

Unclassified

DSTI/ICCP/IE(98)4



Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

OLIS : 21-Jan-1998
Dist. : 22-Jan-1998

PARIS

Or. Eng.

**DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INDUSTRY
COMMITTEE FOR INFORMATION, COMPUTER AND COMMUNICATIONS POLICY**

DSTI/ICCP/IE(98)4
Unclassified

Cancels & replaces the same document:
sent on OLIS 19-Jan-1997

Working Party on the Information Economy

ELECTRONIC COMMERCE: PRICES AND CONSUMER ISSUES FOR THREE PRODUCTS: BOOKS, COMPACT DISCS, AND SOFTWARE

This document is a follow-up to the work on the intermediation and electronic commerce conducted by a consultant, Mr. Joseph P. Bailey, in 1997. The Working Party is invited to discuss the report.

60979

Document complet disponible sur OLIS dans son format d'origine
Complete document available on OLIS in its original format

Or. Eng.

TABLE OF CONTENTS

MAIN POINTS 3

 Introduction 5

 Electronic markets versus physical markets 6

 The role and effect of intermediation 9

 Conclusions and policy implications 10

APPENDIX 1. AMAZON.COM AND BARNES & NOBLE: A CASE STUDY 12

APPENDIX 2. RESEARCH METHODOLOGY 17

REFERENCES 20

NOTES 22

Tables

Table 1. Market differences 6

Table 2. Relative prices discounts: Internet and physical retailer 7

Table 3. Price discount variance: Internet and physical retailers 8

Table 4. Price changes by Internet and physical retailers 8

Table 5. Price changes in Internet markets 10

Table 6. Competition between Amazon.com and Barnes & Noble, 1997 13

Table 7. Changes in prices by Internet retail booksellers 14

Table 8. Price differences at Amazon.com and Barnes & Noble 15

Table 9. Goldman Sachs' Wal-Mart pricing study: On-line versus off-line 18

Figures

Figure 1. Price change for a market basket of 125 books 16

Figure 2. Data collection methodology 17

MAIN POINTS

1. Rapid technological advances in information and communication technologies and their widespread diffusion have led some to speculate about “frictionless” economies where transaction costs are nearly zero, barriers to entry and contestability disappear and markets clear instantly. This environment will give consumers new power as they search for the lowest price for a product from suppliers across the world and will generate downward pressure on prices that some believe will lead to general price deflation. This paper attempts to begin an analysis of these claims by looking at prices and their movement for three of the most popular products being purchased in the business-to-consumer segment of electronic commerce: books, music compact discs (CDs) and software. It does so by examining nearly 24,000 data points during February and March 1997 for Internet and physical retailers.

2. Although only covering a few products and a limited period of time, the preliminary results from this analysis suggest that:

- the empirical evidence does not support the conclusion that prices for books, CDs and are lower when purchased from Internet retailers rather than from physical retailers.;
- the evidence does not show a lower spread (variance) of prices for Internet retailers than physical retailers;
- lastly, Internet retailers often change prices more often than physical retailers especially in the software market; this may be explained by the existence of intelligent agents that perform a useful intermediary service of searching for specific software and the lowest price for that software.

3. Three implications for policy can be drawn from these observations, even though causality has not been statistically established:

- the much heralded shift in market power from producer to the consumer that many associate with electronic commerce may be premature, overstated or incorrect. Although in some areas, electronic commerce is likely to benefit the consumer as he benefits from greater competition and possibly reduced search costs, other qualities of electronic commerce such as an ability to more finely segment markets may benefit the producer. This conclusion is drawn from the fact that lower prices are not observed even though Internet retailers purportedly have lower costs. This observation may be a market anomaly, but it does call into question the assumption that Internet commerce will lead to lower consumer prices in all markets;

- this segmentation of the market also suggests that an increasing array of products may be marketed in a manner where different prices are charged to different people and may explain some of the findings explored in this paper. While this practice is accepted for some products such as airline seats and automobiles, a wider application of this practice to other products may raise issues of fairness and the need to protect consumers;
- one method for instilling more price competition among merchants may be the existence of an intelligent agent that acts as an intermediary in helping the consumer find the product she want at the lowest price and may explain why there appears to be a higher level of price competition in the software market relative to the book and CDs markets. The ability of some e-commerce merchants to block the use of these intermediaries at their sites raises questions about consumer protection for electronic commerce shoppers.

Introduction

4. Rapid technological advances in information and communication technologies and their widespread diffusion have led to speculation about “frictionless” economies where transaction costs are nearly zero, barriers to entry and contestability disappear, and markets clear instantly (Gates, 1996). Some think that electronic commerce, with producers selling directly to consumers over computer networks such as the Internet, will eliminate existing intermediaries (“disintermediation”). Because it is easy to set up an e-shop, competition will force merchants to pass these lower costs on to consumers as lower prices. In addition, consumers will be able to search among thousands of merchants for the lowest prices, thereby increasing the downward pressure on prices and leading to a shift in market power from producer to consumer (Hagel, 1996). Indeed, some believe that electronic commerce will not only check inflation but will have a deflationary impact (Yardini, 1996; Crane, 1997).

5. Because electronic commerce is still at a very early stage of development, much of this thinking is based on speculation or anecdotal evidence. This paper begins to analyse these claims by looking at prices and their movement for three of the most popular items in the business-to-consumer segment of electronic commerce: books, music compact discs (CDs), and software. (Morgan Stanley, 1997). It examined nearly 24 000 data points for February and March 1997 (for a description of the data and methodology, see Appendix 2.)

Price competition among Internet retailers of books, music CDs and software

6. In an industry experiencing double-digit annual growth, there is bound to be creativity and experimentation with business strategy. As Internet commerce will be experiencing triple-digit annual growth over the near term, there is likely to be a great deal of both. Owing to low fixed costs for entering the market, there are many new entries, and one recent survey predicts that by 1999, 39 per cent of all US retailers plan to sell over the Internet.¹ Likewise, a survey of the 100 largest UK firms found that most of their business managers intended to launch at least a pilot project by 1998 (Clark, 1997). It is obviously impossible to explore or determine the strategies of all such companies. This paper therefore examines a subset of 48 firms with innovative ideas which seek to become market leaders in three categories that are widely considered the current best sellers: books, compact discs, and software (OECD, 1997; Goldman Sachs, 1997). A recent report rating the top-50 Web shopping sites based on February 1997 usage found as the top five sites: 1) shareware.com (software); 2) download.com (software); 3) columbiahouse.com (music and video); 4) Amazon.com (books); and 5) hotfiles.com (software) (Morgan Stanley, 1997). Thus, this analysis focuses on the leading products being sold by electronic commerce.

7. The present analysis is based on nearly 24 000 price observations collected in February and March 1997 in the United States (5 058 for books, 5 672 for CDs and 13 031 for software). The findings make it possible to characterise Internet competition, to offer insight into price competition among Internet retailers, and to study the ability of intermediaries to affect price. Two of the most visible on-line book retailers are examined separately as a case study (Appendix 1) of the impact that the entry of a retailer with a significant presence in the physical marketplace (Barnes & Noble) has had on the prices of an established (and what many observers believe to be the most adept) on-line merchant (Amazon.com).

8. While the markets for these three products are somewhat similar, they differ because of product characteristics and market structure. Product characteristics affect the degree of price competition for that product. Books, CDs, and software have different levels of standardisation, product differentiation, and asset specificity (Table 1). Because different editions of books (e.g. hardcover, paperback, audio, large print) have different ISBN numbers, books are highly standardised. CDs have a standard artist/title/media combination (e.g. Dave Matthew's Band/Crash/Compact Disc) but still may vary. The CD format is the *de facto* standard and audio cassettes and vinyl records are released simultaneously with the CD, but the product can also be differentiated further (explicit language or clean version, for example). Software is the most differentiated and requires the greatest amount of specification to distinguish among products, since new versions rapidly replace existing ones, a product is available through different media (CD-ROM, floppy diskette, and electronic distribution), there are differences in software support (manuals and telephone customer support), and products have different capabilities (e.g. some Windows NT servers support 20 users while others support 40). The term "asset specificity" is used in economics to describe the degree to which a product is targeted to certain customers. If asset specificity is low, the product has broad appeal. If it is high, the product is of far narrower interest. In other words, asset specificity is the degree to which a product is manufactured for a particular customer or group of customers. Books, compact disks and software sold through retail channels have low asset specificity.

Table 1. Market differences

Market	Standardisation	Product differentiation	Asset specificity
Books	High	Medium	Low
Compact discs	Medium	Low	Low
Software	Low	High	Low

Source: Bailey (forthcoming).

Electronic markets versus physical markets

9. The shift from physical to electronic markets raises a number of questions. Is it cheaper to buy something on the Web than from a local store? Will competitive pressures be greater for Internet retailers? What effect will Internet market prices have on the prices in physical stores?

10. Prices of retailers that use the Internet as their main means of commerce ("Internet retailers") and those that have a physical presence ("physical retailers") are compared. An Internet retailer has a Web site which allows customers to browse, price items of interest, and order. A physical retailer has a "bricks and mortar" retail location and/or a printed catalogue which allows customers to browse and make purchases. While physical retailers may have an Internet presence, their purpose is doing so is to promote sales via its other channels. Therefore, prices in retail stores often correspond to those posted on the Internet. The value in each cell of Table 2 is the price discount of both Internet and physical retailers relative to the average price. For example, if an Internet retailer sold a CD for \$15 and the same item could be bought in stores for \$10, then the relative price discount for Internet retailers would be \$15

divided by the average price (\$12.50) minus one or 0.20 per cent. The relative price discount for the physical retailer would be \$10 divided by \$12.50 minus one or -0.20 per cent. A negative value indicates the percentage savings compared to the average price; a positive value indicates higher than average prices expressed as a percentage of the average price. The lower the number, the greater the savings. It is important to note that relative discounts are calculated for the same title sold by Internet and physical retailers and then averaged over all titles. In this way, the prices are normalised to the average price of the title; thus, the magnitude of the price will not affect the relative discounts.

11. As Table 2 shows, for all three observed markets (books, CDs, and software) the Internet retail price is actually *higher* than the price in physical stores. The absolute difference represents the distance between the average Internet retailer prices and the average physical retailer prices; the distance is largest for CDs and smallest for software. These comparisons do not take account of taxes or shipping costs. While these additional costs may be significant, the taxes² should theoretically be the same for either channel and shipping costs would only *increase* the cost of Internet retailing over physical retailing. A recent study by Goldman Sachs of the prices of a market basket of 30 products bought on-line from Wal-mart in the United States and the purchase of the same market basket in a Wal-mart off-line store. The study indicated that the on-line price was 1 per cent higher than the off-line price before shipping and was 9 per cent higher after factoring in shipping costs (Appendix 3).

Table 2. Relative price discounts: Internet and physical retailer

Market	Percentage		
	Internet retailers	Physical retailers	Absolute difference
Books	0.6	-3.4	4.0
Compact discs	1.9	-10.8	12.7
Software	1.6	-0.3	1.9

Source: Bailey (forthcoming).

12. Another measure of the difference in prices between the two environments is the variance or “spread” of the two sets of prices around this average. Are prices distributed in a tight cluster around the average? Is there a wide dispersion with some high and low outliers? If all Internet retailers sold at the same price, price variance would be zero. In theory, of course, if electronic commerce moves the economy towards perfect competition as some suggest, the price variance would be zero. As Table 3 shows, there is some variance in the price data, and it is slightly higher for Internet than for physical retailers specialised in selling books and CDs. The same does not hold for the software market, where the variances are small and the differences between Internet and physical retailers have little statistical significance. However, they are not zero as they would be if they were pure commodities. The relative magnitudes of the variance across markets are of interest since they suggest that competition on the Internet does lead to price convergence. The apparent difference in the software market may be due to several factors: it may be the most “mature” Internet market category, it may have a technically sophisticated and more demanding set

of consumers, or it may have a more “successful” search intermediary than books and CDs. This last hypothesis will be examined in the following section on intermediation.

Table 3. Price discount variance: Internet and physical retailers

Market	Percentage	
	Internet retailers	Physical retailers
Books	0.8	0.7
Compact discs	0.3	0.2
Software	0.4	0.5

Source: Bailey (forthcoming).

13. Finally, price changes were tracked for each title in each store at weekly intervals over a five-week period in August and September 1996 and an eight-week period in February and March 1997 (Appendix 2). The frequency of price changes gives one indication of how Internet and physical retailers react to market changes. During the periods observed, Internet retailers changed prices twice as often as physical retailers (books: 7.81 per cent vs. 3.38 per cent, compact discs: 6.80 per cent vs. 2.98 per cent and software: 8.83 per cent vs. 3.28 per cent) (Table 4). This suggests that Internet-only retailers adjust prices more quickly in response to market changes.

Table 4. Price changes by Internet and physical retailers

August/September 1996 and February/March 1997

		Price changes	Observations	Percentage of prices that changed
Books	Physical	71	2 101	3.38
	Internet	233	2 984	7.81
Compact discs	Physical	21	704	2.98
	Internet	338	4 968	6.80
Software	Physical	20	610	3.28
	Internet	1 097	12 422	8.83

Source: Bailey (forthcoming).

14. Three conclusions for the CD, book and software markets can be drawn from the analysis:
- prices are not lower on the Internet than in physical stores;
 - there is a wider range of prices on the Internet than in physical stores;
 - Internet prices change more frequently than those in physical stores.

The role and effect of intermediation

15. In physical retailing of books, compact discs and software, as well as other products, there is a market chain from publisher to distributor to retailer and finally to consumer, with the distributor and retailer acting as intermediaries between the publisher and the customer. The distributor's role is to aggregate products in a central warehouse and sell them to retailers, who in turn sell them to their customers. In a fully disintermediated market, on the other hand, the customer would interact directly with the publisher. In the Internet world of electronic commerce, there is the additional possibility of a *search* intermediary (typically a software tool) to help customers filter information from many retailers. Such intermediaries act on customers' behalf to search the Internet for product and price information, which they obtain from retailers and pass on to their own customers.

16. Two examples of such search intermediaries in electronic commerce are UVision and Price Watch, both of which provide price and product information at a central site, so that customers need not identify places to shop and search through their Web sites (Crowston, 1996). UVision operates a Web site, Computer ESP, which posts price information on software and hardware from different retailers. UVision does not search out the information; it is the retailer's responsibility to give information to UVision. This helps the search intermediary/retailer relationship, since the information posted is information that the retailer wants to share. Also, there is a technical benefit, since it is UVision's server, not that of the retailer, which experiences the search load. While Computer ESP promotes price competition, customers do not necessarily choose the lowest price. Tonny Yu, UVision's president, explains that customers look for more than the lowest price when selecting a retailer. The company's reputation and familiarity often lead a customer to choose one retailer over another. In fact, Mr. Yu points out that a listing of many retailers with very small differences in price sends a message to customers that there is very little difference among the lowest prices. However, the lowest price is sometimes chosen, while the highest almost never is. Price Watch's operation is very similar to UVision's Computer ESP.

17. The effect of this intermediation is to increase price competition among retailers. Thus, one explanation of why software has a relatively low price variance is the existence of an effective search intermediary. While somewhat similar search intermediaries exist in the book and CD markets, many sites block these agents from searching their site, thereby severely limiting their usefulness. A study conducted in January 1997 in the United States found that one-third of the on-line CD merchants blocked access to their site by the intelligent shopping agent, BargainFinder (DeLong and Froomkin, 1997). If search intermediaries were able to operate in the book and compact disc markets, price competition would probably increase and price variance might even fall below the 0.64 per cent for software. Consumers would then benefit both from reduced search costs and from lower prices. Jupiter Communications estimates that there is a \$47 million market for on-line sales of compact discs; a reduction in the variance from 1.05 per cent to 0.64 per cent would save customers approximately \$217 000.³

18. One pitfall of search intermediaries is the "bait-and-switch" tactic. A retailer may advertise the lowest price on a given good (for example, on the UVision Web site), but when customers visit the Web site for that product, they are shown a substitute product at a higher price. The "bait" is the very low

price, which draws customers into the store; the “switch” is the higher-priced product actually offered. While the tactic may be quite effective in physical retail stores, it is less so on Web sites for several reasons: 1) the Web customer does not engage in conversation with a persuasive salesperson; 2) a salesperson cannot “size up” customers and find their “weak points”; and 3) the customer only has to press the “back” button to return to UVision and find another retailer.

19. Table 5 gives some insight into the effects of intermediation on prices. The percentage of titles whose prices changed is greater for software (8.57 per cent) than for books or CDs, an indication that software retailers make more price changes in response to the market. Moreover, the software market is the only market where average price changes are negative, i.e. when prices change, they are, on average, reduced by approximately \$4. The amount is higher because the average price of software is higher than the average price for books or CDs, but even in terms of average price change to average price ratio, the change in price is still rather large (-1.87 per cent) relative to the book and CD markets.

Table 5. Price changes in Internet markets

	Titles with price changes (%)	Average price change (\$)	Average price change to average price ratio (\$)
Books	6.0	0.04	0.23
CDs	6.3	0.06	0.42
Software	8.6	-3.78	-1.87

Source: Bailey (forthcoming).

Conclusions and policy implications

20. Although the analysis covers few products over a limited period of time, it is possible to draw a few preliminary conclusions:

- the empirical evidence does not support the view that prices for books, CDs and software are lower when purchased from Internet retailers rather than from physical retailers.;
- the empirical evidence does not show a lower spread (variance) of prices for Internet retailers than physical retailers;
- lastly, Internet retailers change prices more often than physical retailers, especially in the software market; this may be due to the existence of intelligent agents that perform a useful intermediary service of searching for specific software and the lowest price for that software.

21. While the existence of an intermediary may explain why prices for software from on-line and off-line merchants appear to behave differently than those for books and CDs, a number of other factors may have a role as well.

22. Chief among these is the current, rather embryonic state of business-to-consumer electronic commerce. To date, many customers are experimenting. They tend to be affluent, well educated males aged 25 to 39 (Goldman Sachs, 1997). Many use electronic commerce because it is convenient. Thus, it is very possible that on-line prices are higher than off-line because the consumers' affluence allows merchants to extract a higher price, but this may change as the demographics of e-commerce better reflect the population at large.

23. Related to this are two other observations. The first is that on-line merchants add value in the form of convenience and other characteristics that consumers are willing to pay for (especially busy, affluent consumers). In one sense, therefore, a comparison of prices for books sold on-line and off-line is inappropriate since on-line sales have a high degree of convenience, while off-line sales do not. Moreover, on-line shopping may more readily encourage "impulse" purchases, again allowing the merchant to sell at a higher price.

24. Second, the on-line environment may provide merchants with information about consumers via devices such as "cookies" or one-to-one marketing, which allows segmentation of the market and thus enables merchants to charge different prices to different consumers for the same product, or, in economic terms, to reduce the consumer surplus. This effectively means that different people will be charged different prices for the same product, as is the case for airline tickets and automobiles.

25. Three policy implications can be drawn from these observations, although their relevance is dependent upon the causes of the price movements identified above and the attendant explanations, something the present this analysis has not established. Nevertheless, the observations raise some policy issues that are worthy of consideration:

- The much heralded shift in market power from producer to the consumer that many associate with electronic commerce may be premature, overstated or incorrect. Although in some areas electronic commerce is likely to benefit consumers thanks to greater competition and possibly to reduced search costs, other characteristics of electronic commerce, such as the ability to segment markets more finely, may benefit the producer. This conclusion is drawn from the fact that lower prices have not been observed even though Internet retailers purportedly face lower costs. This observation may be a market anomaly, but it does call into question the assumption that Internet commerce will lead to lower consumer prices in all markets.
- The segmentation of the market also suggests that an increasing array of products may be sold at different prices to different people, and this may explain some of the findings discussed above. While this practice is accepted for products such as airline seats and automobiles, its wider application may raise issues of fairness and the need to protect consumers.
- One method of encouraging more price competition among merchants may be the use of an intelligent agent acting as an intermediary to help consumers find the desired product at the lowest price. This may explain why there appears to be greater price competition in the software market than in the book and CD markets. The ability of some Internet retailers to block access of these intermediaries to their sites raises questions about consumer protection.

APPENDIX 1. AMAZON.COM AND BARNES & NOBLE: A CASE STUDY

26. Amazon.com, which sells books over the Internet to consumers, is widely pointed to as *the* business model for Internet retailing (*The Economist*, 1997; Morgan Stanley, 1997; and Goldman Sachs, 1997). Amazon.com established itself on the Internet in 1995 as a small operation entirely based on Internet sales of books which it then shipped to its customers. Amazon.com keeps very few titles in its warehouse and orders most of the titles from a nearby distributor. While it has no physical retail outlets, Amazon.com was able to establish a global presence in less than two years because of the Internet's reach. Based on first quarter 1997 revenues, Morgan Stanley calculates annual revenue of \$64 million for 256 employees (Morgan Stanley, 1997).

27. In March 1997, Barnes & Noble entered the Internet book market. Barnes & Noble began retail operations in 1965 in New York City as a student book exchange and subsequently expanded to provide better service, selection, and customer support than other New York bookstores. In 1987, it acquired the B. Dalton bookstore chain, thereby expanding its presence in the world of physical commerce, where it is an established industry leader. It has a great number of distribution channels, warehouses full of books, and catalogue sales. Perhaps most important, it brings to the Internet marketplace both customers and a brand name. With over 1 000 physical stores, 430 of which are so-called super stores, Barnes & Noble generated \$2.4 billion in 1996 and employed 26 000 (Morgan Stanley, 1997).

28. Both Amazon.com and Barnes & Noble have business strategies for sale of books via the Internet and are refining them. While Amazon.com has the "first mover" advantage, Barnes & Noble brings a physical retailer market brand name which can help attract both its current and new customers to its Web service. Unlike Amazon, which had to establish a presence from scratch, Barnes & Noble can use the Internet to leverage its existing assets. In particular, some analysts suggest that Barnes & Nobles' state-of-the-art distribution centre and already existing mail order system give it a logistical advantage over Amazon (Morgan Stanley, 1997). An examination of these two market players provides an interesting case study in Internet competition and business strategies and underscores the important differences between Internet commerce and physical retail markets.

29. Amazon.com hopes that providing better service at a good price along with its first-mover advantage will put it in a stronger position to compete with Barnes & Noble and other bookstores such as Borders. It recognises that competition "will intensify in the future. Barriers to entry are minimal, and current and new competitors can launch new sites at a relatively low cost." (*The Economist*, 1997) According to Jeff Bezos, Amazon.com's founder, "Ultimately, we're an information broker. On the left side we have lots of products, on the right side we have lots of customers. We're in the middle making the connections." (*The Economist*, 1997). If retailers like Amazon.com reduce their role as a distribution channel and become more concerned with relationships, then they will be acting as intermediaries, and there does indeed appear to be a trend towards intermediation in Internet retailing (see below). This case study highlights the differences between two distinct kinds of intermediaries.

Table 6. Competition between Amazon.com and Barnes & Noble, 1997

Date	Amazon.com	Barnes & Noble
19 March 1997	Announces discounts for its most popular titles	Start of AOL service
25 March 1997	Discloses that it will have an IPO	
12 May 1997		Start of Web service
12 May 1997		Sues Amazon.com for claiming to have the "worlds largest bookstore"
10 June 1997	Announces further discounts for its titles	
8 July 1997	Pays AOL \$19 million for exclusive promotion of its service	
11 July 1997	Announces a loss \$6.7 million for the second quarter of 1997 – less than expected	
31 August 1997	Sues Barnes & Noble over sales taxes	

Source: Bailey (forthcoming).

30. Table 6 indicates actions taken by the two firms as competition between them grew following the entry of Barnes & Noble into Internet commerce. Barnes & Noble initially began selling electronically only to America Online (AOL) customers with dial-up access. Even though these customers represent a fraction of the total number of potential Internet customers, Amazon.com chose to lower prices relative to those offered by Barnes & Noble on their AOL site. As Table 7 shows, in the weeks of 17 and 24 March 1997, Amazon.com lowered prices on over half of a selection of 125 popular titles. On 17 March 1997, Amazon.com and Barnes & Noble had different prices for 124 out of the 125 titles. A consumer who bought all 125 titles would save \$177.87 by shopping at Barnes & Noble. These prices do not include the costs of shipping or taxes, but, although they are significant, there is little disparity between the two retailers for these costs.

Table 7. Changes in prices by Internet retail booksellers

Number of weekly price changes on 125 titles and average amount of change (\$)

Retailer	3 Feb 97		10 Feb 97		17 Feb 97		24 Feb 97		3 Mar 97		10 Mar 97		17 Mar 97		24 Mar 97		5 May 97		10 June 97		1 July 97		4 Aug 97	
	N°	Avg	N°	Avg	N°	Avg	N°	Avg	N°	Avg	N°	Avg	N°	Avg	N°	Avg	N°	Avg	N°	Avg	N°	Avg	N°	Avg
Amazon.com (1)	-	-	17	0.66	42	2.23	19	2.55	18	1.01	13	-0.3	46	-4.4	27	-2.9	15	3.67	122	-1.54	1	8.80	4	1.07
Barnes & Noble (2)	-	-	-	-	-	-	-	-	-	-	-	-	0	0	5	1.8	11	1.57	10	-0.76	4	2.10	3	1.65
Book Stacks Unlimited (1)	-	-	8	0.52	4	1.36	4	0.77	2	-1.8	2	-3	2	0.53	2	4.17	11	-1.91	8	-0.06	4	2.21	7	1.69
Books-a-Million (2)	-	-	12	1.73	0	0	1	6.9	4	-3.1	8	3.18	2	2.7	0	0	3	7.59	3	0.89	3	-4.44	2	6.29
Crown Books (1)	-	-	1	-6.2	2	1.05	0	0	26	0.54	3	1.45	0	0	1	3.44	0	0	10	5.62	0	0	0	0
Wordsworth (2)	-	-	5	-0.8	10	1.39	3	0.23	1	-0.1	2	1.88	10	3.44	2	-2.3	8	3.72	0	0	0	0	0	0

1. Internet retailer

2. Physical retailer

Source: Bailey (forthcoming).

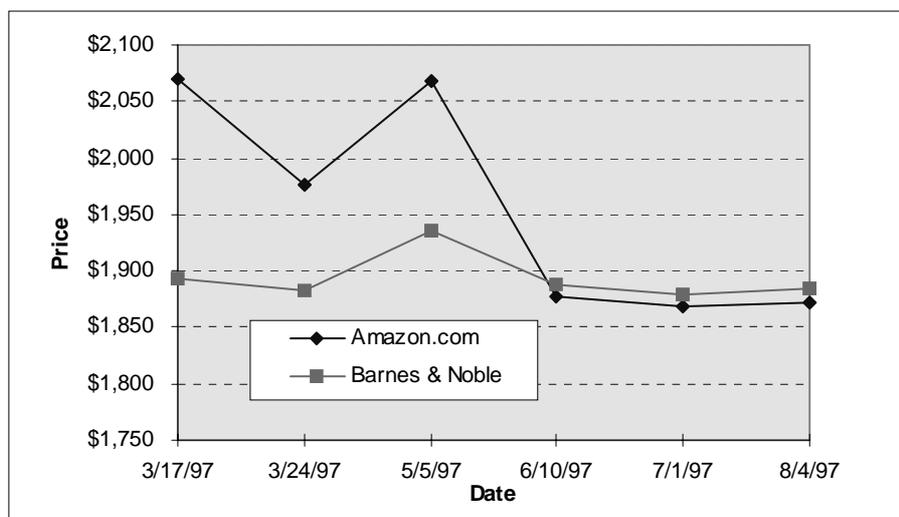
31. Table 7 shows that Amazon.com changed its prices quite regularly before Barnes & Noble entered the market. On average, it raised prices over time, perhaps anticipating price competition following Barnes & Noble's entry into the market. The week of 17 February 1997 had 42 price changes, at an average increase of \$2.23. Then, when Barnes & Noble entered the market (17 March 1997), Amazon.com lowered prices on 46 titles by an average \$4.40. Thus, while Amazon.com lowered prices when Barnes & Noble entered the market, they were reducing a marked-up price.

32. Subsequently, as Table 8 and Figure 1 show, Amazon.com lowered prices on 10 June 1997, about a month after Barnes & Noble extended their on line book store beyond AOL to include a store on the World-Wide Web. As of mid-June, the number of titles with different prices had been reduced from over 120 to 54 (out of 125). It appears that Amazon.com was responding to competition, but Barnes & Noble was not. It suggests that a retailer with a combined physical/Internet presence affected, in this case, the sales and market position of an Internet-only retailer. Morgan Stanley believes that Barnes & Nobles' physical assets "will allow it to be the price leader in Internet book selling -- and to do so profitably" (Morgan Stanley, 1997, p. 8-15). The competition between the two types of market is real and will increase as more physical retailers move to the Internet.

Table 8. Price differences at Amazon.com and Barnes & Noble

Date	Number of titles with different prices (out of 125)	Price differences (Amazon.com - Barnes & Noble) (\$)
17 Mar 97	124	177.87
24 Mar 97	122	94.29
5 May 97	125	133.86
10 Jun 97	54	-10.32
1 Jul 97	52	-10.73
4 Aug 97	53	-11.39

Source: Bailey (forthcoming).

Figure 1. Price change for a market basket of 125 books

Source: Bailey (forthcoming)

33. However, while Amazon.com is competing with Barnes & Noble, the other retailers listed in Table 7 do not appear to be doing so. In true price competition, they would be obliged to follow the lead or lose sales. Price competition between two players with large market share appears not to affect niche markets, a suggestion confirmed by observations up to 4 August 1997.

34. . Because Amazon.com and Barnes & Noble have very similar prices, a customer is likely to use other criteria to decide where to purchase. Clearly, Barnes & Noble and Amazon.com are trying to compete not through prices but in other ways: Web services, customer service, the type of intermediary they are.

35. While both Barnes & Noble and Amazon.com are intermediaries, they follow different intermediary models. Amazon.com encourages reviews from customers and the building of customer communities to promote value. Instead of maintaining an inventory of most of its over 2 million titles, it acts as a broker, ordering books on demand from dealers. Barnes & Noble, instead, integrates their physical and Internet stores and maintains a far larger inventory than Amazon.com. In fact, it is the difference in inventory practices which led to Barnes & Noble's lawsuit against Amazon.com for claiming to be the "World's Largest Bookstore".

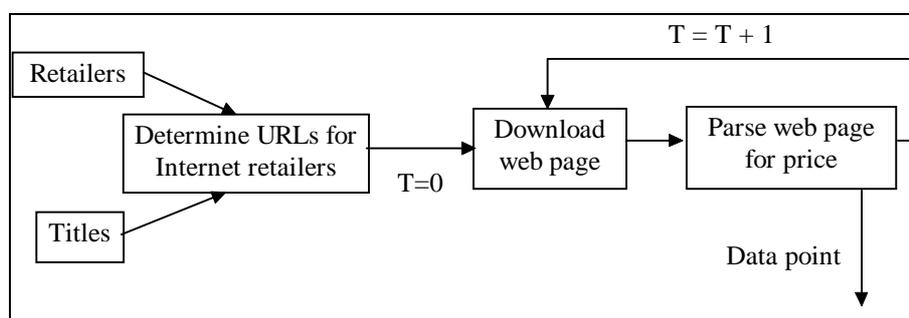
36. The Barnes & Noble and Amazon.com saga has only begun. If retailers like Amazon.com reduce their distribution role and focus more on their role as information brokers and relationships, then the Internet trend will be towards intermediation, not disintermediation. However, if Barnes & Noble prevails as price leader, it may use its position as a vertically integrated retailer to dominate the market. While it is still early, this case study indicates that pure price competition and disintermediation are not likely.

APPENDIX 2. RESEARCH METHODOLOGY

37. The analysis of prices set by Internet retailers draws on an empirical study of Internet retailers in three markets: books, compact discs (CDs), and software (Bailey, forthcoming). These three industries were chosen because they have products that appeal to a variety of customers (they have low asset specificity) and a global market and are sold in a “competitive” market (i.e. there are more than a handful of retailers) both via the Internet and in the physical marketplace. This makes them near-commodities with tractable prices.

38. Data collection began with the identification of specific retailers, common titles, and determination of the price of these “paired” titles at different times (Figure 2). When possible, it is ascertained that precisely the same title is investigated for Internet and physical retailers.⁴ For each pairing, the URL (the unique Web identifier) which lists the price for this retailer and title is identified. Then, at $T = 0$, the Web page is downloaded and parsed for price information, and the data point is extracted. The process is repeated in the next time period.

Figure 2. Data collection methodology



Source: Bailey (forthcoming)

39. A total of 52 retailers were chosen for the study. The Internet retailers had to have Web sites where prices were posted. Since an exhaustive list of retailers in these three markets would be much larger, the retailers selected were chosen because they made it possible to reduce the overhead of data collection. When it was possible to track a retailer’s title via a specific URL (e.g. <http://www.retailer.com/title?12345>), that retailer was given preference. The study covered 8 book, 9 CD, and 35 software retailers.⁵

40. A total of 337 titles were examined: 125 in the book market, 108 in the CD market, and 104 in the software market. Approximately half came from “most popular” lists in the different industries.⁶ To ensure greater depth, the other half were more “obscure” or “niche market” titles taken from specialised lists, recommendations from friends, or identification as a featured selection by niche retailers. While popularity was thought to have some effect on the findings, the results did not seem very different for the 50th title on the *Billboard* list and a more obscure title.

41. Observations were made weekly by a human accessing the unique URL and recording the prices. With a possible total of 44 896 observations not all permutations resulted in an observation. Some retailers were out of stock for a title on a particular week and others did not carry some titles being tracked. In all, 23 789 observations were logged, or approximately 56 per cent of the total possible.

Table 9. Goldman Sachs' Wal-Mart pricing study: On-line versus off-line¹

Category/item	Size/ number	Off-line (\$)	On- line (\$)	Price differential ² on-line vs. off-line (%)
Health and beauty items				
Crest Tartar Control	6.4 oz	1.87	2.54	36
Noxema Skin Cream	10.75 oz	3.12	3.12	0
Pert Plus Normal Shampoo	15 oz	3.28	3.28	0
Tampax	48 ct	4.97 j	5.44	9
Tylenol Extra Strength Tablets	100 ct	6.47	6.55	1
Household chemicals & consumables				
Lysol Spray	12 oz	3.28	4.17	27
Reynolds Wrap	20 ft.	4.84	4.84	0
Home electrical and small appliances				
GE Soft White Light bulbs	100w - 4 pk	1.09	1.44	32
Duracell AA	4 pk	2.97	3.17	7
Kodak Gold 35 mm 200	24 exp.	3.78	3.78	0
Presto Gran'Pappy Frier	No. 05410	29.96	29.96	0
Presto Power Pop Popper	No. 04830	17.84	18.84	6
Presto 15" Jumbo Skillet	No. 06821	39.96	39.96	0
B&D Space Maker Can Opener	EC70	17.96 OS	17.96	0
Kitchen Aid Mixer	K45SS	199.00	197.88	(1)
Sporting goods				
Stanley Aladdin Steel Bottle	1 qt	23.96	23.96	0
Toys				
Playdoh Fun Factory	No. 90020	5.97	5.97	0
Monopoly		9.47	10.97	16
Sorry		13.97	13.97	0

Table 9. Goldman Sachs' Wal-Mart pricing study (continued)

Paint & hardware				
Rustoleum Fiat Black Spray Paint	12 oz	3.27	3.27	0
3M Aluminium Oxide Sandpaper	No. 9000	1.77	1.87	6
Stanley Power Lock Rule 25' x 1"	No. 33-425	9.88 OS	10.46	6
Kidde Fire Away Extinguisher	No. 110	13.47	10.96	(19)
First Alert Fire Detector	No. SA150CLD	19.47	19.47	0
Food				
Snickers Fun Size	14 oz	2.38	2.38	0
Oreo Cookies	20 oz	2.37	2.97	25
Planters Unsalted Peanuts	16 oz	1.88	2.72	45
Ocean Spray Cranapple	64 oz	2.29	3.14	37
Stationery				
Bic Round Stick (Black)	10 pk	0.96	1.28	33
Scotch Tape 3/4" x 650"		1.57	1.57	0
Basket prices		\$453.07	\$457.89	
Shipping costs		N/A	\$37.01	
Basket price differential: on-line vs. off-line		Without shipping		1%
		With shipping (3)		9%
Average price differential: On-line vs. off-line		Without shipping		9%
		With shipping (4)		17%

1. This table only presents items in the compiler's normal pricing study that are available on-line.
 2. Does not include shipping costs.
 3. Reflects \$37.01 charge for shipment by UPS Ground to Tampa, Florida.
 4. Reflects average shipping charge equal to 8 per cent of the cost of goods.
 5. Manufacturers' special included larger quantity or bonus items.
- OS: Out of stock.

Source: Goldman Sachs (1997).

REFERENCES

- Bailey, Joseph P. (forthcoming), "The Emergence of Cybermediaries: Intermediation in Electronic Markets", Ph.D. dissertation in Technology, Management and Policy, Massachusetts Institute of Technology, Cambridge, MA.
- Bailey, Joseph P., and J. Yannis Bakos. forthcoming. An Exploratory Study of the Emerging Role of Electronic Intermediaries. *International Journal of Electronic Commerce*.
- Bakos, J. Yannis, and Erik Brynjolfsson. 1993. From Vendors to Partners: Information Technology and Incomplete Contracts in Buyer-Supplier Relationships. *Journal of Organisational Computing*.
- Bollier, David. 1996. *The Future of Electronic Commerce: A Report of the Fourth Annual Aspen Institute Roundtable on Information Technology*. Washington, DC: The Aspen Institute.
- Clark, Nigel (1997), "Electronic Commerce: Dramatic Increase Seen," *The Financial Times*, 20 November.
- Coase, R. H. 1937. The Nature of the Firm. *Economica* IV: 386-405.
- Crane, Alan (1997), "Information Age will curb inflation," *The Financial Times*, March 17
- Croson, David C. 1995. A New Role for Middlemen: Centralising Reputation in Repeated Exchange. Philadelphia, PA: Wharton School of Business.
- Crowston, Kevin (1996), "Market-Enabling Internet Agents", paper read at the International Conference on Information Systems, December, Cleveland, Ohio.
- De Long, Bradford J. and A. Michael Froomkin (1997), "The Next Economy?," <http://www.law.miami.edu/~froomkin/articles/newecon.htm>, April.
- Dwyer, F. Robert, Paul H. Schurr, and Sejo Oh. 1987. Developing Buyer-Seller Relationships. *Journal of Marketing* 51 (April):11-27.
- The Economist* (1997), "A Survey of Electronic Commerce", 10-16 May, pp. 1-18.
- Gates, William (1995), *The Road Ahead*, (New York, NY: Penguin Books).
- Gellman, Rober (1996), "Disintermediation and the Internet," *Government Information Quarterly* 13 (1):1-8.
- Goldman Sachs (1997), *Cyber Commerce: Internet Tsunami*, August.
- Hagel, John and Arthur G. Armstrong (1997), *Net Gain*, (Boston, MA: Harvard Business School Press).
- Kalakota, Ravi, and Andrew B. Whinston. 1997a. *Electronic Commerce: A Manager's Guide*. Reading, MA: Addison Wesley.

- Malone, Thomas W., Joanne Yates, and Robert I. Benjamin. 1987. Electronic Markets and Electronic Hierarchies. *Communications of the ACM* 30 (6): 484-497.
- McKnight, Lee W., and Joseph P. Bailey, eds. 1997. *Internet Economics*. Cambridge, MA: MIT Press.
- Morgan Stanley (1997), *The Internet Retailing Report*, May. <http://www.ms.com>
- OECD (1997), "Measuring Electronic Commerce," GD(97)185, Paris.
- Resnick, Paul, Richard Zeckhauser, and Chris Avery. 1995. Roles for Electronic Brokers. In *Toward a Competitive Telecommunication Industry: Selected Papers from the 1994 Telecommunications Policy Research Conference*, edited by G. W. Brock. Mahwah, NJ: Lawrence Erlbaum Associates.
- Sarkar, Mitrabarun, Brian Butler, and Charles Steinfield. 1996. Cybermediaries in Electronic Marketspace:
- Stigler, George J. 1961. The Economics of Information. *Journal of Political Economy* LXIX (3): 213-225.
- Williamson, Oliver E. 1979. Transaction-Cost Economics: The Governance of Contractual Relations. *Journal of Law and Economics* 22 (October): 233-261.
- Yardeni, Edward (1996), "Economic Consequences of the Internet," October 22. <http://www.yardeni.com/yardeni/>

NOTES

- 1 Wilder, Clinton, "Survey Shows Retailers Going Online to do Business," Information Week, <http://www.techweb.com>, 21 May 1997.
- 2 While this would be the *de jure* policy regarding taxation, the tax is rarely assessed or collected.
- 3 The calculation assumes an average of \$13 for a compact disc and a cost savings of \$0.06 per title.
- 4 We define an "Internet retailer" as a retailer that allows Internet users to browse, identify, and purchase the product entirely via the Internet medium. The "physical retailer" may have an Internet presence, but they rely on their catalogue or retail stores predominantly for sales. Therefore, the physical retailer predominantly uses the Internet for publishing prices and soliciting sales in its physical locations.
- 5 The presence of a much larger number of software retailers is due to the fact that data collection for the software market was made easier by the UVision search intermediary. Instead of using individual title/retailer URLs, it was possible to get selling prices for many retailers (often 20 or more) from one URL. This facilitated data collection for the software market.
- 6 Books were taken from the *New York Times* bestseller list, CDs from *Billboard's* top 50, and software titles came from *PC Week's* column on popular CD-ROM titles.