Expert Services and User Reviews in the Entertainment Industry

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Abstract

We study the role of expert services in a market for experience goods. We define experience goods as those whose quality becomes known to the consumer only after purchase. We model the entertainment industry as a horizontally and vertically differentiated market, with a good having a known feature (a type or genre) and another unknown to consumers (a quality). All consumers prefer a high-quality good, with the utility they derive from the type being match-dependent (i.e., taste-based). An expert (the critic) offers to reveal information on the good's quality to consumers in exchange for a fee. We find expert services to increase consumer welfare, reduce uncertainty, and allow consumers whose taste is not matched by the good to enter the market. Nevertheless, not all consumers who demand information from the critic buy the good. Next, we introduce user reviews in the form of a free-to-access rating of the good, as found in online review aggregators. User reviews alter the composition of the market, allowing consumers whose taste is matched by the good to buy low-quality goods and vice versa. The expert is sensitive to the competing source of information, serving a smaller demand and charging a lower fee. However, regardless of its source, additional information is welfare-improving for consumers, most significantly when user and expert reviews are present simultaneously.

Keywords: Expert reviews, User reviews, Critics, Entertainment Industry, Experience goods

JEL Classification: L82 , M3 , D8 , D4 , Z1

1 Introduction

Consumers are known to rely on the opinions of others when facing the decision to buy a good with uncertain characteristics. Experts and fellow consumers provide information relevant for the purchase decision when the quality of a good is not observable (Chevalier & Mayzlin, 2006; Duan et al., 2008; Hennig-Thurau et al., 2015; Neelamegham & Jain, 1999; Thrane, 2019). This is the case of experience goods markets such as the entertainment industry, where consumers do not know the quality of a movie, book, show, music album or video game until after consumption. Expert services play a relevant role in these markets, reducing uncertainty and allowing better-informed customer decisions (Basuroy et al., 2003; Boatwright et al., 2007; Chen & Xie, 2005; Dellarocas et al., 2007; Eliashberg & Shugan, 1997; Friberg & Grönqvist, 2012; Reinstein & Snyder, 2005; Sawhney & Eliashberg, 1996; Souza et al., 2019). Experts mediate between the firm and the consumer, offering to reveal information on the good's quality in exchange for a fee. This is the case of critics who publish their product reviews in media outlets like magazines, newspapers, consumer guides, or subscription-based web platforms. For example, a literary critic reviewing an upcoming novel for a newspaper or a film critic posting a Patreon-supported review on YouTube. For a long time expert services were the only informational channel available for consumers before purchase and not controlled by the firm or connected to promotional efforts.

Today, user reviews are another source of pre-purchase information at the disposal of consumers. The literature has shown that the opinions and product assessments, offered by past-consumers to those currently considering buying, influence the decisions of the latter. (Balafoutas & Kerschbamer, 2020; Dhar & Chang, 2009; Hyndman & Ozeturk, 2011; Liu, 2006; Moretti, 2011; Vujic & Zhang, 2018) User reviews are generally provided at no cost to the consumer. Think of a social media post commenting a newly released movie or the reviews posted in websites like *Rate your music*. However, though beneficial for the consumers, user reviews effectively compete with experts. Even if they lack some of the characteristics of an expert's review, they offer additional information for free, thus reducing the incentives for consumers to consult the expert.

Both expert services and user reviews have been studied by researchers – in separate and sometimes simultaneously – but not as competing sources of information. Digital technologies have permitted the growth and proliferation of user reviews but it is not yet clear what effect they have on expert services. Evidence from the market for critics in the entertainment industry suggests a negative impact, with several critical outlets disappearing as their business model is compromised. This is an issue that interests academicians, managers, and planners, since both user and expert reviews offer socially-valued services. In this paper we theoretically investigate the roles played by expert services and user reviews as sources of pre-purchase information, attempting to understand how they interact and influence the decisions of the agents in an experience goods market. We approach the critics as intermediaries in the entertainment

industry, who play some strategies and try to maximize their utility, unlike prevailing models that focus on the producers and consumers or assume the continued presence of experts. We develop a monopolistic model where consumers with different tastes face a good with unknown quality. Such a context gives the opportunity to an expert who reveals the quality to those interested, obtaining profits, and later reacting to the appearance of user reviews. Analyzing this model we grasp with the question on their effect on the critics, which has not been dealt with before in the theoretical literature.

A first objective of ours is to develop a micro-theoretical framework to study the role of expert services in a market for experience goods. In our environment a firm sells a good of unobservable quality to a mass of consumers with idiosyncratic types. Unlike the quality, the good's type is public. Consider as an example the case of a studio releasing a film for an audience with a distribution of tastes. The audience can tell if the movie is a drama or a comedy, but they do not know the quality of the film. All consumers derive more utility from a high quality good and obtain a type bonus. Continuing with the film industry example, in our set-up a comedy fan might enjoy a high-quality drama more than a lousy comedy, though in general he would favor the latter genre. The expert we introduce in the market observes the quality of the good and reports it to consumers in exchange for a fee. In our film industry example this would be a professional critic like Roger Ebert, Pauline Kael, A.O. Scott or Peter Bradshaw.

We find expert services to increase consumer welfare, allowing those whose taste is not matched by the good to participate in the market. Continuing with the film example, comedy lovers who have a very low tolerance for dramas may consider watching a drama when a critic is available to reveal the film's quality to them. The expert serves some of those consumers, but also others who would have bought the good based on their priors had the expert not been available. That is, some drama lovers still read the critique before deciding. However, in the equilibrium the firm is indifferent between serving a market where expert services are present and another where consumers purchase based entirely on their priors. Not everyone who demands information from the critic buys the good. Some because the quality and type combination do not match their participation utility, others because they update the purchase decision from an over-estimation of the good's quality. Hence, even if the firm is impervious to the critic's activity, the consumers benefit from the critic.

Moving on to the study of user reviews, the main difference between these and expert services is that the former are written by consumers who bought the good in a previous period. Thus, although they are free to access or have a very small cost, the quality of the information they provide is lower than that offered by a professional critic. Naturally, a film review published in *Cahiers du Cinéma* or *Film Comment* is hardly comparable to one posted by a user on *IMDb.com* or *FilmAffinity*. To be clear, both user and expert reviews are

informational but the latter have an inherently superior quality.[1] Nevertheless, user reviews offer a refinement on the priors a consumer may have regarding the good's quality, thus having an effect on the demand for experience goods (Cheung & Thadani, 2012; Chevalier & Mayzlin, 2006; Duan et al., 2008).

From the perspective of the expert, user reviews represent a competing source of information. Consumers can decide to skip the critic and base their purchase decision on the information they obtain from user reviews. The second objective of our paper is to understand the effect of user reviews on expert services. To do this we first analyze the role of user reviews on their own, which we model through a mechanism that aggregates opinions in a binary rating system. That is, in our set-up user reviews tell consumers whether the good's quality is above the expected level or not, with the former being awarded a *star review*. This reporting system is common in these markets and can be observed in Rotten Tomatoes' *Certified Fresh* label or any other "thumbs up/thumbs down" system. Indeed, aggregated scores and ratings are the prevalent form of user reviews a consumer can find online. We find that whether a *star review* is observed or not alters the composition of the market, with taste-matched consumers buying the good even when its quality is revealed by user reviews to be low. Conversely, more consumers whose taste is not matched by the good enter the market when user reviews are positive. While the demand-expansion effect is in line with what the literature predicts, the first effect might help explain why critically-panned goods sometimes reach unexpected market performances (the so-called "critic proof" albums or films). In terms of welfare, the presence of user reviews increases consumer surplus. The firm, on the other hand, remains indifferent between these scenarios. In turn, critics are sensitive to competing sources of information, serving a smaller demand, charging a lower fee, and obtaining lower profits when user reviews become available. However, although the firm remains indifferent, consumer surplus further improves when both user reviews and expert services are simultaneously present, indicating that expert services continue to be valuable for a segment of the audience.

Our results align with anecdotal evidence: Expert services are clearly sensitive to changes in the information present in a market. In late 2018 the *New Musical Express*, the last surviving British periodical devoted to music reviews, stopped its print edition after 66 years. Not long ago three Spanish magazines dedicated to publishing cultural goods reviews (*Go Mag*, *H magazine*, and the local version of *Cahiers du Cinema*) ceased publication due to a precarious financial situation. Over the last couple of years this has also been the fate of seasoned US outlets like *Crawdaddy!*, *Paste magazine* and *The Village Voice*, among many others who have either migrated to online platforms (*Spin* magazine, *Rockdelux*, *Hipersonica*) or shut down business entirely (*The Dissolve*, *Q magazine*, *Tiny Mix Tapes*). This occurs in contrast to the boom in notoriety and influence experienced by online review aggregators like *Rotten*

[1] We understand informational quality as how close the reviewer's assessment is to capturing the real quality of the good.

Tomatoes. Our findings seem to support the argument that traditional expert-opinion outlets are negatively affected by the expansion and pervasiveness of user reviews.

We believe our model provides novel insights to approach this phenomenon. We identify a second-order mechanism when a partial refinement on the consumers' priors is available, causing type rather than quality to become a more relevant decision factor for audiences. This means that, in some cases, the information from user reviews is enough for consumers to take the purchase decision, disregarding expert services. From the perspective of critics, the segment of consumers who would be interested in their service after the free refinement is small. Business models that deal with this problem have began to emerge in the market for critics. For instance through direct subscriptions where the consumer pays for value-generating characteristics beyond information on some of the good's characteristics. Nevertheless, considerable welfare-positive effects are generated when both expert services and user reviews are available simultaneously, which highlights the importance of preserving both sources of information. To the best of our knowledge, this is the first paper to theoretically assess the role of expert and user reviews in experience goods markets. The market for critics has been a long-standing interest of marketing scholars and cultural economists. Yet, theoretical models are not common despite the relevant role reviews play in the consumption of entertainment goods. This might be due to the complexities inherent to service critics provide. Namely, that despite being beneficiaries of the information supplied by critics, the marginal cost of criticism to consumers is very small, and often the service is provided almost as an externality of a different principal-agent relation (*i.e.* a media outlet and not the audience employ the critic). Moreover, the demand for critics emanates from the demand for the good, and would likely not exist otherwise. We intend to contribute to the construction of a theoretically robust framework capable of accounting for these particularities.

The rest of this paper is organized as follows: A brief discussion of the entertainment industry and reviews opens the study. We then present a survey of the literature on expert services and user reviews in experience goods markets. Next, we introduce the model and analyze the market when only expert reviews are available. Later, we include user reviews and look at the impact they have on the equilibrium behavior of the consumer, the firm, and the expert. We finally discuss the interaction between user reviews and expert services, concluding with a review of the welfare effects arising from the presence of these sources of information in the market, as well as the theoretical and practical implications of our results.

2 Reviews in the entertainment industry

Entertainment goods are uniquely complex due to their hedonic, experiential, aesthetic, taste-connected, creative, non-perishable, and often intangible

characteristics (Hennig-Thurau & Houston, 2019). From a perspective pertaining marketing and economics, a defining aspect of entertainment goods is that their quality is unknown to the consumers before they purchase. (Nelson, 1970) No one knows if they like a movie, song, book or video game until they have tried them. Both the firm producing the good and the consumers are interested in overcoming this informational asymmetry. They thus resort to different channels and mechanisms, such as advertising, offering trials and samples, developing a brand – on the side of the firm –, and searching for recommendations, consulting experts and past-consumers, or relying on impartial evaluations – on the side of the consumers. Among these, critics have become a staple of the cultural industries, playing the role of arbiters of taste and providing consumers a service consisting on revealing certain characteristics of an experience good before they purchase. In this section we will briefly present the structure of the entertainment industry and how critics take part in it.

The supply side of the entertainment industry is characterized by its high degree of specialization. No film director will build a new cinema to show his latest movie, nor will a music store start recording its own artists. The high fixed costs (and risk) associated to these activities causes said specialization. The activities typically involved between the origination of an entertainment good and the moment it reaches the consumers are: Creation, Production, Distribution, Exhibition (or Circulation), and Consumption (or Participation). Some companies cover all these activities (*e.g.* Netflix) while others are constrained to a very specific activity (*e.g.* Art galleries, Recording studios or Bookshops). In this study we concentrate on the steps going from the circulation to the consumption, assuming an entertainment good fully ready to be sold arrives at the hands of a firm facing a market. The critics become active in between these steps.

Having existed for as long as modern markets for cultural and entertainment goods, critics were the preeminent intermediaries in the relationship between creatives and consumers. For decades, critics and their reviews were the main non-promotional channel available for firms to share information with the consumers. Our analytical benchmark will be the traditional setting in which critics operated, effectively acting as the uncontested owners of superior information on the goods. Critics often receive advanced copies of the products, at no cost and timed in a way that their reviews can affect the demand for the goods. They then examine and review the good, sending a signal to the consumers. Expert services with these characteristics can be found in the film, music, video game, editorial, theatre and several other entertainment industries. Critics are not paid by the firms producing the goods, nor do they sell the goods, being compensated by third parties (who advertise on the media outlets carrying the reviews), are hired by some magazine, website or newspaper, or are directly compensated by their customers (a subset of the

consumers active in the markets).[2] A key aspect of expert services is the credibility they gain from being impartial (beyond the influence of the producers and without stakes in the success of the goods they review). They are also assumed to posses the technology to accurately assess the goods and efficiently communicate their characteristics to consumers.

Today user reviews are one of many channels through which consumers can access information on the goods. In the context of our study, user reviews are reports provided by fellow consumers. These are opinions containing some information on the goods and have long existed in the entertainment industry as fanzines and other media circulated by amateurs. Digital technologies have amplified their reach, volume and influence (*e.g.* in the form of blogs, videos, social media posts, forums, etc.) Although both play similar roles, influencing the interactions between the firm and the consumers, there are three main differences between user reviews and those of critics. First, user reviews are more heterogeneous in quality (not everyone has the knowledge and skills of a professional critic). Second, their timing is delayed (users can only share their reviews after the goods have been publicly released). Third, critics are paid and hence can be considered professional reviewers, whereas users do not get a monetary compensation even if the site where these reviews might appear (*Rotten Tomatoes*, *IMDb*, *Metacritic*) monetizes audience views.

The proliferation of user reviews has entailed changes for critics, affecting the information they hold and their revenue, among other effects we explore in this paper. We make some simplifications and assumptions in order to build a tractable and representative model of the entertainment industry. We characterize the industry as a monopoly, which could fit the case of independent creators circulating their works for a niche audience. We do not include promotional channels, which the firm could use to reveal the quality of the good. We deem search costs for both types of reviews to be negligible and the experts charge the customers for a single review. We assume that both the experts and the users truthfully report the quality of the good, excluding the possibility of review manipulation, biases and other exploitative behavior [3] Our model is a static, one-shot game, excluding the possibility of repeated interactions or learning. Moreover, we can compare user and expert reviews in our set-up because they become available at the same time. We present the theoretical underpinnings of our model in the following section.

[2] Although they were not so common in the past, funding models where audiences directly pay the critic are becoming more frequent. Such emerging business models in the market for expert services are found on platforms like *Patreon* or on streaming services that allow tips and donations. We can think of examples such as Anthony Fantano of *The Needle Drop*, considered by the New York Times the most influential music critic today with his 2 million subscribers, or self-styled movie pundit John Campea and his 200.000 YouTube subscribers, both with nearly 1.000 paying customers on *Patreon*.

[3] A scenario where both reviews are hypothetically conflicting (*i.e.* professional reviews being positive while user reviews are negative, or vice versa) is not possible in our model, since we assume that both reviews are objective assessments of the good's quality and there are no incentives to misreporting. While this may no longer be the case of blockbusters and mainstream music products, with review bombing and other forms of dishonesty disrupting the value of user reviews, one can still find cases close to our model in emerging or niche markets such as VR apps or in platforms requiring a verified purchase.

3 Related literature

The study of expert services goes as far back as the analysis of markets with asymmetric information itself. This line of research was arguably pioneered by Pitchik and Schotter (1987), who innovated in the analysis of markets for goods with an unknown quality by introducing an agent who did not produce the good but was better informed about it than the consumer. Later, Wolinsky (1993) included "diagnose-only" agents in the market, who reported to the consumers whether they needed a given treatment or not. This role is similar to the one played by the experts whose behavior we examine. Subsequently, many variations of the firm-expert-consumer set-up have been explored in the literature. It is possible to categorize them as either analyzing markets for credence or experience goods. The former consider markets where the expert identifies the service best-suited to a consumer who remains uncertain about it even after the purchase. The latter model markets where consumers learn the quality of a good once they try it. Entertainment goods fall in this category and a growing number of works have attempted to understand the informational dynamics entailed in their production, promotion, critique, and consumption.[4]

A seminal effort in this line is the work by Reinstein and Snyder (2005), who look into the influence of film critics on a movie's box-office performance. Examining a data set of Siskel & Ebert's reviews, the authors use a difference-in-differences design to study the effect of critics' opinions on the ticket sales of movies. They find that positive reviews positively influence a movie's box-office performance, once the film's quality and publicity have been controlled for. Moreover, the effect is particularly strong on a film's opening weekend and in the case of limited releases (i.e., not blockbusters).

Building on that foundation, a large number of works examining the role of expert services in experience goods markets have appeared in recent years. For instance, looking at the publishing sector (Caliendo et al., 2015; Clement et al., 2007), the wine market (Ashenfelter & Jones, 2013; Dubois & Nauges, 2010; Friberg & Grönqvist, 2012; Hilger et al., 2011; Thrane, 2019), video games (Cox, 2014; Zhu & Zhang, 2006), and the film industry (Boatwright et al., 2007; Chen et al., 2012; Gemser et al., 2007; Kamakura et al., 2006; Nishijima et al., 2021; Souza et al., 2019; Thrane, 2018). Through different specifications and analytical strategies, these studies have confirmed the importance of expert services on the decisions of consumers in markets for experience goods. We present the most relevant of these contributions in the summary table included as an appendix.

As one can glimmer from the exemplary list above, the inquiry of expert services in markets for experience goods has mainly been pursued from an empirical perspective, either estimating econometric models from industry data or conducting experiments to observe consumer decisions. Theoretical models of critics in the entertainment industry are not common, despite the relevant role they play. Indeed, the market for critics is notoriously complex to

[4] In this study we focus on expert services in a market for experience goods. A primer on expert services in credence goods markets can be found in Dulleck and Kerschbamer (2006).

analyze from a micro-theoretical perspective. In an influential study of criticism in the cultural industries, Cameron (1995) examined several of the issues behind this: heterogeneity in critical ability, taste-matching between critics and consumers, the inherent incompleteness of markets for critics, the fact that critics are not employed directly by the consumer, the negligible marginal cost of criticism to consumers, among others. Cameron thus outlines a realm for the discussion of criticism from the perspective of microeconomics. We follow those steps to develop our analysis of expert services in the entertainment industry.

Our model approaches the entertainment industry as a market with heterogeneous tastes and idiosyncratic quality valuation, building on the literature that uses spatial frameworks to analyze product competition and asymmetric information. We can mention two crucial strands: First, the one studying a market where product quality is the strategic competitive variable. Second, the one that commonly represents product types by points on the horizontal line. We draw inspiration from Shaked and Sutton (1982), in whose set-up consumers observe the quality of a good with some distortion and where experts offer information on this characteristic, and from Grossman and Shapiro (1984), who pioneered the analysis of the effect of pre-purchase information regarding a good's type on sales, albeit with the information coming from the firm and not an expert. Our model develops a setting where goods are vertically (quality) and horizontally (type) differentiated, integrating both of these strands in a model of the entertainment industry.

The analysis of user reviews and the role they play in experience goods markets has also been a fertile field of research. The study of electronic word of mouth, recommendations, and user reviews has flourished in the last two decades (Babic et al., 2020). In this paper we focus on user reviews as the mechanism through which pre-purchase information is shared by consumers. Among the first to explore the effect of user reviews on the decisions of consumers, Chevalier and Mayzlin (2006) found that book reviews written by users were an important source of information at the time of considering buying the goods, and that both positive and negative reviews influenced purchase behavior, with negative reviews having a stronger effect. On the same line, Moretti (2011) quantified the influence of user-generated information on the consumption decisions of individuals who were unaware of a given good's quality. Moretti finds that the effect of users' opinion on a movie's revenue is stronger when the *ex ante* uncertainty on the good is more significant, with a positive review playing a demand-enhancing role and a negative one going in the opposite direction.

Other authors have argued on the strength and nature of this relationship in the film (Duan et al., 2008; Hennig-Thurau et al., 2015; Vujic & Zhang, 2018), music (Dewan & Ramaprasad, 2014; Dhar & Chang, 2009), and hospitality industries (Ye et al., 2009,1). Despite the different approaches and nuances of these works, all point at the existence of a relevant interaction between the demand for an experience good and the information user reviews provide to

the consumers, hence empirically grounding our theoretical model of user and expert reviews in the entertainment industry. The summary table found in the appendix includes some of these studies, positioning the present analysis in the context of this stream of the literature.

Studies simultaneously considering the role of user reviews and professional critics in such markets are comparatively few. To the best of our knowledge, the present paper is the first to theoretical study an experience goods market where the expert and the firm act as independent agents, further incorporating user reviews as an alternative source of information. The distinction between the two informational sources is significant, since the literature establishes essential differences between the information provided by professional critics and by past-consumers, even entailing different effects on the decisions of consumers. For instance, Chakravarty et al. (2010) look at consumer evaluations of upcoming films through an experimental design and find that different sources of information affect certain types of consumers differently, with less frequent consumers relying more on user-generated reviews and frequent consumers being more influenced by critics; though in both cases positive reviews lead to higher pre-purchase evaluations. Wallentin (2016) similarly identify divergences in the aspects critics and audiences value in film products, although review scores and box-office revenue are positively correlated in their model, suggesting that user reviews provide distinct and useful information to potential consumers.

The nature of this information has also interested researchers. Several works have argued that users and experts convey information of different kinds and qualities (Cox & Kaimann, 2015; Hennig-Thurau et al., 2012; de Jong & Burgers, 2013; Kim et al., 2013; Thrane, 2019), supporting our decision to model user reviews as an inferior refinement on the a prioris of consumers. Regarding product types, which we consider in our horizontally differentiated model, works such as Souza et al. (2019) suggest that the influence of reviews may vary according to the type of the goods. Looking at the effect of critics' and users' reviews on the box-office survival of movies, the authors find no effect on wide releases but a significant one over limited releases or niche films. This is a feature we include in our model via type differentiation.

Considering these developments and the lack of direct theoretical precedents, we build this study in the confluence of two streams: the one analyzing information in markets where goods are horizontally and vertically differentiated, with some of such characteristics hidden to consumers, and the one investigating how this information affects the behaviors of the different agents in the market. We focus on the interactions of two sources of information, with distinct costs and accuracy, and which in effect compete with each other while being external to the firm selling the good. In the next section we present the basic components and timeline of our benchmark model of the entertainment industry.

4 The model

We study a market where a single experience good with a quality $q \sim U(0,1)$ is exchanged. A monopolist produces and sells the good at a price p, which he sets before learning the value of q. This reflects the fact that the prices of a movie ticket or music album are set irrespective of the good's quality, which is arguably outside the control of the cinema showing the film or the store selling the good. Indeed, the quality of the good is not a strategic variable for the monopolist, in the sense that nobody sets out to make a "bad" film on purpose. Once the quality of the good is realized, the monopolist learns q and sells the good at the price he had set before. We assume the marginal cost of the good to be negligible for the monopolist. This is not a far-fetched hypothesis for the entertainment industry. Costs are largely fixed when producing and distributing a cultural good: recording an album, producing a movie, etc. Conversely, the cost of streaming a song, pressing an additional copy of an album, or providing a single movie seat, is minimal. Since we look at instantaneous interactions in our model, the firm is assumed to sell the good at no cost.

On the side of the demand, we characterize the audience as a size-one mass of consumers. In this market the audience is differentiated in their taste. That is, all consumers have a unique valuation for quality equal to 1 and are indexed by their type a, which is uniformly distributed over $[0,1]$. This means that all consumers derive the same utility from consuming a good of a given quality q, but obtain an idiosyncratic, type-specific bonus. For instance, if the good were a movie we could say that a "good" movie is equally enjoyable for everyone. Yet, we all have particular preferences for different genres of film, which may lead us to derive higher utilities from a comedy rather than a drama, if the former is the type of movie we most prefer. Thus, the utility that a consumer in this market obtains is:

$$U(q,a) = q + a - p,$$

where $a \in [0,1]$ represents how much a consumer's type aligns with that of the good. From now on, whenever we mention the type we will denote the extent of this match (*i.e.* the value of a). Each consumer knows her own type and can observe that of the good, thus being aware of the value of a when estimating her expected utility. The quality distribution and the price charged by the firm are both publicly known, albeit not the exact value of q, since this is an experience good.

The critic in this market is modeled as an expert who perfectly observes the quality of the good. For a fee $\lambda > 0$ the expert can reveal the good's quality to consumers before they take the participation decision. It is costless for the expert to observe q and report it to the consumer. In the entertainment industry, expert services with the characteristics we study can be encountered in the movie/album/book/show reviews one finds in magazines, newspapers, and similar websites. The fee λ represents the magazine's price, the subscription fee or the equivalent per-reader advertising revenue obtained by the outlet

publishing the review. The expert sets his pricing strategy independently from the monopolist and before learning the quality of the good.

The expert he has no stake in the profits of the firm selling the good. We can therefore assume he truthfully reports the good's characteristics to the consumer. We also assume that this information is not subject to arbitrage. That is, a consumer who learns q from the expert cannot relay the information to other consumers.[5] The expert does not have a type and only includes information on the quality of the good in his reviews. The demand for expert services is given by D^{XP}.

Without loss of generality we assume that p will fall in the interval $\left(\frac{1}{2}, 1\right)$. It is possible to disregard pricing strategies outside such support because, for smaller values of p, all consumers in the market would decide to buy the good based only on their priors, which renders the analysis of expert services uninteresting. In the case of higher values of p, the demand becomes too small for the firm to be interested in participating in the market, given that both the quality and the type of the experience good we study cannot take values above one in our model.

The timing of the game is the following:

1. The monopolist sets a price p for the good.
2. The expert sets a fee λ for the service of revealing the good's quality to consumers.
3. The good's quality is drawn by nature: $q \sim U(0, 1)$.
4. The expert observes q.
5. Each consumer decides whether to consult the expert before buying the good. The value of q is revealed to those who consult the expert.
6. The purchase decision is made.

We solve the game by backward induction, first looking at the decisions of the expert, then paying attention to those of the firm. The following sections present and discuss such results.

5 Market analysis when expert services are available but not user reviews

In this section we look at a market where the consumer can learn the good's quality through the expert, comparing the informational situation created by the presence of expert services with a benchmark where consumers would take the purchase decision based solely on their priors. We can think of this market situation as the one that still takes place today with new film releases. Film studios arrange screenings for a few professional critics to see an upcoming movie some time before its wide release. The critics write and publish their reviews in the days leading to the movie's opening, which means that consumers have not yet seen the movie, thus fending off the appearance of user

[5] In Sect. 6 we introduce a specific mechanism to consider information transmission between consumers.

reviews. For example, if *Avenger: Endgame* opened on April 26 in the US, the reviews published by media outlets before or on that date would stand to be examined under our current framework. Limited releases or festival premieres, such that the number of non-professionals who can see and review the film is insignificant, would similarly fit this situation.

Regarding the interpretation of the type as the taste for a specific kind of good, when we say that a consumer's taste is matched we do not mean a complete or perfect match only, as would occur when $a = 1$, but that the value of a for that consumer is high enough in relation with the good. For instance, a given consumer's taste may be completely matched by a very particular type of comedy (1960s political satire), with the value of a decreasing whenever some of the favored characteristics disappear (the film is a contemporary political satire), but just to the extent that a remains in the upper part of the distribution. Conversely, the hypothetical consumer's taste would not be matched by a gross-out comedy (the value of a falling outside of what could be considered a taste-match). However, this does not mean that such consumer would ultimately not want to see that movie; rather, that the value of q could play a role in their making such decision. The consumer may decide to see the gross-out comedy if it has an outstanding quality. In the case of the expert, we assume that his reviews include accurate and objective assessments on the quality of the good, without any biases due to their own taste. Hence, the role of the critic becomes important for a segment of consumers who may be interested in buying the product under certain conditions.

As a function of the good's price and the fee he charges, the demand for expert services is given by the following function:

$$D^{XP}(\lambda, p) = \begin{cases} p - \sqrt{2\lambda} & : \text{ if } \lambda \in \left[0, \frac{(1-p)^2}{2}\right] \\ 1 - 2\sqrt{2\lambda} & : \text{ if } \lambda \in \left[\frac{(1-p)^2}{2}, \frac{1}{8}\right] \\ 0 & \text{otherwise.} \end{cases}$$

In the following section we present our analysis of the market for expert services in the case where there are no other sources of pre-purchase information available to the consumers.[6]

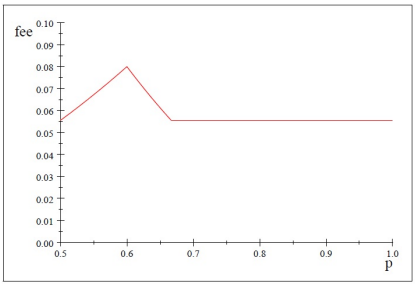
5.1 Consumers behavior and expert pricing strategies

We first study the behavior of the consumers and the pricing decisions of the expert. Generally speaking, the expert's equilibrium fee and demand depend on the price of the good: the more expensive the good becomes, the more consumers would be interested in consulting the expert before purchasing. However, whereas the expert's demand always increases in p, the optimal fee is a convex function of the good's price. The following Proposition presents the equilibrium strategies for the expert as a function of the price of the good.

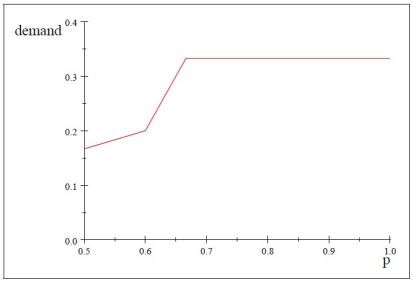
[6] The proofs are presented in detail in the technical appendix and in Rodríguez-Camacho (2016).

Proposition 1 *When the monopolist sets a* low price, $p \in \left(\frac{1}{2}, \frac{3}{5}\right]$, *an expert reveals the good's quality to the consumers for a fee* $\lambda = \frac{2}{9}p^2$, *serving a demand* $D^{XP} = \frac{p}{3}$, *and obtaining profits* $\Pi^{XP} = \frac{2}{27}p^3$. *When the monopolist sets an* intermediate price, $p \in \left(\frac{3}{5}, \frac{2}{3}\right]$, *an expert reveals the good's quality to the consumers for a fee* $\lambda = \frac{(1-p)^2}{2}$, *serving a demand* $D^{XP} = 2p - 1$, *and obtaining profits* $\Pi^{XP} = \frac{(1-p)^2}{2}(2p-1)$. *When the monopolist sets a* high price, $p \in \left(\frac{2}{3}, 1\right)$, *an expert reveals the good's quality to the consumers for a fee* $\lambda = \frac{1}{18}$, *serving a demand* $D^{XP} = \frac{1}{3}$, *and obtaining profits* $\Pi^{XP} = \frac{1}{54}$.

We are solving the game by backward induction. Therefore, we observe that there are different λs depending on the price the monopolist sets. The expert's strategies let us identify three pricing levels: *low* when $p \in \left(\frac{1}{2}, \frac{3}{5}\right]$, *intermediate* when $p \in \left(\frac{3}{5}, \frac{2}{3}\right]$, and *high* when $p \in \left(\frac{2}{3}, 1\right)$. Figure 1 presents the expert's fee and demand as a function of the good's price across the three pricing regions.



(a) Expert's fee as a function of the good's price



(b) Demand for expert services as a function of the good's price

Fig. 1 Expert's fee and demand as a function of p when no other source of information is available

It is possible to see in Fig. 1a that the expert's fee grows when the good's price is in the *low* region, decreasing until it reaches a fixed value in upper

pricing regions. The higher the good's price, the larger the segment of consumers who are potentially interested in demanding the expert's services. This is true even for the consumers with a high type-bonus a, who become interested in the expert's service as the good turns more expensive and "riskier" to buy based on their expectations. A high price increases the audience incentives to learn the quality from the critic even if their taste is matched by the good. However, λ cannot be too high. If the expert's service is too expensive for consumers to obtain sufficient expected utility from learning the quality of the good, and later deciding to buy it, then they will neither ask the expert nor buy the good. Hence, in equilibrium the expert charges a proportionally lower fee as p gets closer to the *high* pricing region. In the *high* region the demand for expert services stops being a function of p. When p is in the *high* region only those consumers whose taste is highly matched ($a \in \left[p - \frac{2}{3}, p - \frac{1}{3}\right]$) consider consulting the expert before buying. The good's price causes non-matched consumers to abandon the market without either buying the good or learning its quality. Thus, only those who are very interested in a movie because it highly matches their taste would consult the critic.

In turn, we can see in Fig. 1b that the behavior of the demand mirrors that of the fee charged by the expert in the equilibrium. When the good's price is *low*, as p moves toward the region's upper bound, more consumers start to consult the expert. Thus, the demand has a positive slope. This demand expansion takes place despite the fact that the expert's fee λ also increases in the good's price when p is *low*. This is not the case when the firm prices in superior regions. Although the demand for expert services positively depends on p in the *intermediate* region, the fee decreases as the good turns more expensive. The expert follows this strategy in order to attract more consumers, trying to compensate the demand drop due to a high p. Although some consumers abandon the market because of the *intermediate* p, others decide to enter after consulting the expert. This effect holds for consumers with both low or high type-match bonuses who become interested in the expert's service when p is *intermediate*. Hence, the rapid growth of the demand for expert services in the intermediate pricing segment, as seen in the much stepper slope of the function represented in Fig. 1b. The demand for expert services reaches a plateau when the good's price enters the *high* region.

While it is not surprising that the demand of the good and for expert services are so strongly connected, the type of consumers who decide to consult the expert and/or buy the good also changes as a result of the strategies of the monopolist and the expert. When p is *low* it will mainly be consumers with low taste-match bonuses who consult the expert, checking whether their lackluster bonus (a) can be compensated by the good's quality. Continuing with our film example, those are the consumers who given that the film is not their preferred genre, are interested in learning its quality before deciding to going to the cinema. Given the small price, they may still consider going. The effects of expert services on the demand for the good are discussed in Sect. 5.3.

We now look at market composition from the perspective of the types of the consumers who decide to consult the expert and potentially buy the good.

5.2 Consumer type and expert services

The decision to consult the expert depends on the value of a as well as p and λ. Consumers with a type bonus $a \geq p - \frac{1}{2}$ would buy the good without additional information, since their expected utility is sufficiently high to purchase the good based on their priors ($EU^{BB}(a,p) = \frac{1}{2} + a - p \geq 0$). Conversely, consumers with types $a \in (p, 1]$ would be willing to demand the expert's services given the good's price and their type, thus outlining a potentially broader demand for the good. When the expert is not active only consumers with type-match bonuses $a \in \left[p - \frac{1}{2}, 1\right]$ would buy the good. The availability of expert services induces the appearance of new segments in the market, including consumers who may have had too low values of a to buy based on their priors and now consult the expert before deciding to buy the good. In the following graph we present the demand for expert services as a function of the good's price and type when user reviews are not available.

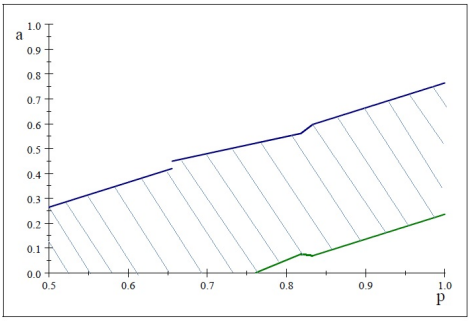


Fig. 2 Demand for expert services as a function of the good's price and type without user reviews

To better understand the graph above, consider that the consumers who pay the expert for his services need to obtain a positive ex-post utility from consulting the expert and buying the good (*i.e.*, the information has to be useful to them). This happens if the quality reported is $q \in [p - a, 1]$ $\forall a \in [0, p], p \in \left(\frac{1}{2}, 1\right)$. No consumer with a type superior to p will ever consider consulting the expert before purchase, no matter how small λ. Hence, the expected utility from consulting the expert is given by:

$$EU^{XP}(a,p) = \begin{cases} \int_{p-a}^{1} (q + a - p)dq - \lambda & \text{if } a \in [0, p] \\ 0 & \text{otherwise.} \end{cases}$$

Further participation thresholds derive from the fact that the expected utility obtained must be superior to what the consumers would get buying based on their priors. In particular: $EU^{XP}(a,p) \geq 0 \iff a \geq a_1 \equiv p-1+\sqrt{2\lambda}$ and $EU^{XP}(a,p) \geq EU^{BB}(a,p) \iff a \leq a_2 \equiv p-\sqrt{2\lambda}$.

This analysis outlines a demand for expert services as a function of the type and price, as presented in Fig. 2, where we see that the demand for expert services increases in p, with taste-matched consumers deciding to consult the expert as the good becomes more expensive. Interestingly, consumers with low values of a consult the expert when p is in the *low* and *intermediate* pricing regions. Let's consider an example from the literary field, where a fan of John Grisham faces the decision of buying a new book of his. Famous for writing crime thrillers, let's imagine Grisham had decided to try his hand at romance novels. Thus, the type of the good would no longer match that of our hypothetical fan, the value for a would be quite low. However, since the price of the new novel is the same as a regular crime paperback, the buyer may read a professional review on the book before deciding to purchase or not. Hence, this fan would fall somewhere in Fig. 2's hashed area. On the other hand, when the monopolist sets an equilibrium price in the *high* region, it is consumers with fairly high values of a who are interested in expert services. At that price, fans of a specific genre may be reluctant to buy based on the genre information alone, deciding to find with the critic whether the exact quality of the good. Again, in the John Grisham example, if his new book is a crime novel − thus matching the type of the hypothetical fan − but the price was unusually high, even the fan may want to learn the quality before deciding to buy.

In a nutshell, returning to our example from the film industry, this section's analysis of the demand for expert services tells us that cheap movie tickets would lead more readers to the critic, particularly among the audience who *a priori* are not interested in the film genre. Those whose taste favors the genre start reading the critique as ticket prices increase. However, it is important to notice that an increase in the demand for expert services does not necessarily mean that the demand for the good follows along. Going back to the Grisham non-crime novel example, upon finding the good's quality from the critic, the reader may ultimately decide not to buy the book, since the type-match bonus and quality combination do not reach his participation utility threshold. We continue with this discussion in the following section.

5.3 Firm behavior

In this section we analyze the behavior of the monopolist when expert services are available in the market. We focus on the firm's demand, price, and profits. The literature suggests that the information provided by third-party sources plays a demand-inducing role for experience goods (Chevalier & Mayzlin, 2006; Dellarocas et al., 2007; Liu, 2006; Reinstein & Snyder, 2005; Souza et al., 2019; Thrane, 2018). The results we obtained seem to indicate this as well, with expert services allowing consumers whose taste is not matched by the good to participate in the market under certain pricing conditions. To verify this

we need a basis of comparison with a scenario where consumers have no other information but their priors when taking the purchase decision. We next study that scenario, where the firm's maximization problem is:

$$\max_{p} \quad \Pi^G \equiv p\left(\frac{3}{2} - p\right).$$

The following Lemma formally presents the equilibrium strategies of the firm when consumers have no additional information to decide whether to buy the good or not.

Lemma 1 *When expert services are not available in the market a monopolist sells an experience good at a price* $p = \frac{3}{4}$*, serving a demand* $D^G = \frac{3}{4}$*, and obtaining profits* $\Pi^G = \left(\frac{3}{4}\right)^2$.

We can see that, without the expert, the demand served by the monopolist in the equilibrium comprises three quarters of the market. All consumers with a type bonus a above $\frac{1}{4}$ purchase the good when they base their participation decision solely on their priors. For further analysis, we will compare consumer welfare in the different informational scenarios using their expected *ex post* surplus as our measure. Thus, when the consumers decide to participate in the market based exclusively on their priors, they obtain a surplus of $\frac{9}{32}$.

To complete our comparison, we next study the decisions of the firm when a critic is present in the market. That is, when consumers can learn the quality of the good before buying. In the equilibrium the firm anticipates that the expert's strategy will follow the behavior discussed in Sect. 5.1. We formally present the result in the following proposition, detailing the equilibrium allocations of the firm.

Proposition 2 *In a market where expert services are available a monopolist sells an experience good at a price* $p = \frac{3}{4}$*, serving a demand* $D^G = \frac{3}{4}$*, and obtaining profits* $\Pi^G = \left(\frac{3}{4}\right)^2$.

Concluding the backwards solution of the game, below we present the equilibrium allocations of the expert in this informational scenario, following the strategies found in Proposition 1.

Corollary 1 *In the equilibrium, when no other source of pre-purchase information is available in the market, the expert charges a fee* $\lambda = \frac{1}{18}$*, serving a demand* $D^{XP} = \frac{1}{3}$*, and obtaining profits* $\Pi^{XP} = \frac{1}{54}$.

When trying to establish a comparison between the cases with and without expert services, it is easy to notice that the monopolist's equilibrium allocations are the same both with and without the critic. Furthermore, it is interesting

that the demand-generating effect of expert services, as established in the literature and suggested by our analysis of the market in Sect. 5.1, does not take place in this set-up. What actually happens is that the market expands to include some customers who pay for expert services but then decide not to buy. Undoubtedly, more consumers consider buying the good when they have additional information in the form of expert reviews. In this scenario he total mass of consumers who ask the expert is larger than the total number of consumers who bought the good based only on their priors. Yet, not all consumers buy the good after consulting the expert. Hence, we observe that equal-size masses of consumers buy the good in the equilibrium when experts are present in the market and when they are not available. In the graph below we present a comparison of the demand for the good as a function of p, both when expert reviews are available and when they are not present in the market. The demand for the good when the expert is active in the market is presented by the solid line. In a dashed line we present the demand for the good when the expert is not available.

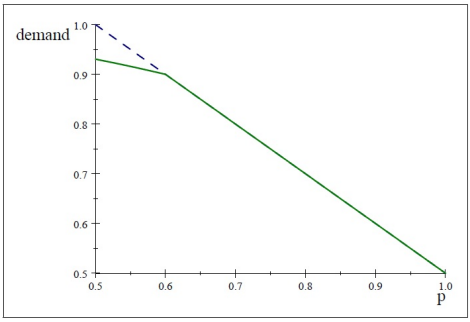


Fig. 3 Demand for the good with and without expert services

We can see that for any $p \in \left(\frac{1}{2}, 1\right)$ the demand for the good when the expert is present is smaller or equal to the demand when the service is not available. Moreover, the demand-attraction effect for the good is negative in the *low* pricing segment. This happens because for a *low* p the expert's fee λ is also small. Hence, more consumers ask the expert before buying the good. As a consequence, a larger mass of consumers stay out of the market after learning the good's quality. In simpler words, the critic dissuades some consumers from buying the good when the quality happens to be low. This effect confirms the intuition of film studios that often withhold or embargo reviews for movies whose quality they presume will be deemed inferior by the critics, thus trying to avoid such information being revealed before the movie opens.[7] On the other hand, the firm faces an identical demand irrespective of the presence of the

[7]Information on review embargoes in the film industry and the strategies studios use when placing and enforcing them can be found here: https://www.denofgeek.com/uk/movies/review-embargoes/53570/review-embargoes-what-are-they-and-do-they-help.

expert for *intermediate* and *high* pricing levels, which could explain the less common presence of embargoes in other entertainment industries.

Regarding the profits, in equilibrium the firm obtains the same level in both when the expert is and is not present: $\Pi^G = \frac{9}{16}$. However, consumer welfare when expert services are available is 0.2920, which is higher than the surplus obtained without expert services. The critic helps the audience to avoid "duds," not paying a ticket for a low quality good, thus inducing these improvements. We will further discuss the market-wide welfare effects of expert services and user reviews in Sect. 7.

6 Market analysis when expert services and user reviews are available

In this section we introduce user reviews as an alternative source of information. We are interested in understanding how the consumer, the expert, and the firm adapt their strategies when consumers can learn some information on the good's quality through free-to-access user reviews. This setting models the current situation of most entertainment industry's critical outlets, such as *Rolling Stone* magazine and *Pitchfork*, professional music review sites that compete with user reviews found in sites like *Rate Your Music* or *Discogs*. This type of competition undermines the most essential characteristic of the service an expert offers: he is no longer in exclusive possession of superior information. In our benchmark, analyzed in Sect. 5, consumers can learn about the good's characteristics only through the critic. In the current section we extend that model to account for user reviews, which provide consumers with a costless refinement on their priors, affecting the decision of some consumers with regard to demanding expert services. Clearly, the information obtained from user reviews might make some consumers discard the idea of consulting the expert. How the expert deals with this situation will determine the impact of user reviews both in terms of the profits the expert obtains as well as the demand for the good itself.

Formally speaking, in this extension of the base model we assume that in a previous period some consumers bought the same good the monopolist is currently selling. Although past-consumers are no longer participating in the market, they are able to inform consumers currently taking the purchase decision. Past-consumers provide active consumers with some information on the good's characteristics through the reviews they write. Many sites and review aggregators offer this information, often alongside expert reviews. See the cases of the *IMDb*, *Rotten Tomatoes*, *Metacritic*, *Letterboxd* or *Filmaffinity* for some relevant examples.

We assume that the information provided by user reviews is not as accurate as the information that can be bought from the critic. Although in most cases user reviews are cheaper than expert services, if not entirely cost-free, they do not have the same informational value due to the differences in skills, experience, training, and communication efficiency between the experts and

past consumers. We model these differences by adopting a binary reporting mechanism for the user reviews. Namely, user reviews convey the quality of a good by telling the consumer whether the good's quality is above its expected value or not. That is, given that q is uniformly distributed between zero and one, whether the realization of the variable is above or below $\frac{1}{2}$. We say that the good gets a *star review* if $q \geq \frac{1}{2}$, otherwise it obtains no signal at all. This is a binary rating system not uncommon in the industry, found under the form of *thumbs up/thumbs down* mechanisms, Rotten Tomatoes' *fresh/rotten* categories, etc. In our model user reviews are available for free to all agents before the participation decision is taken and are independent from the firm and the expert. User reviews are not strategic.

The timing of the game is as follows:

1. The monopolist sets a price p for the good.
2. The expert sets a fee for the service of revealing the good's quality to the consumers.
3. The good's quality is drawn by nature: $q \sim U(0,1)$.
4. The expert observes q.
5. User reviews become available to all consumers at no cost. All consumers learn whether $q \geq \frac{1}{2}$ or not.
6. Consumers decide whether to consult the expert or not. The value of q is revealed to those who consult the expert.
7. The purchase decision is made.

We solve the game by backward induction, focusing first on the decisions of the expert and then considering the strategies of the monopolist.

6.1 Consumer behavior and expert pricing strategies when user reviews are available

In this section we study the behavior of experts when consumers do not know the good's quality but have updated their priors on q through user reviews. That is, at the moment of taking the participation decision each consumer knows whether the good got a *star review* from the users or not.

The expert now faces the following expected demand:

$$ED^{XP-I}(\lambda, p) = \begin{cases} \frac{1}{2}(p - \frac{1}{2} - \sqrt{\lambda}) + \frac{1}{2}\left(\frac{1}{2} - 2\sqrt{\lambda}\right) = \frac{1}{2}\left(p - 3\sqrt{\lambda}\right) & : \text{ if } \lambda \in \left[0, \frac{(1-2p)^2}{4}\right] \\ \frac{1}{2}(0) + \frac{1}{2}\left(\frac{1}{2} - 2\sqrt{\lambda}\right) = \frac{1}{4} - \sqrt{\lambda} & : \text{ if } \lambda \in \left(\frac{(1-2p)^2}{4}, \frac{1}{16}\right] \\ 0 & \text{otherwise.} \end{cases}$$

when $p \in \left(\frac{1}{2}, \frac{3}{4}\right]$ and

$$ED^{XP-II}(\lambda, p) = \begin{cases} \frac{1}{2}\left(p - \frac{1}{2} - \sqrt{\lambda}\right) + \frac{1}{2}\left(\frac{1}{2} - 2\sqrt{\lambda}\right) = \frac{1}{2}\left(p - 3\sqrt{\lambda}\right) & : \text{ if } \lambda \in \left[0, (1-p)^2\right] \\ \frac{1}{2}\left(\frac{1}{2} - 2\sqrt{\lambda}\right) + \frac{1}{2}\left(\frac{1}{2} - 2\sqrt{\lambda}\right) = \frac{1}{2} - 2\sqrt{\lambda} & : \text{ if } \lambda \in \left((1-p)^2, \frac{1}{16}\right] \\ 0 & \text{otherwise.} \end{cases}$$

when $p \in \left(\frac{3}{4}, 1\right]$.

In the following propositions we formally present the equilibrium strategies of the expert as a function of the price of the good.

Proposition 3 *In the presence of user reviews, when the monopolist sets a* low price *an expert reveals the good's quality to the consumer for a fee* $\lambda = \frac{1}{36}$*, serving a demand* $D^{XP} = \frac{1}{12}$*, and obtaining profits* $\Pi^{XP} = \frac{1}{432}$*. When the monopolist sets an* intermediate price *an expert reveals the good's quality to the consumer for a fee* $\lambda = \frac{4p^2}{81}$*, serving a demand* $D^{XP} = \frac{p}{6}$*, and obtaining profits* $\Pi^{XP} = \frac{2p^3}{243}$*. When the monopolist sets a* high price *an expert reveals the good's quality to the consumer for a fee* $\lambda = (1-p)^2$*, serving a demand* $D^{XP} = \frac{4p-3}{2}$*, and obtaining profits* $\Pi^{XP} = \frac{1}{2}\left(-3 + 10p - 11p^2 + 4p^3\right)$*. When the monopolist sets a* very high price *an expert reveals the good's quality to the consumer for a fee* $\lambda = \frac{1}{36}$*, serving a demand* $D^{XP} = \frac{1}{6}$*, and obtaining profits* $\Pi^{XP} = \frac{1}{216}$.

We are solving the game by backward induction. Therefore, we observe different λs depending on the price the monopolist sets.[8] The expert's strategies let us identify four pricing levels for the good, which we use to carry out our analysis: *low* when $p \in \left(\frac{1}{2}, 0.6555\right]$, *intermediate* when $p \in \left(0.6555, \frac{9}{11}\right]$, *high* when $p \in \left(\frac{9}{11}, \frac{5}{6}\right]$, and *very high* when $p \in \left(\frac{5}{6}, 1\right]$. Moreover, whether the user reviews were positive or not will also affect the demand faced by the expert, given that the decision to pay for his services hinges on the expected utility the consumers would obtain.

Intuitively speaking, when the good's price is in the *low* pricing range the consumer does not have strong incentives to consult the expert before buying the good. This was already the case when user reviews were not available in the market. Actually, if the good's quality is revealed to be above the expected value (i.e., $q \geq \frac{1}{2}$) and p is *low*, no consumer consults the critic before buying. That is, all consumers who buy the good from the monopolist do so based on the information gathered from the user reviews. Thus, for a *low* price the expert faces some demand for his services only when the good's quality is revealed by user reviews to be smaller than one half. However, when the good's price

[8] Notice that these regions are loosely defined for presentation clarity only and do not necessarily match the regions similarly denoted for the case without user reviews.

moves outside the *low* region the expert has a chance to attract consumers both in case a *star review* is observed and when it is not. Fewer consumers buy the good based on the user reviews alone. The more expensive the good turns, the more attractive expert services become. When the good's price is *high* the expert is able to attract a potential demand both when a *star review* is found and when it is not. In the case where the good's price is *very high*, the demand for expert services is no longer a function of p.

We will compare the strategies the expert adopts, both when user reviews are available and in our benchmark, in Sect. 6.3. Now we look at the changes in the type of consumer active in the market when both critic and user reviews are available, since the expected utility of the consumers will also be altered by the presence of a new source of pre-purchase information.

6.2 Consumer type and expert services when user reviews are available

From an informational perspective one could say that both when a *star review* is observed and when it is not, more information becomes available with respect to our benchmark. Even if the review is negative, consumers have more information and can thus make a better-informed decision. However, the incentives for consumers to consult the expert are different depending on what kind of user reviews were observed. Moreover, whether a *star review* causes a consumer to bypass expert services depends on the good's price and the consumer's type bonus. These variables determine the expected utility a consumer considers at the time of deciding to consult the expert, buy the good directly or leave the market. Thus, it is interesting for the critic to understand how consumers react to positive and negative reviews, since it will allow him to optimally set a fee that anticipates both scenarios. In the following graph we present the demand for expert services as a function of the good's price and the type-match bonus a, when a *non-star review* is observed.

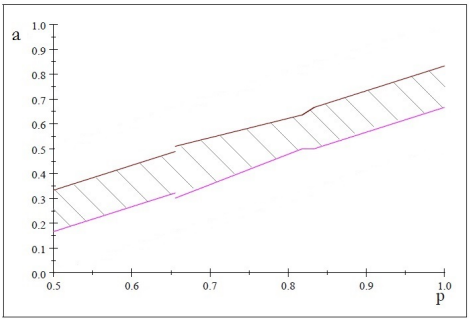


Fig. 4 Demand for expert services as a function of the good's price and type when $q < \frac{1}{2}$

When a *non-star review* is found, the demand for expert services slightly increases with the good's price. The hashed area in Fig. 4 represents the demand the expert faces as a function of p, with the consumers' type-match bonus a in the vertical axis. Though the mass of consumers who consult the expert is quite consistent across the pricing regions, the biggest segment of consumers demanding the critic's services is found when p falls just above the *low* pricing region's upper bound. On the other hand, the smallest segment is served when p falls in the boundary between the *intermediate* and *high* pricing regions. We can also see that the higher the price becomes, the higher the type bonus of the consumers who consult the expert before buying. For instance, when p is *low* consumers with types $a \in [0.15, 0.35]$ ask the expert, whereas when the good's price is *very high*, only those with a type $a \in [0.6, 0.8]$ will ask the expert. Consumers with type bonuses smaller or larger than those, respectively stay out of the market or get enough information to make the purchase decision from the user reviews. In other words, consumers whose taste is more closely matched by the good become interested in reading the critic if the price becomes high, even if user reviews are negative. Indeed, the expert always faces some demand when a *non-star review* is found, irrespective of the good's price or type. This is not the case when a *star review* is observed, which we present in the following graph.

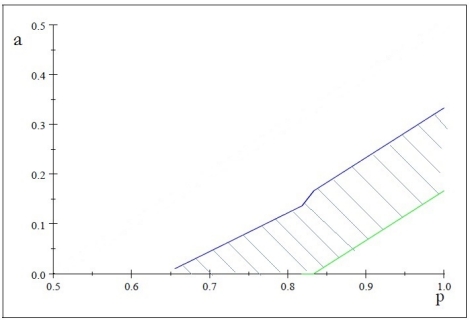


Fig. 5 Demand for expert services as a function of the good's price and type when $q \geq \frac{1}{2}$

When a *star review* is found the expert faces some demand only if the good's price is at least in the *intermediate* pricing region, as indicated by the hashed area in Fig. 5. Yet, even in that case, only consumers whose taste is not matched by the good (low type bonus values) will be interested in the service. The biggest mass of consumers is served when the price of the good falls in the boundary between the *high* and *very high* regions. We can understand this as the case where positive word of mouth is available for a movie not matching the type of the consumer, who thus decides to read what the critic has to say before buying a pricey ticket. Generally speaking, when a *star review* is found, consumers with small type-match bonuses are the ones most interested

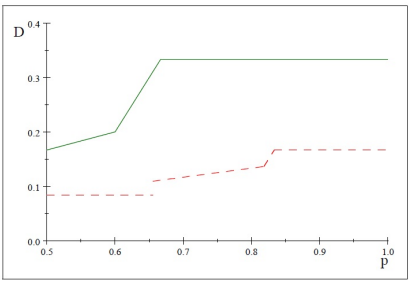
in asking the expert before buying. In fact, no consumer with a type a above 0.3 will ever consider asking the expert when $q \geq \frac{1}{2}$, no matter the size of p. Which is to say, only consumers whose taste is poorly matched by the good will consult the critic when user reviews are positive. When the good's price is in the high regions, the type of consumer who asks the expert increases in p. For such a p, consumers with type values close to zero will no longer consider asking the expert before buying.

It is worthwhile noting that, for all price levels, the type-match bonus of the consumers who ask the expert when a *star review* is found are smaller than those of the consumers who consult him when the review is negative. For example, a consumer with a type 0.3 would ask the expert only if a *star review* was found and p was *very high*. For any other p, he would buy the good based on the positive user review alone. In contrast, the same consumer would stay out of the market if a *non-star review* was observed, unless the good's price was *low*. Similarly, a consumer with a type-bonus value 0.5 would never even consider asking the expert before buying if she observed a *star review*, but she would certainly be interested in the expert's service if the good's price was *high*. Her type-match bonus is sufficiently high for her to decide to buy the good based on the user reviews, even if they are negative, when the good's price is *low*. She would abandon the market if p became *very high*, but has incentives to consult the expert before buying if the good's price was somewhere in-between *high* and *very high*. Hence, it is possible to say that a more expensive good attracts more taste-matched consumers to the expert services. In the next section we compare these results with the benchmark where the expert was the only informational channel available to the consumers.

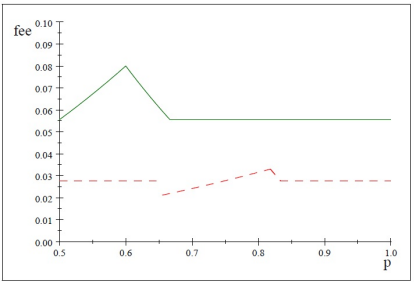
6.3 Effect of user reviews on the behavior of the expert

Now, in light of the results discussed in Sects. 5.1 and 6.1, we analyze the way user reviews affect the expert. User reviews offer the consumers a refinement on the information they have at the moment of taking the participation decision. This fundamentally alters their incentives to consult the expert. A twofold effect takes place: First, negatively influencing the demand for expert services, since consumers now have enough information to purchase based on the user reviews and thus some dismiss the expert. Second, and perhaps less directly, by changing the decisions of the firm. To illustrate these dynamics, we present a comparison of the expert's demand and fee in the following graph.

The demand the expert faces in the presence of user reviews (the dashed line in Fig. 6a) is a non-decreasing function of p. However, it is much smaller than when the expert is the only source of information available to consumers (the solid line in Fig. 6a). A free-to-access competing source of information is bound to detract from the expert's potential demand. There is a discontinuity in the demand function with user reviews at the *intermediate* pricing region. This happens due to the entry of consumers who observe a *star review*. Recall that for *low* prices the critic only faces some demand from consumers who observe a negative review. The behavior of the demands as functions of p is



(a) Demand for expert services as a function of the good's price with and without user reviews



(b) Expert's fee as a function of the good's price with and without user reviews

Fig. 6 Demand and profits of the expert as a function of p when user reviews are available

quite similar in the two cases: more consumers are attracted as p increases, with a maximum demand segment being reached the closer p gets to the *very high* region.

In terms of the fee, the expert can charge a much smaller λ in the presence of user reviews, irrespective of the size of p, as we can see in Fig. 6b. Although still quite smaller than the fee charged when user reviews are not present, the equilibrium λ increases as a function of p through the *intermediate* pricing region, in the presence of user reviews. This is explained by the demand the critic obtains in this region from the consumers who find a *non-star review*. Observing a negative review makes their expectations on q "worse," reinforcing the incentives they have to consult the expert and thus allow him to price highly despite the already high level of p.

Having completed the analysis of the expert's behavior when the good's type is publicly known and user reviews are freely available in the market, we can say that the critic is worse off in such a scenario, confirming what anecdotal evidence has suggested: many outlets devoted to publishing film, music, and other entertainment goods reviews have closed down in recent years, as user reviews became more abundant and easier to access. Our model supports such intuition, describing an equilibrium where an expert serves a smaller demand segment and obtains lower profits when competing with free-to-access user

reviews. One could even argue that, for a high enough cost of providing the service (in our set-up it is assumed to be zero), the expert would ultimately decide to exit the market, as often observed. The welfare effects of such a decision are not trivial. To examine them it is necessary to analyze the equilibrium behavior of the firm in the new scenario. Thus, we now move on to discuss the effect the additional information has on the demand for the good.

6.4 Firm behavior when expert services and user reviews are available

In this section we analyze the firm's decisions when consumers can access information from the expert and user reviews before purchasing. From the analysis of the benchmark carried out in Sect. 5.3 we know that, in the equilibrium, the firm is indifferent between serving the market with or without expert services. That is, it obtains the same level of profits when the critic is present and when the service is unavailable. When we study whether user reviews alone have a similar effect on the decisions of the firm, without yet introducing the critic in the market, we find that the presence of user reviews does not change the equilibrium decisions of the firm, a result we formally present in the following proposition.

Proposition 4 *A monopolist producing an experience good in a market where user reviews are available, sells the good at a price* $p^G = \frac{3}{4}$*, serving a demand* $D^G = \frac{3}{4}$ *and obtaining profits* $\Pi^G = \left(\frac{3}{4}\right)^2$.

What the result above means is that the monopolist obtains the same level of profits, serves an identical demand, and charges the same equilibrium fee when: user reviews are available as the only source of information, the consumers decide to purchase based exclusively on their priors, and also when only the critic is active. Therefore, since the monopolist's allocations in the three informational situations are identical, we can claim that the appearance of just one source of information in the market does not affect the decisions of the firm in equilibrium.

The firm is evidently indifferent between either scenario. It is not concerned about where consumers can obtain extra information on the good's quality, or if there is any information available for them to begin with. The firm's indifference lies in the fact that the mass of consumers who exit the market due to the positive information received neutralizes the mass that abandon the market because of some negative information. However, it is not clear whether this will also be the case when more than one source of information is available at the same time. The simultaneous presence of expert services and user reviews might lead to less underestimation (and overestimation) in equilibrium. In the following proposition we present the equilibrium allocations of the firm when user reviews and expert services are available.

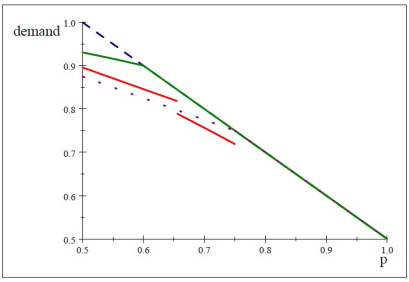
Proposition 5 *A monopolist producing an experience good of quality q unknown to the consumers and a type a publicly known, in a market where user reviews and expert services are simultaneously available, sells the good at a price $p^G = \frac{3}{4}$, serving a demand $D^G = \frac{3}{4}$, and obtaining profits $\Pi^G = \left(\frac{3}{4}\right)^2$.*

We find that the firm is indifferent between a scenario where both the user reviews and expert services are available at the same time and when the consumers have no information to base their decisions other than their priors. The monopolist's equilibrium strategies are the same in the two cases. The firm obtains the same level of profits, serves an identical demand, and charges the same price. Moreover, the monopolist is also indifferent between these two informational situations and the one where only user reviews or expert services are present. That is, the firm's strategies are not affected by the additional information coming from having two instead of a single source of information for consumers to learn about the good.

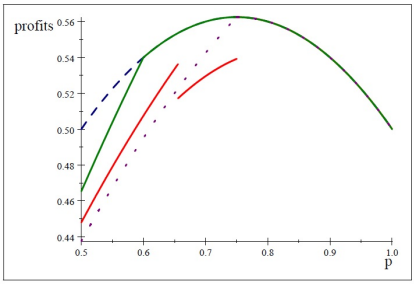
Concluding the backwards solution of the game, below we present the equilibrium allocations of the expert in this informational scenario, following the strategies found in Proposition 3.

Corollary 2 *In the equilibrium, when user reviews are available in the market, the expert charges a fee $\lambda = 0.0278$, serving a demand $D^{XP} = 0.125$, and obtaining profits $\Pi^{XP} = 0.0035$.*

On the other hand, in the equilibrium, the expert is negatively affected by the appearance of user reviews. He serves a smaller demand and charges a smaller fee for his service than in the case where user reviews were absent. This confirms the detrimental effect of a costless source of information on the expert. The following graph compares the demand for the good and the firm's profits as a function of p when no information is available, user reviews and expert services are simultaneously present, and when either of the two are available separately.



(a) Demand for the good as a function of the good's price



(b) Profits of the firm as a function of the good's price

Fig. 7 Demand and profits of the firm as a function of p when one or more sources of information are available

As was the case when only one of the sources of information was available, the demand for the good is a decreasing function of p when user reviews and expert services are simultaneously present. However, the demand for the good when the two sources appear at the same time is not continuous (the solid red line in Fig. 7a, with the dashed line representing the demand under no information, the solid green line the demand when only the expert is present and the dotted line the case when only user reviews are available). This demand comprises three separate segments corresponding to the *low*, *intermediate*, and *high* pricing regions. The consumers behave differently when the good's price falls in each of these regions, since despite already having the information from user reviews their incentives to consult the expert depend on p, causing the jumps we observe in the demand for the good.

In the *low* pricing region the demand for the good when the two sources are available falls in-between the demands when only user reviews and the expert were active, above the former and below the latter. This indicates that there is some demand induction taking place at this pricing level. The effect comes from those consumers who decide to buy the good after asking the expert but who would have otherwise left the market if they had to base their decisions solely on user reviews. However, that demand is still smaller than the one the

monopolist would face for a *low* price if there was no extra information in the market. Actually, it is even smaller than the demand the firm would serve if only the critic were present in the market. This hints at some underestimation from consumers who observe a negative user review and stay out of the market without asking the expert. But also, in the case with no extra information, there is some overestimation due to the low price and the crude expectations consumers initially have. In both of these cases the over/underestimation is measured with respect to the demand the firm would serve when the real q is learned by some consumers through the critic. For *intermediate* levels of p the demand when both sources of information are available falls below the demands of all other cases. This happens because more consumers exit the market after learning the quality of the good from the expert. At higher pricing levels less variation in the demands of the different informational situations is observed, given that the consumers who participate in the market are those with high taste bonuses and a sufficient willingness to pay.

We observe a similar behavior in the monopolist's profits, with the firm obtaining the same level at the equilibrium price $\frac{3}{4}$ across the four scenarios. In Fig. 7b we present the profits the monopolist obtains as a function of p when all the combinations of information sources are available, either alone or simultaneously. In the equilibrium, and for a price bigger or equal than $\frac{3}{4}$, the firm is indifferent between any of the informational situations. That is, it obtains identical profits $\Pi^G = \frac{9}{16}$ when no additional information is available (the dashed line), only the expert (the solid green line) or the user reviews (the dotted line) are present at once, or simultaneously (the solid red line). Nonetheless, although the firm is indifferent between all the informational scenarios in the equilibrium, this does not mean that user reviews or expert services do not play a role in the market. The types of consumers who enter the market and consider the purchase, be it due to the information provided by user reviews or the critic, are not the same in the four scenarios. Nor are the welfare implications of having access to better information before making the purchase decision. We examine this in the following section, looking at the market-wide effects of expert services and user reviews through a measure of consumer welfare.

7 Welfare effects of expert services and user reviews

In this section we study the welfare implications of the presence of different sources of information in a market for experience goods. In Sects. 5 and 6 we found that in equilibrium the firm is indifferent between all of these scenarios. However, we also perceived the potential gains in consumer welfare stemming from the increased availability of information. For instance, over- and underestimations of the good's quality are less prevalent among the consumers when more accurate information regarding q is acquired by a wider range of them.

Consumers who have better information on the good will make better decisions. To fully grasp these effects we will discuss a measure of social welfare. In the following table we present the monopolist's profits, the consumer surplus, and the expert's profits in the equilibrium, across the four informational cases we have been studying.

Table 1 Social welfare when user reviews and expert services are available in a market for experience goods

Informational Situation	Consumer Surplus	Firm Profits	Expert Profits	Total Welfare
No Information	0.2812	0.5625	0	0.8437
Expert Only ($\lambda = 0.0555$)	0.2920	0.5625	0.0185	0.8730
User Reviews Only	0.3125	0.5625	0	0.8750
Both Simultaneously ($\lambda = 0.0278$)	0.3308	0.5625	0.0035	0.8969

The firm is indifferent between the four informational situations, as made evident by the monopolist's profits being identical in the four scenarios. On the other hand, as described in Sect. 6.3, the expert is worse off when competing with user reviews. The critic charges a fee that is barely half the value he would charge if user reviews were not available, obtaining a sixth of the profit level. Consumer welfare, measured through their *ex post* surplus, increases as more information becomes available. Thus, it is the highest when the expert and user reviews are simultaneously active. This is also true for the total social welfare, taken as the sum of our three agents' profits and/or surplus. However, notice that consumer welfare is smaller when expert services are the only source of information, compared to when user reviews alone are present. This is due to the fee the critic charges for his service.

The quality of the information obtained by consumers is important, despite both the total welfare and consumer surplus being higher when only user reviews are available than when only the expert is. We can clearly see this in the case where both are simultaneously available, causing over- and underestimation of q to drastically decrease among consumers. The effect of the finer information offered by the critic is partially mitigated by the transfer taking place between the consumer and the expert in the form of λ. Hence, on the grounds of their surplus, consumers would seem to prefer only the user reviews to be available over only the expert being active. However, consumer welfare significantly improves when both sources of information are available simultaneously. Hence, more (if not better) information leads to socially-desirable states. Therefore, we can conclude that consumers are better off with some information, no matter its cost or source, rather than none. This confirms what the theory has long suggested: better-informed consumers make better decisions in markets where information is not symmetric. A premise that holds, per our results, in the entertainment industry as well.

It must be said that the apparent lack of an effect over the firm's equilibrium decisions is a consequence of some modeling choices, namely the linearity of the utility functions. Some consumers improve their welfare by deciding not to buy the good after consulting the expert and paying his fee, while they would have bought the good (to an *ex post* loss) if the decision had been based only on their priors or on information obtained from user reviews. Some others decide to buy the good after learning q through the expert, though they would not have participated in the market in any other informational scenario. These masses of consumers have equivalent sizes given the characteristics of our model, which causes the informational effects to seemingly cancel out. That said, society at large is better off the more information becomes available, as we can infer from the evolution of the total welfare in Table 1. We go over some potential extensions in the concluding section, addressing alternative modeling set-ups that could help capture the more subtle effects taking place in this market. Next, we identify and discuss some of the theoretical and practical implications of our findings.

8 Theoretical and Practical Lessons

In this section we consider the results of our model in the light of their contribution to the literature and the practical recommendations that can emerge from them.

8.1 Theoretical contributions of our results

In terms of expert services and user reviews being able to induce demand for the experience good, by the way of a reduction in consumer uncertainty, we find no direct effect. Nevertheless, if one regards the demand for the critic as part of the industry, the size of the market expands in the presence of additional information. What this means is that more consumers consider buying the good, either based on user reviews or information from the critic, even if they ultimately do not purchase. One of the particularities of markets for critics is that their demand exists only as a derivation of the demand for the good (Cameron, 1995). In our model there is a demand for expert services that exists beyond the demand for the market, in the form of consumers who decide not to purchase after learning the good's quality. Thus, we can claim that the mass of consumers who consider buying the good increases when the critic and/or user reviews are available. The composition of the market also changes, in terms of the tastes and valuations of the consumers who participate.

It may seem striking that the firm's equilibrium allocations are the same for all the informational scenarios. However, empirical examinations of the market have postulated such a result before. In one of the most recent studies of film reviews, Souza et al. (2019) found that the effect of professional critics on a movie's box-office run was null in the case of wide releases. Yet, the authors found that both expert and user reviews have an effect on niche and smaller film releases. This aligns with our results, since we find that consumers with

a superior taste-match bonus – precisely how we represent niche audiences – are the ones who consult the expert when user reviews become available. We find a similar connection to the work of Gemser et al. (2007), who argue that expert reviews are the most influential on niche audiences. Thus, we can say that our analytical results align with what the empirical literature has previously proposed.

While there are no studies with an specific focus on the financial performance of critical outlets, our results support what intuition and anecdotal evidence from the industry suggests. Critics are constrained in their strategies when a costless source of information appears in the market, causing them to serve a smaller demand and charge lower fees. In simpler words, professional critics are worse off when consumers can access user reviews. This result can be linked to preceding theoretical works, which claim that free online information diminishes an expert's profits (Akçura & Ozdemir, 2017). Moreover, the authors find that if the information available for free is comparable in accuracy to the offline/paid counterpart, the online-only information provider exits the market. Our results connect directly with such findings, providing alternative theoretical analyses of the market situation expert services are facing.

8.2 Managerial implications of our results

Our model allows us to consider three different types of recommendations to practitioners: the firm (*e.g.* a studio head), the critic (*e.g.* the managing editor of a media outlet or a freelancer) and some planner who would be interested in the aggregate or market-wide effects (*e.g.* a ministry of culture or an agency for the development of the cultural industries). We will now detail them in the following:

- *Firm:* Although the firm appears to be indifferent to the presence of critics or user reviews, our results provide conceptual grounding for review embargoes. The demand-attraction effect that a critic may induce is weak when the good's price is low, because more consumers consult the critic before buying, hence update their priors and stay out of the market. The critic stops those consumers from making a sub-optimal choice based on an overestimation of the good's quality. In that light, when a film studio is facing the release of a movie it knows to be below expectations in terms of quality, it would do well to stop such information from being available to consumers through the critic, possibly imposing an review embargo. Indeed, the literature shows that early reviews are the most influential on box-office performance. It should be noted, however, that such an strategy would not work for higher pricing levels.
- *Firm and Critic:* The presence of user reviews causes the type of the consumers who demand expert services to change. To be precise, consumers with a strong taste match are the ones who consult the critic. This hints at a potential path to specialization, perhaps in the form of niche or genre-specific reviews. Conversely, instead of withholding information producers

may prefer to cater to particular critics, specialized in a genre or niche so that the type-match bonus of their readers is high enough for a marginal refinement on the good's quality, obtained from the expert, to cause more consumers to buy the good.

- *Critic:* Their informational advantage, the core of their business model, is compromised by the availability of pre-purchase information on the good. Finding other ways to compete and fund their business is key for critics. Perhaps through business model innovation (*e.g.* offering direct subscriptions to their consumers), by centering the value they generate on the taste-match or exploring additional sources of value relevant to their customers (*e.g.* making the service go beyond revealing the good's quality, bundling information, etc.). Our results and the literature strongly indicate that competing with free-to-access user reviews, while staying simply as a source of information on the quality, is not viable under the prevalent business model.
- *Social Planner:* An industry-wide view would acknowledge that the market expands in the presence of the critic, user reviews, and when both are available at the same time. More people engage in the industry, are interested in the good and discuss about it, even if these exchanges do not immediately reflect in the profits of the agents. From the perspective of a planner, as suggested by our results and the preceding literature, consumer welfare improves when both sources of information are available simultaneously. Moreover, expert services and user reviews are not perfect substitutes. The fact that the demand for the critic exists only as a derivation of the main market does not mean these do not provide value beyond offering a service functional to the firm.
- *Social Planner and Firm:* In all cases, better information leads to socially-desirable states, although the incentives for consumers to pay directly to the expert for information are weak at best. That said, under some conditions, the firm itself might be interested in preserving expert services. Expert services are a relevant source for consumers to update their expectations, particularly when user reviews may be capturing other forms of value instead of a given good's quality. Subsidizing critical outlets might be something for industry agents to consider, if the fact that Warner Media owns *Rotten Tomatoes* is not already an indication of the potential for such an integration. Government grants and private donations have also become increasingly relevant in supporting the financial viability of expert services in the cultural industries.

9 Conclusions

In this paper we studied the role of expert services and user reviews in experience goods markets, in an attempt to model the informational aspects of the entertainment industry. We first develop a theoretical model to understand how the information provided to consumers by the critics affects the market outcomes. Later we introduce free-to-access user reviews, from which

consumers can learn some information on the good. We find that both expert services and user reviews increase consumer welfare with respect to a benchmark where they decide to purchase based on their priors. In particular, user reviews grant consumers a superior surplus to expert services. However, the total welfare in the market is smaller when only user reviews are present than when expert services are simultaneously available. Expert services are sensitive to competing sources of information. In equilibrium the expert charges a fee of nearly half the value of what he could charge when operating alone. The expert also serves a smaller demand and obtains lower profits.

On the other hand, the firm selling the experience good is not affected by the presence of expert services and/or user reviews. In the equilibrium, it charges the same price and serves the same demand as in the benchmark. Thus, direct demand-inducing effects do not appear to take place. Nevertheless, the composition of the market changes. Consumers with different tastes (lower type-match bonuses) enter the market, while some at the upper end of the distribution stop purchasing after learning the good's quality. That is, consumers who would otherwise not have entered the market, participate in the informational exchange with the expert, in some cases buying the good afterwards. Others, who would have bought the good based on their priors, learn its real quality and no longer purchase. The market thus generated is much bigger than the demand for the good, although in equilibrium consumers who enter the experience good's market after consulting the expert cancel out the mass of those who stop buying once they learn the good's quality.

There are clear welfare-improving effects from user reviews and expert services becoming available in the market. Even if the firm is not interested in keeping user reviews and expert services active in a market, due to the weak demand-induction effects, a planner would be. Especially considering the experts, whose situation deteriorates when user reviews appear. Some external agent could sustain expert services in the market through subsidies or direct transfers. This scheme is not entirely unlike what one can observe in everyday life, where native advertising and sponsored content have become prevalent in many critical outlets. Grants, donations and public funding models have also started to become widespread among formerly user-funded critic outlets. Direct membership and subscription models in the spirit of those offered by platforms like *Patreon* can be another funding alternative, where members pay a fee for a service built more on a taste-match with a specific reviewer than for an assessment of the quality of the good alone.

It is interesting to consider the research paths opened by our results. First, future works could look at repeated interactions, where the consumer can choose between buying some good that she is completely unfamiliar with and another she has tried before. This gives the expert room to offer bundles of reviews, expanding his pricing and reviewing strategies. Second, they could let the firm strategically decide the good's quality, which is given by nature in the set-up we discussed. Making the good's type unknown to the consumer is another intriguing road to pursue, as it could lead to different reporting

menus for the critic, perhaps reducing competitive pressure from user reviews. Exploring alternative ways to model the expert's revenue model is another path open for further research. For example, including advertising alongside the direct sale of information. Third, while we briefly mention the phenomenon of diverging expert and user reviews in *Sect. 7*, our model does not contemplate conflicting reviews or fraudulent behavior (*i.e.*, review manipulation from either type of agent) and future examinations may consider these. Looking at the supply side, in this study we have chosen to represent the entertainment industry as a monopoly. Relevant extension would expand the model to $n > 1$ firms and/or competitive configurations closer to the structure of specific entertainment industries (*e.g.* more concentrated in the mainstream music industry than in the independent editorial sector). Finally, allowing the firm to signal the good's quality to consumers directly, thus augmenting the information sources available at the time of making the participation decision, would also serve to represent advertising practices prevalent in the entertainment industry today. All these, along with the results we discussed, will help us set the foundations for a finer understanding of experience goods markets and the role information plays in them, either through expert services, user reviews or both. In particular, when analyzing the complex, engaging and ever evolving entertainment industry.

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