**References**

1. Leberknight, C.S., Sen, S., Chiang, M. (2012). On the Volatility of Online Ratings: An Empirical Study. In: Shaw, M.J., Zhang, D., Yue, W.T. (eds) “*E-Life: Web-Enabled Convergence of Commerce, Work, and Social Life”*. WEB 2011. Lecture Notes in Business Information Processing, vol 108. Springer, Berlin, Heidelberg. <https://doi.org/10.1007/978-3-642-29873-8_8>

Abstract:

Many online rating systems represent product quality using metrics such as the mean and the distribution of ratings. However, the mean usually becomes stable as reviews accumulate, and consequently, it does not reflect the trend emerging from the latest user ratings. Additionally, understanding whether any variation in the trend is truly significant requires accounting for the volatility of the product’s rating history. Developing better rating aggregation techniques should focus on quantifying the volatility in ratings to appropriately weight or discount older ratings. We present a theoretical model based on stock market metrics, known as the Average Rating Volatility (ARV), which captures the fluctuation present in these ratings. Next, ARV is mapped to the discounting factor for weighting (aging) past ratings and used as the coefficient in Brown’s Simple Exponential Smoothing to produce an aggregate mean rating. This proposed method represents the “true” quality of a product more accurately because it accounts for both volatility and trend in the product’s rating history. Empirical findings on rating volatility for several product categories using data from Amazon further motivate the need and applicability of the proposed methodology.

1. Li, Xinxin, and Lorin M. Hitt. “*Price Effects in Online Product Reviews: An Analytical Model and Empirical Analysis.*” *MIS Quarterly*, vol. 34, no. 4, 2010, pp. 809–31. *JSTOR*, [https://doi.org/10.2307/25750706. Accessed 9 Dec. 2023](https://doi.org/10.2307/25750706.%20Accessed%209%20Dec.%202023).

Abstract:

Consumer reviews may reflect not only perceived quality but also the difference between quality and price (perceived value). In markets where product prices change frequently, these price-influenced reviews may be biased as a signal of product quality when used by consumers possessing no knowledge of historical prices. In this paper, we develop an analytical model that examines the impact of price-influenced reviews on firm optimal pricing and consumer welfare. We quantify the price effects in consumer reviews for different formats of review systems using actual market prices and online consumer ratings data collected for the digital camera market. Our empirical results suggest that unidimensional ratings, commonly used in most review systems, can be substantially biased by price effects. In fact, unidimensional ratings are more closely correlated with ratings of product value than ratings of product quality. Our findings suggest the importance for firms to account for these price effects in their overall marketing strategy and suggest that review systems could better serve consumers by explicitly expanding review dimensions to separate perceived value and perceived quality.

1. A. J. Flanagin, M. J. Metzger, R. Pure and A. Markov, "*User-Generated Ratings and the Evaluation of Credibility and Product Quality in Ecommerce Transactions.*" *2011* 44th Hawaii International Conference on System Sciences, Kauai, HI, USA, 2011, pp. 1-10, doi: 10.1109/HICSS.2011.474

Abstract:

This 2 × 2 experimental study (N = 196) tested the effects of source expertise and opinion valence in readers’ comments on the credibility of an online news story about genetically modified organisms (GMOs). Source expertise had a significant influence on perceptions of article credibility; articles were judged more credible when public comments embedded in the story were from expert sources (e.g., scientists) rather than nonexpert sources (e.g., Twitter users). Effects were larger on high-frequency news users, regardless of whether comments were for or against GMOs. Results suggest that Internet users mainly use the peripheral or heuristic route of information processing to evaluate online news credibility. The importance for online journalism of social heuristics via opinions of other people is discussed.

1. I. Bubanja and M. Vidas Bubanja, "*Managing trade transactions in the covid era: The rise of e-commerce.*" Journal of Engineering Management and Competitiveness *(JEMC)*, vol. 12, no. 1, pp. 20-34, 2022, doi: [10.5937/jemc2201020B](https://doi.org/10.5937/jemc2201020B).

Abstract:

The COVID-19 pandemic has widespread and long-lasting implications for the global economy causing general economic stagnation and crisis. Different industries and sectors strive to maintain the functioning of their business and stimulate companies to increasingly rely on the potential and power of digital technologies and network communications. In the trade sector, there was raising awareness about the importance of digitization and leveraging digital commerce as a strategic investment and competitive advantage. More and more trade companies started looking at digital channels not as an addition to their physical location but as a strategic source of long-term, sustained growth, which proved to be a significant boost for e-commerce all over the world. In this paper, B2B and B2C e-commerce segments are analyzed including current trends and dynamics, management of new business models, and expected implications of the latest digital technology innovations. Investments in new digital technologies tools and solutions in e-commerce had been driven by the need for frictionless shopping, personalization, and improved operational efficiency required by new-age customers. Experiences of the Serbian economy in e-commerce transactions are analyzed as well.

1. B. J. Gao and F. Medjo, "*Statistical Correction of Average Customer Ratings for Product Ranking.*" *2019* IEEE International Conference on Big Data (Big Data), Los Angeles,CA, USA, 2019, pp. 6052-6054, doi: 10.1109/BigData47090.2019.9006581

Abstract:

Many e-commerce websites allow customers to contribute product ratings and reviews. Such customer feedback can be used to rank products and make recommendations. As a standard approach, products are typically ranked by their average customer ratings. A problem of this approach is that average ratings based on small samples exhibit very little statistical confidence. They can differ significantly from true average ratings resulting in misleading rankings of products. In this paper, we investigate a systematic approach that applies statistical correction to average customer ratings leading to more robust rankings of products. We also implement the approach with the Yelp API to demonstrate its utility.

1. Mousavi, J., Singh, S. N., Chatterjee, P., & Masters, T. (2023*). “EXPRESS: Unveiling Stars: How Graphical Displays of Online Consumer Ratings Affect Consumer Perception and Judgment.”* Journal of Marketing Research, 0(ja). <https://doi.org/10.1177/00222437231179186>

Abstract:

Prior research has indicated that consumers’ decisions are significantly influenced by online reviews. However, existing research has focused mainly on attributes (e.g., average ratings) that are not fully controlled by firms; only limited research has investigated how controllable attributes (e.g., review display formats) affect consumers. Drawing on visual perception research, the authors examine the effectiveness of two prominent graphical display formats used by major e-commerce platforms—one that displays rating distributions in a proportional format (e.g., Amazon) and one that does so in a simple format (e.g., Google). The results indicate that due to the changes in graphs’ reference points caused by the shrunken x-axis in simple bar graphs, consumers respond more positively to an item when its rating distribution is displayed in a graphically simple (vs. proportional) format. This effect is moderated by the distribution’s peak value (i.e., the share of the most frequent rating) and imbalance score (i.e., the difference between the share of positive and negative ratings). Furthermore, even an item’s future ratings are influenced by the graphical format in which its prior ratings are displayed. The contributions to the marketing literature are discussed, and insights that can aid managers in making more informed decisions are provided.

1. Monic Sun, (2011) How Does the Variance of Product Ratings Matter?. Management Science 58(4):696-707. <https://doi.org/10.1287/mnsc.1110.1458>

Abstract:

This paper examines the informational role of product ratings. We build a theoretical model in which ratings can help consumers figure out how much they would enjoy the product. In our model, a high average rating indicates a high product quality, whereas a high variance of ratings is associated with a niche product, one that some consumers love and others hate. Based on its informational role, a higher variance would correspond to a higher subsequent demand if and only if the average rating is low. We find empirical evidence that is consistent with the theoretical predictions with book data from Amazon. com and BN. com. A higher standard deviation of ratings on Amazon improves a book's relative sales rank when the average rating is lower than 4.1 stars, which is true for 35% of all the books in our sample.

1. A. J. Flanagin, M. J. Metzger, R. Pure and A. Markov, "User-Generated Ratings and the Evaluation of Credibility and Product Quality in Ecommerce Transactions," 2011 44th Hawaii International Conference on System Sciences, Kauai, HI, USA, 2011, pp. 1-10, doi: 10.1109/HICSS.2011.474.

Abstract:

This 2 × 2 experimental study (N = 196) tested the effects of source expertise and opinion valence in readers’ comments on the credibility of an online news story about genetically modified organisms (GMOs). Source expertise had a significant influence on perceptions of article credibility; articles were judged more credible when public comments embedded in the story were from expert sources (e.g., scientists) rather than nonexpert sources (e.g., Twitter users). Effects were larger on high-frequency news users, regardless of whether comments were for or against GMOs. Results suggest that Internet users mainly use the peripheral or heuristic route of information processing to evaluate online news credibility. The importance for online journalism of social heuristics via opinions of other people is discussed.

1. Gasimli, Vasif ‘The Informational Role of Average Rating and Variance of Customer Ratings in the Differential Patterns of Consumer Behavior’. 1 Jan. 2020 : 1 – 10.

Abstract:

BACKGROUND:Different preferences of the customers and their product judgments have been widely neglected in the literature despite their significant influence on decision-making. Hence, decision-makers must recognize customers’ rating evaluations based on their satisfaction that interact with their different behaviours (quality- and prestige-seeking). OBJECTIVE:Our objective was to ascertain the different behaviors of the customers that influence their product judgment in ratings which change the informational role of the ratings. METHODS:This study was empirically conducted based on survey results from 20000 mobile phone customers and showed their different behaviours in their rating evaluations by using a non-recursive SPSS model. RESULTS:The results of our study reveal that: the rating evaluation of quality-seeking customers is carried out with a higher average rating and a lower variance, for prestige-seeking customers are carried out with a higher average rating and a higher variance. Overall, the variance of ratings distribution varies towards two groups of the customers while their ratings evaluations carried out with similar average ratings, in the context of customers’ rating evaluation and their different behaviour. CONCLUSIONS:This study has provided preliminary evidence for different behavioral customer rating evaluations which is crucial in both business owners and potential consumers’ decision-making process.

1. Hossein A. Rahmani, Mohammad mehdi Naghiaei, Mahdi Dehghan, and Mohammad Aliannejadi. 2022. Experiments on Generalizability of User-Oriented Fairness in Recommender Systems. In Proceedings of the 45th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR '22). Association for Computing Machinery, New York, NY, USA, 2755–2764. <https://doi.org/10.1145/3477495.3531718>

Abstract:

Recent work in recommender systems mainly focuses on fairness in recommendations as an important aspect of measuring recommendations quality. A fairness-aware recommender system aims to treat different user groups similarly. Relevant work on user-oriented fairness highlights the discriminant behavior of fairness-unaware recommendation algorithms towards a certain user group, defined based on users' activity level. Typical solutions include proposing a user-centered fairness re-ranking framework applied on top of a base ranking model to mitigate its unfair behavior towards a certain user group i.e., disadvantaged group. In this paper, we re-produce a user-oriented fairness study and provide extensive experiments to analyze the dependency of their proposed method on various fairness and recommendation aspects, including the recommendation domain, nature of the base ranking model, and user grouping method. Moreover, we evaluate the final recommendations provided by the re-ranking framework from both user- (e.g., NDCG, user-fairness) and item-side (e.g., novelty, item-fairness) metrics. We discover interesting trends and trade-offs between the model's performance in terms of different evaluation metrics. For instance, we see that the definition of the advantaged/disadvantaged user groups plays a crucial role in the effectiveness of the fairness algorithm and how it improves the performance of specific base ranking models. Finally, we highlight some important open challenges and future directions in this field. We release the data, evaluation pipeline, and the trained models publicly on