyer	1.41	flyer, mile, world, member, traveller, point, part

2.6.3 The Effect of Cultural Dimensions on Review Text

One advantage of the structural topic modelling is that it provides the flexibility to evaluate the effect of each cultural dimension on the prevalence of the topics. To achieve that, the algorithm allows regressing the topic proportions from the estimated topic solution with the variables of interest, which are the Hofstede cultural dimensions, accounting at the same time for all the controls used in the previous specification. This approach draws proportional odds from the conditional expectation of topic prevalence.

The results of this approach are depicted in Figure 2.1. The graphical representation displays the expected change of topic proportions across the cultural dimensions continuum and the transition from low to high values for each of the Hofstede dimensions. This provides interesting insights on how the culture affects the topics discussed from the reviewers and the importance passengers from different cultures give to different service aspects. In the continuum of the power distance dimension, passengers from societies with higher power distance are more critical to staff and more sensitive to baggage policies and recovery failures. In contrast, passengers from low power distance societies are more willing to praise the staff, and they value staff assistance and in-flight services, such as food/beverage and entertainment. At the continuum of the uncertainty avoidance dimension, the observed changes are smaller in magnitude as most of the topics are placed around the dotted line which represents the zero effect. The two categories that do not seem to follow that pattern are the ticket cost, which is a topic with a more significant effect observed on high uncertainty avoidance countries, and the staff assistance which is more prevalent on the discussion of passengers originated from countries ranked low in that dimension.

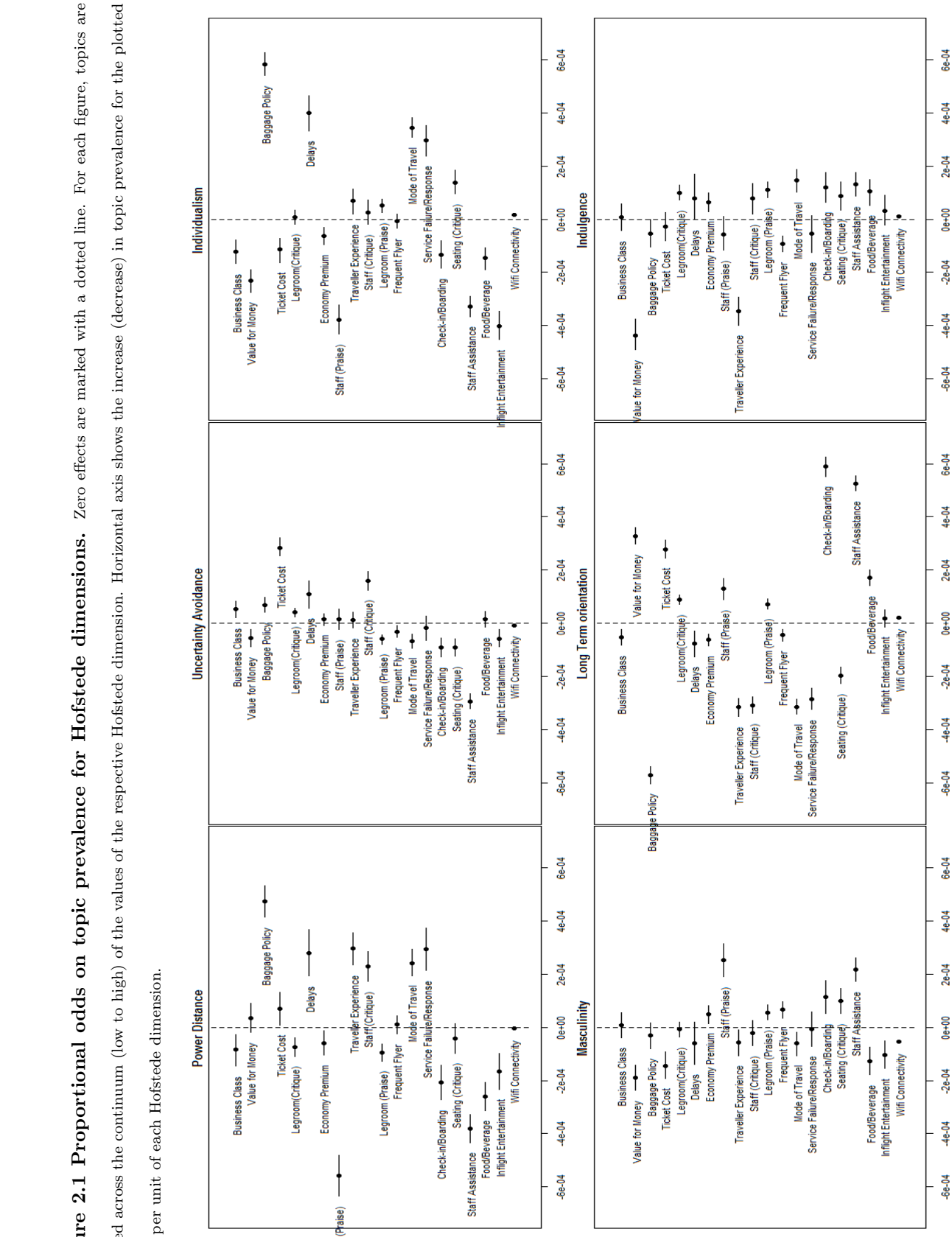


Figure 2.1 Proportional odds on topic prevalence for Hofstede dimensions. Zero effects are marked with a dotted line. For each figure, topics are plotted across the continuum (low to high) of the values of the respective Hofstede dimension. Horizontal axis shows the increase (decrease) in topic prevalence for the plotted topic per unit of each Hofstede dimension.

The masculinity continuum exhibits similar effects in magnitude. The changes in topics are relatively small compared to other distances and similar to those observed for uncertainty avoidance and indulgence. More pronounced effects are observed for the topics that focus on staff praise and staff assistance. These topics matter more for passengers from masculine societies, while for the counterparts from feminine societies pricing is a more critical topic and this is reflected by the discussion related to ticket cost and value for money. The discussion on the topics in the individualism dimension has more variability. More specifically, the baggage policies of carriers, delays, and service failures are discussed extensively by individualistic societies' passengers. The opposite effect is observed for the discussion about the staff and the tangible service aspects, such as in-flight entertainment and food/beverage.

Passengers from long-term oriented societies are more sensitive to pricing and discuss more the value for money and ticket cost, though, this effect is found to be in the opposite direction for baggage policies. Finally, for the indulgence dimension, the most pronounced effect is found on the discussion of the topics related to the value for money which is stronger for the passengers from more constrained societies.

2.7 Cultural Bias Correction and the Effect on Airline Ranking

Both analyses presented in the previous sections reveal that culture has an effect on online reviews and this is observed on both the numerical and textual part. At this point, the study showcases how this may affect the information content of online reviews. It is known that online reviews form an important source of information and a significant influence on customers' purchase decisions (Dellarocas et al., 2007; Dwyer, 2007; Godes and Mayzlin, 2004). In the literature, there is a consensus that consumers do not only pay attention to the star rating (review valence) and the number of available reviews (review volume), but they also read the review content to learn more about the product characteristics and evaluate their perceived value (Chatterjee, 2001; Park and Kim, 2008). This is more apparent for services due to their intangible, heterogeneous, and inseparable nature (Berry and Parasuraman, 2004) where consumers rely more on Word-of-Mouth to lower their perceived risk and the uncertainty that derives from information asymmetry. Having that in mind, and considering that online reviews presented in popular platforms, such as TripAdvisor or Booking.com, stem from an international pool of reviewers with different cultural backgrounds, it should be expected that cross-cultural differences may distort the information content of online reviews.

Failure to account for this influence could lead to wrong decisions and expectations from customers that try to deduce the quality of a service provider through this information source. In this part of the thesis, the magnitude of that distortion is explored by showing how the information would change when accounting for cultural effects. In particular, the study gauges the difference between the overall ranking of airlines between the raw and standardised ratings that consider the country-of-origin

of the reviewer. The overall standardised satisfaction $\boldsymbol{r}$ of the reviewer $\boldsymbol{y}$ net of cultural effects is estimated as follows:

$$\boldsymbol{r_y = \frac{r_i - mean(r_c)}{dispersion(r_c)}}, \tag{2.4}$$

where $\boldsymbol{r_i}$ is the observed rating (overall score) of the reviewer $\boldsymbol{i}$ which is standardised by the overall mean and dispersion of all reviews $\boldsymbol{(r_c)}$ submitted to TripAdvisor by reviewers from the same country (within-country standardisation). This is a quite common approach and widely used to deal with issues of cross-cultural response biases (Fischer, 2004). To make the results robust and not exhaustive there are several filters in the selection of the sample used in this analysis. For that purpose, a threshold is posed that considers only reviews submitted by passengers coming from countries that account for at least 0.5% of the total sample. A second filter requires a carrier to have at least 0.5% of total reviews. The result of these two filters produces a sample of 37 international airlines. These 37 airlines are ranked based on their raw overall score, but also the modified overall score from the standardised process. In order to see the loss of information by not accounting for the cultural influence, Kendall's tau rank correlation coefficient is estimated to check the concordance among the two rankings. The results indicate a strong ($\boldsymbol{\tau = 87\%}$) and significant ($\boldsymbol{T = 946, p < 0.000}$) coefficient of concordance. However, the coefficient is far from the complete agreement level. That level of disagreement suggests that when passengers' cultural traits are not taken into consideration, this can lead to a distortion of the ranking information extracted from the passenger reviews. Table 2.6 shows the top twenty airlines ranked by the overall score (Raw Rank) and the standardised overall score (Standardised Rank). The differential effect of the dispersion in the ranking of each airline (DRank)

is shown in the final column. It should be noted that the results are similar applying different sampling filters or using the whole sample.

Table 2.6 The effect of cultural differences on the ranking of airlines

Airline	Raw Rank(A)	Airline	Standardised Rank(B)	DRank(A-B)
Azul	1	Emirates	1	-3 ↓
Singapore Airlines	2	Southwest Airlines	2	-1 ↓
Emirates	3	Singapore Airlines	3	+2 ↑
Southwest Airlines	4	Azul	4	+2 ↑
Jet2	5	Jet2	5	0
Aeroflot	6	JetBlue	6	-6 ↓
JetBlue	7	Qatar Airways	7	+1 ↑
Qatar Airways	8	Virgin Atlantic Airways	8	+1 ↑
Virgin Atlantic	9	Turkish Airlines	9	+1 ↑
Turkish Airlines	10	Lufthansa	10	+1 ↑
Avianca	11	KLM	11	+3 ↓
KLM	12	Aeroflot	12	+1 ↑
Lufthansa	13	Cathay Pacific	13	+3 ↑
Jet Airways	14	Avianca	14	-1 ↓
Cathay Pacific	15	Jet Airways	15	+2 ↑
LATAM Airlines	16	Qantas	16	-3 ↓
Qantas	17	Delta Air Lines	17	+1 ↑
Delta Air Lines	18	Norwegian	18	+1 ↑
Norwegian	19	LATAM Airlines	19	+1 ↑
Aerolineas	20	Transavia	20	>-1 ↓

2.8 The Joint Effect of Customers' and Service Providers' Culture

A common point for the studies that investigate the effect of cultural traits on customer expectations and evaluations is that they take into consideration only the culture of the customer, neglecting the effect of the service provider's culture. Current literature neglects to account for the fact that service evaluations are highly regulated from the interaction of the customer with the service provider. National culture is also found to influence the way firms are structured and to some extent deliver value. In the management literature, the convergence and divergence debate remains inconclusive. The convergence viewpoint posits that as nations become more industrialised, managers and firms will follow similar practices, while the divergence viewpoint states that the effect of national culture is stronger and the value system of the workforce will remain unchanged (Naor et al., 2010; Ralston et al., 1995; Reisinger and Crotts, 2010). Culture is found to play a significant role, among others, both on quality practices followed by firms (Lagrosen, 2003; Vecchi and Brennan, 2011) and their ethical behaviour (Husted et al., 1996). Service quality is interpreted as a judgement of a customer's perception of provided services (Hussain et al., 2015) and significantly affects passenger loyalty and commitment (Chen and Hu, 2013).

It is reasonable to expect that the service provider's culture affects the quality of product offerings and value-adding activities. What happens for example when a customer from an individualistic culture who cares more about her satisfaction receives the service of a provider from a collectivist culture that may consider that all customers should be equally treated? Alternatively, what happens when a short-term oriented customer who cares about immediate results interacts with a short-term oriented service provider who for the sake of present-day profit may sacrifice a long-term

relationship with the customers? Would recent cases of airline customer service that attracted global attention (for example the United Express Flight 3411 incident, [1] or the recent Emirates episode where a passenger was detained in Dubai after being offered alcohol in flight when travelling to the country[2]) occur if the cultural background of the airline and/or the passenger were different? Given the potential implication of the examples presented here, it is argued that culture incongruence between providers and customers may be responsible for customer service satisfaction detriments. When customer cultural values do not fit with those of the service provider, this may explain the negative attitudes towards the providing organisation. The examination of the cultural dimensions under the prism of the two culture polarities may give rise to a new understanding of the role of culture in service evaluations.

There is evidence that lends support to the idea that the national culture of the service provider through several actions may also affect the overall quality of the service offered. For example, practitioners and firms in countries placed high in power distance are more likely to follow nationally agreed cues, such as ethical behaviour (Westerman et al., 2007). Service providers from countries with a low degree of uncertainty avoidance may be more tolerant on schedule interruptions, which may result to a reduction on passengers' satisfaction (especially for those passengers coming from cultures with a high degree of uncertainty avoidance). In relation to firms' behaviour, companies from countries ranked higher in uncertainty avoidance are expected to be more intolerant to unethical actions and perceive other stakeholders

[1] See, for example, "Passenger dragged off overbooked United flight", article in the CNN published on 11/04/2017 (`http://edition.cnn.com/2017/04/10/travel/passenger-removed-united-flight-trnd/index.html`)

[2] See, for example, "Flying into trouble over a glass of wine", article in the Independent published on 17/08/2018 (`https://www.independent.co.uk/travel/news-and-advice/dubai-uae-ellie-holman-drinking-flight-glass-wine-alcohol-arrest-imprison-jail-a8495756.html`)

as more important than them (Vitell et al., 1993).

Firms from more individualistic countries are also more likely to follow illegitimate routes for success (Martin et al., 2007), while companies from collectivist countries exert higher customer orientation (Yilmaz et al., 2005). Service providers from feminine cultures are expected to have more soft values such as being more caring, while firms from countries with a high masculinity score are more likely to engage in unethical behaviour and rely on practices such as dishonesty in advertising and environmental damage (Christie et al., 2003; Vitell et al., 1993). In general, masculinity is found to have a negative relationship with corporate responsibility (Ringov and Zollo, 2007). Long-term oriented providers will care about their sustainable performance, and, therefore, they will be more eager to satisfy their customers to secure further relationship. Future orientation also is associated with and promote continuous improvement (Naor et al., 2010). Short-term oriented providers will prefer to see their profits maximised to the present in one transaction (Ganesan, 1994) and, consequently, may offer less to the customer to achieve this goal. Finally, service employees from indulgent oriented societies tend to have a better understanding of customers' needs and expectations (Koc et al., 2017). All the aforementioned discussion presents the intuition for cultural effects on customer satisfaction that can be moderated by the culture of the service provider.

2.8.1 Limitation of Difference Scores and Polynomial Regression

The extant literature in international business and marketing explores the effect of cross-cultural differences using difference score measures, such as those proposed by Kogut and Singh (1988). Other approaches that employ the Mahalanobis distance (Berry et al., 2010; Kandogan, 2012) come with the additional advantage of accounting for the correlation among the dimensions. However, these methods have inherent

problems already identified in the literature. More specifically, difference scores methods suffer from reduced reliability, confounding effects, untested constraints, dimensional reduction and conceptual ambiguity (Edwards, 2002). Polynomial regression analysis (Edwards, 1994; Edwards and Parry, 1993) addresses such problems by replacing the difference scores with the individual components, as well as, their higher orders and interactions. This approach, combined with a three-dimensional space representation (response surface), allows to capture more complex relationships among the variables of interest and test their statistical significance.

In this part of the study, the response variable is the average rating score of passengers from a country $\boldsymbol{b}$ with airlines from a country $\boldsymbol{c}$ which is affected by the cultural traits that characterise both countries. The aggregation strategy followed compared to an individual level analysis serves two purposes: First, it addresses one of the limitations of Hofstede's dimensions. In particular, within-country variation exists (Donthu and Yoo, 1998) and, therefore, the examination of the relationship on the individual level may be problematic and noisy. By operationalising the aggregated satisfaction score between country pairs as a response variable, the study mitigates this issue as the aggregation of the rating score is more representative of the Hofstede measures. This approach is also in line with Beugelsdijk et al. (2017) who discuss that Hofstede's cultural dimensions are best applied at the aggregate level. In that way, the analysis poses a threshold of at least 30 reviews for each country pair to be included in the final sample. Second, the aggregation allows computational efficiency and elimination of convergence issues when evaluating the full model.

The general Response Surface Analysis (RSA) model is a two-step process. The first step involves a second-order polynomial regression of the two predictors of interest on the overall rating score $(\boldsymbol{Z})$. The predictors are:

$\boldsymbol{Y_i}$: which represents the cultural trait of the passengers for the i$^{\boldsymbol{th}}$ cultural dimension, and, $\boldsymbol{X_i}$: which represents the cultural trait of the airlines for the i$^{\boldsymbol{th}}$

cultural dimension.

In addition to exploring the six Hofstede dimensions of the customer and service provider, the analysis controls for the flight distance (as a proxy of service exposure), and the travel class (as a proxy of service level). These control variables are aggregated measures and are operationalised as percentages. To avoid influences of domestic bias (Balabanis and Diamantopoulos, 2004), those pairs where customer and airlines come from the same country are omitted. Finally, all variables are mean-centred and scaled. The model has the following specification:

$$\boldsymbol{Z = \beta_0 + \beta_1 X_i + \beta_2 * Y_i + \beta_3 * {X_i}^2 + \beta_4 X_i * Y_i + \beta_5 * {Y_i}^2 + \sum \gamma * \Omega + \epsilon,} \quad (2.5)$$

where $\boldsymbol{\Omega}$ is the matrix of the control variables.

The second step of the analysis involves the computation of four surface coefficients to test the congruence (agreement) and incongruence (disagreement), as well as, the existence of curve-linear effects. Specifically, the slope of the line of the perfect agreement is defined as $\boldsymbol{\alpha_1 = \beta_1 + \beta_2}$. A statistically significantly positive (or negative) $\boldsymbol{\alpha_1}$ suggests that the outcome variable, e.g., overall score, increases (decreases) when both predictors increase.

The second surface test assesses the curvature along the line and is estimated as $\boldsymbol{\alpha_2 = \beta_3 + \beta_4 + \beta_5}$. A statistically significant positive (negative) $\boldsymbol{\alpha_2}$ means an upward (downward) curve. In other words, the higher the congruence of the two predictors the higher the outcome variable. The coefficients $\boldsymbol{\alpha_3 = \beta_1 - \beta_2}$ and $\boldsymbol{\alpha_4 = \beta_3 - \beta_4 + \beta_5}$ are the relevant values for the line of disagreement (incongruence). The coefficient $\boldsymbol{\alpha_3}$ represents how the direction of incongruence is related to the outcome. A positive $\boldsymbol{\alpha_3}$ reveals that when $\boldsymbol{X > Y}$ then the outcome is higher than in the case where $\boldsymbol{Y > X}$.

The opposite relationship is found in the case of a significant negative coefficient. Finally, the coefficient $\boldsymbol{\alpha_4}$ shows the curvature across the line of incongruence, where a positive (negative) coefficient indicates an upward (downward) curve.

2.8.2 Results

The analysis is performed in R using the RSA package (Schönbrodt, 2016). The correlation matrix reported in Table 2.7 displays that several cultural dimensions from both carriers and passengers may affect the overall satisfaction. However, this is only indicative as these effects do not account for control variables or the joint effect of both cultures and they only describe a strictly linear relationship. Results from the polynomial regression and response surface analysis are reported in Table 2.8, while the relationships are also depicted in 3-dimensional planes in Figure 2.2. From the results, several interesting findings can be derived.

Table 2.7 Correlation matrix

	Mean	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Rating	3.70												
(2) Power (P)	53.24	0.25***											
(3) Uncertainty Avoidance (P)	64.58	0.13***	0.35***										
(4) Individualism (P)	59.38	-0.16***	-0.70***	-0.27***									
(5) Masculinity (P)	54.42	-0.08*	-0.12***	0.03	0.22***								
(6) Long-term Orientation (P)	50.87	0.01	0.20***	0.17***	-0.15***	0.21***							
(7) Indulgence (P)	52.68	-0.14***	-0.53***	-0.34***	0.40***	-0.01	-0.54***						
(8) Power (A)	53.37	-0.02	0.08*	-0.06	-0.06	0.06	0.02	-0.03					
(9) Uncertainty Avoidance (A)	59.81	0.03	0.01	0.10**	0.05	0.02	-0.05	0.03	0.13***				
(10) Individualism (A)	53.42	-0.20***	-0.05	0.08*	0.02	-0.06	-0.02	0.01	-0.74***	-0.10**			
(11) Masculinity (A)	50.65	-0.08*	0.07	0.03	-0.06	0.04	0.01	-0.02	-0.02	0.01	0.11**		
(12) Long-term Orientation (A)	51.23	0.24***	0.07	-0.04	-0.03	0.04	0.12**	-0.12***	0.08*	0.02	-0.09*	0.07*	
(13) Indulgence (A)	51.41	0.04	-0.07	0.04	-0.01	-0.05	-0.16***	0.13***	-0.45***	-0.12***	0.41***	-0.06	-0.46***

Regarding the power distance dimension, polynomial regression coefficients reveal that both cultures have a significant effect on the overall score. Specifically, the degree of a carrier's culture in power distance has a positive but insignificant relationship at the level values, however, for the squared values the coefficient is highly significant and negative ($\boldsymbol{\beta_3 = -0.045; p < 0.001}$) depicting an increasing negative association between the power distance of the service provider and the passengers' overall satisfaction. Both the linear and nonlinear effects for the same dimension for passenger's culture are significant revealing a positive relationship that increases with higher values in that dimension ($\boldsymbol{\beta_2 = 0.095; p < 0.001}$ and $\boldsymbol{\beta_5 = 0.037; p < 0.01}$).

On the other hand, for the response surface coefficients, the coefficient $\boldsymbol{\alpha_1}$ is significant and positive ($\boldsymbol{\alpha_1 = 0.087; p < 0.001}$) indicating that, on average, an increase for this dimension in both cultures leads to an increase in the overall satisfaction. Another insight from the results is that satisfaction is maximised when power distance is higher for passengers than carriers ($\boldsymbol{\alpha_3 = -0.102; p < 0.001}$). The graphical representation of this relationship offers a similar intuition. A strong effect of the passengers' power distance is observed that exponentially increases with higher values. At the same time, the association between a carrier's power distance and overall satisfaction is characterised by a small concavity. For this cultural dimension, the maximum satisfaction is achieved at higher values of power distance for the customer but medium values for the carrier. However, the effect of congruence is very strong at low values and the minimum satisfaction is observed when a low power distance customer meets a provider from a similar culture. Lack of respect for the authority either from the side of the passenger or the carrier may lead to conflicts, resulting in low customer ratings.

The response surface analysis for uncertainty avoidance reveals that both the effects of carrier's and passenger's culture are positive and significant with an increasing satisfaction effect of the latter in higher values ($\boldsymbol{\beta_2 = 0.058; p < 0.001}$

and $\boldsymbol{\beta_3 = 0.069; p < 0.001}$). However, this relationship is not depicted in the surface where the minimum satisfaction lies on the centre of the 3-d plane and the maximum satisfaction is achieved mainly for passengers with high uncertainty values when carriers found at both extremes (very high and very low scores in the relevant cultural dimension). Response surface results point out to the same direction revealing a complex relationship with evidence of a positive association for both cultural congruence and incongruence with the overall score, but also an increasing satisfaction when both dimensions increase ($\boldsymbol{\alpha_1 = 0.075; p < 0.001, \alpha_2 = 0.066; p < 0.01}$ and $\boldsymbol{\alpha_4 = 0.083; p < 0.01}$).

When it comes to individualism, the effects are more straightforward. The results of the polynomial regression show that this dimension has a negative effect on the overall score for both the provider's ($\boldsymbol{\beta_1 = -0.090; p < 0.001}$) and passenger's ($\boldsymbol{\beta_2 = -0.071; p < 0.001}$) culture. The relevant response surface coefficient indicates that increases in this dimension for both cultures are associated with lower overall satisfaction ($\boldsymbol{\alpha_1 = -0.161; p < 0.001}$). This relationship is also depicted in the relevant graph in Figure 2.2, where the maximum satisfaction is achieved when a passenger from collectivist countries meet providers from similar cultural traits.

The respective coefficients for masculinity reveal a significant negative effect only of passenger's culture ($\boldsymbol{\beta_2 = -0.038; p < 0.05}$ and $\boldsymbol{\beta_5 = -0.018; p < 0.05}$) on satisfaction rating. Though, the response surface test supports that moving from lower to higher values in the masculinity continuum for both passenger and provider is linked to lower satisfaction ($\boldsymbol{\alpha_1 = -0.065; p < 0.01}$). This relationship is also depicted graphically in the three-dimensional plot suggesting a moderate effect where passengers' satisfaction is maximised when two feminine cultures are met.

With regards to the long-term orientation, only the provider's culture appears to exert a significant positive effect ($\boldsymbol{\beta_1 = 0.099; p < 0.001}$). The response surface coefficients suggest an increase for both cultures in this dimension leading to an

Table 2.8 Polynomial Regression and response surface analysis

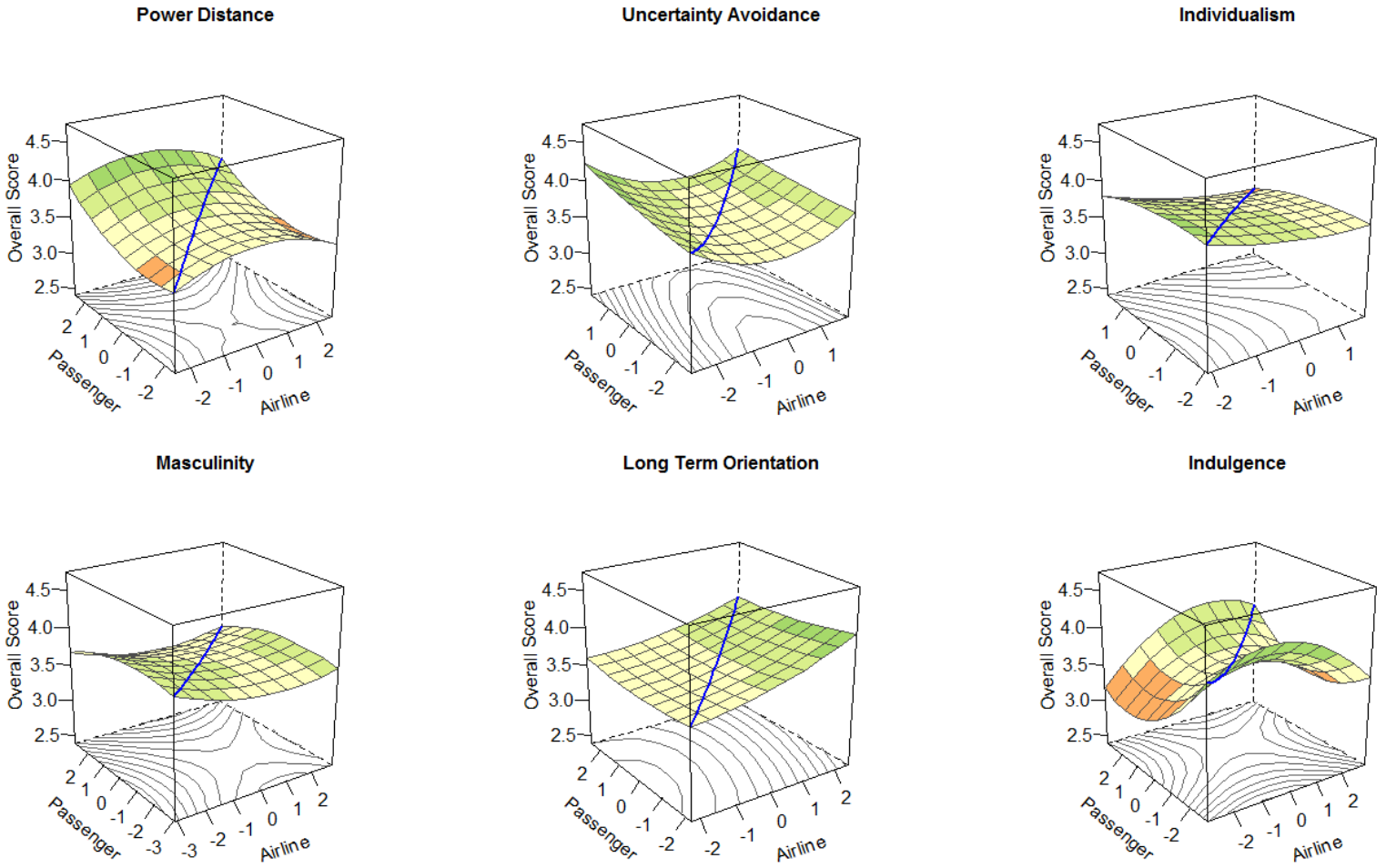
	Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-Term Orientation	Indulgence
Variable	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)
β_0	3.688 (0.024) ***	3.605 (0.026) ***	3.684 (0.032) ***	3.676 (0.021) ***	3.651 (0.026) ***	3.674 (0.024) ***
β_1	-0.007 (0.014)	0.017 (0.016)	-0.090 (0.015) ***	-0.027 (0.019)	0.099 (0.015) ***	0.016 (0.014)
β_2	0.095 (0.016) ***	0.058 (0.017) ***	-0.071 (0.016) ***	-0.038 (0.015) *	-0.015 (0.016)	-0.058 (0.015) ***
β_3	-0.045 (0.013) ***	0.069 (0.015) ***	0.023 (0.019)	0.020 (0.014)	0.017 (0.014)	-0.054 (0.011) ***
β_4	-0.004 (0.014)	-0.008 (0.016)	-0.006 (0.014)	0.003 (0.013)	-0.009 (0.015)	0.034 (0.016) *
β_5	0.037 (0.014) **	0.005 (0.015)	-0.028 (0.018)	-0.018 (0.009) *	0.011 (0.016)	0.054 (0.012) ***
R^2	0.09	0.04	0.07	0.02	0.06	0.08
Surface tests						
α_1	0.087 (0.020) ***	0.075 (0.02) ***	-0.161 (0.022) ***	-0.065 (0.025) **	0.084 (0.021) ***	-0.041 (0.019) *
α_2	-0.013 (0.021)	0.066 (0.023) **	-0.011 (0.030)	0.005 (0.021)	0.019 (0.024)	0.035 (0.019)
α_3	-0.102 (0.022) ***	-0.041 (0.025)	-0.018 (0.021)	0.011 (0.024)	0.114 (0.022) ***	0.074 (0.022) ***
α_4	-0.005 (0.024)	0.083 (0.030) **	0.000 (0.029)	0.000 (0.02)	0.038 (0.028)	-0.034 (0.028)

average higher satisfaction ($\boldsymbol{\alpha_1 = 0.084; p < 0.001}$) which is higher when compared to passengers the airline carrier comes from a more long-term oriented culture ($\boldsymbol{\alpha_3 = 0.114; p < 0.001}$). Examining the three-dimensional plot for this dimension in Figure 2.2, it is observed that short-term oriented customers meet short-term oriented service providers at the point of minimum satisfaction.

Finally, indulgence, the latest addition in Hofstede's framework, reveals the most interesting insights. From the graphical representation in the relevant section of Figure 2.2, it is clear that compared to the other dimensions indulgence exhibits the highest variation for the overall satisfaction, but without a clear direction. Both cultures appear to influence overall satisfaction with that of the passenger following a convex function ($\boldsymbol{\beta_2 = -0.058; p < 0.001;}$ and $\boldsymbol{\beta_5 = 0.054; p < 0.001}$) and a negative relationship for the culture of the provider ($\boldsymbol{\beta_3 = -0.054; p < 0.001}$). At the same time, indulgence is the only dimension that polynomial regression estimates a significant and positive coefficient for the interaction of the two cultures ($\boldsymbol{\beta_4 = 0.034; p < 0.001}$). Response surface tests reveal that increases in both cultures for that dimension are associated with lower satisfaction ($\boldsymbol{\alpha_1 = -0.041; p < 0.001}$). Moreover, satisfaction is higher when indulgence is found higher for carriers than passengers ($\boldsymbol{\alpha_3 = 0.074; p < 0.001}$). The relationship, as depicted in the relevant section of Figure 2.2, is complex, and the model fails to capture the exact association of the two cultures with overall satisfaction. This is also obvious from the conflicting results of the polynomial interaction coefficient and response surface tests. The surface plane reveals that when a passenger from a culture with a very high (or very low) degree of indulgence meets a service provider from a similar culture, then the satisfaction is high. On the other hand, when two cultures at the opposite extremes are met, it seems that the overall satisfaction drops at the lowest levels.

Figure 2.2 Three-dimensional representation of the effect of the carrier and passenger cultural traits on the overall satisfaction.

Note: Country pairs = 733, the line depicted in blue is the line of agreement (or congruence). Contour plots are depicted at the bottom.



2.8.3 Robustness Checks

In order to assess the robustness of the results, several alternative specifications are evaluated. The first alternative deals with the main dependent variable, the overall score. The overall satisfaction can be considered as an aggregated measure of passenger satisfaction with a battery of service aspects some of which are not affected by cultural factors (e.g., legroom, seat comfort). Because of that, it may not completely capture the effect of culture. Alternatively, the rating that passengers provide for the customer service aspect is employed as a response variable. In so doing, the focus is on a service aspect that is more vulnerable to cultural influences compared to the overall score. Customer service is expected to be substantially influenced by culture due to direct human interactions. To this end, the centre of the analysis is on the in-flight service (customer service) aspect.

The rationale is that firms impose practices and monitor the implementation from their employees and, as such, firms' national culture has a direct effect on the interaction with customers. However, the staff of airlines, especially the cabin crew, sometimes is usually quite diverse, comprised of employees from many different nationalities and cultural backgrounds. In that case, employees' culture may be more dominant than the culture imposed by the firm. To alleviate such concerns, the study also examines the second direct service aspect found in the sample, i.e., satisfaction with check-in and boarding. This is done by examining only the flights where the departure country is the country of origin of the airline. The common practice in those cases is that the national identity of ground service employees is the same as that of airlines.

The third alternative deals with the concerns if the country of residence of the passenger reflects her true culture. There are countries with a high percentage of foreign-born population, and in those cases, passengers' country of origin is possible

to be different from the country of residence. The existence of a small number of countries with a high number of immigrants should not distort the results because the overall sample represents most of the countries with a relatively low percentage of foreign-born population on average. However, to address this issue, the basic analysis is repeated by excluding countries that have more than 10% foreign-born population based on the UN International migration report 2017.

The last approach deals with the problems that may arise from the aggregation of the control variables used in the previous analysis. This approach could lead to a substantial loss of information. To address such concerns and since the relevant information for each reviewer is known, a two-stage approach is followed. In the first step, the individual overall satisfaction is regressed to several control variables about the specific flight or reviewer that may explain this score (such as cabin class, flight distance and reviewer level of contribution that capture the experience of a passenger). The second step involves the same methodology used in the basic model, but instead of the overall score as a dependent variable, the residuals from the previous regression are used which capture the unexplained part of passengers' satisfaction from the control variables. The results from all the robustness checks are reported in the appendix in Tables A.1, A.2, A.3, and A.4 and Figures A.1, A.2, A.3, and A.4 and reveal a very similar direction with the previous findings.

Chapter 3

Psychological Effects on Online Reviews and Product Quality Reflections

3.1 Introduction

Over the course of the last two decades, the Internet has profoundly changed the way consumers shop (Grewal and Levy, 2009). One of the main drivers behind this transformation has been the emergence and proliferation of online feedback mechanisms that allow consumers to seek product opinions and reviews from other consumers before making a purchase decision (Dellarocas, 2003). User-generated content is found to exert a more powerful influence on consumer attitudes than content generated from marketers (Huang and Chen, 2006; Chiou and Cheng, 2003). This effect is more prominent to services due to their intangible, heterogeneous, and inseparable nature (Berry and Parasuraman, 2004). For example, a common practice for consumers in the tourism and hospitality sector is to visit popular platforms to gather information about the price and quality of the service of interest. However, while for the price customers have discernible available information, this is not the case for the quality. Consequently, to reduce this information asymmetry consumers consult travel-related personal experiences published online on these platforms from previous customers. In a recent study, 95% of travellers report that they read online reviews with an average

of 6-7 reviews for leisure customers and 5 reviews for business customers. [1]

Due to the economic importance of online reviews, there is an emerging stream of studies in the academic literature that investigates this information tool and its impact on products and services from different perspectives. In particular, there are studies that explore the impact of reviews on sales (Chevalier and Mayzlin, 2006; Dellarocas et al., 2007), the reviewers' motives (Hennig-Thurau et al., 2004), the elements that make a review useful (Mudambi and Schuff, 2010; Pan and Zhang, 2011), the distribution characteristics of reviews and their biases (Hu et al., 2009; Duan et al., 2008; Li and Hitt, 2008). A significant portion of the studies takes place in the tourism and hospitality sector. Utilising the plethora of online travel platforms, scholars examine the impact of online reviews on consumer intentions (Sparks and Browning, 2011; Vermeulen and Seegers, 2009), the effect of content and reviewer characteristics (Sparks et al., 2013; Fang et al., 2016), and discuss managerial responses to eWOM (Sparks et al., 2016).

While the majority of the extant scholarly thought focuses on the effect of online reviews on sales and firm performance or the effect of review characteristics on customer decisions, there is a significant asymmetry in relation to the literature that examines the antecedents of online review characteristics. In the previous chapter, the effect of culture on review valence was explored. In this chapter, the aim is to further add to this limited literature by examining the effect of psychological drivers, and specifically those described by the Construal Level Theory (CLT). In this part of the thesis, the underlying question is whether or not the time distance between experiencing the service and posting the online review affects the rating score the reviewers provide about their experience. The study also explores if similar dynamics are present for the geographical and social distances.

The main theory behind consumer satisfaction and dissatisfaction the expectation-

[1] https://www.tnooz.com/article/trustyou-how-do-consumers-read-travel-reviews/

confirmation/disconfirmation theory (Oliver, 1980). This theory posits that consumers' a posteriori evaluations are based on the experienced deviations of their expectations. However, a product's or service's judgement is a cognitive process which is based on the memory individuals have about the experienced events. The CLT theory from social psychology suggests that several dynamics (so-called distances) influence the way individuals think and recall events (Trope and Liberman, 2010). When an event is perceived as "closer", then people tend to think about it in a more concrete way focusing on specific aspects and details (low-level construals). If an event is perceived as more "distant", then people think it in a more abstract way (high-level construals). The goal of this chapter is to investigate the effect of those dynamics for durable goods and services.

For the particular case of services, following a recent study by Huang et al. (2016), that investigates the review valence of online reviews for restaurants under the prism of the same theory (CLT), this study explores if similar dynamics are found on hotels' online reviews. Specifically, online reviews from TripAdvisor for all London hotels are examined, and the question is whether the review valence provided from hotel customers is affected by the elapsed time between experiencing a service and posting the review as well as the spatial distance between the self-reported location of reviewer and London. However, in addition to the study of Huang et al. (2016), this study also models a third dimension of CLT, that of social distance, using as a proxy the cultural distance between the two countries and an alternative specification which is based on the language of the review text. This is done by controlling for several customers' and hotels' characteristics, as well as, fixed effects. Results are in line with the findings of Huang et al. (2016) regarding the effects of temporal and spatial distance on review valence but reveal an opposite relationship for the social distance. Extending the analysis, the effect of psychological distances on the review text is explored. Based on the work of Brysbaert et al. (2014) that build a dataset

of 40,000 English word lemmas with their corresponding concreteness rating scores, the results show that more abstract review text is related with higher review valence. For robustness of the results, the findings are replicated in a second dataset of online reviews.

A question is whether the effect of psychological distances and in particular of the time distance, is also present in the case of durable goods. While the previous literature, as well as the first part of this chapter, suggest a positive relationship of the time distance with the expressed consumer satisfaction, this is examined under the prism of service encounters. However, the dynamics of the time distance on durable goods may not be similar for at least two reasons; (a) In most cases consumers are eligible to return the product within a specified period if it does not meet their expectations affecting the proportion of negative reviews that could be posted immediately after the purchase, and (b) durable products have a specific lifecycle and as such the passing of time may reflect expected failures. The second reasoning relies on the reliability dimension of product quality and it reflects the likelihood that a product will malfunction or fail within a specified time period (Garvin, 1987).

The rationale is that if online consumer reviews reflect product quality characteristics, the temporal evolution of their characteristics should be consistent with the time dynamics of the quality characteristics of the product itself. According to reliability management theory (Aarset, 1987; Klutke et al., 2003), the failure rate of a product (that reflects its reliability) follows over time a"bathtub curve". This represents the three distinct phases in a product's operational life: the "burn-in", the "useful-life", and the "wear-out" period. During the burn-in period, a relatively high number of failures is expected due to quality issues not identified in the production process. The failure rate, however, monotonically decreases until it reaches its minimum at the beginning of the useful-life period. During this period, only random failures are expected to occur, and thus, the failure rate remains constant. When

the product reaches the end of its operational life, though, the failure rate starts to monotonically increase due to wear. Based on these considerations, if online consumer reviews reflect the reliability dimension of product quality, one should expect their failure time dynamics to be consistent with the bathtub-shaped evolution of the failure rate over a product's operational life.

The temporal evolution of online consumer reviews has attracted considerable interest in the marketing literature (Chen et al., 2011; Godes and Silva, 2012; Hu et al., 2009; Li and Hitt, 2008; Moe and Schweidel, 2012). The present study differentiates from previous literature by examining for the first time the dynamics of the characteristics of online consumer reviews not as a function of time, but rather as a function of the time lapsed from purchasing a product to posting an online review for it. The motivation lies in the fact that reliability, the product quality dimension considered here, is a function of the operational life of a product. Therefore, an empirical link between online consumer reviews and reliability can only be established if the analysis is performed on the basis of a time dimension that is related to a product's operational life. The underlying conjecture is that for a certain product, the temporal distance from purchase to review posting reflects the consumers' reliability assessment of the product up to that point in its operational life. Since reliability is measured in terms of the failure rate, and the bathtub curve describes the evolution of the failure rate over a product's operational life, we would expect the characteristics of the online consumer reviews to evolve consistently over the time from purchase to posting the review.

This study has several contributions to the academic literature. First of all, this is the first study that captures the effect of the three dimensions of construal level theory on consumers' evaluations. The examination of the effect of the psychological distances in isolation and without accounting for the effect of the other distances as well as their interaction is not an optimal approach. Reduced sensitivity (Maglio et al.,

2013) or asymmetries (Zhang and Wang, 2009) could lead to misleading conclusions as some dimensions are more primary than others (Bar-Anan et al., 2007). A second contribution is methodological, and it is related to the measurement of the review text concreteness/abstractness. In this area and based on the work of Brysbaert et al. (2014), a novel bag of word approach is introduced. The 40,000 lemmas found in that dictionary allows one to perform the analysis on the whole sample of reviews and to derive more robust results.

Another significant contribution of this research is that it provides empirical evidence supporting the theoretical link between online consumer reviews and product quality characteristics. More precisely, the results for the case of durable goods indicate that the dynamics of the proportion of negative online reviews over the life of a product are consistent with the bathtub-shaped evolution of a product's failure rate, suggesting that online consumer reviews reflect the reliability dimension of product quality. In order to obtain this information, however, one needs to consider the evolution of the characteristics of the reviews not over time, but over the temporal distance from purchase to review posting. A further contribution of this study, therefore, is that it highlights that the information content of online consumer reviews is not limited to their evolution over time, but also extends to their evolution over the delay from buying a product to posting an online review for this product.

3.2 Theoretical Framework

3.2.1 Construal Level Theory

The way people remember their experiences is found to be inconsistent with their feeling about them the time they happened (Wirtz et al., 2003). Mitchell et al. (1997) report that individuals' recollection of events is more positive than their initial thoughts. In a series of investigations that include a trip to Europe, a Thanksgiving vacation, and a 3-week bicycle trip in California, they provide robust evidence supporting this idea. In all three situations, the participants have a "rosy view" of the past. Similar findings are revealed in the study of Sutton (1992) where again participants have a more idyllic view in their mind when they recall memories compared to their initial thoughts about an event. Construal Level Theory (CLT) of social psychology provides an explanation of those discrepancies. The main idea behind the theory is that the distance of individuals from the events change their mental representations (so-called level of construals) about them (Trope and Liberman, 2010).

This theory has identified four psychological distances and discuss their effects on construal levels. The first distance is the temporal or time distance, which refers to the time between the present and a future experience or the present and a past experience (Liberman and Trope, 1998). The second distance has as a reference point the physical space, known as the spatial or geographical distance (Fujita et al., 2006). Likewise, if an event takes place in near space, the mental representations people use are completely different than in the case of an event that takes place far away. Social distance is the third dimension and has as a reference point the perceived distance between groups or people (Polman, 2012). In its simplest form, when an individual thinks about a personal event or an event related to someone who is perceived as close to her uses completely different mental representations than for an event that

is related to an unknown individual. Finally, the last dimension named hypothetical distance is related to the likelihood of an event occurring in the future (Todorov et al., 2007; Wakslak et al., 2006). With the exception of the hypothetical distance which is not applicable in online reviews as consumer evaluations refer to realised and not hypothetical experiences, the intention of this study is to explore the effect of those dynamics on user-generated content.

The examination of the effect of psychological distances on consumers evaluations and choices is not something new, but most of the extant literature examines it under the prism of future decisions. Ding and Keh (2017) show how construal levels influence choice and service evaluation. They perform two lab experiments and find that intangible assets are more important at high construal levels and tangibles more critical at low construal levels. The study of Chung and Park (2013) discusses the effect of social and temporal distance on consumers' judgement for a company's ambivalent behaviour. The authors show that for a company perceived as close, the evaluation from customers is higher in the case of morality ambivalence than competence ambivalence. The findings of Zhao and Xie (2011) support the idea that the influence of other people recommendations is more significant when the reference point is the distant than the near future. Most of these studies have been performed in a laboratory context. However, evaluating the effect of those distances under realistic marketing mix conditions is challenging as asymmetries in their effect may be materialised (Zhang and Wang, 2009).

3.2.2 Hypotheses development

Most empirical studies related to CLT theory investigate the temporal distance relative to a future decision. The study of Pizzi et al. (2015) goes a step further by including also past events. The authors found that more concrete attributes are used by consumers when recalling near-past experiences compared to distant past experi-

ences. As time changes the perception of individuals about an experience, this has also implication to the overall satisfaction. Their results support that "*satisfaction judgements shift over time as a result of the different psychological mechanisms that are activated as the function of the time elapsing between service experience and its evaluation*" (p.484). Evidence from clinical psychology provides a direction for the expected effect of time distance. Siedlecka et al. (2015) report that the closer people are with a negative event, the more possible is to ruminate about it. Kross et al. (2012) also discuss that a self-distant perspective which focuses more on abstract information eliminates people's anger and negative emotions from negative experiences. Similar findings are also reported in other studies (Ayduk and Kross, 2008; Kross et al., 2012). The study of Spronken et al. (2016) reveals that temporal distance increases the positive thoughts about an event. Finally, similar to this study in the context of online reviews Huang et al. (2016) report that both the temporal and the spatial distances result in a more positive rating. Having that in mind, it should be expected psychological distances to have a positive association with overall satisfaction through the mechanism of high-level construals. Therefore, the following hypotheses are proposed:

H_1: The temporal distance between the hotel stay and the time point of review publication has a significant positive effect on review valence.

H_2: The spatial distance between the location of the reviewer and the location of the hotel has a significant positive effect on review valence.

In their study, Williams et al. (2013) reveal that abstract thoughts increase the positivity of experiences improving evaluations. Kim et al. (2008) confirm that evaluations that refer to events with greater distance focus more on abstract information. Based

also on the findings of Huang et al. (2016), it should be expected high-level construals to impose a more positive rating as they are associated with more abstract thoughts. On the opposite direction, more concrete aspects that are used from low-level construals should result in a more negative rating. As a by-product of the first two hypotheses, and in direct association with the construal mechanism of the abstractness/concreteness of thoughts, the following hypothesis is examined:

H_3: Review text concreteness is associated with a more negative review valence

The hypothesised effect is expected to have the opposite direction, for the third distance. As Liberman et al. (2007) discuss, people are more positive towards those that belong in the same group with them than those who do not. As Karakayali (2009) eloquently states in the presence of high social distance, "*relationships tend to lose their affective content or, worse negative affections dominate the relationship*" (p.538). Evidence also from extant literature reveals a positive association of social closeness with familiarity (Segal et al., 2003). Tasci and Knutson (2004) show that familiarity activates affective responses and provide a sense of security and comfort to customers. One should expect that social distance in the form of cultural distance will affect a customer's experience either through the interaction with locals, employees or other customers. The effect of customer-to-customer interactions is well established (Nicholls, 2010, 2011) and is particularly important in service environments (Martin and Pranter, 1989). In hospitality service this effect may be more pronounced as the interaction among the customers can be for a more prolonged period. Therefore, there is an increasing likelihood that tensions may arise due to deviation from socially accepted behaviours. In the case of airline passengers, the influence is through the different expectations of service employee behaviour (Kong and Jogaratnam, 2007). Deviation from the expected behaviour due to cultural differences may be perceived

as negative. Therefore, It should be expected the social distance to have a negative effect on online reviews and the following hypothesis is examined:

H_4: The social distance between the reviewer's and host country has a significant negative effect on review valence.

Figure 3.1 Measurement model. Note: Arrows in dash represent indirect effects.

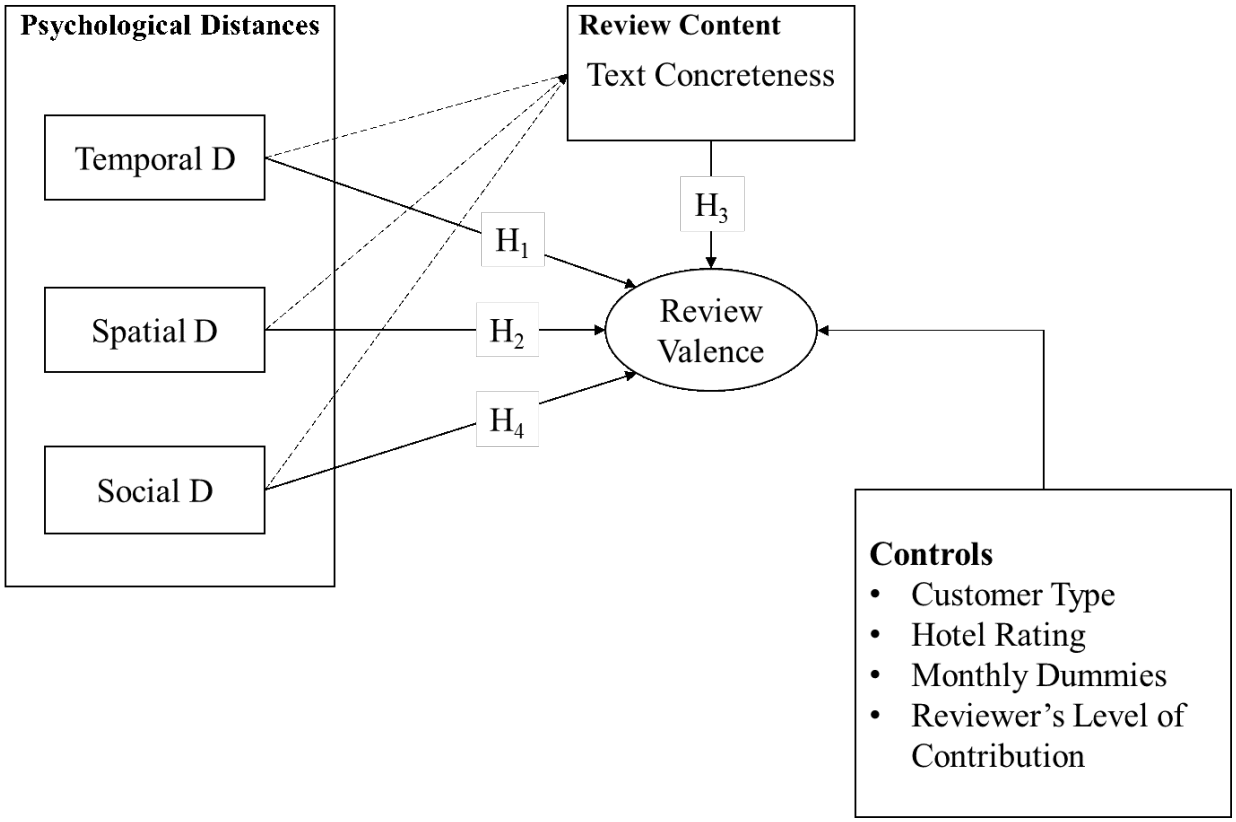


Figure 3.1 illustrates the theoretical model of this study. The focus is on the examination of the effects of the Temporal, Spatial and Social distances, as well as review text concreteness, on review valence by controlling for several factors that could also influence the formation of the review valence.

3.3 Data and Methods

3.3.1 Dataset Description

For the purpose of this study, all online reviews from TripAdvisor for London-based hotels were collected. The choice to collect online reviews from the specific city is based on two reasons. First, in that way, the study secures a level of homogeneity in the experience of reviewers, and second, the application of the alternative proxy of the social distance is based on the language of the review text. As most of the reviewers in these platforms write in English a city with English as the official language is more appropriate.

The initial dataset consists of 900,000 reviews, however, excluding the reviews where the information about reviewers' location is not disclosed, as well as the reviews from customers that are UK-based, reduces this number to N = 215,034 reviews. The reasoning behind the exclusions of the UK customers is because in that case, the effect of social and spatial distances is indistinguishable (both are equal or very close to zero), and also to avoid reverse causality issues. Some locals may prefer to stay in a far away hotel because there are loyal customers, and, as such, the provided rating would reflect this preference. The final sample includes reviews from travellers from 90 countries where the highest population is from the United States (30%). For each of the 1,022 hotels, there is an average of 210 reviews. From those reviews, 151,707 are in English with an average length of 136 words. Finally, reviews are posted on average in 1.3 months after the hospitality service.

3.3.2 Operationalisation of Variables

Table 3.1 presents a description of the variables used in this study and the estimation methods. The computation of the three psychological distances is discussed in more

details below:

Table 3.1 Description of variables

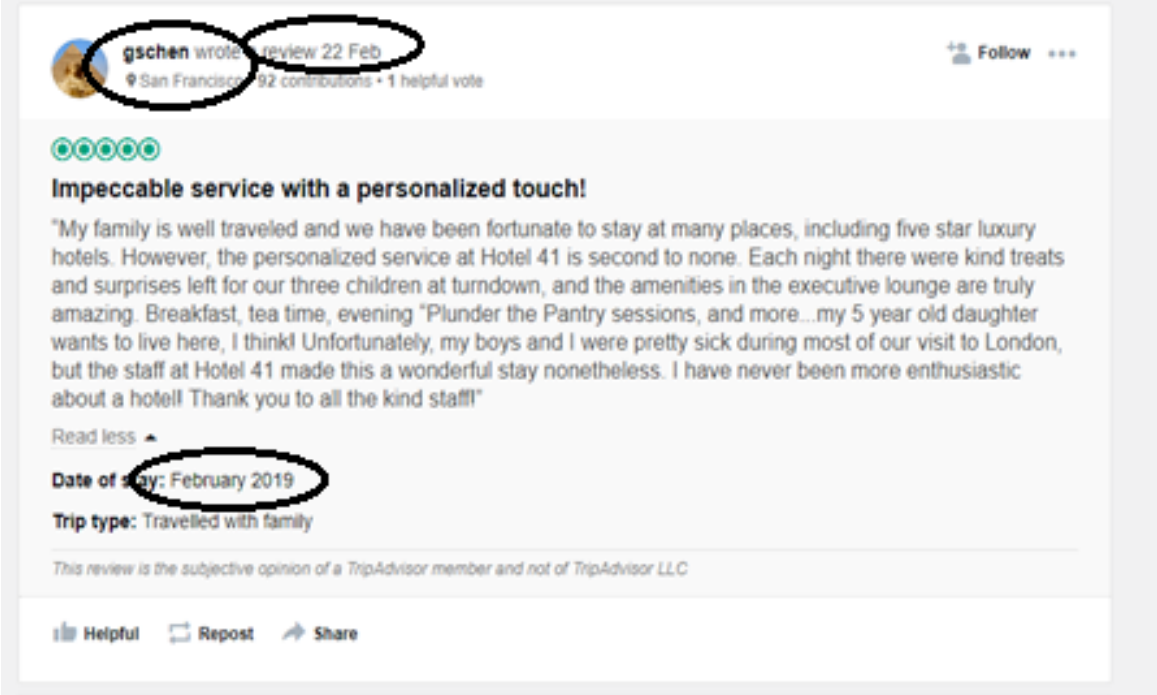
Variable	Description
Review Score	A Likert scale variable that measures the overall satisfaction of the customer with the hotel taking values in the range between 1-5 (1-10 in the Booking.com dataset).
Temporal D	The time elapsed between the month of the customer stay at the hotel and the month of the review posting.
Spatial D	The distance between the self-reported location of the reviewer and London computed with the Haversine method.
Social D	The cultural difference between the country of location of the reviewer and the U.K. This is based on the four main Hofstede dimensions using the formula from Kogut and Singh (1988).
Social D(Alternative)	A dummy that takes the value "0" if the review text is in English and "1" otherwise.
Concreteness	The average concreteness score of the review text based on the work of Brysbaert et al. (2014).
Hotel Average	The average rating for the hotel computed from the total reviews.
Reviewer Experience	The number of total reviews posted from the specific reviewer at the time of data extraction.
Month	Eleven monthly dummies (January is omitted).
Customer Type	Four customer dummies; Business, Solo, Family, Friends (Couple is omitted).

Temporal Distance

Temporal or time distance (***TemporalD***) is the distance in time between the period of service experience and the period the reviewer posted a review on TripAdvisor.

For the computation of this distance, field where the reviewers report the year and month of hotel stay and the review date was used. Since the reviewers do not report the exact dates of their accommodation the measurement units for this distance is in months and not days. In Figure 3.2, there is a screenshot of a review from the specific platform. The reported month of stay is February 2019, and the date of review is the 22nd of the same month. In that particular case, the time distance is equal to zero as both events took place in the same month.

Figure 3.2 An Example of the Computation of Distances. Note: In the circles the fields that used for the computation.



Spatial Distance

The second variable is related to geographical or spatial distance (***SpatialD***). For the computation of this variable, the field where the reviewers disclose their permanent city of residence is used. Based on that information the distance of that city with the

city of London is computed by relying on the recognition of the location by Google's map API. Using algorithms from the R software, the longitude and latitude of that location is computed and subsequently the geographical distance from central London employing the Haversine method. In the particular example presented in Figure 3.2 the self-reported city of residence is the San Francisco. The great circle distance of San Francisco (lat:37.77, long:-122.43) central London (lat:51.50, long:0.11) as a reference point is 8,619km.

Social Distance

A novelty of this study is the inclusion and the examination of the effect of social distance (***SocialD***). While the computation of temporal and spatial distances is crystal clear, this is not the case for the definition and the identification of proxies for the social distance. Literature suggests that a form of social distance is the interpersonal similarity (Liviatan et al., 2008). Based on the idea that cultural similarity is a form of interpersonal similarity the proxy employed for the social distance is the cultural differences. Having that in mind, Hofstede (Hofstede et al., 2010) dimensions are employed to measure the social distance of the reviewer with the country she visits. The dimensions and description of the Hofstede framework have been extensively discussed in the previous chapter. Using the Kogut and Singh (1988) formula, the similarity of the country of residence of the reviewer with the UK is calculated. For this study, only the main four Hofstede dimensions (power distance, uncertainty avoidance, masculinity, and individualism) are used, since for several countries in the sample there are no values for the more recent Hofstede dimensions (long term orientation and indulgence). Consequently, the formula has the following form:

$$\boldsymbol{CD_{ij}} = \frac{1}{4}\sum_{\boldsymbol{k=1}}^{4} \frac{(\boldsymbol{hofstede_{i,k} - hofstede_{j,k}})^{\boldsymbol{2}}}{\boldsymbol{var(hofstede_k)}}, \tag{3.1}$$

where $\boldsymbol{hofstede_{i,k}}$ is the $\boldsymbol{k}$ dimension for the country $\boldsymbol{i}$, and $\boldsymbol{var(hofstede_k)}$ is the variance of the $\boldsymbol{k}$ dimension across all countries in the sample.

An alternative specification for the social distance is based on the language of the review text. The underlying assumption here is that reviewers who write their evaluations in English are more fluent in that language. As such, those individuals should have more social interactions during their stay and feel less socially distant in London compared to the reviewers that are not so fluent. Theoretical support for this choice is provided by Ghemawat (2001) who considers the cultural distance not only as a factor of social norms but also in terms of religious beliefs, race, and language differences. It will not be surprising that many fluent in English reviewers prefer to write their online review in their native language, but on average the two groups should differ significantly. To capture this, a dichotomous variable that takes the value "0" if the review text is written in English and "1" if it is written in any other language, is used. Karakayali (2009) distinguishes the social distance into four categories namely; Affective, Normative, Interactive, and Cultural and Habitual distances. The proxy which is based on the cultural difference has as a point of reference the cultural and habitual distance while the language belongs to the interactive social distance which in its purest form captures the frequency of the interaction between groups.

3.3.3 Control Variables

In order to increase the robustness of the results, several control variables that may affect the provided review score, are included. In particular, the study controls for seasonality (captured by monthly dummies), reviewer expertise (captured by the reviewer's level of contribution on TripAdvisor), hotel quality (captured by the average

hotel rating), and finally, dummies that reflect the customer category (business, family, couple, solo, group).

3.4 Results

3.4.1 The Effect of Psychological Distances on Review Valence

The dependent variable, the review score, is a Likert scale variable that takes values from 1 to 5. Therefore, the suitable econometric method is the Ordinal Logistic regression. The purpose of this study is to examine the concurrent effect of the three distances on customers' expressed satisfaction. To this end, four alternative specifications with or without interaction effects are used, applying the two proxies for the social distance interchangeably. The full econometric specification for a $\boldsymbol{ReviewScore_i}$ has the following form:

$$\begin{aligned}\boldsymbol{ReviewScore_i} = {} & \boldsymbol{\beta_1 TemporalD + \beta_2 SpatialD + \beta_3 SocialD} + \\ & \boldsymbol{\gamma_1(TemporalD \times SpatialD) + \gamma_2(TemporalD \times SocialD) + \gamma_3(SpatialD \times SocialD)} + \\ & \boldsymbol{\gamma_4(TemporalD \times SpatialD \times SocialD) + \delta_1 HotelAverage + \delta_2 ReviewerExperience} + \\ & \sum_{l=1}^{11} \boldsymbol{\delta_3^l Month} + \sum_{k=1}^{4} \boldsymbol{\delta_4^k CustomerType} + \boldsymbol{\epsilon}, \quad (3.2)\end{aligned}$$

where $\boldsymbol{\beta}$ corresponds to the direct effects, $\boldsymbol{\gamma}$ to interaction effects and $\boldsymbol{\delta}$ gauge the effects of the control variables. The estimation method is based on a Maximum Likelihood estimator. The results, found in Table 3.2, lend support to the hypotheses revealing that all the three distances (Temporal D, Spatial D, Social D) have the expected direct effects on review valence. More specifically, temporal ($\boldsymbol{\beta_1 = 0.037, p < 0.001}$) and spatial ($\boldsymbol{\beta_2 = 0.016, p < 0.001}$) distances have

a positive effect on review score while the social distance effect, approximated with the cultural distance, is negative ($\boldsymbol{\beta_3 = -0.015, p < 0.001}$). Similar results are reported when employing the language proxy for the social distance with the effect of the temporal distance being double the size of the effect of spatial distance ($\boldsymbol{\beta_1 = 0.038}$ vs. $\boldsymbol{\beta_2 = 0.019}$) while a stronger negative effect is observed for the social distance ($\boldsymbol{\beta_3 = -0.027, p < 0.001}$).

Accounting for the interaction effects the results remain quantitatively unchanged. All the specifications lend support to the three hypotheses. An important finding is the statistically significant positive effect of the interactions of ***SocialD*** with the other two distances. This result, as in the case of Huang et al. (2016), reveals a distance boosting effect when the distances are combined ($\boldsymbol{\gamma_2 = 0.021, p < 0.001; \gamma_3 = 0.024, p < 0.001}$) on review valence.

3.4.2 Review Text Concreteness and Valence

To test the hypothesised effect proposed in Hypothesis 3 about the relationship between review valence and text concreteness, the study relies on the recent work of Brysbaert et al. (2014). The authors develop a concreteness/abstractness dictionary of 40,000 English lemmas which is based on the SUBTLEX – US word frequency list (Brysbaert and New, 2009) but also on lemmas found on shop catalogues. This dictionary is used to perform a bag-of-word approach and assign an overall concreteness score to each review. Compared to other Linguistic Categorization Models (e.g., De Angelis et al., 2017), the proposed method has the advantage of higher coverage of the words in the sample. The analysis is performed only on the reviews written in English (N=151,714). Those reviews are tokenised and pre-processed to remove punctuation marks, and then each of the words are matched to their relevant concreteness score from the dictionary. In that process, no stemming is required as the lexicon contains all word forms. The followed process is highly representative of the

Table 3.2 Ordinal logistic regression results for the effect of psychological distances on the review score (DV)

	Direct Effects		Interaction Effects	
Temporal D	0.037***	0.038***	0.037***	0.028***
	(0.004)	(0.004)	(0.004)	(0.005)
Spatial D	0.016***	0.019***	0.021***	0.014**
	(0.004)	(0.004)	(0.005)	(0.005)
Social D (Hofstede proxy)	-0.015***		-0.013***	
	(0.004)		(0.005)	
Social D (Language proxy)		-0.027**		-0.022*
		(0.010)		(0.010)
Temporal D × Spatial D			-0.008	-0.007
			(0.005)	(0.006)
Temporal D × Social D			0.021***	0.020*
			(0.004)	(0.009)
Spatial D × Social D			0.024***	0.022*
			(0.005)	(0.001)
Temporal D × Spatial D × Social D			0.002	-0.016
			(0.005)	(0.009)
Hotel Average Rating	1.924***	1.922***	1.923***	1.921***
	(0.008)	(0.008)	(0.008)	(0.008)
Reviewer's Level of Contribution	-0.079***	-0.079***	-0.080***	-0.079***
	(0.002)	(0.002)	(0.002)	(0.002)
Monthly Dummies	YES	YES	YES	YES
Customer Type Dummies	YES	YES	YES	YES
McFaden's $\boldsymbol{R^2}$	0.126	0.126	0.126	0.126
AIC	507,979	507,658	507,940	507,953
Observations	215,034	215,034	215,034	215,034

Note: *,**, and *** stars denote significance at the 5%, 1% and 0.1% level, respectively.

total corpus as it captures the concrete score for 89% of the total words for a particular review. In Table 3.3, an example of the computation followed is provided. This sentence receives an overall score 2.874 which is in the middle area of concreteness score which takes values from 1 (very abstract) to 5 (very concrete).

Figure 3.3 Concreteness score example. Note: This is an example of an online review from TripAdvisor and the concreteness score is analysed in the table 3.3.

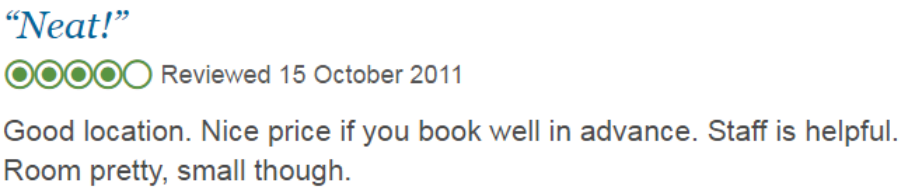


Table 3.3 Example of concreteness score computation

Lemma	Score
good	1.64
location	3
nice	2.18
price	3.63
if	1.19
you	4.11
book	4.9
well	3.33
in	3
advance	2.57
staff	4.36
is	1.59
helpful	1.76
room	4.79
pretty	2.4
small	3.22
though	1.2
Average Score	**2.874**

Notes: Individual lemma scores obtained from Brysbaert et al. (2014)

Having that information on hand is possible to explore and measure the effect of the concreteness of the text on the review valence. In addition to previous control variables, a control for the length of the review text (***ReviewLength***) was included.

The new econometric specification has the following form:

$$\boldsymbol{ReviewScore_i = \beta_1 ConcreteScore + \beta_2 ReviewLength + \delta_1 HotelAverage +}$$
$$\boldsymbol{\delta_2 ReviewerExperience + \sum_{l=1}^{11} \delta_3^l Month + \sum_{k=1}^{4} \delta_4^k CustomerType + \epsilon_i} \tag{3.3}$$

The results reported in Table 3.4 are in line with the third hypothesis that proposes a negative relationship between review score and text concreteness ($\boldsymbol{\beta = -0.560, p < 0.001}$). For robustness, two additional specifications using subsamples that are based on the minimum length of the review text are employed. The two subsamples have cut-offs of 50 and 100 words respectively. The results of the alternative samples also support the proposed hypothesis ($\boldsymbol{\beta = -0.586, p < 0.001; \beta = -0.485, p < 0.001}$), thus, there is a confirmation of the Hypothesis 3.

In order to evaluate the robustness of the previous results, a second dataset from Booking.com is employed. As the reviewers in that platform do not disclose information about the city of residence, this dataset is only adequate for the review text concreteness analysis. The new dataset contains again online reviews from London hotels. A total of 252,874 reviews written in English was collected where most of the previous control variables, except reviewer experience, are present. This dataset also has two distinct advantages. First, the rating score reviewers provide follows more a continuous normal distribution as the rating ranges from 1 to 10 also allowing for decimals. Second, the reviewers provide a separate description of the positive and negative aspects of their experience. These advantages allow someone to test the effects of concreteness separately for the positive and negative parts of the reviews

Table 3.4 Ordinal logistic regression results for the effect of review content concreteness on review score (DV)

	All reviews	Length $>$ **50**	Length $>$ **100**
Concreteness	-0.560***	-0.586***	-0.485***
	(0.036)	(0.045)	(0.066)
Review Length	-0.002***	-0.002***	-0.001***
	(0.000)	(0.000)	(0.000)
Hotel Average Rating	1.952***	1.948***	1.898***
	(0.010)	(0.011)	(0.014)
Reviewer's Contribution Level	-0.077***	-0.069***	-0.043***
	(0.003)	(0.003)	(0.004)
Monthly Dummies	YES	YES	YES
Customer Type Dummies	YES	YES	YES
McFaden's $\boldsymbol{R^2}$	0.121	0.121	0.115
AIC	350003	294032.9	187495.8
Observations	151,707	125,137	76,747

Note: *, **, and *** stars denote significance at the 5%, 1% and 0.1% level, respectively.

and to perform an OLS regression.

The results of the new dataset are found in Table 3.5. There are three alternative specifications for the positive part of the text, the negative part, and the total text. Results further support $\mathbf{H_3}$ revealing a negative relationship which is much higher for the negative part of the text ($\boldsymbol{\beta = -0.034, p < 0.001}$ Vs. $\boldsymbol{\beta = -0.344, p < 0.001}$). As before the effect in the total review text is also significant and negative ($\boldsymbol{\beta = -0.055, p < 0.001}$).

Table 3.5 Regression results for the effect of concreteness on review score for Booking.com dataset

	Positive Text	Negative Text	All
Concreteness (Positive)	-0.034***		-0.055**
	(0.008)		(0.008)
Review Length (Positive Text)	0.014***		0.018***
	(0.000)		(0.000)
Concreteness (Negative Text)		-0.344***	-0.202***
		(0.008)	(0.008)
Review Length (Negative Text)		-0.012***	-0.016***
		(0.000)	(0.000)
Hotel Average Rating	0.863***	0.872***	0.808***
	(0.003)	(0.011)	(0.003)
Monthly Dummies	YES	YES	YES
Customer Type Dummies	YES	YES	YES
$\boldsymbol{R^2}$	0.264	0.271	0.334
Observations	252,874	252,874	252,874

Note: *, **, and *** stars denote significance at the 5%, 1% and 0.1% level, respectively.

3.5 The Case of Durable Products

The value of online reviews lies in the product quality information they carry. A well-established view is that the distribution of the review ratings accurately reflects a product's latent quality (e.g., see Ho et al., 2017; Hu et al., 2017; Li and Hitt, 2008). Thus, consumers commonly base their purchase decisions on the average review valence and use it to infer the quality of a product and determine their expectations from a purchase (e.g., see Anderson, 1998; Gao et al., 2015; Kostyra et al., 2016; Minnema et al., 2016). The informativeness of online reviews is, therefore, a topic that has attracted considerable attention in the marketing literature and justifies the context of this thesis. Relevant studies have focused on understanding the motives behind review posts, purchase and evaluation decisions, and the dynamics of review rating (Godes and Silva, 2012; Moe and Schweidel, 2012). This strand of the literature unveils systematic biases in the ability of online reviews to reflect product quality (Li and Hitt, 2008; Moe and Trusov, 2011; Schlosser, 2005; Sundaram et al., 1998; Hu et al., 2017). Other studies find that characteristics other than the review valence, such as the review volume and variance, are also significant factors in measuring product quality (Hu et al., 2009; Kostyra et al., 2016). Although these studies provide some insights regarding the informativeness of online reviews, they do not explicitly consider the multidimensional nature of product quality (Brucks et al., 2000; Garvin, 1987). In particular, it is not clear how the different product quality dimensions are manifested in online reviews and how consumers gain knowledge for specific quality dimensions of a product from the posted reviews. Focusing on consumer durables, the objective of this research is to address this significant gap in the literature.

Importantly, this part adds to the literature by exploring how different quality dimensions are reflected in online reviews. The main objective is to unveil whether information regarding specific product quality dimensions can be derived from online

reviews expanding the extant literature that considers whether the average review valence reflects quality (Godes and Silva, 2012; Hu et al., 2017; Li and Hitt, 2008). The analysis is performed over the time lapsed from buying a product to reviewing it, that is, at different points in a product's operational life. Although this temporal distance has been considered before (e.g., Huang et al., 2016), the focus has been on examining its effect on review ratings in the case of experience goods and in the context of the construal level theory. This study focuses on consumer durables and argues that this is the appropriate time dimension to consider as not all product quality dimensions are observed after the same period of product use. Specifically, adopting the product quality dimensions proposed by Garvin (1987) and based on the disconfirmation mechanism and the under-reporting bias in online reviews, the posting behaviour of consumers is examined as the time from purchase to review posting increases. The analysis envisages to provide empirical evidence that the information content of online reviews significantly changes as the temporal distance increases; while online reviews posted after a small delay from purchase primarily reflect the consumers' evaluation of a product's short-term experience attributes, those posted after a significant delay from purchase mainly reflect their assessment of its long-term experience attributes and, principally, of its reliability. This is in line with the rationale of the "bathtub curve".

More specifically, in the previous part of this chapter, the study has investigated and provided evidence that supports the idea that psychological distances have a significant influence on the formation of online review ratings. These findings supplement and extend the previous literature. However, this limited literature is focused solely on service encounters. An emerging question is whether or not similar dynamics are observed in the case of goods and in particular of durable goods. In this part, the study attempts to answer two questions. The first is related to the time or temporal distance (time elapsed) between a durable good product purchase and

the review posting building on the previously discussed framework of the Construal Level Theory (CLT). The main difference with the study of Huang et al. (2016) and the first part of this chapter is that the context now is an online marketplace and not a service encounter. The evaluations of restaurants' or hotels' service encounters compared to an online purchase of a durable good, may follow completely different mechanisms in the formation of review valence. The major difference is that while a service encounter is a one-off experience which ends the moment a customer exits the restaurant or at a hotel's check-out, a product purchase is a dynamic, ongoing process that is not finalised the day of the purchase or even the day of the product delivery.

In many cases, a customer may expect further actions from the vendor (for example, when a product is malfunctioning or is not as expected and the customer has contacted the seller for a refund/replacement). Having that in mind, many negative reviews may not appear immediately after the purchase of the product but as a response to vendors' actions. Therefore, it should be expected that the time distance will also have an effect on durable goods' online reviews, but the direction is not as clear as before. As such, the following two competing hypotheses are examined:

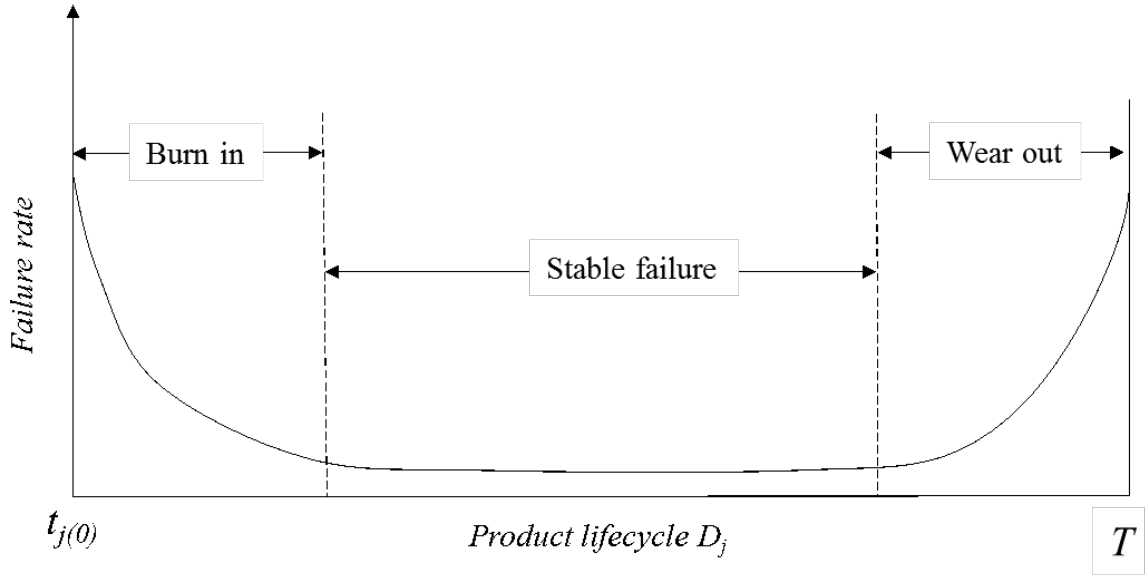
$\mathbf{H_{5a}}$: The time distance between the point of product purchase and the time point of review publication has a significant positive effect on the review valence.

$\mathbf{H_{5b}}$: The time distance between the point of product purchase and the time point of review publication has a significant negative effect on the review valence.

In this part, an alternative hypothesis that refers to the operational lifecycle of a product is considered. The bathtub curve is widely used in the context of quality management and reliability engineering to explain the failure rate of a product

through its different lifecycle phases (Klutke et al., 2003). Its closest application in the marketing literature is for the estimation of warranty length and service program costs, especially when they are used as a marketing tool (Menezes and Currim, 1992; Padmanabhan and Rao, 1993). The bathtub curve suggests that a product's failure rate follows a U-shaped pattern with failures becoming denser at the beginning and the end of a product's lifecycle. It is comprised of three distinct periods (Aarset, 1987; Blischke and Murthy, 1993). The first period is the so-called burn-in or infant mortality period with a high but decreasing failure rate. This period is followed by a normal life period exhibiting a constant and low failure rate and concludes with an increasing failure rate known as the wear-out period. A graphical representation of the bathtub curve is depicted in Figure 3.4. From a statistical point of view, the bathtub curve is a U-shaped distribution with the extremum point being uniformly distributed across an extended period.

Figure 3.4 Bathtub curve. Note: Graphical depiction of the bathtub curve corresponding to the failure rate over a product's life cycle.



For products consisting of a wide variety of mechanical and electronic components, the bathtub curve seems a reasonable and self-explicable pattern. The burn-in failure rate is usually caused by defects and failures of the quality control during assembly while the increased final period is explained from a product's wear out because of ageing or lack of proper maintenance (e.g., cleaning). Based on the study of Cui et al. (2012), it is assumed that the proportion of newly arrived negative reviews over total review volume at a specific time point of the product lifecycle is a proxy of the product failure rate (since it reflects the corresponding consumer sentiment about quality). Following that assumption, negative reviews at the burn-in stage of the bathtub curve should report product defects that have not been observed by the seller or because the seller has not yet developed a proper service structure to support the product. The wear-out failure rate, on the other hand, could have several explanations such as the arrival of superior products from competitors, a shift in consumer preferences, better pricing from competitors of same quality products, or even could reflect that retailers trade-off product quality to achieve a higher profit margin. All these plausible explanations and the resulted increasing failure rate may signal that the final phase of the product lifecycle is approaching.

The use of the bathtub curve in warranty program design is considered as an industry best practice (Blischke and Murthy, 1993). Building on the theoretical motivation that online reviews reflect product quality, then negative reviews should reflect quality defects and other associated reasons for customer dissatisfaction. Considering that the bathtub curve models the relation of these quality "incidents" with the product lifecycle in a U-shaped format, then the relationship of the arrival of negative reviews proportionately to the total volume with the product lifecycle should also follow a U-shaped relation. Consequently, the following hypothesis is proposed:

H_6: Negative reviews across time follow a U-shaped distribution.

In this hypothesis, the underlying question is whether the arrival patterns of negative and positive reviews entail information about the quality of products. In case this hypothesis is supported then this will be evidence that online reviews can capture product quality. Hitherto, the focus of extant research regarding the temporal characteristics of online reviews has been unidirectional taking into consideration only the evolution of the review valence across time. Studies report that review valence follows a J-shaped distribution (Hu et al., 2009) because of purchasing bias or under-reporting bias (Duan et al., 2008) and as such reviews are overwhelmingly positive (Chevalier and Mayzlin, 2006; Pan and Zhang, 2011). Nonetheless, whether this distribution reflects product quality characteristics is something that is unclear since reviews might not only reflect the outcome of consumers' interactions with the product but also the encounter with the retailer (e.g., delivery speed, customer service).

3.5.1 Dataset Description and Variables

This analysis is based on data sourced from Revoo, a meta-aggregator for online reviews that provides a service to retailers on a business-to-business basis. A retailer that wishes to provide a review aggregation system to its customers uses Revoo to outsource the review publication, filtering (for the concern of fake reviews/ making sure that reviews correspond to customers who have purchased the product), and presentation to customers using Revoo's e-commerce platform through an API. The latter allows consumers to see and inspect reviews for this particular product from other retailers as well, providing a solution to the case that products have a limited amount of reviews in an early stage of a platform.

Using a web crawler, all publicly available reviews for N=1,047 products sold from UK retailers were collected, securing in this way a homogeneous sample in terms of market effects on customer preferences (e.g., brand availability). In contrast to other

datasets that are used extensively in the literature, this dataset has some particular characteristics which make it suitable for this analysis. First, the review system asks customers to separate the positive and the negative aspects of their review, allowing to distinguish the polarity aspect of the review text upfront, without having to employ any particular opinion mining framework to separate it (Liu, 2012). Second, each review corresponds to an actual verified purchase, making the dataset free of any manipulation with regards to fake reviews. Third, it provides the date of the purchase, which is crucial for evaluating the temporal distances that are used in the analysis. Fourth, reviews are solicited from consumers using two levels of reporting, one considering only the product and the other considering the interaction with the retailer. As such, the product online reviews contain only information regarding the product evaluation and, therefore, the rating is free for any retailer-related bias that could distort the veracity of the review score in the dataset. Finally, the review score (review valence) ranges between 1 to 10 unlike the standard 5-Likert scale used on Amazon and other online review systems providing in that way additional variation for the dependent variable.

Table 3.6 provides an outline of the variables that were used to the empirical analysis. A total of $\mathbf{200,000}$ reviews that correspond to product sales for a period of 10 years (2007 – 2016) is used in the analysis.

3.5.2 Dependent and Control Variables

Temporal Distance

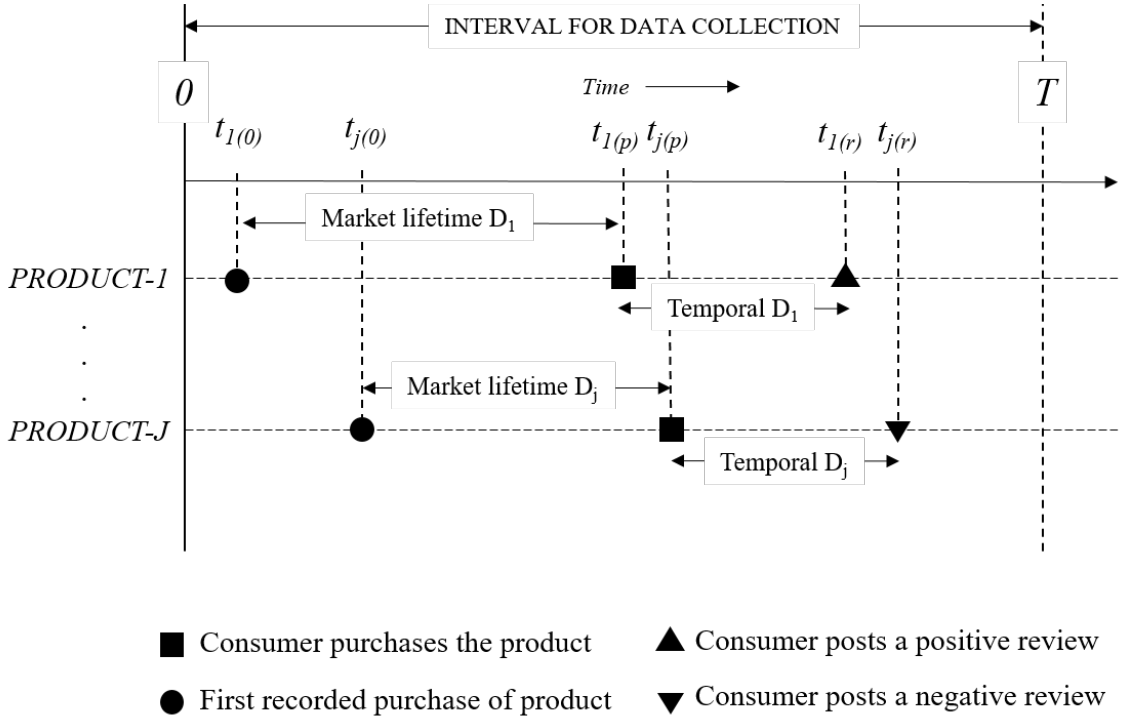
The measure of temporal distance is operationalized as the time elapsed (in days) from the point that the consumer purchased the product to the time that the consumer published the review. For a consumer $\boldsymbol{i}$ purchasing a product $\boldsymbol{j}$ at a time point $\boldsymbol{t_{ij(p)}}$ and posting a review at a later time point $\boldsymbol{t_{ij(r)}}$ the time distance is defined

Table 3.6 Description of variables used in the dataset.

Variable	Description
Review valence	The numerical rating associated with this particular review.
Price	The price of the product.
Positive text length	The length of the positive review text (number of words).
Negative text length	The length of the negative review text (number of words).
Publication date	The date that the review was published.
Purchase date	The date of the verified purchase for the particular product.
Product SKU	The identifier for the product that the review was written about. This variable is used in order to link to the product characteristics that are used as controls.
Total reviews	Total reviews for this particular product SKU at the point of data collection.

as $\boldsymbol{TemporalD_{ij} = t_{ij(r)} - t_{ij(p)} > 0}$. The median time to provide a review was calculated to 32 days with 90% of the reviews in the sample reported within three months (90 days).

Figure 3.5 Product Lifecycle and Temporal Distance. Note: Data collection framework definition for the extraction of Time D and Product lifecycle D on the review dataset.



Market Lifetime Distance

In order to enhance the analysis of temporal effects, the time that the product is available for purchase / is active in the market is considered. Since there is no particular information about the release date of each product, this is approximated by the time point that the first review for this particular product arrived in the dataset and calculated the difference similar to the temporal distance. The reasoning behind this variable relies on the fact that there should be a control about the product entry, as for new products in the markets a self-selection bias exists (Li and Hitt, 2008) that might distort the overall rating. For a product $\boldsymbol{j}$, The study considers the ordered set of its $\boldsymbol{n}$ reviews $\boldsymbol{R_j = r1_j, r2_j, \ldots, rn_j}$ with a vector of values corresponding to the particular date the review was posted. The market lifetime distance is then calculated as the time difference between the date of the first reported purchase

(assumed time point of product $\boldsymbol{j}$ entry in the market) and the date of product purchase of the subsequent reviews. Following the same procedure as in the estimation of the temporal distance measure. An outline of the measurement framework for both time distance variables is shown in figure 3.5.

Control variables

Control variables are used in order to account for time and product fixed effects. For the time variable, the date that the review was published and an additional vector of indicators corresponding to monthly time variations are included. There is also control for product fixed effects by crawling the product information and characteristics from the retailer's website using the stock keeping unit (SKU) variable collected from the review aggregator as an identifier. As a first step the study examines whether the variables are correlated using a non-parametric Spearman rank correlation considering that the temporal distance and market lifetime distance might exhibit high correlation (in order to avoid collinearity in the model specification) and the results suggest no collinearity. An outline of the descriptive statistics and Spearman non-parametric correlations of the variables is provided in Table 3.7.

Table 3.7 Descriptive statistics and Spearman correlation

	M	SD	(1)	(2)	(3)	(4)	(5)
(1) Review score	8.67	1.7					
(2) Temporal D	52.66	72.41	-0.03***				
(3) Market Lifetime D	549.21	599.7	0.03***	0.16***			
(4) Product price	284.38	159.19	0.02***	-0.06***	0		
(5) Length of Negative Comments	40.17	83.84	-0.22***	0.05***	-0.02***	0.04**	
(6) Length of Positive Comments	45.31	79.42	0.09***	0.02***	-0.01***	0.02***	0.60***

3.5.3 Results

Impact of Temporal Distance on Review Valence

The strategy for evaluating the two hypotheses is to examine the impact of the temporal distance on review valence, controlling for additional covariates such as product price, time fixed effects, and product fixed effects. For the dependent variable (review valence), various alternative estimators on evaluating the influence of temporal distance (ordinary least square regression, ordered logistic regression with and without fixed effects) are employed. The most extensive model employed is a two-way fixed effects model (5th model in Table 3.8) combining a product with time fixed effects. The model has the following econometric specification:

$$\boldsymbol{RV_{ij} = \beta_1 TemporalD_{ij} + \beta_2 MarketLifetimeD_{jt} + \beta_3 Price_j + \sum_{k=1}^{11} \gamma_k \Delta_{kt} + C_j + \epsilon_{ij,t},} \quad (3.4)$$

where $\boldsymbol{RV_{ij}}$ is the review valence of review $\boldsymbol{i}$ for product $\boldsymbol{j}$, $\boldsymbol{TemporalD_{ij}}$ is the time distance in days between the time point of purchase and point of review posting (in days), $\boldsymbol{MarketLifetimeD_{jt}}$ is the market lifetime distance as defined in the previous subsection, $\boldsymbol{Price_j}$ is the price of the product at the collection time, $\boldsymbol{D_{kt}}$ represent monthly dummy variables also indexed by calendar month $\boldsymbol{k}$ corresponding to the point of review publication $\boldsymbol{t}$, $\boldsymbol{C_j}$ is the product $\boldsymbol{j}$ fixed effect, and $\boldsymbol{\epsilon_{ij,t}}$ the idiosyncratic error term. Estimation results for all models are reported in Table 3.8. The results regarding temporal distance are robust, as for all models (ordinary least square regression, ordered logistic regression with and without fixed effects) the $\boldsymbol{TemporalD}$ is significant and with a negative sign. Furthermore, with the

exemption of the fixed effect model, the price and the market lifetime distance are also significant. For additional robustness, the multicollinearity on the baseline OLS model is evaluated, with the highest Variance inflation factor being $\boldsymbol{VIFmax = 1.48}$, well below the accepted threshold. At this point, it should be noted that a time-invariant company-specific price as in the case of the dataset used should be captured by the product fixed effect. However, as products are found to have the same price the inclusion of fixed effect allows to capture other than the price non-observable characteristics.

Table 3.8 Regression results for review valence (RV) as dependent variable

	OLS	Ordered Logit	OLS	OLS	OLS
Temporal D	-0.186***	-0.107***	-0.232***	-0.188***	-0.235***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Market Lifetime D	0.051***	0.052***	0.0004	0.056***	0.002
	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)
Product price	0.0003***	0.0003***	0.000	0.0003***	0.000
	(0.000)	(0.000)	(0.032)	(0.000)	(0.032)
Constant	8.987***		9.121	9.084***	9.208
	(0.026)		(35.028)	(0.028)	(35.018)
Time fixed effects	No	No	No	Yes	Yes
Product fixed effects	No	No	Yes	No	Yes
Number of reviews	201.708	201.708	201.708	201.708	201.708
Adjusted $\boldsymbol{R^2}$	0.007		0.075	0.008	0.07

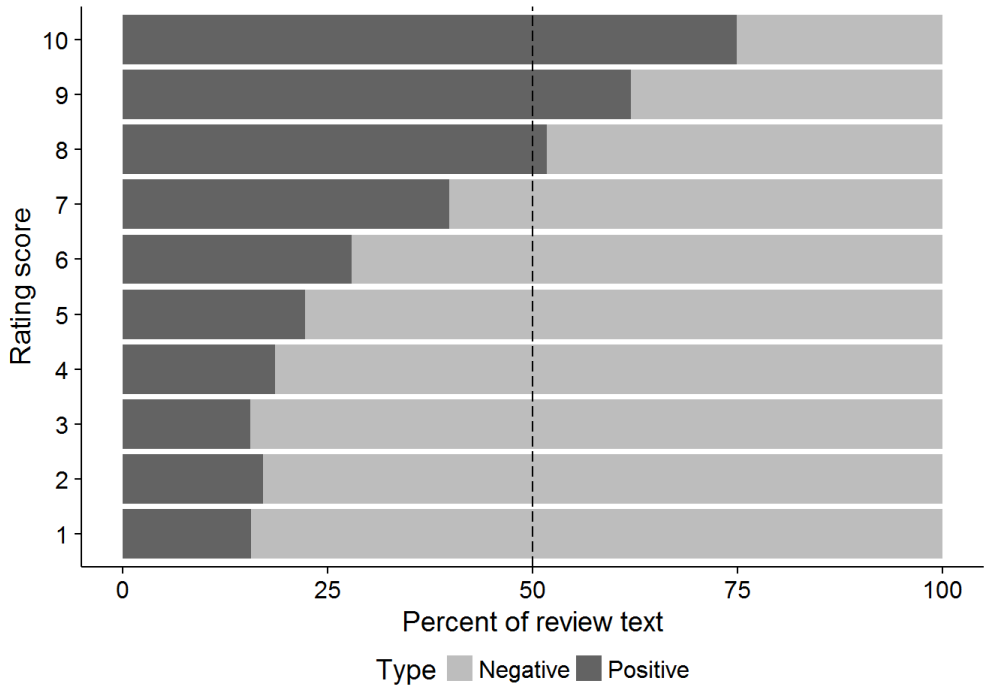
Note: *, **, and *** stars denote significance at the 5%, 1% and 0.1% level, respectively.

Identification of Negative Reviews

The study follows a similar approach with Berger et al. (2010) on identifying those reviews that can be classified as negative by using the ratio of the customer identified positive $(\boldsymbol{LengthP})$ and negative text $(\boldsymbol{LengthN})$ over the total review length $(\boldsymbol{LengthP+N})$. As it was discussed in the dataset description, the review aggregator required consumers to separate the negative from the positive parts of the review text, and as such, there was an a priory classification of what a consumer perceived as positive and negative parts of his/her experience. This clearly has an advantage over other datasets used in the literature as it allows to identify the overall positive and the overall negative reviews using only the ratio of positive and negative text over the combined review length in order to infer the polarity of the review, independently of the review score. As such, and contrary to the procedure of Berger et al. (2010), this study does not have to rely on human coders to classify the text.

Furthermore, by using this property of the dataset, there is reliance on subjectivity analysis methods to identify the parts of the review text that are positive or negative which could lead to biases due to its domain language-specific sensitivity (Liu, 2012). Figure 3.6 shows the distribution of positive and negative text for the reviews in the sample with the dashed line crossing the 50% level on the horizontal axis as the point where the text for this particular review score (vertical axis) shifts polarity (negative to positive and vice versa).

Figure 3.6 Distribution of average positive and negative text. Note: The picture depicts the distribution of average positive and negative text over the review length with the corresponding review rating. The dotted line represents the 50% split in positive and negative text.



As can be seen in Figure 3.6, for review score bigger than **7** the proportion of positive words is more than 50%. Using this proxy, the reviews were classified into positive ($\boldsymbol{P} > \mathbf{7}$) and negative/moderate ($\boldsymbol{N} <= \mathbf{7}$). An additional classification threshold was applied using the median ($\boldsymbol{P} > \mathbf{5}$, $\boldsymbol{N} <= \mathbf{5}$) as the threshold between negative and positive reviews.

Following the theoretical argumentation, assuming that product quality is reflected in reviews then the ratio of negative reviews at a particular point of the product lifecycle (time of posting the review from the time of purchase) will correspond to its expected failure rate from the bathtub curve. As such the failure rate (FR) of a particular product $\boldsymbol{j}$ at time point $\boldsymbol{t}$ of its product lifecycle (PLD) can be defined as follows:

$$\boldsymbol{FR_{jt}} = \frac{\sum \boldsymbol{N}}{\sum \boldsymbol{N} + \boldsymbol{P}} \tag{3.5}$$

where $\boldsymbol{N}$ are the negative reviews defined as those with rating score equal or less than seven (or five in the alternative specification) and $\boldsymbol{P}$ the positive reviews at time $\boldsymbol{t}$.

U-shaped relation between product lifecycle and review-derived failure rate

The hypothesis is that the review derived failure rate has a U-shaped relationship with the products' lifecycle. To evaluate this pattern, the following econometric specification was followed:

$$\boldsymbol{FR_t} = \boldsymbol{a} + \boldsymbol{\beta PLD_t} + \boldsymbol{\gamma} \times \boldsymbol{PLD_t^2} + \boldsymbol{\epsilon_t}, \tag{3.6}$$

where $\boldsymbol{FR_t}$ represents the review derived failure ratio corresponding to the rate of negative reviews over each unit of the product lifecycle $\boldsymbol{(PLD)}$. For confirming a U-shaped relation is expected that $\boldsymbol{\beta < 0}$ and $\boldsymbol{\gamma > 0}$. This is done using all the alternative specifications of negative review classification discussed before, and the results are presented in Table 3.9. Models (1) and (2) correspond to the definitions of $\boldsymbol{FR}$ presented previously. For both alternative specifications of the review derived failure ratio, the quadratic effect of Product lifecycle distance ($\boldsymbol{\gamma}$) is significant and positive implying a U-shaped relationship.

While a standard practice in econometric assessment for proving a U-shape distribution is to involve the examination of the quadratic effect of the independent variable

Table 3.9 Regression results for evaluating U-shape relationship between the product lifecycle distance and alternative specifications of the review derived failure rate. Failure rate is the dependent variable (FR)

	1	2
Product lifecycle $\boldsymbol{D}$	-5.511***	- 3.150**
	(1.475)	(1.025)
Product lifecycle $\boldsymbol{D^2}$	0.519***	0.296***
	(0.125)	(0.087)
Constant	26.111***	13.423***
	(4.291)	(2.982)
Number of observations (days)	473	473
Adjusted $\boldsymbol{R^2}$	0.009	0.005

Note: *, **, and *** stars denote significance at the 5%, 1% and 0.1% level, respectively. Model 1 (2) is for negative reviews defined as equal to or less than seven (five).

in question, the recommendation by Lind and Mehlum (2010) suggests that this is a necessary, but not sufficient condition, as they show that a significant quadratic term may arise even if the relationship is monotonically convex. For that reason, they propose a formal parametric test to validate a U-shaped relationship adopting the framework developed by Sasabuchi (1980). The test is a three-step procedure which calls for $\boldsymbol{\gamma}$ being significant and with the corresponding sign for the U-shaped relation (normal or inverse), the slope to be sufficiently steep at both extremes of the data range (in that specific case the product lifecycle starting point and maximum point), and the turning point (the minimum point of the hypothesised U-shaped relationship) to be within the data range.

Following this approach, $\boldsymbol{PLD_{Low}}$ is the lowest point of the Product lifecycle distance and $\boldsymbol{PLD_{High}}$ the highest point. In order to avoid outliers in the extremes, the $\boldsymbol{PLD}$ range was truncated to three standard deviations. Further, the sign of

the slope is evaluated at the low and high point, i.e., $\boldsymbol{\beta + 2\gamma PLD_{Low}}$ and $\boldsymbol{\beta + 2\gamma PLD_{High}}$, respectively. The final condition for evaluating the robustness of the U-shaped relations calls for the lowest failure rate, defined as $-\frac{\boldsymbol{\beta}}{\boldsymbol{2\gamma}}$) to fall within the data range. A 95% confidence interval was used to evaluate this condition using the Fieller method. The results of all models are found in Table 3.10 confirming Hypothesis 6.

Table 3.10 Lind-Mehlum U test results for alternative specifications of the failure rate (FR)

	1	2
Product lifecycle D	-5.511***	- 3.150**
	(1.475)	(1.025)
Product lifecycle $\boldsymbol{D^2}$	0.519***	0.296***
	(0.125)	(0.087)
Slope at $\boldsymbol{PLD_{Low}}$	-5.511***	-3.150**
$\boldsymbol{\beta + 2\gamma PLD_{Low}}$	-3.736	-3.073
Slope at $\boldsymbol{PLD_{High}}$	2.540 ***	1.439***
$\boldsymbol{\beta + 2\gamma PLD_{High}}$	4.703	3.835
U test	p <0.001	p <0.01
Extremum point ($\frac{\boldsymbol{-\beta}}{\boldsymbol{2\gamma}}$)	5.312	5.327
95% confidence interval, Fieller Method	[4.591; 5.746]	[4.316; 5.854]

Note: *, **, and *** stars denote significance at the 5%, 1% and 0.1% level, respectively. Robust standard errors are in parentheses. Extremum point and Fieller interval correspond to the logarithmic transformation of Product lifecycle D plus a unit increase.

Chapter 4

The Informational Value of Employee Online Reviews

4.1 Introduction

Online reviews occupy a central position in the literature due to the influence on consumers' purchase decisions both in regards to products as well as services such as hotel room bookings (Viglia et al., 2016). However, extant literature focuses only on online reviews that are related to consumption experiences, and this is also the stance followed in the previous studies that are found in this thesis. The proliferation of online platforms that extend the digital discussion beyond consumption experiences offers new opportunities for the study of research questions that can inform managerial practice. Employee online reviews form a special case of word of mouth that contains internal information from rank and file employees that managers and researchers can use to extract valuable insights. This rather untapped source of information has received only limited attention in the extant literature (Huang et al., 2015; Symitsi et al., 2018). This study aims to explore and present the informational and practical value of employee online reviews for firms and managers.

Job satisfaction is a critical factor in attracting and retaining a skilled workforce. Skill shortage and high employee turnover intention for tourism and hospitality employees are important challenges in this industry (Marchante et al., 2006). In the

US specifically, the Federal Bureau of Labor Statistics reports that the annual quits rates for tourism and hospitality employees are persistently the highest among all industries, close to or even exceeding 50%. [1]

David Scowsill, former President and CEO of World Travel Tourism Council, highlighted the problem stating that *"... When I speak to the leaders of the world's Travel and Tourism companies, it is clear that the biggest challenge to their growth plans is the supply and retention of talent across all levels of their businesses..."*.[2] This problem is of high economic significance for firms due to the costs associated with severance, training, and replacement, as well as the differential cost between the performance of the leavers and the newcomers (Cascio, 1991). While exact figures are not disclosed, estimations available in the literature raise that cost between 90% to 200% of the annual salary (Allen et al., 2010).

Extant scholarly thought substantiates a positive relationship among employee satisfaction, customer satisfaction, and corporate performance (Bernhardt et al., 2000; Harter et al., 2002; Huang et al., 2015; Symitsi et al., 2018). This link is stronger in high-contact service industries, i.e., those that require a higher level of contact between the service provider and the customer (Yee et al., 2008). This is mainly attributed to the moderating effect of the customer-employee interaction on the consumption experience (see Brown and Lam, 2008, for a review and meta-analysis). Tourism and hospitality is a high-contact service industry, where most of the services are delivered with a high level of interpersonal contacts between customers and employees (Kong et al., 2018). Employees with a low level of satisfaction have less in-

[1] Annual quits rate by Industry. Bureau of Labour Statistics, Department of Labor. Available at: (`https://www.bls.gov/news.release/jolts.t18.htm`)

[2] WTC Press Release (2015): 14 million jobs at risk due to global Travel and Tourism talent shortage Available at: (`https://sp.wttc.org/about/media-centre/press-releases/press-releases/2015/14-million-jobs-at-risk-due-to-global-travel-tourism-talent-shortage/`)

centives to excel and as such may deliver lower service quality (McPhail et al., 2015), affecting, in turn, corporate performance through the service satisfaction- profitability link (Choy, 1995; Lam et al., 2003). The literature embraces this view, and a significant stream of studies evaluate the determinants of employee satisfaction and its effect on firms' operating and financial performance (Chi and Gursoy, 2009; Huang and Rundle-Thiele, 2014; Lam et al., 2001; Spinelli and Canavos, 2000). While most of these studies rely on the collection of primary data, mainly from employee satisfaction surveys, issues such as sampling and attenuation bias become pertinent to the external validity of their findings. The advent of platforms that enable employees to evaluate their current or previous employers by posting online reviews offers unprecedented opportunities for the study of job satisfaction drivers, both in sector and firm-specific contexts.

Hitherto, online reviews have been extensively explored by scholars in other areas of tourism and hospitality research, mainly under the prism of consumer evaluations in a post-transactional context (Filieri, 2015; Park and Nicolau, 2015, 2017). By considering this unexplored informational cue, which arrives directly from current and former employees, the current study provides new evidence about the facets and dynamics of job satisfaction drivers as well as their relationship with corporate profitability. This study takes advantage of this opportunity analysing a dataset of 297,933 employee review ratings and textual justifications for 11,975 U.S tourism and hospitality firms for the period 2008-2017 provided by Glassdoor Inc., one of US's most popular websites for job listings and employee reviews.

This study contributes to the extant literature as being the first that uses online employee reviews to study job satisfaction determinants in the context of high-contact services. Compared to extant literature that usually examines specific factors in isolation and their connection with job satisfaction, this study approach is to capture all possible factors that could be measured through the numerical scales and the

review text and find their relative importance in explaining variation in employee satisfaction. By incorporating the opinions of former employees, this study also sheds light on the determinants of employee turnover. The latter, as aforementioned, is an essential topic for the hospitality industry which faces challenges stemming from both skill deficiencies and high employee turnover (Hinkin and Tracey, 2000; Zopiatis et al., 2014). Given the difficulty of finding data from previous employees, online reviews provide a solution to this problem, offering access to a large pool of opinions expressed from both current and former employees. To this end, another advantage of this study is the fact that it measures employee turnover determinants through actual departures from a job and not through the intention to leave, as is the case in most studies. A significant departure of this study is that, instead of focusing on specific industries or employee roles, the large volume of participants allows to derive more general insights which are representative of all tourism and hospitality industries and their employees. Finally, this chapter of this thesis revisits the link between employee satisfaction and firm profitability and quantifies this effect per satisfaction unit increase in Return-on-Assets (ROA) for tourism and hospitality firms, shedding also light on the directionality of this relationship.

The examination of online employee reviews fills a knowledge gap in the tourism and hospitality literature and addresses several inherent limitations of established measurement scales, such as the Minnesota Satisfaction Questionnaire (MSQ) and the Job Descriptive Index (JDI) (Khalilzadeh et al., 2013). Employee satisfaction as a multidimensional construct (Matzler and Renzl, 2007) is affected by a plethora of factors that may not be captured directly by specific measurement scales. One of the biggest shortcomings of extant quantitative research is the selection of the measurements that will be operationalised in the research. Items that are not contained within survey instruments will remain unnoticed and their effects unexplored rendering the interpretation of the results problematic (Jung et al., 2009). In employee turnover

research, even the most extensive models fail to incorporate important constructs; therefore their empirical estimation is problematic, and the explained variation in employee turnover behaviour is low (Maertz Jr and Griffeth, 2004).

Compared to such measurements, online reviews offer distinct advantages regarding the volume of participating employees and companies as well as the representativeness of former employees. This approach is to take into consideration both the numerical ratings for specific job elements and the provided textual justification. The latter allows employees to reflect on their working experience with a company, without being constrained by predefined items. Under the reasonable assumption that reviewers discuss the critical drivers of their satisfaction (or dissatisfaction) with an employer, a proper methodology will identify those factors. In that area, text mining methods have been shown to capture latent dimensions that are not explicitly mentioned or measured by scales but significantly affect reviewers' opinion formulation (see, for example, Korfiatis et al., 2019; Tirunillai and Tellis, 2014, among others).

In addition, management and research practice for employee satisfaction, motivation or engagement is based on cross-sectional data usually collected once a year (Lee et al., 2017). This approach ignores any seasonal dynamics and may be influenced by specific events that occur during the data collection period. In a similar vein, psychometric measures adopted from different sectors should be appropriately adjusted to form an accurate instrument for measuring employee job satisfaction in the tourism and hospitality industry due to their generic and confirmatory approach. On the contrary, online reviews represent up-to-date preferences and unveil sector-specific information as reviewers discuss their current or recent experience with specific employers. Furthermore, whereas the collection of primary data is a costly process in terms of the resources and time required, online reviews are readily available to researchers and practitioners through review aggregators. The fact that online reviews arrive from thousands of companies allows capturing both sector-specific and firm

specific effects. As such, managers gain insights not only about their firms but also about their competitors.

4.2 Theoretical Framework

A significant number of scholars examine online reviews from different perspectives, such as their effect on consumer expectations (Narangajavana et al., 2017), characteristics that make a review trustworthy (Filieri, 2015), customer satisfaction determinants (Guo et al., 2017), and firm responses (Sparks et al., 2016). As such, electronic word-of-mouth research is abundant, however, it always examines the topic through the lens of product/service evaluation of a consumption experience, shared online by consumers.

Employee review platforms that allow users to share their opinions about their current and previous employers form a novel case of electronic word of mouth. Job listing sites such as Glassdoor, Indeed, etc. act as a valuable tool for job-seekers, in case they lack internal connections to gain knowledge about the working conditions within a company (Ladkin and Buhalis, 2016). In doing so, job-seekers access information about the benefits, culture, managerial practices, and several other specific job elements of the company of interest, either through the provided numerical ratings or the review text. While the effect of online and social media has been shown to affect recruitment in hospitality organizations (Ladkin and Buhalis, 2016), this information source also provides new opportunities for the study of employee satisfaction and performance in the context of tourism and hospitality literature. However, until now this informational cue has remained unexplored.

In high-contact services, employee satisfaction plays a vital role in the formation of customer experience, while it also has a significant effect on firm profitability (Yee et al., 2008). The service-profit chain model (Heskett et al., 1994) describes the

mechanisms that govern this relationship. Better satisfied employees offer higher service quality to customers, leading to improved customer satisfaction and establishing customer loyalty. In turn, loyalty further stimulates firm profitability and growth.

Having that in mind, unsurprisingly extant literature dedicates significant effort on tourism labour research (Baum et al., 2016; Janta et al., 2011; Ladkin, 2011; Szivas et al., 2003). Scholars try to understand the determinants of employee satisfaction and to measure its effect both on customer satisfaction and corporate profitability. Other studies explain how satisfied employees affect customer satisfaction (Spinelli and Canavos, 2000) and financial performance (Chi and Gursoy, 2009) positively.

4.2.1 Drivers of Employee Satisfaction in Tourism and Hospitality

Extant research in this area examines the relationships among several individual, social and family, work-related, and organizational factors on job satisfaction or similar outcomes. These outcomes are outlined below.

Organizational Factors: Several organizational aspects influence job satisfaction for employees in the tourism and hospitality industry. Nadiri and Tanova (2010) report that organizational justice, i.e., the individual perception of fairness received from an organization, is positively related to job satisfaction. Organizational support is also found to be positively related to job satisfaction. For example, Kim et al. (2005) found that restaurant employees are more satisfied when they receive service training and greater encouragement from management as well as when organizational procedures for optimal service are in place. Sparrowe (1994) reported that employee empowerment and the relationship employees have with their immediate supervisors (high leader-member exchange) influence positively some facets of job satisfaction and more specifically promotion satisfaction for the former factor and pay satisfaction for the latter. Organizational culture, especially culture that is team-oriented,

enhance innovation, employee development, and value customers lead to higher job satisfaction, especially in the case of high perceived person-organization fit (Tepeci and Bartlett, 2002).

Employees also have an increased level of job satisfaction when they work for companies that display corporate social responsibility. In the case of casino employees, Lee et al. (2013) found that legal CSR and supplementary Responsible Gambling (RG) policies have a positive effect on organizational trust, which in turn influences job satisfaction positively. Other organizational factors that explain job satisfaction are training (Lam et al., 2001); work engagement (Yeh, 2013); organizational structure (Øgaard et al., 2008)); role clarity (Li and Tse, 1998); compensation (Ineson et al., 2013); career prospects (McPhail et al., 2015); and internal market orientation (Ruizalba et al., 2014).

Social and Family Characteristics: A parallel body of literature points out to several social and family factors that affect the perceived job satisfaction of tourism and hospitality employees. A significant stream of studies investigates the role of work-family conflicts. For example, Namasivayam and Zhao (2007) provided evidence that work-family conflicts (and mainly the direction where family-related roles interfered with work-related roles) are negatively related to job satisfaction. Similarly, Karatepe and Kilic (2007) found that there is a negative impact on job satisfaction when job interferes with family roles and as a result employees cannot be involved in important family and social activities. The authors, however, reported the positive effect of a supportive supervisor in work and family problems on employee job satisfaction. Extant literature also sheds light to the interaction with other social groups such as colleagues and friends. Bufquin et al. (2017) revealed that employees are more likely to experience higher job satisfaction when they perceive their co-workers as warm and competent individuals. Yang (2010) found that employee socialization contributed significantly to the prediction of job satisfaction for a front-line

employee in hotels in Taiwan. Song et al. (2015) confirmed this effect, showing that hotel employee job satisfaction for newcomers is positively affected by organizational socialization tactics (OST).

Individual characteristics: Several individual characteristics have direct or moderating effects on job satisfaction. Karatepe and Sokmen (2006) reported a positive impact of education and a negative relationship of age on job satisfaction. Additionally, the authors reported the positive effect of organizational tenure, self-efficacy, and effort (frontline employees spending a significant amount of energy in a series of job-related duties). Kim et al. (2009) found that gender and organizational levels (supervisory and non-supervisory roles) have a moderating effect on the impact of role stress on job satisfaction, which is significantly stronger for female employees and supervisory roles than male employees and non-supervisory roles. Generational differences between Baby Boomers and Millennials moderate the effects on the relationship between emotional exhaustion and job satisfaction (Lu and Gursoy, 2016), with emotionally exhausted Millennials to report significantly lower job satisfaction levels and higher employee turnover intention than emotionally exhausted Baby Boomers.

Work-Related Characteristics: This group of factors examines characteristics such as the content of the job and the employment characteristics. Role conflict (when incompatible roles are performed) and role ambiguity (when employees are uncertain about the expectations within a certain role) have a significant negative impact on job satisfaction (Karatepe and Sokmen, 2006). Yang (2010) identified an adverse effect of role conflict on job satisfaction. Job content has a substantial negative impact on overall satisfaction when satisfaction in this aspect is low but no impact when satisfaction is high (Matzler and Renzl, 2007). On the other hand, job polychronicity is positively linked to job satisfaction (Jang and George, 2012). Similarly, job roles that require higher emotive effort increase job satisfaction (Chu et al., 2012), while the same effect is reported for relational and cognitive job crafting (Kim

et al., 2018). Moreover, job characteristics can moderate the effect of other factors, as in the study of Lee, Lee et al. (2016), who reported a positive effect of empowerment on employee satisfaction, with higher effect on customer-facing than non-customer facing employees.

4.2.2 Outline of Contribution

As discussed in the previous section, the mainstream approach followed in the literature is to establish a relationship among a specific, or a number thereof, with job satisfaction and other relevant outcomes, without controlling for other factors that have been found to explain the satisfaction levels of employees with their employers. To this end, one of the most significant shortcomings of existing quantitative research is the selection of the measurements that will be operationalised in the research. Aspects that are not contained within survey instruments are not measured and as such remain unnoticed and their effects unexplored, rendering the interpretation of the results problematic (Jung et al., 2009). Of course, there are some exceptions, such as the work of Pan (2015), who performed an importance-performance analysis for six factors"Evaluation and Promotion"; "Compensation and Fringe Benefits"; "Job Content"; "Work Environment"; "Supervising and Leading"; "Interpersonal Relationships"; and overall satisfaction. However, even those studies are based on predefined constructs that may not fully capture the multidimensionality of employee satisfaction (Matzler and Renzl, 2007) and feature the limitations discussed previously. In the present study, a different approach is followed, as the goal is not to establish a relationship between a specific factor and job satisfaction but instead to assess the relative importance of all factors captured through the review rating and text.

A second aspect that is strikingly common in extant research is that researchers utilise primary data sourced from employee responses in cross-sectional question-

naires. Thus, information that employees (former and current) share online remains unexplored. Data collection for previous employees is always a difficult task for researchers and practitioners. By collaborating with firms, researchers have access mainly to the pool of current employees and as such panel-based longitudinal studies are needed. Indeed, there is a link between the perceptions of current employees about their company and employee turnover performance. However, current employees may be more hesitant to speak out, reveal their true satisfaction, and raise issues with an employer, while there is also a distinct line between them and former employees, which resides on the decision of the latter to leave the company. This study does not gauge employee turnover intention but actual employee departures from a job. Previous studies have shown that these two should be considered as distinct concepts that are predicted by different sets of variables (Cohen et al., 2016).

Finally, extant literature is usually context-specific and does not explore the tourism and hospitality industry as a whole. For example, in Table 4.1 there is a brief summary of the context of the studies that study employee satisfaction directly or indirectly. It is clear that most of the studies are sector-specific and firm-specific (usually taking into consideration employees from a few hotels), role-specific (frontline employees, travel agent employees, chefs, etc.) and the analysis is based on a limited number of questionnaires. However, it is known that employment characteristics regulate the relationship between job satisfaction factors and overall job satisfaction, with employees that work in different domains to report different factors as more important (Lee and Way, 2010). As such, the generalization of the results from context-specific studies is problematic, and consequently, the extant literature may fail to answer which factors capture employee satisfaction for the whole industry.

Considering the above research gaps, this study aims to answer the following research questions: (a) Which factors drive employee satisfaction for tourism and hospitality firms? Considering that numerical ratings can also be decomposed into

specific aspects, which are the most influential aspects? (b) Which factors can be significant predictors of actual employee turnover? Likewise, this study evaluates which aspects of the overall rating predict employee turnover. In addition, and considering the textual justification of the employee reviews, this study answers (c) what other factors (not captured by the rating interface) are revealed from the text as important drivers of employee satisfaction? How does the prevalence of these themes change across the continuum of the rating scale, and employment status (former vs. current)? Finally, (d) how does employee satisfaction (captured through ratings) affect the performance of a tourism and hospitality firms? Considering the economic significance of this question, there are managerial implications that are also pertinent to this analysis, such as what can travel and hospitality firms do to address this issue.

Table 4.1 Indicative studies reported in the literature

Study	Context	Sample Size
Pan (2015)	Employees of a specific hotel	474 questionnaires
Karatepe and Sokmen (2006)	Frontline employees of 37 **3, 4, 5*** hotels in Ankara, Turkey	723 questionnaires
Matzler and Renzl (2007)	Employees of Austrian Hotels	752 questionnaires
Namasivayam and Zhao (2007)	Employees of a large hotel in India	93 questionnaires
Øgaard et al. (2008)	Employees of 54 hotels	734 questionnaires
Robinson and Beesley (2010)	Chefs or cooks from clubs in southeast Queensland	196 questionnaires
Larsen et al. (2012)	Employees of cruise crew	216 questionnaires
Alexander et al. (2012)	Full-time employed chefs across Scotland	164 questionnaires
Belhassen and Shani (2013)	Employees of 3 hotels in Eilat, Israel	473 questionnaires
Lin et al. (2013)	Frontline employees of various tourism and hospitality industries	587 questionnaires
Zopiatis et al. (2014)	Employees of 3,4,5* hotels in Cyprus	482 questionnaires
Huang and Rundle-Thiele (2014)	Australian and Taiwanese hospitality employees in Australia	458 questionnaires
Díaz et al. (2015)	Travel agent employees in Spain	497 questionnaires
Elbaz and Haddoud (2017)	Travel agent employees in Egypt	505 questionnaires
Youn et al. (2018)	Employees of a casino company in Seoul	206 questionnaires
Tsaur and Yen (2018)	Employees from several tourism and hospitality industries in Taiwan	363 questionnaires
This study	Employees of 11,975 US tourism and hospitality firms from all industries.	297,933 online reviews

4.3 Data, Methods, and Results

4.3.1 Dataset Description

Glassdoor – the second most popular jobs listing website in the US with 50 million unique users made available to the authors all employee reviews submitted to the platform for the period between 2008 and 2017. These reviews included both publicly available data as well as other variables, such as job and company classification codes used to source reviews of travel and hospitality employees. As such, no web crawling was used to collect the dataset, and full compliance with the terms of use was obtained under Glassdoor's permission. Glassdoor accommodates a platform where employees share their experiences with current and previous employers, providing ratings about their overall satisfaction with a company as well as for specific job elements. In addition to their overall satisfaction, employees evaluate career opportunities, compensations and benefits, senior leadership, work-life balance, and cultural values of the company. Glassdoor has a particular process in place to safeguard the content and quality of each employee rating from manipulation, and every review that is submitted to the review system is vetted with a variety of methods, employing both automated procedures and curation by human inspectors.

Glassdoor collects information about an employee's tenure (Current vs. Former) as well as demographics. It offers company-specific information in the form of industry/sector, stock ticker (which allows distinguishing between private and public companies), number of employees, and annual revenue. For the review text, Glassdoor asks users to provide separate responses for the positive and negative aspects of their work experience, as well as feedback to management. This text categorization, enforced by Glassdoor's user interface, provides a distinct advantage for analyzing the textual parts of an employee review as no sentiment detection method is needed.

Table 4.2 Sample characteristics

Reviewer Characteristics	
Total Number of Reviews	297,933
- *Former employees*	161,494
- *Current Employees*	136,439
Female Employees	95,206
Male Employees	86,695
Education High School	18,384
Education Bachelor	79,054
Education Postgrad (MSc/MBA/ Ph.D.)	7,123
Average Reviewer Age	32.7
Employer Characteristics	
Total Number of Employers	11,975
Average Number of Employees	1,446.30
Average Annual Revenue ($ millions)	4,324

Table 4.2 provides a depiction of the dataset used in this study. A total of 297,933 employee reviews from 11,975 US firms formed the dataset, with the well balanced participation of former (161,494) and current employees (136,439). The sample almost equally represents female (52%) and male (48%) employees, while the average age reported is 32.7 years. The companies in the sample have on average 1,446 employees and annual revenues of $4.324 million. A breakdown of the sample and the mean overall rating (and standard deviation) per industry is provided in Table 4.3. Glassdoor's internal categorization is used to select two sectors of interest for this study: (a) restaurants, bars and food services; and (b) travel and tourism; which, as seen in Appendix Table B, contain five and ten industries respectively. The rating provided by previous employees is lower than that of current employees (Figure 4.1). However, it is important to note that the rating distribution does not follow the expected U-shaped (or J- shaped) curve that is prevalent on other review aggregators (Hu et al., 2009) but, especially in the case of former employees, it is closer to a normal distribution. This suggests that the dataset is not affected by the

self-selection bias (Li and Hitt, 2008), induced by the participation of only the overly satisfied (or dissatisfied) employees.

Figure 4.1 Distribution of overall rating. Note: star rating (overall rating) by employment relation (type).

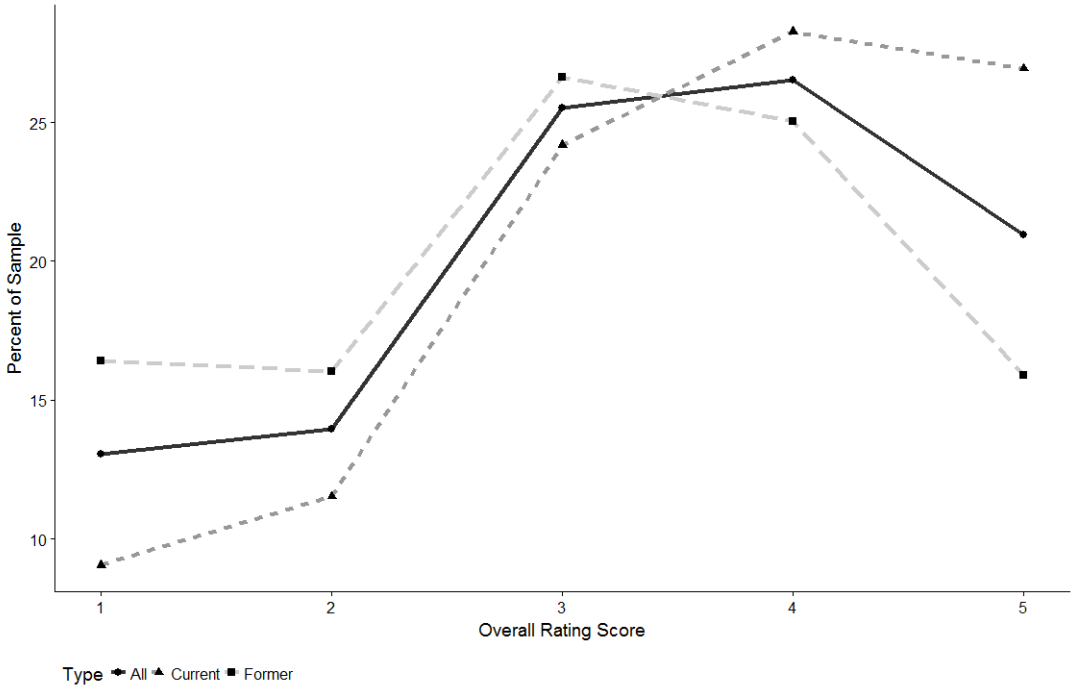


Table 4.3 Descriptive statistics of our sample for broken down by sector / industry and employee status (Current, Former)

		Current Employees (M, SD)						*Former Employees (M, SD)*					
Sector /Industry	% of Sample	Overall Rating	Career Opportunities	Compensation Benefits	Senior Leadership	Work Life Balance	Culture Values	Overall Rating	Career Opportunities	Compensation Benefits	Senior Leadership	Work Life Balance	Culture Values
Restaurants, Bars & Food Services													
Casual Restaurants	32.24	3.51	3.24	3.01	3.14	3.26	3.54	3.07	2.76	2.66	2.64	2.93	3.08
		(1.22)	(1.33)	(1.29)	(1.40)	(1.34)	(1.38)	(1.27)	(1.30)	(1.26)	(1.40)	(1.36)	(1.44)
Catering & Food Service Contractors	4.17	3.43	3.24	3.13	3.08	3.26	3.38	2.83	2.63	2.72	2.45	2.79	2.75
		(1.31)	(1.39)	(1.27)	(1.47)	(1.38)	(1.45)	(1.36)	(1.34)	(1.29)	(1.42)	(1.41)	(1.47)
Convenience Stores & Truck Stops	1.56	3.53	3.43	3.50	3.22	3.05	3.58	3.01	2.89	3.05	2.59	2.67	2.93
		(1.27)	(1.33)	(1.34)	(1.41)	(1.37)	(1.42)	(1.39)	(1.41)	(1.41)	(1.46)	(1.38)	(1.53)
Fast-Food & Quick-Service Restaurants	29.17	3.47	3.15	2.89	3.05	3.25	3.47	3.16	2.76	2.57	2.70	3.06	3.10
		(1.21)	(1.32)	(1.37)	(1.38)	(1.33)	(1.40)	(1.25)	(1.31)	(1.30)	(1.38)	(1.34)	(1.43)
Upscale Restaurants	1.58	3.67	3.38	3.35	3.34	3.40	3.61	3.15	2.81	2.97	2.73	2.89	3.04
		(1.26)	(1.34)	(1.27)	(1.44)	(1.32)	(1.41)	(1.36)	(1.34)	(1.29)	(1.47)	(1.37)	(1.37)
Travel & Tourism													
Airlines	4.7	3.57	3.37	3.36	3.07	3.36	3.48	3.19	3.00	3.16	2.65	3.01	3.11
		(1.29)	(1.33)	(1.28)	(1.44)	(1.33)	(1.43)	(1.36)	(1.37)	(1.33)	(1.44)	(1.39)	(1.50)
Bus Transportation Services	0.88	3.16	2.87	2.87	2.73	3.05	2.93	2.82	2.62	2.80	2.36	2.71	2.57
		(1.28)	(1.38)	(1.33)	(1.41)	(1.43)	(1.45)	(1.36)	(1.35)	(1.36)	(1.43)	(1.45)	(1.43)
Camping & RV Parks	0.03	3.86	3.27	3.23	3.52	3.46	3.59	2.60	2.26	2.30	2.40	2.71	2.34
		(1.21)	(1.52)	(1.23)	(1.43)	(1.36)	(1.41)	(1.55)	(1.12)	(1.10)	(1.50)	(1.38)	(1.36)
Car Rental	4.29	3.45	3.68	3.30	3.31	2.71	3.58	2.83	3.07	2.78	2.63	2.15	2.92
		(1.25)	(1.29)	(1.25)	(1.39)	(1.42)	(1.39)	(1.22)	(1.30)	(1.20)	(1.33)	(1.23)	(1.40)
Charter Air Travel	0.43	3.17	2.94	3.08	2.78	3.01	3.06	2.69	2.42	2.77	2.24	2.62	2.56
		(1.41)	(1.43)	(1.28)	(1.52)	(1.36)	(1.49)	(1.39)	(1.30)	(1.26)	(1.40)	(1.38)	(1.47)
Cruise Ships	0.5	3.54	3.30	3.26	3.09	3.11	3.37	2.97	2.80	3	2.49	2.52	2.86
		(1.38)	(1.43)	(1.28)	(1.42)	(1.34)	(1.45)	(1.45)	(1.41)	(1.28)	(1.43)	(1.37)	(1.54)
Hotels, Motels, & Resorts	17.27	3.65	3.43	3.31	3.29	3.38	3.68	3.12	2.89	2.96	2.71	2.93	3.11
		(1.28)	(1.38)	(1.31)	(1.45)	(1.35)	(1.41)	(1.37)	(1.38)	(1.33)	(1.47)	(1.38)	(1.52)
Passenger Rail	0.22	3.26	2.99	3.59	2.57	3.14	2.76	2.98	2.94	3.51	2.45	3.09	2.68
		(1.31)	(1.45)	(1.28)	(1.36)	(1.45)	(1.39)	(1.37)	(1.35)	(1.36)	(1.36)	(1.41)	(1.40)
Taxi & Limousine Services	0.27	3.42	3.12	2.92	3.21	3.34	3.32	2.50	2.13	2.31	2.19	2.55	2.34
		(1.48)	(1.52)	(1.40)	(1.57)	(1.40)	(1.58)	(1.44)	(1.29)	(1.31)	(1.44)	(1.44)	(1.46)
Travel Agencies	2.7	3.72	3.50	3.43	3.49	3.66	3.77	2.74	2.51	2.74	2.4	2.83	2.74
		(1.39)	(1.44)	(1.30)	(1.51)	(1.37)	(1.46)	(1.41)	(1.35)	(1.29)	(1.47)	(1.42)	(1.51)

4.4 Results

4.4.1 What Drives Overall Employee Satisfaction?

In the first part of the analysis, the overall satisfaction rating is decomposed to the job attributes measured on the platform in order to understand which factors are valued more by employees. Four different econometric specifications were evaluated, with a baseline representing a regression of the overall satisfaction with the five rating subcategories previously described in the sample of all employees. As the dependent variable is an ordinal variable that takes values from 1 to 5 stars (with five denoting the highest satisfaction), following previous studies (Gao et al., 2018; Sridhar and Srinivasan, 2012), an ordered logistic regression specification is used. Let $\boldsymbol{S^*_{ij}}$ be the underlying latent variable which captures the employee's $\boldsymbol{i}$ evaluation for firm $\boldsymbol{j}$, $\boldsymbol{S_ij}$ the observed rating scores that take values $\boldsymbol{k} \in \boldsymbol{[1,5]}$, and $\boldsymbol{\mu_2 - \mu_5}$ the cut-offs for the levels of the latent variable. The main model, controlling for employee (reviewer), and firm characteristics, has the following form:

$$\begin{aligned} \boldsymbol{Pr(S_ij = k)} =& \boldsymbol{Pr(\mu_{k-1} < S^*_{ij} \leq \mu_k), k \in [1,5]} \\ & \boldsymbol{S_ij^* = \beta X_{ij} + \gamma Z_i + \delta W_j + \epsilon_i j,} \end{aligned} \tag{4.1}$$

where, $\boldsymbol{X_ij}$ are the rating scores the reviewer $\boldsymbol{i}$ provides for the five specific rating aspects, $\boldsymbol{Z_i}$ is a vector of reviewer demographics that includes age, sex, and level of education (an ordered categorical variable with three levels, namely high school, bachelor degree, and postgraduate), and $\boldsymbol{W_j}$ contains the firm-specific variables (number of employees, annual revenues, and a binary variable whether the firm is public or

not). The model described above is applied for all reviews but also to subsamples that contain current-only and former-only employees.

Table 4.4 presents the results of the regression analysis for the baseline model (Model 1) as well as for the subsample for former (Model 2), current (Model 3), and with all employee and firm controls (Model 4). When it comes to the rating aspects, the lower coefficient is observed for compensation and benefits (ranging from **0.336** to **0.433**, $\boldsymbol{p < 0.001}$) and work-life balance (**0.452** to **0.489**, $\boldsymbol{p < 0.001}$). On the other hand, the higher coefficients are observed for senior leadership (**0.629** to **0.671**, $\boldsymbol{p < 0.001}$) and cultural values (**0.633** to **0.682**, $\boldsymbol{p < 0.001}$). To ensure robustness of the results, multi-collinearity between the five sub-scales is tested, utilizing the variance inflation factor (VIF) approach. The results did not show any concerns and the square root of all VIF scores in the baseline model was not higher than 2. Additionally, a dominance analysis is employed to measure the relative importance of the explanatory variables using the LMG Metric (Lindeman et al., 1980). This analysis allows measuring the average importance of each factor in explaining the variation of overall satisfaction considering all possible variable combinations and the order of entering the model. Results are shown in Figure 4.2, and the order of the importance of the five factors point out in the same direction as the results reported in the baseline model.

The interpretation of the results requires careful analysis, as they could lead to the fallacy that compensation/benefits and work-life balance are not essential drivers for employee satisfaction. A better explanation of the results is that compensation/benefits and work-life balance are basic needs of employees, where their lower level can increase dissatisfaction but their higher level when standing alone, will not lead to high satisfaction. Strong cultural values and leadership are the factors that present a significant increase in job satisfaction. In this sample, it is common to observe high compensation/benefits and work-life balance ratings coupled with average

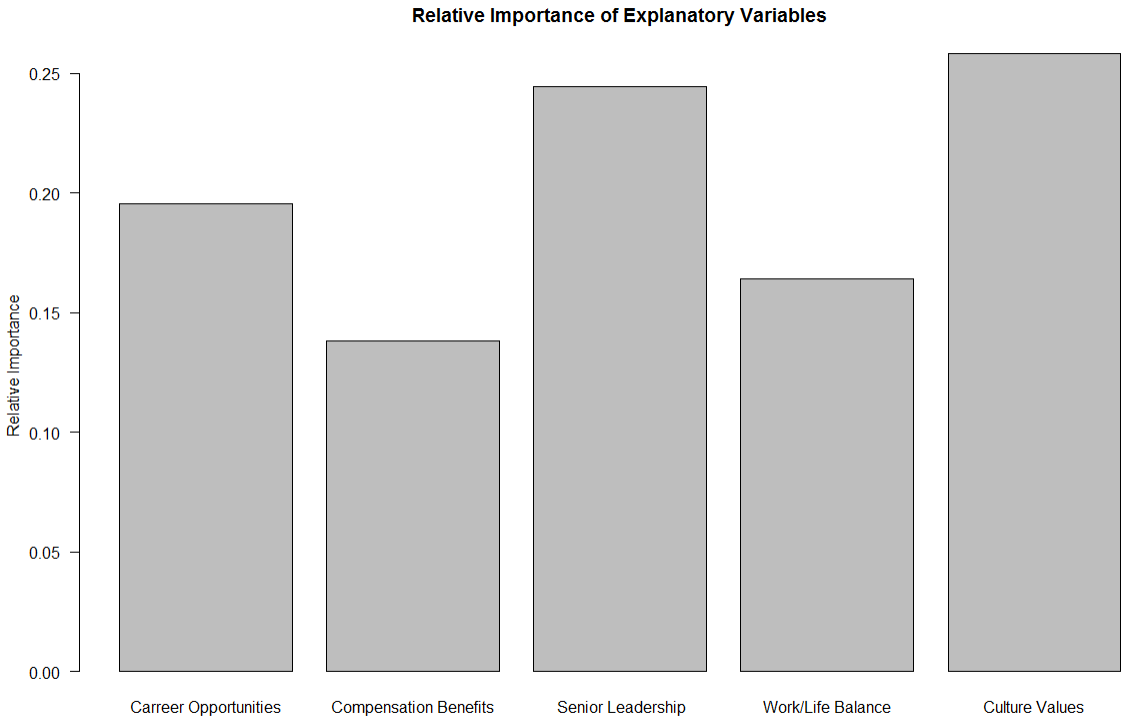
Table 4.4 Results of the factors affecting the Overall Rating

	Model (1)	Model (2)	Model (3)	Model (4)
Rating Dimensions				
Career Opportunities	0.550***	0.490***	0.559***	0.528***
	(0.005)	(0.012)	(0.012)	(0.008)
Compensation and Benefits	0.346***	0.336***	0.433***	0.378***
	(0.004)	(0.011)	(0.012)	(0.008)
Senior Leadership	0.658***	0.671***	0.629***	0.657***
	(0.005)	(0.012)	(0.013)	(0.009)
Work/Life Balance	0.489***	0.452***	0.454***	0.453***
	(0.004)	(0.010)	(0.011)	(0.007)
Culture Values	0.665***	0.682***	0.633***	0.661***
	(0.005)	(0.012)	(0.013)	(0.009)
Employee Controls				
Gender (Male)		0.001	0.070**	0.040**
		(0.021)	(0.023)	(0.015)
Age		-0.0003	0.005***	0.002*
		(0.001)	(0.001)	(0.001)
Education (College)		0.094***	0.027	0.055**
		(0.028)	(0.029)	(0.020)
Education (Postgrad.)		0.087	0.054	0.056
		(0.048)	(0.053)	(0.035)
Employer Controls				
Listed		0.008	-0.017	-0.004
		(0.028)	(0.030)	(0.021)
(Log) Employees		0.005	-0.054***	-0.017**
		(0.009)	(0.009)	(0.006)
(Log) Revenues		-0.013	0.016	-0.001
		(0.008)	(0.008)	(0.006)
$\boldsymbol{McFaddenR^2}$	0.52	0.86	0.85	0.86
AIC	450016	70938	60948	132187
Log Lik.	-224999	-35439	-30444	-66063
Observations	237,135	35,789	32,744	68,533
Sample Segment	Full Sample	Former Only	Current Only	Full Sample

Note: $^{*}p < 0.05; ^{**}p < 0.01; ^{***}p < 0.001$. Model 1 is the model that employs only the five measurement scales captured in Glassdoor to the total sample. Models 2,3 and 4 are with all control variables for the former only, current only, and to the total sample of employees, respectively.

overall satisfaction ratings, while strong cultural values and leadership usually lead to high overall scores.

Figure 4.2 Relative Importance. Note: The plot describes the relative importance of the five job elements measurements scales to the overall satisfaction. The computation is based on partial R2 partitioned by averaging over orders also known as the LMG metric (Lindeman et al., 1980).



Focusing on demographics and firm characteristics, the analysis provides further insights into the way they affect overall satisfaction and the rating to specific job elements. Understanding the differences in the provided ratings among current and former employees, gender, different education background, age as well as private and public corporations, size, and profitability of the firms provides critical insights. As such, a similar econometric specification is utilised, where the dependent variable is not only the overall rating but also the rating aspects to the specific job satisfaction

elements. The explanatory variables contain two clusters of firm and reviewer characteristics as well as an additional binary variable that denotes whether the reviewer is a current or a former employee (with "**1**" assigned to former and "**0**" to current employees).

The results are presented in Table 4.5. The negative coefficient of former employees is quite intuitive and stable for all models (Model 1: $\boldsymbol{\beta = -0.625, p < 0.001}$). As expected, those employees who choose to leave a company are likely to be the most dissatisfied. When it comes to gender, in all job satisfaction aspects (except career opportunities which is statistically insignificant), male employees appear to be more satisfied than their female colleagues.

Companies with higher revenue also tend to achieve higher employee satisfaction as the annual revenue is significantly positive for all models. Similarly, publicly listed companies also appear to have higher employee satisfaction than private companies. However, the coefficient representing the size of the company regarding employees provides mixed results. Although companies with many employees may offer better compensation benefits and career opportunities compared to smaller ones, they seem to lack in terms of cultural values, senior leadership, and work-life balance, which eventually leads to lower employee satisfaction. A higher level of employee education is linked to higher satisfaction, although this could also be the result of different job roles. Finally, employee age is linked to lower satisfaction except for the satisfaction with compensation and benefits. Some of the coefficients in Table 4.5 are not in agreement with the previous model in Table 4.4, such as employee age or company status. However, including all measurement scales that explain a high level of the variation of the overall rating as well as not controlling for employee status may suppress the effect of the control variables presented in the following sections.

Table 4.5 Impact of employee status (former vs. current) on rating dimensions

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Former Employee	-0.625***	-0.615***	-0.442***	-0.598***	-0.426***	-0.581***
	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)
Employee Controls						
Gender (Male)	0.091***	-0.008	0.096***	0.120***	0.079***	0.081***
	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)
Age	-0.008***	-0.003***	0.004***	-0.008***	-0.014***	-0.011***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Education (College)	0.225***	0.089***	0.169***	0.179***	0.195***	0.239***
	-0.016	-0.017	-0.017	-0.017	-0.017	-0.018
Education	0.289***	0.057	0.189***	0.275***	0.379***	0.299***
	(0.028)	(0.029)	(0.029)	(0.030)	(0.030)	(0.031)
Employer Controls						
Listed	0.062***	0.073***	0.130***	0.016	0.067***	0.108***
	(0.016)	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)
Log)Employees	-0.021***	0.036***	0.022***	-0.020***	-0.040***	-0.017**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
(Log) Revenues	0.030***	0.025***	0.034***	0.028***	0.021***	0.031***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Mc Fadden R2	0.72	0.71	0.71	0.71	0.71	0.72
AIC	261,432	249,044	251,550	243,604	252,012	218,134
Log Lik.	-130,690	-124,492	-125,745	-121,772	-125,976	-109,041
Observations	85,091	75,557	75,374	74,211	75,640	70,250

Note: $^{*}p < 0.05; ^{*}*p < 0.01; ^{*}**p < 0.001$. (1) Overall rating, (2) Career Opportunities, (3) Compensation and Benefits, (4) Senior Leadership, (5) Work/Life Balance, and (6) Culture Values are the respective dependent variables.

4.4.2 What Drives Employee Turnover in Travel and Hospitality Firms?

In the previous model, as well as in the initial descriptive analysis, a statistically significant difference was found on the rating provided by former and current employees. Investigating this further the study delves directly into the factors that lead to employee turnover. At this point, the focus is only on the provided numerical rating. The dependent variable is a proxy of the decision of an employee to stay or leave a company, as it is revealed by the time they provided the review. Therefore, a binary variable which takes the value of"**1**" if the reviewer is a former employee and "**0**" otherwise is considered. Controlling for all previously used employee and firm characteristics, the effect of the specific job elements to the decision of an employee to leave a company is examined. This is done in isolation, by studying the factors separately but also by examining their joint effect. Given the nature of this variable, a logistic regression model is considered appropriate for the analysis. As such, six models are estimated under the following specification:

$$\boldsymbol{Ln}[\frac{\boldsymbol{P_i}}{\boldsymbol{1-P_i}}] = \boldsymbol{\alpha} + \boldsymbol{\beta X_{ij}}, \tag{4.2}$$

where $\boldsymbol{P}$ refers to the probability of the employee $\boldsymbol{i}$ to be a former employee at company $\boldsymbol{j}$. $\boldsymbol{X_{ij}}$ is the matrix of independent variables, where on its full specification includes all the firm-specific, reviewer-specific variables, and rating scores used in the previous models, while, when examined in isolation, only the rating of the job element of interest is employed.

Table 4.6 Contribution of rating aspects to employee turnover (DV: Status is former)

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Rating Dimensions						
Career Opportunities	-0.266***					-0.161***
	(0.006)					(0.008)
Compensation and Benefits		-0.197***				-0.005
		(0.006)				(0.008)
Senior Leadership			-0.242***			-0.107***
			(0.005)			(0.009)
Work/Life Balance				-0.182***		-0.007
				(0.006)		(0.007)
Culture Values					-0.232***	-0.061***
					(0.005)	(0.009)
Employee Controls						
Gender (Male)	-0.180***	-0.168***	-0.159***	-0.170***	-0.164***	-0.160***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)
Age	0.003***	0.005***	0.003***	0.002**	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Education (College)	0.174***	0.177***	0.192***	0.184***	0.184***	0.177***
	(0.019)	(0.019)	(0.020)	(0.019)	(0.020)	(0.021)
Education (Postgrad.)	0.296***	0.313***	0.337***	0.342***	0.343***	0.325***
	(0.034)	(0.034)	(0.034)	(0.034)	(0.036)	(0.037)
Employer Controls						
Listed	0.016	0.025	0.01	0.012	0.022	0.026
	(0.020)	(0.020)	(0.020)	(0.020)	(0.021)	(0.021)
(Log)Employees	-0.046***	-0.050***	-0.057***	-0.058***	-0.059***	-0.055***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
(Log) Revenues	0.001	0.001	0.001	-0.001	0.004	0.006
	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	-0.006
$\boldsymbol{McFaddenR^2}$	0.75	0.75	0.76	0.75	0.77	0.78
AIC	101,235	102,029	99,569	102,487	94,340	91,173
Log Lik.	-50,594	-50,991	-49,761	-51,220	-47,147	-45,559
Observations	75,557	75,374	74,211	75,640	70,250	68,533

Note: $^{*}\boldsymbol{p < 0.05;}^{*}$ $*\boldsymbol{p < 0.01;}^{*}$ $**\boldsymbol{p < 0.001}$. Models 1-5 examine the effect of a specific factor in isolation, while Model 6 employs their joint effect

Results from all models are reported in Table 4.6 and point in the same direction. The likelihood of an employee to leave a company is affected more by culture values ($\boldsymbol{\beta = -0.061, p < 0.001}$), senior leadership ($\boldsymbol{\beta = -0.107, p < 0.001}$), and career opportunities ($\boldsymbol{\beta = -0.161, p < 0.001}$). Most importantly in their joint examination, the effect of compensation/benefits and work-life balance vanishes. Either in the stand-alone models or the joint examination with the other factors, career opportunities is what influences the results the most. Keeping all other variables constant, an increase in the rating score for career opportunities by one unit decreases the likelihood of an employee to be a former employee by $\boldsymbol{e^{-0.161} - 1 = 14.87\%}$.

4.5 Extracting Qualitative Dimensions

Online employee reviews have the advantage of coupling the numerical ratings with open-ended responses; thus, allowing employees to reflect on their experience with their current or former employer. Glassdoor asks employees to write their opinion in three separate texts, distinguishing the negative and positive factors of their working experience with the specific company, as well as providing feedback to management. This information allows someone to perform a qualitative analysis and to shed further light on the topics of interest. As a tool to perform this analysis, the same approach with chapter 2 is followed, using the STM topic method.

The analysis is followed the same three steps process described previously namely; pre-processing of the text; identification of the number of topics that explain better the variability of the corpus, and the analysis of how the topics change with the rating the employees provide, which in fact captures the dominant topics for more satisfied and dissatisfied employees.

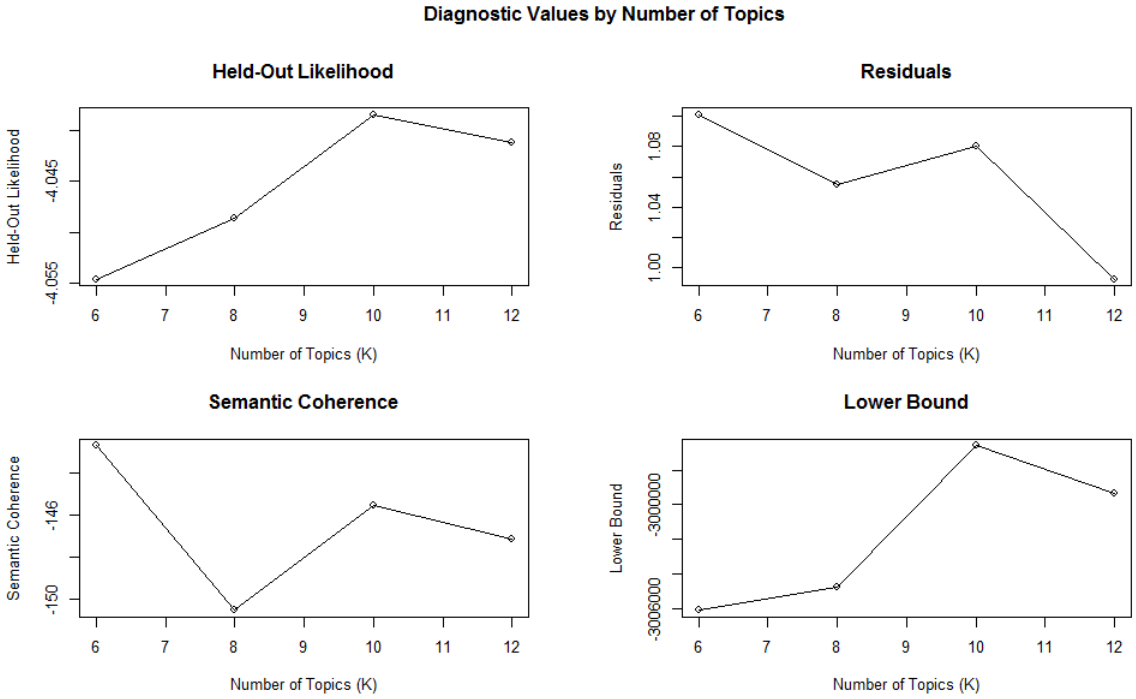
4.5.1 Text Preparation for Analysis

Glassdoor provides a user interface that separates the textual feedback provided with each review into positive, negative, and feedback to management. After initial inspection, a sentiment scoring procedure utilizing the Hu and Liu (2004) sentiment dictionary was applied to the negative and feedback to management fields to identify and remove those parts of text that were used by employees as placeholders for empty text (e.g., nothing to report; no feedback that I can think of etc). After pre-processing, the remaining words were lemmatised, and filtering was applied in order to keep only those terms appearing in at least 1% of the initial corpus. The final datasets are a set of $\boldsymbol{Nprosstm = 149,289}$ reviews for the positive, $\boldsymbol{Nnegstm = 148,354}$ reviews for the negative and $\boldsymbol{Nfeedstm = 135,506}$ for the feedback to management.

Considering that the primary metadata associated with the employees' textual feedback is the numerical rating that captures the overall satisfaction, this variable and the employee's status were used as the primary prevalence covariates. For each of the corpora in the topic solution, the seed vector of the number of topics had a range of $\boldsymbol{Kmin = 6}$ topics as a seed value, since this is the number of all rating aspects that are provided by Glassdoor on its review interface, and evaluated the held-out likelihood for a maximum of $\boldsymbol{Kmax = 12}$ topics in the sample.

The candidate topic solutions with the highest held-out likelihood were then evaluated against the ratio of their semantic coherence and exclusivity. After considering the above criteria (See Figure 4.3), a $\boldsymbol{K = 10}$ topic solution was found to best describe the variability of each of the three corpora, subject to rating and employee status. For the labelling of the topics, a two-step procedure was followed. First, two experts in human resource management and organizational behaviour were recruited to help on the labelling of the topics, based on a discussion and reading of the top loading reviews from the topic solution, estimated for each corpus. The second step involved a concordance study of the assigned labels among a panel of 8 experts with substantial experience in human resource management for travel and hospitality services. For each label, the pool of raters provided an agreement (1) or disagreement (0) score with the assigned label. The resulted Cohen's kappa was $\boldsymbol{\kappa = 0.88}$, indicating an almost perfect agreement among the experts. Considering their feedback, some of the labels of the topics were adjusted accordingly to reflect the topic content better.

Figure 4.3 Diagnostic values for the number of topics. Note: The plot describes the diagnostic values in terms of Held-out Likelihood, Semantic Coherence, Lower Bound for word importance and the residuals obtained for the full model. As can be seen, the best combination is achieved when the number of topics (K) is 10, as this provides the best relationship between the held-out likelihood and semantic coherence.



In addition to the estimation of the topic-word and topic-document distribution, the proportion that each topic reflects on the overall corpus is estimated. For the topic solution on the positive feedback (Table 4.7), some topics occupy a significant portion in that corpus. More specifically, intangible aspects such as the working environment (Topic 1), career opportunities (Topic 2), and on-the-job aspects such as task variety (Topic 3) and flexibility with scheduling (Topic 4) accounted for over 50% of the positive aspects of the textual feedback. Tangible benefits such as compensation (Topic 5) and employee benefits (Topic 6 and Topic 7) accounted for less, highlighting the importance of intangible aspects of the work environment in hospitality and tourism services on driving employee satisfaction. This result is also supported by the insights

provided in the previous analysis based on the numerical ratings.

Negative points raised by the employees (Table 4.8) were mostly concentrated on issues pertinent to management processes and communication (Topic 1) as well as the continuous shift of management roles and managerial turnover (Topic 2). A surprising topic that emerged from the topic solution was topic 8 related to customer behaviour. As a high-interaction service industry, customers' challenging behaviour has a direct effect on employees' dissatisfaction with their work. Therefore, not only employees moderate the consumption experience but also customers moderate the work experience.

Table 4.7 Topic Solution for Positive Feedback

Topic #	Topic Label	Prop. (%)	Top 7 Frex Words
1	Working Environment	16.51	great, staff, atmosphere, awesome, fun, friendly, environment
2	Career Opportunities	15.34	opportunity, growth, culture, advancement, training, many, room
3	Task Variety	11.71	always, guest, part, new, place, something, people
4	Scheduling Flexibility	9.49	flexible, schedule, easy, coworkers, co-worker, college, scheduling
5	Compensation	8.91	pretty, money, nice, busy, much, manager, server
6	Employee Perks	8.37	free, discount, food, coffee, drink, meal, shift
7	Benefits	8.05	health, benefits, pro, benefit, insurance, better, bonus
8	Working Hours	7.71	hour, good, high, school, work, wage, job
9	Skills Development	7.18	customer, service, experience, skill, able, fast, product
10	Work/Life Balance	6.73	day, week, month, store, long, night, decent

.

Other issues that arose from the negative feedback involved particular issues of work conditions such as scheduling (Topic 4) and working unsocial hours with limited rewards (Topic 6). In comparison with the distribution of topics for the positive text provided by the employees, the distribution of topics for the negative text seems to have a more uniform distribution. In the subsequent section, there is an evaluation on how these distributions change (for the positive and negative text topics) under

the influence of two main covariates: Overall Rating and Employee Status (Former vs. Current).

Table 4.8 Topic solution for negative feedback

Topic #	Topic Label	Prop. (%)	Top 7 Frex Words
1	Leadership/Communication	13.49	upper, poor, lack, communication, leadership, management, corporate
2	Management Turnover	12.79	store, year, different, month, manager, first, something
3	Work/Life Balance	11.79	long, life, stressful, hour, balance, sometimes, work
4	Scheduling	9.93	back, day, call, one, right, even, front
5	Career Opportunities	9.26	great, little, opportunity, difficult, con, advancement, position
6	Night Shifts and Tips	9.2	server, shift, night, tip, wage, food, break
7	Employee Turnover	8.99	turnover, high, low, rate, extremely, culture, salary
8	Customer Behavior	8.48	rude, customer, service, worker, schedule, enough, amount
9	Benefits	8.41	much, really, car, lot, pretty, insurance, good
10	Managerial Behavior	7.66	horrible, bad, managers, family, favoritism, terrible, benefit

.

4.5.2 Assessing the Effect of Overall Rating and Employee Status on the Topic Distribution

The topic distribution, highlighted in the textual justification of employees' online reviews for both the positive and negative aspects, provides an overall picture of the main satisfaction/dissatisfaction determinants. Following the estimation of the topic solution and considering that STM allows to model the dependence between topic prevalence and other covariates, the following questions are explored: (a) How does the topic distribution change when other factors are considered?; (b) What are the dominant positive (or negative) topics that employees reflect upon when they are overly satisfied (or overly dissatisfied)?; and finally, (c) How does the topic distribution change between former and current employees?

An already discussed advantage of structural topic models contrast to LDA is that they allow the incorporation of covariates in the topic- document distribution. This is very important because the fundamental assumption of a topic modeling application considers the case of exchangeability in the textual feedback. Employees may use a particular topic as a dominant theme in the text to reflect upon or may equally distribute their feedback (positive or negative) between two or more topics. Having estimated the topic model solution, the marginal effects in the topic distribution are estimated.

Figure 4.4 Proportional odds on topic prevalence. Note: Marginal effects of overall rating (low to high) for the topic distribution of positive (upper) and negative (lower) aspects of the review text. The dotted line represents the zero effect.

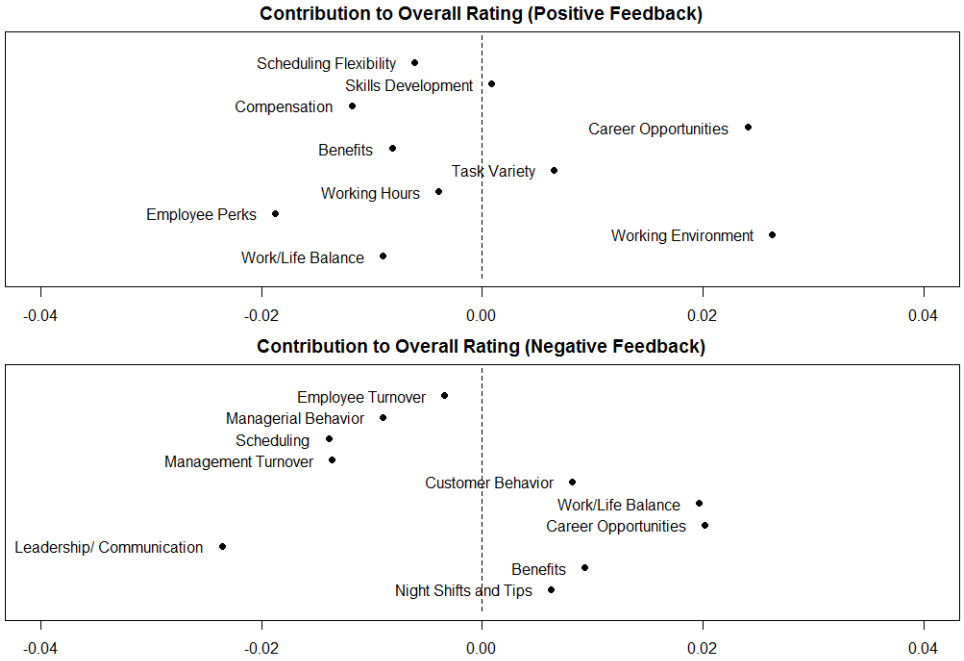
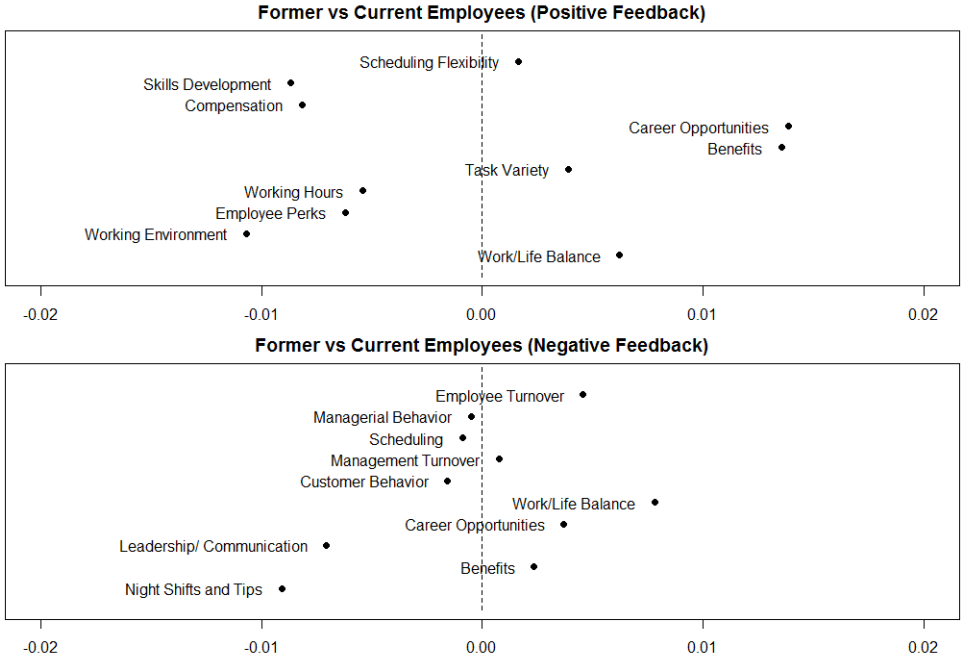


Figure 4.4 provides a graphical depiction of the marginal effects on the topic distribution between low and high overall ratings. The dotted line represents the zero effect. The topics that appear on the right side are those that are discussed more when the overall rating satisfaction increases and the opposite stands for the left

side topics. The horizontal axes show the marginal effect, i.e., the positive feedback, where an increase of one unit in overall satisfaction signifies an increase by almost 3% on the reviews that discuss mainly Career Opportunities. The same effect is also observed for the discussion about Working Environment. It is evident that for satisfied employees the prevalence of the topics related to Career Opportunities and Working Environment is increasing (as a positive aspect of the job). When ratings become lower, issues such as Employee Perks and Compensation tend to become more dominant.

Figure 4.5 Proportional odds on topic prevalence (Employee status). Note: Marginal effects of employee status (former to current) for the topic distribution of positive (upper) and negative (lower) aspects of the review text. The dotted line is the zero effect, and in that case, the topics that are close to this line are the topics that do not differ between former and current employees. The topics that are on the right side are those that were discussed more by current employees and vice-versa for topics on the left side having been discussed mainly by former employees.



A similar result is observed in Figure 4.5 when assessing the impact of employee

status on the prevalence of topics. When it comes to the positive aspects of the job, current employees discuss similar aspects with those reported for overly satisfied employees with career opportunities (together with the benefits) being the dominant topic. This comes as no surprise given the analysis from Section 3.2 regarding the significant drivers of employee turnover. For former employees, the most negative topics discussed tend to cluster around managerial and leadership issues as well as working at unsocial hours.

4.6 Job Satisfaction and Financial Performance

Having assessed the drivers of employee satisfaction and dissatisfaction and employee turnover, the attention now is on the economic significance of employee ratings for travel and hospitality firms. Based on the service-profit chain model (Heskett et al., 1994), it should be expected that more satisfied employees perform better; thus, influencing positively firm performance. In high-contact services, this effect is expected to be higher due to the higher interaction of employees with customers. At this point, the study aims to quantify the economic effect of employee satisfaction on firm performance, taking into account the changes in overall satisfaction rating. A couple of recent studies have seen this relationship, but they have been conducted for the whole market and not for a specific sector (Huang et al., 2015; Symitsi et al., 2018).

In order to explore this relationship, a subsample of the companies found in the dataset is employed. The reason is that there is a total of 297,933 reviews spread across 10 years for the 11,975 firms, meaning that for most of the companies there are no reviews for many periods or the number of reviews is so limited that will induce a bias to the information derived. As such, following previous literature (Symitsi et al., 2018) a cutoff of 100 reviews was selected for the whole period. For those companies, several financial data were collected from Thomson Reuters Eikon Database. After omitting those that were found to report financial results as part of the group of companies they belong to and those for which no financial data were available, the final sample consisted of an unbalanced dataset of 78 firms. Corporate performance is measured with ROA. For the effect of employee satisfaction, the average overall rating employees provide for the specific company for a month is used. Controlling for several financial variables that are used in the finance literature the full model has the following form (Equation 4.3).

$$\boldsymbol{ROA_{i_t} = AverageRating_{i_{t-1}} + TotalAssets_{i_{t-1}} + Leverage_{i_{t-1}} + ROA_{i_{t-1}}} \\ \boldsymbol{+ CAPEX_{i_{t-1}} + FirmAge_{i_t} + T + C + \epsilon_{i_t},} \quad (4.3)$$

where $\boldsymbol{AverageRating_{i_{t-1}}}$ is the mean rating of current employees for the company for the previous year, $\boldsymbol{TotalAssets_{i_{t-1}}}$ is the logarithm of the total assets of the company for the previous year, $\boldsymbol{Leverage_{i_{t-1}}}$ is the ratio Debt/Total Assets, $\boldsymbol{CAPEX_{i_{t-1}}}$ refers to capital expenditures, $\boldsymbol{FirmAge_{i_t}}$ is computed from the date of incorporation, T is for time-fixed effects, and C is for industry-fixed effect based on the NAICS sector. Three specifications were employed for this analysis. The baseline model (1) is for all observations with more than one employee review. However, if only one review exists for the examined period, the insufficient information that arrives from employees could be noisy and may not capture the actual employee satisfaction for a particular firm. Therefore, for reasons of robustness, two subsamples were employed where the first subsample (Model 2) is for all firms with annual reviews above the 25th percentile ($\boldsymbol{n \geq 4}$ observations) and the second (Model 3) for annual reviews equal to and above eight ($\boldsymbol{n \geq 8}$). The study takes into consideration only the information that arrives from current employees as this information is representative of the financial period under examination. In the case of former employees while the calendar date the employee posted the review is known, there is no information about his/her departure date from the company, as such those reviews should not represent up-to-date information. For example, an employee who may have left the company five years ago cannot articulate the current working conditions of a company. Therefore, to reduce the noise only current employees are used, and this is an approach that has been followed in the aforementioned previous relevant literature.

Results (Table 4.9) reveal that in all cases employee satisfaction has a statistically significant positive relationship with firm performance. On average, an increase by one star in the overall rating of a company is linked with an increase between 1.2 and 1.4 of ROA. Reverse causality is not an issue here, as lagged variables are employed. Instead, a contemporaneous relationship could reveal dubious results, as higher profitability may also lead to higher employee satisfaction, i.e., in the case of a better bonus.

Table 4.9 Employee satisfaction and firm profitability

	Dependent Variable: ROA_t		
	Model (1)	Model (2)	Model (3)
Average Rating$_{t-1}$	1.199*	1.127*	1.563*
	(0.533)	(0.545)	(0.771)
Leverage$_{t-1}$	2.000**	2.339**	2.534**
	(0.561)	(0.597)	(0.796)
ROA$_{t-1}$	0.592***	0.594***	0.562***
	(0.076)	(0.084)	(0.093)
Total Assets$_{t-1}$	-0.512	-0.201	-0.261
	(0.294)	(0.299)	(0.351)
Firm Age$_t$	0.066***	0.073***	0.056*
	(0.020)	(0.022)	(0.024)
CAPEX$_{t-1}$	0.000	-0.004	0.000
	(0.000)	(0.004)	(0.000)
Constant	2.152	-3.695	-1.667
	(4.927)	(4.830)	(5.264)
Time Effects	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes
Observations	404	350	276
Adjusted R^2	0.47	0.55	0.54

Note: $^*p < 0.05; ^**p < 0.01; ^***p < 0.001$. Robust clustered (firm) standard errors in parentheses.

Considering other studies in the literature, which report that employee satisfaction is the outcome of a company's financial performance (see for example Schneider

et al., 2003; Yee et al., 2008), the focus now is on evaluating whether any reverse causality issues would be exhibited. Using the econometric specification provided in equation 4.4, the reverse model shown in equation (6) is tested which employs the employee rating as the dependent variable.

$$\begin{aligned} \boldsymbol{AverageRating_(i_t) = ROA_{i_{t-1}} + AverageRating_{i_{t-1}} + TotalAssets_{i_{t-1}}} \\ \boldsymbol{+ Leverage_{i_{t-1}} + CAPEX_{i_{t-1}} + FirmAge_{i_t} + T + C + \epsilon_{i_t},} \quad (4.4) \end{aligned}$$

Employing the same model identification procedure as in the previous specification, the results are provided in Table 4.10.

Results of all three models reveal no dependence between the current average rating and the return on assets of the previous period when controlling for all the additional parameters discussed in the previous specification.

Table 4.10 Robustness check for reverse causality

	Dependent Variable: Average Rating$_t$		
	Model (1)	Model (2)	Model (3)
ROA$_{t-1}$	0.001	0.005	0.002
	(0.003)	(0.003)	(0.002)
Average Rating$_{t-1}$	0.544***	0.588***	0.710***
	(0.065)	(0.066)	(0.071)
Leverage$_{t-1}$	-0.066	-0.093	-0.073
	(0.052)	(0.053)	(0.042)
Total Assets$_{t-1}$	0.021	0.019	0.032*
	-0.022	-0.019	-0.015
Firm Age$_t$	-0.001	-0.004*	-0.002
	(0.002)	(0.002)	(0.002)
CAPEX$_{t-1}$	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Constant	1.171**	1.034**	0.568
	-0.358	-0.35	-0.32
Time Effects	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes
Observations	414	356	280
Adjusted R^2	0.31	0.36	0.51

Note: $^*p < 0.05;^* *p < 0.01;^* * *p < 0.001$. Robust clustered (firm) standard errors in parentheses.

4.7 Feedback to Management

Considering the results of the analysis, managers need to act to increase employee satisfaction and address the adverse effects of employee turnover and de-motivation at work. In order to give tangible guidelines, the study utilises the feedback to management field that employees provide on Glassdoor. Using the same topic-modelling approach (See Table 4.11) discussed in Section (4), there are three main directions for improvement for tourism and hospitality companies.

The highest loading is for employee treatment. Many employees refer to the need to be respected, treated equally, and receive better behaviour. "*... stop treating your employees like thieves, not everyone is trying to steal...*", "*... start treating your employees with respect and you will actually have less employee turnover...*", "*... treat women with respect, treat anyone with respect...*", "*... employees are real people who need to be treated with respect like real people...*" are some of the many quotes that refer to this problem. Many employees report that they receive negative treatment from their line managers, a fact that signifies lack of training but also inappropriate policies and mechanisms for capturing such behaviours.

To this direction, tourism and hospitality service providers should implement mechanisms that will identify toxic behaviours. Such mechanisms could take the form of anonymous hotlines where employees can report negative treatment towards them or towards other employees, multi-source performance reviews (where employees can give feedback on their bosses anonymously, i.e., 360 reviews), and post-exit interviews, among others. In addition, open dialogue and discussion through communication and agreement of achievable and agreed targets are critical management tools.

Lack of training and its connection with the high employee turnover rate is also revealed in a separate topic. Representative reviews include reflections such as: "*... new employee training should be more straightforward...*", "*... offer more elab-*

Table 4.11 Results of topic solution for feedback to management

Topic #	Topic Label	Prop. (%)	Top 7 Frex Words
1	Employee Treatment	12.52	stop, hire, respect, actually, everyone, people, professional
2	Better Payment	12.17	pay, better, wage, crew, employee, long, member
3	Improve Customer Service	12.03	sure, customer, service, happy, make, good, food
4	Management Structure	11.96	store, manager, upper, management, corporate, position, location
5	Communication	10.18	great, communication, advice, job, need, please, continue
6	Reward Performance	9.15	worker, hard, raise, life, little, much, one
7	Scheduling	8.49	hour, shift, day, schedule, week, time, enough
8	Improve Culture	8.28	culture, team, thing, focus, leader, many, way
9	Care for Staff	7.72	care, staff, guest, experience, place, line, front
10	Training and Turnover Rate	7.49	training, high, turnover, person, new, get, someone

orate training, there is basic training mostly online...", "*...get additional training and training plans, following the training plans, will prevent the outrageous turnover rates...*" are what some employees say. It is common knowledge that professionalism is an issue on this industry and in many cases, employees in tourism and hospitality work part-time or on a temporary basis to cover their financial needs (e.g., during their studies). As such, their relationship with a firm has an expiration date, and thus they cannot imagine themselves being part of this company in the future. Considering the nature of the employment in the specific industry, which is based significantly on young people, online and social media recruitment strategies can be used for both attracting applicants to fill vacancies but also for better screening of the applicants and their fit with the organization (Ladkin and Buhalis, 2016).

It is also clear that firms fail to motivate employees and make the sector more attractive as well as a long-time career prospect. Extant research has found that employee perception of training program accessibility is positively related to their commitment level. Employees in tourism and hospitality are more loyal to their or-

ganization when training programs upgrade and develop their required skills (Dhar, 2015). Firms can employ several practices in this direction, such as to support employee development through paid or subsidised courses, webinars, job shadowing, mentoring, among others. In doing so, they communicate a message to their employees that the latter is an essential part of the enterprise and they can have a career within this company. In this direction, it is critical for firms to understand their employees' actual needs and goals and then align training with those expectations (Yang et al., 2012).

Employees also discuss compensatory aspects, such as better payment and reward for their efforts. Typical quotes found in these reviews are: "*... you should not be paying us minimum wage but expect maximum efficiency...*"; "*... minimum wage is not sufficient to cover one's financial obligation...*"; "*... I am a very hard worker that makes the job done, and I'm just looking for better opportunities, so I can support my family a little more financially...*". Most companies do not monitor the financial situation of their employees and do not have an understanding of the personal circumstances of their employees. Neither can they provide solutions following a "stand-by-me" approach. Those firms fail to understand that their employees are their sustainable competitive advantage and their interaction with customers forms the tangible part of an intangible service (Kusluvan et al., 2010). A direction for those firms is to make clear what is expected from their employees in order to gain a better reward. In most cases, employees do not just ask for better wages but performance based compensations. "*... embrace the workers and reward the hard working...*", "*... recognize your hard workers and not your favorites...*", "*... give more incentives for your hard workers to continue work hard...*" are some of their quotes, which signify that in many cases productivity is not connected to rewards or the imposed criteria are not clear.

The effect of culture, leadership, and communication is also prevalent, and many

employee reviews reflect those values. Typical quotes include: "*... listen to your associates. The associates that are on your front line and have the interaction with your guest are your most valuable assets. Do not get too focused on numbers and analytics when you have raw data from your associates and your guests...*", "*... when you say you would like feedback don't dismiss what is being said by them or talk over them because you don't like or agree...*", "*... continue listening to your employees and assist their needs. Already doing a great job at it...*". In many cases, employees ask for their active participation in the design and implementation of the policies or product offerings. Firms should not only employ policies and procedures where employees can express their opinions, but they should consider these suggestions, rewarding smart ideas and outline implementation action plans or provide clear justification when an idea cannot be applied. Here comes the crucial role of employee empowerment that simultaneously improves operational performance and the employees' work experience (Cheung et al., 2012; Lin et al., 2017). Firms should direct their focus on the implementation of strategies that will allow sharing of information, rewards, and power with employees to make them more autonomous and eager to take the initiative and make their own decisions to facilitate customer experience. While the design of HR policies, which are already in place for most firms in the sample, focus on continuous improvement and evaluation of the company environment, it seems prevalent that a significant portion of employees do not recognise those efforts, signifying that their implementation is unsuccessful or that those policies do not address their actual issues.

Chapter 5

Conclusion

5.1 Summary of Contribution and Theoretical Implications

This thesis explored the value of online reviews and investigated the factors that affect their informational content. It tried to answer whether online reviews capture product quality, and demonstrated how this information can be used in other domains extending the current literature that focuses solely on consumption-based experiences. To this end, a battery of well-established theoretical and methodological approaches were employed introducing innovative methods and techniques in this area of research. Findings extended extant scholarly thought and made a contribution to the academic knowledge in several ways.

The first chapter explored cultural influences on online reviews. A voluminous part in the literature examines online reviews from different angles including their effect on consumer choices (Sparks and Browning, 2011; Vermeulen and Seegers, 2009), the characteristics that make them useful (Liu and Park, 2015), the determinants of customer satisfaction (Guo et al., 2017), the motivation of users to share their experience online (Munar and Jacobsen, 2014), and the responses of companies (Sparks et al., 2016). However, cultural influences are largely ignored in the literature of eWOM. This chapter filled some of the knowledge gaps by investigating the effect of

culture and cross-cultural differences on customers' overall satisfaction from a service provider captured through the lens of online reviews. A significant advantage of using online reviews, and particularly, reviews for airlines is that they allow someone to study these effects using a pool of international passengers examining ratings across multiple countries. As such, this study contributes to the literature that relates culture and service satisfaction in the broader travel and hospitality context (Laroche et al., 2004; Reisinger and Crotts, 2010; Li, 2014).

Results revealed a number of interesting findings. First of all, the study provided evidence of the significant cross-national cultural effect that explain variation in airline passengers' perceived service quality satisfaction. Interestingly, these differences are not only reflected on the overall satisfaction but also on the rating reviewers provide for various service aspects. The study also reported a strong association between the cultural distance of the passenger and the airline company with passengers being more satisfied when the service providers come from countries that share similar cultural values with them. Most importantly, innovative unsupervised algorithm-based topic methods were applied, and the results presented unmasked the specific service aspects that matter for the different cultural dimensions and how the distributions of these topics change across the Hofstede's dimensions continuum. Findings also revealed a distortion in the informational content of online reviews as a result of cross-national differences which signifies that readers should be cautious when they consult online reviews as the mean overall rating (or its dispersion) can be explained partially by different rating patterns. This highlights also implications for companies when they attempt to measure service quality from a customer's experience.

In the second part of this study, the limitations of previous studies due to methods, sample bias or dimensions used (Brouthers et al., 2016) were discussed. The thesis addressed some of the limitations and extended the current literature by unmasking the effect of service provider's culture on overall satisfaction. It was argued

that a joint effect of service and passenger culture to overall satisfaction exists and may be indistinguishable. The study's key findings provided evidence of a complex relationship that cannot be captured by studying customers' culture in isolation. Consequently, discrepancies identified in the previous literature may be better explained. By embracing the polynomial regression analysis and response surface methodology, the thesis examined the concomitant effect of the two cultures. At the same time, the extensive sample of reviews from passengers and airlines covered the majority of countries and, as such, was representative of the whole population.

The second empirical study presented in chapter 3, provided several interesting insights about the formation of online review valence for service encounters and durable goods under the prism of construal level theory and reliability management. It was revealed that different dynamics are present for these two distinct categories. In the particular case of service encounters, the analysis was in line with the studies of Huang et al. (2016) and Pizzi et al. (2015) about the positive effect of temporal and spatial distances. However, the thesis extended these findings by incorporating the social distance of the construal level theory. The results indicated a strong negative association between social distance and consumer satisfaction. This approach of estimating the effect of all three distances simultaneously adds to the stream of the construal level theory literature that discusses the existence of sensitivities and asymmetries (Maglio et al., 2013; Zhang and Wang, 2009). The results corroborated this idea by displaying a "distance boosting effect" of the social distance with the other two distances.

In the case of durable goods, the findings revealed that the temporal distance between the time point of purchase and review publication has a different effect than that reported for services. In that particular category of products, there was evidence of a significant negative effect of the temporal distance rather than the positive effect that is found on service encounters. The U-shaped relationship of failure rates during

a product's lifecycle complements the research on the distributional patterns of online reviews where other U-shaped characteristics have been uncovered. This study extended this literature stream by providing evidence that quality is reflected in the reviews of durable goods. More specifically the time between product purchase and review publication has a significant negative effect on review valence revealing that more positive reviews are to arrive in a shorter time than negative reviews. Durable search goods online reviews reflect product quality characteristics as they follow a pattern similar to the bathtub curve. As such, the results also highlighted the importance of product lifecycle in marketing decisions (Mukhopadhyay and Chung, 2016).

The third study introduced a novel form of electronic word of mouth, that of employees' online reviews. The thesis presented how this information can be used for firms and it contributed to the ever-growing stream of the tourism and hospitality literature, which studies human resource management aspect in this industry (Baum et al., 2016; Janta et al., 2011; Ladkin, 2011; Szivas et al., 2003). The empirical analysis revealed a set of important insights about the drivers of employee satisfaction and dissatisfaction in the tourism and hospitality industry and their concomitant effect on employee turnover. This has specific implications for research in this critical aspect of the tourism and hospitality literature, which are outlined below.

An important theoretical implication is the evaluation of the relative importance of the satisfaction aspects extracted from online reviews. While several studies have tried to rank the importance of these factors on employee satisfaction and subsequently employee turnover intentions, this study evaluated the relative importance of these factors by utilising both numerical ratings and textual content. Hitherto, most studies explored the relationship among a specific factor and job satisfaction or other relevant outcomes. Based on the numerical scales, the analysis showed that some factors are better in explaining satisfaction while other factors are better predictors of dissatisfaction. Borrowing the terminology from Herzberg's two-factor motivation

theory (Herzberg, 1966), the compensation/salary and work-life balance are the "hygienes" for employees, while high cultural values and leadership are the "motivators", i.e., the factors that, when present, significantly increase job satisfaction.

These findings were also in agreement with the topic analysis, a non constrained by predefined scales information. Again, reviewers who provide a high satisfaction score significantly discuss less the remuneration/benefits as positive factors, while managerial factors such as leadership/communication are discussed less as negative topics by highly satisfied employees. The study also provided theoretical implications for the determinants of employee turnover. To this end, there was a confirmation of findings from previous studies that report that, although a high dissatisfaction with remuneration exists in the industry, this has no significant relationship with employee turnover (see for example Deery and Iverson, 1996; Riley et al., 1998). As the relevant analysis revealed, what mainly causes employees to leave a company is the lack of career advancement.

Another theoretical implication of this study is related to the consideration of causality between employee satisfaction and financial performance. The study clearly showed no reverse causality in that aspect. Satisfied employees bring higher returns, especially in an industry where service quality is a critical success factor. While a set of studies have found (see for example Schneider et al., 2003; Yee et al., 2008) that a reverse link co-exists between job satisfaction and financial performance, the study did not support such reciprocal link. Two major reasons can explain this. The first is the industry effect and its associated employee turnover rate. Tourism and hospitality is an industry characterised by a high employee turnover rate and embeddedness in the workforce is minimal since employment in such companies is characterised by part-time working hours and seasonal occupation. The second reason is related to the low barriers to enter this particular sector, as well as, the limited training required to be employed, impose a pressure in compensation. Overall, the results

provided theoretical support for the direct link of the service-profit model which is confirmed empirically in this study. Researchers in the human resource management aspect of the tourism and hospitality literature can evaluate this implication further by considering the satisfaction aspects of the job role.

Finally, this study demonstrated the importance of online employee reviews and social media in general as a reliable data source. To this end, the thesis discussed the methodological advances compared to established measurement scales. As Matzler and Renzl (2007) argue, employee satisfaction is a multidimensional construct and as such no single measurement instrument can capture all the aspects of satisfaction that are context and industry-specific. Thus, researchers in tourism and hospitality human resources can focus their attention on employee feedback expressed in job sites platforms such as Glassdoor, which contain highly representative and reliable information.

5.2 Practical Implications

The present thesis has practical value for both airline carriers and passengers, but the benefits can also be extended to other service domains. Given that there is a concomitant effect of the service provider and consumer culture, managers should recognise the threefold effect of cultural congruence when interpreting online reviews. This is of sheer importance for airlines, as managers may have some direct control to pro-actively manage customer expectations.

First, it is important for firms to understand that service evaluations may be influenced by consumer culture and the perception of their own culture as well. This is fundamental for interpreting consumer expectations regarding the service offering and provides a springboard for improving existing monitoring processes for capturing these particular aspects as well. A better understanding of the cultural level of consumer

expectations is critical, and this can form a new basis for competitive advantage – beyond changes in the competitive landscape of a specific service industry. Second, the concomitant effect between the service provider and consumer culture enables firms to align their value-adding activities to drive consumer loyalty. A wide range of service attributes may be considered essential when taking into consideration firms' national culture and may assist in improving the quality practices and service offering as well. Third, there are clear benefits for market segmentation on the basis of cultural congruence among firms and consumers. By linking firms' cultural characteristics to customer segments, this approach may produce an advantageous understanding of provider selection attributes and their link towards consumer satisfaction.

For consumers, the practical implications are of equal importance. When consulting online reviews, they should primarily focus on the reviews provided by customers with similar cultural (and perhaps demographic) characteristics and avoid relying on a handful of reviews to make an informed decision. Review aggregators that base their success and profitability to a certain extent on the presentation of reviews that will allow customers to take the proper decisions should also consider that cross-national differences exist and, as such, promote alternative measures that account for cultural effects. Such alternative has been presented in this thesis through a weighted rating score that eliminates such influences.

The second study has implications not only for marketing practitioners such as customer service specialists but also for those involved with product quality assessment. The results show that reviews can be used as a quality management instrument for capturing and identifying product field failures. As such a response to negative reviews using customer support (e.g., return and/or exchange) and service policies might be an important instrument to alleviate the effect of negative reviews attributed to product quality, given that average review valence has a high sale elasticity. By showing that the relationship between various review-derived operationalisations of

the failure rate is a robust U-shaped one, the study provides evidence of clustering of negative reviews in the early and late stages of the product life time. This is attributed to the reliability characteristics of the product. Therefore, marketers tasked with customer service should consult the clustering of the arrivals of negative reviews after a period of a steady fraction of positive versus negative reviews as a signal of possible wear outs (or incompatibilities of complementary products with the current generation of the product) and as such inform their service and support functions. In doing so, they can consult the time dependent-clustering of moderate and/or negative reviews in order to estimate shifts in consumer preferences and inform their purchase, renewal, and catalogue pruning decisions accordingly. In a similar manner, the results are also useful to retail practitioners tasked with category and catalogue management and, in particular, the estimation of a product's market lifetime using signals from online reviews.

In the third study, the informational value of employee online reviews is explored as complement information coming from internal metrics. This complementarity arises because online reviews arrive at a higher frequency than internal surveys, but, most importantly, because they offer unconstrained information through the review text offer. Therefore, online reviews can be particularly valuable for firms in order to (a) validate the results of existing internal metrics mostly based on primary data; (b) capture changes that may occur in the interim period of the lower frequency internal metrics; (c) provide information for the adjustment of internal metrics in case employees discuss topics beyond those currently measured; (d) address employee silence issues; and (e) gain knowledge of the whole market, acting as a benchmark for the performance of the company. Considering the results of this analysis, managers need to act to increase employee satisfaction and address the adverse effects of employee turnover and demotivation at work. Further implications are offered for tourism and hospitality service providers by using employee online reviews in order

to identify behaviours against the culture and the values of the companies. Moreover, managers could exploit the value of online employee platforms by offering similar within-company means to employees in order to share information. Anonymous hotlines where employees can report negative treatment towards them or towards other employees, multi-source performance reviews (where employees can give feedback on their bosses anonymously, i.e., 360 reviews), and post-exit interviews could be examples of such sources. Finally, the output of this research exhibits the sensitivity of hospitality and tourism companies to maintain and motivate employees and demonstrates how listening to employees could have an effect on reduced employee turnover rates and elevated employee satisfaction.

5.3 Limitations

The studies presented in this thesis were not free of limitations. These limitations can be mainly attributed to the nature of online reviews. In regard to the first study, due to limitations in data availability, the study could not account for reviewers' demographics (income, sex, age, education, etc.). Further, within-country variation exists and, as such, individuals from the same country may have heterogeneous cultural traits than those reflected by the country profiles in Hofstede's framework (Sivakumar and Nakata, 2001). By taking the average score of the population instead of individual reviews and posing a restriction of at least 30 reviews (and the alternative cut-offs) per examined pair the analysis mitigated such concerns. In that way, it was expected the groups to be representative of the Hofstede's values assigned. Another critique is that cultural dimensions may change over time. However, the recent study of Beugelsdijk et al. (2015) reports that cultural change is absolute rather than relative and that countries' scores relative to the scores of other countries remain stable.

Online reviews also have been found to be prone to several biases such as self-selection (Li and Hitt, 2008), response biases (Hu et al., 2009) or manipulation (Mayzlin et al., 2014). While such concerns are valid other measures used in the empirical literature (e.g., questionnaires) also require the voluntary participation of the participants, therefore, they do not differ substantially from online reviews. The data used in the analysis were retrieved from the most popular review aggregation platform (TripAdvisor) and pertain to the last two years where intelligent in-house mechanisms have been developed to capture fake reviews and comply with regulatory requirements which prohibit such behaviour in many countries. As such, manipulation of online reviews becomes more difficult. To this direction, the size of the companies in the sample is reassuring as big companies (or the majority of those) will not resort to such practices given the reputation loss, if found, will be bigger than the potential gain. However, even under the existence of such biases (for example the undisputed under-representation) given the significant effect reviews exert on customers' decision and subsequently to corporate performance, firms should understand the determinants of satisfaction or dissatisfaction that lead those people to express their opinion online and adjust their offering accordingly.

In regards to the limitations of the second study, the secondary data employed in this research did not permit to control for several personal characteristics and demographics, because they were not available. Having such information, it would be possible to compute other forms of cultural distance (i.e., religion) or even to explicitly ask the participant how socially close they feel in those experiences. Moreover, the computation of social distance was based on the self-reported country-of-residence which could be a noisy proxy given the existence of individuals that live in a specific country, but they have a different cultural background (e.g., in the case of expatriates). Further, as before within-country variation exists, and individual responses could be more representative (Donthu and Yoo, 1998). However, the size of the dataset

employed here may cancel out such errors. Even in the existence of such errors, the second approximation of cultural distance pointed out in the same direction. It should be clear, however, that the examination of the social distance is through the lens of in-group vs. out-group distance and not self vs. others. Online reviews, in any case, represent own personal experiences. Another limitation for the case of durable goods is that the product price was available only at the collection time point and, therefore, the effect of price variation to review valence cannot be estimated.

Finally, limitations were also present in the third study. Interestingly the online reviews in the sample did not follow the established U-shaped distribution, giving an indication that may be free of the biases that often accompany online reviews. However, the numerical scales for the subcategories in Glassdoor measure satisfaction with specific aspects such as career development, compensation and benefits, senior management, work/life balance, and cultural values. Though these categories are important in explaining a big part of employee satisfaction and employee turnover, several critical variables are still not measured, such as working hours, work overload, role ambiguity, and role conflict. The topic analysis approach addressed to some extent to this limitation, as in the text employee are free to discuss what they want. Moreover, looking for direct effects of the job satisfaction aspects, the literature has shown that some act as moderators and, as such, exploring the moderating relationships of these factors needs to be addressed in future research.

Appendices

Table A.1 Polynomial Regression and response surface analysis with dependent variable the satisfaction score with customer service

	Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-Term Orientation	Indulgence
Variable	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)
β_0	3.713 (0.025) ***	3.66 (0.027) ***	3.717 (0.033) ***	3.705 (0.022) ***	3.69 (0.026) ***	3.699 (0.024) ***
β_1	-0.018 (0.015)	0.031 (0.016)	-0.077 (0.015) ***	-0.029 (0.019)	0.115 (0.015) ***	0.014 (0.015)
β_2	0.077 (0.016) ***	0.046 (0.017) **	-0.051 (0.017) **	-0.052 (0.016) **	-0.037 (0.016) *	-0.039 (0.015) **
β_3	-0.046 (0.013) ***	0.06 (0.016) ***	0.017 (0.02)	0.031 (0.014) *	0.024 (0.014)	-0.053 (0.011) ***
β_4	-0.003 (0.014)	0.002 (0.017)	-0.006 (0.014)	0.009 (0.013)	-0.016 (0.015)	0.034 (0.016) *
β_5	0.043 (0.014) **	-0.01 (0.016)	-0.024 (0.019)	-0.026 (0.009) **	-0.002 (0.016)	0.06 (0.012) ***
$R2$	0.07	0.04	0.04	0.04	0.08	0.07
Surface tests						
α_1	0.059 (0.021) **	0.077 (0.021) ***	-0.128 (0.023) ***	-0.081 (0.026) **	0.078 (0.021) ***	-0.025 (0.019)
α_2	-0.006 (0.022)	0.052 (0.025) *	-0.013 (0.031)	0.015 (0.020)	0.006 (0.025)	0.041 (0.018) *
α_3	-0.094 (0.023) ***	-0.014 (0.026)	-0.027 (0.022)	0.023 (0.024)	0.152 (0.022) ***	0.053 (0.023) *
α_4	0.001 (0.025)	0.048 (0.032)	0.000 (0.03)	-0.004 (0.021)	0.038 (0.028)	-0.026 (0.028)

Table A.2 Polynomial Regression and response surface analysis for the overall satisfaction (Two-stage approach)

	Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-Term Orientation	Indulgence
Variable	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)
β_0	0.019 (0.023)	-0.064 (0.025) *	0.041 (0.031)	0.009 (0.021)	0.002 (0.026)	0.009 (0.024)
β_1	-0.009 (0.014)	0.024 (0.015)	-0.090 (0.014) ***	-0.028 (0.018)	0.084 (0.015) ***	0.021 (0.014)
β_2	0.104 (0.016) ***	0.071 (0.016) ***	-0.081 (0.015) ***	-0.048 (0.015) **	-0.004 (0.016)	-0.071 (0.014) ***
β_3	-0.042 (0.012) ***	0.066 (0.014) ***	0.014 (0.019)	0.025 (0.013)	0.012 (0.014)	-0.054 (0.011) ***
β_4	0.000 (0.014)	-0.007 (0.016)	0.004 (0.013)	0.001 (0.013)	-0.001 (0.015)	0.042 (0.015) **
β_5	0.039 (0.014) **	0.014 (0.015)	-0.039 (0.017) *	-0.018 (0.008) *	0.001 (0.015)	0.056 (0.012) ***
R^2	0.1	0.05	0.08	0.03	0.04	0.01
Surface tests						
α_1	0.095 (0.02) ***	0.095 (0.02) ***	-0.170 (0.021) ***	-0.076 (0.024) **	0.080 (0.021) ***	-0.050 (0.018) **
α_2	-0.003 (0.021)	0.074 (0.022) ***	-0.022 (0.029)	0.008 (0.020)	0.013 (0.024)	0.044 (0.019) *
α_3	-0.112 (0.022) ***	-0.047 (0.025)	-0.009 (0.021)	0.020 (0.023)	0.088 (0.022) ***	0.092 (0.021) ***
α_4	-0.004 (0.024)	0.087 (0.029) **	-0.029 (0.028)	0.006 (0.020)	0.015 (0.027)	-0.040 (0.027)

Table A.3 Polynomial Regression and response surface analysis with dependent variable the overall satisfaction (Control for Migration)

	Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-Term Orientation	Indulgence
Variable	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)
β_0	3.745 (0.028) ***	3.699 (0.034) ***	3.777 (0.038) ***	3.753 (0.025) ***	3.709 (0.031) ***	3.753 (0.028) ***
β_1	-0.001 (0.018)	0.026 (0.019)	-0.091 (0.018) ***	-0.05 (0.024) *	0.079 (0.018) ***	0.011 (0.017)
β_2	0.109 (0.019) ***	0.029 (0.024)	-0.032 (0.018)	-0.036 (0.018) *	-0.002 (0.02)	-0.063 (0.019) ***
β_3	-0.039 (0.016) *	0.066 (0.018) ***	0.004 (0.023)	0.015 (0.018)	0.014 (0.018)	-0.061 (0.014) ***
β_4	0.009 (0.017)	-0.002 (0.02)	0.004 (0.017)	0.005 (0.017)	-0.007 (0.019)	0.06 (0.019) **
β_5	0.031 (0.015) *	-0.027 (0.025)	-0.043 (0.02) *	-0.03 (0.011) **	0.016 (0.018)	0.036 (0.013) **
R^2	0.1	0.04	0.07	0.04	0.04	0.08
Surface tests						
α_1	3.745 (0.028) ***	3.699 (0.034) ***	3.777 (0.038) ***	3.753 (0.025) ***	3.709 (0.031) ***	3.753 (0.028) ***
α_2	-0.001 (0.018)	0.026 (0.019)	-0.091 (0.018) ***	-0.05 (0.024) *	0.079 (0.018) ***	0.011 (0.017)
α_3	0.109 (0.019) ***	0.029 (0.024)	-0.032 (0.018)	-0.036 (0.018) *	-0.002 (0.02)	-0.063 (0.019) ***
α_4	-0.039 (0.016) *	0.066 (0.018) ***	0.004 (0.023)	0.015 (0.018)	0.014 (0.018)	-0.061 (0.014) ***

Table A.4 Polynomial Regression and response surface analysis with dependent variable the satisfaction score with ground service where departure airport is from the same country with the airline.

	Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-Term Orientation	Indulgence
Variable	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)	Coefficient (s.e)
β_0	3.619 (0.046) ***	3.619 (0.048) ***	3.619 (0.059) ***	3.68 (0.04) ***	3.635 (0.054) ***	3.685 (0.048) ***
β_1	-0.042 (0.027)	-0.02 (0.029)	-0.061 (0.028) *	-0.05 (0.042)	0.073 (0.029) *	0.037 (0.028)
β_2	0.052 (0.033)	0.041 (0.031)	-0.049 (0.039)	-0.072 (0.028) **	0.008 (0.03)	-0.043 (0.032)
β_3	-0.001 (0.023)	0.034 (0.025)	0.067 (0.04)	0.008 (0.032)	0.03 (0.028)	-0.06 (0.023) **
β_4	0.002 (0.024)	0.024 (0.035)	-0.01 (0.024)	0.001 (0.033)	-0.041 (0.031)	0.002 (0.028)
β_5	0.042 (0.019) *	0.003 (0.03)	-0.026 (0.03)	-0.028 (0.012) *	-0.002 (0.035)	0.035 (0.026)
R^2	0.07	0.03	0.05	0.06	0.05	0.07
Surface tests						
α_1	0.01 (0.04)	0.02 (0.034)	-0.11 (0.052) *	-0.121 (0.049) *	0.081 (0.038) *	-0.007 (0.043)
α_2	0.044 (0.032)	0.061 (0.039)	0.032 (0.053)	-0.019 (0.043)	-0.012 (0.052)	-0.023 (0.033)
α_3	-0.093 (0.045) *	-0.061 (0.049)	-0.013 (0.043)	0.022 (0.051)	0.065 (0.045)	0.08 (0.043)
α_4	0.039 (0.043)	0.013 (0.066)	0.051 (0.053)	-0.021 (0.05)	0.069 (0.059)	-0.027 (0.056)

Figure A.1 Three-dimensional representation of the effect of carrier and passenger cultural traits to satisfaction with customer service. Note: Country pairs = 733, the line depicted is the line of agreement (or congruence). Contour plots are depicted at the bottom.

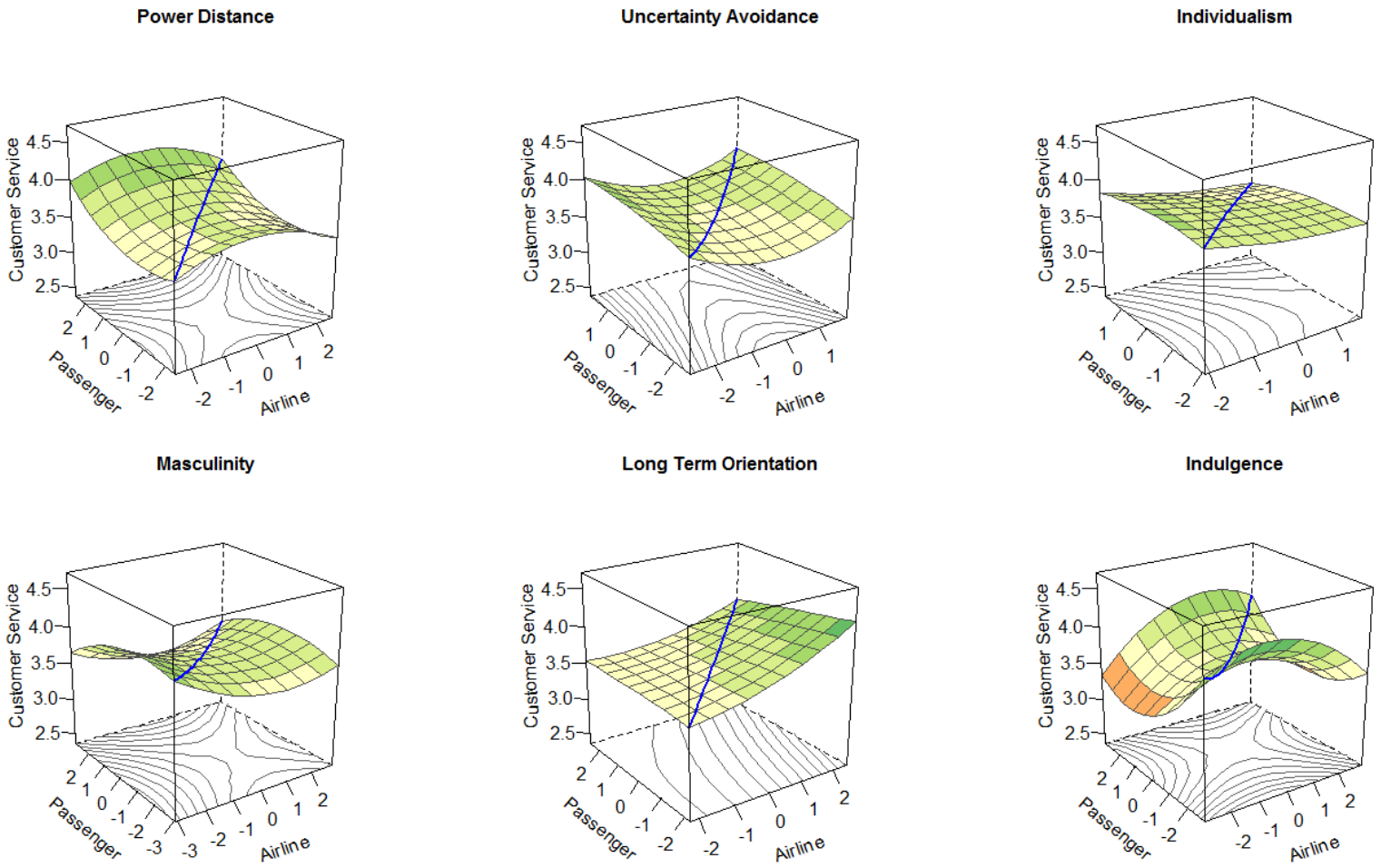


Figure A.2 Three-dimensional representation of the effect of carrier and passenger cultural traits to overall satisfaction (Two-stage least squares approach). Note: Country pairs = 733, the line depicted in blue is the line of agreement (or congruence). Contour plots are depicted at the bottom.

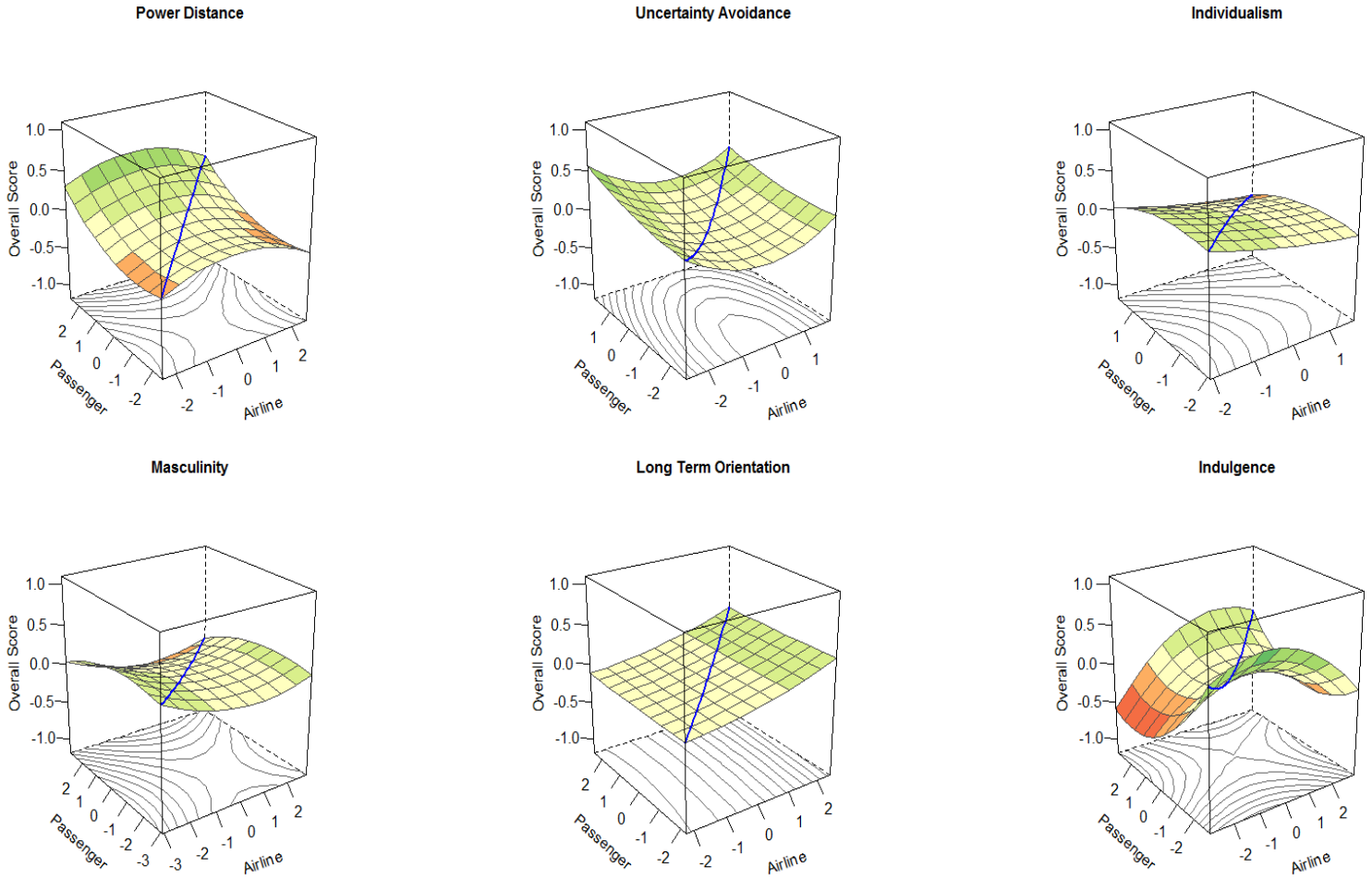


Figure A.3 Three-dimensional representation of the effect of carrier and passenger cultural traits to overall satisfaction (Control for Migration). Note: Country pairs = 471, the line depicted in blue is the line of agreement (or congruence). Contour plots are depicted at the bottom.

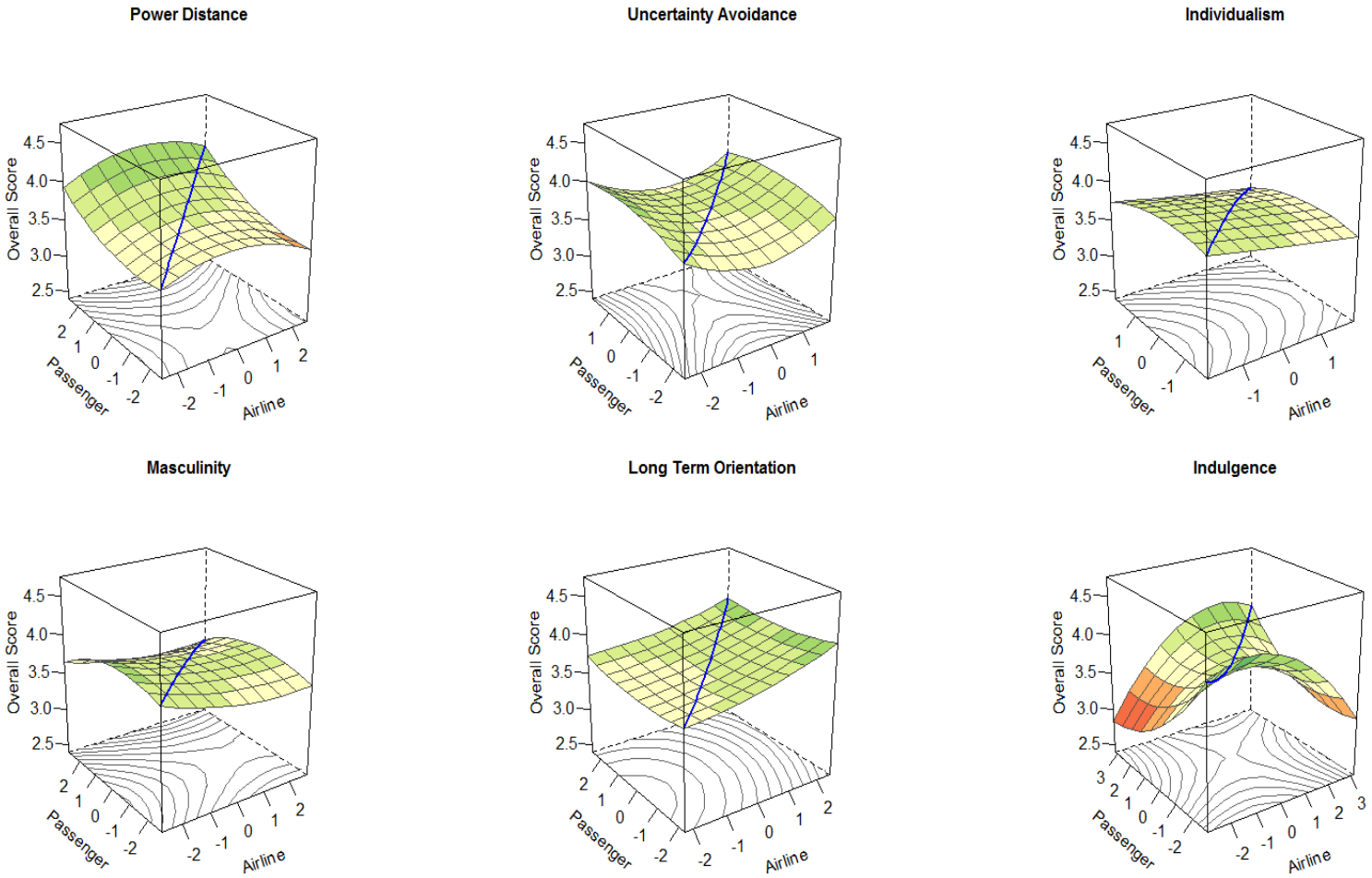
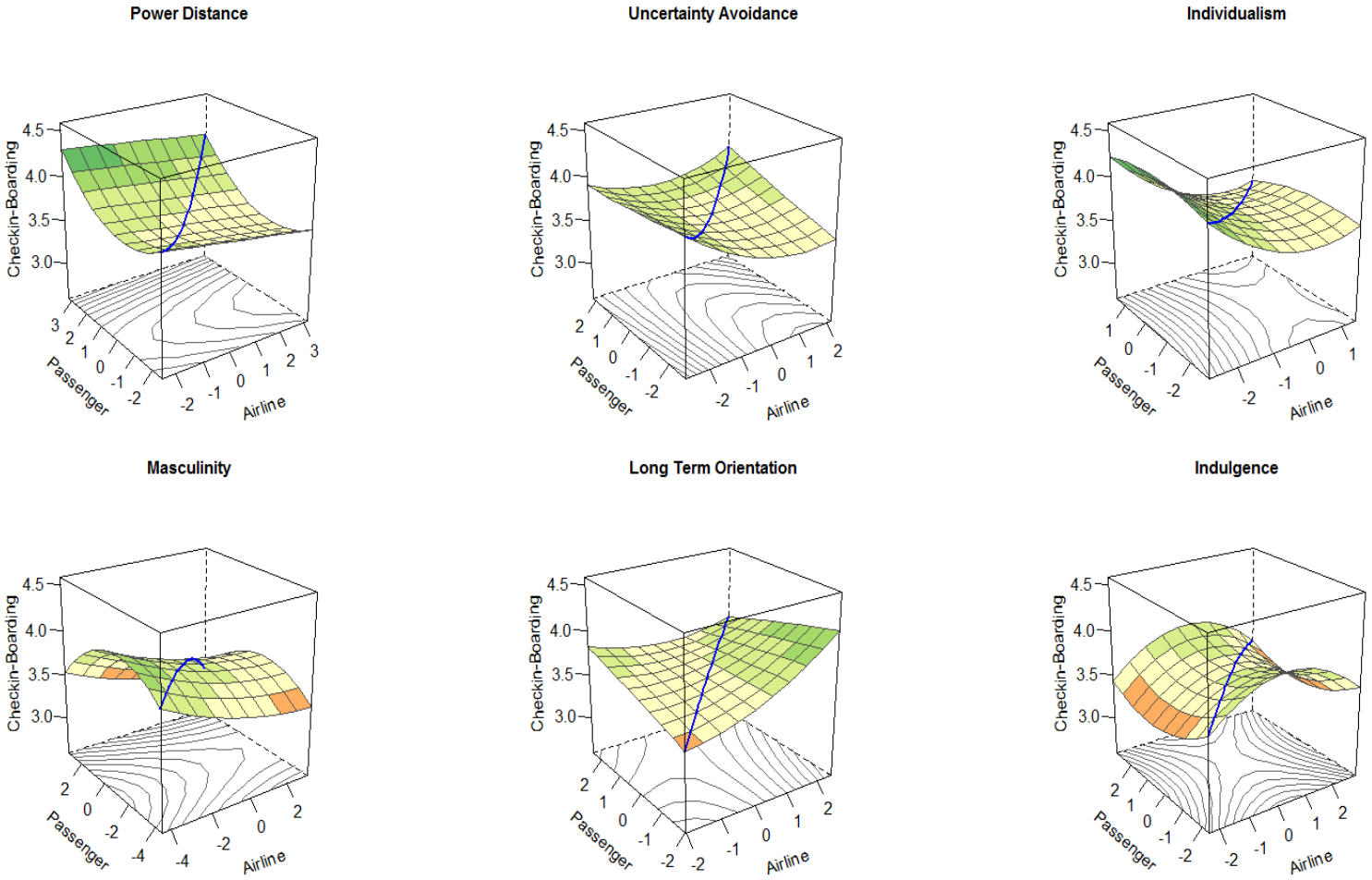


Figure A.4 Three-dimensional representation of the effect of carrier and passenger cultural traits to satisfaction with ground service. Note: Country pairs = 196, the line depicted in blue is the line of agreement (or congruence). Contour plots are depicted at the bottom. Departure airport is from the same country with the airline.



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