



## Reputation and prices on the e-market: Evidence from a major French platform<sup>☆</sup>



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### ABSTRACT

We use an exhaustive data set from one of France's largest e-commerce platforms, [PriceMinister.com](http://www.priceminister.com), to estimate a statistical causal effect of a seller's reputation (rating and size) on transaction prices. We go beyond the results currently available by tackling the issue of seller unobserved heterogeneity and the dynamics of reputation in price equations. We can also produce results for a large range of product categories (books, CDs, video games or DVDs), product conditions (used or new) and seller types (individual or professional sellers). Our results show large-scale empirical evidence of a significant, positive and strong effect of seller reputation on prices.

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## 1. Introduction

Over the past fifteen years, e-commerce has evolved from a marginal and sporadic medium of trade involving small numbers of IT enthusiasts into an economy-wide phenomenon. One of the biggest challenges e-commerce web sites are faced with is to design mechanisms that address fraud and seller misbehavior (such as poor delivery service or misrepresentation). One of the main responses to this challenge has been to develop online feedback procedures as a “technology for building trust and fostering cooperation” ([Dellarocas](#),

2006). These procedures aim to alleviate adverse selection and moral hazard problems by providing a publicly observable measure of seller reputation. The empirical importance of these reputation indicators is the focus of a burgeoning literature in economics, that has arisen from the expansion of e-commerce and increasing data availability. The objective of this paper is to conduct an empirical analysis of the effect of seller reputation on transaction prices that contributes to this literature on at least two dimensions. First, the scale of our analysis is larger than that of previous papers as we can document the effect of reputation for a wide range of product categories, seller types and product conditions. The second contribution is methodological as we account for unobserved heterogeneity and we highlight and address issues related to the dynamics of seller reputation arising from the feedback mechanism.

We use a unique and exhaustive data set from one of France's largest e-commerce platforms, [PriceMinister \(www.priceminister.com\)](http://www.priceminister.com) to study the relation between a seller's average feedback score and its prices for different categories of products, product conditions and types of sellers. Like other e-commerce web sites, PriceMinister implements a rating system where buyers grade their transactions. A seller's

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web page displayed at all times the (running) average rating over all transactions completed by that seller and the number of completed transactions, referred to as the size. We consider a seller's reputation as resulting from this public information. Our main findings are the following:

- We estimate a statistically significant, positive and large causal effect of average rating on transaction prices.
- The effect differs across products and seller categories (professional sellers or private individuals).
- The effect of average rating increases with the size and decreases with the advertised condition of the good.
- We also find a positive effect of recent feedback scores on prices, but of a small magnitude.

Identifying and understanding the effects of feedback mechanisms on transactions is a key step in the economic analysis of online markets. Our work confirms that reputation effects are significant, and thus that due care should be taken in the design of feedback systems. Our results also confirm the importance of information in online trading, and suggest that variation in buyers' information may partly explain why the internet does not seem to have caused the substantial reduction in price dispersion that was initially expected (see Baye et al. (2004)).

More generally, our work provides evidence of reputation effects at work. Economic theory has identified several channels through which public information about buyer satisfaction may improve trade efficiency (see MacLeod (2007) or Bar-Isaac and Tadelis (2008) for a review), but the empirical evidence remains scarce and often inconclusive. Rating systems whereby one or both trading parties can report to the community of traders about their level of satisfaction with any transaction they were involved in are interesting for at least two reasons: they apply to a large set of agents who can be tracked across time and transactions, and the information transmitted is directly observable. These features provide economists with new opportunities to analyze reputation effects.

While a number of contributions have already taken steps in that direction, efforts to exploit these features have been constrained by data availability (see Bajari (2004) or Cabral (2012) for a recent review).<sup>1</sup> Our rich data set allows us to overcome several of the difficulties previously encountered in this emerging domain of research.

PriceMinister has several specific features that distinguish it from eBay, which has been the focus of most of the existent literature. First, PriceMinister has a unilateral rating system in which only buyers rate sellers, which avoids the sophisticated gaming between buyers and sellers that arises on eBay's bilateral rating mechanism. Also, PriceMinister uses a pure price-posting mechanism, as opposed to auctions, and it serves as an intermediary for payment in all transactions. Importantly, PriceMinister makes the completion of any transaction conditional on the buyer acknowledging receipt of the item and rating the seller. These features arguably make the data from PriceMinister better suited to the analysis of reputation mechanisms. The flip side of that coin however is that our results might not apply to platforms with a different feedback mechanism. We will compare our results with those from other studies at the end of the paper and see that our conclusions are broadly in line with the existing literature.

Another interesting feature of our data set is that, in an effort to help sellers set their prices, PriceMinister records the list price of each product, that is the suggested retail price of the product when it was released. For books, the list price would then be the price set by the

publisher. An important aspect of our analysis is that we can control for this variable, which will facilitate comparisons across products.

Most studies of feedback systems rely on data downloaded directly from a web site using a spider software (a prominent example is Cabral and Hortaçsu (2010)), which inevitably makes the resulting information limited in time and in product space. In this paper, we use an exhaustive data set obtained directly from PriceMinister. This data set allows us to overcome many of the issues attached to the use of observational internet data, from seller heterogeneity to limited product ranges.<sup>2</sup> To our knowledge, ours is the first study that estimates reputation effects for different types of product categories, advertised product conditions, and sellers. We show that the impact of reputation on prices varies across product categories, as suggested by Resnick et al. (2006).

Our data allow to track the full transaction and feedback rating history of sellers (including items sold), objective measures of the products' value (mainly, their list price) and condition (as advertised by the seller). This enables us to control for seller unobserved heterogeneity which has been identified as a major limitation in existing work (Resnick et al., 2006 or Cabral, 2012). This issue has been addressed in the literature by relying on field experiments (see Durham et al. (2004) or Resnick et al. (2006)) or natural experiments (Cabral and Hortaçsu, 2010). An alternative strategy adopted by Lei (2011) is to focus on one specific product (Gmail invitations), for which there is little heterogeneity, and further including well chosen measures of seller quality. Klein et al. (2013) exploit a natural experiment and multiple feedback on eBay to provide evidence that the feedback mechanism affects seller behavior, but their data do not allow to measure effects on transaction prices.

More recent papers have been using rich data sets from e-commerce web sites. For instance Fan et al. (2013) follow a group of sellers on a large internet platform in China for 14 months and estimate the effect of reputation measures on sellers' monthly revenue and sales. Another recent paper by Cai et al. (2013) uses a panel of online sellers from a Chinese e-commerce web site with similar features as eBay. Its focus and approach are different from ours as these authors study both theoretically and empirically how buyer protection may affect trust between buyers and sellers. Using a data on eBay, Elfenbein et al. (2012) study how charity donations can be used as a substitute for reputation. Hui et al. (2014) also use data on eBay to study the effect of the 'Top Rated Seller' label, which grants sellers with a better visibility in listings. These authors find that this label has a positive effect on transaction prices and, although they cannot break the effect down by product category, they find that it varies with the item's condition and value, which is in line with our results.

Due the exhaustive nature of our data, we are able to address the issue of unobserved heterogeneity using more standard panel data methods and thus draw inference for a varied set of product categories, product conditions and seller types. In so doing, we also highlight another substantive issue that was not investigated before: feedback ratings given by buyers depend on the prices set by a seller, thereby introducing an effect of past prices on rating that needs to be taken into account in the estimation strategy.

The empirical evidence on the effect of reputation on the internet is not solely based on data from e-commerce web sites. Two recent papers, Anderson and Magruder (2012) and Luca (2011), use data from Yelp.com, a web site providing reviews of restaurants. An interesting feature of these studies is that they exploit a discontinuity in restaurant scores to estimate the effect of a change in a restaurant's rating on its bookings (Anderson and Magruder, 2012) or its revenues (Luca, 2011). Our paper is different in at least two dimensions. Firstly, our outcome variable is the transaction price and we control for the value of the item (through its suggested retail price). We thus have a direct measure

<sup>1</sup> The earlier literature includes Dewally and Ederington (2006); Dewan and Hsu (1995); Houser and Wooders (2006); Livingston (2005); Lucking-Reiley et al. (2007); McDonald and Slawson (2002); Melnick and Alm (2002); Resnick and Zeckhauser (2002). See also the review by Dellarocas (2003).

<sup>2</sup> A detailed discussion of these issues is conducted in Einav et al. (2013). These authors also use a rich data set from eBay to study the effect of listing characteristics on prices and other outcomes.

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