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Exploring the ways of providing high service quality at low cost in the economy hotel sector

A dissertation submitted in partial fulfilment of the requirements of the Royal Docks School of Business and Law, University of East London for the degree of **MSc International Business Management**

September 2020

15,225 words

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**Exploring the ways of providing high service quality at
low cost in the economy hotel sector**

London, September 2020

Abstract

Industry experts uniformly agree that economy hotel sector can be competitive and profitable only if it provides high-quality service at low operating costs. Several researchers, however, believe that this is not possible because constraint models state that low cost always results in low quality and that high quality always requires high investment. A solution would benefit both customers and operators, but most of the existing studies in this field are decades old and often contradict each other. This limitation in the academic literature supports the need for new, up-to-date research.

The aim of this study is to find out whether it is possible to provide high service quality at low cost in the economy hotel sector, and if so, how. The secondary data source for the quantitative analysis is Booking.com's extensive database, which contains live data of 712,322 hotels and their more than 100 million guest reviews.

This study has revealed that it is possible to provide high quality at low cost while respecting the statements of the constraint models: The hotels need to provide core services at high quality to achieve high perceived quality and reduce or eliminate all non-core services to achieve low-cost operation. The study discusses in detail what the target customers consider core services. Although this analysis resulted in several obvious findings (for example, free Wi-Fi is a core service), it also provides some surprising conclusions.

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Table of Contents

CHAPTER 1: INTRODUCTION	1
1.1 - RESEARCH BACKGROUND	1
1.2 - PURPOSE OF THE STUDY	1
1.3 - RESEARCH QUESTIONS AND RESEARCH OBJECTIVES	2
1.4 - RESEARCH STRUCTURE	3
CHAPTER 2: LITERATURE REVIEW	5
2.1 - INTRODUCTION	5
2.2 - ECONOMY HOTELS	6
2.2.1 - <i>Hotel industry</i>	6
2.2.2 - <i>Economy hotel sector</i>	7
2.3 - PRICE VS. COST	9
2.3.1 - <i>Price</i>	9
2.3.2 - <i>Cost in the economy hotel sector</i>	10
2.4 - QUALITY	11
2.4.1 - <i>Service quality in the economy hotel sector</i>	12
2.5 - REDUCING COST VS. IMPROVING QUALITY	14
2.5.1 - <i>Reducing cost vs improving service quality in the economy hotel sector</i>	18
2.6 - SUMMARY OF THE LITERATURE REVIEW	20
2.6.1 - <i>Findings</i>	20
2.6.2 - <i>Limitations and suggestions for future research</i>	21
2.6.3 - <i>Identification of the research question</i>	21
CHAPTER 3: RESEARCH METHODOLOGY	23
3.1 - INTRODUCTION	23
3.1 - RESEARCH RATIONALE AND RESEARCH QUESTIONS	25
3.3 - RESEARCH METHODS	27
3.3.1 - <i>Research philosophy</i>	27
3.3.2 - <i>Approach to theory development</i>	28
3.3.3 - <i>Methodological choice: qualitative vs. quantitative</i>	30
3.3.4 - <i>Research strategy</i>	32
3.3.5 - <i>Time horizon</i>	34
3.3.6 - <i>Techniques and procedures</i>	34
3.3.6.1 - <i>Data collection method: primary vs. secondary</i>	34
3.3.6.2 - <i>Accessibility, validity and reliability of the data</i>	36
3.3.6.3 - <i>Sampling strategy</i>	37
3.3.6.4 - <i>Data analysis method</i>	45
3.4 - SUMMARY OF THE RESEARCH METHODOLOGY	50
CHAPTER 4: DATA ANALYSIS	51
4.1 - INTRODUCTION	51
4.2 - MAIN RESEARCH QUESTION	51
4.3 - ADDITIONAL RESEARCH QUESTION	53
4.3.1 - <i>Introduction</i>	53
4.3.2 - <i>Analysis of hotel attributes</i>	55
4.3.3 - <i>Analysis of room attributes</i>	59
4.3.4 - <i>Analysis of guest reviews</i>	63
4.4 - SUMMARY OF THE DATA ANALYSIS	66

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS	70
5.1 - AIM AND OBJECTIVES OF THE STUDY	70
5.2 - SUMMARY OF FINDINGS	70
5.3 - THEORETICAL IMPLICATIONS	71
5.4 - PRACTICAL IMPLICATIONS	72
5.5 - LIMITATIONS AND CHALLENGES OF THE STUDY	73
5.6 - DIRECTIONS FOR FUTURE RESEARCH	74
BIBLIOGRAPHY	75
APPENDICES	86
<i>Appendix 1 - The 62 selected cities in the sample</i>	<i>86</i>
<i>Appendix 2 - Economy hotels in the sample</i>	<i>88</i>
<i>Appendix 3 - High-performing hotels in the sample</i>	<i>90</i>
<i>Appendix 4 - Hotel attributes: location and parking</i>	<i>92</i>
<i>Appendix 5 - Hotel attributes: arrival and departure</i>	<i>94</i>
<i>Appendix 6 - Hotel attributes: entertainment</i>	<i>97</i>
<i>Appendix 7 - Hotel attributes: property policies, cleaning, breakfast</i>	<i>99</i>
<i>Appendix 8 - Hotel attributes: other facilities</i>	<i>101</i>
<i>Appendix 9 - Room attributes: comfort</i>	<i>103</i>
<i>Appendix 10 - Room attributes: bathroom</i>	<i>105</i>
<i>Appendix 11 - Room attributes: kitchen</i>	<i>107</i>
<i>Appendix 12 - Room attributes: media and technology</i>	<i>109</i>
<i>Appendix 13 - Room attributes: other room amenities</i>	<i>111</i>
<i>Appendix 14 - Guest reviews</i>	<i>113</i>

Chapter 1: Introduction

1.1 - Research background

In the profit-oriented lodging industry, the main task of the managers is to improve their sales. To attract more guests, the basis of the solution is usually simple: they should lower their prices and enhance their services. In practice, however, the solution is not so simple and straightforward: price reduction must be reached through cost reduction to avoid profit loss, but reduced cost disables the company to fund high-quality services like expensive spa facilities.

In this industry, the economy hotel sector needs the most help because it has to compete against both the cheap non-hotel sectors (guest houses, apartments, homestays) and the high-class hotel sectors (premium hotels, midscale hotels) at the same time.

1.2 - Purpose of the Study

In order to help the economy hotels to decrease their cost and improve their service quality, several pieces of advice can be given without any specific research: for example, economy hotels should provide comfortable beds for the high perceived quality, and they should not offer marble bathroom with gold decoration to save costs.

In professional practice, however, multiple questions cannot be answered without extensive, specific business research: Do guests prefer a cheap shared bathroom or a more expensive private bathroom? Do guests require 24-hour reception or the hotel should save costs by eliminating this service? Should the hotel spend resource on breakfast service or hotels can achieve high perceived quality without breakfast? Do multiple-night guests require daily housekeeping or the hotel can save cost on cleaning staff? Is the

kitchen a fundamental facility or guests can highly enjoy an economy hotel without this costly facility?

As the existing literature does not offer precise, up-to-date answers to such vital questions, the purpose of this study is to provide practical advice to the economy hotel managers and other industry professionals about how to provide high service quality at low cost in the economy hotel sector.

1.3 - Research questions and research objectives

Some academic theories (e.g. triple constraint model) state that low cost always results in low quality and that high quality always requires high investment. Thus, as a first step of the research, it is necessary to find out whether it is possible to solve the problem of economy hotels at all. This situation raises the main research question:

*Is it possible to provide high service quality at low cost
in the economy hotel sector?*

If the answer is positive, an additional research question is necessary to be able to develop comprehensive practical recommendations to the management of economy hotels:

*How is it possible to provide high service quality at low cost
in the economy hotel sector?*

In order to be able to answer the research questions, the following research objectives have been developed. These objectives determine the scope and depth of this study and also provide directions to the research.

Research objectives for the main research question are:

1. To explore whether there are cheap hotels whose quality is rated high by the guests
2. To test the hypothesis that providing high quality with low cost is not possible

Research objectives for the additional research question are:

1. To identify the high-performing economy hotels
2. To identify key patterns among the high-performing economy hotels

1.4 - Research structure

This research is structured into five chapters.

The introduction chapter is followed by the literature review, which provides an overview of existing key theories and concepts in the fields of cost reduction, quality improvement, and economy hotels. It also discusses the major academic conversations about the relationship of these three topics.

The third chapter determines and explains the research methodology behind this study. This section follows the structure of the Research Onion framework, developed by Saunders *et al.* (2019). The methodological decisions are discussed and justified in six stages, representing the six layers of the Research Onion.

The fourth chapter proceeds to the analysis of the collected secondary data. This chapter provides answers to the research questions, and it concludes with a summary of the research findings.

The last chapter reviews and summarises the main findings of previous chapters to draw a broad conclusion for the study. Furthermore, this chapter

also provides recommendations for management practices and further research in the hospitality industry.

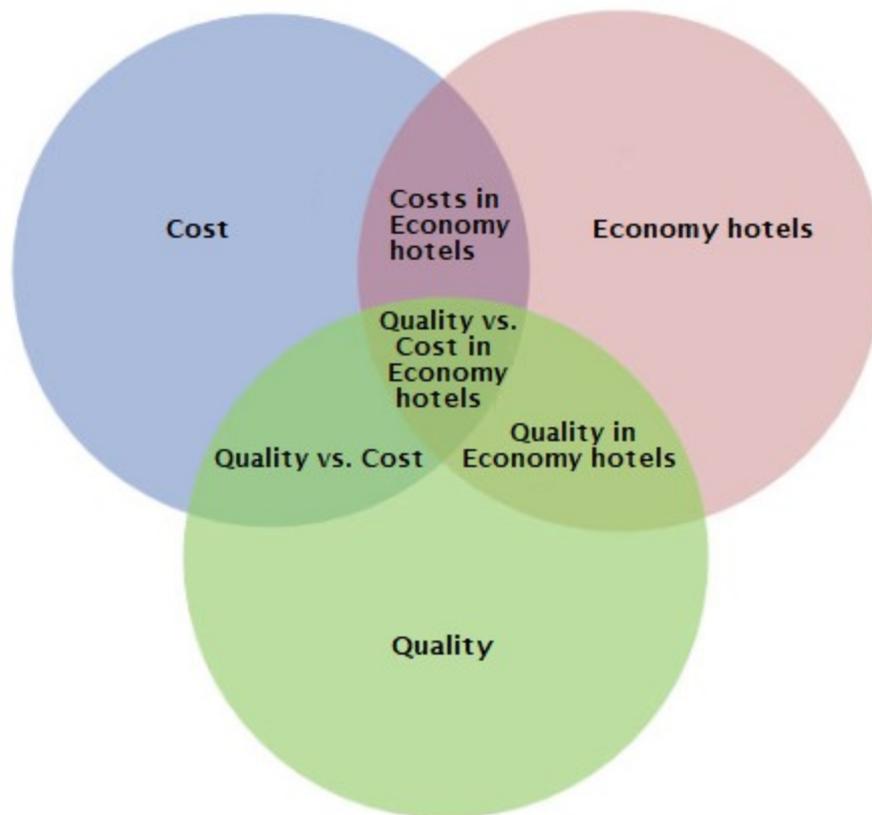
Chapter 2: Literature Review

2.1 - Introduction

It is a common belief that in business, it is not possible to provide high-quality service/product at low cost because quality improvement always causes higher cost (Collins, 2020). A solution for this problem would be beneficial to both customers and (in a competitive environment) providers; therefore, this chapter aims to determine and evaluate the current knowledge and previous academic debates about the possibility of providing high service quality at low cost, with a focus on the economy hotel sector.

The literature review starts with a brief introduction of the definitions and key theories of quality improvement, cost reduction, and economy hotel topics, followed by the evaluation of the major academic conversations about the relationship of the three topics (Figure 1).

Figure 1. The structure of the literature review



The last section of this chapter summarises the key findings and the limitations of the literature that points the way to future research.

The primary sources of the literature review are the tourism and hospitality journals of the past few decades; however, the study demonstrates a wide variety of sources, such as books of theoretical researchers and practical experiences of CEOs.

2.2 - Economy hotels

2.2.1 - Hotel industry

The tourism industry is one of the fastest growing sectors of the global economy, 'accounting for nearly one-third of the global services trade, one-

tenth of global GDP, and one-tenth of all jobs' (Richard, 2017, p. 56). A recent report of World Tourism Organization (2017, p. 3) predicts further growth: 'international tourist arrivals worldwide are expected to increase by 3.3% a year between 2010 and 2030 to reach 1.8 billion by 2030'.

One of the leading tourism products is the hotel service (Heung, 2000, p. 308). The hotel industry had a significant retail value of 600.49 billion U.S. dollars globally in 2018 (Lock, 2019).

The wide variety of hotel types urged industry experts to categorise hotels into smaller, unitary, definable sectors and handle them separately. The method most commonly used by researchers is to classify hotels from the aspect of price and level of service in a scale where the economy hotel sector represents the lower end, and the luxury hotel sector represents the upper end (Mathews, 2000; Miller *et al.*, 2013; Wilson, 2015).

2.2.2 - Economy hotel sector

Economy hotels, also referred to as budget hotels or limited-service hotels, originated in the United States after the Second World War (Li *et al.*, 2017, p. 1), reached a rapid growth internationally especially in the 1990s (Brotherton, 2004, p. 944) and became one of the most successful phenomena in the hotel industry (Fiorentino, 1995, p. 455).

Macroeconomics researcher Dr Lin Liu (2011) has drawn attention to the importance of this sector: the market share of economy hotels is 70% in developed countries and 8% in developing countries that 'indicates that economy hotels have huge development potential in market competition' (p. 599).

Senior and Morphew (1990) explained the emergence of economy hotel sector by the following observation:

In response to rising consumer demands, many of the larger hotel operators have upgraded their establishments, but this

has pushed costs up with tariffs rising beyond the levels many consumers wish to pay. A large number of the smaller independent hotels and guest houses have been unable to keep pace with consumer expectations, due to the large amounts of finance needed continuously to up-date their services. The smaller establishments therefore cannot guarantee the consistent and high service levels consumers are now demanding. This has left a gap in the marketplace for establishments that can provide consistently good standards at relatively low prices. (p. 5)

That gap has been filled by a new hotel sector, the economy hotels (Senior and Morpew, 1990, p. 7), therefore definitions of economy hotels consistently relate to both low prices and good service quality.

Huang *et al.* (2014, p. 268) define economy hotels as 'a hotel product category or sector which can offer relatively low room rates while guaranteeing convenience and value for money'. Researcher Alessandro Fiorentino (1995, p. 461) also notes that the economy hotel concept relies heavily on 'value for money and service consistency'.

The academic literature uniformly shows that due to the needs of the guests, the main attractiveness of the economy hotel sector are the low, affordable price and the consistent, convenient service quality. Therefore, the management needs to seek opportunities to keep decreasing their prices and improving their service quality at the same time.

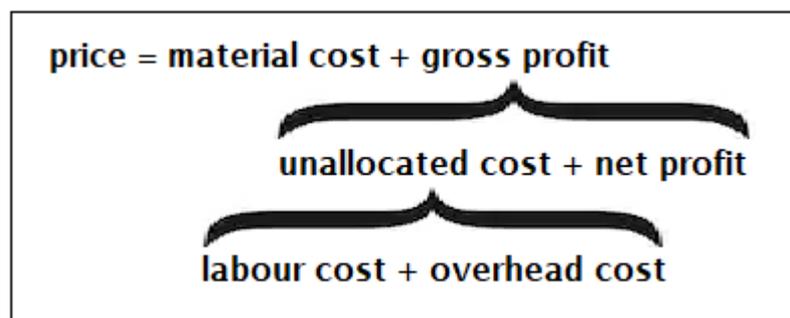
2.3 - Price vs. cost

2.3.1 - Price

The literature review of the previous chapter pointed out that low price is one of the main characteristics of economy hotels, the business cannot be successful without a relatively low price. To be able to maintain a sustainable low-price pricing strategy, the elements of price need to be reviewed.

According to Cousins et al. (2011, p. 296), there is an established relationship between price, costs and profits in the hospitality industry; price can be described as the sum of material costs and gross profit, where gross profit equals the sum of labour costs, overhead costs and net profit (Figure 2).

Figure 2. The relationship between price, cost and profit in hospitality (Cousins et al., 2011, p. 296)



This relationship indicates that the hotel needs to decrease either or both the costs or the net profit to achieve reduced price. In this study, the net profit reducing option will not be considered as it would harm the business. Although there are marketing strategies that consider temporary short-term profit loss as a successful business tool (e.g. penetration pricing as noted by Norton, 2006), these strategies do not provide ultimate solution because economy hotels must offer low price permanently due to their characteristics, the profit-oriented businesses should not be left without sufficient profit amount for long-term. Thus, economy hotels need to exploit all opportunities

to reduce their costs to be able to offer sustainable low price for their customers.

2.3.2 - Cost in the economy hotel sector

A number of different studies (Senior and Morpew, 1990; Fiorentino, 1995; Liu, 2011) suggested that the economy hotels' ability to offer very competitive room rates was achieved through their particular design and management: low construction costs and low operating costs.

Some researchers, however, argue that reducing all costs universally is not an effective strategy because some cost types have a positive impact on the business. Peccei (2004) described the universal cost reduction strategy as 'throwing the baby out with the bathwater' (p. 36) because in an attempt to reduce costs and become more competitive, critical capabilities are lost, resulting in reduced competitiveness. O'Hearn (2016) explained that we need to differentiate the strategically-critical 'good costs' and the non-essential 'bad costs': 'the key priority in strategic cost reduction is targeting resources where they can earn the best return, rather than just cutting costs in itself' (p. 4). Good costs help saving more or increasing return, e.g. automation or artificial intelligence can save more cost than their costs by speeding up processes (O'Hearn, 2016, p. 6).

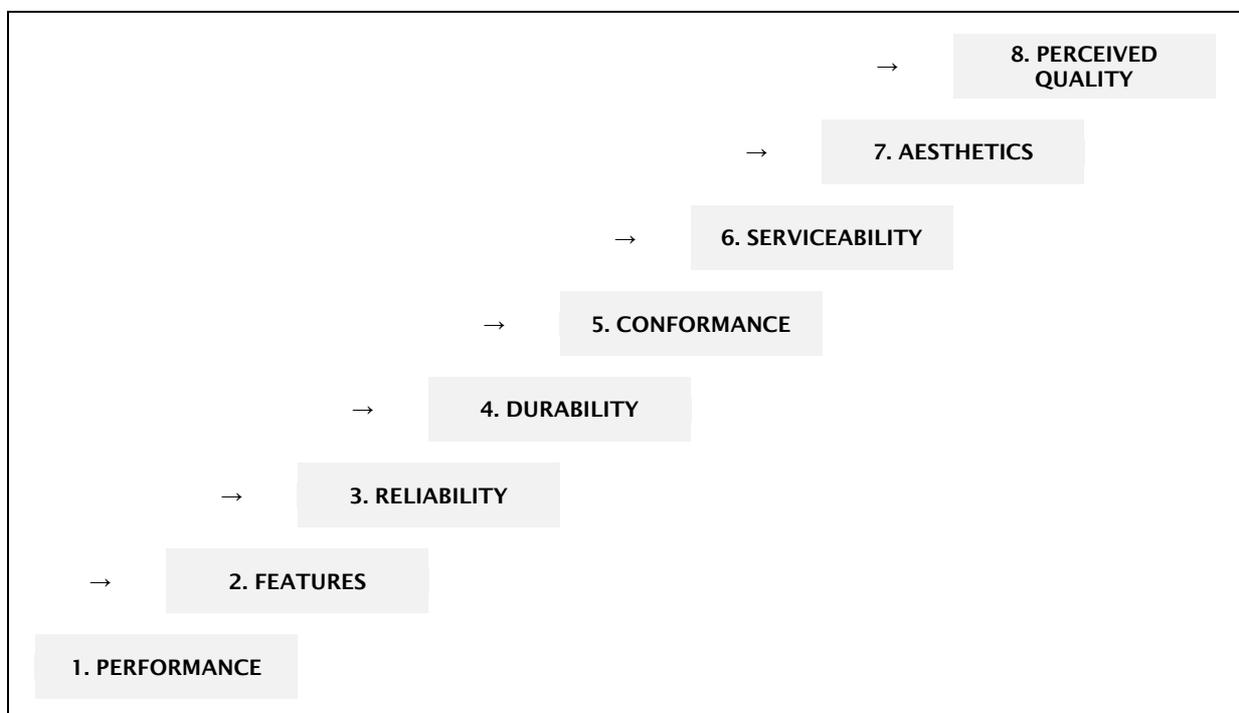
The literature clearly shows that a wide variety of cost-saving strategies help the hotels to be able to attract new guests through low price. However, in Chapter 2.1.2 it was demonstrated that low price alone is not enough to achieve success in the economy hotel sector: the hotels must provide sufficient service quality for that price to maintain their long-term competitiveness.

2.4 - Quality

Quality theories originate from the manufacturing industries where there was a need to create as much output from the input as possible. Historically, the first form of this concept was the 'zero error - do right first time' (Parasuraman *et al.*, 1985) or 'zero defects' (Garvin, 1987) approach to avoid failure, based on Japanese philosophy.

As quality concepts evolved, researchers have made numerous attempts to define quality. They described it from many different aspects of countless different situations; for example, quality was explained as usefulness and value of the product (Domingo, 2003), conformity to specifications (Kara *et al.*, 2005), the ability to satisfy given needs (Ma *et al.*, 2005), while Garvin (1987) firmly pointed out that the word quality must be broken down to manageable parts (eight dimensions) in order to be able to define it (Figure 3).

Figure 3. Eight dimensions of quality (Garvin, 1987)



Due to the vastly diverse approaches of researchers, common global definition was never made (Dortyol, 2014, p. 472), most quality concepts represent different phenomena (Vinagre and Neves, 2008).

The first form of adaptation of quality theories in the service industry was described by management theorist Christian Grönroos (2000, p. 208) as 'how well a service provider uses resources to create output in the form of acceptable perceived quality and value for customers'. Although this perceived quality, or so-called 'true quality' (Redman and Mathews, 1998) is the basis of most service quality frameworks, we can classify concepts into two categories: some researchers focus only on the superiority of service output (Stewart *et al.*, 1998; Jun *et al.*, 2004), while others recognise service quality as a comparison of customers' expectations and perceptions of the actual service performance (Parasuraman, 1985; Lewis *et al.*, 1994; Duffy *et al.*, 1997; Harvey, 1998; Kelley and Turley, 2001).

2.4.1 - Service quality in the economy hotel sector

Hospitality researchers consistently agree that superb service quality has multiple benefits in the hotel industry. They highlight that service quality is

- 'the most important focus of the company' (Ropeter, 1997, p. 133)
- 'a prerequisite for success' (Parasuraman, 1988, p. 13)
- 'a key factor in differentiating service products' (Hudson, 2012, p. 26)
- 'relates to customer satisfaction and customer loyalty' (Rauch, 2015, p. 88)
- 'a link between employee job satisfaction and satisfied customers' (Worsfold, 2016, p. 2575)
- 'a source of competitive advantage' (Ingram, 1999, p. 24)

The relevance of high service quality is even more significant in the economy hotel sector. Economy hotel research of Huang *et al.* (2014) found evidence that service quality 'ultimately determines the success or failure of an operator' in this sector (p. 268).

Due to the complexity of hotel service, academics separate the elements of service quality into key areas or dimensions to be able to analyse the importance of consumer perceptions and expectations more profoundly and to find opportunities to improve them.

The most popular framework definitely is the SERVQUAL model (Parasuraman *et al.*, 1988) that measures the gaps that may exist between customers' expectations and perceptions in five dimensions of service quality: reliability, responsiveness, assurances, empathy and tangibles. Although this concept is widely accepted as the most important general service quality measure, several experts argued that it is too cumbersome for general use, it is useful only to point the way forward for more specified quality monitoring (Johns, 1996); therefore, several hotel researchers have attempted to adjust the SERVQUAL dimensions by developing instruments specifically tailored to the tourism and hospitality industries (Rauch, 2015, p. 90). The two most significant adaptations are the Lodging Quality Index that amended the SERVQUAL concept from five to ten dimensions (Getty and Getty, 2003) and the LODGSERV which is a 26-item index designed to measure the five SERVQUAL dimensions in the hotel experience (Knutson *et al.*, 1991).

Literature shows that the deeper the researchers try to understand the behaviour of service quality in the hotel industry, the more dimensions they introduce. Callan (1996) thoroughly studied not less than 166 characteristics in order to find precise details about the most essential needs of business travellers (staff efficiency and tangible guestroom items) and leisure travellers (service quality delivered by staff and value for the price paid). Ryu *et al.* (2012) described this complex quality phenomenon in hospitality as multidimensional and dynamic.

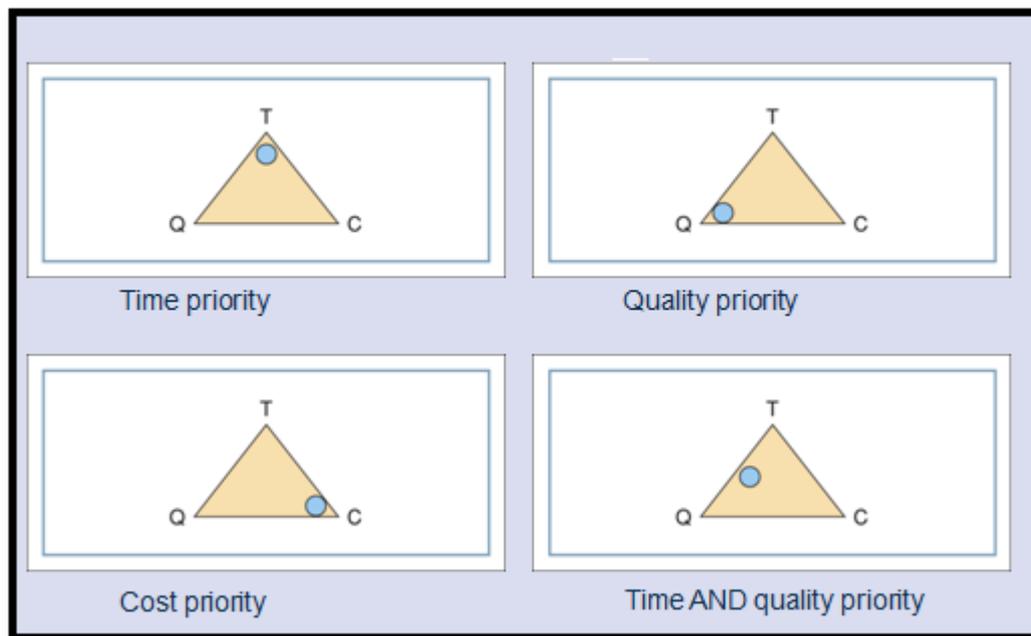
As a summary of quality researches, Garvin (1987) proposes that hotel managers have to stop thinking about quality merely as a tool to keep service level under control, and start thinking more vigorously about consumers' needs and preferences. 'Quality is not simply a problem to be solved; it is a competitive opportunity.' (p. 109)

2.5 - Reducing cost vs. improving quality

Consumers demand multiple convenient attributes at the same time for the service/product (low price, high quality, quick delivery time, etc.); hence providers need to manage a sensitive balance among these business constraints (cost, quality, time, etc.).

The balancing situation among business factors is researched by academics as trade-off theories or constraint models and is often described as a triangle (triangle of balance) in a graphic abstraction: the three vertices of the triangle represent three constraints, the management needs to balance among them because it is not possible to put the focus point close to all of the opposite vertices at the same time. Numerous triangle models show quality and cost constraints at the vertices of the triangle that indicates that the firm cannot produce high quality service/product at low cost: the closer the focus is to the low cost vertex, the further it is from the high quality vertex, while focusing on the high quality results far distance from the low cost vertex (Figure 4).

Figure 4. Time-Cost-Quality triangle model (Atkinson, 1999, p. 338)

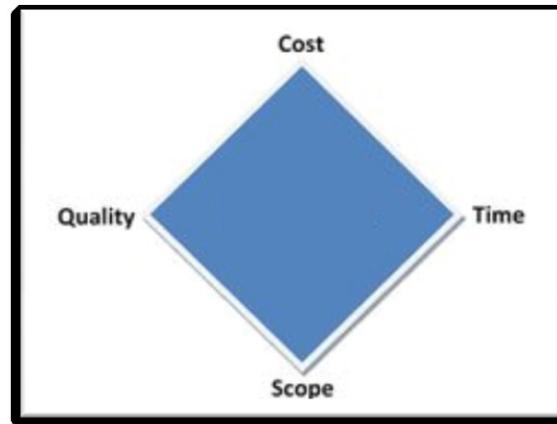


One of the leading models of such quality-cost triangles is the Quality, Cost, Delivery (QCD) model. The QCD management approach, originating from the automobile sector, manages the product or service in three interdependent dimensions: quality, cost and delivery. Domingo (2003) describes this interdependent relationship as three legs of a stool on which the customer would sit: the buyer needs all three dimensions to be satisfied. 'He wants a good quality product at the right cost, at the right time.' (para. 2).

Choosing the right constraints for the vertices of the trade-off triangles causes heated arguments among researchers because they examine and group constraints from different aspects. For example, the QCD theory is often criticised because it does not highlight the critical time factor (Morgan, 1994), while the Iron Triangle model, which is the most known triple constraint model since the 1950s, causes disagreement about the quality factor. Traditionally the Iron Triangle is a cost-time-scope triangle (Haughey, 2011); however, during the 70 years of evolution of this model, two main trends appeared to highlight the importance of the quality element: some researchers changed the scope constraint to quality (Atkinson, 1999), while others added the quality factor as a fourth constraint (Figure 5) and

presented this quadruple constraint model as Project Diamond (Brown, 2009).

Figure 5. The updated Iron Triangle: Project Diamond (Brown, 2009)



The common issue with all the trade-off theories is that they consider the quality-cost relationship as opposite constraints where management needs to balance. They strictly disallow high quality at low cost because these factors are far from each other. This means that improving quality and reducing cost at the same time would be possible only if there would be a mistake or loophole in the popular, traditional, industry-standard trade-off models.

This critical business problem inspired a handful of researchers to try to break the trade-off models and find a solution to satisfy both customers and providers. The basis of this endeavour was established in 1979 by statistician George E. P. Box who radically stated that 'All models are wrong. Some are useful.' (p. 202). He explained: 'All models are approximations. Assumptions, whether implied or clearly stated, are never exactly true.' (2009, p. 61). In other words: 'a model is a simplification or approximation of reality and hence will not reflect all of reality' (Burnham, 2002, p. 20).

This idea gave a boost to other academics to rethink the traditional model. Based on Box's statement, Baratta (2006) pointed out that the Triple Constraint model is both wrong and not useful because if cost decreasing would cause quality decreasing, cost increasing logically should cause improved quality. However, in reality, we could see many examples where

expenses were rising significantly while quality and time were also negatively affected.

A new, modern point of view has launched the next generation of cost-quality theories in the 2000s where the goal was to focus on the solution rather than purely relying on the old, general theories.

Caccamese, outstanding project management professional, presented his paper *Beyond the Iron Triangle* in 2012. He described the soft skills of management as one of the main tools to move cost and quality constraints closer to each other: 'the soft skills for the project manager have been identified as a set of cross-cutting skills that should complement the core job of establishing and maintaining reasonable tradeoffs among the elements of the iron triangle'.

In the present, more and more large international companies are established for the mission to help providers to implement the modern theories in practice and as a very first step, to teach the contemporary mindset to the management. David Collins (2020), Consulting Director of CM Consultants points out: 'the first step to achieving greater results is to reject the idea that you need to sacrifice either quality, cost, or delivery to achieve the other two'. He explains that improving quality can reduce cost (e.g. because higher quality results in fewer costly mistakes) and reducing cost can improve quality (e.g. by changing expensive imperfect human labour to cheaper automated software/robots who do not make mistakes).

As the modern approach indicates that it is possible (and necessary in the competitive environment) to achieve high quality at low cost, it worths to further research the solution specifically in the economy hotel sector.

2.5.1 - Reducing cost vs. improving service quality in the economy hotel sector

The previously presented literatures have shown several theories, researches and surveys that demonstrate the importance of high service quality in the hotel industry, but most of them ignore the cost of the quality improvement. Hilleke and Butscher (1997) explained that the traditional reason behind this phenomenon is that most low-price businesses target customers with low-quality products; the low-price - high-quality combination in most industries is 'the exception rather than the rule' (p. 108). Senior and Morphew (1990), however, have undoubtedly confirmed that the economy hotel sector was designed to offer good service quality with affordable price; therefore, low-cost - high-quality combination must be achieved in this sector.

Notwithstanding the above, surprisingly few literatures exist about how to provide high service quality with low cost in the economy hotel sector. The few resources that can be found, however, uniformly point to the same conclusion: the economy hotel needs to provide high service quality for the core services (for the high perceived quality) and save cost on all the extra services (for the low-cost operation).

Fiorentino (1995) stated that the economy hotel, as a specific hospitality concept 'provides the core hospitality service but without costly amenities, designed to meet the needs of selected customers, the budget conscious travellers' (p. 456).

Garvin (1987) demonstrates that a hotel does not need to pursue all eight dimensions of quality simultaneously; 'in fact, that is seldom possible unless it intends to charge unreasonably high prices' (p. 108).

In this business model, it is crucial to identify the core services and the non-core services precisely. Yu and Timmerman (2014) noticed that 'hoteliers must understand which products and services are meaningful to the customers they want to attract so they can offer amenities that will entice

customers without increasing price to a level that will drive guests away' (para. 10).

While the experts agree that the economy hotels should focus on the quality of the core services and save cost on all the non-essential services, there is a massive argument about which services are the vital core services and which ones can be considered as negligible. Garvin (1987) pointed out that 'shoddy market research often results in neglect of quality dimensions that are critical to consumers' (p. 109). Furthermore, it is not enough to identify the core services once, because the guests' priorities are keep changing: 'it is often a mistake to stick with old quality measures when the external environment has changed' (Garvin, 1987, p. 109).

Results from Kandampully's (2000) study indicate that 'all aspects of a hotel operation are not equally important to the customer' (p. 350), bedroom and the quality of housekeeping service are the most important factors. Yu and Timmerman (2014) suggest that 'hotels would be far better off if they cut amenities that customers don't value (hotel retail shop, hotel bar, concierge services, in-room dining, fitness facility, luggage services) and invested those savings in selecting and developing employees with the right talents and problem-solving skills to engage guests with world-class service' (para. 17).

Cousins (2011) classified hotel services as core (e.g. comfortable bedroom), tangible (e.g. vending machine) and augmented (e.g. entertainment) concepts and pointed out that the augmented level 'can be modified in cost-effective ways' (p. 13).

The literature, therefore, suggests that economy hotels first need to find out the most up-to-date, actual needs and preferences of the target customers, then highly improve the quality of the most required services and eliminate or significantly reduce the costs of all other negligible services.

2.6 - Summary of the literature review

2.6.1 - Findings

The literature review has shown that the economy hotel sector was born to fill the gap between the premium hotels that are expensive due to their high operating costs and the smaller establishments that cannot guarantee the consistently high service level. Therefore, experts uniformly agree that the economy hotels can be competitive and profitable only if they provide high service quality at low operating costs.

The reviewed literature has demonstrated various strategies to reduce costs. They revealed that not all costs are bad costs, while some studies pointed out that sometimes even bad costs can be turned into assets.

This chapter has discussed several practical quality enhancement concepts as well; however, the academic debates are much more intense here than in the cost topic due to the multiple different approaches of the elusive quality factor. Most researchers argue that the hotels need to focus on the guests' perceived quality rather than on the quality itself, whilst some add that the most critical factor is the difference between the expected quality and the perceived quality.

While there has been much research on cost and quality topics separately, few researchers have taken into consideration how to enhance quality and keep costs low at the same time. The main reason for this phenomenon is the popularity of the constraint models in the second half of the 20th century, which tried to prove that quality improvement necessarily requires spending more money.

In the last two decades, however, experts have developed a concept to deal with the constraint models in the economy hotel sector: the hotels need to provide high service quality for the core services to achieve high perceived quality, and reduce or eliminate all non-essential services to achieve low-cost operation. There is an argument, though, about how to differentiate core

services from non-core services, especially because the preferences of the target customers keep changing.

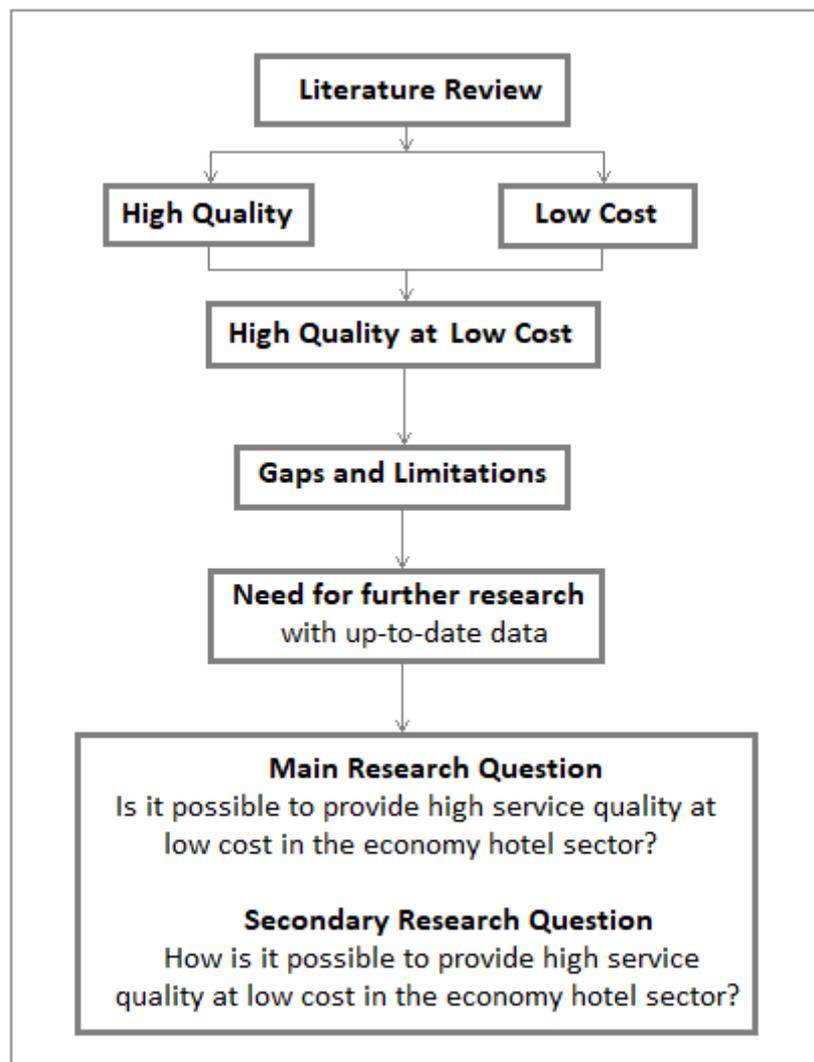
2.6.2 - Limitations and suggestions for future research

The most significant limitation of the literature is that the majority of the resources are not up-to-date. Garvin (1987) pointed out that the guests' preferences keep changing; hence the decades-old surveys and researches do not provide accurate information about the current needs of the target customers. Therefore, the existing body of knowledge should be amended by further studies to better understand the present-day needs of the budget travellers.

2.6.3 - Identification of the research question

The limitation in the literature supports the need for a new, up-to-date research with live data sources (live prices and guest feedbacks about quality) to thoroughly explore whether (and how) it is possible to provide high service quality at low cost in the economy hotel sector (Figure 6).

Figure 6. The formulation of the research question of this study



Chapter 3: Research methodology

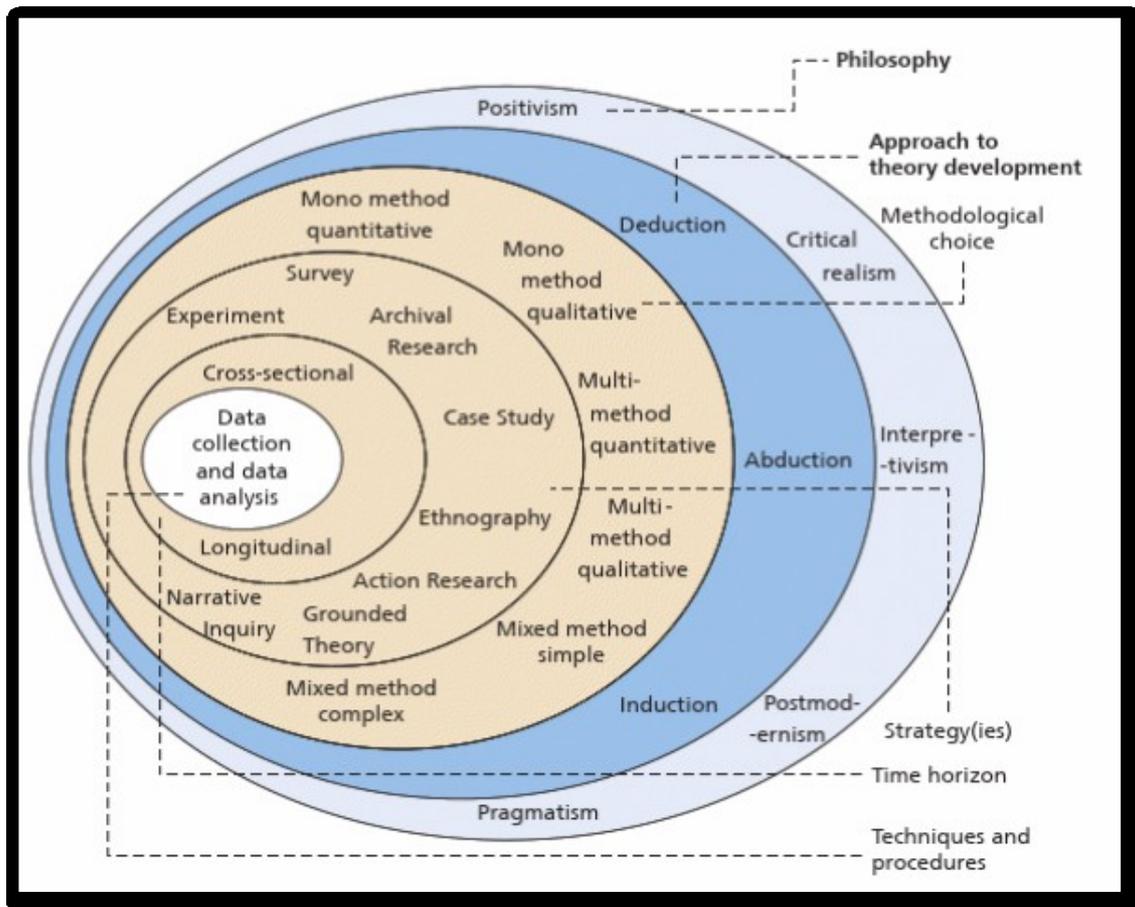
3.1 - Introduction

The aim of this chapter is to determine and explain the research methodology behind this study.

It begins with the research rationale that discusses the necessity for conducting this study and introduces the research questions and research objectives.

The presentation of the research methods section follows the structure of the Research Onion framework (Figure 7). This framework was developed by Saunders *et al.* (2019) to provide a practical approach through which a credible research methodology can be designed. According to Saunders *et al.* (2019), the researcher needs to pass six layers of the onion from outside to inside, where each layer describes a more detailed stage of the research process.

Figure 7. The Research Onion (Saunders et al., 2019, p. 130)



Therefore, the methodological decisions are discussed and justified in six stages, representing the six layers of the Research Onion.

First, the research philosophy and the selected approach to theory development are justified. These two layers subsequently influence the selections shown in the next three layers of the research onion: methodological choice, research strategy, and time horizon (Saunders *et al.*, 2019). 'These three layers can be thought of as focusing on the process of research design, which is the way you turn your research question into a research project' (Saunders *et al.*, 2019, p. 173).

In the last, inner layer of the onion, the data collection and data analysis techniques are evaluated, including the demonstration of the research ethics and the reliability of the outcome.

Finally, limitations and challenges of the research are underlined, followed by a summary of the chosen research methodology.

3.1 - Research rationale and research questions

The literature review underlined that the economy hotels need to provide high service quality at low cost (Chapter 2.2.2); however, many researchers argue that it is not possible. Other experts believe that they have found solution for this problem, but their studies are mostly based on decades-old theories and surveys.

Bryman and Bell (2015) state that a gap in the literature, an inconsistency between a number of studies or an unresolved issue in the literature are valid reasons to conduct a new research. 'There is no single reason why people do business research, but, at its core, it is done when there is an aspect of business and management that is believed to be inadequately understood' (Bryman and Bell, 2015, p. 5).

The inconsistency in the literature review supports the necessity of the present study that aims to explore the ways of providing high quality at low cost by using the most recent data on the economy hotel sector.

Saunders *et al.* (2019) pointed out that it is important to express the research topic as a clearly defined research question before commencing the research process because a research question allows the researcher to say what study will seek to find out, explain and answer. Bryman and Bell (2015) noted that 'having no research questions or poorly formulated research questions will lead to poor research (p. 10).

Due to the disagreement in the literature, the main research question is:

Is it possible to provide high service quality at low cost
in the economy hotel sector?

Saunders *et al.* (2019), however, noted that the pitfall that must be avoided is asking a research question that will not generate new insights. Thus, if the answer to the main research question is a simple yes answer, it logically and practically raises the need for more details; therefore, an additional research question is a must:

How is it possible to provide high service quality at low cost
in the economy hotel sector?

Saunders *et al.* (2019) suggest that research questions do not give sufficient detail about the steps that will need to take to answer the questions. Therefore, it is necessary to determine a set of research objectives that will transform the research questions into a research project and will help to choose the most appropriate research strategy and data collection and analysis techniques (Saunders *et al.*, 2019). Research objectives provide a set of coherent and connected steps to answer the research questions (Saunders *et al.*, 2019).

The research objectives for the main research question are:

1. To explore whether there are cheap hotels whose quality is rated high by the guests
2. To test the hypothesis that providing high quality with low cost is not possible

In order to find out how to achieve high performance in the hotel industry, Professor In Lee (2016) recommends selecting the high-performing hotels from the pool of

all hotels, then analysing how that extraordinary group of hotels has achieved their outstanding performance by searching for commonality among them.

Therefore, to be able to answer the additional research question, it is desired to identify the high-performing economy hotels (cheap economy hotels whose quality rating is competitive with the luxury hotels) and find patterns among them. These patterns will highlight the attributes (price, services, facilities, distance from city centre, etc.) the economy hotels need to provide to achieve high quality. They will also reveal which attributes they should not provide to achieve low-cost operation (the attributes that are not commonly offered by the high-performing economy hotels).

Thus, the research objectives for the additional research question are:

1. To identify the high-performing economy hotels
2. To identify key patterns among the high-performing economy hotels

3.3 - Research methods

3.3.1 - Research philosophy

Easterby-Smith *et al.* (2015) state that awareness of research philosophy can increase the quality of research, contribute to the creativity of the researchers, and help researchers to create designs that may be outside their past experience.

'The term research philosophy refers to a system of beliefs and assumptions about the development of knowledge' (Saunders *et al.*, 2019, p. 130). At every stage in the research, the researcher makes assumptions, which include assumptions about the nature of reality (ontological assumptions) and human knowledge (epistemological assumptions) (Saunders *et al.*, 2019). 'A well-thought-out and consistent set of assumptions will constitute a credible research philosophy, which will underpin your methodological choice, research strategy and data collection techniques and analysis procedures.' (Saunders *et al.*, 2019, p. 130-131).

The two major philosophies in business research are positivism and interpretivism (Collis and Hussey, 2014; Bryman and Bell, 2015).

'Positivism relates to the philosophical stance of the natural scientist and entails working with an observable social reality to produce law-like generalisations' (Saunders *et al.*, 2019, p. 144). Bryman and Bell (2015) describe it as a philosophy that 'advocates the application of the methods of the natural sciences to the study of social reality' (p. 28).

'The epistemological position of positivism describes the researcher and phenomena as two separate entities' (Nawaz, *et al.*, 2017, p. 2). Saunders *et al.* (2019) pointed out that the essence of this philosophy is to yield pure data and facts uninfluenced by human bias and it is based on external, independent, observable and measurable facts, where the researcher can create law-like generalisations from highly structured, large samples.

Interpretivism, however, was developed as a critique of positivism because it is critical of the application of the scientific model to the study of the social world (Bryman and Bell, 2015; Saunders *et al.*, 2019).

Bryman and Bell (2015) noted that the study of the social world (people and their institutions) is fundamentally different from that of the natural world; thus, it requires a different logic of research that reflects the distinctiveness of humans as against the natural order.

As this research is interested in objective, law-like generalisations to support the research objectives of this study, positivism is the most appropriate research philosophy. Positivism is suitable to analyse independent, observable and measurable facts about the economy hotel sector in order to find answers to the research questions.

3.3.2 - Approach to theory development

The research philosophy will guide the research project; however, there is a second factor in considering the relationship between theory and research, which is often interpreted as two contrasting approaches: deductive or inductive (Bryman and Bell, 2015; Saunders *et al.*, 2019).

'With deduction, a theory and hypothesis are developed and a research strategy designed to test the hypothesis. With induction, data are collected and a theory developed as a result of the data analysis.' (Saunders *et al.*, 2019, p. 160). Figure 8 demonstrates the characteristics of the two approaches.

Figure 8. Deduction and Induction (Saunders *et al.*, 2019, p. 153)

	Deduction	Induction
Logic	In a deductive inference, when the premises are true, the conclusion must also be true	In an inductive inference, known premises are used to generate untested conclusions
Generalisability	Generalising from the general to the specific	Generalising from the specific to the general
Use of data	Data collection is used to evaluate propositions or hypotheses related to an existing theory	Data collection is used to explore a phenomenon, identify themes and patterns and create a conceptual framework
Theory	Theory falsification or verification	Theory generation and building

The literature review (Chapter 2.5) has underlined the hypothesis of the most relevant existing theory (constraint model): quality and cost are strongly correlated; therefore, providing high quality with low cost is not possible. The main research question aims to evaluate this hypothesis to see if providing high quality with low cost is possible though.

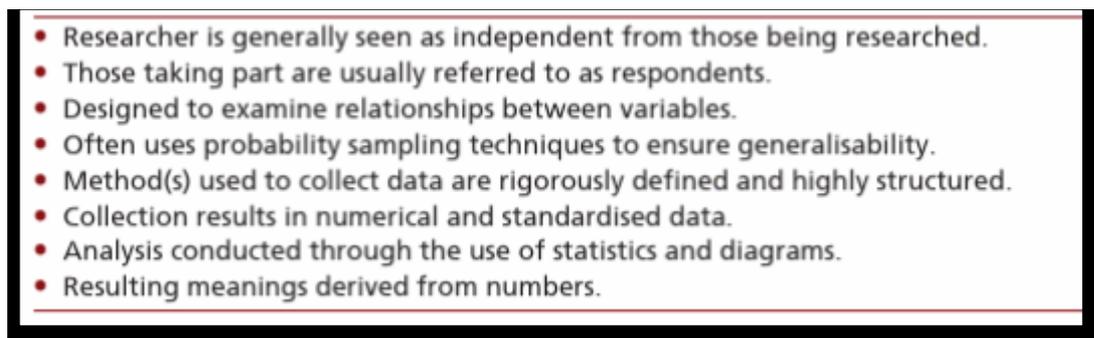
As the hypothesis has been deduced from an existing theory in order to test it and then verify or falsify it, this research will follow the deductive approach. Furthermore, Corbetta (2003) and Saunders *et al.* (2019) suggest that positivist philosophy usually leads researchers to the deductive approach.

3.3.3 - Methodological choice: qualitative vs. quantitative

Bryman and Bell (2015) recommend distinguishing between quantitative (Figure 9) and qualitative (Figure 10) research because this distinction represents a constructive means of classifying different methods of business research, each carries differences in terms of the role of theory, epistemological issues, and ontological concerns.

'Quantitative research examines relationships between variables, which are measured numerically and analysed using a range of statistical and graphical techniques' (Saunders *et al.*, 2019, p. 178).

*Figure 9. Characteristics of quantitative research
(Saunders et al., 2019, p. 178)*

- 
- Researcher is generally seen as independent from those being researched.
 - Those taking part are usually referred to as respondents.
 - Designed to examine relationships between variables.
 - Often uses probability sampling techniques to ensure generalisability.
 - Method(s) used to collect data are rigorously defined and highly structured.
 - Collection results in numerical and standardised data.
 - Analysis conducted through the use of statistics and diagrams.
 - Resulting meanings derived from numbers.

In qualitative research, meanings are derived from words and images that may have multiple meanings as well as unclear meanings (Saunders *et al.*, 2019). 'Methods used are unstructured or semi-structured, so that questions, procedures and focus may alter or emerge during a research process that is both naturalistic and interactive.' (Saunders *et al.*, 2019, p. 179).

*Figure 10. Characteristics of qualitative research
(Saunders et al., 2019, p. 180).*

- Researcher is generally recognised as not being independent from those researched.
- Those taking part are referred to as participants or informants.
- Designed to study participants' attributed meanings and associated relationships.
- Generally uses non-probability sampling techniques.
- Based on meanings expressed through words (spoken and textual) and images.
- Method(s) used to collect data are unstructured or semi-structured.
- Collection results in non-standardised data generally requiring classification into categories.
- Analysis conducted through the use of conceptualisation.
- Resulting meaning derived from words (spoken or text) and images.

Bryman and Bell (2015) noted that these methods can be fruitfully combined within a single study, called mixed methods research. 'In mixed methods research, quantitative and qualitative techniques are combined in a variety of ways that range from simple, concurrent forms to more complex and sequential forms' (Saunders *et al.*, 2019, p. 182).

The research objectives suggest that the present research requires data about the price and quality of the hotels. In terms of quality, two types of data are necessary: hotel attributes (facilities, services, distance from city centre, etc.) and guests' perceived quality (cleanliness, comfort, staff behaviour, etc.). These data have the following nature:

1. Hotel price: These are numbers, pure quantitative data.
2. Hotel attributes: These can be either numbers (e.g. distance from city centre: 2 miles) or simple binary data (e.g. coffee machine in the room: yes or no); therefore, quantitative data.
3. Perceived quality by the guests: For example, the softness of the bed, behaviour of the staff, cleanliness of the bathroom are qualitative data. This raises a concern: qualitative data cannot be analysed in a large amount economically (Saunders *et al.*, 2019); however, Boddy (2016) suggests that a large amount of data results in more reliable findings. As a solution for this concern, Saunders *et*

al. (2019) pointed out that qualitative data can be quantified (numerically coded for statistical analysis). Riazi (2016) added that the guests can quantify their qualitative data by assigning a numerical value for their hotel quality experience and provide this quantitative data to the researcher. The quantitative data hence evolve from the qualitative data that enables the researcher to perform convenient quantitative analysis on a large amount of data (Riazi, 2016). Thus, the guests themselves will evaluate their perceived quality about their stay at the hotel on a scale of 1 to 10; this study will collect these numbers and will analyse them quantitatively.

In order to utilise the benefits of the large, structured statistical data, this research will obtain numerical (or binary) data and analyse them quantitatively.

3.3.4 - Research strategy

The research strategy is a plan of how the researcher will go about answering the research questions, and it helps the researcher to achieve coherence throughout the research design (Saunders *et al.*, 2019). It is a link between the research philosophy and the data collection and analysis methods (Denzin and Lincoln, 2018). Therefore, the methodological choice of strategy will be guided by the research questions and objectives, the coherence with research philosophy and research approach, and pragmatic concerns such as available resources (Saunders *et al.*, 2019).

Saunders *et al.* (2019) noted that that experiment and survey are the two strategies that are principally linked to a quantitative research design; however, case study and archival/documentary research also can involve quantitative research, and the combination of different strategies is also possible.

An experiment is a form of research that owes much to the natural sciences, with the purpose of studying the probability of a change in an independent variable causing a change in another, dependent variable (Saunders *et al.*, 2019).

'An experiment uses hypothetical explanations, known as hypotheses, rather than research questions' (Saunders *et al.*, 2019, p. 190). It is vital to empirical testing and falsification, and it allows causal inference via controlled manipulation of treatment in controlled surroundings (Busenitz *et al.*, 2003).

In contrast, a survey is a 'systematic method for gathering information from a sample of entities for the purposes of constructing quantitative descriptors of the attributes of the larger population of which the entities are members' (Groves *et al.*, 2009, p. 2.). These quantitative descriptors attempt to outline the dominant characteristics of populations in our world (Groves *et al.*, 2009).

Saunders *et al.* (2019) noted that survey strategies are popular because they allow the collection of standardised data from a large number of respondents economically, allow easy comparison, and suggest possible reasons for particular relationships between variables. Saunders *et al.* (2019), however, argue that the researcher needs to spend time ensuring that the sample is representative. Groves *et al.* (2009) found that properly conducted surveys can achieve very high quality results and are potent in producing reliable statistical generalisations to large populations; thus surveys are a key tool in tracking global economic trends.

As the research objectives require the measurement of dominant characteristics of a large, up-to-date sample of economy hotels, and reliable generalisations to the global economy hotel sector, web survey is the most suitable research strategy for this study.

Furthermore, web survey strategy fits the present research because it is usually associated with a deductive research approach (Saunders *et al.*, 2019) and positivist philosophy (Groves *et al.*, 2009).

3.3.5 - Time horizon

Saunders et al. (2019) noted that it is necessary to decide whether the research aims to study a "snapshot" taken at a particular time (cross-sectional study) or to study the diary of a series of "snapshots" (longitudinal study) in order to complete the research design.

According to Saunders *et al.* (2019), the research questions help to determine the appropriate time horizon. As the research questions are originated from the limitation of the literature review (the lack of the up-to-date studies), this paper aims to reveal the current situation of the cost-quality topic in the economy hotel sector. Malhotra *et al.* (2017) suggest that the time horizon is cross-sectional if the data collection refers to a single point of time. Thus, this research will conduct a cross-sectional study to examine the most recent (or live) data, collected between 10th and 19th July 2020.

3.3.6 - Techniques and procedures

3.3.6.1 - Data collection method: primary vs. secondary

Persaud (2012) stated that data collection requires a purposeful and systematic approach that is determined by the research design. In order to meet the research objectives and answer the research questions, this study requires data about the economy hotel sector with the following requirements:

1. A large amount of data about the global hotel industry is needed to validate the generalisation of the findings (Boddy, 2016)
2. Up-to-date (preferably live) data is necessary because this study originates from the gap of the existing literature (the literature is outdated)

3. Reliable, trustworthy data source (Persaud, 2012)
4. Economical data collection method (in terms of time, cost, etc.) due to the limited scale of this research

Therefore, it is necessary to consider which data collection method (primary or secondary) offers better support to collect a large amount of reliable, up-to-date data economically.

Primary data are the data that are gathered first hand to answer the research question being investigated; they are collected directly from respondents using data collection methods like survey interviews, questionnaires, measurements or direct observation (Sreejesh *et al.*, 2013).

Persaud (2012) pointed out that one of the main advantages of the primary data collection method is the complete control of the data collection process that provides high credibility and validity to the research.

Newby (2014) recommends using primary sources only if secondary sources do not exist or are inadequate because obtaining data first hand is expensive and time-consuming, resulting in less resource to work with a large amount of data.

According to Saunders *et al.* (2019), the researcher is expected to consider undertaking further analyses of data that were collected initially for some other purpose, known as secondary data, which can be large, structured, numerical data, organised into a format that is easy to process.

Saunders *et al.* (2019) noted that 'secondary data may be available in sufficient detail to provide the main data set from which to answer your research question(s) and to meet your objectives' (p. 345); furthermore, this method may be the only way in which the researcher can obtain the required amount and type of data. In addition, secondary data is often higher-quality than the data the researchers can collect themselves (Smith, 2006), because the highly experienced organisations usually have well-established procedures to quickly collect and check the quality of a large number of international samples (Bryman and Bell, 2015).

The main advantage of this method is the significant saving in time and money (Vartanian, 2011; Bryman and Bell, 2015), while the main disadvantage is that there is no control over data quality that requires careful evaluation of the data source (Wernicke, 2014).

As the characteristics above suggest, the primary data collection method is not suitable to collect a large amount of recent data economically at the scale of this study. Therefore, this study will collect and analyse secondary data, using a carefully selected, trustworthy data source.

3.3.6.2 - Accessibility, validity and reliability of the data

The previous chapter (Chapter 3.3.6.1) has noted that it is crucial to select a trustworthy data source for secondary data collection because the researcher has no control over data quality (Wernicke, 2014).

Saunders *et al.* (2019) stated that secondary data from large, well-known organisations, are likely to be reliable and trustworthy because the continued existence of such organisations is dependent on the credibility of their data, their procedures for collecting and aggregating the data are likely to be well thought through and accurate.

In the global hotel industry, these large, well-known organisations are the Online Travel Agencies, such as Airbnb, Booking.com and Expedia (Prieto, 2019). Therefore, this study will collect secondary data from the largest open-access accommodations platform in the world, Booking.com (Solomon, 2016; Booking Holdings, 2020), that keeps collecting and publishing live data about the attributes of the hotels (prices, services, facilities, etc.), and recent guest reviews about the quality of those hotels.

Booking.com database contains more than 29 million accommodation listings and over 170 million guest reviews; about 1.5 million room nights are reserved on this platform each day (Booking Holdings, 2020). The company has more than 17,000 employees (Booking.com, 2020), including the researcher who has been working as an accommodation specialist at

Booking.com for several years. Therefore, the researcher has excessive professional knowledge about the operation of Booking.com, ensuring that the researcher collects and comprehends the secondary data precisely, with a decreased chance of mistake or misunderstanding.

The hotels are interested in loading valid data to Booking.com database about their services and prices because under-promising would lead to a decreased number of reservations, over-promising would lead to poor guest reviews.

Booking.com is also interested in publishing accurate data to keep its reputation intact; thus, the company uses technologically advanced data management systems and comprehensive fraud prevention and detection mechanisms (Booking.com, 2020). For example, to ensure the credibility of the reviews, the anti-fraud system allows submitting only genuine reviews from real guests, hotels cannot manipulate these reviews.

The publicly accessible online database will be used for this study with the awareness and consent of the management and the Data Protection Office of Booking.com. Hotels have accepted the terms and conditions of Booking.com that grants Booking.com right to distribute their publicly accessible data to third party for research purposes. Saunders *et al.* (2019) suggest to handle the collected data as confidentially as possible; thus, this study does not name any hotels but refers to them by randomly assigned ID numbers.

3.3.6.3 - Sampling strategy

TARGET POPULATION

Sreejesh *et al.* (2013) noted that it is vital to define the target population of the research; otherwise, the research results may not be relevant to the research questions. 'The target population is all instances that meet the requirements of the research issue' (Newby, 2014, p. 236).

As this study aims to provide generalised answers to the research questions, data need to be collected worldwide. The advantage of global research is to

mitigate the distorting effect of the local characteristics. For example, data only from Finland could show that air conditioning is not an essential hotel service; however, in most countries in the world, this can be a core service. Therefore, the target population of this study is all the hotels in the world, approximately 1 million hotels (Clapperton, 2013; Biemans, 2019; Bailador, 2020).

SAMPLING

Saunders *et al.* (2019) pointed out that for many research questions it is impossible either to collect or to analyse all the potential data, owing to restrictions of time, money and access; therefore, the researcher needs to select data only for a subgroup or sample of all possible cases. 'A well-defined sample has the same characteristics as the population as a whole, and therefore, when a research is conducted on such sample, the results obtained will represent the characteristics of the whole population' (Sreejesh *et al.*, 2013, p. 19).

As the target population is huge (approximately 1 million hotels) for the scale and resources of this study, a sampling procedure is necessary.

SAMPLING FRAME

Groves *et al.* (2009) noted that researchers often do not have access to the whole population; thus, researchers need to draw samples from the sampling frame. Each element in the target population that we can identify and reach in order to collect research data is the sampling frame (Newby, 2014, p. 237).

The sampling frame in this study is all the hotels that the researcher can access in the secondary data source (Booking.com database), a total of 712,322 hotels (Booking.com, 2020).

SAMPLING TECHNIQUES

According to Saunders *et al.* (2019), sampling techniques can be divided into two types: probability sampling and non-probability sampling.

- With probability samples, the chance, or probability, of each case being selected from the target population is known and is usually equal for all cases (Saunders *et al.*, 2019). This is the most robust sampling method because it is designed to ensure that there is a clear link between the sample and the target population (Newby, 2014).
- When subsets of a population in which little or no attempt is made to ensure a representative cross-section are chosen, it is called non-probability sampling (Sreejesh *et al.*, 2013). For non-probability samples, the probability of each case being selected from the target population is not known and it is impossible to make statistical inferences about the characteristics of the population (Saunders *et al.*, 2019).

Based on the characteristics of the sampling frame of this study (e.g. precisely known sampling frame), probability sampling is the most suitable type of sampling technique for this study.

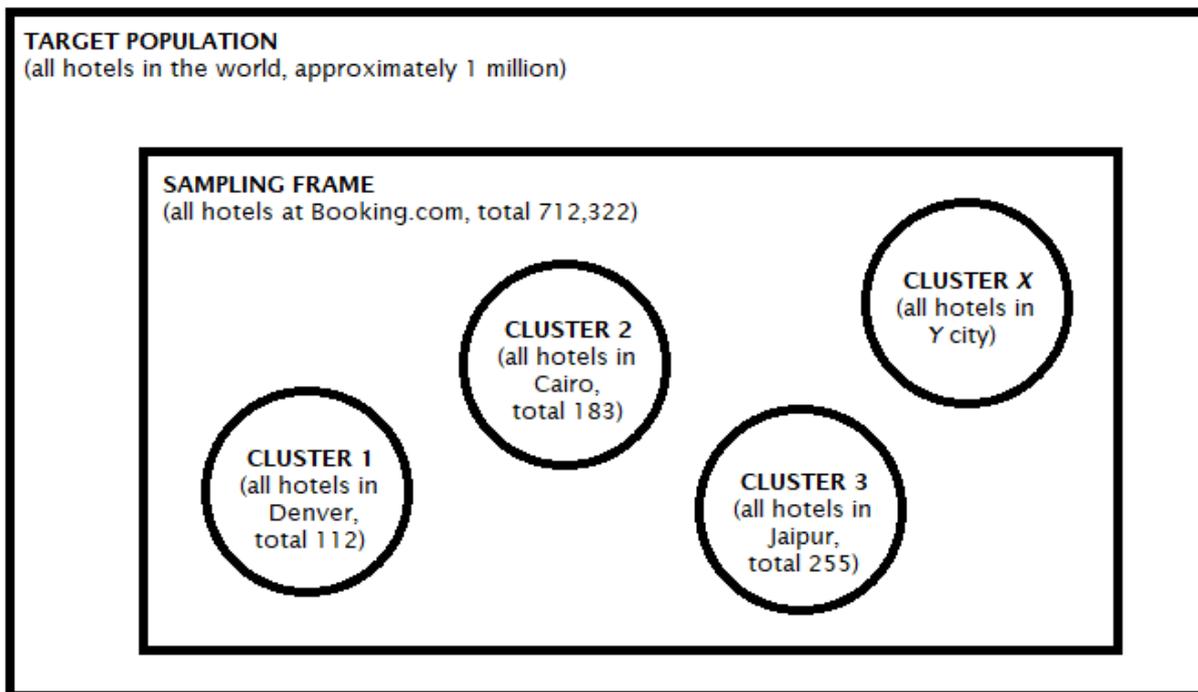
PROBABILITY SAMPLING

Saunders *et al.* (2019) explained that four main techniques can be used when selecting a probability sample:

- *Simple random*: selecting the sample at random from the sampling frame
- *Systematic random*: selecting the sample at regular intervals from the sampling frame
- *Stratified random*: dividing the target population into relevant subsets (strata), a random sample is then drawn from each of the strata
- *Cluster*: dividing the target population into naturally occurring groups (clusters), then selecting a few clusters at random; data are collected from every case within the selected clusters

Saunders *et al.* (2019) added that the choice of probability sampling technique depends on the research questions and objectives. The research questions and objectives of this paper relate to the low price and high quality of the economy hotels. The "low price" and "high quality", however, are relative (U.S. Department of Commerce, 1947; Angyridis and Sen, 2010), they depend on the local economic environment and the price and quality of the competing hotels nearby. For example, US\$ 150 per night price represents both the cheapest (economy class) hotels in Monte Carlo and the most expensive (luxury class) hotels in Sofia (Booking.com, 2020). Luo and Yang (2013) and Lee *et al.* (2018) explained that hotels are spatially clustered, based on local economic conditions and tourism areas. Therefore, the sampling technique must manage each city (small economic area) as an individual group where all the competing hotels need to be handled together. Hence, cluster sampling is the most appropriate technique to create the sample, where each city in the world represents a cluster. The random selection will choose an appropriate number of cities; all the hotels in the chosen cities will make up the sample (Figure 11).

Figure 11. Cluster sampling of this study



SAMPLE SIZE

Saunders *et al.* (2019) stated that each cluster needs to contain a minimum number of samples to avoid spurious results.

Several statisticians suggest that sample size of 30 per cluster is adequately large (Gay and Diehl, 1992; Fraenkel and Wallen, 1993; Pett, 1997; Corder and Foreman, 2009; Stutely, 2014). Therefore, all the cities in the world with at least 30 hotels should be loaded into a random generator. As such city list is not available for the researcher, for practical reasons all the cities in the world with a minimum of 100,000 inhabitants (a total of 3,182 cities, according to United Nations Statistics Division, 2018) will be loaded into a random generator (<https://www.randomlists.com/list-randomizer>), and the result will be checked at Booking.com: if there are no at least 30 hotels in that city in Booking.com database, another city will be randomly picked instead.

The minimum number of cities also needs to be determined that can reflect the target population precisely.

Newby (2014) pointed out that normal distribution calculation (Figure 12) is one of the most popular methods for determining the minimum sample size, where 5% margin of error (the amount of error we are prepared to accept) and 95% confidence level (the level of assurance that we will be within this margin of error) can provide sufficient accuracy.

Figure 12. Normal distribution calculation for sample size, where n is the minimum sample size, E is the margin of error, N is the target population size, r is the fraction of responses, and $Z(c/100)$ is the critical value for the confidence level c (Raosoft, 2004)

$$x = Z(c/100)^2 r(100-r)$$

$$n = N x / ((N-1)E^2 + x)$$

$$E = \text{Sqrt}[(N - n)x / n(N-1)]$$

This calculation results in a sample size of 384 hotels; therefore, the sample should consist of 13 cities (384/30). Saunders *et al.* (2019), however, pointed out that cluster sampling technique may reduce the representativeness of the sample; hence the number of clusters needs to be maximised to allow for variations in the target population. Consequently, this study will work with a lower margin of error (3%) and significantly higher confidence level (99%) than recommended by Newby (2014), resulting in a much more robust sample size of 1,839 hotels in 62 cities (1,839/30).

This means, for example, that if 50% of all the hotels in a population of 712,322 hotels offer spa facilities to the guests, and if this study collects data from 1,839 hotels, then 99% of the time this study would find that between 47% and 53% of the hotels in the sample provided spa facilities.

The 62 cities were selected on 30th June 2020 (Appendix 1). As a result, the sample consists of all the hotels in 62 cities of 39 countries in 5 continents, a total of 9,076 hotels with 3,748,359 guest reviews.

CHECKING THE REPRESENTATIVENESS OF THE SAMPLE

As the last step of the sampling strategy, Saunders *et al.* (2019) recommend to 'check that the sample is representative of the target population' (p. 297). Newby (2014) noted that 'if the sample is bad, the analysis and research results are worthless' (p. 266).

Recent hotel industry research (Lee *et al.*, 2018) has shown that hotels are not randomly distributed across the Earth, hotels tend to be regionally clustered. Therefore, investigation of the geographical distribution of the sample can evaluate the representativeness of the sample. For example, Oceania has less than 1% of the world's population (Statista, 2019); therefore, Oceanian hotels should not represent much more than 1% of the sample.

Sreejesh *et al.* (2013) noted that even though a representative sample is taken, 'a small random sampling error is evident' (p. 73).

The distribution of the global population and the distribution of the hotels in the sample show a similar pattern across the continents (Figure 13). The difference is less than 5% across all continents except Africa (5.28%); this proves that none of the continents is significantly over-represented or under-represented in the sample.

*Figure 13. Distribution of the global population (Statista, 2019)
and the sample by continents*

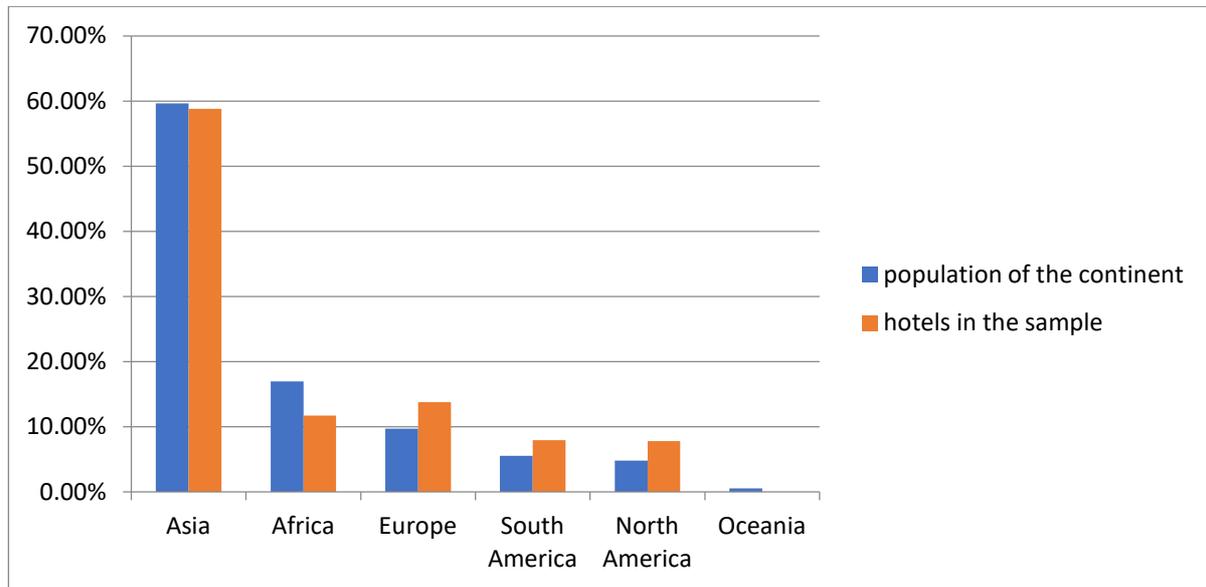
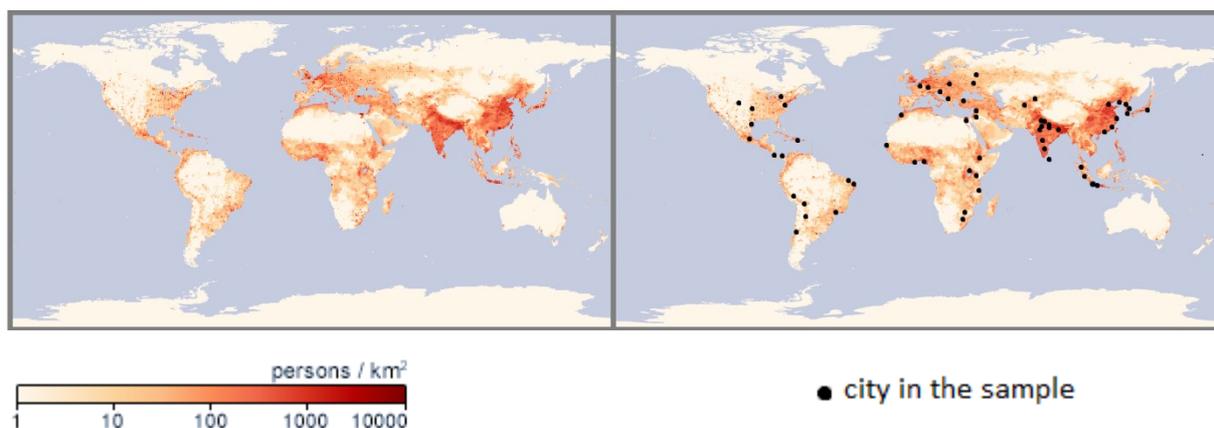


Figure 14 shows the location of the 62 cities of the sample, compared to the world population heatmap. It demonstrates that the sample represents the urban and rural areas accurately across the globe (the black dots mostly cover the red areas and do not significantly cover the white areas), so there is no notable bias in the sample selection.

*Figure 14. Population density (NASA Earth Observations, 2000)
and sample distribution in the Earth*



3.3.6.4 - Data analysis method

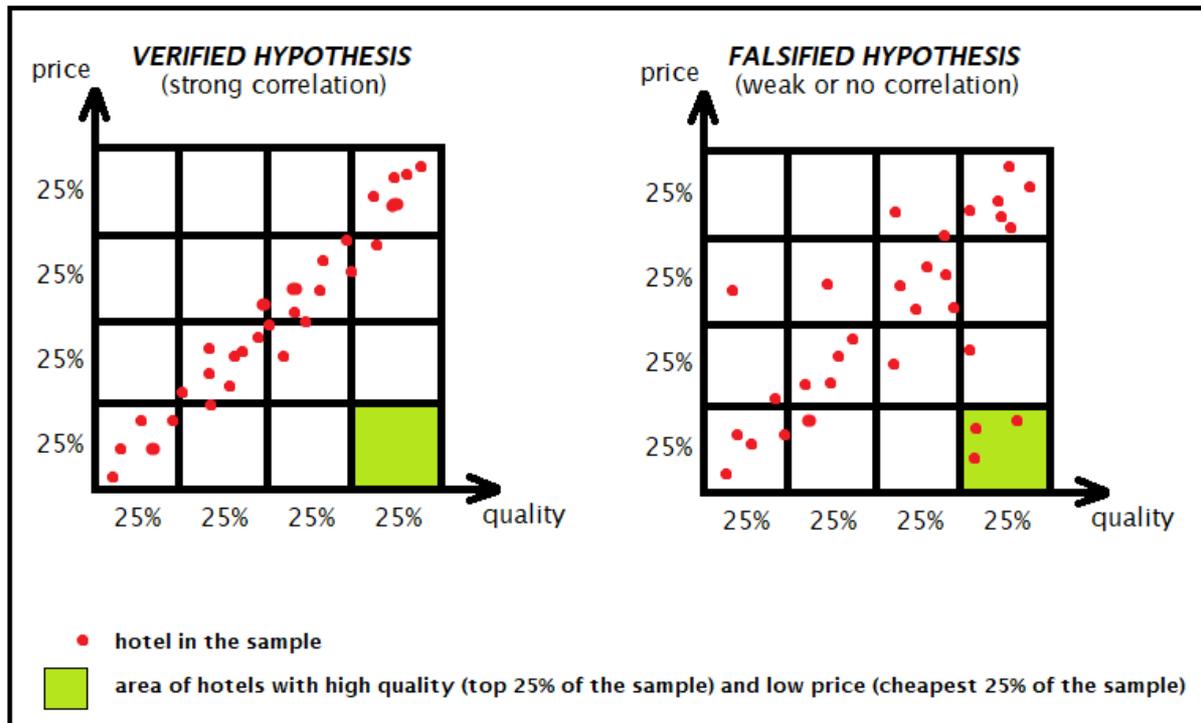
ANALYSIS FOR MAIN RESEARCH QUESTION

The main research question originates from the hypothesis of the constraint models (Chapter 2.5) that state that it is not possible to provide high quality with low cost because cost and quality are in strong correlation (low cost always results in low quality; high quality always results in high cost). The aim of the main research question is to verify or falsify this hypothesis in the economy hotel industry; therefore, conducting a correlation analysis is necessary.

Correlation analysis is used to determine the strength of a relationship between two item sets (Han and Kamber, 2006), it is an extensively used pattern mining technique in the domain of data analysis (Kumar and Chong, 2018). The two item sets in this analysis are the quality of the hotels (as rated by the guests at Booking.com) and the price of the hotels (as they appear at Booking.com).

The hypothesis is verified if the correlation analysis does not find a hotel with both high quality and low price (the green area in Figure 15 is empty). Otherwise, the hypothesis is falsified (the green area in Figure 16 is not empty).

Figure 15. Typical correlation analysis graphs of a verified and a falsified hypothesis (graphs are based on the graph of Kumar and Chong, 2018, p. 2)



The quality and price classification system used here is based on Benz's (2011) research that recommends comparing price with quality by grouping them into four categories (for example, cheapest, second cheapest, second highest price, highest price), each representing 25% of the sample; and analysing the correlation of these groups.

To mitigate the risk of errors in this analysis (for example, if a manager of a luxury hotel accidentally loaded incorrectly low price to Booking.com), mathematician Xin-She Yang (2020) suggests taking into account a 5% margin of error. Thus, the hypothesis will be falsified only if at least 5% of the cheap hotels (cheapest 25% of the sample) is in the green area (Figure 16), a minimum of 114 hotels.

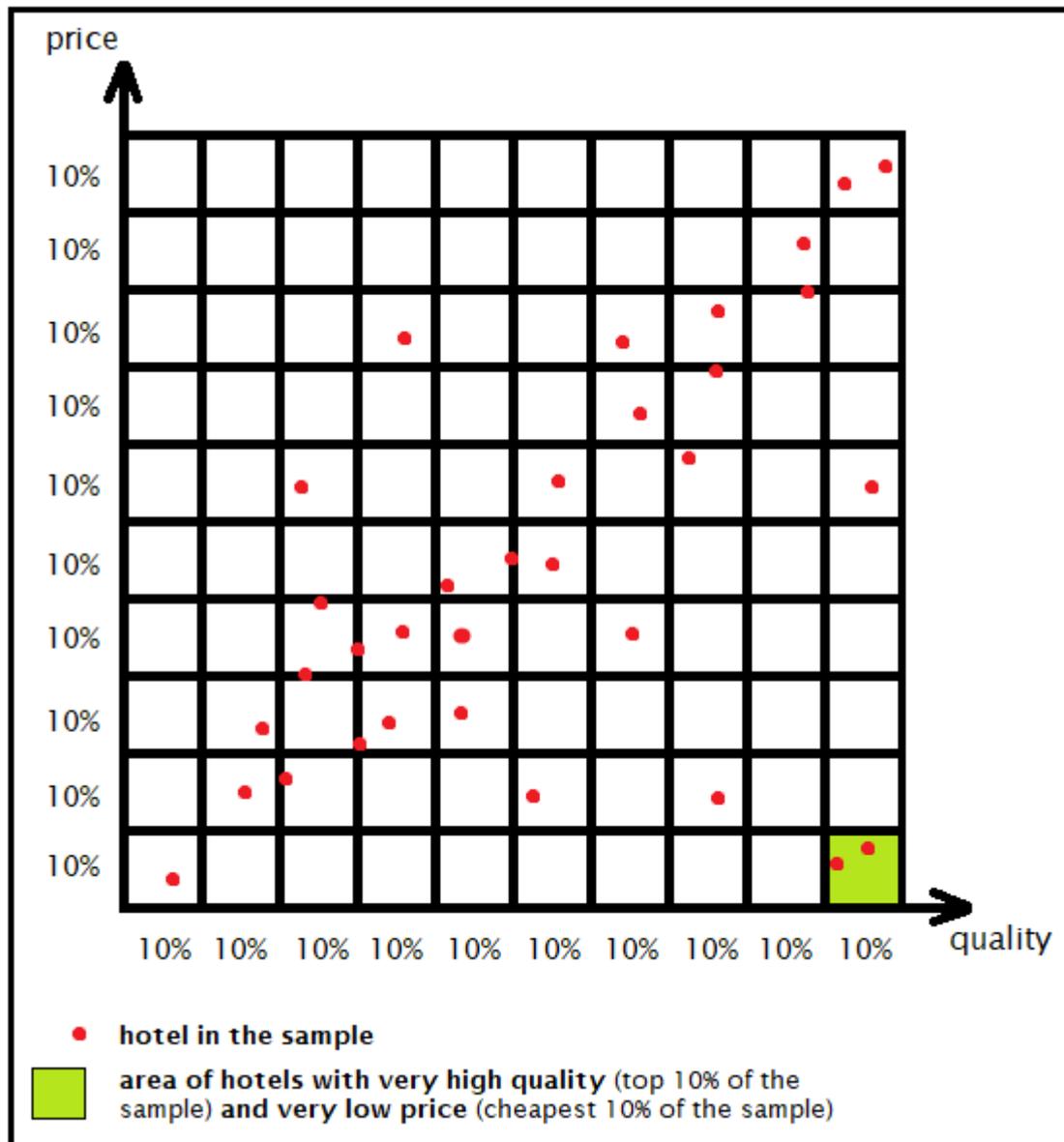
ANALYSIS FOR ADDITIONAL RESEARCH QUESTION

If the analysis for the main research question proved that it is possible to provide high quality with low cost, it is rewarding to find out how it is possible.

To find out how to achieve high performance, Wojtusiak (2006) suggests identifying the high-performing elements (the ones that have already successfully implemented the high-quality – low-cost model) in the sample (research objective 1.), then identifying key patterns among them (research objective 2.). These key patterns will highlight what services and facilities the economy hotels need to offer to achieve high quality. At the same time, the non-common attributes will underline what services and facilities they should not provide to achieve low-cost operation. In their Independent Press Awards winner business book, MacNeice and Bowen (2016) also used the technique of selecting the most impressive organisations around the world and revealing the key principles they have in common to enable any business to raise their own bar.

To identify the high-performing economy hotels in the sample, the same correlation analysis method will be used as at the main research question but with significantly more (ten) groups. Therefore, a hotel will be considered as high-performing if it is both in the cheapest 10% and the highest quality 10% of the hotels in the city (green area in Figure 16).

Figure 16. Identifying the high-performing hotels in a correlation analysis graph (graph is based on the graph of Kumar and Chong, 2018, p. 2)



After the high-performing economy hotels are selected, a total of 47 attributes will be evaluated in three categories at each hotel:

- hotel attributes (24-hour reception, swimming pool, Wi-Fi, etc.)
- room attributes (television, kettle, private bathroom, etc.)
- guest reviews (cleanliness, comfort, staff, etc.)

Saunders *et al.* (2019) pointed out that data should be recorded using numerical codes before conducting the quantitative analysis because numerical data allows extensive statistical calculations (trends, proportions, distribution of values, comparisons, etc.).

As some attributes will be collected in a numerical form (e.g. distance from the city centre in miles, cleanliness score in a scale of 10 provided by the guests, etc.), coding is necessary only where the attribute can have one of the following three possible statuses:

- not offered (e.g. car park is not available at the hotel), code: 0
- offered for free (e.g. car park is available, its cost is included in the room price), code: 1
- offered as an optional extra for a fee (e.g. car park is available, but guests need to pay for it if they want to use it), code: 2

The coded data will be managed and analysed in IBM SPSS Statistics analysis software and Microsoft Excel spreadsheet software; an example of a data matrix in Microsoft Excel is presented in Figure 17.

Figure 17. An example of a data matrix in Microsoft Excel after coding

	A	B	C	D	E
1	hotel ID	24-hour reception (0/1)	car park (0/1/2)	swimming pool (0/1/2)	distance from city centre (miles)
2	#1	1	2	0	1.2
3	#2	1	1	0	4.1
4	#3	1	2	0	0.3
5	#4	0	2	0	0.6

Data then will be analysed by using various quantitative analysis methods that are recommended by Newby (2014) and Saunders *et al.* (2019), such as pattern and data relationship analysis, mean indicator, identifying the median, measuring spread, highest and lowest data value, etc. (detailed descriptions will be demonstrated in Chapter 4.). These different analysis methods can give insight to several dimensions of the high-performing economy hotels: simple findings (for example, Figure 17 indicates that swimming pool should not be offered to keep costs low), complex conclusions (for example, Figure 17 suggests that car park should be offered

but its cost should not be included in the room price) and highly complex ones as well (for example, correlation analysis can reveal the relationship between the cleanliness of the property and the guests' experience about comfort).

3.4 - Summary of the research methodology

This chapter has demonstrated the research methods that will be used to collect and analyse the quantitative data and, ultimately, to answer the research questions. The accessibility and validity of the secondary data were also discussed, along with the challenges the researcher needs to face and deal with.

The next chapter will present the quantitative analysis of the sample; 9,076 hotels and their 3,748,359 guest reviews will be processed in IBM SPSS Statistics and Microsoft Excel software.

Chapter 4: Data analysis

4.1 - Introduction

Having presented the research methodology, the study proceeds to the analysis of the collected data and the presentation of the findings. The first part of the analysis (Chapter 4.2) aims to answer the main research question:

*Is it possible to provide high service quality at low cost
in the economy hotel sector?*

If the analysis results in a positive answer for the main research question, the next chapter (Chapter 4.3) will focus on the additional research question:

*How is it possible to provide high service quality at low cost
in the economy hotel sector?*

Finally, the chapter concludes with a summary of the research findings.

The analysis of this study is based on secondary data that was collected from Booking.com database between 10th and 19th July 2020, including the attributes of 9,076 hotels worldwide and their 3,748,359 guest reviews.

4.2 - Main research question

The literature review (Chapter 2.5) has shown that the popular constraint models had found a strong relationship between cost and quality: low cost is always associated with low quality, and high quality always requires high cost. Hence, the hypothesis states that it is not possible to provide high quality at low cost. The main research question aims to find out whether this hypothesis is true or false.

As the research methodology chapter (Chapter 3.3.6.3) demonstrated, the cheapest 25% of the hotels and the highest-quality 25% of the hotels need to be selected in each city of the sample, looking for hotels that belong to both groups.

If a hotel belongs to both groups, it means that the hotel could achieve high guest satisfaction with a low-cost operation; therefore, it is possible to provide high quality at low cost. The research methodology chapter (Chapter 3.3.6.3) pointed out that the hypothesis will be falsified if at least 114 hotels of the sample belong to both groups in order to mitigate the risk of errors in the analysis (5% margin of error); otherwise, the hypothesis will be verified.

Appendix 2 presents the details of all the 62 cities of the sample, including the number of hotels that belong to both groups in each city.

For example, in Istanbul, there are a total of 1,647 hotels (Appendix 2, also available in Figure 18). Among the 412 cheapest hotels (price of USD 45 or cheaper), there are 102 hotels that belong to the 412 highest-quality hotels (quality score of 8.6 or higher). Thus, 24.77% of the cheap hotels provide high quality in Istanbul.

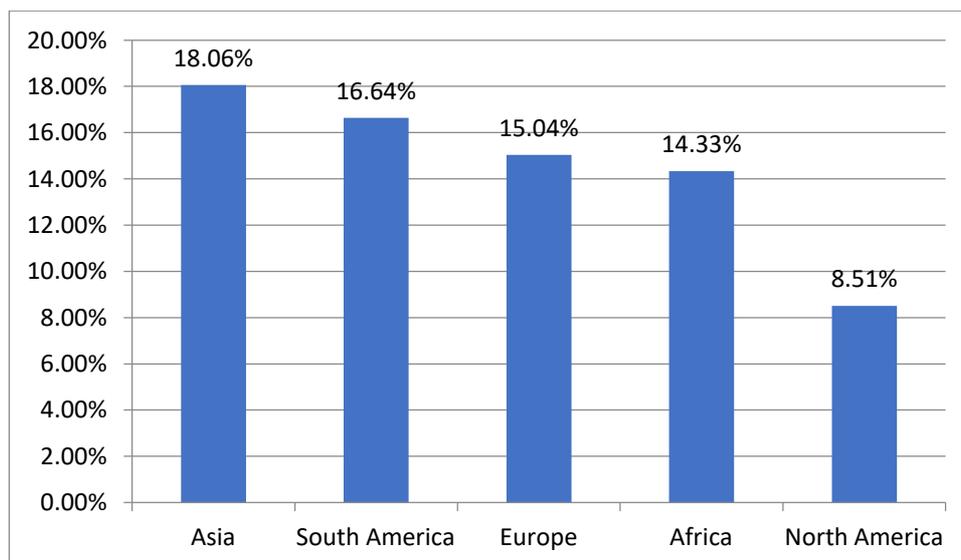
Figure 18. Statistics of the sample in Istanbul (an extract of Appendix 2)

city	total number of hotels	highest price of the cheapest 25% of the hotels (USD)	lowest quality score of the best 25% of the hotels	NUMBER OF ECONOMY HOTELS (hotels in both the cheapest 25% and best 25%)	ratio of best 25% of hotels among cheapest 25% of the hotels
Istanbul	1,647	45	8.6	102	24.77%

The hypothesis is falsified if at least 5% of the cheap hotels (cheapest 25% of the sample) are high-quality hotels (highest-quality 25% of the sample), a total of at least 114 hotels. Data of this study show that 16.35% of the hotels fulfil this requirement worldwide, a total of 371 hotels in the sample. Furthermore, the 5% margin is achieved not only in the overall global data but in all the five evaluated continents as well (Figure 19).

Therefore, as a result, this research has found clear evidence that the hypothesis is false because, in practice, it is possible to provide high service quality at low cost in the economy hotel sector.

Figure 19. The ratio of high-quality hotels (highest-quality 25% of the hotels) among cheap hotels (cheapest 25% of the hotels) in the sample, by continent



4.3 - Additional research question

4.3.1 - Introduction

Although 371 economy hotels have proved in the previous chapter that it is possible to provide high quality at low cost, it would be rewarding to know how they could achieve their great performance.

As the methodology chapter (Chapter 3.3.6.3) explained, the high-performing hotels need to be selected (first research objective), and the key patterns among them need to be analysed (second research objective). A hotel is considered a high-performing hotel if it is both in the cheapest 10% and the highest quality 10% of the hotels in the city.

Appendix 3 presents the statistics of the high-performing hotels in the 62 reviewed cities. The data of the sample show high-performing hotels in all the five reviewed continents, a total of 51 high-performing hotels.

For example, in Varanasi, there are a total of 78 hotels (Appendix 3, also available in Figure 20). Two of them belong to both the eight cheapest hotels and the eight highest-quality hotels (their quality score is at least 8.8 in a scale of 10, while their price does not exceed USD 12 per night for two adults).

Figure 20. High-performing hotels in Varanasi (an extract of Appendix 3)

city	total number of hotels	highest price of the cheapest 10% of the hotels (USD)	lowest quality score of the best 10% of the hotels	NUMBER OF HIGH-PERFORMING HOTELS (hotels in both the cheapest 10% and best 10%)	ratio of best 10% of hotels among cheapest 10% of the hotels
Varanasi	78	12	8.8	2	25.64%

The 51 high-performing hotels will be analysed in three categories, as discussed in the research methodology chapter (Chapter 3.3.6.3):

- hotel attributes (Chapter 4.3.2)
- room attributes (Chapter 4.3.3)

- guest reviews (Chapter 4.3.4)

Finally, the relationship among the three categories will be analysed (for example, the impact of the room amenities on the guest review scores).

4.3.2 - Analysis of hotel attributes

LOCATION (distance from city centre, distance from closest landmark, airport shuttle) - Appendix 4

When the investors plan to build, buy, or rent a hotel, it is crucial to choose an appropriate location because it cannot be changed later. It can be challenging to decide whether the hotel should be near to the city centre or near to a landmark.

The 51 high-performing hotels are located 3.72 miles distance from the city centre in average (as Google Maps shows) and only 0.78 miles distance from the closest landmark (tourist attractions like Eiffel Tower, international airport, ocean, etc.). More than 70% of the high-performing hotels are close (less than one mile) to a landmark, while only less than 20% of them are close to the city centre.

Hotels could achieve high performance by being far from the city centre (two high-performing hotels are more than 12 miles from the centre), but none of the hotels out of the 9,076 hotels could achieve high-performing status by being more than 3 miles from a landmark.

Therefore, data show clear evidence that the hotel must be located in less than 3 miles from a landmark, even if it is far from the city centre.

More than half (52.9%) of the high-performing hotels are willing to organise airport shuttle, but only 11.1% of such hotels offer it for free. Therefore, economy hotels should not provide complimentary airport shuttle to keep their costs low; however, as a paid service it can help to achieve high guest satisfaction.

PARKING (car park, valet parking, electric vehicle charging) - Appendix 4

70.6% of the high-performing hotels offer car park, 69.4% of these hotels provide it for free. Thus, it is recommended to offer this facility for free; however, it is possible to achieve high guest satisfaction with paid or no car park as well.

Valet parking is offered by only one of the high-performing hotels; hence, hotels in the economy sector should not spend any resource (staff training, insurance, etc.) on valet parking.

Data in the sample suggest that economy hotels should not spend resource on electric vehicle charging points (only two high-performing hotels offer such facility, none of them for free). Electric vehicles, however, are becoming more and more popular (21.8% more electric cars were sold in 2019 than in 2018 in the United Kingdom according to the statistics of Next Green Car Ltd, 2020); thus, conducting new research in the near future about this service is recommended.

ARRIVAL / DEPARTURE (check-in period, check-out period, gap between check-out and check-in periods, 24-hour front desk, concierge service, English-speaker staff, credit card acceptance, luggage storage) - Appendix 5

Reception makes both the first impression (check-in) and last impression (check-out) of the hotel. Hence, the management needs to design the operation of the reception carefully; however, it is often challenging to find out the preferences of the guests (for example, management needs to know whether early check-in or late check-out attracts guests more in order to design the check-in and check-out times).

The end of the check-out period is between 11 am - 12 pm in the majority (88.2%) of the high-performing hotels, while the check-in period starts

between 12 pm - 2 pm in most of them (92.2%). In average, these hotels operate with only a short 1-hour gap between the two periods (e.g. for cleaning) to provide flexibility and comfort for the guests (13.7% of them work with zero gaps). Guests can store their luggage at the reception after check-out for free in 56.9% of these hotels.

The majority (82.4%) of the high-performing hotels have 24-hour reception (with English-speaker staff in 80.4% of them) and two-thirds of the high-performing hotels offer concierge service. Most of the high-performing hotels (80.4%) accept credit card payment at the reception.

These data highlight that excellent reception is one of the most vital services in the economy hotel sector to achieve high guest satisfaction.

ENTERTAINMENT (entertainment staff, spa&wellness centre, swimming pool, fitness centre, beauty services, massage, bar, barbecue facilities, bicycle rental, babysitting/child services) - Appendix 6

To be able to fund the high-quality reception, economy hotels should save costs by eliminating all the entertainment services and facilities: none of the high-performing hotels offers entertainment staff, fitness centre, spa/wellness centre, swimming pool or beauty services. Less than 10% of them offer bicycle rental, massage, babysitting/child services or barbecue facilities. Only 11.8% of them have a bar.

In the literature review, Yu and Timmerman (2014) also suggested that economy hotels should cut facilities like fitness centre and hotel bar, and invest those savings in selecting and developing employees. Cousins (2011) also noted that entertainment should be modified in cost-effective ways.

PROPERTY POLICIES (pet, youngest child-age allowed) - Appendix 7

Allowing pets can have both positive effects (e.g. attracting guests with pets) and negative effects (e.g. barking dog disturbs other guests). Data of this

study show that the majority (84.3%) of the high-performing hotels do not allow pets.

Allowing children also can have both positive effects (e.g. attracting guests with children) and negative effects (e.g. crying baby disturbs other guests). In contrast to the pet policy, the majority of the high-performing hotels (82.4%) allow children without age limit, and all of the high-performing hotels allow 11 years old and older children.

Therefore, economy hotels should be children friendly (including babies) but should not allow pets.

CLEANING (daily housekeeping) - Appendix 7

It is recommended to provide daily housekeeping for free (74.5% of the high-performing hotels offer it for free); however, 21.6% of the cheap hotels could achieve high quality without this service (partially because this does not cause any issue for the 1-night-stay guests).

BREAKFAST - Appendix 7

17.6% of the high-performing hotels could achieve low-cost operation with free breakfast, while about half of the high-performing hotels could achieve high quality without offering breakfast. Therefore, this research found that it is possible to achieve high performance with free breakfast, paid breakfast and no breakfast as well.

OTHER FACILITIES (garden, business centre, shops on site, vending machine) - Appendix 8

More than 90% of the high-performing hotels could achieve their extraordinary performance without garden, business centre, shops on site or

vending machine; therefore, economy hotels are advised to save costs by eliminating all of these facilities.

4.3.3 - Analysis of room attributes

COMFORT (soundproof room, allergy-free room, air conditioning, fan, room service, VIP room facilities) - Appendix 9

Less than half (47.1%) of the high-performing hotels have soundproof rooms, and only one-fifth of the high-performing hotels offer allergy-free rooms; therefore, economy hotels can save costs on these services without significantly harming their quality.

VIP room facilities (such as cozy seating area, kids' corner with toys, etc.) are not provided by any of the high-performing hotels. This data correlates with the 'entertainment' section of the previous chapter that notes that cheap hotels do not provide luxury/VIP facilities.

Room service (for example, serving food and beverages to guests in their rooms) is available in two-thirds of the high-performing hotels. Research of PKF Hospitality (2013), however, pointed out that the demand is kept decreasing due to the changing needs of the modern travellers (20% drop in 2012 compared to 2007); thus, further research is necessary in the coming years.

Air conditioning is provided by more than three-quarters (78.4%) of the high-performing hotels, 95% of them offer it for free. The vast majority (90.2%) of the hotels offer either air conditioning or a fan. Hence, economy hotels should provide air conditioning for free. If they cannot offer it for free, they should provide a fan to achieve high quality.

Demand for air conditioning, however, presumably has a strong relationship with the external temperature (climate and weather at the hotel). Thus it is

worth to check this assumption by regression analysis between the average temperature of the warmest month of the year at the hotel (Climate Data, 2020; available in Appendix 9) and the air conditioning facility of the high-performing hotels in the sample.

Regression analysis in the IBM SPSS Statistics software shows 0.285 constant coefficient and 0.019 temperature coefficient. These data predict that 28.5% of the guests demand air conditioning if the average temperature of the warmest month is zero degrees Celsius, and every one degree Celsius increase in temperature boosts the demand by 1.9 percentage points. Based on this regression, the following formula (Figure 21) can be defined that helps the hotel management to calculate the predicted demand for air conditioning:

Figure 21. Formula for the calculation of demand for air conditioning, based on the regression analysis of the high-performing hotels in the sample. d is the demand for air conditioning, and t is the average temperature of the warmest month of the year at the hotel in Celsius degree.

$$d = 0.285 + t * 0.019$$

For example, at temperature 11.3 degrees Celsius 50% of the guests would demand air conditioning, while at temperature 24.5 degrees Celsius we can expect that 75% of the guests would need it.

BATHROOM (private bathroom, shared bathroom, bidet, hairdryer, towel, toothbrush, shampoo, shower cap) - Appendix 10

According to the literature review, one of the most important core services is the bathroom (Huang and Sun, 2014; AA Hotel & Hospitality Services, 2018). The present study corroborates this finding: all of the high-performing hotels in the sample provide a bathroom. Furthermore, 92.2% of these hotels provide a private bathroom for free. Hence, it is not enough to offer a shared

bathroom, it must be a private bathroom; otherwise, the hotel cannot reach high quality even in the economy sector.

The most important amenity of the bathroom is the towel; 92.2% of the high-performing hotels provide it. Hairdryer and shampoo are provided in about half of the high-performing hotels, while toothbrush, shower cap and bidet are offered in less than one-sixth of them.

KITCHEN (kitchen, kitchenette, electric kettle, refrigerator, microwave, coffee machine) - Appendix 11

A full-size kitchen can be found in 23.5% of the high-performing hotels, and a further 7.8% provide a kitchenette.

An electric kettle is provided in more than half (54.9%) of the high-performing hotels; refrigerator (41.2%) and microwave (25.5%) are also often provided. Only 9.8% of them offer coffee machine; therefore, economy hotels should save costs and cleaning time by not providing it.

Spearman correlation analysis is suitable to reveal more in-depth statistical details about which appliances should a kitchen or kitchenette contain in the economy hotels.

Figure 22 shows that microwave and refrigerator are the core appliances because they have a very strong positive correlation with kitchens/kitchenettes of the high-performing economy hotels. The correlation coefficient of electric kettle is moderate, while the coffee machine is not a typical amenity in the kitchens/kitchenettes at all.

Figure 22. Two-tailed, bivariate Spearman correlation analysis for the kitchen/kitchenette appliances in the high-performing hotels of the sample, calculated in IBM SPSS Statistics software. Correlation coefficients above 0.5 represent a strong relationship (Cohen, 1988). A p-value of less than 0.05 is statistically significant (Quinn and Keough, 2002).

variable	variable	Spearman correlation coefficient	Statistical significance (p-value)
kitchen/kitchenette	microwave	0.865	0.000
kitchen/kitchenette	refrigerator	0.722	0.000
kitchen/kitchenette	electric kettle	0.443	0.001
kitchen/kitchenette	coffee machine	0.061	0.669

MEDIA & TECHNOLOGY (Wi-Fi, TV, telephone, adapter, game console, streaming service) - Appendix 12

Data of this research clearly show that the core technology services are Wi-Fi and television; both are provided for free by about 90% of the high-performing hotels.

Telephone and adapter are provided by one-third of the high-performing hotels, while game console is not available in any of them.

Streaming service (like Netflix, Disney+, etc.) is offered in only 7.8% of the high-performing hotels. The popularity of this modern service, however, is fastly increasing (89% growth in 2018 compared to 2017 according to the streaming TV Industry report of Conviva, 2019); therefore, further research about this service is recommended in the upcoming years.

OTHER ROOM AMENITIES (desk, safety deposit box, washing machine, iron, minibar) - Appendix 13

There are desks in 64.7% of the high-performing hotels. A desk can be useful, especially for the business travellers; a market report in the literature review (Chapter 2.2.2) has shown that 43% of the guests are business travellers in the economy hotels.

Less than half of the high-performing hotels provide iron (47.1%), safety deposit box (35.3%), minibar (29.4%) and washing machine (17.7%).

4.3.4 - Analysis of guest reviews

Guests are entitled to write a review if they have stayed in a hotel that was booked at Booking.com. They can select a review score on a scale of 10 for their overall experience and six main categories (staff, value for money, cleanliness, comfort, location, facilities) as well. This analysis processes 18,123 guest reviews of 51 high-performing hotels (Appendix 14).

The average score of staff (9.6), value for money (9.5) and cleanliness (9.42) are above the average overall score.

In the sample of 9,076 hotels, none of the hotels could achieve high-performing status with a score of 8 or less in any of these categories. Therefore, economy hotels should focus on the development of the staff (such as hiring process, training, salaries, etc.), with particular attention to the cleaning staff.

The average score of comfort (9.31), location (9.2) and facilities (9.19) are below the average overall score. Data show that it is possible to achieve high performance even with a score under 8 in these three categories (for example, a hotel in Addis Ababa could achieve high-performing status with a location score of only 7.2).

Thus, economy hotels should save costs on non-essential facilities (e.g. by not providing costly swimming pool) and location (e.g. by not buying or renting a hotel in the expensive city-centre area).

This finding corroborates with the literature that recommends saving costs on all the non-core services and facilities (Fiorentino, 1995; Cousins, 2011; Huang and Sun, 2014; Yu and Timmerman, 2014; Worsfold, 2016; Hotel Quality Assurance guide, 2018).

The findings of the present chapter also corroborate with the 'comfort' and 'entertainment' parts of the previous two chapters that found that economy hotels must not provide any luxury/VIP facilities.

Although the guests will definitely have poor experience about the comfort and facilities with this strategy, the management of an economy hotel does not need to worry: data clearly show that guests appreciate the low price in the economy sector (for example, a high-performing hotel in Bengaluru has a facility score of only 8.1, while the value for money score is perfect 10) and an outstanding staff can balance the negative effects of the lack of comfort (for example, a hotel in Gurgaon could achieve high-performing status with a facility score of only 8.1, because both staff score and cleanliness score are perfect 10).

For more precise statistical details, and to check the reliability of the previous findings, it is worth to conduct a Pearson correlation analysis that determines the associations between the categories of guest experiences.

Figure 23. Two-tailed, bivariate Pearson correlation analysis for the six categories that the guests reviewed in the high-performing hotels of the sample, based on a total of 18,123 guest reviews, calculated in IBM SPSS Statistics software. Correlation coefficients above 0.5 represent a strong relationship (Cohen, 1988). A p-value of less than 0.05 is statistically significant (Quinn and Keough, 2002).

Review category	Review category	Pearson correlation coefficient	Statistical significance (p-value)
facilities	comfort	0.828	0.000
comfort	value for money	0.804	0.000
cleanliness	comfort	0.705	0.000
facilities	cleanliness	0.681	0.000
facilities	value for money	0.665	0.000
staff	comfort	0.612	0.000
cleanliness	value for money	0.579	0.000
staff	value for money	0.569	0.000
location	value for money	0.518	0.000
location	comfort	0.492	0.000
location	facilities	0.444	0.001
facilities	staff	0.424	0.002
staff	cleanliness	0.364	0.009
location	staff	0.355	0.011
location	cleanliness	0.320	0.022

Pearson correlation analysis (Figure 23) reveals similar patterns as the previous findings: the better the staff and the cleanliness, the better the comfort and the value that guests' experience (and it is not possible to achieve great value/comfort with poor staff/cleanliness) because they correlate very strongly.

Facilities also strongly correlate with comfort and value experience of the guests, this is why it is vital to offer all the essential facilities that the target

customers of the economy sector need, and save costs only on the non-essential facilities.

Location, however, does not correlate very strongly with other categories; therefore, it is possible to achieve a high comfort level even if the hotel is far from the city centre.

In conclusion, the analysis of guest reviews found that economy hotels should save costs on location and extra facilities, and must highly focus on staff quality.

This result corresponds to the literature review that noted that economy hotels (also called limited-service hotels) would be far better off if they cut facilities like fitness centre and invested those savings in selecting and developing employees with the right talents to engage guests with world-class service (Yu and Timmerman, 2014).

4.4 - Summary of the data analysis

Chapter 4. has presented the analysis of 51 high-performing economy hotels, along with their 18,123 guest reviews in order to find answers to the research questions: is it possible and, if yes, how is it possible to provide high service quality at low cost in the economy hotel sector?

This study has found evidence that it is possible to provide high quality at low cost by providing all the core services in high quality that the target customers need, and save costs by eliminating all the non-essential services that the target customers of the economy sector do not demand strongly. As a result, guests will enjoy all their demanded services in high quality, while the hotel can maintain low-cost operation.

The core services the economy hotels should provide to achieve high perceived quality are the followings:

- ✓ less than 3 miles distance from a significant landmark
- ✓ car park
- ✓ 24-hour reception with English-speaker staff and concierge service
- ✓ check-in period from 2 pm or earlier, check-out period until 11 am or later, with a maximum of 1 hour gap between the two periods
- ✓ free luggage storage after check-out
- ✓ available credit card payment method
- ✓ highly trained staff
- ✓ outstanding cleanliness, daily housekeeping for free
- ✓ accept children without age limit
- ✓ free air conditioning if the average temperature of the warmest month of the year is above 11.3 degrees Celsius
- ✓ private bathroom for free
- ✓ towel for free
- ✓ electric kettle
- ✓ free Wi-Fi
- ✓ television
- ✓ desk

The non-essential services the economy hotels should not provide to save costs are the followings:

- × close distance to the city centre
- × free airport shuttle
- × valet parking
- × entertainment staff
- × babysitting/child services
- × fitness centre
- × spa/wellness centre
- × swimming pool
- × beauty services
- × massage
- × bicycle rental
- × accept pets

- × garden
- × barbecue facilities
- × business centre
- × shops on site
- × hotel bar
- × vending machine
- × allergy-free rooms
- × VIP room facilities
- × bidet
- × toothbrush
- × shower cap
- × kitchen/kitchenette
- × microwave
- × coffee machine
- × telephone
- × adapter
- × game console
- × safety deposit box
- × minibar
- × washing machine

This low-cost approach corroborates with the literature review that showed that the business concept of economy hotels is based on the no-frills principle and should not go too far beyond this principle to avoid losing its low-price nature.

The constraint models in the literature state that low cost consistently results in low quality; however, the present study has demonstrated a workaround: as the complex hotel service consists of multiple sub-services, it is possible to create a mix of low-cost—low-quality (e.g. no swimming pool) and high-cost—high-quality (e.g. excellent staff) sub-services. The mixture of all of these sub-services can result in an overall low-cost—high-quality operation because the high quality of the core sub-services overcomes the lack of the non-essential sub-services.

Although this analysis resulted in several obvious findings (e.g. Wi-Fi is an essential service), the present paper also provides some surprising outcomes (e.g. shared bathroom is rejected by the guests even if the price is extremely low) and practically useful formulas (e.g. a mathematical formula that can predict the demand for air conditioning by external temperature).

Chapter 5: Conclusions and recommendations

5.1 - Aim and objectives of the study

The purpose of this study is to explore the ways of providing high service quality at low cost in the economy hotel sector.

Main research question: Is it possible to provide high service quality at low cost in the economy hotel sector?

Research objectives:

1. To explore whether there are cheap hotels whose quality is rated high by the guests
2. To test the hypothesis that providing high quality with low cost is not possible

Additional research question: How is it possible to provide high service quality at low cost in the economy hotel sector?

Research objectives:

1. To identify the high-performing economy hotels
2. To identify key patterns among the high-performing economy hotels

5.2 - Summary of findings

The literature review has shown that economy hotels can be competitive and profitable only if they provide high-quality service at low operating costs.

While there has been much research on cost and quality topics separately, few researchers have taken into consideration how to enhance quality and keep costs low at the same time, mainly because of the popularity of the

constraint models. Constraint models state that low cost always results in low quality and that high quality always requires high investment.

Quantitative secondary data of Booking.com was analysed in a sample of 9,076 hotels and their 3,748,359 guest reviews.

This study has revealed that it is possible to provide high quality at low cost while respecting the statements of the constraint models: The hotels need to deliver core services at high quality to achieve high perceived quality and reduce or eliminate all non-core services to achieve low-cost operation.

5.3 - Theoretical implications

The highly popular constraint models state that low cost always results in low quality and that high quality always requires high investment. For example, a swimming pool cannot be provided at a low cost because the hotel cannot save the costs of water, electricity, cleaning, staff, etc. The literature has shown that the clear and reasonable statement of this popular theory restrains many researchers and practitioners from trying to improve quality when there is no enough fund for it, causing massive damage to the industry.

This study, however, pointed out that a workaround enables the businesses to provide high quality at low cost while respecting the statements of the constraint models. The statement of the constraint models can be valid for one service (such as swimming pool), but a hotel-experience never consists of only one service but multiple services (Wi-Fi, bathroom, car park, etc.). Therefore, businesses should provide the core services at high quality to achieve high perceived quality (even if their cost is high) and reduce or eliminate all non-core services to achieve low-cost operation (even if their quality decreases). A proper mix of low-cost—low-quality and high-cost—high-quality services can result in an overall low-cost—high-quality operation

because the high quality of the core services overcomes the lack of non-essential services.

This theoretical workaround may work in other hospitality sectors and other industries as well where the business service consists of multiple sub-services.

5.4 - Practical implications

The analysis of the high-performing economy hotels has found that management of economy hotels needs to focus primarily on their staff: 24-hour reception with highly-trained English-speaker staff, concierge service, and daily housekeeping with outstanding cleanliness must be the basis of the hotel service.

Free Wi-Fi, television, available credit card payment method, free towel and electric kettle also highly required by the guests.

Guests desire private bathroom even in the cheapest economy hotels; hotels cannot achieve high guest satisfaction with shared bathroom.

The present study also urges hoteliers to offer car park, free luggage storage after check-out, desk, and air conditioning.

Economy hotels should not offer the following services and facilities to save costs: swimming pool, fitness centre, entertainment staff, babysitting/child services, beauty services, hotel bar, and garden. Most guests do not require bicycle rental, free airport shuttle, allergy-free rooms, minibar, business centre, washing machine. Economy hotels can achieve high guest satisfaction without a kitchen and coffee machine.

Management does not need to worry about the lack of these services because the low price and the high-quality core services can sufficiently mitigate its negative effects in this sector.

Furthermore, this study suggests that investors (who plan to build, buy or rent economy hotel building) should choose a location within 3 miles distance from a significant landmark, regardless of the distance from the city centre.

5.5 - Limitations and challenges of the study

The sample was collected worldwide in order to mitigate the effects of local characteristics (e.g. local climate can affect the need for air conditioning according to Roaf *et al.*, 2009) and current local events (e.g. hurricanes can affect the prices of the hotels nearby according to Fox, 2017); however, it is still a challenge that the global COVID-19 coronavirus pandemic affects the hotels worldwide during the conduction of this study (e.g. temporary hotel closures have decreased the number of bookable hotels according to Whitmore, 2020).

Although the globally collected data mitigates the distorting effects of the local factors, it also limits the practical usage of the findings. For example, the generalised finding of the need for air conditioning may not be accurate in countries with an excessively cold or hot climate.

The data source of this study (Booking.com database) limits the depth of details of the findings.

Guest reviews at Booking.com do not contain information about the demographic details of the guests (e.g. it is not known whether elderly couples need different facilities than families with children) and the purpose of their travel (e.g. it is not known whether business travellers prefer different hotel location than leisure travellers).

The sampling frame (712,322 hotels at Booking.com) does not contain all the hotels in the world (approximately 1 million hotels according to Clapperton, 2013; Biemans, 2019; Bailador, 2020). Furthermore, the hotels in small cities

(with less than 30 hotels) were not investigated in this research because a small number of samples in a cluster could lead to spurious results (Saunders *et al.*, 2019).

5.6 - Directions for future research

This study originates from the lack of up-to-date literature. Garvin (1987) pointed out that the guests' preferences keep changing; hence the decades-old surveys and researches do not provide accurate information about the current needs of the target customers. For the same reason, the author recommends further studies in the near future on the latest needs of the target customers. For example, this paper has demonstrated that electric vehicle charging point and streaming services are currently not core services but guests' demand for these services likely will rise.

Booking.com does not publish guest details (age, purpose of travel, group size, etc.) about the 3,748,359 guest reviews. It would be beneficial to conduct a further study about the preferences of different types of guests (business travellers, families, young couples, etc.) to get more detailed answers to the additional research question.

Providing high service quality at low cost is a challenge for all business leaders in every industry; therefore, similar research is recommended in other hospitality sectors (e.g. hostels with dormitory rooms) and other industries (e.g. budget airlines) as well by using the demonstrated workaround of the constraint models.

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Appendices

Appendix 1 - The 62 selected cities in the sample

city	country	total number of hotels
NORTH AMERICA		
Ciudad De Panamá	Panama	91
Baltimore	United States of America (MD)	60
Denver	United States of America (CO)	112
Corpus Christi	United States of America (TX)	100
Wichita	United States of America (KS)	62
Cuernavaca	Mexico	61
Mississauga	Canada	50
San Cristóbal	Dominican Republic	66
San José	Costa Rica	103
SOUTH AMERICA		
Natal	Brazil	79
Fortaleza	Brazil	92
Salta	Argentina	41
Cochabamba	Bolivia	30
Cusco	Peru	282
Santiago	Chile	145
Campinas	Brazil	52
EUROPE		
Stuttgart	Germany	106
Caen	France	36
Trieste	Italy	32
Lublin	Poland	40
Belgorod	Russia	35
Moscow	Russia	842
Tirana	Albania	159
AFRICA		
Addis Ababa	Ethiopia	93
Accra	Ghana	80
Casablanca	Morocco	77

Cairo	Egypt	183
Dakar	Senegal	51
Johannesburg	South Africa	92
Pretoria	South Africa	45
Kampala	Uganda	94
Dar es Salaam	Tanzania	83
Lagos	Nigeria	109
Nairobi	Kenya	154
ASIA		
Chiba	Japan	92
Bishkek	Kyrgyzstan	74
Samarkand	Uzbekistan	38
Agra	India	109
Gurgaon	India	109
Amritsar	India	107
Udaipur	India	125
Varanasi	India	78
Srinagar	India	30
Aurangabad (Maharashtra)	India	46
Jaipur	India	255
Bangalore	India	440
Padang	Indonesia	34
Tangerang	Indonesia	57
Jakarta	Indonesia	471
Medan	Indonesia	105
Colombo	Sri Lanka	59
Shanghai	China	468
Guangzhou	China	392
Tianjin	China	63
Fuzhou	China	39
Dalian	China	38
Beirut	Lebanon	82
Jerusalem	Israel	69
Jeju	South Korea	96
Incheon	South Korea	58
Busan	South Korea	158
Istanbul	Turkey	1647
TOTAL		9076

Appendix 2 - Economy hotels in the sample

city	total numbers of hotels	highest price of the cheapest 25% of the hotels (USD)	lowest quality score of the best 25% of the hotels	NUMBER OF ECONOMY HOTELS (hotels in both the cheapest 25% and best 25%)	ratio of best 25% of hotels among cheapest 25% of the hotels
NORTH AMERICA					
Ciudad De Panamá	91	43	8.7	0	0.00%
Baltimore	60	96	8.8	1	6.67%
Denver	112	116	8.8	3	10.71%
Corpus Christi	100	86	8.8	2	8.00%
Wichita	62	81	9	2	12.90%
Cuernavaca	61	39	8.7	1	6.56%
Mississauga	50	89	8.5	1	8.00%
San Cristóbal	66	45	8.7	0	0.00%
San José	103	50	8.8	5	19.42%
SOUTH AMERICA					
Natal	79	26	8.7	5	25.32%
Fortaleza	92	28	8.5	6	26.09%
Salta	41	35	8.8	0	0.00%
Cochabamba	30	36	8.7	1	13.33%
Cusco	282	29	9.1	12	17.02%
Santiago	145	66	9	5	13.79%
Campinas	52	50	8.6	1	7.69%
EUROPE					
Stuttgart	106	109	8.4	5	18.87%
Caen	36	65	8.7	0	0.00%
Trieste	32	94	8.9	1	12.50%
Lublin	40	43	9.2	1	10.00%
Belgorod	35	28	8.9	4	45.71%
Moscow	842	36	8.9	27	12.83%
Tirana	159	35	9.3	9	22.64%
AFRICA					
Addis Ababa	93	50	8.3	6	25.81%
Accra	80	50	8.2	2	10.00%
Casablanca	77	56	8.3	3	15.58%
Cairo	183	37	8.5	15	32.79%

Dakar	51	70	8.2	2	15.69%
Johannesburg	92	49	8.9	0	0.00%
Pretoria	45	52	8.9	1	8.89%
Kampala	94	40	8.2	1	4.26%
Dar es Salaam	83	36	8.3	2	9.64%
Lagos	109	43	8	3	11.01%
Nairobi	154	45	8.4	3	7.79%
ASIA					
Chiba	92	82	8.5	2	8.70%
Bishkek	74	35	9.1	4	21.62%
Samarkand	38	44	8.9	3	31.58%
Agra	109	22	8	4	14.68%
Gurgaon	109	32	8.1	5	18.35%
Amritsar	107	17	8.4	3	11.21%
Udaipur	125	26	8.7	2	6.40%
Varanasi	78	22	8.2	4	20.51%
Srinagar	30	19	9.1	4	53.33%
Aurangabad (Maharashtra)	46	27	7.7	2	17.39%
Jaipur	255	21	8.4	16	25.10%
Bangalore	440	23	8.2	18	16.36%
Padang	34	23	8.2	3	35.29%
Tangerang	57	23	8	3	21.05%
Jakarta	471	23	8.2	21	17.83%
Medan	105	18	8.5	6	22.86%
Colombo	59	62	9	2	13.56%
Shanghai	468	45	8.6	7	5.98%
Guangzhou	392	35	8.1	9	9.18%
Tianjin	63	31	8.7	0	0.00%
Fuzhou	39	35	8.8	0	0.00%
Dalian	38	26	8.6	2	21.05%
Beirut	82	61	8.8	1	4.88%
Jerusalem	69	140	8.6	3	17.39%
Jeju	96	37	8.2	1	4.17%
Incheon	58	43	8.5	4	27.59%
Busan	158	46	8.7	10	25.32%
Istanbul	1647	45	8.6	102	24.77%
TOTAL	9076			371	
AVERAGE		47.03	8.58		16.35

Appendix 3 - High-performing hotels in the sample

city	total numbers of hotels	highest price of the cheapest 10% of the hotels (USD)	lowest quality score of the best 10% of the hotels	NUMBER OF HIGH-PERFORMING HOTELS (hotels in both the cheapest 10% and best 10%)	ratio of best 10% of hotels among cheapest 10% of the hotels
NORTH AMERICA					
Ciudad De Panamá	91	29	9	0	0.00%
Baltimore	60	69	9	0	0.00%
Denver	112	79	9.1	0	0.00%
Corpus Christi	100	62	9.1	0	0.00%
Wichita	62	58	9.3	0	0.00%
Cuernavaca	61	30	9.2	1	16.39%
Mississauga	50	74	8.7	0	0.00%
San Cristóbal	66	29	9.1	0	0.00%
San José	103	29	9.1	0	0.00%
SOUTH AMERICA					
Natal	79	19	8.8	1	12.66%
Fortaleza	92	23	8.8	1	10.87%
Salta	41	23	9.3	0	0.00%
Cochabamba	30	26	9.2	0	0.00%
Cusco	282	22	9.3	2	7.09%
Santiago	145	49	9.2	1	6.90%
Campinas	52	32	8.9	0	0.00%
EUROPE					
Stuttgart	106	81	8.7	1	9.43%
Caen	36	46	8.8	0	0.00%
Trieste	32	81	9.2	0	0.00%
Lublin	40	39	9.3	0	0.00%
Belgorod	35	23	9.3	0	0.00%
Moscow	842	28	9.1	5	5.94%
Tirana	159	31	9.5	1	6.29%
AFRICA					
Addis Ababa	93	38	8.6	1	10.75%
Accra	80	31	8.7	0	0.00%
Casablanca	77	39	8.7	0	0.00%

Cairo	183	25	8.7	2	10.93%
Dakar	51	50	8.4	1	19.61%
Johannesburg	92	35	9.3	0	0.00%
Pretoria	45	43	9.3	1	22.22%
Kampala	94	32	8.8	0	0.00%
Dar es Salaam	83	28	8.5	1	12.05%
Lagos	109	32	8.5	0	0.00%
Nairobi	154	31	8.9	0	0.00%
ASIA					
Chiba	92	65	8.9	0	0.00%
Bishkek	74	23	9.3	1	13.51%
Samarkand	38	36	9.3	0	0.00%
Agra	109	11	8.6	0	0.00%
Gurgaon	109	21	8.7	1	9.17%
Amritsar	107	11	9	0	0.00%
Udaipur	125	18	9.2	1	8.00%
Varanasi	78	12	8.8	2	25.64%
Srinagar	30	7	9.1	0	0.00%
Aurangabad (Maharashtra)	46	13	8.6	0	0.00%
Jaipur	255	16	9	1	3.92%
Bangalore	440	18	8.8	3	6.82%
Padang	34	16	8.5	1	29.41%
Tangerang	57	15	8.4	0	0.00%
Jakarta	471	17	8.7	5	10.62%
Medan	105	15	9.2	1	9.52%
Colombo	59	41	9.3	0	0.00%
Shanghai	468	33	8.8	1	2.14%
Guangzhou	392	25	8.5	1	2.55%
Tianjin	63	24	9.1	0	0.00%
Fuzhou	39	26	9.1	0	0.00%
Dalian	38	18	8.8	1	26.32%
Beirut	82	47	9	0	0.00%
Jerusalem	69	110	8.9	0	0.00%
Jeju	96	29	8.6	0	0.00%
Incheon	58	31	8.8	0	0.00%
Busan	158	37	8.9	1	6.33%
Istanbul	1647	32	9.1	12	7.29%
TOTAL	9076			51	
AVERAGE		34.4	8.94		5.04

Appendix 4 - Hotel attributes: location and parking

hotel ID	city	distance from city centre	distance from closest landmark	airport shuttle	car park	valet parking	electric vehicle charging
0 = "Not available" 1 = "Available for free" 2 = "Available for extra fee"		miles	miles	0/1/2	0/1/2	0/1/2	0/1/2
#1	Cuernavaca	1.5	0.1	2	2	0	0
#2	Natal	6.2	0.2	2	1	0	0
#3	Fortaleza	3.7	0.6	0	1	0	0
#4	Cusco	3.1	0.6	0	1	0	0
#5	Cusco	0.6	0.2	2	1	0	0
#6	Santiago	4.3	1.5	2	1	0	2
#7	Stuttgart	0.8	0.2	0	2	0	0
#8	Moscow	2.2	0.2	2	0	0	0
#9	Moscow	5	0.5	2	0	0	0
#10	Moscow	13	0.9	2	1	0	0
#11	Moscow	4.3	2.3	0	1	0	0
#12	Moscow	6.2	1.4	0	1	0	0
#13	Tirana	2.7	1.7	0	1	0	0
#14	Addis Ababa	4.3	2.5	1	1	0	0
#15	Cairo	0.5	0.5	0	0	0	0
#16	Cairo	6.8	0.3	1	1	0	0
#17	Dakar	5	1.4	0	1	0	0
#18	Pretoria	3.7	1.5	0	1	0	0
#19	Dar es Salaam	12.4	1.5	2	1	0	0
#20	Bishkek	2.1	0.2	1	1	0	0
#21	Gurgaon	3.1	2.1	0	0	0	0
#22	Udaipur	1.2	0.2	2	1	0	0
#23	Varanasi	2.7	0.7	2	1	0	2
#24	Varanasi	3.1	0.2	2	1	0	0
#25	Jaipur	1.5	0.4	2	1	0	0
#26	Bengaluru	1.8	0.5	0	0	0	0
#27	Bengaluru	3	0.4	0	0	0	0
#28	Bengaluru	1.8	0.4	2	1	0	0
#29	Padang	1.6	0.9	0	1	0	0
#30	Jakarta	2.5	0.5	0	1	0	0
#31	Jakarta	3.1	0.2	0	0	0	0
#32	Jakarta	3.7	1.2	0	0	0	0
#33	Jakarta	5	0.1	0	0	0	0
#34	Jakarta	6.2	0.9	0	1	0	0

#35	Medan	6.2	2.9	0	0	0	0
#36	Shanghai	7.5	1.2	0	1	0	0
#37	Guangzhou	14.3	0.5	0	0	0	0
#38	Dalian	7.5	1.3	0	1	0	0
#39	Busan	1.6	0.2	0	0	0	0
#40	Istanbul	2.1	0.2	2	2	0	0
#41	Istanbul	0.3	0.1	2	0	0	0
#42	Istanbul	0.4	0.2	2	2	0	0
#43	Istanbul	0.4	0.1	2	2	0	0
#44	Istanbul	1.7	0.1	2	2	0	0
#45	Istanbul	0.3	0.1	2	2	0	0
#46	Istanbul	8.1	3	2	0	0	0
#47	Istanbul	0.7	0.5	2	2	2	0
#48	Istanbul	0.5	0.5	2	2	0	0
#49	Istanbul	6.8	1.5	0	2	0	0
#50	Istanbul	2.1	0.2	2	2	0	0
#51	Istanbul	0.3	0.2	2	0	0	0
average		3.72	0.78				
total number of "0"				24	15	50	49
total number of "1"				3	25	0	0
total number of "2"				24	11	1	2
total number of "1" + "2"				27	36	1	2
ratio of "0" (%)				47.06	29.41	98.04	96.08
ratio of "1" (%)				5.88	49.02		
ratio of "2" (%)				47.06	21.57	1.96	3.92
ratio of "1" + "2" (%)				52.94	70.59	1.96	3.92

Appendix 5 - Hotel attributes: arrival and departure

hotel ID	city	check-in start	check-in end	check-out start	check-out end	gap between check-out & check-in	24-hour front desk	concierge service	staff speaks English	credit card accepted	luggage storage
0 = "Not available" 1 = "Available for free" 2 = "Available for extra fee"		time of the day	hours	0/1	0/1	0/1	0/1	0/1/2			
#1	Cuernavaca	13:00	22:00	11:00	12:00	1	1	0	0	1	0
#2	Natal	14:00	22:00	09:00	12:00	2	0	0	0	1	1
#3	Fortaleza	14:00	24:00	00:00	13:00	1	1	0	0	1	0
#4	Cusco	12:00	24:00	00:00	11:00	1	1	0	0	0	0
#5	Cusco	10:00	24:00	00:00	09:00	1	1	1	1	0	1
#6	Santiago	14:00	21:00	10:00	12:00	2	0	0	0	1	1
#7	Stuttgart	12:00	17:00	10:00	12:00	0	0	0	1	1	0
#8	Moscow	13:00	24:00	00:00	12:00	1	1	0	0	1	2
#9	Moscow	14:00	24:00	00:00	12:00	2	1	0	1	1	1
#10	Moscow	14:00	23:00	00:00	12:00	2	1	1	0	0	0
#11	Moscow	13:00	24:00	00:00	12:00	1	1	1	1	0	1
#12	Moscow	14:00	24:00	00:00	12:00	2	1	1	1	1	1
#13	Tirana	12:30	16:00	06:00	11:30	1	1	0	1	1	0
#14	Addis Ababa	12:00	24:00	00:00	11:00	1	1	1	1	1	1
#15	Cairo	13:00	21:00	11:00	12:00	1	1	0	1	0	1
#16	Cairo	14:00	24:00	00:00	13:00	1	1	1	1	1	1
#17	Dakar	12:30	23:30	08:00	12:00	0.5	1	1	1	0	1
#18	Pretoria	14:00	20:00	10:00	11:00	3	0	0	1	1	0
#19	Dar es Salaam	12:00	24:00	00:00	10:00	2	1	0	1	0	0
#20	Bishkek	14:00	24:00	00:00	12:00	2	1	0	1	0	1
#21	Gurgaon	12:00	24:00	00:00	11:00	1	1	0	1	1	0
#22	Udaipur	11:00	15:00	10:00	11:00	0	1	1	1	1	1
#23	Varanasi	12:00	24:00	10:00	10:30	1.5	0	1	1	0	0
#24	Varanasi	12:00	22:00	10:00	11:00	1	1	0	1	0	2
#25	Jaipur	12:00	24:00	00:00	12:00	0	1	1	1	1	1
#26	Bengaluru	13:00	23:00	06:30	11:00	2	1	0	1	1	1

#27	Bengaluru	12:00	23:30	10:00	11:00	1	1	0	1	1	0
#28	Bengaluru	11:30	24:00	11:00	11:30	0	1	0	1	1	0
#29	Padang	12:00	17:00	00:00	12:00	0	1	0	1	1	0
#30	Jakarta	14:00	24:00	00:00	12:00	2	1	0	1	1	0
#31	Jakarta	13:00	24:00	00:00	12:00	1	0	0	1	1	0
#32	Jakarta	14:00	24:00	00:00	12:00	2	0	0	1	1	0
#33	Jakarta	14:00	24:00	01:30	12:00	2	1	0	0	1	0
#34	Jakarta	14:00	24:00	07:00	12:00	2	1	0	0	1	0
#35	Medan	14:00	24:00	00:00	12:00	2	1	0	0	1	1
#36	Shanghai	14:00	24:00	00:00	12:00	2	1	0	1	1	1
#37	Guangzhou	14:00	18:00	00:00	12:00	2	1	0	1	1	1
#38	Dalian	14:00	24:00	00:00	12:00	2	1	0	1	1	1
#39	Busan	16:00	22:00	00:00	11:00	5	0	1	1	1	1
#40	Istanbul	14:00	24:00	00:00	12:00	2	1	0	1	1	1
#41	Istanbul	12:00	24:00	11:00	12:00	0	1	0	1	1	2
#42	Istanbul	13:00	24:00	00:00	12:00	1	1	1	1	1	1
#43	Istanbul	12:00	24:00	10:00	11:00	1	1	0	1	1	1
#44	Istanbul	14:00	24:00	00:00	12:00	2	1	1	1	1	1
#45	Istanbul	13:30	24:00	00:00	12:00	1.5	1	1	1	1	1
#46	Istanbul	14:00	23:30	11:30	12:00	2	1	1	1	1	1
#47	Istanbul	14:00	24:00	10:00	12:00	2	1	0	1	1	1
#48	Istanbul	13:00	24:00	00:00	12:00	1	1	1	1	1	1
#49	Istanbul	13:00	24:00	00:00	12:00	1	1	0	1	1	1
#50	Istanbul	14:00	24:00	00:00	12:00	2	0	0	1	1	0
#51	Istanbul	13:00	24:00	00:00	13:00	0	1	1	1	1	1
average						1.00					
total number of "0"							9	34	10	10	19
total number of "1"							42	17	41	41	29
total number of "2"							0	0	0	0	3
total number of "1" + "2"							42	17	41	41	32
ratio of "0" (%)							17.65	66.67	19.61	19.61	37.25
ratio of "1" (%)							82.35	33.33	80.39	80.39	56.86
ratio of "2" (%)											5.88
ratio of							82.	33.	80.	80.	62.

"1" + "2" (%)							35	33	39	39	75
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Appendix 6 - Hotel attributes: entertainment

hotel ID	city	entertainment staff	spa & wellness centre	swimming pool	fitness centre	beauty services	massage	bar	BBQ facilities	bicycle rental	babysitting services
0 = "Not available" 1 = "Available for free" 2 = "Available for extra fee"		0/1	0/1/2	0/1/2	0/1/2	0/2	0/1/2	0/2	0/1/2	0/1/2	0/1/2
#1	Cuernavaca	0	0	0	0	0	0	0	0	0	2
#2	Natal	0	0	0	0	0	0	0	0	0	0
#3	Fortaleza	0	0	0	0	0	0	0	0	0	0
#4	Cusco	0	0	0	0	0	0	0	0	0	0
#5	Cusco	0	0	0	0	0	0	2	0	0	0
#6	Santiago	0	0	0	0	0	0	0	0	0	0
#7	Stuttgart	0	0	0	0	0	0	0	0	0	0
#8	Moscow	0	0	0	0	0	0	0	0	0	0
#9	Moscow	0	0	0	0	0	0	0	0	2	0
#10	Moscow	0	0	0	0	0	0	0	0	0	0
#11	Moscow	0	0	0	0	0	0	0	0	0	0
#12	Moscow	0	0	0	0	0	0	0	0	0	0
#13	Tirana	0	0	0	0	0	0	2	0	0	0
#14	Addis Ababa	0	0	0	0	0	2	2	0	0	1
#15	Cairo	0	0	0	0	0	0	0	0	0	0
#16	Cairo	0	0	0	0	0	0	0	0	0	0
#17	Dakar	0	0	0	0	0	0	2	0	0	0
#18	Pretoria	0	0	0	0	0	0	0	1	0	0
#19	Dar es Salaam	0	0	0	0	0	0	2	0	0	0
#20	Bishkek	0	0	0	0	0	0	2	0	0	0
#21	Gurgaon	0	0	0	0	0	0	0	0	0	0
#22	Udaipur	0	0	0	0	0	2	0	0	0	0
#23	Varanasi	0	0	0	0	0	0	0	0	0	0
#24	Varanasi	0	0	0	0	0	2	0	0	0	0
#25	Jaipur	0	0	0	0	0	2	0	0	0	0
#26	Bengaluru	0	0	0	0	0	0	0	0	0	0
#27	Bengaluru	0	0	0	0	0	0	0	0	0	0
#28	Bengaluru	0	0	0	0	0	0	0	0	0	0
#29	Padang	0	0	0	0	0	0	0	0	0	0
#30	Jakarta	0	0	0	0	0	0	0	0	0	0
#31	Jakarta	0	0	0	0	0	0	0	0	0	0
#32	Jakarta	0	0	0	0	0	0	0	0	0	0

#33	Jakarta	0	0	0	0	0	0	0	0	0	0
#34	Jakarta	0	0	0	0	0	0	0	0	0	0
#35	Medan	0	0	0	0	0	0	0	0	0	0
#36	Shanghai	0	0	0	0	0	0	0	0	0	0
#37	Guangzhou	0	0	0	0	0	0	0	0	0	0
#38	Dalian	0	0	0	0	0	0	0	0	0	0
#39	Busan	0	0	0	0	0	0	0	0	0	0
#40	Istanbul	0	0	0	0	0	2	0	0	0	0
#41	Istanbul	0	0	0	0	0	0	0	0	2	0
#42	Istanbul	0	0	0	0	0	0	0	0	2	0
#43	Istanbul	0	0	0	0	0	0	0	0	0	2
#44	Istanbul	0	0	0	0	0	0	0	0	0	0
#45	Istanbul	0	0	0	0	0	0	0	0	0	2
#46	Istanbul	0	0	0	0	0	0	0	0	0	0
#47	Istanbul	0	0	0	0	0	0	0	0	0	0
#48	Istanbul	0	0	0	0	0	0	0	0	0	0
#49	Istanbul	0	0	0	0	0	0	0	0	0	0
#50	Istanbul	0	0	0	0	0	0	0	0	0	0
#51	Istanbul	0	0	0	0	0	0	0	0	0	0
total number of "0"		51	51	51	51	51	46	45	50	48	47
total number of "1"		0	0	0	0	0	0	0	1	0	1
total number of "2"		0	0	0	0	0	5	6	0	3	3
total number of "1" + "2"		0	0	0	0	0	5	6	1	3	4
ratio of "0" (%)		100.00	100.00	100.00	100.00	100.00	90.20	88.24	98.04	94.12	92.16
ratio of "1" (%)									1.96		1.96
ratio of "2" (%)			0.00				9.80	11.76		5.88	5.88
ratio of "1" + "2" (%)			0.00				9.80	11.76	1.96	5.88	7.84

Appendix 7 - Hotel attributes: property policies, cleaning, breakfast

hotel ID	city	pet allowed	youngest child-age allowed	daily housekeeping	breakfast
0 = "Not available" 1 = "Available for free" 2 = "Available for extra fee"		0/1/2	years	0/1/2	0/1/2
#1	Cuernavaca	0	0	2	0
#2	Natal	1	0	0	0
#3	Fortaleza	1	0	1	1
#4	Cusco	0	0	0	0
#5	Cusco	0	5	1	1
#6	Santiago	0	10	1	1
#7	Stuttgart	0	0	1	2
#8	Moscow	0	0	1	0
#9	Moscow	0	5	1	0
#10	Moscow	1	0	0	0
#11	Moscow	0	0	2	0
#12	Moscow	2	0	0	0
#13	Tirana	0	0	1	1
#14	Addis Ababa	0	1	1	1
#15	Cairo	0	0	1	0
#16	Cairo	0	0	1	1
#17	Dakar	0	0	1	2
#18	Pretoria	0	0	1	0
#19	Dar es Salaam	2	0	0	1
#20	Bishkek	0	0	1	0
#21	Gurgaon	0	0	1	1
#22	Udaipur	2	0	0	2
#23	Varanasi	0	2	1	2
#24	Varanasi	0	0	1	2
#25	Jaipur	0	0	1	1
#26	Bengaluru	0	1	1	0
#27	Bengaluru	0	0	0	1
#28	Bengaluru	0	0	1	0
#29	Padang	0	0	1	1
#30	Jakarta	0	0	1	1
#31	Jakarta	0	0	0	0
#32	Jakarta	0	0	1	0
#33	Jakarta	0	0	0	0
#34	Jakarta	0	0	0	1
#35	Medan	0	0	1	0

#36	Shanghai	0	0	1	2
#37	Guangzhou	0	0	1	0
#38	Dalian	0	0	0	0
#39	Busan	0	1	1	0
#40	Istanbul	0	0	1	0
#41	Istanbul	0	0	1	1
#42	Istanbul	0	0	1	0
#43	Istanbul	0	0	1	2
#44	Istanbul	0	8	1	1
#45	Istanbul	0	0	1	0
#46	Istanbul	0	6	1	1
#47	Istanbul	0	0	1	0
#48	Istanbul	0	0	1	0
#49	Istanbul	1	0	1	2
#50	Istanbul	2	0	1	2
#51	Istanbul	0	0	1	0
average			0.76		
total number of "0"		43		11	26
total number of "1"		4		38	16
total number of "2"		4		2	9
total number of "1" + "2"		8		40	25
ratio of "0" (%)		84.31		21.57	50.98
ratio of "1" (%)		7.84		74.51	31.37
ratio of "2" (%)		7.84		3.92	17.65
ratio of "1" + "2" (%)		15.69		78.43	49.02

Appendix 8 - Hotel attributes: other facilities

hotel ID	city	garden	business centre	shops on site	vending machine
0 = "Not available"					
1 = "Available for free"					
2 = "Available for extra fee"		0/1	0/1/2	0/2	0/2
#1	Cuernavaca	0	0	0	0
#2	Natal	0	0	0	0
#3	Fortaleza	0	0	0	0
#4	Cusco	0	0	0	0
#5	Cusco	1	0	0	0
#6	Santiago	1	0	0	0
#7	Stuttgart	0	0	0	0
#8	Moscow	0	0	0	0
#9	Moscow	0	0	0	0
#10	Moscow	0	0	0	0
#11	Moscow	0	0	0	0
#12	Moscow	0	0	0	0
#13	Tirana	1	0	2	2
#14	Addis Ababa	0	2	2	0
#15	Cairo	0	0	0	0
#16	Cairo	1	0	0	0
#17	Dakar	0	0	0	0
#18	Pretoria	1	0	0	0
#19	Dar es Salaam	1	0	0	0
#20	Bishkek	0	1	0	0
#21	Gurgaon	0	0	0	0
#22	Udaipur	0	0	0	0
#23	Varanasi	0	0	2	0
#24	Varanasi	0	0	0	0
#25	Jaipur	1	2	0	0
#26	Bengaluru	1	0	0	0
#27	Bengaluru	0	0	0	0
#28	Bengaluru	0	0	0	0
#29	Padang	1	0	0	0
#30	Jakarta	0	0	0	0
#31	Jakarta	0	0	0	0
#32	Jakarta	0	0	0	0
#33	Jakarta	0	0	0	0
#34	Jakarta	0	0	0	0
#35	Medan	0	0	0	0
#36	Shanghai	1	0	2	0
#37	Guangzhou	0	0	0	0
#38	Dalian	0	0	0	0

#39	Busan	0	0	0	0
#40	Istanbul	0	0	0	0
#41	Istanbul	0	0	0	2
#42	Istanbul	0	0	0	0
#43	Istanbul	0	0	0	0
#44	Istanbul	1	0	0	0
#45	Istanbul	0	2	0	0
#46	Istanbul	0	0	0	0
#47	Istanbul	0	0	0	0
#48	Istanbul	0	0	0	0
#49	Istanbul	0	0	0	2
#50	Istanbul	0	0	0	0
#51	Istanbul	0	2	0	0
total number of "0"		40	46	47	48
total number of "1"		11	1	0	0
total number of "2"		0	4	4	3
total number of "1" + "2"		11	5	4	3
ratio of "0" (%)		78.43	90.20	92.16	94.12
ratio of "1" (%)		21.57	1.96		
ratio of "2" (%)			7.84	7.84	5.88
ratio of "1" + "2" (%)		21.57	9.80	7.84	5.88

Appendix 9 - Room attributes: comfort

hotel ID	city	temperature in the city	allergy-free room	sound-proof room	VIP room facilities	air conditioning	fan	room service
0 = "Not available" 1 = "Available for free" 2 = "Available for extra fee"		Celsius degree	0/1	0/1	0/1	0/1/2	0/1	0/1/2
#1	Cuernavaca	23.7	0	0	0	0	1	0
#2	Natal	27	0	0	0	1	0	0
#3	Fortaleza	27.2	1	1	0	1	1	2
#4	Cusco	12.6	0	0	0	0	0	0
#5	Cusco	12.6	0	0	0	0	0	0
#6	Santiago	20.8	0	1	0	0	1	0
#7	Stuttgart	18	1	1	0	0	0	2
#8	Moscow	18.4	0	1	0	1	1	0
#9	Moscow	18.4	0	1	0	1	1	2
#10	Moscow	18.4	0	0	0	1	0	2
#11	Moscow	18.4	0	1	0	0	0	0
#12	Moscow	18.4	1	1	0	1	1	2
#13	Tirana	23.8	0	1	0	1	0	2
#14	Addis Ababa	18.2	0	1	0	0	0	2
#15	Cairo	27.6	0	0	0	1	0	2
#16	Cairo	27.6	0	1	0	1	1	2
#17	Dakar	28.1	0	1	0	1	0	2
#18	Pretoria	22.4	0	0	0	0	1	0
#19	Dar es Salaam	28.5	0	0	0	1	1	2
#20	Bishkek	23.9	0	0	0	1	0	2
#21	Gurgaon	34.2	0	0	0	1	1	2
#22	Udaipur	28.3	0	0	0	0	1	2
#23	Varanasi	34.3	1	0	0	0	1	2
#24	Varanasi	34.3	0	0	0	2	1	2
#25	Jaipur	33.1	0	0	0	1	1	2
#26	Bengaluru	27.1	0	0	0	2	1	2
#27	Bengaluru	27.1	0	0	0	1	1	2
#28	Bengaluru	27.1	0	0	0	0	1	2
#29	Padang	25.6	0	0	0	1	1	2
#30	Jakarta	28.3	0	1	0	1	0	2
#31	Jakarta	28.3	0	0	0	1	0	0
#32	Jakarta	28.3	0	0	0	1	0	2
#33	Jakarta	28.3	0	0	0	1	0	2
#34	Jakarta	28.3	0	0	0	1	0	0

#35	Medan	27.5	0	0	0	1	0	0
#36	Shanghai	28	0	1	0	1	0	2
#37	Guangzhou	28.8	0	0	0	1	0	2
#38	Dalian	19.9	0	1	0	1	0	2
#39	Busan	25.9	0	1	0	1	0	0
#40	Istanbul	23.2	1	1	0	1	0	0
#41	Istanbul	23.2	1	1	0	1	1	2
#42	Istanbul	23.2	1	1	0	1	0	0
#43	Istanbul	23.2	1	0	0	1	0	2
#44	Istanbul	23.2	0	1	0	1	0	2
#45	Istanbul	23.2	0	0	0	1	0	2
#46	Istanbul	23.2	0	1	0	1	0	2
#47	Istanbul	23.2	1	1	0	1	1	0
#48	Istanbul	23.2	0	1	0	1	0	0
#49	Istanbul	23.2	0	1	0	1	0	0
#50	Istanbul	23.2	0	0	0	1	0	2
#51	Istanbul	23.2	1	1	0	1	1	2
total number of "0"			41	27	51	11	30	17
total number of "1"			10	24	0	38	21	0
total number of "2"			0	0	0	2	0	34
total number of "1" + "2"			10	24	0	40	21	34
ratio of "0" (%)			80.39	52.94	100.00	21.57	58.82	33.33
ratio of "1" (%)			19.61	47.06		74.51	41.18	
ratio of "2" (%)						3.92		66.67
ratio of "1" + "2" (%)			19.61	47.06		78.43	41.18	66.67

Appendix 10 - Room attributes: bathroom

hotel ID	city	private bathroom	shared bathroom	towel	bidet	hairdryer	toothbrush	shampoo	shower cap
0 = "Not available" 1 = "Available for free" 2 = "Available for extra fee"		0/1	0/1	0/1/2	0/1	0/1	0/1	0/1	0/1
#1	Cuernavaca	1	0	1	0	0	0	1	0
#2	Natal	1	0	1	0	0	0	0	0
#3	Fortaleza	1	0	1	0	0	0	0	0
#4	Cusco	1	0	0	0	0	0	0	0
#5	Cusco	1	0	1	0	1	0	0	0
#6	Santiago	1	0	1	1	1	0	0	0
#7	Stuttgart	1	0	1	0	1	0	0	0
#8	Moscow	1	0	1	0	1	0	0	0
#9	Moscow	0	1	1	0	1	0	1	0
#10	Moscow	1	0	1	0	1	0	0	0
#11	Moscow	1	0	1	0	0	0	0	0
#12	Moscow	1	0	1	0	1	0	1	0
#13	Tirana	1	0	1	1	1	0	1	1
#14	Addis Ababa	1	0	1	1	1	1	1	1
#15	Cairo	1	0	1	1	1	0	1	0
#16	Cairo	1	0	1	0	1	0	1	0
#17	Dakar	1	0	1	0	1	0	1	0
#18	Pretoria	1	0	1	0	0	0	0	0
#19	Dar es Salaam	0	1	1	1	0	0	0	0
#20	Bishkek	1	0	1	0	1	1	1	0
#21	Gurgaon	1	0	1	0	0	1	1	0
#22	Udaipur	1	0	1	0	0	0	0	0
#23	Varanasi	1	0	1	1	0	0	0	0
#24	Varanasi	1	0	1	0	1	0	1	0
#25	Jaipur	1	0	1	0	1	0	1	0
#26	Bengaluru	1	0	1	0	0	0	0	0
#27	Bengaluru	1	0	1	0	0	0	0	0
#28	Bengaluru	1	0	1	0	0	0	0	0
#29	Padang	1	0	0	1	0	1	1	0
#30	Jakarta	1	0	0	0	0	1	1	0
#31	Jakarta	1	0	0	0	0	0	0	0
#32	Jakarta	1	0	1	0	0	0	0	0
#33	Jakarta	1	0	1	0	0	0	0	0

#34	Jakarta	0	1	1	0	0	0	0	0
#35	Medan	1	0	1	0	0	0	1	0
#36	Shanghai	1	0	1	0	1	0	1	0
#37	Guangzhou	1	0	1	0	1	1	1	0
#38	Dalian	1	0	1	0	0	1	1	0
#39	Busan	1	0	1	0	1	1	1	0
#40	Istanbul	1	0	1	0	1	0	1	1
#41	Istanbul	0	1	1	0	1	0	1	0
#42	Istanbul	1	0	1	0	1	0	1	0
#43	Istanbul	1	0	1	0	1	0	1	0
#44	Istanbul	1	0	1	0	1	0	1	0
#45	Istanbul	1	0	1	0	1	0	1	1
#46	Istanbul	1	0	1	1	1	0	1	1
#47	Istanbul	1	0	1	0	1	0	0	0
#48	Istanbul	1	0	1	0	1	0	1	0
#49	Istanbul	1	0	1	0	1	0	1	0
#50	Istanbul	1	0	1	0	1	0	1	0
#51	Istanbul	1	0	1	0	1	0	1	1
total number of "0"		4	47	4	43	21	43	21	45
total number of "1"		47	4	47	8	30	8	30	6
total number of "2"		0	0	0	0	0	0	0	0
total number of "1" + "2"		47	4	47	8	30	8	30	6
ratio of "0" (%)		7.84	92.16	7.84	84.31	41.18	84.31	41.18	88.24
ratio of "1" (%)		92.16	7.84	92.16	15.69	58.82	15.69	58.82	11.76
ratio of "2" (%)									
ratio of "1" + "2" (%)		92.16	7.84	92.16	15.69	58.82	15.69	58.82	11.76

Appendix 11 - Room attributes: kitchen

hotel ID	city	kitchen	kitchenette	electric kettle	microwave	refrigerator	coffee machine
0 = "Not available" 1 = "Available for free" 2 = "Available for extra fee"		0/1	0/1	0/1	0/1	0/1	0/1
#1	Cuernavaca	1	0	0	1	0	0
#2	Natal	0	0	0	0	0	0
#3	Fortaleza	0	0	0	0	0	0
#4	Cusco	0	0	0	0	0	0
#5	Cusco	0	0	0	0	0	0
#6	Santiago	1	0	1	1	1	0
#7	Stuttgart	0	0	0	0	0	0
#8	Moscow	1	0	1	1	1	0
#9	Moscow	1	0	0	1	1	1
#10	Moscow	0	0	1	0	1	0
#11	Moscow	0	0	1	0	0	0
#12	Moscow	1	0	1	1	1	0
#13	Tirana	0	0	0	0	0	0
#14	Addis Ababa	0	0	1	0	1	0
#15	Cairo	0	0	0	0	0	0
#16	Cairo	1	0	1	1	1	0
#17	Dakar	1	0	1	1	1	0
#18	Pretoria	0	1	1	1	1	0
#19	Dar es Salaam	0	0	1	0	0	0
#20	Bishkek	0	0	1	0	0	0
#21	Gurgaon	0	0	1	0	0	0
#22	Udaipur	0	0	0	0	0	0
#23	Varanasi	0	0	1	0	0	0
#24	Varanasi	0	0	0	0	0	0
#25	Jaipur	0	1	1	0	1	0
#26	Bengaluru	0	0	0	0	0	0
#27	Bengaluru	0	0	0	0	0	0
#28	Bengaluru	0	0	0	0	0	0
#29	Padang	0	0	0	0	0	0
#30	Jakarta	0	0	0	0	0	0
#31	Jakarta	0	0	0	0	1	0
#32	Jakarta	0	0	0	0	0	0
#33	Jakarta	0	0	0	0	0	0
#34	Jakarta	0	0	0	0	1	0
#35	Medan	0	0	0	0	0	0

#36	Shanghai	0	0	1	0	0	1
#37	Guangzhou	0	0	1	0	0	0
#38	Dalian	1	0	1	1	1	0
#39	Busan	0	0	0	0	1	0
#40	Istanbul	1	0	1	0	1	0
#41	Istanbul	0	0	1	0	0	0
#42	Istanbul	0	1	1	1	1	0
#43	Istanbul	0	0	1	0	0	0
#44	Istanbul	0	0	0	0	0	0
#45	Istanbul	0	0	1	0	1	0
#46	Istanbul	0	0	1	0	0	1
#47	Istanbul	1	0	1	1	1	1
#48	Istanbul	1	0	1	1	1	0
#49	Istanbul	1	0	1	1	1	0
#50	Istanbul	0	1	1	0	1	0
#51	Istanbul	0	0	1	0	0	1
total number of "0"		39	47	23	38	30	46
total number of "1"		12	4	28	13	21	5
total number of "2"		0	0	0	0	0	0
total number of "1" + "2"		12	4	28	13	21	5
ratio of "0" (%)		76.4 7	92.16	45.10	74.5 1	58.8 2	90.20
ratio of "1" (%)		23.5 3	7.84	54.90	25.4 9	41.1 8	9.80
ratio of "2" (%)							
ratio of "1" + "2" (%)		23.5 3	7.84	54.90	25.4 9	41.1 8	9.80

Appendix 12 - Room attributes: media and technology

hotel ID	city	adap ter	Wi-Fi	game console	telep hone	TV	stream ing service
0 = "Not available"							
1 = "Available for free"							
2 = "Available for extra fee"		0/1	0/1/2	0/1	0/2	0/1	0/1
#1	Cuernavaca	0	1	0	0	1	0
#2	Natal	0	1	0	0	1	0
#3	Fortaleza	0	1	0	0	1	0
#4	Cusco	0	1	0	0	1	0
#5	Cusco	0	1	0	0	0	0
#6	Santiago	0	1	0	0	1	0
#7	Stuttgart	0	1	0	0	1	0
#8	Moscow	0	1	0	0	1	0
#9	Moscow	0	1	0	0	0	0
#10	Moscow	0	1	0	0	1	0
#11	Moscow	0	1	0	0	1	0
#12	Moscow	0	0	0	0	1	0
#13	Tirana	0	1	0	2	1	0
#14	Addis Ababa	1	1	0	2	1	0
#15	Cairo	1	1	0	0	1	0
#16	Cairo	1	1	0	0	1	0
#17	Dakar	1	1	0	2	1	0
#18	Pretoria	1	0	0	0	1	0
#19	Dar es Salaam	0	0	0	0	0	0
#20	Bishkek	1	1	0	2	1	1
#21	Gurgaon	0	1	0	2	1	0
#22	Udaipur	0	1	0	0	1	0
#23	Varanasi	1	1	0	0	0	0
#24	Varanasi	0	1	0	0	0	0
#25	Jaipur	1	1	0	2	1	0
#26	Bengaluru	0	1	0	2	1	0
#27	Bengaluru	0	1	0	0	0	0
#28	Bengaluru	0	1	0	0	1	1
#29	Padang	0	1	0	0	1	0
#30	Jakarta	0	1	0	0	1	0
#31	Jakarta	0	0	0	0	1	0
#32	Jakarta	0	1	0	0	1	0
#33	Jakarta	0	1	0	0	1	0
#34	Jakarta	0	1	0	2	1	0
#35	Medan	0	1	0	0	1	0
#36	Shanghai	1	1	0	2	1	1

#37	Guangzhou	0	1	0	2	1	0
#38	Dalian	0	1	0	0	1	0
#39	Busan	1	1	0	0	1	0
#40	Istanbul	1	1	0	0	1	0
#41	Istanbul	1	1	0	2	1	0
#42	Istanbul	0	1	0	0	1	0
#43	Istanbul	0	1	0	2	1	0
#44	Istanbul	0	1	0	2	1	0
#45	Istanbul	1	1	0	2	1	0
#46	Istanbul	1	1	0	2	1	1
#47	Istanbul	1	1	0	0	1	0
#48	Istanbul	1	1	0	0	1	0
#49	Istanbul	0	1	0	2	1	0
#50	Istanbul	0	1	0	0	1	0
#51	Istanbul	1	1	0	2	1	0
total number of "0"		34	4	51	34	6	47
total number of "1"		17	47	0	0	45	4
total number of "2"		0	0	0	17	0	0
total number of "1" + "2"		17	47	0	17	45	4
ratio of "0" (%)		66.6 7	7.84	100.00	66.6 7	11.76	92.16
ratio of "1" (%)		33.3 3	92.16			88.24	7.84
ratio of "2" (%)					33.3 3		
ratio of "1" + "2" (%)		33.3 3	92.16		33.3 3	88.24	7.84

Appendix 13 - Room attributes: other room amenities

hotel ID	city	desk	safety deposit box	washing machine	iron	minibar
0 = "Not available"						
1 = "Available for free"						
2 = "Available for extra fee"		0/1	0/1	0/1	0/1	0/2
#1	Cuernavaca	0	0	0	1	2
#2	Natal	0	0	0	0	0
#3	Fortaleza	0	0	0	1	0
#4	Cusco	0	0	0	0	0
#5	Cusco	1	0	0	0	0
#6	Santiago	0	0	1	1	0
#7	Stuttgart	0	0	0	0	0
#8	Moscow	1	0	1	1	0
#9	Moscow	1	0	1	1	0
#10	Moscow	0	0	0	1	0
#11	Moscow	1	0	0	0	0
#12	Moscow	0	1	1	1	0
#13	Tirana	1	1	1	1	0
#14	Addis Ababa	1	1	0	1	2
#15	Cairo	0	0	0	1	0
#16	Cairo	1	0	1	1	0
#17	Dakar	1	1	1	1	2
#18	Pretoria	0	0	0	0	0
#19	Dar es Salaam	0	0	0	0	0
#20	Bishkek	1	1	0	1	2
#21	Gurgaon	0	0	0	0	0
#22	Udaipur	0	0	0	0	0
#23	Varanasi	1	1	0	1	0
#24	Varanasi	1	1	0	1	0
#25	Jaipur	1	1	0	1	0
#26	Bengaluru	0	0	0	0	0
#27	Bengaluru	1	0	0	0	0
#28	Bengaluru	1	0	0	0	0
#29	Padang	1	0	0	0	0
#30	Jakarta	0	0	0	0	0
#31	Jakarta	1	0	0	0	2
#32	Jakarta	1	0	0	0	0
#33	Jakarta	0	0	0	0	0
#34	Jakarta	0	0	0	0	0
#35	Medan	1	0	0	0	0
#36	Shanghai	1	0	0	0	0
#37	Guangzhou	1	0	0	0	0

#38	Dalian	1	0	1	0	0
#39	Busan	1	0	0	0	0
#40	Istanbul	1	0	0	1	2
#41	Istanbul	1	1	0	0	2
#42	Istanbul	1	1	0	1	2
#43	Istanbul	0	1	0	1	2
#44	Istanbul	1	1	0	1	2
#45	Istanbul	1	1	0	0	2
#46	Istanbul	1	1	0	1	2
#47	Istanbul	1	1	0	0	0
#48	Istanbul	1	1	0	1	2
#49	Istanbul	1	1	1	0	2
#50	Istanbul	1	0	0	1	0
#51	Istanbul	1	1	0	1	2
total number of "0"		18	33	42	27	36
total number of "1"		33	18	9	24	0
total number of "2"		0	0	0	0	15
total number of "1" + "2"		33	18	9	24	15
ratio of "0" (%)		35.29	64.71	82.35	52.94	70.59
ratio of "1" (%)		64.71	35.29	17.65	47.06	
ratio of "2" (%)						29.41
ratio of "1" + "2" (%)		64.71	35.29	17.65	47.06	29.41

Appendix 14 - Guest reviews

hotel ID	city	overall	staff	value for money	cleanliness	comfort	location	facilities
0 = "Not available"								
1 = "Available for free"								
2 = "Available for extra fee"		scale 1-10	scale 1-10	scale 1-10	scale 1-10	scale 1-10	scale 1-10	scale 1-10
#1	Cuernavaca	9.2	9.5	9.2	9.4	9.1	9.1	9
#2	Natal	8.8	9	9.1	8.9	8.5	9.4	8.6
#3	Fortaleza	9.1	9.6	9.6	9.3	8.9	8.2	9
#4	Cusco	9.8	10	10	9.4	10	10	9.4
#5	Cusco	9.3	9.7	9.4	9.5	9.1	8.8	9.2
#6	Santiago	10	10	10	10	10	10	10
#7	Stuttgart	10	9.4	10	10	9.4	9.4	10
#8	Moscow	10	10	10	10	10	10	10
#9	Moscow	9.1	9.3	9.3	9.3	8.9	9.5	9
#10	Moscow	10	10	10	10	10	10	10
#11	Moscow	10	10	10	10	10	10	10
#12	Moscow	9.6	9.8	9.3	9	9.3	8.5	9
#13	Tirana	9.8	9.6	9.6	9.2	9.6	8.8	10
#14	Addis Ababa	8.9	9.6	8.9	9.3	8.8	7.2	8.4
#15	Cairo	9.3	9.7	9.2	9.6	9.3	9.6	9
#16	Cairo	8.9	9.8	9	8.5	8.4	9.2	8.2
#17	Dakar	8.5	8.8	8.6	8.9	8.7	7.6	8.4
#18	Pretoria	9.4	9.7	9.6	9.7	9.3	9.6	9.2
#19	Dar es Salaam	10	10	10	10	10	10	10
#20	Bishkek	9.5	9.8	9.7	9.8	9.7	8.2	9.7
#21	Gurgaon	9.3	10	8.8	10	9.2	8.8	8.1
#22	Udaipur	9.3	10	9.8	8.7	8.8	9.8	8.6
#23	Varanasi	9.5	10	9.5	10	9.5	8.5	9.5
#24	Varanasi	8.8	9.2	9.2	8.3	8.3	8.3	7.5
#25	Jaipur	9	9.1	9.1	9.3	9.1	8.8	8.7
#26	Bengaluru	9.3	10	10	9.2	10	10	10
#27	Bengaluru	9	9.4	8.8	8.1	8.8	9.4	8.8
#28	Bengaluru	9	9.4	10	9.4	9.4	10	8.1
#29	Padang	8.7	8.9	8.3	8.8	7.9	8.8	7.9
#30	Jakarta	9.2	8.8	9.2	9.6	9.2	10	9.2
#31	Jakarta	10	10	10	10	10	10	10
#32	Jakarta	8.9	8.9	8.6	8.6	8.9	8.6	8.9
#33	Jakarta	8.8	10	10	8.3	9.4	8.8	8.3
#34	Jakarta	9.3	8.3	10	10	9.2	8.3	9.2
#35	Medan	9.7	9.7	9.7	9.7	9.7	9.7	9.7

#36	Shanghai	9.1	9.7	9.4	9.3	9.3	7.7	9.3
#37	Guangzhou	8.7	8.6	8.9	8.6	8.6	9.1	8.8
#38	Dalian	9.3	9.7	9.3	9.1	9.3	8.8	9.3
#39	Busan	9.2	9.6	9.3	9.6	9.3	8.7	9
#40	Istanbul	10	10	10	9.7	10	10	10
#41	Istanbul	9.9	10	10	9.8	9.7	9.3	9.8
#42	Istanbul	9.6	9.4	9.6	9.7	9.6	9.5	9.6
#43	Istanbul	9.8	10	10	10	9.7	10	10
#44	Istanbul	10	10	10	10	9.5	10	9.5
#45	Istanbul	9.3	9.9	9.4	9.1	9	9.6	8.9
#46	Istanbul	9.1	9.2	9.4	9.6	9.4	8.6	9.2
#47	Istanbul	9.2	10	9.7	9.9	9.3	8.7	9.5
#48	Istanbul	9.3	9.7	9.4	9.5	9.4	8.9	9.4
#49	Istanbul	9.5	10	10	10	10	10	9.4
#50	Istanbul	9.1	9.1	9.1	9.4	9.1	9.7	9.4
#51	Istanbul	9.4	9.7	9.4	9.5	9.1	9.8	9
average		9.36	9.60	9.50	9.42	9.31	9.20	9.19
lowest score		8.5	8.3	8.3	8.1	7.9	7.2	7.5
total number of perfect score 10		9	18	17	13	10	14	11