MODUL VIENNA UNIVERSITY

WORKING PAPER SERIES

Modul University Working Paper No. 8

Efficient Satisfaction Building: A Comparative Study of Ski Resorts

Bozana Zekan
Josef A. Mazanec

August 2020

Co-editors of the Modul University Working Paper Series are Dimitris Christopoulos (dimitris.christopoulos@modul.ac.at) and Ulrich Gunter (ulrich.gunter@modul.ac.at).

Efficient Satisfaction Building: A Comparative Study of Ski Resorts

Dr. Bozana Zekan (corresponding author)
Department of Tourism and Service Management
MODUL University Vienna
Am Kahlenberg 1, 1190 Vienna, Austria
bozana.zekan@modul.ac.at

Prof. Dr. Josef A. Mazanec
Department of Tourism and Service Management
MODUL University Vienna
Am Kahlenberg 1, 1190 Vienna, Austria
josef.mazanec@modul.ac.at

Acknowledgements:
For providing the database:
Michael Partel
Mountain-Management C.E.
Industriering 21, FL 9491 Ruggell
mpartel@mountain-management.com

Efficient Satisfaction Building: A Comparative Study of Ski Resorts

Abstract

Destination managers aim at increasing and maintaining visitor satisfaction. In this study the authors examine the levels of efficiency which ski resorts attain in pursuing this objective for a sample of 54 Austrian, French, German, Italian, and Swiss ski resorts based on a survey totaling 12.234 cases. Configurations of resort attributes lead to some level of overall satisfaction. An individual satisfaction item contributes to overall satisfaction depending on the simultaneous value of other items. Qualitative Comparative Analysis (QCA) is tailor-made for demonstrating the holistic effect of such item configurations. Data Envelopment Analysis (DEA) extracts the differences with regard to efficient satisfaction building and paves the way for resort benchmarking by proposing best-fitting benchmarking partners. As results indicate, destinations need not deliver top service quality in all satisfaction dimensions to achieve above average overall satisfaction.

Keywords: Satisfaction Monitoring; Ski Resorts; Qualitative Comparative Analysis (QCA); Data Envelopment Analysis (DEA).

1. Introduction

Monitoring visitors' trip satisfaction provides information useful for planning market-oriented strategies and actions. Taking comparable satisfaction measurements over time enhances the information value in research for the same and competing destinations. The purpose of this study is to investigate efficiency differences in satisfaction building between destinations. This is equivalent to the research question how different configurations of more or less satisfying destination attributes correspond with high or low overall satisfaction. The database originates from 2016 and consists of 12.324 cases sampled in 54 Austrian, French, German, Italian, and Swiss ski resorts (Partel and Matzler, 2016). The respondents represent two contrasting subgroups with very high or very low overall satisfaction selected from a much larger sample. This extreme group analysis excludes respondents with medium overall satisfaction. The focus is on the inter-destination comparison of markedly distinct satisfaction patterns highlighting the opportunity for benchmarking.

The study pursues a mixed-methods approach by applying qualitative analytics (QCA-Qualitative Comparative Analysis) and a quantitative technique (DEA - Data Envelopment Analysis) in parallel. Both methods are non-parametric and appropriate for small samples. The tandem application for assessing resort efficiency requires aggregation of the individual satisfaction measures on resort level. Aggregating the skiers' response to resort level incurs loss of information regarding satisfaction segments within destinations. Consequently, the satisfaction profiles of the resorts represent a majority vote. It may not reflect each skier's individual view on disaggregate level, but nevertheless, captures the variety of satisfaction patterns among destinations.

The study-guiding hypotheses assume that (i) the destinations exhibit different patterns of more or less satisfying attributes leading to a high or low level of overall satisfaction, and (ii) that they differ in terms of efficiency in molding individually satisfying experiences into an above-average satisfaction outcome. Articles pursuing similar research questions for winter resorts are rare. Goncalves (2013) investigated efficiency and productivity of ski resorts. She used input variables such as number of slopes or duration of the skiing season and output variables like ski-lift turnover or skier days. By contrast to these objective measures, this study relies on the subjective measures of skiers' satisfaction ratings. In their study on the positioning of winter tourism destinations, Evren and Kozak (2018) analyzed qualitative and quantitative data originating from a small number of in-depth interviews with destination stakeholders and a large-scale visitor survey.

The current study encourages researchers to further experiment with efficiency aspects of multidimensional conceptualizations of satisfaction. Destination managers learn about detecting effective combinations of satisfactory resort attributes and about the competitive standing of resorts based on the resulting overall satisfaction.

2. Literature Review

2.1 Destination Satisfaction

While tourism academics were still pondering on whether the alleged uniqueness of tourism requires special satisfaction theory and measurement (Bowen and Clarke, 2002), satisfaction tracking on destination level has long been a standard ingredient of guest surveys and a prominent service in the portfolio of DMO marketing activities (Mazanec, 1996; Mazanec and

Zins, 1996). On national level leading tourism receiving countries like Switzerland and Austria began regular guest surveys in the 1980s but very few national tourist offices (NTOs) release their results publicly. A notable exception is VisitBritain with its reports on 40 British destinations ranging from 2015-2018 (https://www.visitbritain.org/destination-satisfaction-and-perceptions).

Tourist behavior model builders typically specify satisfaction as a multidimensional construct and a determinant of repeat visitation or word-of-mouth (Campo-Martínez and Garau-Vadell, 2010; Arash and Baradarani, 2014). In further elaborating this causal relationship one must consider the role of novelty seeking and strongly loyal tourists who tend to be less sensitive to transaction-specific dissatisfying service encounters, which they do not regard as long-term failure (Mazanec, 1999). For the purpose of this study the assumed cause-effect relationship represents the link between patterns of satisfaction items and overall satisfaction. This relationship will be examined on the aggregate level of resorts. Therefore, the analysis does not consider potential nonlinear relationships by trying to distinguish between performance, dissatisfier/hygiene, and delight satisfaction items on the disaggregate level of individual tourists (Mazanec, 2007).

2.2 Destination Benchmarking

In contrast to the organization benchmarking (e.g., hospitality-related studies), academic literature on destination benchmarking is still far from abundant. There are multiple reasons for this: (1) complexity of destination benchmarking "… due to its multidimensional, heterogeneous, and inter-related (multirelated) features" that one must take into account with destinations (Kozak and Rimmington, 1999a, p. 33); (2) decision on appropriateness of benchmarking partners (Wöber, 2001); (3) data availability and ultimately, their comparability; and (4) resources (e.g., time) needed for such a comprehensive data collection effort. Arguably, the very same can be said about the industry benchmarking initiatives. When discussing the intercity comparison, Heeley (2011) did single out the benchmarking efforts of European Cities Marketing (ECM); however, he also went as far as to claim that "… presently benchmarking is very much 'work in progress' and a challenge for all involved in city marketing" (p. 36). Now in 2019, this still holds true. The forthcoming 15th edition of the ECM Benchmarking Report is certainly one of the most prominent destination benchmarking endeavors to date, which will include about 120 cities (ECM, n.d.). Yet, they are still benchmarked only on two indicators (bednights and capacities), with a rather limited regard for heterogeneity of cities and various data definitions. On the other hand, the latest, 7th edition of the Travel & Tourism Competitiveness Report that was published in 2017 by the World Economic Forum (WEF) ranks 136 countries by employing not less than ninety indicators (WEF, 2017). One may raise an additional concern in this particular case with regard to calculation of scores based on the unweighted averages. This merely means that all indicators are treated as equally important for all countries and as such do not really reflect reality.

Going back to the academic literature, Wöber (2002) and Kozak (2004) were most likely the first ones to provide a status quo of the field in the early 2000s, in which they reviewed studies such as: an analysis of the performance of Scotland in comparison with six other countries with respect to a number of quantitative measures in order to identify strengths and weaknesses (Seaton, as cited in Kozak, 2004); a regional benchmarking study assessing tourism volumes across 65 European cities conducted by Wöber (1997); a case study on the Tyrolean Tourism Barometer with the main purpose of identifying the development opportunities for the same (Fuchs and Weiermair, 2001), or a study on destination benchmarking of Turkey by Kozak and Rimmington (1999b).

Topic-wise, other destination benchmarking studies have dealt with issues such as: assessing the managerial performance of museums in an intercity comparison (Remich, 2002); identifying the performance gap between Turkey and Mallorca (Kozak, 2002); evaluating efficiencies of state tourism advertising programs in the US (Wöber and Fesenmaier, 2004); applying the data envelopment analysis approach to strategy development in Tyrolean tourism destinations (Fuchs, 2004); applying benchmarking to the study of cities (Luque-Martínez and Muñoz-Leiva, 2005); assessing the performance of Italian regions in terms of environmental management and their overall competitiveness by analyzing their efficiency (Bosetti et al., 2006; Cracolici et al., 2007; Cracolici et al., 2008); evaluating the performance of French regions (Botti et al., 2009; Barros et al., 2011); benchmarking cross-country sustainable tourism (Cernat and Gourdon, 2012); measuring the performance, along with identifying and ranking the determinants of tourism performance on a global scale (Assaf and Josiassen, 2012); determining the performance of Spanish regions (Benito et al., 2014); and lastly, evaluating the efficiency of European urban tourism destinations by assessing sustainability measures available in TourMIS (Tourism Marketing Information System, see www.tourmis.info) by Önder et al. (2017).

3. Comparative Methodology

The present study applies two entirely different advanced methods, one qualitative, one quantitative, to examine hypotheses on destination satisfaction configurations. Nonparametric analytic tools are useful in particular given the modest sample size of 54 resorts and the severe (i.e., fatal) shortcomings of using symmetric tools (Hubbard, 2015; Ziliak and McCloskey 2008). Combinations of resort attributes lead to some level of overall satisfaction. A satisfaction item is likely to contribute positively or negatively to overall satisfaction depending on the value of other items. Hence, the analysis must be capable of processing configurations. Qualitative Comparative Analysis (QCA) is tailor-made for studying this kind of complexity. For exploring the differences with regard to efficiency, the method of choice is Data Envelopment Analysis (DEA). DEA extracts the efficiency information and paves the way for resort benchmarking by proposing best-fitting individual benchmarking partners.

3.1 Qualitative Comparative Analysis

QCA, as conceived and propagated by Ragin (1987), allows for causal complexity within a sample of heterogeneous cases. This means that within the variety of ski resorts different mixtures of satisfaction items may lead to the same level of overall satisfaction and very similar satisfaction configurations may provoke dissimilar values of overall satisfaction. QCA pursues the causal conditions and their necessity and sufficiency for achieving some specific result. Woodside (2013) strongly advocates QCA in business and marketing research. Typical applications in tourism-related fields of study are Prentice and Woodside’s (2013) and Woodside et al.’s (2015) analyses of casino gambling or Ferguson et al.’s (2017) investigation of nation-specific tipping behavior. Papatheodorou and Pappas (2017) demonstrated the advantages of QCA over linear methods for analyzing Greek tourists’ decision-making under economic stress. Woodside and Ahn (2008) investigated complex cultural causes in their behavioral study of overseas visitors to Australia. Pappas (2017) also added a predictive step to his complex causality findings about holidaymakers’ risk perceptions.

QCA combines within-case analysis and comparison of cases in the search for patterns of association that may be indicative of causal relations (Legewie, 2013). The cases may be members of crisp as well as of fuzzy sets which appears particularly useful if variables are not measured numerically but verbally. This opens an avenue for analyzing qualitative data in rigorous cross-case comparisons. The preprocessing steps of the current study of satisfaction-determining resort attributes aggregate the data resort-wise within a large sample of respondents. Based on these destination-specific mean values the resorts become members of crisp sets of cases characterized by overall satisfaction below or above average.

3.2 Data Envelopment Analysis

Nowadays, there are more than 10.000 research articles published in the DEA Bibliography (Emrouznejad, 1995-2012), which undoubtedly demonstrates the popularity of this method. DEA is "… a mathematical programming method of estimating the best practice frontiers and evaluating the relative efficiency of different entities", commonly referred to as Decision Making Units (DMUs) (Bogetoft and Otto, 2011, p. 81). The similarity (i.e., homogeneity) of DMUs under evaluation is assumed (Dyson et al., 2001). Popular DMUs are destinations (Cracolici et al., 2008), Airbnb listings (Zekan et al., 2018), hotels (Barros, 2005), tourism offices (Wöber and Fesenmaier, 2004), tourism websites (Bauernfeind and Mitsche, 2008), airports (Gitto and Mancuso, 2011), and travel agencies (Köksal and Aksu, 2007), to name a few examples of application within the domain of tourism and hospitality.

Wöber and Fesenmaier (2004) interpreted the efficiency measure as the ratio of the weighted sum of outputs to the weighted sum of inputs. Thus, DEA is fully capable of processing multiple variables regardless of the units of measurement (Cook et al., 2014; Herrero and Salmeron, as cited in Bauernfeind and Mitsche, 2008). Another significant strength of this method is that no *a priori* information is needed with respect to importance of the individual variables (Wöber, 2002; Wöber and Fesenmaier, 2004). Hence, its empirical orientation and benchmarking analysis make DEA a superior method for efficiency evaluation in various fields of management science (Cooper et al., 2004; Baek and Lee, 2009; Reynolds and Taylor, 2011; Emrouznejad and Yang, 2018). Given that the focus of the current study is on inter-destination comparison, DEA is evidently an optimal method for such benchmarking exercise.

4. Results and Discussion

4.1 Database and Preprocessing

Best Ski Resorts (http://best-skiresorts.com/en/best-ski-resort-awards-2016/), a joint initiative of Mountain Management Consulting and the University of Innsbruck, is monitoring skier satisfaction in Alpine ski resorts via interviewing skiers on the slopes. The survey during the winter season 2016 collected more than 48.000 self-administered questionnaires in more than 50 Austrian, French, German, Italian, and Swiss resorts. Partel and Matzler (2016) report on the details of this project. Despite the sizeable and multi-national sample the authors do not claim that the database represents all types of European ski resorts, leaving aside the destinations overseas. In the following, the 2016 database covering 54 resorts, addressed with numbers 1 to 54, serves for running QCA and DEA. Both methods need preparatory steps as visualized in Figure 1. Reducing the usual skewness via collapsing the lowest rating values and factorizing the individual response data into satisfaction dimensions eliminates the redundancy within the original set of satisfaction items measured on ten-point rating scales and secures a manageable number of configurations. The scale changes are admissible in the light of recent tourism research findings which have shattered the belief in the superiority of rating scales over simpler formats (Dolnicar and Grün, 2007, 2013; Dolnicar, Grün, and Leisch, 2011).

FIGURE 1

The EFA routine with (oblique) GEOMIN rotation of Mplus provides the data reduction (Muthén and Muthén, 2017). The large size of the master sample (48.559) allows for building contrasting groups on disaggregate level by selecting the cases with the lowest (1 to 6) and the highest (top rank) overall satisfaction ratings. This extreme group approach (EGA) neutralizes the typical skewness of multi-point rating scales and the ambiguity of the intermediate scores. The weaknesses of EGA if applied in conjunction with parametric statistical testing (Preacher, Rucker, MacCallum, and Nicewander, 2005) do not affect the nonparametric, exploratory and set-theoretic procedures of QCA. The two contrasting groups comprise 4.162 low rank and 8.162 top cases. Aggregating the factor scores to resort level leads to 54 cases featuring four interval-scaled satisfaction dimensions and zero-one coded markedly strong or weak overall satisfaction. For ease of addressing and considering the most distinct loadings, the satisfaction dimensions are labelled as:

- Ski-Core, encompassing size of the area, quality of runs, snow conditions, lifts, and security,
- Ski-Peripheral: nature, peace and quiet, ambience, exclusivity, coziness, authenticity,
- Fun: entertainment, après-ski, food and beverage, and
- Value-for-Money: VfM of lifts, accommodation, and restaurants.

The remaining and still large sample of 12.324 cases guarantees sufficient size for all resort subsamples. The typical resort sample size ranges between 390 for resort 37 and 136 for resort 25; resorts 26 (796), 21 (50), 31 (24), and 41 (57) contribute the biggest and smallest samples. The Appendix shows and discusses the frequencies of the individually dichotomized satisfaction patterns, their association with high overall satisfaction, and the resort-specific frequency distributions. However, the tandem application of QCA and DEA requires aggregating and dichotomizing on destination level. Thereby, the ski resorts become the units of analysis. The satisfaction dimensions function as their properties which constitute the conditions for QCA and the input variables for DEA.

4.2 Configuration Results

A clustering approach makes a preliminary step toward analyzing configurations. After considering old but ingenious methods allowing for non-disjunctive classes (Peay, 1975) or new fuzzy classification (D'Urso and Massari, 2013; D'Urso et al., 2016) the authors adopted a crisp clustering approach. Previous applications in tourism studies (Dolnicar and Leisch, 2004; D'Urso et al., 2013, 2015) recommend bagged clustering. By combining k-means clustering with subsequent hierarchical clustering of k-means centers as implemented by Leisch (1999), this procedure advocates six classes for the 54 ski resorts. Figure 2 shows the gain in homogeneity for ten replications of ten centers. Table 1 exhibits the share of respondents with high overall satisfaction in each resort together with the cluster average. There is a clear tendency of higher and lower satisfaction resorts to form classes of similar patterns of satisfaction dimensions. However, similarity is measured by distance in satisfaction space. A small difference in one satisfaction variable may partly counterbalance a big difference in another variable. Adjacent resorts may still differ in some dimension and overall satisfaction also varies to some extent within seemingly homogeneous resort classes. For example, resort values in a high satisfaction cluster such as 2 still vary between 0.71 and 0.90; values in the medium satisfaction cluster 3 range between 0.59 and 0.79.

FIGURE 2

TABLE 1

In the next step Qualitative Comparative Analysis provides a closer look into the satisfaction patterns of individual resorts. There is more to learn in terms of necessary and sufficient configural conditions of high overall satisfaction.

The following analyses employ the QCA package contributed to the R open source system (Thiem and Dusa, 2013a, b; Dusa, 2019). For treatment with QCA the configurations of satisfaction dimensions are calibrated into crisp sets where values below average get transformed into zero and those above average into one. Out of the 2^4=16 possible combinations the truth table of satisfaction patterns contains 13 actually observed configural conditions. Six of them (Nr. 10, 11, 12, 15, 8, and 16) perfectly correspond with above average overall satisfaction (OUT = 1) and 26 resorts fulfill these conditions (Table 2). The high level of the Ski-Core and Value-for-Money dimensions are present in five of these configurations. Sufficiency of inclusion and Proportional Reduction in Inconsistency attain their maximum of 1.0. This means that assuming these configurations to be sufficient for generating a high-level satisfaction outcome is fully consistent with the empirical observations. Further four of the five resorts with configuration Nr. 14 attain high-level overall satisfaction.

TABLE 2

Necessary subsets of conditions with necessity coverage > 0.80 are (Ski-Core OR Ski-Peripheral; 0.88), (Ski-Core OR Value-for-Money; 0.81), (Ski-Core OR Fun; 0.83), and (VfM OR Fun; 0.86). Coverage describes the empirical relevance by measuring the overlap between these unions of conditions and the high-satisfaction set. Not too surprising after examining the truth table, the only sets of conditions with high sufficiency coverage are the intersections (Ski-Core AND VfM; 0.77) and (Ski-Peripheral AND VfM; 0.77).

TABLE 3

Looking for generalizations from the resort data the Boolean minimization of the truth table in Table 2 identifies three patterns with sufficiency coverage 0.77, 0.07, 0.73. Table 3 also lists the resort numbers of the associated cases. As already visible in the observed truth table, either Ski-Core or Value-for-Money satisfaction must be high. The second condition demanding absence of Ski-Peripheral has negligible sufficiency coverage (0.07). The superset combining all three conditions attains sufficiency coverage of 0.87. There is a lesson to learn from these findings: if high performance along all satisfaction dimensions is not required for playing in the overall high satisfaction league of resorts, then there may be more or less efficient strategies of entrance into the top ranks. The following DEA examines this issue more thoroughly by operating on the original (not dichotomized) dimension scores. It regards the resorts' efforts to achieve better performance along the satisfaction dimensions (i.e., mean values of aforementioned Ski-Core, Ski-Peripheral, Fun, and Value-for-Money) as input variables and the resulting overall satisfaction rating as output. Using factorized dimensions enables inclusion of multiple items and as such ensures that the DEA model takes many aspects of satisfaction into account. Given the aim of this study, the output-oriented BCC (Banker, Charnes, Cooper) radial model that maximizes the output variable (Scheel, 2000) is proposed (Figure 3). Furthermore, as the sample includes 54 ski resorts (= DMUs), there is no doubt about meeting the arguable 'rule of thumb' (number of DMUs = twice/three times the sum of modeled variables) and thus preserving the discriminatory power (Cook et al., 2014). Lastly, DEA efficiency scores were computed using Scheel's Efficiency Measurement System (EMS) software version 1.3.

FIGURE 3

4.3 Efficiency and Benchmarking Results

The configuration analysis demonstrated that there are 'recipes' of how a resort may achieve a high level of overall satisfaction without struggling for top performance in all satisfaction dimensions. Satisfaction tracking, therefore, also becomes a matter of monitoring a resort's efficiency in channeling scarce resources and its relative position in a group of comparable benchmarking partners.

Yet, prior to presenting the results of DEA computations, a brief look is made into descriptive statistics of the satisfaction data that serve as input and output variables (Table 4). Observed heterogeneity is a rather common occurrence in destination benchmarking studies, as is the current study. On inspection of the mean values, one can conclude that there is certainly room for improvement as all values are rather on a low end, especially when it comes to the overall satisfaction rating.

TABLE 4

DEA efficiency scores for 54 ski resorts (i.e., DMU1-DMU54; Table 5) range from 84.13% (DMU35) to 117.24% (DMU31). Furthermore, for every inefficient unit (i.e., those with scores above 100% in the output-oriented modeling) best-fitting benchmarking partners with the allocated weights are proposed. With regard to efficient units (i.e., those with scores below 100%), the number of their benchmark appearances is noted instead. Thus, out of 54 analyzed resorts, 33 (61.1%) are inefficient, whereas 21 (38.9%) are efficient in the proposed modeling.

TABLE 5

Looking into the inefficient resorts first, DMU39 is the closest to the cut-off point, with a marginal inefficiency of 0.13%. The implication of this score is as follows: its overall satisfaction rating can be improved by 0.13% with the same level of inputs. In spite of this marginal room for improvement, three benchmarking partners are still proposed to DMU39: DMU4, DMU14, and DMU40, where the last out of three is the most relevant with the weight of 0.49. On the other end, DMU31 is the most inefficient resort in the sample with a score of 117.24%, which implies a potential of 17.24% for improvement of its overall satisfaction rating. DMU35, DMU36, and DMU44 are three suggested benchmarks for DMU31, with DMU35 being the most important one with the weight of 0.45. DMU30 and DMU25 follow DMU31 on top of the weakest performers, being 13.81% and 10.20% inefficient. Altogether, 31 resorts have potential to improve their overall satisfaction rating by about 10%.

One approach used in the DEA modeling for overcoming incomparability and addressing heterogeneity of units is to merge the unit's proposed benchmarking partners into a virtual benchmark (also referred to as hypothetical composite, virtual unit or virtual reference), based on their assigned weights. For example, Wöber and Fesenmaier (2004), Bauernfeind and Mitsche (2008), and Önder et al. (2017) used and advocated this approach. Thus, the assumption is justified that such virtual benchmark is a feasible solution (Wöber and Fesenmaier, 2004). The most interesting candidate for this benchmarking evaluation is certainly the most inefficient resort in the sample, DMU31. The virtual benchmark for this resort is formed by a linear combination of its benchmarking partners (DMU35, DMU36, and DMU44) and their assigned weights (0.45, 0.12, and 0.43). Table 6 exhibits this result. It is evident that two out of four of DMU31's inputs are higher than those of its virtual benchmark, whereas the opposite holds true for the output factor with DMU31 reaching 84.44% of its benchmark's value. This deficiency clearly points toward a clearly defined target and an improvement potential of 18.42% with regard to the overall satisfaction rating.

TABLE 6

Moving onto efficient resorts, the two that stand out among 21 are DMU41 and DMU21 with their 'big' scores, are so-called infeasible solutions, which are likely due to their extremely high efficiency (Boljuncic, as cited in Wöber and Fesenmaier, 2004). Remaining are 19 resorts with a numerical score ranging from 84.13% (DMU35) to 99.99% (DMU17). This also suggests that in spite of both being efficient with utilization of inputs, DMU35 is outperforming DMU17 by 15.86%. Furthermore, two observations concerning the benchmark appearances of efficient resorts are in order: (1) DMU4 and DMU16 are prominent with 17 and 16 appearances, and as such, are the most popular (yet not universal) benchmarking partners; and (2) five resorts (DMU17, DMU7, DMU15, DMU13, and DMU21) are not identified as benchmarks for any of the inefficient DMUs, despite of their high scores. The latter finding is also in line with studies by Önder et al. (2017) and Zekan et al. (2018), who suggest that an efficient unit is not automatically a benchmark, nor is likely universal best practice for all inefficient units.

5. Conclusions, Restrictions and Recommendations

From the destination management point of view the effect of satisfaction configurations represents a major lesson of the qualitative comparison results. They demonstrate the conditions necessary for achieving high overall trip satisfaction. Among the 26 resorts reaching this level, 20 fulfill the trivial condition of rendering top quality in all four satisfaction domains, namely Ski-Core elements, Ski-Peripheral aspects, Value-for-Money, and Fun. However, six resorts manage to join the high level group by offering trade-offs and being top-rated in three or even two satisfaction domains. In that respect the Ski-Peripheral and Fun factors are less crucial than the Ski-Core and Value-for-Money elements. If only the Value-for-Money misses the top level rating, there is still an 80 percent chance of ending up in the high overall satisfaction league. A closer inspection of the success conditions reveals that either high satisfaction with Ski-Core or Value-for-Money is an indispensable prerequisite for entering this premier league. Put in more general terms, destination managers are not absolutely forced to struggle for maximum quality in each and every service domain. Monitoring the detailed conditions gives them hints about where to relax the requirements and put up with less than superior service delivery.

The route toward efficient satisfaction building gets further highlighted by analyzing the input-output relationships. There are 20 resorts which fulfill both the Ski-Core-AND-Value-for-Money and the Ski-Peripheral-AND-Value-for-Money-AND-Fun condition (Table 3). But only five of them emerge among the 21 DEA-efficient destinations (Table 5). These resorts manage to reach both objectives, a top satisfaction rating and an optimal input-output ratio. The majority of the high-rated destinations have room for efficiency improvement. More specifically, DEA findings reveal inter-destination differences in utilization of resources and give insights to destination managers about the competitive standing of their resorts within a group of comparable partners (i.e., competing destinations). Moreover, this benchmarking endeavor highlights areas for improvement for all inefficient resorts and proposes optimal benchmarking partners. As such, it paves the way for individual resorts to efficiently channel resources into improving the overall satisfaction of visitors at their destinations, which is arguably the most valuable practical implication of this study.

The study on resort level reflects the situation dependent on the guest-mix of the visitors experiencing particularly high or low overall satisfaction. From a selective marketing point of view it is a weakness that the aggregate satisfaction ratings ignore the market segment structure within the resorts. Destination managers who are practicing a segmentation strategy and want to address specific target groups will have to run the QCA and DEA analyses for homogeneous visitor subgroups. Future research may depart from a classification of skiers on disaggregate level. It may either apply a-posteriori segmentation based on patterns of satisfaction ratings or a-priori segments formed with predefined profiling criteria (e.g., first vs. repeat visitors). Efficiency of satisfaction building then relates to market segments rather than destinations. As to methodology one may regard it a weakness that the scale transformations and extreme groups approach incur sacrifice of information. Future research might explore the consequences by employing fuzzy QCA acknowledging the fact that the analyst’s decision on the fuzzy scale thresholds are not less arbitrary than the collapsing of points on the long low-frequency tail of rating scales.

In addition, a word of caution is in order: one database (the 2016 database) covering 54 resorts was used for both QCA and DEA runs. Recommendation for the future research would be to place this study into a longitudinal context and therefore, repeat the same types of analyses on the same sample. This would help in monitoring the competitive standing of the individual resorts over time, but also in investigating the importance of the individually proposed benchmarks for the inefficient resorts. For instance, if DMU31 remains inefficient over time and DMU35 happens to be repeatedly proposed as its best-fitting partner, this will clearly point toward importance of this particular benchmark for DMU31’s DMO in the efforts of attaining high levels of overall satisfaction. This simple example demonstrates how the information value of satisfaction monitoring can be significantly enhanced. Ultimately, this study can serve as a starting point of discussion and a guide for both destination managers and satisfaction researchers regarding the application of case-oriented analytical tools in examining the properties of destination satisfaction patterns.

Appendix

Dichotomizing the factor scores for the satisfaction dimensions Fun, Ski-Core, Ski-Peripheral, and Value-for-Money on disaggregate level produces the satisfaction patterns in Table A1 below. These results are not directly comparable with DEA findings. However, they complement the interpretation of the QCA conditions which require dichotomization of the satisfaction factor scores on the aggregate level for being commensurable with DEA.

Above average satisfaction with all four dimensions characterizes the skiers' response most frequently (37.8%), followed by the entire below-average pattern (28.9%). All intermediate patterns with one up to three highly satisfying dimensions attain much lower frequencies. Broken up by resorts the pattern frequencies vary considerably, in their extreme as well as intermediate combinations. Consequently, 13 out of the 16 possible patterns also emerge after dichotomization on resort level. The full pattern (1,1,1,1) plays a dominant role in the truth table and the minimization results of QCA (Tables 2 and 3 of Section 4.2). Actually, only two of the 20 resorts with pattern (1,1,1,1) in Table 2 fail to significantly exceed a 37.8% share of pattern Nr. 1 in Table A1 (resorts Nr. 32 and 49). On the other hand, as demonstrated in the QCA conditions, a resort needs not aim at perfectly satisfying performance for surviving in the top satisfaction league. Resorts Nr. 18, 22, and 26 are examples with seemingly unimpressive satisfaction patterns in Table A1.

TABLE A1

References

Arash, S. and Baradarani, S. (2014), “European tourist perspective on destination satisfaction in Jordan’s industries”, *Procedia - Social and Behavioral Sciences,* Vol. 109, pp. 1416 – 1425.

Assaf, A.G. and Josiassen, A. (2012), “Identifying and ranking the determinants of tourism performance: a global investigation”, *Journal of Travel Research*, Vol. 51 No. 4, pp. 388-399.

Baek, C. and Lee, J. (2009), “The relevance of DEA benchmarking information and the least-distance measure”, *Mathematical and Computer Modelling*, Vol. 49 No. 1-2, pp. 265-275.

Barros, C.P. (2005), “Measuring efficiency in the hotel sector”, *Annals of Tourism Research,* Vol. 32 No. 2, pp. 456-477.

Barros, C.P., Botti, L., Peypoch, N., Robinot, E., Solonandrasana, B. and Assaf, A.G. (2011), “Performance of French destinations: tourism attraction perspectives”, *Tourism Management*, Vol. 32 No. 1, pp. 141-146.

Bauernfeind, U. and Mitsche, N. (2008), “The application of the data envelopment analysis for tourism website evaluation”, *Information Technology & Tourism*, Vol. 10 No. 3, pp. 245-257.

Benito, B., Solana, J. and López, P. (2014), “Determinants of Spanish regions’ tourism performance: a two-stage, double-bootstrap data envelopment analysis”, *Tourism Economics,* Vol. 20 No. 5, pp. 987-1012.

Bogetoft, P. and Otto, L. (2011), *Benchmarking with DEA, SFA, and R*, Springer, New York, NY.

Bosetti, V., Cassinelli, M. and Lanza, A. (2006), “Benchmarking in tourism destination, keeping in mind the sustainable paradigm”, working paper, Fondazione Eni Enrico Mattei, available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=879706 (accessed 20 July 2010).

Botti, L., Peypoch, N., Robinot, E. and Solonandrasana, B. (2009), “Tourism destination competitiveness: the French regions case”, *European Journal of Tourism Research,* Vol. 2 No. 1, pp. 5-24.

Bowen, D. and Clarke, J. (2002), “Reflections on tourist satisfaction research: past, present and future”, *Journal of Vacation Marketing*, Vol. 8 No. 4, pp. 297-308.

Campo-Martínez, S. and Garau-Vadell, J. B. (2010), “The generation of tourism destination satisfaction”, *Tourism Economics,* Vol. 16 No. 3, pp. 461-475.

Cernat, L. and Gourdon, J. (2012), “Path to success: benchmarking cross-country sustainable tourism”, *Tourism Management,* Vol. 33 No. 5, pp. 1044-1056.

Cook, W.D., Tone, K. and Zhu, J. (2014), “Data envelopment analysis: prior to choosing a model”, *Omega, The International Journal of Management Science,* Vol. 44, 1-4.

Cooper, W.W., Seiford, L.M. and Zhu, J. (2004), “Data envelopment analysis: history, models and interpretations”, in Cooper, W. W., Seiford, L. M. and Zhu, J. (Eds.), *Handbook on Data Envelopment Analysis,* Kluwer Academic Publishers, Norwell, MA, pp. 1-39.

Cracolici, M.F., Nijkamp, P. and Cuffaro, M. (2007), “Efficiency and productivity of Italian tourist destinations: a quantitative estimation based on data envelopment analysis and the Malmquist method”, in Matias, Á., Nijkamp P. and Neto P. (Eds.), *Advances in Modern Tourism Research: Economic Perspectives*, Physica-Verlag, Heidelberg, Germany, pp. 325-343.

Cracolici, M.F., Nijkamp, P. and Rietveld, P. (2008), “Assessment of tourism competitiveness by analysing destination efficiency”, *Tourism Economics,* Vol. 14 No. 2, pp. 325-342.

Dolnicar, S. and F. Leisch (2004). “Segmenting Markets by Bagged Clustering”, *Austalasian Marketing Journal,* Vol. 12 No. 1, pp. 51-65.

Dolnicar S., Grün B. (2007). “How constrained a response: A comparison of binary, ordinal and metric answer formats”, *Journal of Retailing and Consumer Services*, Vol. 14 No. 2, 108–122.

Dolnicar, S. and Grün, B. (2013). “ ‘Translating’ between survey answer formats”, *Journal of Business Research*, Vol 66 No. 9, 1298-1306.

Dolnicar, S., Grün, B., and Leisch, F. (2011). “Quick, simple and reliable: forced binary survey questions”, *International Journal of Market Research*, Vol. 53. 233. doi: 10.2501/IJMR-53-2-233-254.

D’Urso, P., M. Disegna, R. Massari, and G. Prayag (2015). “Bagged fuzzy clustering for fuzzy data: An application to a tourism market”, *Knowledge-Based Systems*, Vol. 73, pp. 335-346.

D’Urso, P., M. Disegna, R. Massari, and L. Osti (2016). “Fuzzy segmentation of postmodern tourists”, *Tourism Management*, Vol. 55, pp. 297-308.

D’Urso, P., L. De Giovanni, M. Disegna, and R. Massari (2013). “Bagged Clustering and its Application to Tourism Market Segmentation”, *Expert Systems with Applications*, Vol. 40 No. 12, pp. 4944-4956.

D’Urso, P. and R. Massari (2013). “Fuzzy Clustering of Human Activity Patterns”, *Fuzzy Sets and Systems*, Vol. 215, pp. 29-54.

Dusa, A. (2019; in print). *QCA with R: A Comprehensive Resource*, Springer, New York, NY, 10.1007/978-3-319-75668-4.

Dyson, R.G., Allen, R., Camanho, A.S., Podinovski, V.V., Sarrico, C.S., and Shale, E.A. (2001), “Pitfalls and protocols in DEA”, *European Journal of Operational Research*, Vol. 132 No. 2, pp. 245-259.

ECM. (n.d.), “ECM benchmarking report”, available at: https://www.europeancitiesmarketing.com/ecm-benchmarking-report/ (accessed 11 March 2019).

Emrouznejad, A. (1995-2012), “Ali Emrouznejad’s data envelopment analysis”, available at: http://deazone.com/en/resources/bibliography (accessed 08 March 2019).

Emrouznejad, A. and Yang, G. (2018), “A survey and analysis of the first 40 years of scholarly literature in DEA: 1978-2016”, *Socio-Economic Planning Sciences*, Vol. 61, pp. 4-8.

Evren, S. and Kozak, N. (2018), “Competitive positioning of winter tourism destinations: A comparative analysis of demand and supply sides perspectives–Cases from Turkey”, *Journal of Destination Marketing & Management*, Vol. 9, pp. 247-257.

Ferguson, G., Megehee, C. M. and Woodside, A.G. (2017), “Culture, religiosity, and economic configural models explaining tipping-behavior prevalence across nations”, *Tourism Management*, Vol. 62, pp. 218-233.

Fuchs, M. and Weiermair, K. (2001), “Development opportunities for a tourism benchmarking tool: the case of Tyrol”, in Pyo, S. (Ed.), *Benchmarks in Hospitality and Tourism*, The Haworth Press, Inc., Binghamton, NY, pp. 71-91.

Fuchs, M. (2004), “Strategy development in tourism destinations: A DEA approach”, *The Poznan University of Economics Review*, Vol. 4 No. 1, pp. 52-73.

Gitto, S. and Mancuso, P. (2011), “Airport efficiency: a DEA two stage analysis of the Italian commercial airports”, MPRA Paper No. 34366, available at: https://mpra.ub.uni-muenchen.de/34366/1/MPRA_paper_34366.pdf (accessed 16 January 2016).

Goncalves, O. (2013), “Efficiency and productivity of French ski resorts”, *Tourism Management*, Vol. 36, pp. 650-657.

Heeley, J. (2011), *Inside City Tourism: A European Perspective*, Channel View Publications, Bristol, UK.

Hubbard, R. (2015), *Corrupt Research: The Case for Reconceptualizing Empirical Management and Social Science*, Sage, Los Angeles, CA.

Köksal, C.D. and Aksu, A.A. (2007), "Efficiency evaluation of A-group travel agencies with data envelopment analysis (DEA): a case study in the Antalya region, Turkey", *Tourism Management*, Vol. 28 No. 3, pp. 830-834.

Kozak, M. and Rimmington M. (1999a), "Developing a benchmarking model for tourist destinations", in Chon, K.S. (Ed.), *The Practice of Graduate Research in Hospitality and Tourism*, The Haworth Press, Inc. Binghamton, NY, pp. 23-42.

Kozak, M. and Rimmington M. (1999b), "Measuring tourist destination competitiveness: conceptual considerations and empirical findings", *International Journal of Hospitality Management*, Vol.18 No. 3, pp. 273-283.

Kozak, M. (2002), "Destination benchmarking", *Annals of Tourism Research*, Vol. 29 No. 2, pp. 497-519.

Kozak, M. (2004), *Destination Benchmarking: Concepts, Practices and Operations*, CAB International, Wallingford, UK.

Legewie, N. (2013), "An introduction to applied data analysis with qualitative comparative analysis (QCA)", *FQS-Forum Qualitative Social Research*, Vol. 14 No. 3, available at: http://www.qualitative-research.net/index.php/fqs/article/view/1961/3594 (accessed 3 August 2018).

Leisch, F. (1999). *Bagged Clustering*, Working Paper Series "Adaptive Information Systems and Modelling in Economics and Management Science", No. 51, Vienna University of Economics and Business Administration.

Luque-Martínez, T. and Muñoz-Leiva, F. (2005), "City benchmarking: a methodological proposal referring specifically to Granada", *Cities,* Vol. 22 No. 6, pp. 411-423.

Mazanec, J. A. (1996), "Guest satisfaction tracking: Eine Analyse am Beispiel der Sommerurlauber in Österreich", in Fischer, G. and Laesser, Ch. (Eds.), *Theorie und Praxis der Tourismus- und Verkehrswirtschaft im Wertewandel,* Paul Haupt, Bern, pp. 97-115.

Mazanec, J. A. (1999), "Perceived quality, repeat visitation, and the role of loyalty: a causal model for winter travel to Austria", in Fuchs, M., Peters, M., Pikkemaat, B. and Reiger, E. (Eds.), *Tourismus in den Alpen, Internationale Beiträge aus Forschung und Praxis*, Studia, Innsbruck, pp. 79-90.

Mazanec, J. A. and Zins, A. (1996), "Alpine winter tourists and guest satisfaction: an exploration of the typological relationships", in Weiermair, K. (Ed.), *Alpine Tourism: Sustainability. Reconsidered and Redesigned. Proceedings of the International Conference at the University of Innsbruck,* Institut für Tourismus und Dienstleistungswirtschaft, Innsbruck, pp. 186-213.

Mazanec, J. A. (2007), "Exploring tourist satisfaction with nonlinear structural equation modeling and inferred causation analysis", *Journal of Travel & Tourism Marketing,* Vol. 21 No. 4, pp. 73-90.

Muthén, L. K. and Muthén, B.O. (2017), *Mplus User's Guide,* 8th ed., Muthén and Muthén, Los Angeles, CA.

Önder, I., Wöber, K. and Zekan, B. (2017), "Towards a sustainable urban tourism development in Europe: the role of benchmarking and tourism management information systems – a partial model of destination competitiveness", *Tourism Economics,* Vol. 23 No. 2, pp. 243-259.

Papatheodorou, A. and Pappas, N. (2017), "Economic recession, job vulnerability, and tourism decision making: a qualitative comparative analysis", *Journal of Travel Research*, Vol. 56 No. 5, pp. 663-677.

Pappas, N. (2017), “Risks and marketing in online transactions: a qualitative comparative analysis”, *Current Issues in Tourism*, Vol. 20 No. 8, pp. 852-868.

Partel, M. and Matzler, K. (2016), *Best Ski Resort Report 2016*, Mountain-Management.C.E., Rugell.

Peay, E. R. (1975). “Nonmetric grouping: Clusters and Cliques”, *Psychometrika*, Vol. 40, No. 3, pp. 297-313.

Preacher, K. J., Rucker, D. D., MacCallum, R. C., and Nicewander, W. A. (2005). “Use of the Extreme Groups Approach: A Critical Reexamination and New Recommendations”, *Psychological Methods*, Vol. 10 No. 2, pp. 178-192.

Prentice, C. and Woodside, A. G. (2013), “Problem gamblers’ harsh gaze on casino services”, *Psychology & Marketing*, Vol. 30 No. 12, pp. 1108–1123.

Ragin, C. C. (1987), *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*, Univ. of California Press, Los Angeles and London.

Remich, A. (2002), “Marketing strategies for European museums: an inter-city comparison by means of advanced benchmarking methodologies”, in Wöber, K.W. (Ed.), *City Tourism 2002: Proceedings of European Cities Tourism’s International Conference in Vienna, Austria, 2002*, Springer-Verlag Wien, Vienna, Austria, pp. 353-362.

Reynolds, D. and Taylor, J. (2011), “Validating a DEA-based menu analysis model using structural equation modeling”, *International Journal of Hospitality Management*, Vol. 30 No. 3, pp. 584-587.

Scheel, H. (2000), “EMS: efficiency measurement system user’s manual”, available at: http://www.holger-scheel.de/ems/ems.pdf (accessed 22 February 2015).

Thiem, A. and Dusa, A. (2013a), “QCA: a package for qualitative comparative analysis”, *The R Journal*, Vol. 5 No. 1, pp. 87-97.

Thiem, A. and Dusa, A. (2013b), *Qualitative Comparative Analysis with R: A User's Guide*, Springer, New York, NY.

WEF. (2017), "The travel & tourism competitiveness report 2017", available at: http://www3.weforum.org/docs/WEF_TTCR_2017_web_0401.pdf (accessed 20 January 2019).

Woodside, A.G. (2013), "Moving beyond multiply analysis to algorithms: calling for a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory", *Journal of Business Research*, Vol. 66(4), pp. 463-472.

Woodside, A. G. and Ahn, I. (2008), "Culture's consequences on experiencing international tourism services and products", in Woodside, A. G. and Martin, D. (Eds.), *Tourism Management: Analysis, Behaviour and Strategy*, CABI, Wallingford, pp. 28-61.

Woodside, A. G., Prentice, C. and Larsen, A.J. (2015), "Revisiting problem gamblers' harsh gaze on casino services: applying complexity theory to identify exceptional customers", *Psychology and Marketing*, Vol. 32 No. 1, pp. 65-77.

Wöber, K.W. (1997), "International city tourism flows", in Mazanec, J.A. (Ed.), *International City Tourism: Analysis and Strategy*, Pinter, London, England, pp. 39-53.

Wöber, K.W. (2001), "A heuristic model for benchmarking SME hotel and restaurant businesses on the Internet", in Pyo, S. (Ed.), *Benchmarks in Hospitality and Tourism*, The Haworth Press, Inc., Binghamton, NY, pp. 49-70.

Wöber, K.W. (2002), *Benchmarking in Tourism and Hospitality Industries: The Selection of Benchmarking Partners*, CAB International, Wallingford, UK.

Wöber, K.W. and Fesenmaier, D.R. (2004), "A multi-criteria approach to destination benchmarking: a case study of state tourism advertising programs in the United States", *Journal of Travel & Tourism Marketing*, Vol. 16 No. 2/3, pp. 1-18.

Zekan, B., Önder, I. and Gunter, U. (2018), "Benchmarking of Airbnb listings: how competitive is the sharing economy sector of European cities?", *Tourism Economics*, advance online publication, doi: 10.1177/1354816618814349

Ziliak, S. T., and McCloskey, D. N. (2008), *The Cult of Statistical Significance: How the Standard Error Costs Us Jobs, Justice, and Lives*, University of Michigan Press, Ann Arbor, MI.

Table 1: Overall satisfaction in six resort clusters

Resort number	Cluster number	Overall satisfaction	Cluster average
21	1	0.08	
35	1	0.23	
41	1	0.16	0.156
1	2	0.84	
2	2	0.77	
4	2	0.89	
15	2	0.90	
24	2	0.80	
30	2	0.71	
34	2	0.86	
39	2	0.79	
42	2	0.82	
47	2	0.76	
48	2	0.83	0.815
5	3	0.73	
10	3	0.61	
12	3	0.61	
14	3	0.63	
17	3	0.74	
18	3	0.69	
19	3	0.67	
22	3	0.67	
23	3	0.71	
26	3	0.72	
27	3	0.61	
33	3	0.70	
36	3	0.73	
37	3	0.69	
44	3	0.59	
45	3	0.62	
46	3	0.60	
49	3	0.79	
50	3	0.72	
51	3	0.63	0.673
20	4	0.85	
28	4	0.91	
38	4	0.79	
40	4	0.93	
53	4	0.89	0.874
6	5	0.50	
13	5	0.43	
16	5	0.55	
29	5	0.54	
31	5	0.38	
32	5	0.59	
43	5	0.54	
52	5	0.44	
54	5	0.49	0.495

3	6	0.40	
7	6	0.33	
8	6	0.33	
9	6	0.29	
11	6	0.37	
25	6	0.40	0.353

Table 2: Truth table of resort satisfaction patterns

Nr.	SKI_CORE	SKI_PERIPH	VALUE_FOR_MONEY	FUN	OUT	n	incl	PRI
10	1	0	0	1	1	1	1.000	1.000
11	1	0	1	0	1	1	1.000	1.000
12	1	0	1	1	1	1	1.000	1.000
15	1	1	1	0	1	1	1.000	1.000
8	0	1	1	1	1	2	1.000	1.000
16	1	1	1	1	1	20	1.000	1.000
14	1	1	0	1	0	5	0.800	0.800
2	0	0	0	1	0	1	0.000	0.000
4	0	0	1	1	0	1	0.000	0.000
13	1	1	0	0	0	1	0.000	0.000
3	0	0	1	0	0	2	0.000	0.000
9	1	0	0	0	0	2	0.000	0.000
1	0	0	0	0	0	16	0.000	0.000

Legend:
OUT: overall satisfaction (coded 1, if the pattern attains sufficiency inclusion = 1.0)
n: number of cases in configuration
incl: sufficiency inclusion score
PRI: proportional reduction in inconsistency

Table 3: Minimization results and associated resorts

1 (Ski_Core AND VfM):
22;
36;
18;
1, 2, 4, 5, 15, 20, 24, 28, 30, 33, 34, 37, 38, 39, 40, 42, 47, 48, 49, 53

2 (Ski-Core AND NOT Ski-Peripheral AND Fun):
26;
36

3 (Ski-Peripheral AND VfM AND Fun):
14, 19;
1, 2, 4, 5, 15, 20, 24, 28, 30, 33, 34, 37, 38, 39, 40, 42, 47, 48, 49, 53

Table 4: Descriptive statistics of input and output variables

	Maximum	Minimum	Mean	Standard deviation
Inputs				
Ski-Core	2.31	0	1.42	0.54
Ski-Peripheral	2.44	0.25	1.50	0.48
Value-for-Money	2.11	0.44	1.39	0.40
Fun	2.16	0.39	1.47	0.42
Output				
Overall Satisfaction Rating	0.93	0.08	0.63	0.20

Table 5: Summary of DEA results

		Output-oriented BCC Radial DEA Model
Ski Resort	**Score**	**Benchmarks & Weights (Ineff.) / Benchmark Appearance (Eff.)**
Inefficient DMUs		
31	117.24%	35 (0.45) 36 (0.12) 44 (0.43)
30	113.81%	4 (0.26) 14 (0.01) 36 (0.54) 40 (0.19)
25	110.20%	3 (0.47) 16 (0.26) 35 (0.18) 49 (0.08)
45	110.11%	3 (0.04) 16 (0.29) 49 (0.54) 51 (0.13)
52	109.93%	6 (0.07) 14 (0.24) 16 (0.04) 35 (0.40) 36 (0.25)
38	109.92%	4 (0.92) 51 (0.08)
33	109.23%	4 (0.11) 6 (0.14) 34 (0.05) 49 (0.70)
47	108.96%	4 (0.39) 36 (0.04) 40 (0.01) 49 (0.55)
29	108.64%	16 (0.69) 49 (0.07) 51 (0.24)
10	108.14%	3 (0.01) 16 (0.17) 26 (0.54) 46 (0.10) 51 (0.18)
9	107.78%	3 (0.51) 35 (0.43) 41 (0.06)
11	106.93%	16 (0.27) 35 (0.53) 51 (0.20)
2	106.90%	4 (0.76) 16 (0.12) 22 (0.11)
20	106.62%	4 (0.59) 40 (0.41) 49 (0.00)
54	106.09%	14 (0.03) 16 (0.18) 35 (0.35) 36 (0.44)
5	105.61%	4 (0.44) 14 (0.31) 36 (0.24) 40 (0.01)
1	104.93%	4 (0.56) 34 (0.09) 40 (0.20) 49 (0.14)
50	104.47%	4 (0.37) 49 (0.16) 51 (0.47)
18	102.96%	4 (0.45) 16 (0.51) 26 (0.04)
19	102.95%	4 (0.23) 14 (0.36) 16 (0.27) 49 (0.13)
42	102.50%	4 (0.87) 6 (0.08) 16 (0.05)
32	102.43%	6 (0.11) 35 (0.27) 36 (0.07) 49 (0.55)
24	102.35%	4 (0.73) 51 (0.27)
37	102.35%	4 (0.06) 14 (0.36) 36 (0.54) 49 (0.05)
28	102.20%	40 (1.00)
43	102.11%	14 (0.08) 16 (0.27) 35 (0.24) 36 (0.41)
27	101.67%	3 (0.20) 16 (0.09) 26 (0.54) 46 (0.18)
48	101.51%	4 (0.81) 14 (0.18) 40 (0.01)
23	101.23%	16 (0.08) 49 (0.59) 51 (0.33)
53	101.23%	4 (0.73) 40 (0.27)
12	100.46%	14 (0.33) 16 (0.34) 35 (0.05) 36 (0.29)
8	100.22%	16 (0.31) 35 (0.69)
39	100.13%	4 (0.05) 14 (0.46) 40 (0.49)
Efficient DMUs		
17	99.99%	0
7	99.65%	0
15	99.58%	0
44	99.15%	1
49	98.14%	12
34	98.04%	2
4	97.75%	17
6	97.28%	4
14	96.84%	10
36	96.84%	10
26	96.79%	3
22	96.66%	1
46	96.40%	2
40	96.37%	9
16	96.09%	16
13	95.98%	0
3	95.40%	5
51	93.76%	8
35	84.13%	10
21	big	0
41	big	1

Table 6: Virtual benchmark for DMU31

	DMU31	Virtual benchmark	Difference
Inputs			
Ski-Core	0.94	0.91	0.03
Ski-Peripheral	0.94	0.94	0
Value-for-Money	1.17	1.02	0.15
Fun	1.15	1.15	0
Output			
Overall Satisfaction Rating	0.38	0.45	-0.07

Figure 1: Flowchart of analytical steps

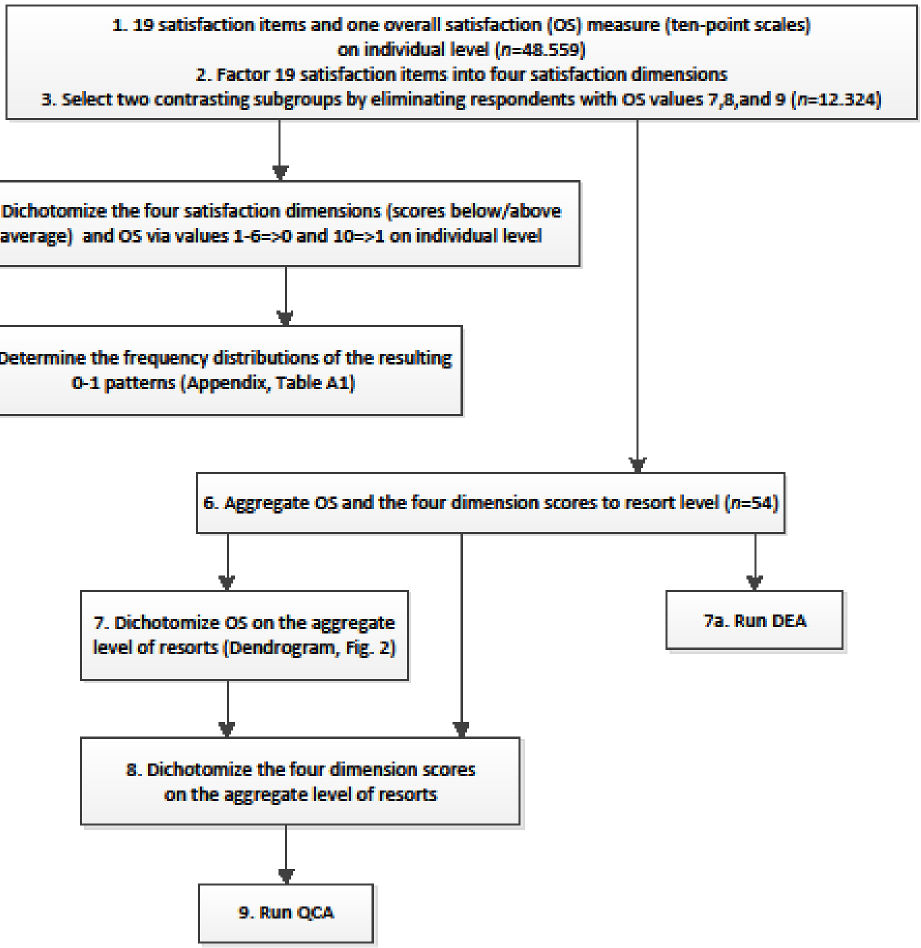


Figure 2: Suggested number of six resort clusters of similar satisfaction patterns

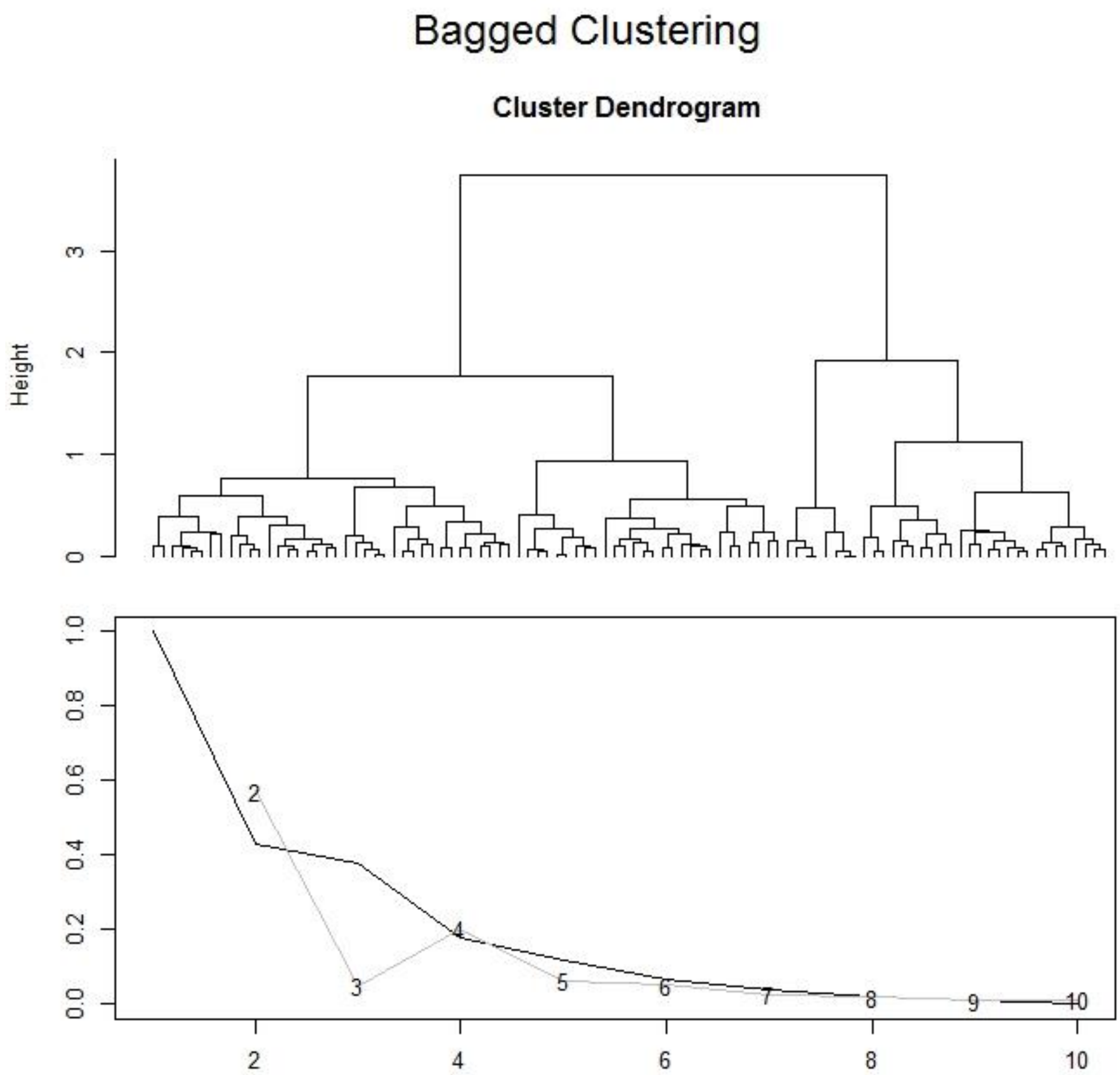
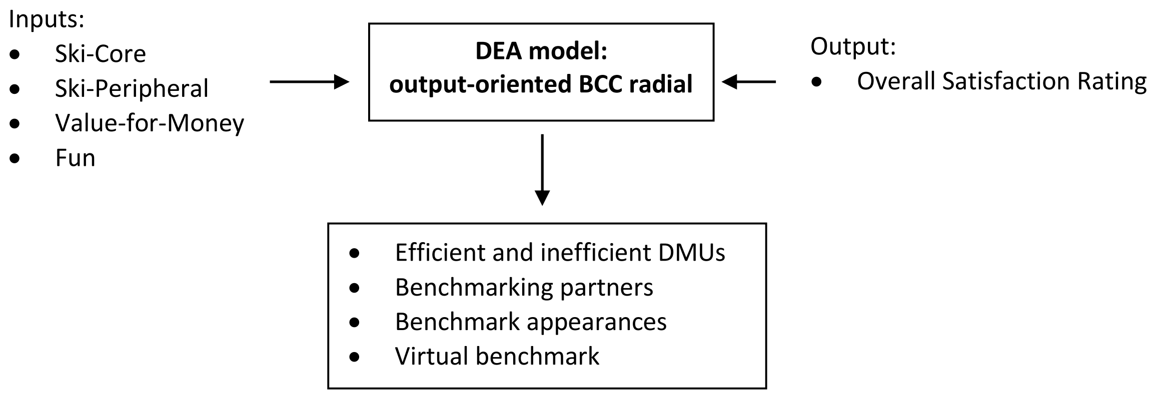


Figure 3: Satisfaction with ski resorts – DEA model



Source: Authors' modification of the DEA model proposed in Bauernfeind and Mitsche (2008, p. 250)

Appendix

Table A1: Frequency of destination-specific satisfaction patterns (resorts 1-18)

Satisfaction patterns	1111	1110	1101	1011	0111	1100	1001	0011	0101	1010	0110	1000	0100	0010	0001	0000	
Pattern nr.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	∑
Abs. frequency of patterns	4660	591	291	498	570	142	158	145	309	125	187	204	407	108	366	3563	12324
Rel. frequency of patterns (%)	37,8	4,8	2,4	4	4,6	1,2	1,3	1,2	2,5	1	1,5	1,7	3,3	0,9	3	28,9	100
% of high overall satisfaction	98,8	88,7	96,2	91,8	97,9	78,9	88	82,8	94,2	76	85,6	40,2	60,7	43,5	57,1	6,6	66,2
Frequency within resorts (%):																	100%=
Resort number 1	53,6	3,6	2	2,3	8,8	2,6	0,7	0,7	3,3	0,3	2,9	0,7	2,9	0,7	1,3	13,7	306
2	43,9	5,3	1,1	3,5	10,9	0,7	1,1	1,8	2,5	0,4	2,8	1,8	2,1	1,1	2,8	18,6	285
3	15,5	3,1	0,8	6,2	0	0,8	1,6	1,6	0,8	1,6	1,6	3,9	6,2	0,8	2,3	53,5	129
4	45,7	4,1	2,1	5,3	11,1	1,2	1,2	1,2	5,3	0,8	2,5	1,6	5,8	0,8	2,9	8,2	243
5	48,3	2,5	3,8	3	4,7	0	1,7	2,1	3	1,3	0,8	0	1,7	0,8	3,4	22,9	236
6	26,8	3,3	0,5	4,7	3,8	0	2,8	3,3	1,9	0,5	0,5	0,5	0,5	0,9	6,1	44,1	213
7	16,3	2,9	1	3,8	0	0	0	1	1	1,9	0	0	1,9	0	6,7	63,5	104
8	13,6	0	0,7	8,2	3,4	0,7	1,4	2,7	0	2	0,7	0,7	3,4	1,4	1,4	59,9	147
9	15,6	3,3	0,8	2,9	0,8	0,4	0	0,8	1,2	0,8	0,4	1,6	2,5	1,6	4,5	62,6	243
10	35,7	4,6	1,5	2,6	3,6	1	0,5	1	1,5	1	4,1	3,1	4,6	1	3,1	31,1	196
11	21,9	2	1,5	2,5	0	0	0,5	1	0	1,5	1	2,5	1	3	5,5	56,2	201
12	35,4	3,9	3,2	5,9	2,1	0,7	2,5	1,1	0,9	0,9	0,2	2,1	2,1	0	4,1	34,9	438
13	24,2	0,8	0,4	6,8	3	0	1,9	2,3	0	0,8	0	0,8	0,8	2,3	4,9	51,1	264
14	33,6	1,9	1,9	6,9	4,2	0	1,5	1,9	1,9	2,3	1,2	2,3	1,2	1,5	5	32,4	259
15	51,7	6,4	2,2	2,6	11,6	0	1,1	2,2	4,5	0,7	2,2	0	3,4	0,7	2,6	7,9	267
16	31	2,3	2,3	1,8	6,4	0,6	0	2,9	2,3	0	0	0	1,2	4,1	3,5	41,5	171
17	43,6	8,1	5,1	2,1	0,4	6,4	0,8	0,8	2,1	0,4	0,4	4,2	3	0	1,7	20,8	236
18	30,9	3,6	3,6	3,2	5	0	1,4	1,4	3,6	0,5	0,5	2,7	0,5	0,5	4,5	38,2	220

Table A1 cont'd: Frequency of destination-specific satisfaction patterns (resorts 19-36)

Satisfaction patterns	1111	1110	1101	1011	0111	1100	1001	0011	0101	1010	0110	1000	0100	0010	0001	0000	
Pattern nr.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	∑
Abs. frequency of patterns	4660	591	291	498	570	142	158	145	309	125	187	204	407	108	366	3563	12324
Rel. frequency of patterns (%)	37,8	4,8	2,4	4	4,6	1,2	1,3	1,2	2,5	1	1,5	1,7	3,3	0,9	3	28,9	100
% of high overall satisfaction	98,8	88,7	96,2	91,8	97,9	78,9	88	82,8	94,2	76	85,6	40,2	60,7	43,5	57,1	6,6	66,2
Frequency within resorts (%):																	100%=
Resort number 19	42,2	3,2	1,2	3,6	4	0,8	1,2	0,8	3,6	1,6	0,8	1,6	2	0,8	4	28,7	251
20	55,9	6,1	3,2	3,6	7,3	0,8	0,4	0,4	4	1,6	0,4	0,8	2	0,4	1,2	11,7	247
21	8	0	0	0	0	2	0	2	0	0	0	0	0	2	2	84	50
22	34	2,5	2,5	3,6	2,5	0,5	0,5	0,5	5,1	1	1,5	0	8,6	0,5	4,1	32,5	197
23	40,5	7,8	1,5	2,6	3	2,2	1,9	1,1	1,9	1,5	1,1	1,5	5,6	0	2,2	25,7	269
24	48,7	7,7	3,6	5,6	4,1	0,5	1	1,5	2,1	1	2,6	0,5	3,6	0	1,5	15,9	195
25	20,6	7,4	1,5	2,9	0	0,7	0	1,5	0,7	2,2	0	3,7	3,7	0	4,4	50,7	136
26	31	6,8	3,4	3,4	4,1	3,6	1,8	0,5	4,5	0,5	2	1,8	9,8	0,4	2,5	23,9	796
27	27,2	6,8	2	4,1	4,8	2	1,4	0,7	2	0,7	4,1	1,4	7,5	0	1,4	34	147
28	60,1	6,9	2,6	3,4	9	0	0,9	1,3	3,9	0,9	1,3	0	1,3	0	0,9	7,7	233
29	27,7	4,2	0,6	5,4	4,2	0	1,2	0,6	0	0,6	4,8	3,6	3	2,4	3	38,6	166
30	46,9	3,9	4,2	4,5	4,5	0	1,6	0,6	2,9	1	1,3	1,3	3,2	0,6	3,5	19,9	311
31	25	0	0	8,3	0	0	0	0	4,2	0	0	0	0	0	0	62,5	24
32	30,9	3,6	3,6	3,2	5	0	1,4	1,4	3,6	0,5	0,5	2,7	0,5	0,5	4,5	38,2	220
33	35,1	6,5	4,3	3,8	5,4	2,2	1,1	1,6	0	1,6	4,9	1,1	3,8	1,1	5,4	22,2	185
34	46,3	4	3,4	5,6	8,5	1,7	1,1	1,1	6,8	0,6	1,7	0	2,8	0,6	2,8	13	177
35	9,3	2,8	0,4	2,8	1,2	0	0,8	0,8	0	0,4	0,4	3,7	1,2	0,4	2,8	72,8	246
36	44,1	2,7	6,8	3,2	1,4	1,4	4,1	1,4	2,3	1,4	0	1,4	2,3	0	2,7	25,2	222

Table A1 cont'd: Frequency of destination-specific satisfaction patterns (resorts 37-54)

Satisfaction patterns	1111	1110	1101	1011	0111	1100	1001	0011	0101	1010	0110	1000	0100	0010	0001	0000	
Pattern nr.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	∑
Abs. frequency of patterns	4660	591	291	498	570	142	158	145	309	125	187	204	407	108	366	3563	12324
Rel. frequency of patterns (%)	37,8	4,8	2,4	4	4,6	1,2	1,3	1,2	2,5	1	1,5	1,7	3,3	0,9	3	28,9	100
% of high overall satisfaction	98,8	88,7	96,2	91,8	97,9	78,9	88	82,8	94,2	76	85,6	40,2	60,7	43,5	57,1	6,6	66,2
Frequency within resorts (%):																	100%=
Resort number 37	41,5	3,6	4,6	5,9	1,5	0,5	2,8	0,3	3,8	1,3	0	2,3	2,1	0,8	1,5	27,4	390
38	60,1	3,9	0	2,5	5,9	0,5	1	0	3	0	2,5	1	2	1,5	1,5	14,8	203
39	48,7	4,5	2,6	8,6	3	2,2	2,2	1,5	1,9	1,9	0	4,9	0,4	0	1,5	16,1	267
40	59,2	3,7	4,6	3,2	5,5	0,9	3,2	0,9	3,7	0,9	1,8	1,8	1,8	0	1,8	6,9	218
41	8,8	3,5	0	3,5	0	0	0	0	0	0	0	3,5	1,8	0	1,8	77,2	57
42	47,8	5,6	0,6	3,7	8,1	0	0	2,5	5	0,6	2,5	0,6	1,2	0,6	3,7	17,4	161
43	27,6	4,1	2,6	5,6	2,6	2	2	1,5	2,6	1,5	1	1	2,6	0,5	4,6	38,3	196
44	33	1,8	8,3	2,8	1,8	2,8	0,9	0	2,8	0,9	0	4,6	4,6	0,9	1,8	33	109
45	35,4	8,3	2,8	5,5	3,3	3,9	1,1	0,6	0,6	0,6	1,1	6,1	1,7	1,1	1,1	27,1	181
46	31,3	8,3	1,3	1,3	7,3	2	0	0,7	1	1,3	3	1,3	7,3	3,3	0,7	29,7	300
47	48,1	2,6	4,1	1,5	6,4	0,8	0,8	2,3	4,5	1,9	0,8	1,5	2,6	0,8	3,4	18	266
48	47,8	2,2	1,7	3,9	14,8	0	1,7	2,6	3	0,4	1,3	0	0,4	0	5,7	14,3	230
49	37,4	8,6	3,7	5,3	3,2	1,1	1,1	0,5	7	1,1	1,6	2,1	4,3	1,6	2,7	18,7	187
50	41,5	11,9	1	3,1	1,6	2,1	1	0	1,6	1	2,6	1	6,7	0,5	2,1	22,3	193
51	31,1	9,8	1,5	4,2	2,3	0,8	1,5	0,4	1,1	1,9	2,7	3,4	6,8	1,9	1,1	29,5	264
52	22,3	3,8	0,4	7,1	2,9	0,4	1,7	0	1,3	0	0,4	1,7	2,5	1,7	6,7	47,1	238
53	63,7	7,6	1,4	2,9	4,3	1,1	0	0,4	1,8	1,4	3,6	0,4	2,9	1,1	0,4	7,2	278
54	28,2	2,3	0,9	2,3	1,9	0,9	1,4	1,4	1,4	1,4	0,9	2,3	2,3	0,5	7,4	44,4	216