

ANALYZING THE POTENTIALS OF AIRLINE SERVICE ELEMENTS TO IMPACT PASSENGER LOYALTY - A HIERARCHICAL APPROACH

Josip Mikulić
University of Zagreb
Faculty of Economics and Business
Croatia
josip.mikulic@efzg.hr

Darko Prebežac
University of Zagreb
Faculty of Economics and Business
Croatia
darko.prebezac@efzg.hr

Abstract: The aim of this paper is to analyze the potentials of airline service elements to impact intentional passenger loyalty. Based on this information, improvement-priorities of the service elements are derived. A regression-based framework is used to derive improvement-priorities under consideration of competitor airlines and asymmetric effects in customer satisfaction and intentional loyalty. A hierarchical attribute model of passenger services is used to minimize the risk of multicollinearity and to facilitate a more detailed analysis. The relevance and determinance of service elements in explaining customer loyalty do not necessarily converge, which has to be accounted for when prioritizing service elements. Moreover, several service elements are found to have a significantly asymmetric impact on satisfaction and loyalty. This is the first study to compare the relevance and determinance of airline service elements, and to analyze asymmetric effects in passenger satisfaction and loyalty.

Keywords: Airline services, improvement priorities, asymmetric effects, loyalty, satisfaction

ANALIZA MOŽNOSTI VPLIVA SESTAVIN LETALSKIH STORITEV NA ZVESTOBO POTNIKOVA – HIERARHIČNI PRISTOP

Povzetek: Letalske družbe delujejo v smeraj bolj dereguliranem okolju, saj na trg uveljavljenih letalskih prevoznikov vstopajo novi letalski prevozniki. Doseganja visoka stopnja zvestobe kupcev (ZK) zato postaja glavni strateški cilj managementa v letalskih družbah. Namen tega članka je, po eni strani, analizirati faktorje letalskih storitev, ki lahko vplivajo na zvestobo potnikov. Po drugi strani pa naša raziskava skuša predstaviti okvir za prednostno obravnavo tistih elementov storitve, ki jih je treba izboljšati, pri čemer je potrebno upoštevati konkurenčne letalske družbe in asimetrične učinke zadovoljstva potnikov in njihove zvestobe.

V raziskavi smo zbirali podatke dveh letalskih prevoznikov, ki poslujeta na večjem hrvaškem mednarodnem letališču in imata podoben vozni red, tako glede destinacij kot tudi pogostosti poletov. Prva letalska družba je za to raziskavo odločilnega pomena (FAL), medtem ko je druga njen glavni tekmeč (CAL). Vzorec predstavlja 718 potnikov (FAL=383; CAL=335).

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Ker analitični okvir v tej raziskavi v glavnem temelji na multipli regresijski analizi, je bil uporabljen dvostopenjski pristop za storitve letalske družbe, ki je omogočil natančno analizo in zmanjšal nevarnost večkolinearosti. Analiza se v prvem koraku osredotoča na glavne sestavine storitev letalskih prevoznikov, v drugem koraku pa na glavne attribute storitev. Za analizo ključnih dejavnikov ZK na ravni sestavin, kot tudi ključnih dejavnikov zadovoljstva na ravni atributov smo uporabili analizo relevantnosti-determinance (ARD) in analizo determinance-asimetrije (ADA).

Rezultati so pripeljali do zanimivega vpogleda v vpliv glavnih sestavin storitev letalske družbe na zvestobo potnikov v prihodnje. Analiza relevantnosti-determinance je pokazala, da *ponudba poletov/ destinacij* predstavlja najpomembnejšo sestavino storitve pri razlagi ohranitve števila potnikov. *Odnosi-izkušnje ter polet-izkušnje* sta prav tako sestavini storitve, ki imata močan vpliv na zvestobo, čeprav se potnikom zdita nekoliko manj pomembni. Po drugi strani pa sta *izkušnja z letališčem in izkušnja pri nakupu vozovnice* najmanj pomembni za razlago zvestobe, četudi sta po mnenju potnikov izredno pomembni. V raziskavi je bilo nadalje ugotovljeno, da obstaja več pomembnih asimetričnih učinkov pri oblikovanju zadovoljstva potnikov s posameznimi sestavinami storitve.

Prednosti predlaganega pristopa so v tem, da uporablja dve najpogosteje uporabljeni merili atributov pomembnosti, poleg tega pa upošteva dejstvo, da na trgu obstajajo konkurenti. Druge prednosti predlaganega pristopa so v tem, da upošteva asimetrične učinke v zadovoljstvu in zvestobi kupcev ter morebitne probleme multikolinarosti v podatkih o zadovoljstvu kupcev. Dejstvo, da pomanjkanje ozaveščenosti o teh vprašanjih lahko pripelje do napačnih priporočil glede sestavin storitve/prednostnih atributov, govori v prid velike vrednosti tega raziskovalnega okvirja za upravljanje letalskih storitev.

Gre za prvo raziskavo, ki primerja pomembnost in determiniranost elementov letalskih storitev in analizira asimetrične učinke pri zadovoljstvu in zvestobi potnikov.

Ključne besede: letalske storitve, prioriteta izboljšav, asimetrični učinki, zvestoba

1. INTRODUCTION

Airlines act in an increasingly deregulated environment, with new carriers constantly entering the markets of established ones. Achieving high levels of customer loyalty (CL) thus becomes a major strategic goal for the airline management.

In general, CL is regarded as a key outcome of service quality (SQ) and customer satisfaction (CS), and a crucial antecedent to business success (Anderson and Mittal, 2000). Since it is difficult to measure CL directly, behavioral intentions are usually used as a proxy. However, most studies dealing with the above relationships regard SQ and CS as summary concepts, and thus do not facilitate an insight into the strength and nature of impact that particular service elements have on CL. This study intends to fill this gap for airline services. Moreover, though the importance of the loyalty concept has been early recognized in the air transportation sector, there are only a few studies dealing with it. In most of these studies, CL is regarded as a pure behavioral concept, with price being the main determinant, and repeat purchase the ultimate goal, whereas scarce research pays attention to CS, SQ or relationship quality (e.g. Cheng *et al.*, 2008), which represent key drivers of psychological loyalty.

2. METHODOLOGY

The aim of this study, on the one hand, is to explore the main airline service elements influencing CL. On the other hand, this study further aims to introduce a framework for prioritizing the service elements for improvement, under consideration of competitor airlines and asymmetric effects in passenger satisfaction and PL.

For this study, data were collected for two full-service carriers operating at a major Croatian international airport with similar flight schedules regarding destinations and flight frequencies. The first airline is the focal airline of this study (FAL), whereas the second one is regarded its main competitor (CAL). In total, 718 airline passengers formed the sample for this study (FAL=383; CAL=335). The research instrument was a structured questionnaire which comprised measures for: (i) service attribute-performance; (ii) service component-satisfaction and (iii) intentional loyalty (IL). Service attribute-performance and service component-satisfaction were measured with single item seven point Likert scales, whereas IL was measured with four

items derived from the scales of Zeithaml *et al.* (1996) and Taylor and Baker (1994). To generate the initial item pool of airline passenger service attributes, a qualitative study involving several open-ended questions with 30 airline passengers was conducted. The results were paired with items identified in previous research in the relevant literature. A panel of four expert judges then independently grouped the attributes into a smaller number of main components of airline passenger services. The categorizations were then compared by the expert judges, and refined in a three-stage iterative Delphi process. Based on the results from the qualitative research process, a pre-test questionnaire was constructed which comprised five service components (flight offer; ticket purchase experience; airport experience; flight experience; and relationship experience) with 34 items. The questionnaire was tested on a sample of 100 international airline passengers at a major Croatian airport. In order to explore significant intercorrelations among attributes, correlational matrices were computed. Attributes with high intercorrelations within the proposed service components were reassessed by the judges, who either excluded such attributes from the final attribute list or grouped them with other attributes. By the end of this process, the initial item pool was subsequently reduced to 25 service attributes.

2.1. ANALYTICAL FRAMEWORK

Since the analytic tools used in this study are primarily based on multiple regression analysis, a two-level approach to airline passenger services was used to facilitate a detailed analysis and to minimize the risk of multicollinearity. On the first level the analysis focuses on the main components of airline services, and on the second level on the main service attributes forming the components. To analyze the key drivers of PL at the component-level, as well as the key drivers of component-satisfaction at the attribute-level, relevance-determinance analysis (RDA) and determinance-asymmetry analysis (DAA) were used. The two analyses are explained in the two subsequent sections.

2.1.2. Relevance-determinance analysis

The RDA is an extension of traditional two-dimensional importance-performance analysis (IPA, Martilla and James, 1978). In the proposed approach, a third dimension was added to the analysis by using two measures of attribute-importance (AI) commonly used in IPA—i.e. direct AI ratings and weights obtained through MRA.

Why were both measures used? Several studies failed to confirm convergence between these two measures, while several authors recommend not regarding them as alternative measures for the same concept (e.g. Mikulić and Prebežac, 2008; Smith and Deppa, 2009). Consequently, since the two measures apparently do not assess identical concepts, a combination of the measures would be likely to provide managers with surplus information regarding the ‘real importance’ of service attributes. But what do the two measures actually measure? According to a meta-review of the validity of AI measurement by Van Ittersum *et al.* (2007), direct AI ratings measure the *relevance* of service attributes whereas regression weights measure the *determinance* of service attributes. What is the difference between these two concepts? Attribute-relevance (AR), on the one hand, could be described as the customer-perceived importance of an element in a service-configuration based on existing industry norms. AR is thus similar to an attitude, as well as it is a relatively stable concept over time. On the other hand, attribute-determinance (AD) represents an attribute’s significance in judgment and choice (Myers and Alpert, 1977), and it is calculated “... based on the difference in (valuation of) different attribute levels” (Van Ittersum *et al.*, 2007, p.1180). But why do measures of relevance and (average) determinance not always correspond? Should not higher/lower relevance be an indicator of higher/lower determinance? One possible explanation is that there simply are no significant variations in attribute-performance (AP) for some attributes, while it may happen that such attributes show low and insignificant regression weights when regressed against overall satisfaction or IL, though they have high direct AI scores. Another possible explanation for AR-AD discrepancies is that AR ratings for some attributes are artificially inflated, though such attributes actually do not play a significant role in explaining variations in IL. There may frequently be some kind of *discrimination effect* which causes respondents to intentionally assign higher importance to core product/service attributes than to augmented product/service attributes, especially when they are presented next to each other in a questionnaire. However, core attributes are frequently provided by all competitors at a satisfactory level, and customers usually assume them to always perform well, while it can happen that augmented product/service attributes (lower relevance attributes) actually cause more variation in IL, and have larger AD scores compared to some core attributes. It is important to note that low and insignificant regression weights do not necessarily mean that attributes

are not important in achieving high IL, but that they simply are not important in explaining variations in IL in a particular research setting.

Consequently, a comparison of the two measures facilitates the identification of four attribute-categories with distinct 'importance-levels' in explaining IL, and with subsequently different priority-levels when it comes to their improvement (Figure 1).

Figure 1: The relevance-determinance grid

D E T E R M I N A N C E	H I G H	Secondary loyalty-drivers (low relevance, but high determinance)	Primary loyalty-drivers (high relevance and high determinance)
	L O W	Lower importance attributes (low relevance and low determinance)	Spurious loyalty-drivers (high relevance, but low determinance)
		LOW	HIGH
		RELEVANCE	

- *Primary loyalty-drivers (high AR/high AD):* These attributes are perceived highly important by customers, and they have a strong influence on IL. The management should therefore assign this attribute-category highest priority in improvement strategies.
- *Secondary loyalty-drivers (low AR/high AD):* These attributes are perceived less essential by the customer for providing the core service, but they have nevertheless a large influence on IL. Attributes from this category usually form the augmented service. It is important to note that the importance of these attributes may be underestimated, if only a measure of AR is used as decision criterion.
- *Spurious loyalty-drivers (high AR/low AD):* These attributes are perceived very important by the customer, but they do not have a significant influence on IL. Attributes from this category are fully expected by the customer, and they are usually provided by all competing service providers at a satisfactory level. It is important to note that a low and insignificant

level of AD (e.g. regression coefficient) might be a consequence of a lack of variance in AP data. Managers should therefore treat such attributes with care, because they might in fact be latent dissatisfiers with a strong negative impact on IL in case of performance-failures.

- *Lower-priority attributes (low AR/low AD):* Attributes in this category have lower levels of both AR and AD compared to other attributes. The management should assign this attribute-category lower priority than the other three categories in improvement strategies.

In our analysis, main competitor performance was further included as a fourth dimension into the RDA. However, since a 4D representation would be confusing, a 2D-grid was constructed using scores of AR and AD of service components, whereas components with CS scores below average (i.e. below the grand mean of component-CS scores) were marked with a minus (-), and components with CS scores above average were marked with a plus (+). Components performing below the CAL-level were further presented in italics. In order to keep the questionnaire length at a reasonable level, AR scores (i.e. direct importance scores) were collected only for the main service components. Thus, the RDA was conducted only at the service component level.

2.1.2. Determinance-asymmetry analysis (DAA)

The DAA was introduced by Mikulić and Prebežac (2008) as a research tool for categorizing service attributes according to the range of their impact on OCS, and the degree of asymmetry of their impact on OCS. To remain consistent with the terminology used in the previous section, the range of impact on OCS will be referred to as determinance, and the asymmetry of impact will be referred to as determinance-asymmetry (DA). In this study, DAAs were conducted at both the component- and attribute-level. Determinance scores were obtained through a MRA with scores of component-satisfaction (attribute-performance) as predictors, and IL (component satisfaction) as the criterion variable. DA was calculated in two steps. First, a MRA was conducted using two sets of dummy variables for each component (attribute) as predictors, and scores of IL (component satisfaction) as the criterion variable. The first dummy was created by coding highest scores to 1, whereas all other scores were coded as 0. This set was used to quantify the impact on the criterion in case of very high perceptions (reward coefficient). The second set was created

by coding lowest scores to 1, whereas all other scores were coded as 0. This set was used to quantify the impact on the criterion in case of very low perceptions (penalty coefficient). In the second step, reward coefficients and penalty coefficients for each component (attribute) were divided by their sum, and difference scores were calculated to obtain DA scores ranging from -1 to +1. A DA score of -1 means the component (attribute) has only dissatisfaction-generating potential (DGP), whereas a score of +1 means it has only satisfaction-generating potential (SGP). By depicting scores of determinance and DA along the axes of a two-dimensional grid, the analysis facilitated the identification of low-, medium- and high impact components (attributes), as well as a categorization of components (attributes) based on the degree of their DA.

3. ANALYSIS AND RESULTS

The RDA on the service-component level (Figure 2) revealed that one service component was a primary loyalty driver—i.e. *flight offer*. *Flight offer* is perceived important by customers when choosing an airline, and it indeed strongly impacts IL. As its satisfaction score is quite low (4.85), and below the CAL level (5.21), this component should be assigned highest priority in improvement strategies. Moreover, two components were categorized as secondary loyalty drivers—i.e. *relationship experience* and *flight experience*. These components are considered less important in airline choice, but they nevertheless strongly influence IL. As the satisfaction score of *relationship experience* is below average (5.03) and the CAL level (5.11), it should be improved right after *flight offer*. *Airport experience* and *ticket purchase experience* were

Figure 2: RDA for airline service components

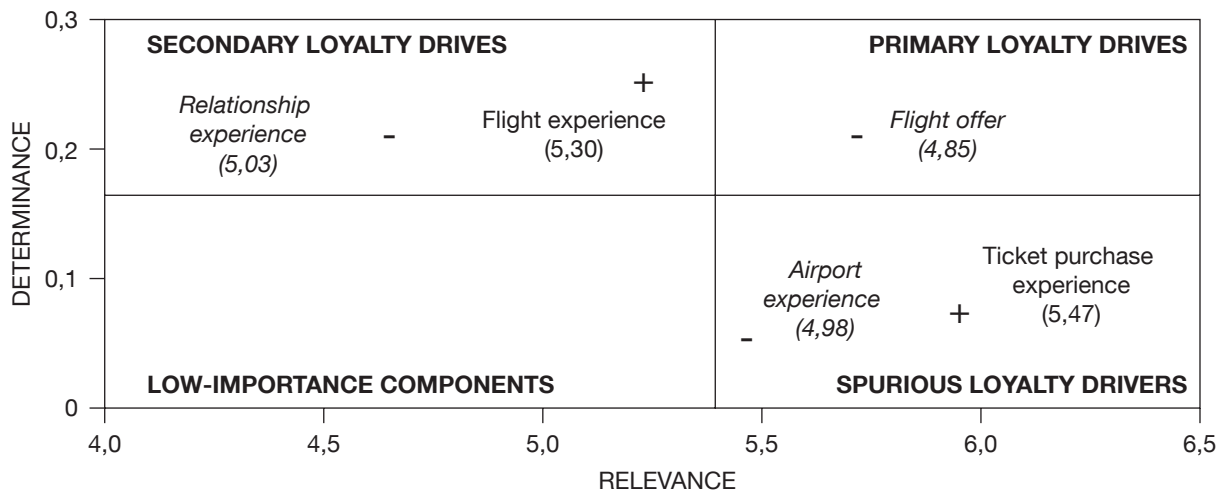
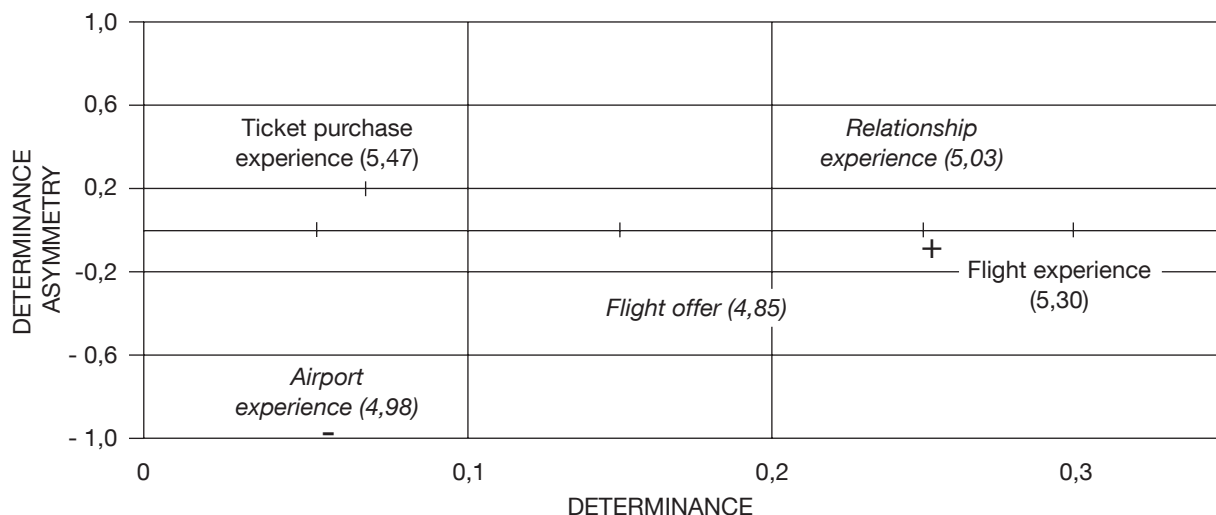


Figure 3: DAA for airline service components



categorized as spurious loyalty drivers. Passengers consider them very important when choosing an airline, but they in fact do not strongly influence IL.

In the next step, a DAA was performed to reveal asymmetries in the relationship between component-satisfaction and IL (Figure 3). The analysis revealed that four of five components approximately linearly impact IL—i.e. *ticket purchase experience, flight offer, relationship experience* and *flight experience*. The only component with a significant asymmetric influence on IL was *airport experience*. Since the asymmetry is extremely negative, this component has no positive influence on IL, even in the case of very high satisfaction levels. However, in the case of low satisfaction levels, the *airport experience* negatively influences IL.

To explore the key drivers of service component satisfaction, in the following step DAAs were conducted at the attribute-level.

The DAA for the component *flight offer* (Figure 4), which is a primary loyalty driver, revealed three highly determinant attributes with a significant positive asymmetrical influence on component-satisfaction—i.e. *partnership destinations, destination attractiveness* and *destination variety*. In other words, these attributes have a significantly larger satisfaction-generating potential (SGP) than dissatisfaction-generating potential (DGP). *Destination attractiveness* and *partnership destinations* are performing above both component average and the respective CAL-levels. However, *destination variety* performs below both component-average and the CAL-level, while it should be assigned highest priority

Figure 4: DAA for flight offer

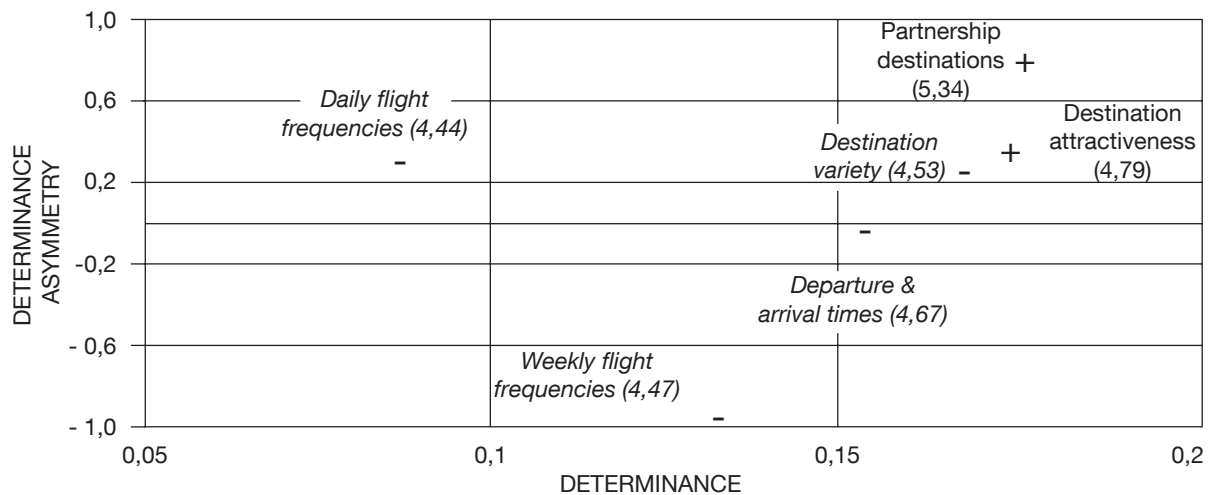
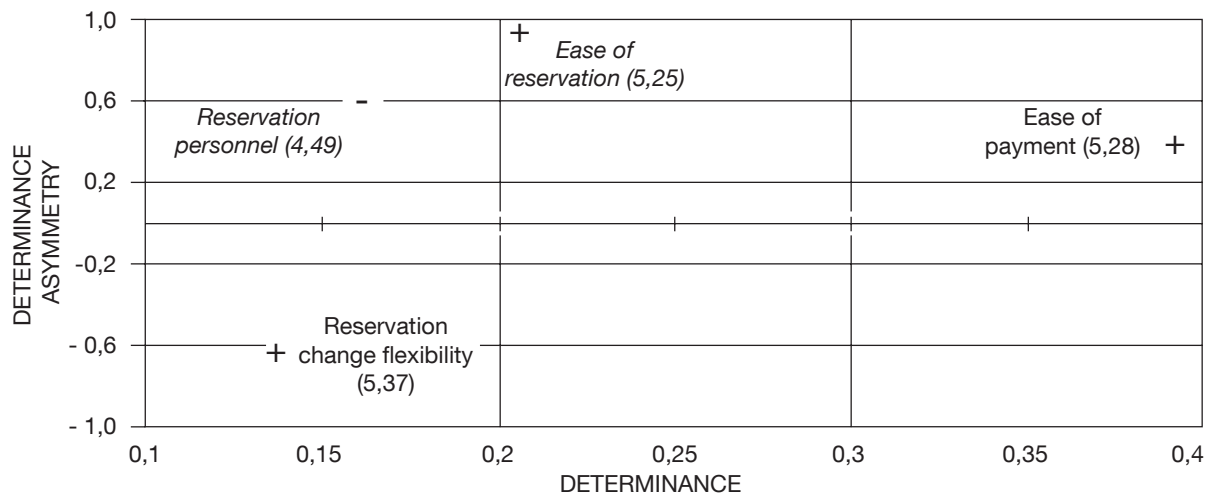


Figure 5: DAA for ticket purchase experience



within this component. High priority should as well be assigned to *attractiveness of departure and arrival times*.

Key drivers of satisfaction with the *ticket purchase experience*, which is a less important component in explaining IL, are shown in Figure 5. The DAA revealed that *ease of payment* is dominant in determining component satisfaction. This attribute has a significantly larger SGP than DGP, and performs above both component-average and the CAL level, while it does not necessitate managerial action.

The DAA for the *airport experience* (Figure 6), which is a spurious key driver of IL, revealed that the airline should mainly focus on *on-time performance* and *airport lounge attractiveness*. Both attributes are highly determinant and

perform below both component-average and the CAL level. As *lounge attractiveness* has a significantly larger DGP than SGP, and a much lower performance-level than *on-time performance*, the management should consider assigning this attribute highest improvement priority within this component.

The DAA for the *flight experience* (Figure 7), which is a secondary loyalty driver, revealed that three attributes largely determine the level of component-satisfaction—i.e. *cabin staff*, *cleanliness of aircraft* and *comfort level of aircraft*. Highest improvement priority should be assigned to *comfort level of aircraft*, as this attribute has a significantly larger DGP than SGP, and is performing quite low (though above the CAL level). After having resolved the performance problems of this attribute, the management

Figure 6: DAA for airport experience

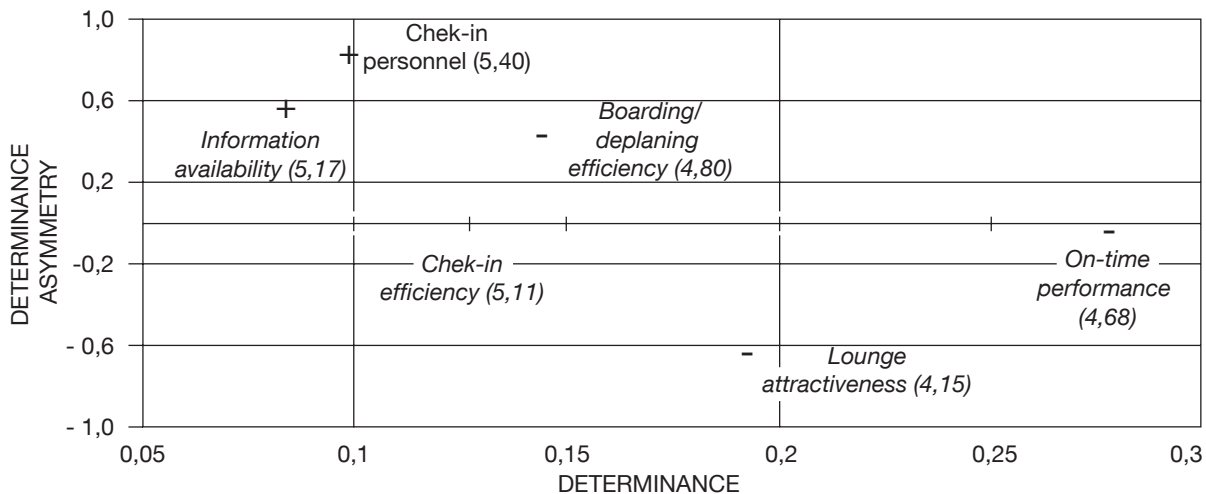
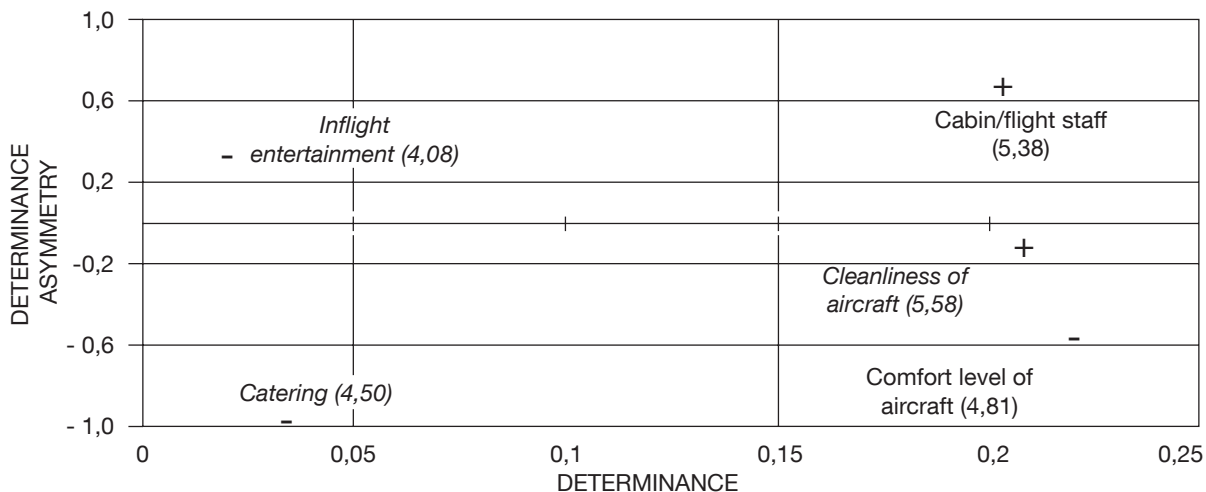


Figure 7: DAA for flight experience



should consider improving *cleanliness of aircraft*, as its performance-level is below the CAL level. The attribute *cabin/flight staff* does not necessitate any action, as its performance-level is above both component-average and CAL level. The remaining two attributes—i.e. *in-flight entertainment* and *catering* are less important in determining component-satisfaction. However, both have very low performance-levels (below component-average and CAL level), why they should be considered for improvement after having resolved the previously mentioned performance shortfalls. Among the two attributes, *catering* should be improved first, as it has only DGP.

The key drivers of the *relationship experience*, which is a secondary loyalty driver, are presented in Figure 8. All four attributes forming this category perform below the respective CAL levels, while this category should generally be assigned high priority in improvement strategies. The attribute with the largest influence on component-satisfaction is *care for customer needs and wishes*. This attribute has a significantly larger SGP than DGP, and its performance-level is very low (4.78). The airline should therefore assign this attribute highest improvement-priority within this component, since this attribute bears a large potential to increase component-satisfaction, and consequently IL.

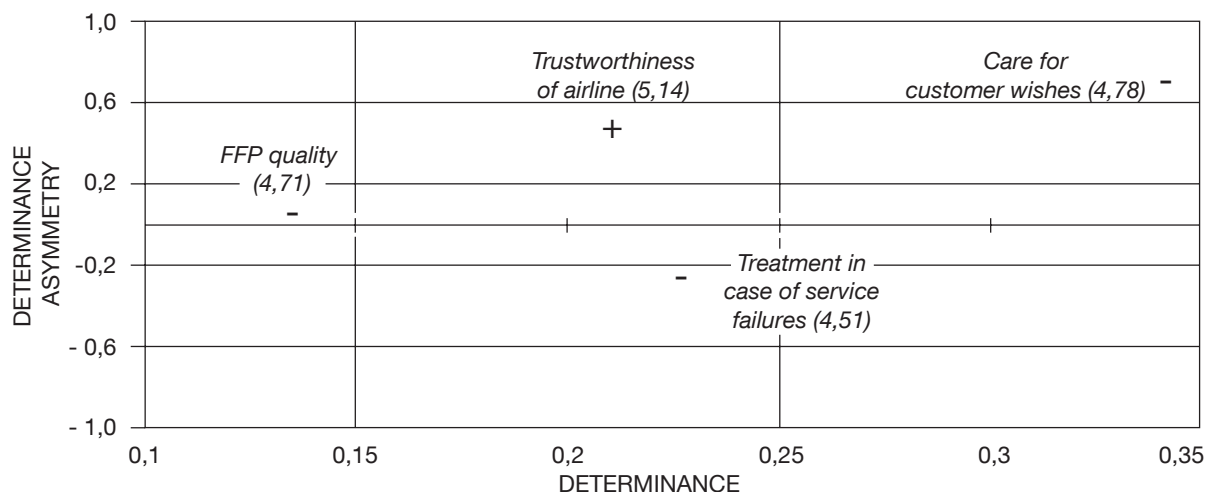
4. CONCLUSION

This study provided an interesting insight into the influence of the main airline service components on intentional passenger loyalty. A relevance-

determinance analysis revealed that the *offer of flights/destinations* is the most influential service-component in explaining passenger retention. The *relationship-experience* and the *flight-experience* emerged as service-components which also have a strong influence on IL, though they are perceived relatively less important by the passengers. Conversely, the *airport experience* and the *ticket purchase-experience* appeared as the least influential components in explaining IL, though the passengers stated them to be very important. In a subsequent analysis on the service-attribute level (i.e. the level of attributes forming the components), the study further revealed several significant asymmetric effects in the formation of passenger satisfaction with the particular service components.

Moreover, the authors of this study derived improvement priorities of airline service components, and service attributes forming the components. In fact, the proposed analytical framework could be described as an extended importance-performance analysis (Martilla and James, 1977), which uses the two most commonly used measures of attribute-importance, as well as it considers the existence of competitors in the market. Further advantages of the proposed approach are that it considers asymmetric effects in passenger satisfaction and loyalty, and the potential problem of multicollinearity in customer satisfaction data. The fact that a lack of awareness about these issues might result in misleading recommendations regarding service component/attribute prioritization, underpins the high managerial value of the framework.

Figure 8: DAA for relationship experience



REFERENCES

1. Anderson, E.W., & Mittal, V. (2000). Strengthening the satisfaction-profit chain. *Journal of Service Research*, 3, 2: 107-120.
2. Martilla, J.A., & James, J.C. (1977). Importance-performance analysis. *Journal of Marketing*, 41, 1: 77-99.
3. Mikulić, J., & Prebežac, D. (2008). Prioritizing improvement of service attributes using impact range-performance analysis and impact-asymmetry analysis. *Managing Service Quality*, 18, 6: 559-576.
4. Mikulić, J., & Prebežac, D. (2009). Developing service improvement strategies under consideration of multicollinearity and asymmetries in loyalty intentions—A study from the airline industry. Proceedings of the 11th International Conference QUIS-The Service Conference, Wolfsburg, Germany.
5. Myers, J.H., & Alpert M.I. (1977). Semantic confusion in attitude research: salience vs. importance vs. determinance. *Advances in Consumer Research*, 4: 106-110.
6. Smith, R. & Deppa, B. (2009). Two dimensions of attribute importance. *Journal of Consumer Marketing*, 26, 1: 28-38.
7. Taylor, S.A., & Baker, T.L. (1994). An assessment of the relationship between service quality and customer satisfaction in the formation of consumers' purchase intentions. *Journal of Retailing*, 70, 2: 163-178.
8. Van Ittersum, K., Pennings, J.M.E., Wansink, B., & van Trijp, H.C.M. (2007). The validity of attribute-importance measurement: A review. *Journal of Business Research*, 60, 1177-1190.
9. Zeithaml, V.A., Berry, L.L., & Parasuraman, A. (1996). The behavioral consequences of service Quality. *Journal of Marketing*, 60, April: 31-46.