Pricing Strategies on the Web: Evidence from the Online Book Industry

Karen Clay*, Ramayya Krishnan*, Eric Wolff**

* *Heinz School of Public Policy and Management, Carnegie Mellon University, Pittsburgh, Pennsylvania 15213*
email: kclay@andrew.cmu.edu, rk2x@andrew.cmu.edu

** *Graduate School of Industrial Administration, Carnegie Mellon University, Pittsburgh, Pennsylvania 15213*
email: wolff@andrew.cmu.edu

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Abstract

Using data collected between August 1999 and January 2000 covering 399 books, including New York Times bestsellers, computer bestsellers, and random books, we examine pricing by thirty-two online bookstores. One common prediction is that the reduction in search costs on the Internet relative to the physical channel would cause both price and price dispersion to fall. Over the sample period, we find no change in either price or price dispersion. Another prediction of the search literature is that the prices and price dispersion of advertised items or items that are purchased repeatedly will be lower than for unadvertised or infrequently purchased items. Prices across categories of books appear to conform to this prediction, with New York Times bestsellers having the lowest prices as a fraction of the publisher's suggested price and random books having the highest prices. Interestingly, price dispersion does not conform with this prediction, apparently for reasons related to stores' decisions to carry particular books. One reason why we may not observe convergence in prices is because stores have succeeded in differentiating themselves even though they are selling a commodity product. We observed differentiation (or attempted differentiation) in selection in certain categories, overall selection and price. A few online stores, usually branches of specialty physical stores, have chosen to focus on depth of offering within a particular category such as computer books, children's books, or religious books. Other full-line stores focus on overall selection, carrying 90 percent or more of the books in the sample. For those offering low prices, most stores focused on marginally undercutting Amazon, usually by 10 cents or less. As of January 2001, some of these stores have gone out of business or changed their business model, and the surviving ones appear to still be at risk.

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Introduction

One widely reported prediction is that the availability of low-cost information on price – specifically the rise of comparison-shopping engines – will lead all Internet retailers to charge the same price for mass-produced physical goods and that price will be approximately cost. For instance, in a September 1999 New York Times article, Bob Tedeschi noted “New shopping search engines are being developed quickly, bringing the promise of low prices for consumers and thinner margins for Web retailers.”[1] And an August 1999 Economist article stated “Fierce competition has forced web companies to slash prices.”[2] These statements are based on a Bertrand model of competition.

The empirical literature has primarily focused on comparisons of price and price dispersion in the Internet and physical channels, saying relatively little about changes in prices or price dispersion over time. Lee (1997) compared pricing of used autos in Internet and physical channels and found that prices were higher in the Internet channel. This may be due to unobserved quality variation. Bailey (1998) using matched sets of books, compact disks, and software also finds higher prices in the Internet channel for 1996-1997. Brynjolfsson and Smith (1999) on books and compact disks for 1998-99 found that Internet retailers had *lower* prices, made smaller price adjustments, and had greater or smaller price dispersion than conventional channels, depending on whether prices were weighted by proxies for market share.

Another prediction of the search literature is that the prices and price dispersion of advertised items or items that are purchased repeatedly will be lower than for

[1] http://search.nytimes.com/search/daily/bin/fastweb?getdoc+site+site+89051+0+wAAA+internet%7Eprices

[2] The Economist, August 21, 1999.

unadvertised or infrequently purchased items. The differences in prices and price dispersion are the result of differences in information. The previous prediction assumed that individuals would be informed about all books, because they will all use comparison-shopping engines. The current prediction assumes that individuals might be better informed about prices for some types of books, such as New York Times bestsellers, since on and off-line bookstores frequently advertise their discounts on these books.

Empirical studies testing Stigler's (1961) prediction that advertising that improves price information would cause both price and price dispersion to fall confirm this intuition. Comparisons of the prices of goods such as eyeglasses, optometry services, and prescription drugs in states that permitted or did not permit advertising showed that advertising was associated with lower prices and price dispersion.[3] More recently Milyo and Waldfogel (1999) found that increased advertising did lower prices on advertised products, but not overall. And they found that price dispersion was stable or increasing in the short run. Sorenson (2000) examined the posted price of drugs across drugstores in two communities. In line with the predictions of search theory, he finds that average price-cost margin and price dispersion are lower if the prescription is purchased repeatedly than if it is purchased only occasionally. It is notable that none of these papers examines data from the Internet.

The first prediction that low cost price information on the Internet will force price and price dispersion to fall is in tension with a third prediction. This third prediction states that firms will seek to differentiate their products. Firms prefer to be differentiated,

[3] See Benham (1972), Cady (1976), Devine and Marion (1979), Feldman and Begun (1978, 1980), Glazer (1981) and Kowka (1984).

because it mutes price competition. Thus with product differentiation, prices may not converge in equilibrium and could in fact diverge.

Several authors have found evidence of product differentiation. In a study of the online travel industry, Clemons, Hitt, and Hann (1998) found agents responded to identical requests with different time/price pairs. This evidence suggests that online ticket agents engaged in significant product differentiation. In a previous paper (Clay et al. 1999), using data from April 1999 we found indirect evidence that online booksellers were engaging in product differentiation through price, selection, and other nonprice attributes. Although it is not a focus of their paper, Brynjolfsson and Smith (1999) on books and compact disks for 1998-99 also find evidence that is consistent with product differentiation.

To investigate these three predictions, we use data on pricing in the online book industry covering the period August 1999 to January 2000. Automated agents collected data for 399 books from thirty-two online bookstores over twenty-five weeks. The books included New York Times bestsellers, former New York Times bestsellers, computer bestsellers, former computer bestsellers, and random books. The stores included big names such as Amazon, BarnesandNoble.com, and Borders.com as well as smaller stores such as Wordsworth and BCY Bookloft.

We find no evidence that prices or price dispersion are converging. Both are stable over the sample period. Thus, any effects of lower search costs either have already been realized or are yet to come. Prices across categories of books appear to be lower for advertised items or items likely to be purchased repeatedly. New York Times bestsellers have the lowest normalized prices, random books have the highest prices, and bestsellers have lower normalized prices than former bestsellers. Interestingly, price dispersion does not conform with this prediction, apparently for reasons related to stores' decisions to carry particular books. We observed differentiation (or attempted differentiation) in selection in certain categories, overall selection and price. A few online stores, usually branches of specialty physical stores, have chosen to focus on depth of offering within a particular category such as computer books, children's books, or religious books. Other full-line stores focus on overall selection, carrying 90 percent or more of the books in the sample. For those offering low prices, most stores focused on marginally undercutting Amazon, usually by 10 cents or less. As of January 2001, some of these stores have gone out of business or changed their business model, and the surviving ones appear to still be at risk.

Background

Although book selling over the Internet began in the 1980s, it started to attract national attention from the press in 1993 (Wilke 1993). At first online stores, not surprisingly, primarily sold computer books. An interesting exception was distribution of an electronic version of a Stephen King short story through an online store prior to publication of the book (WSJ, Sep 17, 1993).

Incredible rates of growth in the number of people with access to Internet and the spread of early web browsers in the early 1990s made the book market increasingly attractive. The number of stores and the range of books available increased dramatically. In July 1995 Amazon entered the market. The two largest bricks and mortar chains –

Barnes and Noble and Borders – began Internet sales in May 1997 and May 1998, respectively.

Several factors have shaped the structure of this industry. Each version of a book title has a unique identifier. Unique identifiers (ISBNs) are important for two reasons. First, the existence of unique identifiers allowed wholesalers to computerize their catalogs in the late 1980s. Computerized catalogs led to more efficient order processing, benefiting the industry as a whole. The first Internet bookstores built their systems on top of these catalogs. Second, consumers can search by ISBN and be assured that they are getting exactly the same product. In some other commodity markets, firms can hinder comparison shopping by bundling a few items and issuing the bundle a new SKU (stock keeping unit) number. Bundles in the book world, in contrast, would be identified by component ISBNs or would have to be issued a new ISBN by the issuing agency.

Market penetration of online bookstores is relatively high. Penetration is estimated to be in the 3-6 percent range. As of April 1999, the number of individuals using the Internet to shop for books was estimated to be second only to the number of individuals using it to shop for cars and car parts. (Hoynes 1999 citing the Shop.org study) Consumers can choose among a large number of Internet bookstores. For instance, Yahoo lists more than one hundred online bookstores. And new stores are opening all of the time. Some of the new entrants are physical stores that are migrating to the web, but many others are new internet-only bookstores.

Consumers also can choose among comparison-shopping engines to shop for books. For instance, Yahoo lists ten comparison-shopping engines that focus primarily or exclusively on books. Examples include BestBookBuys, DealTime, and AddAll.

Consumers can also choose from a wide range of comparison-shopping engines that focus on many goods, of which books are only one. Examples of these comparison-shopping engines include including Yahoo Shopping, MySimon, and PriceScan. Most of the major comparison-shopping engines cover twenty or more U.S.-based online bookstores. For instance, DealTime, BestBookBuys, and PriceScan all search between 20 and 30 stores. Their search set includes major players as well as smaller online booksellers.

Finally, online bookstores face very similar wholesale prices for books: As a result of a recent lawsuits in the book industry, all players with even minimal volume now face very similar wholesale prices for books. Prices may not be identical due to factors such as return rates, but otherwise all stores face the same prices for books. (Conversation in November 1999 with Y. S. Chi, COO, Ingram Book Group, Friedman 1999, and Bookweb.org 1999)[4]

Predictions

Underlying the prediction that the availability of low-cost information on price will lead all Internet retailers to charge the same price for mass-produced physical goods and that price will be approximately cost are a number of strong assumptions about the

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[4] Other costs that stores face can be divided into infrastructure costs, nonmarginal book specific costs, and order fulfillment costs. We are intentionally ignoring marketing expenditures, since they are effectively discretionary. Infrastructure costs include the costs of maintaining warehouse space, most personnel, and the hardware and software associated with the database, orders, and customer service. Nonmarginal book specific costs are one time setup costs related to the creation of the entry for the book in the database with a scanned photo of the cover, establishing linkages with the supplier database, and other efforts that support creation of the page, placement of the order, and order fulfillment.

Order fulfillment costs together with the wholesale price of the book determine the marginal cost of the book. Stores with significant numbers of orders either outsource order fulfillment or maintain large semi or fully automated warehouses. In discussions with companies, it does not appear that the marginal cost of order fulfillment differs much within or between the two options.

market. In the Bertrand model of competition, goods are identical, firms choose price, supplying whatever quantity the market demands at constant marginal cost, and consumers are perfectly informed about firms' prices (Bertrand, 1883). In such a market, if a firm charges a higher price than a competitor, it faces zero demand. Conversely, if a firm charges a marginally lower price than competitors, it will capture demand for the entire market. Thus, price will fall to the marginal cost of a good, with all firms charging the same price.

We may see price dispersion if some of the assumptions do not hold. For instance, consumers may not have perfect information about prices and the products that firms offer may not be identical, even if the books are. Although comparison-shopping engines are common, their market penetration is limited, around 2 percent.[5] Reasons for the limited penetration include the fact that comparison-shopping engines tend to be slow and the fact that they are cumbersome to use for a basket of goods. As a result, the vast majority of consumers are relatively uninformed about prices. These consumers may, however, be relatively better informed about prices of certain categories of books. In particular, they may be informed about the prices of New York Times bestsellers, because on and off-line bookstores regularly advertise their discounts on these books.

A large theoretical literature examines the conditions under which price dispersion will exist.[6] In most models, dispersion is driven by imperfect information. Imperfect information can arise in a number of different ways – through ex ante differences across consumers or ex post differences created by the operation of the

[5] It is important to note that search engines do differ in the amount of information provided and bookstores covered. Thus, even consumers who use a search engine may not have perfect information.

market. The relationship between information and price, however, hinges on the use of quantity weighted measures of price. For instance, if more consumers become informed, this may reallocate consumers among existing stores, but it may or may not cause firms to change their prices. Hence, unweighted measures of price may not change. In our empirical work, we work with unweighted measures of price. So even if we believe that consumers are becoming more informed, we may not find corresponding price decreases.

Two other factors suggest that static theoretical models and empirical results from stable markets may not translate neatly into dynamic, volatile market such as the Internet. First, huge numbers of new consumers are entering the market. If later adopters tend to be less technologically sophisticated, the effect of their entry may be swamping the effects of the increase in the number of informed consumers. In particular, even if the absolute number of informed consumers is increasing, they may represent a declining fraction of the population. Second, firms are entering and exiting. Burdett and Coles (1997) model an economy with noisy search and repeat purchases where both firms and consumers enter and exit. In equilibrium, younger firms offer lower prices to attract consumers and older firms offer higher prices to existing customers who face switching costs. Thus, average prices and price dispersion could be falling or rising, depending on the interaction among changes in information, the number of customers, and the entry and exit of firms.

All of the foregoing analysis assumed the products that firms offered were homogeneous. Theory predicts that firms will seek to differentiate their products in competitive markets to soften price competition. Thus, price dispersion may be a result

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[6] See Butters (1977), Salop and Stiglitz (1977), Pratt, Wise, and Zeckhauser (1979), Wilde and Schwartz (1979), Varian (1980), Salop and Stiglitz (1982), Burdett and Judd (1983), Benabou (1993), Burdett and

of successful product differentiation. In the online book market, firms may differentiate on brand, selection, price, or other factors.

Data

Collection

Automated agents (spiders) were constructed to collect data from two major comparison-shopping engines and some individual stores. The web pages for each book in the sample were downloaded and parsed to extract information on unit price, shipping cost, shipping time, and delivery time. The collection process began around 2 am to minimize the load on the servers and to maximize response rate.

The collection process does not cover the universe of all online stores, but the thirty-two stores in our sample cover the largest United States-based stores. For example it includes Amazon, BarnesandNoble.com, Borders.com, Buy.com, and Booksamillion.[7] Stores were included if they were covered in one of two major comparison-shopping engines – DealTime or PriceScan. The focus here on the impact of comparison-shopping engines and the fact that many stores are represented made it natural to collect data from comparison-shopping engines. We also sent agents to some individual stores to guarantee data from important stores and to determine the accuracy of the information from DealTime and PriceScan.

The sample includes five categories of books: New York Times bestsellers, former New York Times bestsellers, computer bestsellers, former computer bestsellers and a random sample of books in print. New York Times bestsellers were included,

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Coles (1997), Rauh (1997), and Arnold (2000).

[7] A complete list of the stores is provided in Table 3.

because they are widely carried, represent high aggregate sales, and are a focal point for discounts. For the New York Times bestsellers, a new panel of approximately 60 titles is begun each week that includes that week's bestsellers in each of four categories: paperback fiction, paperback nonfiction, hardcover fiction and hardcover nonfiction.[8] When New York Times bestsellers go off of the list, we continue to track them as former bestsellers.

Computer books were included, because they were one of the first categories of books sold on the Internet and remain an important category. In particular, purchasers of computer books might also be early adopters of comparison-shopping engines. While, the New York Times does not maintain a comparable bestseller list for computer books, Amazon.com does.   We chose Amazon's bestseller list because of Amazon's high volume of book sales and the generalist (as opposed to specialist) orientation of the site.[9] Thus the 50 books on the bestseller list are likely to be purchased by large numbers of consumers and offered in a large number of stores. Like the New York Times bestsellers, a new panel is begun each week and that panel is followed on an ongoing basis.

Random books were included to provide a baseline against which to compare the prices and price dispersion of bestsellers and former bestsellers and to understand pricing for the millions of books not covered by the bestseller lists. The random sample was created by generating random strings of letters of random length and then checking the result against the online *Books in Print* database until approximately 200 in-print titles

[8] The number is approximate, because there are often ties for the #15 spot.
[9] Use of any store's bestseller list raises unavoidable issues of endogeneity.

were found.[10] Unlike the two types of bestsellers, we generated only a single panel. This panel has been followed from August to the present.

For the purposes of this paper, we focus on the weekly prices of 399 books between August 1999 and January 2000. Although data collection continued through November 2000, we decided to cut the sample after approximately six months of data collection. We constructed new panels of New York Times bestsellers and computer bestsellers every week. Given computational constraints, however, we chose to focus on just the first, ninth, and seventeenth weeks' bestsellers.[11] Reported prices are weekly minimums. Data is nominally collected daily, but unavailable servers, problems with the information returned, and changes in search engines, resulted in some data loss. Further problems with disk space forced us to reduce the frequency of collection to every other day for a period in November and December 1999 until the problems could be resolved. Because a bookstore changes the price of a book less than twice on average over the sample period, there is little loss in aggregating to the weekly level.

Summary Statistics

Summary statistics for the data set are presented in Table 1. Our sample includes 181 random books, 136 New York Times bestsellers, and 82 computer bestsellers. If the bestseller lists in weeks one, nine, and seventeen had not overlapped, the sample would have had 180 New York Times bestsellers and 150 computer bestsellers. The number of unique bestsellers was reduced by the fact that bestsellers tended to stay on the lists for 15-16 weeks on average, and thus appear on multiple bestseller lists.

[10] Some, although technically in print, were not available in any bookstores. After eliminating these, the data set includes 181 random books.
[11] We chose weeks one, nine, and seventeen because they are equally spaced throughout the twenty-five week period.

Different categories had different mixes of hardcover/paperback and fiction/nonfiction books. New York Times bestsellers are, by construction, an even mix of hardcover fiction, hardcover nonfiction, paperback fiction, and paperback nonfiction. Departures from the even split are explained by overlap in the bestseller lists from weeks one, nine, and seventeen. In contrast to the New York Times bestsellers, computer bestsellers are predominantly paperback and exclusively nonfiction. And random books tend to be hardcover nonfiction.

Across the five categories, prices show substantial differences between average unit prices and publishers' recommended prices. It is easiest to compare prices and price dispersion if we first normalize prices by the publisher's recommended price. Average prices are the lowest for New York Times bestsellers and former New York Times bestsellers (0.69 and 0.76 of publisher's recommended price), are higher for computer bestsellers and former computer bestsellers (0.78 and 0.79), and are the highest for random books (0.86).

Wholesale prices tend on average to be about 50 percent of the publisher's recommended price. Random books are the exception – they tend to sell for 60 percent of the publisher's recommended price. Average margins are the lowest for New York Times bestsellers (0.19), are higher for former New York Times bestsellers (0.24) and random books (0.26), and are the highest for computer bestsellers and former computer bestsellers (0.29 and 0.29). So despite having higher prices than computer books, random books have lower margins.

Measures of price dispersion are inversely related to price. Standard deviation as a percentage of average price is the highest for New York Times bestsellers (28 percent), is lower for former New York Times bestsellers and current computer bestsellers (18 and 16 percent), and is the lowest for former computer bestsellers and random books (14 and 13 percent). The difference between the minimum and maximum prices as a percentage of average price follows this pattern as well.

The last line of Table 1 presents another, more applied measure of price dispersion. Many consumers routinely go to Amazon without checking prices at other stores. Thus, we computed savings that they could have realized by purchasing a book from the lowest cost vendor instead. The average savings as a percentage of Amazon's price ranged from a low of 10 percent for New York Times bestsellers to a high of 25 percent for former New York Times bestsellers. For current New York Times bestsellers, the savings is likely to be about $1. For computer books, however, particularly former bestsellers, the amounts can be more significant. For instance, 20 percent savings on a $40 computer book is $8.

Prices

The differences in prices across the five categories of books as well as hardcover and paperback books and fiction and nonfiction books are explored further in Table 2. The dependent variables in regressions are price, normalized price, and normalized margin.[12] The second regression is slightly easier to interpret than the first, so we will focus on the second regression. The results there show substantial average discounts (17%-9%) relative to paperback, nonfiction, random books for current and former New

[12] Using price as the dependent variable presumes that stores set prices in absolute dollar terms. In contrast, using normalized price as the dependent variable presumes that stores set prices as a percentage of cover price or equivalently as a percent markup over wholesale price. Wholesale prices are typically quoted as a fraction of the publisher's recommended price.

York Times and computer bestsellers, small (2%) discounts for hardcover books, and more substantial (6%) discounts for fiction books. One change is in the pricing of week seventeen bestsellers. Relative to weeks one and nine, the average price of a bestseller has increased 1 percent. It suggests that a few stores may be increasing their prices on bestsellers in anticipation of Christmas (week twenty).

Regressions on margins indicate that random books and former bestsellers had margins of 25 percent. An average store earned margins of 16 percent on New York Times bestsellers and 22 percent on computer bestsellers. The smaller margins for New York Times bestsellers than for the computer bestsellers may reflect the relative importance of the two lists and the fact that many stores advertise their discounts on New York Times bestsellers but they do not advertise their discounts on Amazon's computer bestsellers. The slightly larger discount for hardcovers may reflect stores willingness to accept lower margins on more expensive books and the price sensitivity or expectations of the buyers.

The (descriptive) regression results presented in Table 2 do not capture two things that might be important – the competitive structure of the book market and differences between Amazon, Barnes and Noble, and Borders (the big three) and all other bookstores.[13] We focus on these three bookstores, because in discussions with managers of other bookstores, managers identified these three as market leaders. Book availability by bookstore and category is presented in Table 3. The big three stores carry nearly all of the books in the data set. Some other stores such as Booksamillion and Buy.com carry

[13] This represents a natural grouping given that the big three account for the vast majority of online booksales. Other groupings are clearly possible given the heterogeneity of the other category. We explore this further in the section on firm strategy.

many of the books as well. Most other stores have limited selection, either across the board like Allbooks4less or in certain categories like Bookpool and Brian's Books.

In Table 4, we explore the effects of market structure on pricing behavior.[14] It is interesting to start by looking at the control variables. The big three had significantly larger average discounts than other bookstores on both current and former bestsellers. The big three's discounts on hardcover and fiction were larger as well. The value of the constant indicates that the two types of stores had nearly identical prices on random, paperback nonfiction books. The effect of the week (time) variable on prices was positive and significant but very small in both cases, indicating that prices were essentially stable over time. This finding is consistent with the patterns of prices over time that we observe in Figure 1.[15]

Given the baseline differences in prices between the big three and other bookstores, the marginal effects of competitors are remarkably similar. For the big three, the effect of the first competitor of the same type is to lower the price 5.2 percent and the effect of the first competitor of the other type is to lower the price 4.9 percent. For other bookstores, the effect of the first competitor of the same type is to lower the price 5.6 percent and the effect of the first competitor of the other type is to lower the price 5.7 percent. The total effect of the second competitor (including the first) of the other type is to lower prices 4.0 percent for the big three and 5.8 percent for other bookstores. The marginal effects of the second competitor of the other type are small, 0.9 percent increase

[14] There are two changes we plan to implement in the next draft: i) weight observations to avoid overemphasizing books from the least concentrated markets, and ii) correct for the endogeneity of market structure, see Mazzeo (2000).

[15] We had technical problems downloading the computer bestseller list in week nineteen, so we were unable to determine whether books were still on the bestseller list that week or not. This accounts for the gaps in Figures 1 and 2.

for the big three and a 0.2 decrease for other bookstores. The coefficients on second same for other bookstores and additional other for the big three are much larger – 11 and 12 percent – because they encompass the effect of adding on average 15 other bookstores.

The fact that the marginal effect of competitors is similar across the two types of bookstores is striking, because it suggests that the competitive fringe effectively disciplines the big three. We believe that this is caused by the aggressive pricing policies of a relatively small number of stores that carry 90 percent or more of the books in the sample. In markets where a relatively small number of stores sell a book, it is these stores that are repeatedly putting competitive pressure on the big three. We explore this issue in more detail below.

Price Dispersion

If costs are same across firms, then the standard intuition is that equilibrium price dispersion will be zero for both a monopolist and zero or very small for competitive markets where most consumers are informed. In particular, we might think that consumers are likely to be informed about the price of New York Times bestsellers, since most internet and physical bookstores widely advertise their discounts on these books. Neither weighted nor unweighted standard deviation fit neatly into this story. Amazon and BarnesandNoble.com currently represent 80 percent or more of sales. As we will see below, their pricing strategies are very similar, so standard deviation weighted by sales would be close to zero for all books. If the distribution of prices in the market is of interest, then unweighted standard deviation is an important metric.

Table 5 explores the relationship between unweighted standard deviation of prices and book characteristics. Standard deviation may depend on unit price, making it hard to interpret the first equation, so we will focus on the second regression. The baseline is a paperback, nonfiction, random book, and for that book the standard deviation as a fraction of normalized price is 0.10. Sorenson (2000) found that the price and standard deviation of prescription drugs was lower for more frequently purchased items, a finding that is consistent with standard search theory. Thus it is somewhat surprising that New York Times bestsellers have much higher standard deviations than other books, 0.08 higher than the baseline of 0.10. This effect is driven by some online stores, typically branches of physical stores, offering bestsellers at full price. The slightly higher standard deviations for computer bestsellers, former computer bestsellers, and former New York Times bestsellers are also a result of some stores charging full price.

In addition to interstore standard deviation, two other measures of standard deviation are potentially of interest – prices for a given book at a given store across time (intertemporal price dispersion), and within a category of books at a given bookstore at a given time (intracategory price dispersion). The average standard deviations for these measures are reported by category in Table 6. Intertemporal variation is relatively low, suggesting that bookstores do not change their prices very often. This is consistent with the fact that the modal bookstore does not change the price of a book, except when the book goes off of the bestseller list. Intracategory variation is higher, but still relatively low as well, indicating that stores tend to use similar pricing rules for books in a given category. One surprise is the variation within New York Times bestsellers. This seems to be the result of two factors: discounts are often smaller for paperback bestsellers than for hardcover bestsellers, and some stores only discount the top ten titles, rather than the top fifteen.

In Table 7, we explore the effects of market structure on standard deviation. It is interesting to start by looking at the control variables. Holding competitive structure constant, there are striking differences between the two types of stores across the control variables. For the big three, the prediction that widely advertised books should have lower standard deviation of price seems to hold. Specifically, random books have the highest standard deviation and New York Times bestsellers have the lowest standard deviation. For other bookstores, advertising (or more generally greater competition) seems to lead to higher standard deviation. This is driven by stores that tend to sell their books at full price or nearly full price offer bestsellers at high prices, but presumably sell very few copies. The effect of time is negligible for both types of stores. This finding is consistent with the patterns of prices over time that we observe in Figure 2.

Examining the effects of competitors, going from two to more than two competitors of the same type increases the standard deviation of own type prices. And adding the first competitor of the other type also increases the standard deviation of own type prices. For instance, going from a market structure of (2,0) to (3,0) increases the standard deviation of the big three's prices 0.012, and going from a market structure of (2,0) to (2,1) increases the standard deviation of the big three's prices 0.046. The total effect of competitors of the other type is declining as we move from one to two to three for the big three and as we move from two to three for other bookstores. Thus, the marginal effect of another competitor is to lower the standard deviation. So at some point, as predicted, more competition does lead to lower standard deviation.

Firm Level Strategies

Thus far we have restricted discussion to aggregate patterns. In this section we turn to firm level pricing strategies. One approach would be to compute average prices for the stores in Table 3 by book category, but as Table 3 indicates, there is huge variability in what stores carry. To control for this problem, we ran regressions on normalized price by category using both store and book fixed effects. The coefficients on the store dummies for each category of book are presented in Table 8.

Based on selection and prices, we divided the stores in Table 8 into six types.[16] The six types are: i) the big three bookstores, ii) other full-line stores that offer low prices on New York Times bestsellers, iii) full-line stores that offer average prices on New York Times bestsellers, iv) full-line stores that charge close to full price for most books, v) stores with limited selection and very low prices, and vi) specialty bookstores. The first two types of stores are very similar in that they offer wide selection and low prices on New York Times bestsellers. Given the similarity of the second type's pricing policy to the big three's pricing policy, the second type is probably the part of the competitive fringe that is disciplining the pricing behavior of the big three. The third type also offers wide selection but offers less competitive prices on of current and former New York Times bestsellers. The fourth type is usually a physical store that sells books at full price and seems to be using the web as a form of advertising. The fifth type is a specialty store that specializes in remaindered books.[17] The sixth type is a store that specializes in one or more categories of books. Examples include Brian's Books and Bookpool that

[16] This categorization is not unique in the sense that one could have finer or less fine categorization, but it helps structure the analysis.
[17] The sale of remaindered books is discussed in more detail below.

specialize in computer books, Christianbooks that specializes in Christian books, and Cherry Valley that specializes in children's books.

Because of Amazon's dominant status in the online book industry, its prices tend to act as a focal point. Table 9 compares each store's prices with Amazon's prices to determine the frequency with which that store's prices are above, below, or equal to Amazon's.[18] Overall, only 14 percent of book prices are the same as Amazon's, with 43 percent above Amazon's price and 43 percent below. Expanding the definition of equal to include prices that are within one percent of Amazon's expands this number to 21 percent and within $0.10 expands it to 47 percent. Given that roughly two-thirds of the increase is coming from prices that were lower than Amazon's prices, it suggests that firms are marginally undercutting Amazon's price. This strategy ensures better placement if prospective customers search for prices either manually or using comparison-shopping engines.

The comparison in Table 9 highlights just how similar the strategies are for firms in the first type. The fraction of prices that are within $0.10 of Amazon's prices ranges from a low of 70 percent for Buy.com to a high of 100 percent for Bookbuyer's Outlet. The results also suggest that despite their more limited discounts on New York Times bestsellers, some stores in the second type, notably Books.com and to a lesser extent BCY Book Loft, Fatbrain, and Kingbooks have similar prices to Amazon's for many titles. Not surprisingly the third group almost always is the same price or more expensive than Amazon. The fourth group carries very few titles but is usually cheaper than Amazon. The fifth group is more of a mixed bag. Most sites have fewer than 1,000 observations, reflecting their specialty status. For the somewhat broader range of titles they carry, Alldirect and Bookpool are cheaper on average than Amazon and Page1book is more expensive than Amazon. The correlations presented in Table 10 tell a similar story.

Given the strategies documented in Tables 8-10, the question is how these strategies play out in the market.   Based on their prices, the fourth type of stores (wide selection, full price) seem to be using their websites primarily as a form of advertising. Andy Ross of Cody's Books confirmed that his site offered customers a way to check whether books were in stock at the physical store. If the person can not come to the store, books can be delivered in the San Francisco Bay Area, usually the next business day, via U.S. Mail. Computerlibrary, Powells, and Wordsworth are all physical stores that happen to have websites as well.   The two internet-only stores in this group, Booksnow and Classbook do sell a wide selection of books, but seem to do so as an adjunct to their main line of business. For Booksnow (now ClickSmart), this is offering "services to magazines and Internet content web sites that want to outsource the sale of products, targeted to their readers' interests, that are mentioned in their print or electronic publications."[19] For Classbook, its main line of business is textbooks.

The fifth type seems to be attracting traffic through low prices. John Vogus of Allbooks4less indicated that selling remaindered book was a viable business. Most books are sold individually and can be returned to the publisher if they do not sell. In contrast, remaindered books are sold by the pallet in mixed bundles and cannot be returned. Given their low wholesale cost, stores in this category can afford to offer

[18] Thanks to Mike Smith for suggesting this measure to us.
[19] http://www.clicksmart.com/csinsert1.html

customers discounts of 40-60 percent off of the publisher's recommended price and still make a profit.

The sixth type represents a mix of strategies, some differentiation, some low prices, and some advertising. Alldirect and Bookpool are internet-only stores that specialize in low prices for the books they stock. Books4mom and Cherryvalleybooks are no longer operational. (Cherryvalleybooks was the website for the physical children's bookstore of the same name.) Brian's books is internet-only and specializes in computer books. It is a division of Davidson Computer Services and therefore may be an advertising or promotional tool. Christianbook began as a catalog book and now sells a wide selection of Christian products. It seems to be an example of successful differentiation. Hamiltonbook originated as and continues to be affiliated with a book catalog company of the same name. This too may be a source of differentiation. Page1book is the website of a physical store and seems to be primarily a means for the store to advertise.

The second group offers wide selection at low prices. Booksamillion.com is familiar names because of their physical stores. Buy.com and Bookbuyers Outlet are both parts of larger internet-only stores that specialize in selling a variety of merchandise including books, music, videos, computer hardware, and computer software at low prices. In early 1999 Buy.com adopted a model that involved selling at wholesale and make revenue through advertising. Recent Securities and Exchange Commission filings indicate that Buy.com has moved away from this business model towards a model in which it makes positive margins on the merchandise that it sells. Despite having sold $200 million worth of merchandise in the quarter ended September 2000, Buy.com's stock price recently hit an all time low, and it along with many other .coms may be at risk. Shopping.com has transformed from a bookstore into a shopbot.

The puzzle then is how the third type of firms is attracting and retaining customers. 1Bookstreet is a division of Soda Creek press. Although it does not have exceptionally low unit prices, it offers free shipping on all orders. In contrast, nearly all other booksellers charge $3.00-$5.00 to ship the first book and $0.90-$1.00 for each additional book. Alphacraze, A1 Books, and BCY Book Loft all seem to be following a strategy of being slightly cheaper than Amazon for most books. They are not, however, cheaper on average than Buy.com. All three appear to be internet-only stores, and two of the three explicitly identify their advantage as low prices. For instance A1 Books states, "We have the best prices, compared to any major online bookstore, on over 500,000 titles." [20] Alphacraze focuses on "price, selection, and service."[21] BCY Book Loft carries a wide range of discounted items beyond books. Books.com was purchased by BarnesandNoble.com in the fall of 1999. Fatbrain is the online site for two physical stores that specialize in computer books. So although it has prices that are generally similar to Amazon's, it primarily serves individuals who are buying computer books or accessing its information exchange software. Kingbooks appears to have gone out of business. And Varsitybooks, as the name suggests, specializes in textbooks. So other than Kingbooks which has already failed, we would predict that the sites most at risk are those offering marginally lower prices and little else to differentiate their products – Alphacraze, A1 Books, and BCY Book Loft.

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[20] http://www.a1books.com
[21] http://www.alphacraze.com/shop/customercare3.asp?tab=1&acd=6BW5TMLRP3S92KX400J74RCQ8ST0FSUD&tabnew=1#About us

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Table 1: Summary Statistics

	NYT Bestseller	Former NYT Bestseller	Computer Bestseller	Former Computer Bestseller	Random Book
# of observations	25,681	28,342	26,870	16,661	63,879
Number of books	136	122	82	69	181
Average weeks on list	15.0	NA	15.6	NA	NA
Percent hardcover	52.9%	52.5%	18.3%	20.3%	66.9%
Percent fiction	56.6%	58.2%	0.0%	0.0%	24.3%
Prices					
Publisher's rec. price	$17.28	$17.97	$43.08	$51.55	$37.92
Unit price	$11.83	$13.48	$33.57	$40.23	$34.39
Normalized price	0.69	0.76	0.78	0.79	0.86
Wholesale price	$8.25	$9.43	$21.84	$28.85	$24.66
Normalized wholesale price	0.50	0.52	0.49	0.50	0.60
Normalized margin	0.19	0.24	0.29	0.29	0.26
Price Dispersion					
St. dev. of unit price	$6.63	$7.31	$17.31	$31.09	$31.08
Diff. min and max price	$7.62	$6.06	$12.90	$14.12	$8.23
St. dev. as % of avg. price	27.7%	17.8%	15.6%	14.0%	12.9%
Diff. as % of avg. price	65.2%	42.8%	38.6%	35.7%	31.9%
Percent savings from not using Amazon	9.8%	24.7%	17.6%	21.2%	22.6%

Notes: The unit of observation is the price of a given book in a given store in a given week. Publisher's recommended price is the suggested retail price listed in Books in Print. Unit price is the price offered by a retailer on either its website or a shopbot that lists prices for several bookstores. Wholesale price is based on published terms that are quoted to the trade bookstores. Wholesale prices include estimated cost of shipping and include best possible discounts from publishers including any discounts for returnable books. Normalized price is unit price divided by the publishers recommended retail price. Normalized wholesale price is the wholesale price divided by the publisher's recommended retail price. Normalized margin is calculated as unit price minus wholesale price divided by publisher's recommended price. St. dev. is standard deviation and was computed by book for unit price and as a percentage of the mean price for that book and then averaged across books. Diff. min and max price is the difference between the minimum and maximum prices for a book and was computed by book using unit price and as a percentage of the mean price for that book and then averaged across books. Percent savings from not using Amazon represents the average percentage difference in unit price between Amazon and the lowest priced seller of a specific book in a specific week.

Table 2: Fixed-Effects Regression of Price on Book and Sample Characteristics

	Dependent Variable		
Independent Variables	Unit price	Normalized price	Normalized margin
Constant	2.14***	0.86***	0.25***
	(0.081)	(0.001)	(0.001)
Publisher's rec. price	0.89***		
	(0.001)		
NYT bestseller	-5.07***	-0.17***	-0.09***
	(0.057)	(0.001)	(0.001)
Former NYT bestseller	-7.17***	-0.11***	0.00***
	(0.058)	(0.001)	(0.001)
Computer bestseller	-3.25***	-0.09***	-0.03***
	(0.053)	(0.001)	(0.001)
Former computer bestseller	-7.75***	-0.09***	0.00***
	(0.066)	(0.001)	(0.001)
Hardcover	-1.63***	-0.02***	-0.03***
	(0.038)	(0.001)	(0.001)
Fiction	-1.98***	-0.06***	-0.01***
	(0.043)	(0.001)	(0.001)
Week 9 bestseller	0.69***	0.00**	0.00**
	(0.049)	(0.001)	(0.001)
Week 17 bestseller	1.02***	0.01***	0.01***
	(0.062)	(0.001)	(0.002)
Store fixed effects	Yes	Yes	Yes
Number observations	161,433	161,433	135,257
R-squared	0.933	0.455	0.420

Notes: Unit price is the price offered by a retailer on either its website or a shopbot that lists prices for several bookstores. Normalized price is unit price divided by the publishers recommended retail price. Normalized margin is calculated as unit price minus wholesale price divided by publisher's recommended price. Weekly observations for unit price, normalized price, and normalized margin are used. NYT Week 9 bestseller and Week 17 bestseller are dummy variables for books that enter the sample on the bestseller lists that become available on the 9^{th} and 17^{th} weeks of the sample, respectively. All regressions were estimated with store fixed effects. The omitted dummy variables are random books, paperback, and nonfiction. * = coefficient is significant at the 10 percent level, ** = coefficient is significant at the 5 percent level, *** = coefficient is significant at the 1 percent level.

Table 3: Percentage Availability of Books by Bookstore and Category of Book

Store	NYT Bestseller	Former NYT Bestseller	Computer Bestseller	Former Computer Bestseller	Random Book
			Percentage		
1000’s of Discount Books	0	0	0	0	1
1Bookstreet	99	98	97	96	73
A1 Books	99	97	95	98	75
Allbooks4less	6	1	0	0	2
Alldirect	41	38	25	26	29
Alphacraze	90	89	89	94	64
Amazon	99	98	98	98	84
BarnesandNoble.com	100	100	100	100	86
BCY Book Loft	90	90	74	57	39
Bookbuyer’s Outlet	58	40	62	38	52
Bookcloseouts	5	1	1	0	0
Bookpool	0	0	87	91	10
Books.com*	38	21	43	23	43
Books4mom	1	1	0	0	0
Booksamillion	92	93	93	96	75
Booksnow	54	44	61	44	55
Borders.com	99	98	98	98	87
Brian’s Books	0	0	34	15	7
Buy.com	98	94	94	97	75
Cherryvalleybooks	8	2	0	0	4
Christianbook	2	2	0	0	1
Classbook	36	23	60	44	51
Codys books	92	80	93	91	34
Computerlibrary	76	73	82	65	33
Fatbrain	90	97	97	99	79
Hamiltonbook	11	14	0	2	8
Kingbooks	99	96	95	97	76
Page1book	41	38	24	24	30
Powells	98	98	95	93	45
Shopping.com	93	88	93	87	74
Varsitybooks	63	55	59	66	58
Wordsworth	53	58	54	50	44

Notes: All of the above are .com sites. The .com has been removed unless there is significant potential for confusion with the physical site such as Borders.com and BarnesandNoble.com or the .com is an integral part of the name as in Books.com, Buy.com, and Shopping.com. Percentage availability is the number of sample ISBN’s with prices reported by a bookstore in a week divided by the total possible number of sample ISBN’s for the same week, averaged across all the weeks in the sample. Books.com was purchased by BarnesandNoble.com in the fall of 1999, so it dropped out of the sample part way through the period.

Table 4: Normalized Price Regression for Two Types of Bookstores

Variable	Big Three	Other Bookstores
Constant	1.056***	1.044***
	(0.009)	(0.011)
Effects of Competitors		
First same type	-0.052***	-0.056***
	(0.008)	(0.012)
Second same type	-0.054***	-0.113***
	(0.008)	(0.010)
First other type	-0.049***	-0.057***
	(0.012)	(0.008)
Second other type	-0.040***	-0.058***
	(0.011)	(0.006)
Additional other type	-0.121***	-0.055***
	(0.009)	(0.006)
Control Variables		
NYT bestseller	-0.354***	-0.125***
	(0.002)	(0.002)
Former NYT bestseller	-0.129***	-0.091***
	(0.002)	(0.001)
Computer bestseller	-0.135***	-0.067***
	(0.002)	(0.001)
Former computer bestseller	-0.104***	-0.084***
	(0.003)	(0.002)
Hardcover	-0.028***	-0.021***
	(0.002)	(0.001)
Fiction	-0.067***	-0.046***
	(0.002)	(0.001)
Week	0.001***	0.000***
	(0.000)	(0.000)
Number observations	28,199	133,234
R-squared	0.551	0.093

Notes: The dependent variable is the mean normalized price of a given book in a given week. Normalized price is unit price divided by the publishers recommended retail price. Unit price is the price offered by a retailer on either its website or a shopbot that lists prices for several bookstores. Weekly observations for unit price and normalized price are used. The big three are Amazon, Barnes and Noble, and Borders. The same type variable for the big three and the other type variable for other bookstores refer to the addition of a store from this set. Other bookstores refers to the other 29 stores in our data set. Thus the first of same type variable for other bookstores refers to the addition of one store from this set. The second of same type variable refers to the addition of any number of stores greater than one. Similarly, the first (second) of other type variable for the big three refers to the addition of one (two) store (s) from this set. The additional other type variable for the big three refers to the addition of more than two stores from this set. NYT Week 9 bestseller and Week 17 bestseller are dummy variables for books that enter the sample on the bestseller lists that become available on the 9^{th} and 17^{th} weeks of the sample, respectively. * = coefficient is significant at the 10 percent level, ** = coefficient is significant at the 5 percent level, *** = coefficient is significant at the 1 percent level.

Table 5: Regression of Standard Deviation of Price on Book and Sample Characteristics

Variable	SD of unit price	SD of normalized price
Constant	-0.11*	0.10***
	(0.066)	(0.001)
Publisher's rec. price	0.09***	
	(0.001)	
NYT bestseller	1.53***	0.08***
	(0.097)	(0.002)
Former NYT bestseller	1.18***	0.01***
	(0.100)	(0.002)
Computer bestseller	0.63***	0.02***
	(0.084)	(0.001)
Former computer bestseller	0.91***	0.01***
	(0.107)	(0.002)
Hardcover	0.50***	0.00***
	(0.059)	(0.001)
Fiction	0.10	0.01***
	(0.067)	(0.001)
Week 9 bestseller	-0.13	0.00
	(0.085)	(0.001)
Week 17 bestseller	-0.01	0.00
	(0.106)	(0.002)
Number observations	8,544	8,544
R-squared	0.613	0.294

Notes: Unit price is the price offered by a retailer on either its website or a shopbot that lists prices for several bookstores. Normalized price is unit price divided by the publishers recommended retail price. Standard deviations are calculated for either unit price or normalized price of a given book in a given week. NYT Week 9 bestseller and Week 17 bestseller are dummy variables for books that enter the sample on the bestseller lists that become available on the 9th and 17th weeks of the sample, respectively. The omitted dummy variables are random books, paperback, and nonfiction. * = coefficient is significant at the 10 percent level, ** = coefficient is significant at the 5 percent level, *** = coefficient is significant at the 1 percent level.

Table 6: Standard Deviation of Normalized Price
as a Fraction of Average Normalized Price by Category

	Interstore Standard Deviation	Intertemporal Standard Deviation	Intracategory Standard Deviation
New York Times bestseller	0.277	0.025	0.101
	(0.030)	(0.065)	(0.073)
Former NYT bestseller	0.178	0.045	0.117
	(0.044)	(0.073)	(0.035)
Computer bestseller	0.156	0.026	0.093
	(0.055)	(0.045)	(0.063)
Former computer bestseller	0.140	0.019	0.113
	(0.025)	(0.037)	(0.031)
Random books	0.129	0.027	0.159
	(0.067)	(0.053)	(0.084)

Notes: Normalized price is unit price divided by the publishers recommended retail price. Unit price is the price offered by a retailer on either its website or a shopbot that lists prices for several bookstores. Intertemporal standard deviation is the standard deviation of prices across time for a given book in a given store then averaged across all observations. Intracategory standard deviation is the standard deviation of prices across a book category (e.g. computer bestsellers) for a given store in a given week then averaged across all observations. Interstore standard deviations standard deviation of prices across stores for a given book in a given week then average across all observations. Average normalized prices are computed for the same groupings used to define intertemporal, intracategory, and interstore standard deviation. Standard deviations of standard deviations are given in parentheses.

Table 7: Standard Deviation Regression for Two Types of Bookstores

Variable	Big Three	Other Bookstores
Constant	0.058***	0.055***
	(0.012)	(0.007)
Effects of Competitors		
Third or greater competitor of the same type	0.012***	0.045***
	(0.003)	(0.006)
First competitor of the other type	0.046***	0.002
	(0.018)	(0.007)
Second competitor of the other type	0.028*	0.021***
	(0.016)	(0.006)
Third or greater competitor of the other type	-0.016	0.006***
	(0.012)	(0.006)
Control Variables		
NYT bestseller	-0.033***	0.071***
	(0.001)	(0.001)
Former NYT bestseller	-0.003	0.016***
	(0.002)	(0.001)
Computer bestseller	-0.006***	0.025***
	(0.002)	(0.001)
Former computer bestseller	-0.014***	0.007**
	(0.002)	(0.001)
Hardcover	-0.005***	0.007***
	(0.002)	(0.001)
Fiction	0.016***	0.007***
	(0.001)	(0.001)
Week	-0.000***	0.000*
	(0.000)	(0.000)
Number observations	8,156	8,358
R-squared	0.060	0.290

Notes: The dependent variable is the standard deviation of the normalized price of a given book in a given week. Normalized price is unit price divided by the publishers recommended retail price. Unit price is the price offered by a retailer on either its website or a shopbot that lists prices for several bookstores. Weekly observations for unit price and normalized price are used. The big three are Amazon, Barnes and Noble, and Borders. The same type variable for the big three and the other type variable for other bookstores refer to the addition of a store from this set. Other bookstores refers to the other 29 stores in our data set. Thus the first of same type variable for other bookstores refers to the addition of one store from this set. The second of same type variable refers to the addition of any number of stores greater than one. Similarly, the first (second) of other type variable for the big three refers to the addition of one (two) store (s) from this set. The additional other type variable for the big three refers to the addition of more than two stores from this set. NYT Week 9 bestseller and Week 17 bestseller are dummy variables for books that enter the sample on the bestseller lists that become available on the 9th and 17th weeks of the sample, respectively. * = coefficient is significant at the 10 percent level, ** = coefficient is significant at the 5 percent level, *** = coefficient is significant at the 1 percent level.

Table 8: Average Normalized Price by Store

Store	NYT Bestseller	Former NYT Bestseller	Computer Bestseller	Former Computer Bestseller	Random Book
			Normalized Price		
			Big Three		
Amazon	0.50	0.72	0.73	0.78	0.87
BarnesandNoble.com	0.50	0.70	0.79	0.80	0.85
Borders.com	0.50	0.69	0.77	0.79	0.83
			Wide Selection, Low NYT Prices		
Bookbuyer's Outlet	0.50	0.72	0.71	0.76	0.86
Booksamillion	0.51	0.63	0.76	0.77	0.83
Buy.com	0.47	0.61	0.71	0.71	0.76
Shopping.com	0.54	0.66	0.72	0.74	0.82
			Wide Selection, Average NYT Prices		
1Bookstreet	0.68	0.82	0.87	0.89	0.94
A1 Books	0.71	0.71	0.71	0.74	0.81
Alphacraze	0.64	0.68	0.67	0.69	0.78
BCY Book Loft	0.73	0.72	0.76	0.77	0.81
Books.com	0.67	0.72	0.78	0.79	0.85
Fatbrain	0.67	0.71	0.74	0.76	0.85
Kingbooks	0.74	0.74	0.73	0.74	0.84
Varsitybooks	0.74	0.75	0.7	0.72	0.8
			Wide Selection, Close to Full Prices		
Booksnow	0.89	0.89	0.88	0.86	0.92
Classbook	0.97	0.97	0.97	0.93	0.9
Codys books	1.00	1.01	0.97	0.97	1.07
Computerlibrary	1.00	0.99	0.96	0.99	1.07
Powells	0.92	0.90	0.91	0.92	0.93
Wordsworth	0.82	0.85	0.89	0.9	0.95
			Limited Selection, Low Prices		
1000's of Discount Books					0.63
Allbooks4less	0.43	0.55			0.43
Bookcloseouts	0.47	0.42	0.47		
			Limited Selection, Average to Full Prices		
Alldirect	0.62	0.64	0.61	0.64	0.75
Bookpool			0.63	0.64	0.71
Books4mom	0.63	0.64			0.76
Brian's Books			0.81	0.82	0.82
Cherryvalleybooks	0.89	0.92			0.89
Christianbook	0.73	0.74			0.74
Hamiltonbook	0.66	0.69		0.75	0.63
Page1book	0.99	1.00	0.97	0.96	0.99

Notes: Average prices are the regression coefficients from the regression of normalized prices on store dummies with book fixed-effects. Normalized price is unit price divided by the publishers recommended retail price. Unit price is the price offered by a retailer on either its website or a shopbot that lists prices for several bookstores.

Table 9: Price Comparisons with Amazon

	Obs.	Equal: Equal	Equal: Above	Equal: Below	Within 1%: Equal	Within 1%: Above	Within 1%: Below	Within \$0.10: Equal	Within \$0.10: Above	Within \$0.10: Below
Big Three										
BarnesandNoble.com	3,907	55%	14%	32%	77%	11%	11%	87%	7%	6%
Borders.com	3,953	73%	12%	15%	75%	10%	15%	85%	6%	9%
Wide Selection, Low NYT Prices										
Bookbuyer's Outlet	1,488	95%	3%	2%	95%	3%	2%	100%	0%	0%
Booksamillion	3,492	54%	10%	36%	65%	10%	25%	76%	7%	18%
Buy.com	3,650	3%	7%	90%	13%	7%	80%	70%	4%	26%
Shopping.com	3,329	41%	12%	47%	52%	12%	36%	74%	8%	17%
Wide Selection, Average NYT Prices										
1Bookstreet	3,739	3%	89%	8%	4%	88%	8%	24%	70%	6%
A1Books	3,833	3%	32%	65%	6%	32%	63%	58%	27%	15%
Alphacraze	3,397	4%	27%	69%	4%	27%	69%	48%	18%	34%
BCYBookLoft	2,778	7%	36%	56%	7%	36%	56%	67%	32%	2%
Books.com	1,005	0%	34%	66%	59%	34%	8%	78%	18%	4%
Fatbrain	3,667	24%	26%	50%	57%	26%	18%	65%	23%	12%
Kingbooks	3,756	0%	52%	48%	1%	52%	47%	64%	29%	7%
Varsitybooks	2,309	5%	48%	47%	5%	48%	47%	48%	28%	24%
Wide Selection, Close to Full Prices										
Booksnow	1,398	1%	85%	14%	1%	85%	14%	26%	67%	7%
Classbook	1,427	0%	71%	29%	1%	71%	28%	22%	69%	8%
Codysbooks	3,043	4%	96%	1%	4%	96%	1%	5%	95%	0%
Computerlibrary	2,047	1%	98%	0%	1%	98%	0%	4%	96%	0%
Powells	3,197	3%	86%	12%	6%	85%	9%	25%	72%	3%
Wordsworth	1,911	12%	83%	5%	12%	83%	4%	24%	74%	2%
Limited Selection, Low Prices										
1000'sofDiscountBooks	18	0%	0%	100%	0%	0%	100%	17%	0%	83%
Allbooks4less	93	0%	11%	89%	0%	11%	89%	27%	5%	68%
Bookcloseouts	28	0%	50%	50%	0%	50%	50%	57%	4%	39%
Limited Selection, Average to Full Prices										
Alldirect	1,696	0%	27%	72%	2%	27%	71%	19%	19%	62%
Bookpool	1,157	0%	8%	92%	2%	8%	90%	24%	0%	76%
Books4mom	29	0%	48%	52%	0%	48%	52%	59%	17%	24%
Brian'sBooks	214	0%	49%	51%	2%	49%	49%	57%	34%	10%
Cherryvalleybooks	129	4%	73%	23%	4%	73%	23%	19%	67%	14%
Christianbook	25	4%	40%	56%	48%	40%	12%	56%	36%	8%
Hamiltonbook	297	21%	32%	47%	44%	32%	24%	49%	28%	22%
Page1book	1,667	7%	84%	9%	8%	83%	9%	14%	81%	5%
Average		14%	43%	43%	21%	43%	36%	47%	34%	20%

Notes: Observations include only the unit prices that Amazon and the competitor list on the same day. Unit price is the price offered by a retailer on either its website or a shopbot that lists prices for several bookstores. Price comparisons within 1% are measured as 1% of Amazon's listed price for a specific ISBN on a specific day. Price comparisons within \$0.10 include those prices within \$0.10 of Amazon's listed price for a specific ISBN on a specific day.

Table10: Individual Price Correlations between Amazon and Competing Online Booksellers

Store	Overall	NYT Bestseller	Former NYT Bestseller	Computer Bestseller	Former Computer Bestseller	Random Book
			Big Three			
BarnesandNoble.com	0.88	0.56	0.71	0.55	0.85	0.88
Borders.com	0.85	0.49	0.57	0.57	0.67	0.83
			Wide Selection, Low NYT Prices			
Bookbuyer’sOutlet	0.98	0.79	1.00	0.98	1.00	1.00
Booksamillion	0.82	0.45	0.33	0.42	0.47	0.89
Buy.com	0.81	0.42	0.32	0.55	0.53	0.85
Shopping.com	0.78	0.12	0.23	0.53	0.62	0.83
			Wide Selection, Average NYT Prices			
1Bookstreet	0.78	0.18	0.44	0.50	0.68	0.80
A1Books	0.70	0.33	0.45	0.52	0.63	0.81
Alphacraze	0.65	0.17	0.44	0.33	0.77	0.74
BCY Book Loft	0.38	0.54	0.52	0.58	0.72	0.34
Books.com	0.84	0.38	0.48	0.55	0.86	0.87
Fatbrain	0.68	0.18	0.30	0.67	0.68	0.76
Kingbooks	0.66	0.62	0.17	0.40	0.75	0.75
Varsitybooks	0.44	0.47	-0.10	0.20	0.60	0.58
			Wide Selection, Close to Full Prices			
Booksnow	0.24	0.24	0.02	0.14	0.16	0.30
Classbook	-0.10	0.65	0.42	0.47	0.53	-0.27
Codysbooks	0.15	0.74	0.21	0.54	0.43	0.17
Computerlibrary	0.14	0.80	0.14	0.49	0.40	0.11
Powells	0.02	0.12	0.27	0.27	0.40	-0.05
Wordsworth	0.57	0.32	0.41	0.45	0.62	0.62
			Limited Selection, Low Prices			
1000’sofDiscountBooks	0.30					0.20
Allbooks4less	-0.39	-0.42	0.09			0.27
Bookcloseouts	0.08	0.73	0.64			-0.76
			Limited Selection, Average to Full Prices			
Alldirect	0.73	0.38	0.55	0.63	0.91	0.77
Bookpool	0.72			0.57	0.63	0.35
Books4mom	-0.34	0.50	0.18			-0.64
Brian’sBooks	0.73			0.74	0.87	0.46
Cherryvalleybooks	0.38	-0.32	0.88			0.38
Christianbook	-0.02	0.54	-0.62			0.52
Hamiltonbook	-0.05	-0.65	-0.23			-0.04
Page1book	0.12	0.48	0.16	0.67	0.36	0.14

Notes: Correlations are individual correlations of unit prices between Amazon and a retailer listed for the identical ISBN’s on the same day. Unit price is the price offered by a retailer on either its website or a shopbot that lists prices for several bookstores.

Figure 1. Average Normalized Price by Book Category

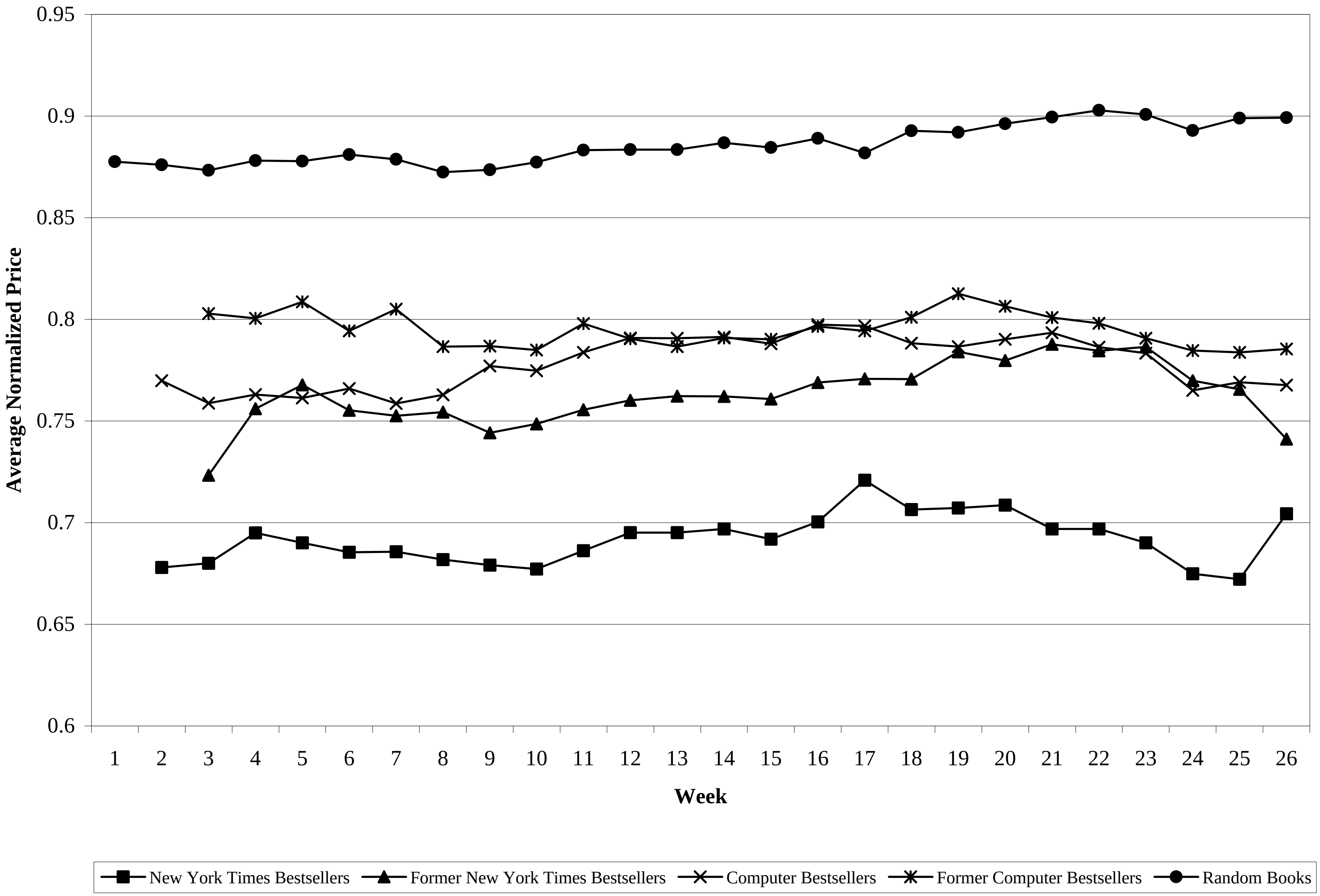

Figure 2. Average Standard Deviation of Normalized Prices by Category