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Platform Economy: Beyond the Traveled Paths

David Dann · Timm Teubner · Sunil Wattal

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1 Platform Economy

Digital platforms and services are ubiquitous in our daily lives. They enable a wide range of social and economic activities and, arguably, represent a major part of today's e-commerce landscape (Hesse et al. 2022; Mittendorf et al. 2019; Zimmermann et al. 2018). With billions in venture capital and significant market evaluations, multi-sided online platforms have emerged as viable alternatives to traditional media channels and business models. As of 2022, examples include:

- Electronic commerce (e.g., *Amazon*, *eBay*, *Zalando*, *Etsy*),
- Accommodation sharing (e.g., *Airbnb*, *Homestay*),
- Real estate (e.g., *Booking.com*, *ImmobilienScout24*),
- Mobility (e.g., *Getaround*, *BlaBlaCar*, *Uber*, *Lyft*, *Zipcar*),
- Freelancing (e.g., *Upwork*, *Fiverr*, *99designs*, *Freelancer*),
- Manual work (e.g., *Helping*, *TaskRabbit*, *MyHammer*),
- Micro tasks (e.g., *Amazon Mechanical Turk*, *Clickworker*),
- Career and job search (e.g., *Indeed*, *Monster*, *Glassdoor*),

- Temp work & jobbing (e.g., *Zenjob*, *InStaff*),
- Food delivery (e.g., *Deliveroo*, *Uber Eats*, *Just Eat*),
- Research recruiting (e.g., *Prolific*, *Qualtrics*),
- Dating (e.g., *Parship*, *Tinder*, *Bumble*),
- Review sites (e.g., *Kununu*, *Jameda*, *TripAdvisor*, *Yelp*, *Google Maps*),
- Appointment management (e.g., *Doctolib*, *OpenTable*),
- App marketplaces (e.g., *Google Play*, *App Store*),
- Price comparison (e.g., *Idealo*, *Verivox*, *Check24*),
- Crowd funding (e.g., *Patreon*, *Kickstarter*, *GoFundMe*, *Indiegogo*),
- Crowd investing (e.g., *Companiso*, *AngelList*),
- Crowd lending (e.g., *PeerBerry*, *Zopa*, *Ratesetter*, *Funding Circle*, *Auxmoney*),
- Video streaming (e.g., *Youtube*, *Twitch*, *Vimeo*),
- Music streaming (e.g., *Spotify*, *Apple Music*, *Deezer*),
- Games marketplaces (e.g., *Steam*, *Epic Games Store*),
- Knowledge exchange (e.g., *StackOverflow*, *Quora*),
- Social and professional networks (e.g., *Facebook*, *Instagram*, *TikTok*, *Twitter*, *LinkedIn*, *Xing*),

and many more. Not only in consumer-facing applications such as ride sharing or online review sites but also within and across firms, digital platform concepts are widely being used for the provisioning of technology infrastructure and provide benefits such as increased efficiency, productivity, and innovation. All these platforms and businesses hence impact society in many ways. As a result of this marketization (and *platformization*), platforms' design choices and algorithms affect our lives in many ways as they – deliberately or not – set the rules for our social and economic interactions.

By and large, the literature agrees that *trust* represents one of, if not *the* most important factor within this platform economy. To create the necessary levels of trust between

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service providers and consumers, platforms make use of a broad variety of mechanisms and features (Hesse et al. 2020). Before focusing on this Special Issue's papers, we would like to explore the matter of online trust from the perspective of *online ratings* and take a brief look at rating *valence* and *volume*.

2 Non-linearity of Online Reputation

The power of reputation systems roots in the fact that online markets are governed by information asymmetry (Teubner et al. 2020). Hence, information on the past behavior of an actor in the form of a specific rating score can reduce this asymmetry and the associated risks for the less informed side (usually the consumer). As this approach attempts to infer future behavior from past behavior, it can be understood as a backward-looking approach to engendering trust. There is, however, also a forward-looking approach as malicious behavior is likely to be sanctioned. Hence, the very presence of a reputation system can have a disciplining effect. Previous work has repeatedly shown that online reputation represents a tangible economic asset in a variety of markets. Specifically, valence (i.e., quality) and volume (i.e., quantity) are usually found to have positive effects on various outcome variables – including sales (Ke 2017a; Lee et al. 2015), clicks (Ke 2017b), enforceable prices (Ert et al. 2016; Neumann and Gutt 2017; Teubner et al. 2017), trusting beliefs (Lee 2015; Zervas et al. 2021), or stated purchase intentions (Abramova et al. 2017; Dann et al. 2020).

When investigating the effects of online reputation, most research implicitly assumes a linear effect on outcomes. Here, we want to lay out the idea that this may not always be the case and that – when it comes to online reputation – *more* (i.e., more reviews, higher scores) may not always be better. To understand this, let us first take a look at how the effects of rating volume and valence are usually conceptualized.

First, the mechanism behind the positive effect of rating valence (i.e., higher scores) is mostly straightforward. A product (or an actor) with excellent ratings has demonstrated high quality (decent behavior) in the past, and there is usually no reason to assume this to discontinue. Quite to the contrary, the higher the standing rating score is, the higher the incentive for the owner to maintain it, as there is simply more to lose. In this sense, an Airbnb host that drops from a 4.5 to a 3.5-star rating is almost inevitably faced with not receiving any more booking requests and, consequently, being excluded from the market (Teubner and Glaser 2018; Zervas et al. 2021).

Second, review volume speaks to the popularity of a product (social proof), the experience of an actor, but also

to the *reliability* of the score itself (Salganik and Watts 2008). In that sense, a – say – 4.6 star-rating based on 275 reviews is more reliable than the same 4.6-star rating based on 5 reviews as, from a statistical point of view, the score's standard error is inversely proportional to the square root of the number of underlying reviews (i.e., canceling out natural variation). Moreover, an average score based on many ratings is also less likely to be subject to deliberate manipulation (i.e., fake reviews) as these can be assumed to be rather expensive, impractical, and hence unlikely to be acquired at scale. In this sense, it would be much more difficult to buy an effective share of fake reviews for 275 reviews, whereas it could be done with relative ease for 5 reviews.

Now, however, too many or all too good reviews may introduce issues of *credibility*. In fact, previous work proposes that a disproportional amount of positive online reviews might lead consumers to perceive them as implausible (Chevalier and Mayzlin 2006) and that they may become suspicious of reviews that appear to be all too positive (Bosman et al. 2013; O'Reilly and Marx 2011). In view of the increasing annoyance of *fake reviews*, this reaction is quite understandable (Guardian 2019). Here, we would like to propose that a rating score's overall effect on its holder's trustworthiness will emerge *as the interaction of its value and its credibility* where too many (or too positive) ratings will impair credibility. In this sense, one can ask whether online reputation may actually be too good to be beneficent (Maslowska et al. 2016).

To explore this matter, we (1) draw on click data from a large e-commerce website ($n = 5.3 \times 10^9$) and (2) report results from an online experiment in which we systematically vary review volume and valence and participants evaluate different (hypothetical) seller profiles in terms of credibility and trustworthiness ($n = 575$). Rather than considering this as conclusive evidence, we would like to offer a conceptual starting point for further thought and research in this direction.

3 Data from an e-Vendor

As a first asset, we draw on 2019 click data from a large e-commerce vendor across a total of 6 million active products. To reduce the impact of outliers and one-off effects, we here focus on products with 1000 or fewer reviews (88% of the data) as well as prices of \$3300 or less (99% of the data), yielding a total of 5.3 billion product page visits. Note that as per agreement with the vendor, absolute conversion rates remain undisclosed. Figure 1 shows conversion rates by rating volume (left), rating valence (center), as well as rating volume and price decile (right).

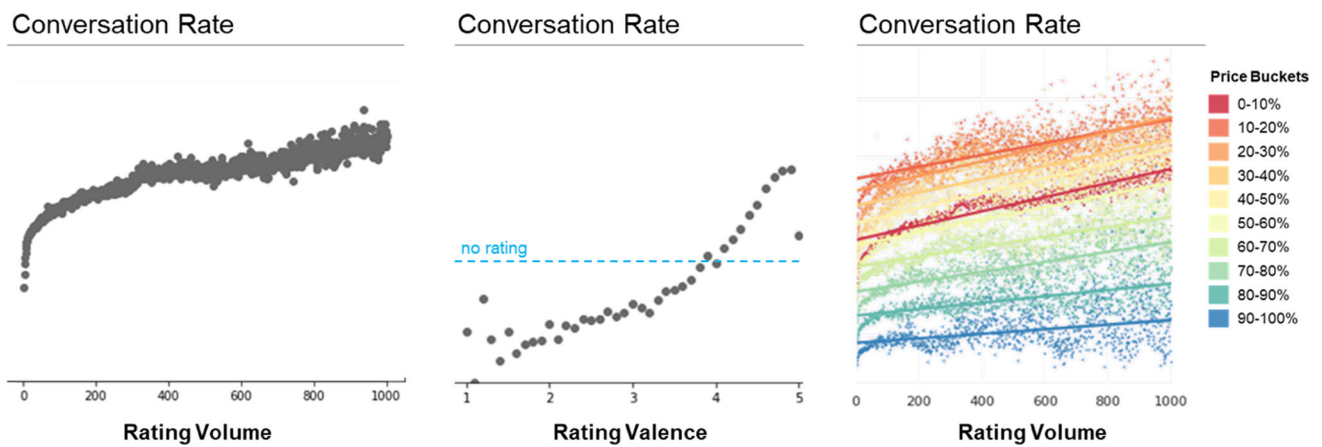


Fig. 1 Conversion rate by rating volume, rating valence, and product price

As can be seen there, conversion rates increase in rating volume where the relation is well-approximated by a square root function. Similarly, there is a positive relation between rating valence and average conversion rates – with the distinct exception of products with a straight 5.0-star rating. Interestingly, products with no rating at all (i.e., volume = 0, valence = NA) yield conversion rates equivalent to (approximately) four stars. Last, conversion rates are decreasing for more expensive products (where only the least expensive price decile seems to represent an exception).

Conflating rating volume and valence into one diagram, Fig. 2 shows average conversion rates (y-axis) for products with a rating score of at least 4.0 stars – grouped by review volume (x-axis) and valence (color). Note that this rating score is shown on the website with one decimal place precision. Overall, both review volume and valence seem to have positive effects on conversion, while products with a straight 5.0-star rating form an odd exception when rating volume increases.

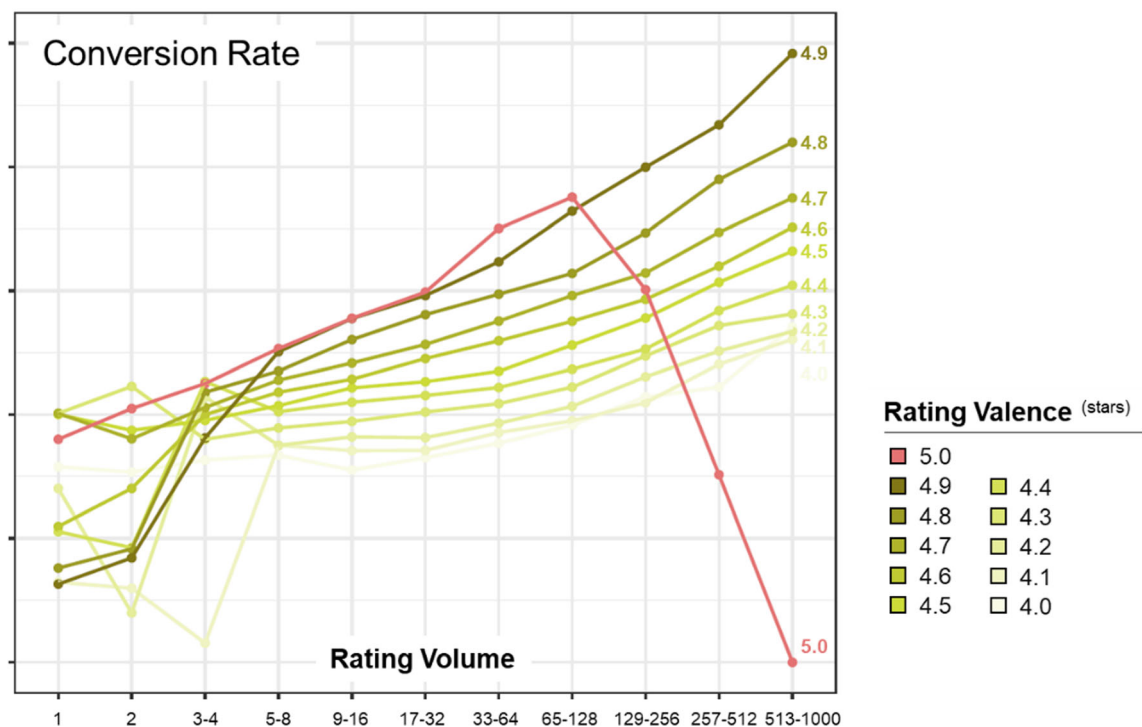


Fig. 2 Conversion rate by rating volume (x-axis) and rating valence (color; 4.0–5.0 stars)

4 Data from a Scenario-Based Online Survey

To follow up these (strictly empirical) observations and to overcome (at least to some degree) the associated issues due to correlations in the variables, uneven distribution of observations, and unobserved variables, we conducted a scenario-based online survey in which participants evaluated different product pages on a (hypothetical) e-commerce website in terms of credibility and trustworthiness – where we systematically varied rating volume and valence. Participants were recruited via Prolific.co (Palan and Schitter 2018) and we used a between-subjects design where each participant saw a random combination of one out of six products, a random price drawn from a product-specific range, as well as the rating score. Specifically, we used 49 different values for rating valence with increasing granularity across the 1.00–5.00-star range. Rating volume ranged between 5 and 1000 underlying ratings – consistent with the distribution seen in empirical data. To evaluate participants' assessment of rating credibility as well as their trust towards the product, we used three items per construct on 1–7 point Likert scales. Full documentation of our stimulus materials and measurement instrument is provided in the Online Appendix (available via <http://link.springer.com>).

Figure 3 shows participants' evaluations of credibility (left) and trust (right) based on rating valence (i.e., 1.00–5.00 stars). As can be seen, piecewise linear regressions indicate a more or less flat level of credibility, which only decreases when rating valence approaches the 5.00 stars boundary. Trust, in turn, exhibits a positive slope in valence and then also drops markedly. Consistent with our proposition, these findings suggest that a review's effective

capability to engender trust emerges as the interaction of rating valence and credibility, where credibility itself can be conceptualized as a function of valence: $\text{trust} \sim \text{valence} \times \text{credibility}(\text{valence})$.

Both our experimental and the empirical data point in the same direction, providing a first explanation as to the underlying mechanisms of consumers' perceptions of online ratings. However, note that this analysis is far from being complete or conclusive. For instance, looking at our experimental data, we have only briefly dived into the role of rating valence, disregarding volume. Instead, we understand this first glance at the data as an impulse for deeper examination of a new perspective on online reputation, the effects of which have widely been premised as linear. Moreover, we see potential in this matter for platform operators and service providers. This pertains to questions such as what psychological factors are triggered by the presence of a large number of (immaculate) reviews, how service providers can avoid walking into this potential *credibility trap*, and how platform operators can leverage interface- and mechanism design to mitigate such negative effects. These and other questions may offer viable directions for future research on the platform economy – beyond the traveled paths.

5 On this Special Issue

Our motivation for this Special Issue was to shed some new light on the *less traveled paths* within the domain of the platform economy. A rich body of work has emerged within this field, but many open questions remain – and new ones are prompted literally every week. In addition, it

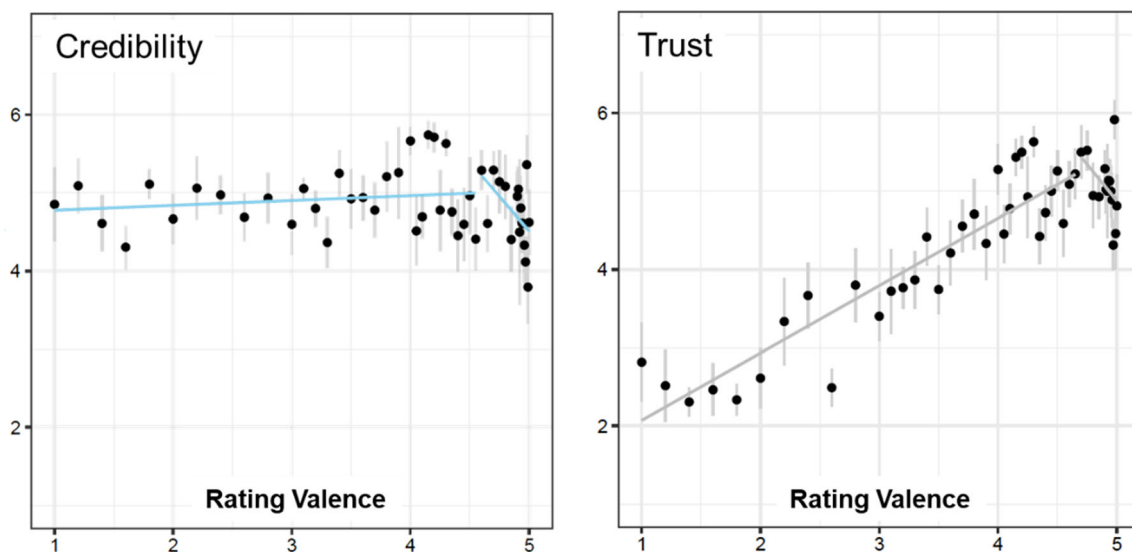


Fig. 3 Credibility (left) and trust (right) by rating valence

is apparent that there exist theoretical deficits within the platform literature. We are delighted to feature two research papers and an interview with Rahul Jalali in this issue.

The first paper by Lars Hornuf and Daniel Vrankar presents results from a meta-analysis on wages on crowd working platforms, which have become a relevant source of income for a growing number of freelancers worldwide. Their study points out an important – and oftentimes overlooked – factor in this regard: unpaid work (e.g., for maintaining one’s user profiles, searching for tasks, communicating with requesters, etc.). They suggest considering a *wage correction factor* to account for the varying levels of unpaid work necessary on different platforms and for different job types to make research results more comparable.

The second paper by Andrea Wrabel, Alexander Kupfer, and Steffen Zimmermann explores the effects of scarcity cues in electronic commerce and, specifically, how such cues affect the processing of other relevant information found in text reviews. Reporting findings from an online experiment, they suggest that scarcity cues can lower the processing of textual review information with adverse effects on decision quality. As scarcity cues are increasingly being employed by online vendors and platform operators, often in bad faith, as a dark pattern of choice architecture (CMA 2022), the paper touches upon a timely and relevant topic with implications for consumers, platforms, and policymakers.

The interview in this special issue with Rahul Jalali (Senior Vice President and Chief Information Officer at Union Pacific Railroad) highlights a key aspect of digital platforms – how companies can use the tools and principles of digital platforms internally to scale their IT operations and drive efficiency, productivity, and innovation. While digital platforms are primarily associated with the likes of consumers facing companies such as Uber, Airbnb, and Youtube, the reality is that both traditional and new age companies are leveraging digital platforms internally in building a technology infrastructure that is scalable, replicable, and accessible. Rahul stressed the importance of complementary capabilities such as agile development, customer centricity, and an analytic mindset in realizing the full benefits of digital platforms, and that digital platforms can provide a launch pad for integrating technologies such as artificial intelligence, machine learning, and deep learning in the future.

We would like to express our profound gratitude to all the authors, our interviewee Rahul Jalali as well as the numerous reviewers who have contributed to the research presented in this special issue. A very special thank you goes to the *Business & Information Systems Engineering* team that made this special issue possible. We hope that

researchers and practitioners will find the concepts and scientific results presented in this issue useful in furthering research on the online platform economy.

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