

The Economics of the Internet Retail Industry and Its Impact on the Business-to-Consumer Retailing Environment

Amanda M. Jones¹
Duke University
Durham, NC
Fall, 2001

¹ Amanda Jones graduated from Duke University in May 2002 with a B.S. in Economics and a minor in Chinese. Originally from Cleveland, Ohio, she will move to New York City in July 2002 to work at Lehman Brothers as a member of their sales, trading, and research (START) analyst program.

Acknowledgment

I would like to thank Professor Pietro Peretto for inspiring me to challenge myself in his Industrial Organization course and for his support and encouragement in the writing process.

I would also like to dedicate this paper to my parents, who have always believed in me and who gave up so much to allow me to study at Duke.

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1. Introduction

Although it was hypothesized that Internet retail would very closely approximate the conditions necessary for perfect competition by increasing product information and price transparency, the concentration of electronic retail firms and the pricing patterns observed thus far demonstrate that an oligopoly is a more appropriate market structure for describing the current online retail industry. High endogenous sunk costs create a barrier to entry into the industry, but those e-tailers that are able to survive will be able to exploit the advantages of retailing through the Internet, such as the low cost of collecting and providing a wealth of information, improved opportunities for price discrimination, and savings in operating costs.

The success of online retailers will depend not just on their capacity to use Internet technology to their advantage but also on their ability to accommodate customer preferences by providing superior service and website features that will address the major deterrents to online shopping. As Internet retailers grow more skilled in meeting these challenges, the evolution of the online retail industry is expected to have a greater impact on the traditional retailing environment, so bricks-and-mortar retailers must either adopt strategies to contend with the potential threat of online competition or choose to expand their business onto the Internet, transforming themselves into clicks-and-mortar firms.

2. The Business-to-Consumer Retail Industry

The United States Department of Commerce estimated electronic retail (heretofore referred to as e-tail) sales of goods and services in the first three quarters of 2001 to be just \$22.5 billion out of \$2.32 trillion total retail sales, or about 0.9 percent (see Appendix, Table 1 and Figure 1). Although this is currently a rather small percentage, online sales are projected to account for \$269 billion² for the four quarters of 2005, or about 7.8 percent of total retail sales in that year³. With the potential growth that is forecasted for Internet retail, it is important to study characteristics of this industry in order to understand the impact that it will have on retail trade as a whole. Thus, analysis will begin with a description of

² Note that because no data sources specified that dollar values have been adjusted for inflation, it will be assumed that monetary figures mentioned in this paper are nominal amounts.

³ Bakos, p. 69

the conditions of the general retail industry and then will focus on aspects that are unique to online retail.

The business-to-consumer (commonly referred to as B-to-C) retail industry encompasses all of those goods and services that are produced by firms and subsequently purchased by consumers, excluding transactions which are conducted from one business to another (business-to-business, or B-to-B)⁴. In general, firms within most industries all produce one broad type of good and then focus on differentiating their individual product offerings through a countless number of varying characteristics. A study of the retail industry is unique, however, because each product category is an industry in itself, so it is difficult to make generalizations about retail goods as a whole. Realizing this limitation, this analysis will divide retail products into two main categories, which will later be included in the assumptions for the economic models that will be applied: homogeneous goods and heterogeneous goods.

3. Internet Economics for the B-to-C Retail Industry

In its most basic function, the Internet is a tool that facilitates and dramatically decreases the cost of the flow of information. The major effects that this would be expected to have on the market for retail goods are the lowering of search costs for buyers and sellers to obtain information and an increase in competitive pressure, due to the enhanced opportunities for price comparison among sellers⁵. It was often postulated in the Internet's nascent years that electronic commerce (i.e. e-commerce) would very nearly meet the assumptions of a perfectly competitive market, particularly perfect information, no transaction costs, free entry and exit, and price taking by consumers and producers.

As the Internet market has matured, however, it has become evident that an oligopoly model is more appropriate for explaining the conditions and interactions that have been observed thus far. The following section will explain why, despite a plethora of freely available

⁴ Services and information goods will also be excluded from this analysis because these products exhibit characteristics in their purchase and distribution that would considerably broaden the scope of the argument. Therefore, only consumer goods that can be delivered in a physical form will be discussed. Major categories of these tangible products might include, but would not be limited to, the following: apparel, consumables (ex. food, beverages, health and beauty aids, etc.), computers and software, electronics, books, music, videos, housewares, office supplies, tools and hardware, and transportation (automobiles, bicycles, etc.).

⁵ Graham, p. 149

information and a reduction in search costs for buyers and sellers, factors such as barriers to entry and the potential for pricing above marginal cost cause the market for Internet retail to more closely approximate the conditions for oligopoly rather than perfect competition.

3.1 Digital Information

Although informational content on the Web is plentiful, this does not necessarily mean that buyers and sellers are perfectly informed. First, the proliferation of information on the Web, much of it in the form of personal home pages and amateur websites, means that effort must be exerted to determine the reliability and value of the available material, and some individuals may not be willing to expend these resources. Second, the production of digital information typically involves high fixed costs but marginal costs that are nearly zero, resulting in average costs that decline as output increases. Therefore, significant economies of scale are present for digital information, as well as economies of scope if material can be repackaged to serve another purpose. Economies of scale and scope, however, generally lead to concentration rather than competition⁶. Also, it was supposed that the fixed costs of providing information for the Internet would decline with improvements in technology, but they are not falling as fast as predicted, mainly because human capital, aside from technology, also makes up a large portion of the fixed costs⁷. These three factors all help to explain why despite its relative abundance on the Web, information has not facilitated the development of a model of perfect competition on the Internet.

3.2 Search Costs

One of the major advantages of online retailing for businesses and consumers is that both parties are no longer confined by the geographical constraints that limit their options in traditional retailing⁸. B&M retailers are limited to those customers that wish to expend the

⁶ Graham, p. 149

⁷ Graham, p. 150

⁸ Within the B-to-C retail industry, consumers may purchase products in a number of different environments, which can be divided into two main categories: 1) physical locations, where the consumer can actually inspect and directly buy the good and 2) remote locations, in which goods are viewed and purchased from a distance and then delivered to or picked up by the consumer. Sellers that maintain physical locations will be referred to in this paper as either traditional, conventional, or bricks-and-mortar (B&M) retailers. Several different channels exist for producers to offer their goods from remote locations, including catalogues, home shopping television networks, and the Internet. Sellers that take advantage of two or more of these channels, whether they involve physical and/or remote locations, are called multi-channel retailers. Those firms that combine a bricks-and-mortar location with an Internet selling capability will be referred to as clicks-and-mortar (C&M) retailers.

resources necessary to visit their physical location. Internet retailers are able to reach any individual that has access to the Internet, and because the costs of providing information on a website do not differ with the geographical location of customers, the Internet enables retailers to maintain an expansive customer base. In fact, it was reported in 2000 that the top ten U.S. websites receive more than thirty percent of their traffic from outside North America^{9*}. A consumer's search for a particular good is greatly facilitated by the ability to simply type in a new URL (uniform resource locator, i.e. website address) rather than having to travel to another location.

The efficiency of consumer search is further improved by the development of search engines, or shopbots, which are “automated software agents that simultaneously query many stores” to return a list of results for easy price comparison by the consumer¹⁰. Not only does this technology consolidate the search process to a few seconds for the consumer rather than the amount of time it would take to travel to each physical site, but once price differentials are discovered, purchasing online makes it easier to switch from one retailer to another.

Although these conditions would appear to closely approximate those required for perfect competition, there are several opposing factors that cause the search process to remain somewhat costly. One is that consumers may not be fully aware of all online retail sites. While B&M retailers have the advantage of a physical location to remind consumers of their presence and to exploit geographic relationships, the Internet retailer must advertise heavily to make consumers aware of its URL and product line and to differentiate itself from other similar sites. Another factor is that online retailers may implement programs that impose switching costs on the buyer, through such means as saving consumers' purchasing information or instituting loyalty programs¹¹.

In addition, one study¹² found that many online buyers do not engage in any type of search and that as user experience increases, the intensity of searches may decline by sticking with a particular retailer once they have provided a satisfactory shopping experience. Finally,

⁹ Rosen and Howard

* Note that all citations without page number references are based on sources that were found in online databases, where pagination is not equivalent to that of the original publication.

¹⁰ Darity and Kapur, p. 203

¹¹ Latcovich and Smith, p. 219

¹² Johnson *et al.*, 2000

although shopbots do enable easier price comparisons, sellers may be able to deliberately reduce the efficiency of these search engines by concealing price information or creating slight variations in their product to confuse the software¹³. These four factors demonstrate that although the search costs traditionally involved with shopping are dramatically lowered through online retailing, the consumer must still expend some time and resources in searching for a particular good on the Internet, which means that the perfect competition assumption of no transaction costs is not completely met.

4. A Supply-Side Perspective: Industry Structure and Pricing

It has been shown that two of the conditions for a perfectly competitive environment, namely perfect information and no transaction costs, are more closely approximated for online retail, when compared to traditional retail. Because all of the assumptions of an economic model are rarely met in reality, failure to completely approximate these conditions might not be a problem, except that two of the other requirements for perfect competition, free entry and exit and marginal cost pricing, are not present in online retailing, thus making an oligopoly model more accurate.

In their textbook *Modern Industrial Organization*, Carlton and Perloff define a noncooperative oligopoly as “a small number of firms acting independently but aware of one another’s existence” (153). Some of the main assumptions they list for a traditional oligopoly model include a constant number of firms maintained through barriers to entry, price-taking consumers, and firms that have sufficient market power to raise price above marginal cost (154). The barriers to entry into the Internet market will first be discussed and then the implications of an oligopoly for pricing on the Internet, using models for both undifferentiated and differentiated products. Although several well-known oligopoly models exist, this analysis will apply the Bertrand model, in which firms set prices rather than output, since this model will provide a more complete explanation of pricing interactions between Internet retailers.

For several reasons, the online book market will be used as an example to describe barriers to entry and pricing on the Internet. First, the book market was one of the first retail

¹³ Daripa and Kapur, p. 206

sectors on the Internet, so it is more likely to have stabilized in terms of structure and pricing. In addition, because of the homogeneous nature of books and the low cost of shipping this product, there will be fewer confounding factors in the application of oligopoly theory. Finally, a great deal of data on this market is available, since the main online booksellers are publicly held and bestseller lists provide an approximation for weekly demand of this product¹⁴.

4.1 Barriers to Entry

Sunk costs create commitment for firms because it is costly to exit a market when a portion of fixed costs is not recoverable (i.e. sunk). Potential entrants view an industry with high sunk costs as less attractive, since their ability to exit without incurring losses is reduced; therefore, sunk costs act as a barrier to entry for firms. Latcovich and Smith divide sunk costs for Internet firms into two types: set-up costs and endogenous sunk costs (220).

Set-up costs are those that are expended in order to begin operations and are thought to be relatively small for online firms. These include “administration costs, the setting up and maintenance of a functional website, and the distribution warehouse” (220). Although the magnitude of these expenditures will obviously depend on the anticipated scale of the retailer’s operations, these costs need not be large in order for a firm to function at the most basic level. Substantial economies of scale may exist for investments in technological and organizational infrastructure, though, which may further limit incentives for potential entrants¹⁵.

Endogenous sunk costs are a choice variable for firms and are spent on those factors which are necessary for attracting and maintaining a customer base, including “costs of improving speed of processing, security of transactions, development of website, and advertising”¹⁶. As previously mentioned, advertising is enormously important for Internet firms to make consumers aware of their existence and to signal price and quality product characteristics, since products cannot be physically inspected. A study conducted by Boston Consulting Group and Shop.org [1999, 2000] found that Internet retailers spent an average of \$26 on marketing and advertising per order generated, compared to an average expenditure of \$2.50 by conventional retailers¹⁷. A well-designed website can also greatly enhance a retailer’s

¹⁴ Latcovich and Smith, p. 218

¹⁵ Darity and Kapur, p. 203

¹⁶ Latcovich and Smith, p. 220

¹⁷ Rosen and Howard

operations by implementing strategies which will make switching expensive and by creating systems for gathering customer information for marketing purposes.

Using the online book market as an example, the expenditures on development and administrative costs for the four largest online booksellers (Amazon.com, Bn.com, Fatbrain.com, and Buy.com, as of summer 2001) are detailed in the Appendix, Table 2. Although Buy follows a different strategy of low costs and low prices, the other three firms spend a considerable amount of their revenues on endogenous sunk costs: when development and advertising costs are combined, Amazon spends about 32 percent of revenues on endogenous costs, while Bn (the online branch of the B&M firm Barnes & Noble) and Fatbrain each spend over 50 percent¹⁸. For the traditional retailers listed in Table 2, marketing and development expenses were combined with administrative expenses to create one category, “selling and administrative expenses.” It is interesting to note that Barnes & Noble and Borders spent 19-22 percent of revenues on this more comprehensive category of “selling and administrative expenses”, which is less than the online firms spend on endogenous costs alone¹⁹.

The presence of these endogenous sunk costs in starting an online business and the impact on entry into the Internet market can be analyzed using the following equation:

$$(1) \quad p = pq - c(q, R) - R$$

where R is defined as some endogenous sunk cost that shifts the marginal cost curve lower as it increases and where q and R are chosen to maximize π . $pq - c(q, R)$ in this equation represents a firm's cash flow, which necessitates that cash flow be greater than R in order for $\pi > 0$. Since cash flow decreases with new entrants, there will be less entry when R is high, as potential entrants see that it will be more difficult to earn the necessary cash flow for profitability. In a more competitive environment, R increases, since firms have more of an incentive to improve their business when the threat of competition is greater. Therefore, the conclusion is that competition leads to higher R , but R discourages entry, as profit decreases with the number of firms.

Industries with high R are typically oligopolies, since industry concentration increases with R . The larger the q over which firms undertake R , the smaller the unique cost of engaging

¹⁸ Latcovich and Smith, p. 224

¹⁹ Latcovich and Smith, p. 226

in activities where R is the necessary sunk cost, so larger firms will take on more of the types of practices involving R . This results in an escalation effect, whereby a level of market size exists after which larger markets will actually be more concentrated, since R increases with q . This is in contrast to the usual assumption of a wider dispersion of market share when the number of firms is greater (see Appendix, Figure 2).

Since investments in R increase productivity, a threshold level of R is established, so firms below this point will not be able to sell enough to cover fixed costs and will exit the industry; with an increase in sunk costs, the threshold level shifts even higher. Thus, the low-productivity firms are automatically selected out by this market mechanism. The number of firms and thus, the shape of the firm size distribution, which will be skewed towards smaller firms, will be held constant. This is consistent with oligopoly theory, but there will be a great deal of turnover within the industry, as low-productivity firms exit and are replaced by new entrants.

This pattern of high R and resultant industry concentration is evident in the e-tailing market. The level of traffic that passes through each site is one measure of online concentration. A study conducted by Jupiter Media found that in March 1999, eleven sites accounted for 50 percent of the time that people spent online, but this figure had dropped to just four sites by May 2001. Within the same time period, the number of sites that attracted 60 percent of online visits had declined from 110 to 14²⁰. As an example of concentration in specific markets, the one-firm concentration ratio (C1) is 62 percent for worldwide online books and 77 percent for online books, music, and videos, compared to C1s of about 20 percent for traditional markets in the United States and United Kingdom (see Appendix, Table 3).

This winner-take-all feature of the Internet encouraged excessive entry in the early years, as optimistic entrepreneurs envisioned dramatically lower operating costs and fantastic profits. This situation was further perpetuated by the willingness of venture capitalists to invest large sums of money in start-up firms and the high valuations awarded to these companies by the stock market. It soon became evident, though, that the massive amounts of advertising and web site development necessary for online success (i.e. investments in R) would make it difficult

²⁰ Graham, p. 150

for all but the few firms who could afford these expenditures to survive. Thus, online retailing markets currently mirror the characteristics of a high R industry: within each specific product sector exists high concentration, in which a few large firms hold a majority of the market share and many small firms who are not able to recover their sunk costs are forced to leave the market.

4.2 Pricing

Whereas prices are set equal to marginal cost in a perfectly competitive environment, firms collectively have market power in an oligopoly, allowing them to set prices above this minimum level. The evidence thus far for Internet retailing shows prices and price dispersion higher than would be expected under the competitive model, giving further credence to the conjecture that online retail markets more closely resemble those of an oligopoly. Since a Bertrand model gives more complete information regarding how prices are set, this approach will be used, rather than the quantity-setting game of a Cournot or Stackelberg model. The conditions for a Bertrand equilibrium will be briefly explained to facilitate the understanding of two practices enabled by Internet technology: price discrimination and tacit collusion.

a) The Bertrand model

The assumptions for a traditional Bertrand model include no entry, homogeneous products²¹, single period, and constant marginal cost. The key difference between this model and the quantity-setting Cournot game is that each firm will sell as much quantity as is demanded under the price it sets. Supposing that the supply side consists of two firms producing an identical product, consumers will buy from the firm that offers the lowest price. At any price below marginal cost, Firm 1 would lose money, but at any price above marginal cost, Firm 2 would undercut Firm 1's price and the same situation in reverse, so both firms charge a price equal to marginal cost (competitive equilibrium) and earn zero profits. The assumptions listed above are not always realistic in practice, however, and in these cases, the Bertrand equilibrium will not be the social optimum. For instance, in the case of heterogeneous products that will be discussed shortly, the Bertrand price is above marginal cost.

²¹ When comparing retail sellers to one another in determining industry structure, this paper will also characterize quasi-commodity goods as homogeneous goods. These are products, such as books, where individual products can be distinguished from one another (for example, a romance novel differs from a mystery), but the goods are homogeneous across sellers, facilitating price comparisons (de Figueiredo).

b) Observations of Internet Pricing

One would expect that because of the ease of online price comparison and the transparency of competitors' prices, prices on the Internet would be lower and less dispersed than those of traditional retailers. Although the studies that have been conducted thus far have not found conclusive evidence as to whether prices are lower for online or conventional retailers, almost all of the studies have reported substantial and persistent price dispersion.

In a widely-cited study, Brynjolfsson and Smith (2000) found that online prices for books and CDs were 9-16 percent lower than those offered by traditional retailers, even when adding in shipping and handling charges for products bought online and local sales taxes for goods bought in physical stores²². In contrast, Bailey (1998) concluded that Internet retailers charge higher prices for books, CDs, and software in comparison to B&M retailers²³. Considering the time delay between these two studies, one possible explanation for the discrepancy might be that prices have dropped over time, perhaps because retailers' costs have dropped as the most efficient firms have survived.

In terms of price variance, though, Brynjolfsson and Smith found that book prices were 33 percent more dispersed than traditional retailers and CD prices 25 percent more, and Bailey also found greater price variance online for these two products. In addition, these studies both concluded that online prices exhibit far less "stickiness" in that they are changed more often and in smaller increments²⁴. This is due to the much lower menu costs on the Internet; it is very easy and inexpensive to frequently change prices online, compared to a physical store where prices are visible to all buyers at once.

These findings that prices are more dispersed online and that they may not necessarily be lower than those offered by conventional retailers help to disprove the notion of a perfectly competitive online environment. They also raise some interesting questions, though, as to how well the evidence fits the Bertrand oligopoly theory, which will now be addressed in terms of homogeneous and heterogeneous products.

In markets with homogeneous products, the Bertrand model predicts that any firm

²² Bakos, p. 73

²³ Wiseman, p. 44

²⁴ Wiseman, p. 46

pricing above marginal cost would be undercut by its competitors because consumers always choose the seller with the lowest price. Therefore, all sellers would price at marginal cost, which is the same as the competitive equilibrium. In accordance with this theory, Daripa and Kapur do note that the arrival of online retailers has put a great deal of downward pressure on the prices of homogeneous goods (202). For instance, prior to the entry and lower prices of Bn.com, Amazon.com had been charging much higher prices, but after four months, prices had equalized, which provides some indication of price competition²⁵. Under Bertrand theory, though, Buy.com, which charges lower prices than the other firms for almost all titles, should be the leader in market share. Instead, Amazon.com, which has much higher investments in *R* than Buy.com (according to Table 3), has the greatest market share of the top four firms²⁶. In addition, the price variance found by Brynjolfsson, Smith, and Bailey would also seem to be in contradiction with the Bertrand equilibrium.

This seemingly inconsistent evidence can be explained by quality differences in the retail services of various online retailers. Web sites that offer a superior interface, more complete information, and more secure and reliable methods of purchase and delivery will be able to charge a premium for these offerings, assuming that they are of value to consumers. One study found that in addition to the price of the goods sold, consumers weigh several factors in determining which retailer they will visit, including breadth and depth of product assortment, service, and the convenience of the shopping experience²⁷, which would indicate that price is only one of several important variables in the purchase of a good. Buyers thus choose to purchase from the firm that offers them the greatest utility by most closely matching their set of preferences.

For instance, Amazon.com has patented a technology that allows firms to purchase goods with “1-click” of the mouse and also offers a wealth of product information and personalized recommendations. These investments in website development (i.e. endogenous sunk costs) help to explain why consumers are willing to pay a higher price for the same good at Amazon.com rather than Buy.com. Therefore, although the product itself may be

²⁵ Latcovich and Smith, p. 219

²⁶ Latcovich and Smith, p. 226

²⁷ Maruca

homogeneous, the services with which it is bundled are of varying quality, so the seller's offering as a whole becomes a heterogeneous good, for which the Bertrand equilibrium price will be higher than marginal cost.

In a market with heterogeneous goods, firms always face a downward-sloping demand curve because there is never a perfect substitute for any one product (i.e. a consumer always exists that has an infinite reservation price for a particular firm's product). Quantity in this market is determined by the following function:

$$(2) \quad q_i = f(p_1, p_2, \dots, p_N, R_i)$$

where R again is some endogenous, sunk cost, such as advertising or technological change, that improves a firm's product and thus, increases its market share (since demand is not changing).

Profit is therefore determined by:

$$(3) \quad p_i(p_i, R_i) = -R_i + p_i q_i - c_i(q_i)$$

By investing in R and increasing its market share, a firm further differentiates its product, so elasticity of demand decreases with market share. The equation for the price of a firm's good is:

$$(4) \quad p_i = (dc_i / dq_i) * e_i / (e_i - 1)$$

where $e_i / (e_i - 1)$ is the mark-up on the marginal cost in determining the firm's price. The variable e_i represents the percentage change in demand that results from a 1% change in price and thus represents the price elasticity of demand perceived by the firm²⁸.

Since a higher market share will lead to a greater quantity produced and a lower elasticity of demand, both the marginal cost and the mark-up will increase, leading to a higher price for firms with greater market shares. Thus, since the online retail market is highly concentrated with a small number of firms holding the majority of market share, price will be higher than marginal cost when products are differentiated. This solution for a heterogeneous goods market can be used to explain why prices are higher when sellers of homogeneous products differentiate themselves based on service characteristics and also when higher prices are observed for goods that actually vary between sellers.

²⁸ A well-defined equilibrium requires that $e_i > 1$. This condition is satisfied since a profit-maximizing firm will never choose to operate on the segment of the demand curve where elasticity is less than or equal to 1. Therefore, the mark-up $e_i / (e_i - 1)$ will be greater than 1.

c) Price Discrimination

Internet technology greatly enables price discrimination by allowing firms to more easily collect consumer information and thus to more accurately estimate individual buyers' willingness-to-pay. Because online retailers have market power as a result of their oligopolistic market structure, they can charge prices above marginal cost in accordance with consumers' demand without losing business to their competitors.

All of the sites visited by consumers online are captured by cookies, or "small bits of information lodged on the user's computer that allow the retailer's computer to 'recognize' a returning customer," making it "possible to match the customer to his previous history of browsing and purchases at the site"²⁹. Retailers can further take advantage of existing third-party databases, which might be able to provide insight on other aspects of the consumer's purchasing capability, such as average income in his neighborhood, to more closely estimate the price he might pay for a certain good.

Price discrimination may then take several forms. Firms might exploit differences in customers' time preferences by charging higher prices initially and then gradually raising prices to capture the more patient customers. This may also relate to delivery of the good for C&M retailers, who might be able to charge a higher price to consumers who wish to have the good shipped to them and a lower price to buyers who will come to pick up the purchase in the physical store. Also, technology exists that allows retailers to pinpoint which consumers have been referred by price comparison websites and to then charge them a lower price, assuming that they are more price sensitive³⁰. Finally, online retailers might be able to charge a lower price initially to new customers in order to build a loyal customer base and then raise prices once the consumers' demand becomes more inelastic. Amazon.com was actually accused of offering lower prices to new customers, to which they responded by stating that contrary to the allegations against them, they were experimenting by randomly varying prices to estimate the price elasticity of demand for each of the goods it sells³¹.

These three methods of price discrimination are all examples of third-degree price

²⁹ Daripa and Kapur, p. 209

³⁰ Daripa and Kapur, p. 210

³¹ Borenstein and Saloner, p. 10

discrimination, in which different prices are offered to different groups of consumers, each made up of individuals who share similar preferences. Depending on the breadth of the information that the Internet retailers are able to collect, online firms may be able to engage in first-degree price discrimination, where each individual is charged the maximum amount he is willing to pay. Consumers often resent discrepancies between prices offered to themselves and to other consumers, but prices can be personalized and easily changed for each individual, since typically, only one person is viewing the price on a computer at any one time. Compared to a physical retail location in which prices are posted publicly, the potential for a situation that more closely approximates first-degree price discrimination is much enabled by Internet technology.

Welfare differs under these two types of price discrimination. Under first-degree, output is at the efficient, competitive level, but the consumers are worse off because all of their consumer surplus is transferred to producers, since consumers are charged at their individual maximum willingness-to-pay. Under third-degree, there is inefficiency in consumption, since every individual within a group will not have exactly the same willingness-to-pay, so there are unexploited opportunities for further trade. If output is higher than in a non-discriminating context, welfare may also be higher, but the question of whether third-degree price discrimination results in greater welfare is theoretically ambiguous³². Therefore, although Internet firms will benefit from engaging in price discrimination, the personalization of prices for individuals or groups may be detrimental to consumers.

d) Tacit Collusion

Because of the transparency that results from the ease of monitoring rivals' prices, the Internet also creates an environment conducive to tacit collusion between online firms. In conventional markets, menu costs prohibit retailers from immediately responding to changes in competitors' prices, but these costs are very small on the Internet, allowing online firms to rapidly and inexpensively fluctuate prices. Prices are easily changed in the site's central database, and many online retailers also use simple algorithms that track competitors' prices and automatically respond to them³³.

³² Carlton and Perloff, p. 290

³³ Daripa and Kapur, p. 207

As an example, Table 4 in the Appendix shows that the two market leaders, Amazon.com and Bn.com, consistently charge almost identical prices for the bestsellers that were tracked, and the three other top booksellers also often charge in lockstep with the market leaders. This table also shows an interesting pattern that is a common strategy used by Internet firms. In the early weeks after the books had been released, when they were in highest demand, prices were lower than those charged as time passed and the book dropped on the bestseller list. Online retailers often use price reductions of hot products to attract customers, with the assumption that they will buy other products at higher prices once they are at the site³⁴.

Tacit collusion may also be a further explanation for why some studies found higher prices on the Internet in comparison to B&M retailers. Daripa and Kapur explain that “if your rivals match your price cuts instantly, a price reduction does not increase the market share but results in lower profits on existing, infra-marginal sales; the incentive to lower prices is thereby dampened” (207-208).

e) Online Auctions

Due to the lowered search costs in matching buyers and sellers on the Internet, there has been a proliferation of auction websites, the most recognizable name being eBay.com. Conventional auctions involve significant transaction costs in that buyers and sellers must all meet in a specific place at a certain time; conducting auctions over the Internet allows consumers from across the world to participate asynchronously and cheaply. Most of these sites employ some variation of the English auction, in which subsequent bids continue to raise the price until a single bidder is left, who then pays his final bid for the good³⁵. This type of auction allocates goods efficiently in that they are purchased by the consumers that value them the most, which allows sellers to earn more revenue than they might with one posted price offered to all buyers.

The opportunities for a reverse auction, which combines notions of price discrimination with traditional auction characteristics, have been greatly enhanced by the Internet, with perhaps the most notable example being Priceline.com. In this type of auction, bidders name the price they would be willing to pay, and these bids are submitted to sellers, who then have the option

³⁴ Latcovich and Smith, p. 228

³⁵ Daripa and Kapur, p. 213

of fulfilling the bid at that price. Reverse auctions have been successfully executed for goods such as hotel bookings, airline tickets, and car rentals.

This type of system further improves the seller's ability to price discriminate, as it can charge its normal, posted price to buyers who purchase through their own website and can then charge a lesser amount to the more price-sensitive consumers who frequent reverse auction websites³⁶. Reverse auction sites offer greater opportunities for more flexible consumers, as buyers are often forced to compromise on certain characteristics of the good that are significant to most individuals. For instance, in the case of airline tickets, Priceline.com does not allow the consumer to specify a certain time or airline on which they would like to fly, and the consumer must also grant permission to automatically charge the buyer's credit card if the bid is accepted, without being able to first view the details of the flight.

5. A Demand-Side Perspective: Consumer Preferences

As shown above for the Bertrand oligopoly with "homogeneous" products, consumers care about other factors than simply the price of product, including quality, retailer characteristics, and ease of purchase and delivery. These consumer preferences will be examined by using the tourists-and-natives model to demonstrate the information that consumers have before purchase, followed by a brief discussion of Salop's circle model to explain how consumers maximize their utility and surplus in choosing goods for consumption.

5.1 Product Information: Tourists-and-Natives Model

While information on the Internet is not perfect in the sense that all buyers and sellers are fully informed, there is, at the very least, a plethora of information available, not all of which is necessarily valuable or accurate. Because online retailers are not constrained by the limited shelf space with which B&M retailers must contend, product information on the Internet has the potential for being much more comprehensive and customized to the user's needs. To compensate for buyers' inability to physically inspect goods before purchase, online retailers can provide other facts and data to simulate the traditional buying environment. Information, such as user reviews, more elaborate product descriptions, and personalized recommendations, can all

³⁶ Daripa and Kapur, p. 214

be grouped for convenient access on the retailer's website, or buyers can use any number of sites that offer general product reviews and comparisons.

One distinction that must be made is that although shopping online lowers the search costs involved in obtaining information from many different retailers, the reduction in search costs alone will not have an effect, since consumers must still expend resources in gathering information when search costs are greater than zero. Equilibrium price will only change when there is an actual increase in information. It will be assumed that online retailers provide more information than B&M retailers, since they have more of an incentive to make information available when the marginal cost of providing it is close to zero. The tourists-and-natives model will be used to describe how increases in information availability and quality affect pricing.

In this model, there are two types of consumers: tourists, who are uninformed and have search costs of c , and natives, who are informed and have zero search costs. Equilibrium price will depend upon the relative shares of natives (aL) and tourists ($(1-a)L$) in the population. If there are many informed customers, a single-price, competitive equilibrium will exist, since natives will only buy from low-price stores, and it will not pay for a firm to deviate from charging the competitive price. On the other hand, if many consumers are uninformed, the competitive price equilibrium will be broken because a deviant firm that raises its price will not lose all of its customers. A two-price equilibrium may also exist, where firms charge either a low price of p^c or a high price of p^u . Natives will all buy from the low-price stores, and tourists will shop randomly, so low-price firms will have a greater share of the market³⁷.

This model indicates that increases in information will lower the prices charged to consumers. As consumers become more informed natives, the share of the low-price firms will increase even further until equilibrium is reached at the competitive price. Another way of explaining this result is that when price is the major consideration for consumers, they will gather information to estimate which store offers the lowest price. Assuming that buyers cannot exactly determine prices, firms can still profit by raising prices, but demand will become more elastic as information increases, eventually leading to declining prices³⁸.

³⁷ Carlton and Perloff, p. 436-441

³⁸ Carlton and Perloff, p. 442

These results are significant for analyzing the retail industry, where information is abundant. Traditional stores may use methods such as direct mailings, advertisements in the media, and in-store promotions as means to distribute information or to attract customers to the store to gather information by shopping. For companies and price comparison services that operate purely on the Internet, however, buyers may not be aware of their presence unless they resort to advertising offline, negating many of the benefits of providing information at almost zero marginal cost online. Thus, although the amount of information provided by Internet retailers may be greater than that offered by B&M retailers, it may not decrease the proportion of uninformed buyers in the market.

In addition, not all consumers are willing or price-sensitive enough to expend the resources necessary to gather information on the Internet, since search costs are still positive, albeit reduced. More price-sensitive consumers may use shopbots or gather information from a variety of sites for comparison purposes, but other buyers may value quality or service more, perhaps opting for the well-established brand name of a C&M. Since technology exists to identify those consumers that were referred by shopbots, the two-price equilibrium may be relevant for individual sites as a method of price discrimination rather than the Internet retail market as a whole.

Therefore, although information is abundant on the Internet, not all consumers are able or willing to gather it, so the shares of tourists and natives should both be fairly significant. The non-competitive pricing on the Internet can further be explained by sellers who exploit this disparity in consumer awareness, charging higher prices under the assumption that not all buyers are aware of the lowest price available.

In the future, though, this model predicts that prices online will fall with an increase in the number of informed consumers. As previously discussed, retailers that are to survive on the Internet will need to be able to afford advertising to increase consumer awareness of their website and products. With time, the most successful shopbots and websites will thus become more familiar to consumers, and as users concurrently acclimate themselves to the Internet, it can be expected that more buyers will take advantage of the available price comparison

information. This could provide an explanation for the lower Internet prices that Brynjolfsson and Smith observed in 2000, compared to those noted by Bailey in 1998.

Several studies have shown that although providing information to consumers lowers average price, the price will rise once again when information programs are ended³⁹. This seems more unlikely on the Internet, though. The methods of information dissemination listed above for use by traditional retailers are typically of a more short-term nature, as it is costly to continue to print out mass mailings or to run advertisements on television, for example. On the Internet, it is inexpensive to archive older information, and providing links to this data rather than keeping it on the main page will prevent consumers from feeling overwhelmed by a glut of information.

One might question the incentive, though, for sellers to provide information if the eventual result will be a decline in prices. A trade-off exists, then, in offering comprehensive information that will differentiate a retailer's website and induce customers to buy its products and in withholding information to prevent consumers from using it mainly for price comparison purposes. Online retailers have addressed this problem in several ways. Some websites require users to register before being able to view their products or services, which also allows the retailer to collect customer information for their database. A different solution might be to provide some information for free but to demand payment or some other type of effort to obtain the remaining portion. The low cost of maintaining information on the Internet, countered by the trade-off that retailers must endure in its provision, makes it likely that prices online will fall to some extent in the future but not to the competitive level of marginal cost.

5.2 Maximizing Utility

In order to determine consumer preferences in a differentiated oligopoly, Salop's circle model is appropriate to explain how buyers maximize their consumer surplus with the caveat that sellers do not engage in price discrimination. When discriminated against, a consumer's utility and the price that he is charged will be equal, so there will be no consumer surplus to maximize. Salop's circle model imagines each product to occupy a certain location along a circle, with distance representing either geographic or characteristic differentiation. The extent

³⁹ Carlton and Perloff, p. 444

to which two products are substitutes for one another is dependent on their proximity in space. On a particular circle, many variations of a particular product A will exist, as well as a second good B that is undifferentiated and supplied by an outside industry⁴⁰.

A customer locates himself at t^* , which represents his preferred brand of A . His utility in consuming a brand located at t is:

$$(5) \quad U(t, t^*) = u - c|t - t^*|$$

where u is the utility from consuming the optimal brand at t^* , $|t - t^*|$ represents the degree of substitutability between these two brands, and c is a measure of how fast deviations from the preferred brand decrease the utility the consumer enjoys. The customer will choose a brand in an attempt to maximize consumer surplus, which is represented by the difference between the utility that the customer derives from consuming the brand at t and the price paid for this consumption. If the utility from consuming the outside good ($\underline{u}$) is greater than the consumer surplus from enjoying the brand located at t , the outside good will be consumed as an alternative, and the difference between $U(t, t^*)$ and $\underline{u}$ is referred to as the net surplus. Thus, a customer will only choose to consume a particular brand of the differentiated good if the net surplus is positive⁴¹:

$$(6) \quad \max_i [(u - \underline{u}) - c_i |t - t^*| - p_i] = 0$$

Thinking about maximizing consumer surplus in this manner is particularly useful for characterizing the retail industry, which not only displays a variety of brands for many different products but also a variety of products sold within this one industry. The fact that the consumer does not always purchase the good at t^* reveals that buyers may be willing to compromise on certain product characteristics in order to obtain the best value for the money that is spent. Including the outside good as an option in the maximization of an individual's utility allows for a more realistic model in which for example, a customer might intend to buy a television as a gift but is persuaded to buy a DVD player instead, which is a similar good but not a substitute. The point at which a consumer locates himself involves a combination of all of the preferences he has for the purchase of a certain product, including not only product characteristics but also the ease

⁴⁰ Carlton and Perloff, p. 216-218

⁴¹ Carlton and Perloff, p. 218-219

and convenience in buying the good. Some of these preferences, including those for inspection and delivery of a good, convenience, and security and privacy concerns, will now be discussed.

5.3 Other Consumer Considerations

a) Inspection and Delivery of Goods

In principle, any type of good may be sold over the Internet, but the ease of inspection and delivery of the good will vary greatly for both buyers and sellers. Because catalogue retail and Internet retail are parallel in several aspects, the history and success of the catalogue industry can be viewed as a case study for which types of products might be most effectively bought and sold over the Web.

When catalogues first began operations, they also experienced very high rates of growth, leading some to predict that they would supersede the physical store. Although catalogues sell almost every imaginable type of good, certain products have translated to this type of selling format more readily, with the majority of catalogue sales coming from computer equipment, standardized and/or lower-priced apparel, office supplies, and gift products. Many catalogue retailers have extended their business to successful shopping center operations, and it is predicted that they will also do quite well in shifting their business to the Internet. By 2003, 40% of all catalogue sales (approximately \$42 billion or 37% of estimated e-retail revenues) are expected to be transferred to the Internet, with the top twelve catalogue firms already established online⁴². One interesting analogy is that the rapid growth of catalogue retail began decreasing after thirty years, and this decline is attributed to the same factors that are considered to be impeding the growth of Internet, namely the cost of return and delivery for buyers and sellers and the inability to physically inspect the goods⁴³.

Using the catalogue retail industry as a model, one would expect that high-margin products that are cheap to ship and commodity and quasi-commodity goods that may not require direct inspection will be the types of products sold most effectively over the Internet, although this does not preclude the success of other types of goods as well. Because of the nature of commodities and quasi-commodities, buyers may already be sufficiently aware of product characteristics to diminish the need for physical inspection. For quasi-commodity

⁴² Rosen and Howard

⁴³ Rosen and Howard

goods, in which individual products differ from one another but are homogeneous across sellers, one strategy for websites may be to offer a small sample of the product, an excerpt from a novel or an audio clip from a CD, for instance.

Selling goods that vary in quality across sellers or even across the same product, as with produce or used cars, may be more of a challenge for remote sellers, such as online retailers. Even if consumers have researched products thoroughly or if they are familiar with the brand, it will be more desirable for the customer to directly inspect the good to determine closeness of fit, either to one's preferences or in literal terms for apparel.

Because B&M retailers have limited capacity to carry a variety of goods, customers may also find it difficult to immediately obtain a product in the physical world that exactly meets their specifications. Thus, since there is already a time lag between the purchase and receipt of goods, several Internet retailers have realized the value in exploiting this lag for customization of products to consumers' preferences. For example, Dell Computer Corporation has based their very successful business model on online customization, allowing consumers to choose from a range of options to create a built-to-order personal computer. Although buyers have long been able to custom-order cars through a dealer, it has been shown that 85 percent prefer to take a car directly off the lot rather than wait for the typical delay of three to eight weeks⁴⁴. In order to fully realize the value of customization to the consumer, retailers will have to reconsider the efficiency of their manufacturing processes to ensure that the utility one receives from buying a customized product is not diminished by a considerable time lag in receiving the good.

In order to rectify the information asymmetry that may result between buyers and sellers in a market for goods that differ in quality, consumers may prefer to consult with a knowledgeable salesperson in person, which might be simulated online through ample product information and a customer service center that will respond quickly to buyers' queries, either through e-mail or the telephone. Internet retailers may have a difficult time, though, capturing those customers that actually enjoy the browsing and shopping experience and that greatly value the instant gratification that results from purchasing and immediately owning the good.

Customers may be more likely to start with buying inexpensive goods of variable

⁴⁴ Borenstein and Saloner, p. 9

quality, which mitigates the risk involved and helps the retailer to build a reputation, and then move to higher-priced goods if their shopping experience is pleasant. One limitation, however, is that customers experience economies of scale in shipping and also are often wary of purchasing items online, so unless buying in bulk, inexpensive goods may not be worth the effort involved.

The cost of shipping and terms of delivery and return are some of the consumers' most important considerations in whether to purchase online or in a conventional retail setting. Currently, Internet retail is treated similar to the mail-order catalogue industry in terms of taxation, in that companies are not required to collect sales taxes on goods that are sold to customers in a state where the company does not have a physical presence (see **7. Future Considerations** for more details on Internet taxation). Thus, this taxation differential often provides an incentive for consumers to purchase online rather than in a traditional store. If the cost of shipping exceeds the taxes that are saved by buying online, the additional hassle of not being able to view the good before purchase and the time lag involved may deter the customer from buying online a similar good to one that could be purchased more easily in a B&M retail setting.

In addition, particularly for goods of variable quality, liberal return policies will be another important factor in choosing whether to buy online or in a traditional store. 30 to 40 percent of all catalogue purchases are returned, and Merrill Lynch estimates that the percentage will be even higher for online purchases, so a smooth returns process will be important for attracting and retaining customers⁴⁵. For C&M retailers who are located nationwide, they may have an advantage over pure play Internet retailers in this area if they allow customers to return items to their physical stores, a policy that many of their online divisions have implemented. It has been shown that 65 percent of online shoppers abandon their shopping carts at the checkout after viewing the shipping costs, so a growing number of Internet retailers are actually eliminating shipping costs as a strategy to retain these customers⁴⁶.

⁴⁵ Bellman

⁴⁶ Bellman

b) Convenience and Service

While online customers may lose the personalization of service provided by B&M retailers, they benefit from the convenience of the online shopping experience and the other services that Internet retailers offer as compensation. Consumers can shop on the Internet at any convenient time, rather than standard business hours, and they are able to avoid traffic, parking, and crowds that might be encountered in traveling to a retail store⁴⁷. Furthermore, a study conducted in 1999 by Ernst & Young found that 51 percent of Internet shoppers live in towns with populations of 50,000 or less, in contrast to the mere 2 percent of Internet consumers who reside in major metropolitan areas⁴⁸. The Internet enables buyers in rural and urban areas alike to access retailers across the world, and in addition, small, localized companies may benefit from the increased reach to consumers.

By adding features that simulate the experience of shopping in a physical store, successful online retailers have attempted to design their websites to be as personalized and user-friendly as possible. Since cookies lodged on a user's computer allow online retailers to view previous browsing and purchasing history, personalized recommendations, such as those offered by Amazon.com, are useful to guide consumers towards other products they might enjoy. Many other websites have created personal shopping features based on a consumer's estimated preferences or search functions that steer users toward particular products, based on specified criteria. These personalized features, as well as the economies of scale involved in shipping, produce an incentive for the consumer to concentrate shopping to a few sites.

Retailers have added other elements to their websites that will induce consumer loyalty by making switching expensive. Many websites employ technology that can securely save shoppers' addresses, credit card information, and passwords to expedite transactions in the future; Amazon.com has even patented its system that allows returning customers to complete purchases with one click. In addition, familiarity with the site interface and available features can be described as "cognitive lock-in"⁴⁹. Other loyalty programs, such as discounts, promotional e-mails, and personalized reminders for important birthdays or occasions, are also used to build

⁴⁷ Rowley and Okelberry

⁴⁸ Rosen and Howard

⁴⁹ Daripa and Kapur, p. 206

a solid customer base. Additional aspects of a website that might be important to consumers include ease of navigation, fast downloading times, a visible toll-free number, multilingualism, and ability to process foreign currency⁵⁰.

c) Privacy and Security

Because of the uncertainty involved in transmitting information over the Internet, many consumers are reluctant to provide personal or credit card information for fear that it will be used in a bothersome or unethical manner. Besides the contact information that is collected during the purchase of a good, cookies have enabled retailers to construct complete customer profiles, and they may be tempted to sell this information to marketers or to abuse it for their own marketing efforts. One solution for retailers might be to offer some incentive, such as price discounts, to consumers who agree to provide information and permit monitoring in order to gain a better understanding of customer demographics⁵¹.

One Forrester Research study concluded that transaction security is the number one deterrent to purchasing goods online⁵². Any savings in transaction costs might be reduced if consumers must expend a great deal of resources to ensure that a vendor is trustworthy and that information will remain secure, so retailers have developed cryptography technologies that will attempt to reassure their customers. These techniques have been used in the creation of digital certificates, which “work as a form of identification, issued by a third party, called a Certification Authority (CA)”⁵³. The certificate is an assurance that the transaction will be conducted in a secure manner by confirming the identity of both parties. Development of reliable online payment systems and further research into online security will help to further quell consumers’ fears.

6. Impact on the Traditional Retailing Environment

Although online retail sales made up only 1.5 percent of total retail sales in 2000⁵⁴, just 1.8 percent of visits to retail sites actually resulted in purchases as of May 2001. Since this fact

⁵⁰ Biehn

⁵¹ Allen and Hillstrand

⁵² Rosen and Howard

⁵³ Town

⁵⁴ Bakos, p. 69

indicates that many consumers are at least visiting e-tail sites, the potential for growth in the online retail sector is huge if online retailers can convert more of the browsers into buyers. Thus, conventional retailers must be cognizant of the competition that is surfacing online and must determine whether an online presence will enhance or detract from their current business. The effect that the Internet is expected to have on both B&M and C&M retailers will be analyzed, followed by a discussion of some of the factors a retailer must consider in determining whether or not to expand to the Internet.

6.1 How Will Bricks-and-Mortar Retailers Be Affected by Online Retail?

The United States has more square meters of retail space than any other developed country, even when adjusting for purchasing power⁵⁵, and retail properties take several different forms, some of which will likely be affected to a greater extent by the Internet. Traditional retailers have several absolute advantages, in terms of most consumers' buying preferences, over online retailers, including the potential for sales personnel to cross-sell and to exploit buyers' impulses, ability to spread marketing and advertising expenses over a number of stores (unless the firm is confined to one location), and the ability to provide customers with a visual and tactile browsing experience and instant gratification.

Retail properties such as neighborhood shopping centers should remain relatively well insulated from online competition, as much of their value derives from geographical convenience for customers to make spontaneous, typically small-ticket purchases. Power centers, which usually combine a discount department store with several well-established category retailers, may be at greater risk, since customers tend to frequent these centers for better prices and products, not because they offer superior service or an unusually pleasant shopping experience. In the last several years, though, power centers have realized some of the industry's strongest same-store gains, and many of the stores that would typically be included in a power center already have an online presence⁵⁶.

With the rapid development of power centers, malls have already lost sales and have learned to emphasize the shopping experience to attract customers. Many malls now include movie theaters to supplement the entertainment they are able to provide, and the past several

⁵⁵ Maruca

⁵⁶ Rosen and Howard

years have witnessed the growth of new forms of malls, including lifestyle centers (storefronts face the street rather than a mall interior) and hybrid malls (combine a covered mall with specialty shops and entertainment), meant to enhance the pleasures of browsing and shopping⁵⁷. Despite the adaptations malls have made to compensate for loss of sales to power centers, Forrester Research still projects that Internet retail sales of goods that compete with malls will increase from \$10 billion in 1999 to over \$130 billion in 2004⁵⁸. Rosen and Howard suggest that:

“Over time, the Internet will cause a shift in tenancy at the mall as different products win acceptance on the Web. Malls have the opportunity to fill the gap between what the Internet offers and customers require, providing entertainment, display showroom, try-on, tactility, pick-up, delivery, and return and service functions.”

6.2 Advantages and Disadvantages of Online Operations

Although it has already been established that retailing on the Internet entails large sunk costs for advertising and website development, retailers may realize significant cost advantages in back-end operations by establishing an online business, as compared to starting or expanding conventional retail operations. Online firms are not constrained by the limited shelf and inventory space that B&M retailers have for each of their stores; instead, they may store their products in a space-maximizing warehouse, since they are not displayed directly to customers. For instance, the largest physical Barnes & Noble in the United States carries only 200,000 titles, while Amazon is able to offer 4.5 million volumes⁵⁹. In addition, the Internet enables firms to provide a much more interactive branding experience to their customers, compared to the static nature of merchandising displays. As an example, an interactive fantasy world can be created for a good like Barbie, with storytelling, dress-up, and audio and video clips⁶⁰.

Severin Borenstein and Garth Saloner, professors at the business schools of UC-Berkeley and Stanford, respectively, note that delivering goods directly to consumers can reduce costs in several ways:

⁵⁷ Knack

⁵⁸ Hendershott et al.

⁵⁹ Evans and Wurster

⁶⁰ Evans and Wurster

“Despite the relative inefficiency of delivering goods directly to the home, there are so many sources of cost savings from direct delivery that for many items supplying direct to the consumer is less expensive than doing so through a store. The sources of cost savings include the reduction of handling within the store (unpacking, stocking and maintaining shelves, and such), theft (which can easily account for 3 percent of the sales of a retailer), rent (low-cost distribution centers replace expensive urban or suburban real estate), and selling costs (automated and tele-sales replace relatively expensive in-store salespeople” (5-6).

In their last point about selling costs, however, Saloner and Borenstein imply that the cost of human capital is lower online, but it is important to note that functional websites also require skilled technicians to design and maintain the site, who can often command high salaries, somewhat reducing possible cost savings⁶¹.

Traditional retailers typically have high costs of maintaining inventories for a number of products in locations that are geographically spread out. Thus, one benefit for Internet firms are the economies of scale realized in maintaining centralized inventories⁶². Moreover, e-tailers enjoy significant increasing returns from “the infrastructure that is required- sophisticated fulfillment technology, efficient call centers, websites that offer accurate in-stock information, order tracking, comparison engines and product configurators”⁶³. From a logistical standpoint then, firms can realize many cost advantages in starting or extending a business online.

If firms can operate at such low cost online, what has prevented all companies from striving to create an online business? Although 95 percent of the leading B&M retailers have a Web site, only 45 percent actually sell their products online⁶⁴. About one third of homes in the United States still lack access to the Internet, a majority of which are low- or middle-income households, so depending on a retailer’s customer base, laying out the money to establish a web site may not create any new business. Ikea, a retailer that sells low-price furniture, found that the cost of shipping some goods would be prohibitive when compared to their value, citing as an example a \$79 bookcase that would cost \$24 to ship. Other companies have performed cost/benefit analyses and have determined that money paid out for fixed costs, such as advertising and website development, and/or variable costs of operating would be better spent

⁶¹ Wiseman, p. 65

⁶² Borenstein and Saloner, p. 7

⁶³ Borenstein and Saloner, p. 11

⁶⁴ Fuscaldo, p. R10

on other expansion opportunities. Other retailers fear that they may anger their primary distributors by offering their goods directly online⁶⁵. The corporate culture and bureaucratic nature of many large, established companies has made it difficult to embrace the high-paced, entrepreneurial environment of the Internet. Finally, some physical retailers fear that Internet operations will cannibalize their traditional business⁶⁶. Regardless of whether these B&M retailers' fears or misgivings are valid, they all represent reasons for why these firms have decided that an online selling capacity does not make sense for their business presently.

6.3 The Emergence of Clicks-and-Mortar Retail Firms

The B&M retailers that have decided to develop an online selling capacity (effectively transforming themselves into C&M retailers) have generally been successful relative to pure play Internet firms, primarily through exploiting the advantages inherent in running physical and online operations. One of the most obvious benefits is the value of an established brand name and reputation in attracting customers to a C&M website. Bain & Company research found that more than 40 percent of visitors to C&M sites came because of previous affiliation with their physical locations, which offers C&M retailers a huge advertising and marketing cost advantage over pure play Internet firms⁶⁷. Also, customers who are concerned about transaction security may be more likely to frequent the website of a retailer whom they know and trust. Moreover, B&M retailers who establish online divisions are able to drive incremental revenue from both new and existing customers⁶⁸.

C&M retailers also have an advantage in that their physical stores are a convenient way for customers to handle returns. One survey showed that 83 percent of online buyers would like to be able to return online purchases to offline stores, and 59 percent would be willing to pick up a product at a physical store that had been ordered online⁶⁹. The latter statement reflects an opportunity for online retailers to price discriminate by perhaps offering a discount to consumers who agreed to pick up their purchase in the physical location and also a scheme that will draw online customers into the store, where sales personnel could promote additional

⁶⁵ Fuscaldo, p. R10

⁶⁶ de Figueiredo

⁶⁷ Sanderson and Zook

⁶⁸ Biehn

⁶⁹ "Poor online service"

purchases⁷⁰.

One danger inherent in merging physical and online operations in such a manner is that the physical location might be turned into a showroom and a returns depot, where consumers come to check goods and prices, order online to exploit the taxation differential, and then return the good if it is not to their liking. In this scenario, the physical store might not collect adequate revenue to compensate it for its inventory, display and marketing efforts⁷¹. Physical locations may be able to prevent this situation by emphasizing the experiential component of the shopping experience and providing superior service to those customers that desire face-to-face sales interaction.

Another means by which physical and online businesses may be linked is through in-store kiosks that link customers to the company's website. The kiosks would enable customers to purchase items that are sold out or not stocked at that location or large items, such as appliances, that could be shipped directly to the buyer's home. Awareness of and familiarity with the retailer's website would also increase, and retailers can simultaneously cater to customers that prefer to shop online and those that prefer the physical shopping environment. Leading retailers, such as Kmart, Best Buy, and Barnes & Noble, have already put this idea into practice⁷².

As the Internet market matures, the online retail industry may grow to more closely mirror that of the physical retail industry. One key to successful modern retailing has been the clustering of a variety of stores under a single owner, which may lead to the creation of virtual malls on the Internet. Any site that generates significant traffic could be a potential anchor around which strategic alliances are formed to provide a variety of product offerings to shoppers⁷³. An innovator in many ways, Amazon.com is an excellent case study for the advantages that retailers can realize through the formation of virtual malls.

With its book site as its anchor, Amazon began entering into strategic alliances with e-commerce companies to offer a wide range of products on its site, including Target, Toys 'R' Us, Circuit City, and Borders. By paying Amazon to promote their products on its site and to

⁷⁰ Miller

⁷¹ Miller

⁷² Alter

⁷³ Hendershott et al.

store their merchandise (effectively renting pieces of Amazon's virtual and physical space), Amazon's partners were able to realize significantly reduced shipping, packing, and customer acquisition costs from these partnerships⁷⁴.

In addition to providing the benefits of a "one-stop shop" for consumers and reduced costs for Amazon's partners, this arrangement has also been successful for Amazon and could be one of the driving factors in its prediction that it will finally achieve "pro-forma" operating profitability in the fourth quarter of 2001. Amazon's technology-service deals have gross margins of 60 percent or higher, which is more than double its total gross margins, and one analyst predicts that service revenues might increase from 7 percent of total revenues currently to 50 percent in five years⁷⁵.

In an effort to capitalize on its strengths in online sales, fulfillment, and customer service, Amazon announced in an e-mail sent on November 14 of 2001 that it will restructure itself to further concentrate on technology services. Despite its bright prospects for the future, though, Amazon is still losing money in certain product categories where it attempted to provide the goods itself, rather than through a strategic partnership, and it is expected to drop these items, which might include tools, hardware, and kitchen equipment, in the near future⁷⁶. Amazon's further development as a virtual mall anchor will provide an indication of how this online retail model can be expected to prosper in the future.

7. Future Considerations

If the inability to physically inspect goods and transaction security concerns are two of the main deterrents to the success of online retail, developments in technology may provide solutions for these problems, thereby improving the Internet's future prospects for success. Taxation policy changes will also have a dramatic impact on the viability of online retail, if implementation of an online sales tax reduces consumers' willingness to purchase goods over the Internet.

⁷⁴ Hendershott et al.

⁷⁵ Black

⁷⁶ Black

7.1 Technology and Security

a) Online Payment Systems

After the rapid development of Internet auction sites, many buyers and sellers desired a more secure and efficient way to transfer payments, and a number of online payment systems have been started with the intention of meeting that need. Users set up accounts with online payment services, which link to credit cards or bank accounts from which funds are then transferred. Sellers have noted that the time lag for receipt of payment has been shortened from as long as a month to a few days, and these systems also help small firms to pay a lower charge for using these services, compared to a roughly 6% charge for credit card sales. Rather than making credit card information available to every site from which a consumer wishes to purchase, users of online payment services benefit by only having to provide this information to the payment service provider⁷⁷. If consumers become more aware of and comfortable with these services, the ease and convenience of online retail will further increase, as should the incentive for consumers to purchase inexpensive items which may not have been worth the effort involved in previous payment methods.

b) Customization and Product Details

Technology that more closely simulates the real experience of physical good inspection will cause customers to feel less anxious about purchasing products of variable quality over the Internet. Some websites currently employ features that allow the user to rotate the good in several directions or to view minute details close-up. As a more extreme example, Lands' End experimented with a technology in which a van that contained equipment for electronically recording consumers' precise body measurements traveled to different cities; the information was then loaded online and customers could view the exact fit of the retailers' apparel on a virtual model of themselves. Although the service has since been discontinued for logistical reasons, it provides an interesting example of the possibilities that exist for improving the means by which consumers view and interact with goods online.

As a further note, developments in technology may hinge on the extent to which retailers are able to obtain patents for innovative processes or ideas that they may apply on their

⁷⁷ Morton, p. R13

website. One example is the challenge that Bn.com brought to court, regarding its contention that the patent obtained by Amazon.com on its one-click technology was invalid. The court ruled in favor of Amazon, stating that “the only factor determining patentability is whether the patent claims a machine, process, manufacture, or composition that has ‘practical utility’”⁷⁸. By ruling that business methods are patentable, this may lead to a situation in which those retailers that invent and patent truly useful and innovative features on their website may be able to gain in market share. Without patents, though, firms would not have the incentive to research these new technologies, which would cause the potential loss of features that could improve prospects for online retail.

7.2 Taxation

The current situation for taxation of remote sales was established by two Supreme Court cases *National Bellas Hess v. Department of Revenue of the State of Illinois* (1967) and *Quill v. North Dakota* (1992), which ruled that “companies cannot be compelled to collect sales taxes on those transactions that occur in a state where they do not have a ‘physical nexus’, which is loosely defined as a geographical presence”⁷⁹. In reality, consumers that live in one of the 45 states with a sales tax are supposed to pay a use tax on online or catalog purchases, but this law is rarely enforced and thus, compliance is very low. A report issued by the Center for Business and Economic Research at the University of Tennessee estimated sales tax revenue losses from Internet sales to amount to \$13.3 billion in 2001⁸⁰.

The difficulties with taxation of remote sales involve actually defining nexus and determining a way in which retailers can somehow deal with the 30,000 different taxing jurisdictions in the United States⁸¹. To allow time to resolve these issues and to prevent impeding the growth of the infant Internet, the Internet Tax Freedom Act (ITFA) was passed in 1998, which placed a three-year moratorium on new Internet taxes. This moratorium was recently extended for another two years by a Senate vote on November 15, 2001⁸².

In order to come to an eventual resolution of this debate, 33 states have signed onto the

⁷⁸ Jacobs

⁷⁹ Wiseman, p. 88

⁸⁰ Gold, p. R14

⁸¹ Wiseman, p. 90

⁸² Rigsby

Streamlined Sales Tax Project to create a simpler and unified tax system. Although traditional retailers generally support the simplification of the tax code and the dissolution of the competitive advantage in pricing that Internet retailers currently enjoy, online firms are, not surprisingly, opposed to the imposition of a tax on remote sales⁸³. Austan Goolsbee, a widely cited figure in the Internet taxation debate, found that the higher the local sales tax rate, the greater the probability and the larger the amount of purchase online, which implies that consumers deliberately avoid paying taxes to offline stores by buying goods over the Internet instead. Goolsbee concluded that if existing taxes are applied to the Internet, the number of buyers online will be reduced from 20-25 percent and total sales will be reduced by 25-30 percent, a legitimate reason to incite fear in online retailers⁸⁴.

8. Conclusion

The lowering of search costs and the abundance of information available online might be expected to greatly enhance consumer price comparison and thus to drive price to the level of marginal cost, but studies have found evidence of non-competitive pricing on the Internet. This result can be explained by using Salop's circle model to show how buyers maximize their consumer surplus: consumers will not necessarily choose the good with the lowest price if they derive more value from additional retail services that are offered with a higher-priced good.

The notion of a perfectly competitive online retailing environment can be further dispelled with the observations of barriers to entry created by the high endogenous sunk costs inherent in Internet retailing and high concentration in sectors of this industry, causing an oligopoly model to be a more appropriate choice for explaining the structure of online retail. Thus, the market power that firms have in an oligopoly is of great advantage to online retailers, who can exploit Internet technology to gather customer information for price discrimination and targeted marketing purposes.

It is important to note that Internet retail is a very young industry, and thus, observations of market structure and online pricing are based on just a few years of data, making it difficult to come to definitive conclusions about the industry. In addition, many Internet start-ups engaged

⁸³ Gold, p. R14

⁸⁴ Wiseman, p. 94-95

in “penetrative pricing” practices, where they charged at or below cost, in the hopes that building a solid customer base would compensate for the losses they were making. This technique proved to be unsustainable and one of the main factors in the failure of a large number of Internet firms, but the very low prices charged by these companies might skew pricing observations downward. Hence, in deducing market structure and pricing patterns for the long-term future of the Internet industry, further research should factor the relationship between pricing and firm success into its calculations to obtain a more accurate picture of a sustainable business model.

Research might be extended in several other ways to further prove the hypothesis that the Internet is not perfectly competitive and exhibits pricing levels above marginal cost. Because of the data that was readily available, this paper focused on the book sector as a representative example of the rest of the online retail industry. Several other sectors, in which goods can easily be compared across sellers (such as videos, CDs, and brand-name products), should be chosen, and prices should be tracked across websites that sell these products to see if the same pricing patterns are observed. Furthermore, to investigate if retailers are taking advantage of opportunities for price discrimination, it would be interesting to compile a large sample of consumers, who would be diverse in terms of age, income, city of residence, and other factors upon which Internet retailers might be able to base differential pricing. Tests could then be run to see how consumer characteristics and deliberate disparities in their browsing and purchasing histories would affect the prices they are offered.

An oligopoly market structure necessitates that only a few firms will control the majority of market share in a particular sector or industry. In order to survive in this type of market, online retailers should exploit opportunities to collect a wealth of customer data and to use this information for pricing purposes, two areas in which e-tailers have an advantage over traditional retail counterparts. Differentiating themselves based on superior service and an efficient distribution infrastructure or partnership will further ensure that the Internet retailers will have a significant impact on retail trade in the future.

Appendix

Table 1

Table 1. Estimated Quarterly U.S. Retail Sales¹: Total and E-commerce

(Data in millions of dollars. Not adjusted for seasonal, holiday and trading-day differences.)

Period	Retail Sales ¹		E-commerce as a Percent of Total Sales	Quarter-to-Quarter Percent Change		Year-to-Year Percent Change	
	Total	E-commerce ²		Total Sales	E-commerce Sales	Total Sales	E-commerce Sales
1999 4 th Quarter	785,869	5,266	0.7	8.6	(NA)	9.2	(NA)
2000 1 st Quarter	714,425	5,526	0.8	-9.1	4.9	12.0	(NA)
2 nd Quarter	777,819	5,982	0.8	8.9	8.3	8.6	(NA)
3 rd Quarter	772,796	6,898	0.9	0.6	15.3	6.8	(NA)
4 th Quarter	817,715	8,881	1.1	5.8	28.7	4.1	68.6
2001 1 st Quarter	728,662	7,592	1.0	-10.9	-14.5	2.0	37.4
2 nd Quarter	807,409	7,458	0.9	10.8	-1.8	3.8	24.7
3 rd Quarter	786,581	7,472	0.9	-2.6	0.2	1.8	8.3

NA Not available. † Revised. ‡ Preliminary.

¹ Does not include Food Services.

² E-commerce sales are sales of goods and services where an order is placed by the buyer or price and terms of sale are negotiated over an Internet, extranet, Electronic Data Interchange (EDI) network, electronic mail, or other online system. Payment may or may not be made online.

Source: United States Department of Commerce
<http://www.census.gov/mrts/www/ecom.pdf>

Figure 1



The retail e-commerce sales estimate for the fourth quarter of 2001 is scheduled for release in February 2002.

E-commerce retail sales data and frequently asked questions (FAQ's) about e-commerce sales are available on the Census website at <http://www.census.gov/mrts/www/mrts.html>. For additional information about Census Bureau e-business measurement programs and plans visit <http://www.census.gov/estats.htm>.

Source: United States Department of Commerce
<http://www.census.gov/mrts/www/ecom.pdf>

Table 2
Gross Profits, Advertising, and Website Development Costs

	1995	1996	1997	1998	1999	2000
<u>Online retailers</u>						
Advertising (% of sales)						
Amazon	39	39	27	22	25	22
Barnesandnoble	--	--	--	171	55	43
Fatbrain	--	--	38	50	71	61
Buy	--	--	--	12	12	12
Product and website development (% of sales)						
Amazon	41	15	9	7	10	10
Barnesandnoble	--	--	--	19	10	12
Fatbrain	--	--	8	15	19	15
Buy	--	--	--	1	1	3
<u>B&M retailers</u>						
Selling and administrative costs (% of sales)						
Barnes & Noble ^a	21	21	19	19	19	20
Borders	19	19	21	21	22	25
Advertising and development (% of sales)						
Barnes & Noble ^b	16	16	14	14	14	15
Borders ^b	14	14	16	16	17	20

Notes: a) includes administrative costs; b) assumes mean administrative costs are 5 per cent.

Source: Oxford Review of Economic Policy, Vol 17, No 2, pp 217-234, 2001, Pricing, Sunk Costs, and Market Structure Online.

Figure 2

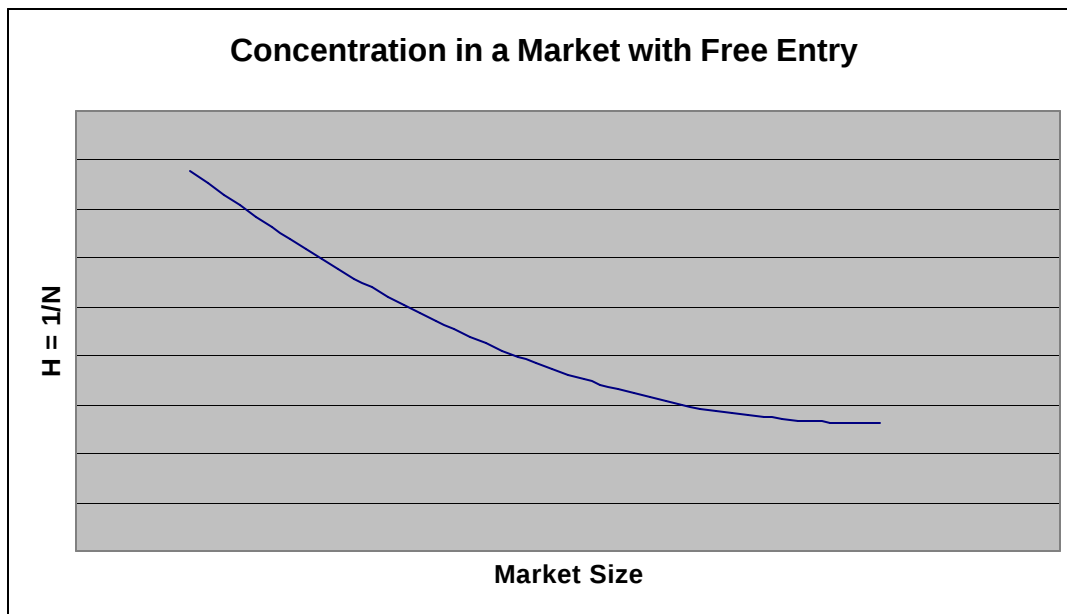
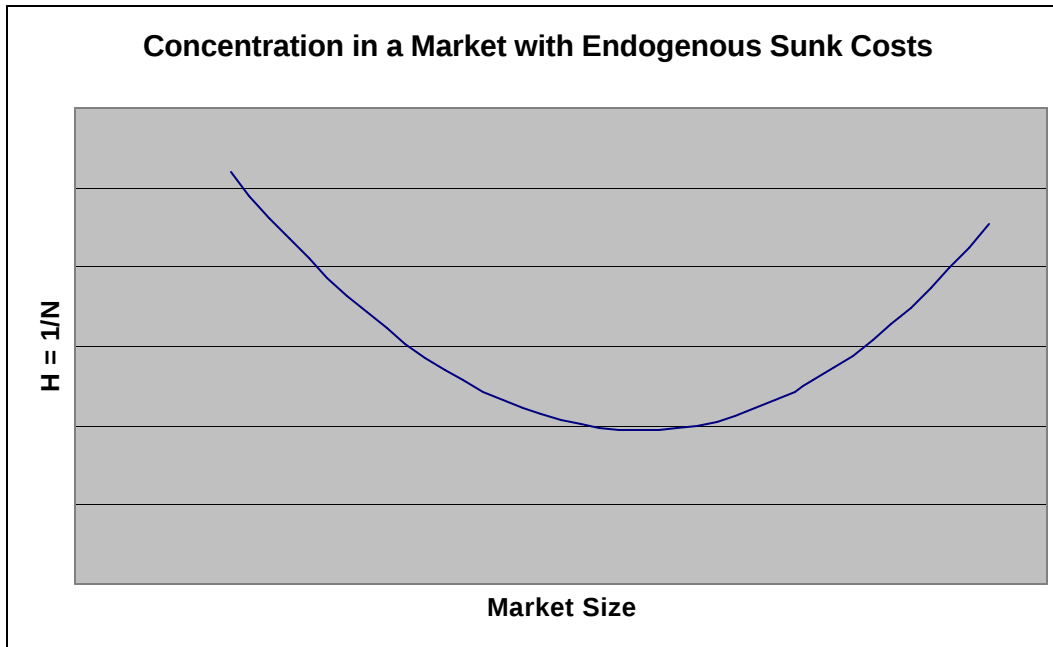


Table 3
Sales and Concentration Levels for Traditional and Online Retailers

Traditional USA (1997)			Traditional UK (1998)		
Books					
	\$m	%		£m	%
Total	12,536	100	Total	2,841	100
C4	5,641	45	C4	1,210	40
Barnes & Noble	2,758	22	Waterstones	574	20
Borders	2,256	18	WH Smith	509	18
Crown	301	2	Blackwells	68	2
Books-a-Million	326	3	Books Etc.	60	2`
Online (1999)			Online (1999)		
Books, music, video			Books		
	\$m	%		\$m	%
Total	1,700	100	Total	1,125	100
C4	1,589	93	C4	962	86
Amazon	1,308	77	Amazon	697	62
Bn	202	12	Bn	188	17
Borders	18	1	Borders	16	2
Fatbrain	19	1	Fatbrain	17	2
Buy	70	4	Buy	60	5

Sources: American Booksellers Association, UK Booksellers Association, Harris Interactive, Jupiter Communications, www.sec.com

Source: Oxford Review of Economic Policy, Vol 17, No 2, pp 217-234, 2001, Pricing, Sunk Costs, and Market Structure Online.

Table 4
Book Prices and Position on Bestseller List

Notes: Figure in brackets is previous week's rank. *Indicates a missing observation. Bold type indicates a change in price.

Hannibal by Thomas Harris (30 August 1999-21 February 2000)

Week	Rank	Amazon.com	Bn.com	A1books.com	Fatbrain.com	Buy.com
1	5(-)	\$13.90	\$13.97	\$18.25	\$19.95	*
2-8	<16(5)	\$13.98	\$13.97	\$18.25	\$13.95	*
9-11	18(12)	\$19.57	\$19.56	\$18.25	\$13.95	*
12	24(20)	\$19.57	\$19.56	\$18.25	\$19.55	*
13-16	>15(24)	\$19.57	\$19.56	\$19.50	\$19.55	\$18.77
17-19	>15(16)	\$19.57	\$19.56	\$19.00	\$19.55	\$18.77
20	15(20)	\$13.98	\$13.97	\$19.00	\$19.55	\$18.77
21	23(15)	\$19.57	\$19.56	\$19.00	\$19.55	\$18.77
22-26	>15(23)	\$19.57	\$19.56	\$18.25	\$19.55	\$18.77

Granny Dan by Danielle Steel (30 August 1999-21 February 2000)

Week	Rank	Amazon.com	Bn.com	A1books.com	Fatbrain.com	Buy.com
1	6(-)	\$9.90	\$9.97	\$13.00	*	*
2-5	<16(6)	\$9.98	\$9.97	\$13.00	\$13.95	*
6-12	>15(12)	\$13.97	\$13.96	\$13.00	\$13.95	*
13-16	>15(>15)	\$13.97	\$13.96	\$13.75	\$13.95	\$12.97
17-21	>15(>15)	\$13.97	\$13.96	\$13.50	\$13.95	\$12.97
22-26	>15(>15)	\$13.97	\$13.96	\$13.00	\$13.95	\$12.97

Assassins by Tim LaHaye and Jerry Jenkins (30 August 1999-21 February 2000)

Week	Rank	Amazon.com	Bn.com	A1books.com	Fatbrain.com	Buy.com
1	2(-)	\$15.90	\$11.49	*	*	*
2-4	<16(2)	\$9.99	\$11.49	\$13.00	\$9.95	*
5	6(5)	\$9.99	\$9.98	\$13.00	\$9.95	*
6-8	<16(6)	\$9.99	\$11.49	\$13.00	\$9.95	*
9-11	<16(8)	\$9.99	\$9.98	\$13.00	\$11.45	*
12-13	<16(12)	\$9.99	\$9.98	\$13.75	\$11.45	*
14	15(11)	\$9.99	\$9.98	\$13.75	\$16.05	\$8.99
15-16	>15(15)	\$13.98	\$13.97	\$13.75	\$13.95	\$13.98
17-26	>15(21)	\$13.98	\$13.97	\$15.50	\$13.95	\$13.98

Black Notice by Patricia Cornwell (30 August 1999-21 February 2000)

Week	Rank	Amazon.com	Bn.com	A1books.com	Fatbrain.com	Buy.com
1	1(1)	\$12.90	\$12.97	\$17.00	*	*
2-8	<16(1)	\$12.98	\$12.97	\$17.00	\$12.95	*
9-10	>15(9)	\$15.57	\$18.16	\$17.00	\$12.95	*
11-12	>15(18)	\$15.57	\$12.97	\$17.00	\$12.95	*
13	25(23)	\$15.57	\$12.97	\$18.00	\$12.95	*
14	29(25)	\$18.17	\$12.97	\$18.00	\$18.15	\$14.99
15-17	>15(34)	\$18.17	\$12.97	\$17.50	\$18.15	\$15.57
18-19	>15(35)	\$12.98	\$12.97	\$17.50	\$18.15	\$15.57
20-21	>15(34)	\$12.98	\$18.16	\$17.50	\$18.15	\$15.57
22-23	>15(29)	\$12.98	\$18.16	\$17.00	\$18.15	\$15.57
24-25	>15(>15)	\$18.17	\$18.16	\$17.00	\$18.15	\$15.57
26	>15(>15)	\$18.17	\$18.16	\$17.00	\$18.15	\$17.17

Pop Goes the Weasel by James Patterson (8 November 1999-21 February 2000)

Week	Rank	Amazon.com	Bn.com	A1books.com	Fatbrain.com	Buy.com
1-2	3	\$13.48	\$13.47	\$17.75	\$18.85	\$12.94
3-4	<16(3)	\$13.48	\$13.47	\$18.85	\$18.85	\$12.94
5-11	<16(8)	\$13.48	\$13.47	\$18.75	\$18.85	\$13.47
12	12(11)	\$13.48	\$13.47	\$17.75	\$18.85	\$13.47
13-14	>15(12)	\$18.87	\$18.86	\$17.75	\$18.85	\$13.47
15	20(19)	\$18.87	\$18.86	\$17.75	\$18.85	\$15.00
16	29(20)	\$18.87	\$18.86	\$17.75	\$18.85	\$18.17

'O' is for Outlaw by Sue Grafton (8 November 1999-21 February 2000)

Week	Rank	Amazon.com	Bn.com	A1books.com	Fatbrain.com	Buy.com
1	6(-)	\$13.00	\$13.00	\$17.00	\$15.60	\$12.48
2	6(6)	\$13.00	\$13.00	\$17.00	\$15.60	\$12.99
3	7(6)	\$13.00	\$13.00	\$18.00	\$15.60	\$12.99
4-6	<16(7)	\$13.00	\$13.00	\$18.00	\$18.20	\$12.99
7	12(12)	\$13.00	\$13.00	\$17.50	\$18.20	\$12.99
8	14(12)	\$13.00	\$13.00	\$17.50	\$20.95	\$12.99
9-10	14(14)	\$13.00	\$13.00	\$17.50	\$18.20	\$12.99
11	19(14)	\$18.20	\$18.20	\$17.50	\$18.20	\$12.99
12-16	>15(19)	\$18.20	\$18.20	\$17.00	\$18.20	\$17.60

Source: Oxford Review of Economic Policy, Vol 17, No 2, pp 217-234, 2001, Pricing, Sunk Costs, and Market Structure Online.

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