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Biased Listing in Electronic Marketplaces - Evidence from the Online Hotel Distribution

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BIASED LISTING IN ELECTRONIC MARKETPLACES - EVIDENCE FROM THE ONLINE HOTEL DISTRIBUTION

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Abstract

In this study we investigate the phenomenon of biased listing. Biased listing describes the practice of listing items in search engines or market platforms according to criteria other than the normally expected ones (e.g. relevance or quality). We were able to access real booking data from the hotel distribution platform provider Hotel.de. Hotel.de offers different contract types that have a direct impact on the ranking of hotels in the search results pages presented to customers. By carrying out comparisons of hotel bookings before and after switching contract types we are able to show that biased listing has a significant impact on the number of bookings a hotel is able to draw from the platform. Our findings have implications for the market participants. For example, market providers, by engaging in practices of biased listing, are able to exploit their gatekeeper position by making hotels compete for listing positions on the platform.

Keywords: Biased listing, ranking, search, electronic marketplaces, hotel distribution, tourism.

1 INTRODUCTION

In this paper we investigate the phenomenon of biased listing in electronic marketplaces. Biased listing is the practice of listing items in market platforms according to criteria other than the normally expected ones (such as relevance, product quality or price). In electronic marketplaces, biased listing is the result of biased behaviour of the market provider who gives preference to some items listed on the platform at the expense of others. In our example, by listing hotels on his platform, the provider of a hotel booking platform gives priority to those hotels that signed up for a higher value contract than others. Hence, the market provider has given up neutrality by providing hotels with the opportunity to improve their listing by paying a listing fee. As a consequence, these hotels are ranked higher in the results lists that are provided to customers searching for hotels on the platform. The aim of this exploratory study is to investigate the effects of biased listing on the success of hotels listed in this manner. Consequently, the main research question is whether a higher ranking in the results list, secured by a hotel by means of signing a contract, affects the number of bookings that the hotel is able to draw from the platform.

Biased listing in electronic marketplaces is not a new phenomenon. However, to our knowledge no studies exist that investigate the effect using actual booking data. For our study we were able to access hotel reservation data provided by Hotel.de, which operates the second largest hotel online reservation portal in Europe (www.hotel.de). Hotel.de is especially interesting for this type of study since it offers a range of different contract types, each of which has a direct impact on the ranking of a hotel within the search results lists. These contract types were introduced gradually in a period from 2003 to 2006. We were able to access and analyse the complete record of hotel reservations for this period.

The purpose of our study was to explore whether biased listing has an effect on the success of the hotel suppliers listed on the platform. To this end, we analysed all hotels for the destination Berlin that have switched contract types during this period. Based on a comparative analysis of bookings before and after changing contract types we are able to show that contract choice and the corresponding listing effect have a significant impact on the bookings received through the platform. Hence, we are able to prove the existence of listing effects and to show that the ranking in the search results lists has a significant impact on the bookings received and thus on the success of the listed suppliers. We begin with a brief introduction of the phenomenon, before we introduce the case company Hotel.de. Then, we elaborate on the design of our study and derive a set of hypotheses that are subsequently tested using booking data. We interpret our results and discuss implications for the three market parties - the provider, the service suppliers (hotels) and the customers.

2 ELECTRONIC MARKETPLACES AND BIASED LISTING

Electronic marketplaces are platforms provided by intermediaries to enable the trade of goods and services on the Internet. Such intermediaries are especially important in markets with a highly fragmented supply side (Sen and King, 2003, 154), where they carry out aggregation functions in relation to both supplier and customer related information and thus can hold what is called an information gatekeeper position (see Baye and Morgan, 2001). Providers of electronic market platforms need not take an independent role (Kaplan and Sawhney, 2000, 102). Rather they can make the listing on their platform dependent on payments by the suppliers and thus give up their neutrality in dealing with market participants. The so originating distorted or biased listing is the main interest of our study. Practices of biased listing are most frequently found in information intensive industries like tourism or other service industries including the media industry or search engines.

The phenomenon of biased listing is as old as the idea of electronic marketplaces itself. However, the phenomenon still warrants empirical investigation using real data. Early examples of biased listing are found in the first electronic marketplaces, i.e. the computer reservation systems (CRS) of international

airlines. These systems (such as Sabre by American Airlines) have been used since the 1970s by travel agencies to carry out electronic reservations of flights (Farhoomand, 2000, 6). Being established by single airlines these systems gradually advanced to the first forms of electronic marketplace that listed air travel services by a range of competing airlines. The phenomenon of biased listing appeared at the beginning of the 1980s, when public investigations proved that the system operators' own flights were listed in the systems preferentially on the first few search results places, and that the providers thus used the systems in their own favour (Bakos, 1997, 23; Lee et al., 2000, 4). However, even after numerous investigations the resulting effects of this biased listing could only be estimated in the end (see William, 1994).

The consequences and effects of biased listing are still only poorly understood, in particular when it comes to the possible benefits for the listed suppliers. For the online hotel distribution Carrol and Siguaw deplore that the actual amount of bookings received by the hotels through listing programs is unknown, largely due to a lack of access to reservation data (Carroll and Siguaw, 2003, 45). From research on search engine usage we know that users prefer the top hits and in general the first page of a search results list (e.g. Spink and Xu, 2000, 4). Drawing on these findings, an effect of biased listing on the users' behaviour in electronic marketplaces and with it on the success of the listed suppliers can be assumed. However, up to now no studies exist investigating the effects of biased listing using real data. With our study we hope to make a contribution to filling this void.

3 THE CASE COMPANY HOTEL.DE

Hotel.de operates an online distribution platform for hotel services that offers customers the services of more than 180,000 hotels world wide. The company was founded in 1998 as a joint venture of German internet auction provider Atrada and hotel distributor Intergerma Marketing. With 0.718 million visitors Hotel.de was the highest ranking hotel distribution site in a study of Nielsen/Netratings from August 2005. In the following year Hotel.de was able to double the number of monthly visitors to approx. 1.5 million (as of July, 2006). On its platform Hotel.de sells a monthly total of 240,000 overnight stays with a volume of approx. 20 million. Hotel.de has more than 1.3 million registered customers with a daily growth rate of an additional 1,200 new customers.

3.1 Contract types

Hotel.de offers hotels three different contract types. Without a specific contract every hotel receives a basic listing on the web site (http://www.hotel.de) with photos and information about prices, rooms and geographic position of the hotel. Further services, especially in the form of an improved listing, are available through the choice of one of three contract types called *Basic*, *Premium* and *Preferred partnerships*. Hotels that choose *a Basic partnership* pay a commission fee of 8% on every booking and are listed in the search results page before all hotels without contract. For a *premium partnership* hotels have to pay an extra fixed listing fee of 25 per month. The advantage of this contract is that the hotels are listed before the Basic partners. In addition, Premium partners are allowed to add to their listing a hyperlink to their hotel homepage. Finally, the *Preferred partnership* brings about a listing on top of all hotels with a lower contract type. It entails the payment of a commission fee of 12% for every room booking sold through the platform. Besides improving the ranking, hotels with a Preferred partnership are also marked with a "Preferred partner" logo. Subsequently, when we talk about hotels with a specific contract type such as the Preferred partnership we simply refer to them as Preferred hotels. In addition to the three contract types, hotels can opt for what is called a *Bestprice Guarantee*. By agreeing to a Bestprice Guarantee (subsequently called BP guarantee or BP option) a hotel operator commits himself to always provide the lowest online prices through the Hotel.de platform. Hotels with a BP option are then marked with a "Bestprice" logo. If customers do find a better online price, the hotel agrees to compensate the customer.

3.2 Ranking of hotels

Taking into account the BP option, ranking of hotels in the Hotel.de search results pages is determined by the following steps:

1. Hotels are sorted in groups according to their contract types with Preferred hotels listed before Premium hotels listed before Basic hotels listed before all other hotels.
2. Hotels are then sorted within the three groups according to BP option with hotels having booked a BP option being listed before hotels without it.
3. Within the resulting sub groups hotels are ordered according to room rates in ascending order.

This is the default order presented to the customers. However, customers are not explicitly made aware of the way hotels are ranked in the results pages. While customers, by browsing through the pages or clicking on the "Preferred" logo, are able to learn about the nature of the ranking (e.g. that hotels marked as "Preferred partners" are listed on top of other hotels), they are not told that the ranking is the result of hotels paying for an improved listing, i.e. that the list is biased. Possible implications are discussed at the end of the paper.

Customers can override the contract-based ranking by re-ordering the results pages according to other criteria such as price or distance to a landmark (e.g. the airport). Unfortunately, no (log file) data is available from Hotel.de as to how often customers make use of this feature. Again, we will discuss implications of this aspect at the end of the paper.

4 STUDY DESIGN

The central question of our study reads as follows: Does the biased listing (which is essentially created by the contract types) impact on the booking behaviour of Hotel.de customers and with it on the success of the listed hotels? To explore the existence of such listing effects, our study had to focus on the investigation of the effects that the different contract types have on the number of bookings a hotel is able to draw on the platform. Specifically, it is a matter of answering if 1) the contract type chosen by a hotel (Basic, Premium and Preferred partnership) influences the number of bookings and 2) if hotels with a BP options draw more bookings than hotels without this contractual option. To be able to answer these questions with the available data some important design decisions had to be made.

4.1 Restriction of the study sample to one destination

In order to only measure the relationship between contract type and the number of bookings received through the platform we had to restrict our study to hotels from the same destination. Without a focus on one destination other factors, such as the general popularity of the destination or large public events taking place in one destination, might have compromised the results. To control for such background variables we restricted our sample to hotels from the destination Berlin. This choice was also motivated by the large number of Berlin hotels listed on the platform. In order to investigate biased listing and possible ranking effects, it seemed appropriate to select a destination for which the number of hotels results in lists that extend over several screen pages. The longer these search results lists are, the larger should be a potential influence of contract choice and the subsequent improvement in the ranking within these lists. For Berlin the results list for a standard search query "hotels in Berlin" currently covers about nine pages with 50 hotels each. Once a user chooses to restrict the search by zip code or suburb name the search results pages still extend over more than one to up to three pages.[1]

[1] While we expect this to happen frequently, unfortunately no data (e.g. from log files) is available from Hotel.de as to how often customers choose to use such a feature.

4.2 Restriction to hotels that changed their contract enabling before-after comparisons

The next important sampling decision was to only include hotels that have switched contract types during the period under consideration. By doing so, we were able to further exclude possible background variables from our study. For example, had we simply compared booking numbers of hotels with different contract types, it would have been possible that other variables like hotel size, reputation or the market power were responsible for the differences in booking numbers, simply because different hotels choose different contract types. To avoid such problems from the outset, we focused our analysis on hotels that have switched contract types. Fortunately, with the available data set we were able to carve out samples large enough to carry out this type of analysis.

Before-after comparisons of booking numbers allow us to isolate the impact that a contract change has on booking numbers and on hotel success on the platform. We were able to identify 66 hotels that switched contracts between Premium and Preferred and another 12 hotels that changed between Basic and Premium[2]; no hotels were identified that changed contracts directly between Basic and Preferred. In addition to this, 34 hotels with a Preferred contract changed their Bestprice option and a total of 112 hotels switched to or from BP option holding a Premium contract. Since the group of Basic hotels is very small, we were not able to identify a sample of hotels switching BP options that was large enough for statistical analysis.

4.3 Operationalisation of the dependent variable - introduction of the standardised booking level (SBL)

In order to carry out before-after comparisons of bookings for each hotel we had to develop a measure that consolidates all bookings in the periods before and after the contract change. Hence, we had to calculate two *booking levels* for every single hotel representing the mean number of individual bookings (per day) before and after the contract transition. The main problem with this approach was that hotels of course did not switch contracts all at the same time. By simply carrying out before-after comparisons of mean booking numbers we would have compared numbers that were drawn from different time periods. This is problematic, firstly because the total number of bookings on the platform is still growing significantly and, secondly because bookings are subject to seasonal influences. Depending on the point in time a hotel switches contracts the number of bookings before and after might be heavily influenced by these factors. Hence, to further improve measure validity, the *booking levels* before and after contract transition had to be standardised by way of normalisation. Since, on average, the above mentioned factors impact on all hotels of the destination equally, standardisation with the destination average can take out these effects from the measure. Hence, we calculated two figures for every hotel corresponding with the two contract types (before and after). Both figures are calculated on the basis of the exact contract periods of this hotel. We refer to this measure as the *standardised booking level (SBL)*; it reads as follows:

$$SBL(X_{contract}) = \frac{\sum_{\text{Contract start}}^{\text{Contract end}} \text{number of bookings of X per day}}{\sum_{\text{Contract start}}^{\text{Contract end}} \frac{\text{number of bookings for Berlin per day}}{\text{number of listed hotels for Berlin}}}$$

The SBL represents the relative booking level of a hotel *X* in relation to the average booking level of all hotels in Berlin. If the SBL of a hotel changes with a contract change, it means that the hotel benefits accordingly with an improvement of its booking level relative to the average of all Berlin

[2] In nearly all cases hotels upgraded from lower to higher contract. Occasionally a hotel is degraded to a lower contract, if they fail to pay their contract fee.

hotels. Through its design, an increase in SBL now truly reflects an immediate improvement brought about by the contract change.

While bookings in the Hotel.de system typically contain one or more room reservations, we further normalised the data by interpreting each room reservation as a separate booking. By doing so, we are able to level out differences in booking patterns between hotels that result from differences in booking behaviour of target groups such as business customers or tourists.

4.4 Two-step analysis by contract type and BP option

Using the SBLs we were then able to carry out the before-after comparisons in two steps. In the first step, all hotels that switched from Premium to Preferred or from Basic to Premium contracts were analysed. We essentially tested the following two-part hypothesis:

> *Hypothesis 1*: The contract type has a significant influence on the SBL.
>
> *Hypothesis 1a)*: The transition from Premium to Preferred contract induces a significant increase in the standardised booking level (SBL).
>
> *Hypothesis 1b)*: The transition from Basic to Premium contract induces a significant increase in the standardised booking level (SBL).

In the second step we examined the relationship between the BP option and the SBL in the two groups of Preferred and Premium hotels. Here, again a two-part hypothesis was tested:

> *Hypothesis 2*: The Bestprice (BP) option has a significant influence on the SBL.
>
> *Hypothesis 2a)*: The switching to a BP option induces a significant increase in the standardised booking level (SBL) among the hotels holding a Preferred contract.
>
> *Hypothesis 2b)*: The switching to a BP option induces a significant increase in the standardised booking level (SBL) among the hotels holding a Premium contract.

Please note: It was not possible to carry out combined analyses that differentiate by contract type and BP option at the same time (e.g. hotels switching from Premium without BP to Preferred with BP option), since the resulting sub groups would have been too small to carry out any statistical tests.

4.5 Inclusion of a control group of hotels that did not switch contracts

To further corroborate our results we included a control group of hotels that have not changed their contract type in the study period. The rationale for this is as follows: Should the contract transition and with it the improvement in ranking have a positive effect on the SBL of hotels that switch their contracts, and should at the same time the number of hotels with a higher value contract be growing (see figure 1), then we should be able to vice versa observe a drop in ranking and thus a reduction in SBL of those hotels that stay with a middle type contract. To investigate the existence of such a crowding-out effect we set up a control group of hotels that did not change their contracts. This group was drawn from the largest groups of hotels - those with a premium contract without BP option (see figure 1). The idea was to carry out a before-after comparison of the SBLs in the first half of the year 2005 and the second half of 2005. This led to the identification of the third hypothesis:

> *Hypothesis 3*: Premium hotels without BP option that did not change their contract throughout the year 2005 show a significantly lower SBL in the second half of the year than in the first half of the year.

5 DATA ANALYSIS

In order to test whether a change in contract type caused a change in the hotels' SBLs, we applied statistical tests to the samples of before and after SBL values. Since we had to test values of one variable (SBL) before and after a treatment (contract change), the two samples were dependent so that a *paired t-test* had to be applied. We tested its applicability by means of a *Kolmogorov-Smirnov Test*: For all five sample pairs the required goodness of fit was given.

5.1 Statistical tests

Table 1 shows the outcomes of the statistical tests for the five sample pairs that correspond with the five hypotheses introduced above. First, the respective sample sizes are shown. Obviously, the pairs for each sample have equal sizes, since both consist of the SBLs of the same hotels once before and once after the contract change. Second, the mean SBL values are provided for each sample. Finally, the standard deviations are shown as well as the significance levels of the t-tests (p-values). The paired t-test tests the null hypothesis that the two mean SBL values are equal. Since we expect a possible deviation to only occur in one direction - the SBL being higher after the contract change or lower for the control group in the second half of the year - the tests can be applied as one-tailed tests.

Hypothesis	*Contract change to/from*	*n*	*Mean SBL values (∅SBL)*	*Standard deviation (SD)*	*p-values*
1 a)	Preferred	66	1.8061	1.15044	0.000*
	Premium	66	0.8914	0.70061	
1 b)	Premium	12	1.0166	0.47963	0.000*
	Basic	12	0.2187	0.12513	
2 a)	Preferred with BP	34	2.6868	1.88982	0.248#
	Preferred without BP	34	2.3883	1.80599	
2 b)	Premium with BP	112	0.9178	0.77680	0.000*
	Premium without BP	112	0.6049	0.61330	
3)	Premium 2nd half of 2005	71	1.0260	0.25364	0.001*
	Premium 1st half of 2005	71	1.1678	0.28220	

* paired t-test: significant at the 0.001 level | # paired t-test: not significant; the two-sided significance is shown

Table 1. Results of the paired t-tests for the five hypotheses

Four of the five hypotheses were supported by the t-tests, all of which were highly significant at the 0.01 level (or better). Both parts of hypothesis 1 were supported, which points to a significant impact of the choice of contract on the booking success represented by the increase in mean SBL (see table 1). The results for hypothesis 2 are mixed: While hypothesis 2b) was supported proving a relationship between BP option and increase in SBL for the Premium hotels, the same relationship could not be confirmed for the hotels in the Preferred group (hypothesis 2a) was not supported). Hypothesis 3 was supported, which confirms the assumed crowding-out effect. The reasons for these results are discussed in the next section. As we will show, all results can be interpreted by a ranking rationale.

The following figure is provided for additional clarity. It shows the development of the number of Berlin hotels listed on the platform and the respective distribution of contract types among these hotels. The figure reflects the increase in the total number of hotels listed on the platform as well as the fluctuation towards higher value contract types.

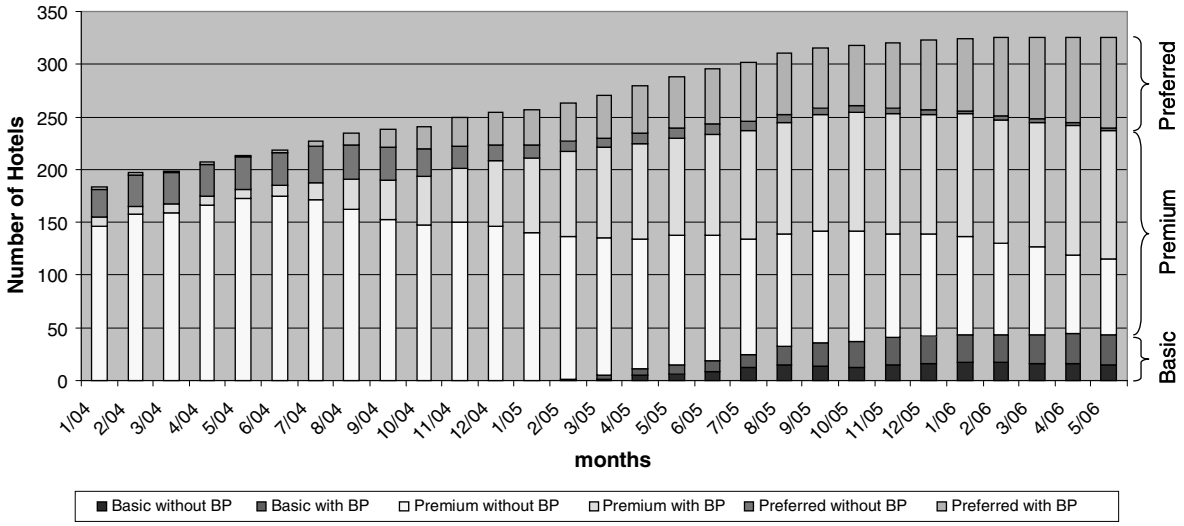

Figure 1. Development of listed hotels for Berlin and the respective contract types over time[3]

6 INTERPRETATION OF RESULTS

6.1 Support of hypothesis 1

Both parts of hypothesis 1 were supported. Hotels that change their contract from Premium to Preferred (on average) experience a significant increase in bookings relative to the other hotels in the destination. The reason for this can be found in a significant improvement in ranking brought about by the changing of contracts. For example, in the middle of 2006 a standard search for "hotels in Berlin" delivered a results list that was over eight pages long. Preferred hotels were listed on the first two pages, Premium hotels from the bottom of page two through to page seven and the basic hotels further down the order. Consequently, a hotel that decided to change its contract from Premium to Preferred realised an improvement of up to five results pages and was then listed on page one or two (depending on whether the hotel also held a BP option and depending on the lowest available room rate). Until the end of 2004 this change would have taken the hotel straight to the first page due to the lower number of hotels with a Preferred contract at that time. The transition from Basic to Premium contract has a similar impact. In 2006, in the best scenario, a hotel improved its listing from page seven to page two.

6.2 Mixed results for hypothesis 2

Contrary to hypothesis 1, only one part of hypothesis 2 was supported. Consequently, no unequivocal relationship between the BP option and an increase in booking level can be identified. No significant impact of the BP option was found for the Preferred hotels (hypothesis 2a). At first, the mixed result was surprising. However, on closer examination we were able to explain the results with the particular nature of the ranking effects resulting from the contract changes in the two sub groups. The reason for the insignificant increase in SBL in the Preferred group lies in the fact that for these hotels the switching to a BP option did not result in a significant improvement in their ranking. Instead, by switching to the BP option, they were only able to hold their listing position over time: Nearly all

[3] Please note: In this figure only those hotels are included that hold a contract with Hotel.de and for which the exact contract period could be identified. The total number of listed hotels is higher (slightly over 400 in May 2006). Hence, the figure does not allow for the identification of the exact number of search result pages that a hotel was able to gain by switching contracts.

Preferred hotels opted for a BP guarantee over the course of the two and a half years under consideration. While almost all Preferred hotels were listed without a BP option at the beginning of 2004 all but two had switched to Bestprice by the middle of 2006. Hence, hotels that switched to a BP option ultimately only prevented a drop in the ranking. However, the situation is different for the Premium hotels. Here, a comparatively high increase in ranking positions could be realised by changing to the BP option. For example, in May 2006 a Premium hotel without BP option was able to jump from the lower half of the results list (e.g. page five to seven) as high as up to page three or even to the bottom of page two.

6.3 Hypothesis 3 (control group) supported

The control group for this study was made up of 74 hotels that were all available on the platform during the complete year 2005 and that stayed with a Premium contract without BP option throughout the period. Hypothesis 3 assumes a crowding-out effect for these hotels caused by a gradual switching of other hotels to contract types with a higher ranking, which should lead to a subsequent decrease in ranking of hotels in the control group. The crowding-out can again be explained by the ranking effect: In January 2005 only 116 hotels were listed before the 74 control group hotels. At the beginning of the second half of 2005 however, this number had increased to 170 hotels, and it increased further to a total of 209 hotels at the end of 2005. Consequently, the control group hotels lost almost two ranking pages for a general search query.

6.4 Summary of results

In summary, our results support the hypothesis that the ranking of a hotel on the Hotel.de platform, which is based on contract type, has a significant impact on its booking success. More specifically, it can be argued from our data that the higher a hotel is promoted in the listing by a change in contract the bigger is the improvement in booking level. At the same time, an improvement on an already high level, as was the case in hypothesis 2a), does not translate into a significant increase in booking level. Furthermore, we can demonstrate that the competition for ranking positions leads to a crowding-out of those hotels that do not change their contract over time. Here, a loss of ranking positions goes along with a decrease in bookings. In combination, we are able to prove the existence of listing effects and their immediate impact on the success of the listed hotels.

7 DISCUSSION AND IMPLICATIONS

7.1 Customer behaviour as the cause of listing effects

A core finding of our study is that the ranking of a hotel in the search result pages has a significant impact on the number of bookings that the hotel is able to draw on the platform. Ultimately, the cause for this effect is to be found in the behaviour of customers who obviously prefer hotels listed at the top of the results lists. This is consistent with findings from research on user behaviour in information search, where it is well documented that most searchers only take into account the first few entries of a search results list (Jansen and Resnick, 2006; Sen, 2005; Spink and Xu, 2000). While users might miss out on relevant information, it has been argued that the users might not be able or willing to find the optimal entries within the wealth of information presented to them (Tonta, 2005, 4). Rather they quite often express feelings of information overload (Sugiyama et al., 2004, 676). In a typical search results list provided by Hotel.de the user first sees a list of Preferred hotels. These hotels usually show enough variance in terms of typical search criteria such as size, price, quality etc. Hence, we can assume that a majority of users is able to find a suitable hotel in this group that matches to a certain degree with what they are looking for. Consequently, they are able to make a decision without browsing to the following pages of the results list, thus creating the ranking effect we identified in our study.

7.2 Implications for the intermediary

Our findings reveal interesting insights on the role of the intermediary Hotel.de in the relationship between hotels and the customers. From the growing number of bookings on the platform over the last years, it is obvious that Hotel.de has overcome its critical mass and thus further attracts more participants on both the customer and supplier side (Kollmann, 2001). By way of these positive network effects (Bhargava and Choudhary, 2004), an intermediary like Hotel.de becomes an indispensable player in the marketplace (Anderson and Anderson, 2002, 59). From the point of view of the hotels, this means that they cannot pass on a listing on the Hotel.de platform if they want to reach the growing number of customers that is using the platform. However, on the platform they face an increasing competition due to the growing number of listed hotels; this competition is further fuelled by the price transparency created by the marketplace (Carroll and Siguaw, 2003, 46).

Platform success in combination with market fragmentation on the supply side and the hotels competing for customer attention puts the platform provider in a comfortable position for contract negotiations (Carroll and Siguaw, 2003, 44). Consequently, Hotel.de can use its gatekeeper position to engage in practices of biased listing by making hotels compete for listing positions on the platform. Obviously, this is an additional way for the intermediary to generate income and to skim off customer dividend (Bhargava and Feng, 2002, 122). By way of introducing this listing competition, Hotel.de is better able to elicit the individual willingness to pay of the individual hotel. Hotels can opt for a higher value contract in order to improve their current listing or risk a steady decline in listing positions and booking numbers, as we demonstrated with the crowding-out effect. At the same time our findings suggest that, due to the competition on the platform, a listing improvement might only be temporary; in fact, switching to a higher contract might be necessary to preserve the status-quo (hypothesis 2a).

The intermediary can use this situation to further differentiate its contractual options in order to exploit the hotels' differences in willingness to pay. By inventing new contract types Hotel.de is able to further improve its financial position in the triad between customer and supplier. Interestingly, since the collection of our data Hotel.de already introduced a new contract type called "Preferred select", which guarantees three hotels in each region the top three listing positions. In summary, by finding out about the nature and effect of biased listing we are able to reinterpret the role of the intermediary as being one of a gatekeeper with the power to use competition among suppliers for its own benefit.

7.3 Implications for hotels

Given the discussion so far, a vital question is whether or not it is a reasonable decision for hotels to get listed on the Hotel.de platform. With the growing number of listed hotels competition on the platform increases and at the same time the individual benefit for the single hotel diminishes (Bhargava and Choudhary, 2004, 34); this translates into negative network effects from the point of view of the hotels (Yoo et al., 2003, 45). However, the hotels face a dilemma: Given the success of the platform, they might not be in a position to abstain from a listing. On the other hand, with the contract types Hotel.de has created an effective instrument for the hotels to actively confront competition and move ahead of competitors. However, the question which contract type and option are best for a particular hotel can only be answered by taking into account the additional hotel data and booking patterns. The same holds true for the decision as to what extent a hotel should take part in the race for the best listing positions ('rat race') initiated by the invention of new contractual options.

7.4 Implications for customers

On the Hotel.de platform, customers are not made aware of the biased listing, e.g. that hotels pay for being listed as Preferred partners. When we take into account typical customer behaviour (see above), it becomes clear that customers do not receive the objectively best service quality on the platform. When making their selection from the first pages they will assume to draw from a selected list of high

quality ("preferred") hotels, while in fact they are likely to miss out on equally good suppliers that are listed further down the order, but which did not pay for a Preferred listing.

From research on search engine marketing we know that customers fundamentally mistrust the paid placement of search results (Feng et al., 2003; Jansen and Resnick, 2006; Sen, 2005). The main difference to our case is that in search engines these results are clearly marked as "sponsored links" or "advertisements". Studies reveal a systematic aversion for sponsored links (Sen, 2005, 22). We can only speculate what the implications might be for Hotel.de, if the customers were to learn about the nature of biased listing on its platform. If customers get the impression that the results listings only serve the interests of the intermediary and the suppliers, they might lose trust in the platform. Ultimately, a public discussion and a change in customer behaviour might undermine Hotel.de's strategy and business model. The gatekeeper position depends on the existence and working of the biased listing, which is dependent on customer trust and the already discussed customer behaviour.

8 LIMITATIONS OF THE STUDY

The main limitation of our study is the lack of log file data to further analyse user behaviour on the Hotel.de web site. Consequently, some issues have to remain vague. First and foremost, log file data could help to separate the above discussed ranking effect from a possible additional marking effect that stems from the marking of hotels with Preferred and Bestprice logos. We do not know how often customers reorganise the results pages and thus make their choice based on a list that is not ranked in the discussed order anymore, but still shows the logos. Our data analysis clearly shows that biased listing on the Hotel.de platform exists and that it has a positive effect on the booking levels of hotels. It seems plausible that the effect stems largely from the ranking effect. For example, the Premium hotels are still favoured over Basic hotels although no additional marking is involved. However, it would be interesting to see if there is an additional influence of the marking and whether there are differences in the two logos (Preferred and Bestprice). At any rate, impact and implications of biased listing as identified above stay the same even if a marking effect was to contribute to it. Second, log file data might tell us about how often customers carry out a regular search for "hotels in Berlin" and how often they specify their query using zip code or suburb names. Such data could be helpful in further differentiating our interpretation above. Finally, no data is available on how many customers defect from the platform to hotel homepages via the link provided with the Premium and Preferred contracts. Bookings received by way of switching are not included in our data, but would further contribute to the effect of biased listing.

9 CONCLUSION

In this study we were able to explore, prove and demonstrate the existence of biased listing in an electronic hotel distribution marketplace and to illustrate the resulting effects for the listed hotels. Using a study design that allowed us to carry out comparisons of hotel bookings before and after changing contract types we were able to show that the biased listing on the platform Hotel.de, affected by the contract type, has a significant impact on the number of bookings a hotel is able to receive.

Our findings have implications for the market parties. The study reveals that cybermediaries, who are able to overcome critical mass and to establish themselves as indispensable players in the marketplace, move into a beneficial gatekeeper position. By engaging in practices of biased listing they are able to exploit this position by generating income and eliciting the willingness to pay of the market parties, in our case the suppliers. The suppliers on the other hand face the dilemma that with a growing platform success they might not be able to pass on a platform listing; at the same time, to stay ahead in the competition on the platform, they might have to pay an ever increasing listing fee to the platform provider who keeps inventing new contractual options in order to improve its income from biased listing. Finally, in our case, customers are largely left unaware of the biased listing. The main issue

here is that diminishing customer trust and a change in customer behaviour might potentially threaten the provider's business model, which is based on the success of biased listing.

As indicated above, our results on biased listing and its causes can be linked to research in other domains, e.g. the search engine market. Furthermore, Hotel.de is a typical e-marketplace provider that offers listing services to suppliers and booking capabilities to customers. Hence, our findings on the impact of biased listing should be transferable to other electronic marketplaces and their providers. Future research should try to replicate our study in other domains. In addition, experimental research might be conducted to corroborate our findings with analyses of users dealing with biased results lists.

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