Retail Prices and E-Commerce

E

Jihui Chen
Illinois State University, USA

INTRODUCTION

In the pre-Internet era, consumers relied on media such as Sunday newspapers and flyers for product and price information. Such search process is time-consuming and unlikely to be exhaustive. The existence of incomplete information leads to price dispersion in the marketplace (Stigler, 1961). Recent advances in information technology have dramatically changed the manner in which consumers and businesses gather and transmit information.

Online shoppers enjoy enhanced search capability through effective tools. Search sites, such as Google and Yhaoo!, become indispensable for comparison shopping. A recent comScore Media Matrix monthly qSearch™ analysis reports a total of 16.8 billion unique desktop search queries submitted in February 2016.[1] With the rising popularity of mobile devices, from smartphones to tablets, one would only expect a greater utilization of search engines.[2] Along with ever-increasing competition among online retailers, we would expect prices to converge in the new economy. However, an extensive literature on Internet prices has documented persistent price dispersion in various online markets. In this chapter, I review existing studies on the topic and discuss future research directions in light of recent developments with e-commerce.

BACKGROUND

The Internet provides an ideal setting for empirical studies with abundance of data.[3] In this section, I review research on retailer prices on the Internet. In general, we may sort e-retailers into two categories: web-based e-retailers (Dotcoms), such as eBay and Amazon, who exclusively conduct their business on the Internet and have no physical presence,[4] and multi-channel retailers (MCR), such as Best Buy's online branch, which is an extension of the brick-and-mortar establishment.

Early studies usually compare online and offline prices on books, CDs, and DVDs sold in the U.S. (Bailey, 1998; Brynjolfsson & Smith, 2000) as these commodities were among the first available on the Internet. Gradually, the empirical literature expands to include a wide variety of products such as airfares (Clemons et al., 2002; Chen, 2006; Chellappa et al., 2011), automobiles (Zettelmeyer et al., 2006), pharmaceuticals (Stylianou et al., 2005), service supply products (Ghose & Yao, 2011), consumer electronics (Baye et al., 2004a, 2004b; Xing et al., 2004), groceries (Gan et al., 2007), and hotel rooms (Delos Santos et al., 2011), to name a few.

Recent studies also include international data. For example, Liu and Tang (2005) study the Chinese book market, Li et al. (2009) study the Australian DVD market, Mizuno et al. (2010) electronics in Japan, Koppius et al. (2004) Dutch flower auctions; Englmaier and Schmoller (2011) football game auctions at HATTRICK, U.K., Zhong and Ong (2011) prepaid phone cards at Taobao.com, China, and Richards et al. (2016) online groceries in U.K., to name a few.

The empirical literature often compares prices and price dispersion between online and brick-and-mortar sellers, and between Dotcoms and MCRs. While most have found lower online than offline prices and lower Dotcoms than MCR prices, there seems no general consensus regarding the level of dispersion across different distribution channels or types of e-retailers. However, it is clear that persistent price dispersion remains on the Internet.

DOI: 10.4018/978-1-5225-2255-3.ch248

Existing studies have developed several measures of price dispersion:[5] In a given product market,

- **Price Range:** The difference between the highest and the lowest price.
- **Percent Price Range:** The ratio of price range to the lowest price.
- **Coefficient of Variation:** The ratio of the standard deviation to the average price.
- **Standard Deviation:** The fraction of average unit price: defined as the ratio of standard deviation to the mean unit price that is averaged across all products in a given market (Chiou and Pate, 2010, Table 4, p.302).
- **Gini Coefficient:**

$$Gini = 1 + \frac{1}{N} - \frac{2}{\lambda N^2}\sum_{i=1}^{N}\left(N+1-i\right)p_i$$

where p_i is the price of observation *i*, with *i*=1,2,…, N, λ is the mean price. (Gaggero and Piga, 2009).

- **Price Gap:** The price difference between the two lowest-priced firms (Baye et al., 2004a).
- **Atkinson Index:** Defined as

$$= \begin{cases} 1 - \frac{1}{\lambda}\left(\frac{1}{N}\sum_{i=1}^{N} p_i^{1-\phi}\right)^{\frac{1}{1-\phi}} & for\ \forall \phi > 0\ and\ \phi \neq 1 \\ 1 - \frac{1}{\lambda}\left(\prod_{i=1}^{N} p_i\right)^{\frac{1}{N}} & for\ \phi = 1 \end{cases}$$

where p_i is the price of observation *i*, with *i=1,2,..., N*; λ is the mean price; and ϕ is the choice parameter (Gaggero and Piga, 2009, p.8, footnote 14).

- **Entropy Index:** Defined as

$$= \begin{cases} \frac{1}{N}\left(\sum_{i=1}^{N}\left[\left(\frac{p_i}{\bar{\lambda}}\right)^{\phi} - 1\right]\right) & for\ \forall \phi > 0\ and\ \phi \neq 1 \\ \frac{1}{N}\sum_{i=1}^{N}\left(\frac{p_i}{\bar{\lambda}}\right)^{\phi} \ln\frac{p_i}{\bar{\lambda}} & for\ \phi = 1\ or\ \phi = 0 \end{cases}$$

where p_i is the price of observation *i*, with *i=1,2,..., N*; λ is the mean price; and ϕ is the choice parameter (Gaggero and Piga, 2009, p.8, footnote 14).

Explaining E-Retail Prices

The literature has documented a number of explanations for pricing issues observed in various markets, which I summarize below:

- **Branding/Reputation:** Because consumers have to submit the payment before receiving an order, trust plays a crucial role in online shopping. Naturally, risk-averse online shoppers prefer more reputable stores (Smith and Brynjolfsson, 2001). Thus, consumer awareness and sensitivity to branding allow some sellers to charge premia (Baylis and Perloff, 2002; Dinlersoz and Li, 2006), resulting in price dispersion (Chen and Hitt, 2002).[6]
- **Channel Substitution:** As sellers expand to the online channel, various coordination issues arise. While there is some evidence of cannibalization of the Internet channel in the publishing industry (Gentzkow, 2007), the actual outcome varies across product markets, and probably over time as well. For instance, Goolsbee (2001) finds evidence of channel conflict when consumers buy computers between channels; Pozzi (2013) estimates a 13% rise in overall revenue resulting from the establishment of the Internet channel by a supermarket chain, with little impact on traditional sales; Overby and Forman (2015) show that the