Competition and Markets Authority: Response to Call for Information for Online Reviews

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Consultation response from the

Centre for Competition Policy

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This consultation response has been drafted by a named academic member of the Centre, who retains responsibility for its content.

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Background and context

The call by the CMA for information about the use of online reviews is to be welcomed. In the growing context of the digital economy, online reviews play a crucial role in reducing information asymmetry for consumers and for rewarding businesses that focus on customer satisfaction. This response to the call for information is centred on the issue of online review manipulation with a particular emphasis on the travel industry using recent research I and others have undertaken at the Centre for Competition Policy (CCP) and Norwich Business School at the University of East Anglia. The response will focus on point (2) of section 5.2 of the information call targeting *hotels and holidays*.

Based on our research we argue that review sites, particularly the ones which provide travel bookings are prone to manipulation by either the hotel owners (upwards-manipulation) or their competitors (downwards-manipulation) and in particular we explore how these practices can mislead travellers in their accommodation bookings. We draw on a large online review dataset using a methodology we have developed and outlined in Markellos et al [1]. Our analysis is based on the dataset of Korfiatis and Poulos [2] and contains in total 1.78 million reviews for major travel destinations across the globe. CCP would be glad to discuss with the CMA how these findings might be used to make online booking sites (and in general review aggregators) more resilient to manipulation by businesses that use them.

Online reviews are prone to manipulation

Figure 1 depicts a varied seasonality effect on the average star rating where the average review score (Scale from 1 to 10) grows alongside the supply of reviews on a dataset collected by a popular online booking site.

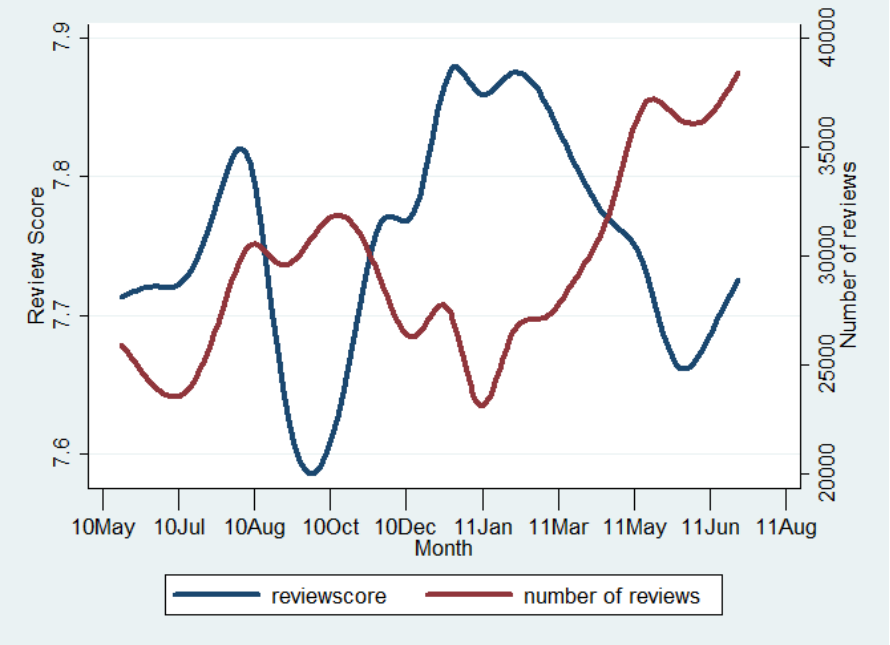

Figure 1: Time series of the average star rating (reviewscore) and number of reviews in the dataset of Poulos and Korfiatis [2]. Star rating ranges from 1 to 10 stars and depicts the moving average between May 2010 and August 2011.

We believe that some hotel owners are aware of the manipulation possibilities that online booking websites provide. While the majority of them introduce a safe-lock by allowing only customers who booked through the website to provide a review ex-post, the safe-lock can be bypassed by the so-called offline payment mode (pay at the hotel once they arrive), making it possible for manipulative agents to enter the system and post reviews on behalf of the hotel owner. The booking website is going to charge a percentage of the offline paid booking price which can be the entry cost sponsored by the hotel owner to the manipulative

agents. Using the technique outlined in [1] we are able to identify a manipulation strategy that uses the technique of "ballot stuffing". This happens due to the fact that online booking websites (as well as the majority of other review hosting websites) depict the average star rating of review star ratings (r) by using the standard mean estimator as:

$$\bar{r} = \frac{1}{N}\sum_i r_i$$

For this estimator a manipulation strategy using ballot stuffing involves the use of a single or more manipulative agents in a coordination scheme. If the hotel owner coordinates an effort to provide N_f fake reviews at time point t then the effect of a genuine review on the average star rating will be $1/(N_f + 1)$. Since the N_f has to be relatively large in order to minimize the effect of a genuine review, the manipulative process will need to have a certain time duration which we are able to evaluate using the methodology outlined in [1]. The hotel owner has a high incentive for t to be as early as possible in the service season in order to better influence the decision of prospective clients.

In addition, ballot stuffing manipulation can be achieved without manipulative agents by showing preferential treatment (service discrimination) to customers arriving early in the season since their review will be more influential than of those customers that arrive later.

Based on our research, we would encourage the CMA to focus on examining how offline bookings and early season bookings can be used for review manipulation and consider asking the booking websites to introduce stricter procedures for examining whether the offline-paid reviews are genuine or not. A particular issue is how to introduce better review aggregation. One approach can be the consideration of seasonality adjusted average star ratings (considering only the last 30 or so reviews) which can act as a possible way to dis-incentivize hotel owners from utilizing the above described manipulation technique.

I would be happy to discuss my research and related issues further should the CMA be interested.

References

1. Markellos, R., Vlastakis, N., and Korfiatis, N. (2014). A Time Series Analysis of Online Review Market Microstructure. Proceedings of the INFORMS Marketing Science Conference. Baltimore, USA. (Abstract available online: http://tinyurl.com/og38cup)
2. Korfiatis, N., & Poulos, M. (2013). Using online consumer reviews as a source for demographic recommendations: A case study using online travel reviews. Expert Systems with Applications, 40(14). http://dx.doi.org/10.1016/j.eswa.2013.03.046