Asymmetric information in two-sided markets: a model with applications to platforms in the tourism and cultural industry.

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Scope and background of the research

A series of innovative services that appeared in the last decades, such as retail and marketplace services, mobile commerce, customer service, e-procurement and purchase-to-pay, are commonly traded online by economic platforms operating in internet or in social networks. Beside e-commerce businesses (eBay), several creative industries such as Google (website), Facebook (social network), and Sony (gaming) as well as the modern cultural and tourism industries (Netflix, Spotify, YouTube, Booking.com, Expedia, TripAdvisor etc.) produce and distribute their contents by open or closed platforms. Not only platforms themselves are among the most innovative and successful start-up initiatives in recent years; but, more and more, both established businesses and new entrepreneurial ventures rely on them for their growth and performance.

In general, the organizations that intermediate the interactions between two (or more) “customers” are called multi-sided platforms and they form the so-called two-sided markets. As for the definition given by Rochet and Tirole (2003), a two-sided market is made of at least a platform in which sellers and buyers meet and trade, and has a volume of transactions that varies as the fees applied by the platform to the seller or to the buyer change while maintaining the aggregate fees constant. In other words, if the sellers' fees increase (and hence buyers' decrease), the volume of the transactions varies in a two-sided market; in case the volume would not change, we would have a one-sided market.

Since the first years of 2000s, with the seminal works by Rochet and Tirole (2003), Gabszewicz and Wauthy (2004), and Evans (2003), this matter has been a topic of interest for the economic scholars (see Roson (2005) and Rysman (2009) for a review of the literature). In the following years, the studies on two-sided markets were published in several top journals in economics (see, for example, Rochet and Tirole (2006), Armstrong (2006), Armstrong and Wright (2007), Hałaburda (2010), Weyl (2010), Lee (2013), and Halaburda and Yehezkel (2016)).

Most of the works available in literature covers interaction among sellers and buyers through one or more platforms, in a context of perfect information; monopoly and competition are considered, as well as single-homing and multi-homing behaviors, that is, the possibility for a buyer to choose more than one platform. On the contrary, economics scholars started to investigate imperfect information two-sided markets only in very recent years. In Halaburda and Yehezkel (2013) the authors assume that both sides have uncertainty about the exchanged quality ex-ante, and that they acquire this information when they choose a certain platform, so the ex-post information is private; they demonstrate that competition, in this framework, could lead to a market failure, but multi-homing could solve this failure. Hagiu and Halaburda (2014) assume instead that consumers have imperfect information and passive expectations while producers have full information about the goods, finding that the level of information detained by the consumers affects positively the level of price competition in case of more than one platform, while in case of monopoly the higher the information detained by the consumers the higher the profits the platform gains. Finally, Jullien and Pavan (2016) study how the dispersion of information about users’ preferences affects demands and prices through the introduction of uncertainty. All of the above models are static, besides Halaburda and Yehezkel (2013) and Jullien and Pavan (2016) that have a discrete timing. The only work that analyses the two-sided markets in a dynamic approach is Halaburda et al. (2016), in which the
platform that dominated the market in the last period becomes "focal" in the current period, and hence the buyers have a preference for it; one can say, then, that also the Hałaburda et al. (2016) model is about imperfect information, since consumers have information only on the focal firm and not on the new ones, and they have no information about the quality. In this framework, the authors demonstrate that, depending on the considered time horizon, a low-quality platform could prevail in the market if it is focal.

**Purpose of the project**

Based on the existing gaps in the literature, the primary aim of the project is to develop a theoretical model of two-sided markets that analyzes in-depth how the various potential configuration of asymmetric information could affect the entrepreneurial strategies of the platforms (and of firms) in a two-sided market. First of all, the model will consider different types of asymmetric information situations covering search, experience, and credence goods. Platforms in retail services (online good and services) are example of search good markets; traveling and tourism services of experience good markets; art galleries and action houses of credence goods.

Our goal is to throw new light on firms’ pricing strategies in each context and on the consequences of asymmetric information, such as the market failures that are generated in the experience and in the credence goods markets (Emons (1997; 2001); Dulleck and Kerschbamer (2009); Dulleck and Kerschbamer (2006)). Second, when more platforms compete in the same two-sided market, also the quality of the platform becomes relevant in that the entrepreneurs will choose the platform(s) considering it. Also, platforms too may lack of information about the sellers asking their services, as in the case of booking.com or other tourism booking platforms that do not check the actual quality of these tourism goods, so that the asymmetry can be bilateral. Once these problems have been identified and solved in this new framework, one could eventually propose policy interventions that can be implemented by a policy maker to correct them, or alternative pricing strategies that a platform could put into effect, in order to avoid the occurrence of market failures; these interventions could concern information diffusion, through information campaigns if coordinated by a policy maker, or through advertising as part of a platform business strategy. In the case of tourism, for instance, in order to increase the platform's externalities effect, destination manager could support hotels and other tourism sellers; in art markets, art dealers could support collectors and other buyers of cultural goods.

**Research methodology**

The main methodology for this project is theoretical, based on existing industrial organization formal models of two-sided markets. The construction of a theoretical model characterized by a microeconomic setting of interaction among sellers and buyers that can only meet on a certain platform, and on the peculiar characteristics of each of the three kind of goods (search, experience, and credence) would work as a base for studying the managerial implications for platforms and sellers and the potential welfare-improving policies to apply.

As a possible follow up of our modelling analysis, we intend to proceed by empirically testing the model implications by using data from the cultural and tourism market, obtained through the e-commerce platforms trades, as Kaiser and Wright (2006), Argentesi and Filistrucchi (2007), and Rysman (2007) did for the magazine, the news, and the credit cards market using the Payment Systems Panel Study.

**Expected results**

The primary, and final, outcome of this project will consist in a research paper to be submitted to
top field (industrial organization) journals. As an interim deliverable (first draft), we intend to produce a working paper in the UNIBO Department of Economics (DSE) series, to be presented in national and international conferences and seminars. In addition to that, given the potential interest of our results both at the managerial and policy level, we intend to produce a non-technical report, based on the existing literature and evidence and our new results, which derives implications for the cultural and tourism industries. Such a report could be presented in public initiatives (such as the Unirimini supported conferences at the TTG for tourism) and a synthesis could be published in non-academic outlets such as Internet blogs.

Training plan

The training plan of the selected candidate, and the corresponding plan of activities of the project, are as follows:

- Month 1-3: Survey of the literature and set-up of the model.
- Month 4-8: Derivation of the results
- Month 10-12: Paper presentation in conferences and seminars (including non-academic environments).
- End of month 12: Possible submission of the paper to a scientific journal.

Research group

The research group is constituted by Prof. Massimiliano Castellani, proponent of the project, and by Prof. Lorenzo Zirulia, both members of the Department of Economics. For the possible empirical follow-up, for example for what concerns the data retrieval on tourism and on big data about online auction, the group could collaborate with other members of Department of Economics and of CAST.
References


