

E-BOOKS AND LIBRARIES: AN ECONOMIC PERSPECTIVE

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NOTE

In this paper, we provide an economic analysis of the current environment in which libraries acquire electronic books (e-books) and offer some thoughts about the future. However, we must emphasize that, because the use of e-books is evolving so rapidly, our predictions must be treated as subject to considerable uncertainty. Moreover, it should be noted that factors such as social equity, community welfare, and intellectual freedom are necessarily outside the scope of the paper.

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Introduction

The Association of American Publishers/Book Industry Study Group has reported that sales of Trade e-books, which account for 97% of e-book sales, grew by more than 210% between 2010 and 2011.¹ Although print editions still account for 79% of the sales of Trade books, that is likely to change in light of the enormous growth in the demand for e-books. At the same time, the availability of e-books through public libraries is also expanding. About two thirds of public libraries (67.2%) offered e-books in 2011, up from 55.4% in 2009 and 38.3% in 2007.²

The introduction and dramatic growth of the use of e-books is radically changing the relationships between libraries and publishers and distributors, on the one hand, and libraries and their patrons, on the other. Although the full effect of the transition from print to e-books will probably not be felt for several years, public libraries find themselves immersed in that transition as they plan for the future. This paper provides a preliminary economic analysis of how publishers provide digital content to libraries, focusing mainly on the value that libraries place on access to e-books and how that is affected by the various restrictions that publishers place on access and use. However, because publishers are just starting to adapt to the new environment, and appear uncertain as to how to adapt, we consider not only the behavior of publishers that we currently observe in the marketplace but also possible “models” of the library-publisher relationship that may come into existence in the future.

The Differences between Print and Electronic Books

Print books have certain characteristics that affect the way they are priced and the way libraries make them available to their patrons. First, unless a library purchases multiple copies of the same print book, only one patron can borrow it at any given time. Second, print books “wear out” after multiple uses, or may be lost or stolen, so that libraries must either purchase new copies or repair the copies that they have in order to be able to continue to lend them. Third, in order to borrow a print book from a library, a patron must be present at the library during a time when the book has not been checked out. Fourth, if a library maintains a waiting list for a print book, a borrower must wait for his or her name to reach the top of the list at which point he or she must make a trip to the library within a given period of time in order to check the book out. Finally, a patron must return a print book to the library when he or she is finished using it and must do so within a specified period of time in order to avoid late fees.

On the surface, none of these characteristics applies to an e-book. Armstrong and Lonsdale (2011: XXV) define an e-book as “any content that is recognizably ‘book-like’, regardless of size, origin or composition, but excluding serial publications, made available electronically for reference or reading on any device that includes a screen.”³ Algenio and Thompson-Young (2005: 114) note that “one e-book could be accessed by multiple library users at a time...” and JISC (2009: 26) reported that one of the “key attractions” of e-books for libraries is that they “provide a solution to spikes in demand by providing concurrent access.”

¹ Association of American Publishers, Inc. and Book Industry Study Group (2012), p. 12.

² See Hoffman, et al., “Public Library Funding & Technology Access Study” (American Library Association, 2012).

³ Our analysis focuses on print and electronic versions of the same or comparable books. However, we note that some books are now being released only in electronic form. For a discussion of this trend, see Bosman and Peters (2011).

Moreover, a patron does not have to go to the library to borrow an e-book. As Bosman (2011a) notes, “...unlike print books, library users don’t have to show up at the library to pick them up – e-books can be downloaded from home, on to mobile devices, personal computers, and e-readers, including Nooks, Sony Readers, laptops and smartphones.”⁴ Thus, the e-book technology does not require a library to maintain a waiting list for an e-book (unless, as we note below, the publisher places restrictions on simultaneous use).

Finally, an e-book need not be physically returned to the library when a patron is finished using it and, indeed, access to an e-book may be automatically terminated after a certain period of time. Grigson (2011: 20) notes that “the library user may be able to download the e-book from the website to be read offline, although...this is usually a temporary download in the form of a file, which can only be accessed for a limited time period.”⁵

The Costs of Publishing Print and E-books

Many seem to believe that copies of e-books cost far less to produce than copies of print books because publishers save printing and distribution costs. However, a spate of recent articles, most notably Rich (2010) (see also Claypool, 2011), points out that the basic tasks involved in creating e-books are very similar to those of creating a print book: acquisition, financing, production, marketing, sales and delivery of books. The New York Times interviewed executives at several major houses and provided an instructive composite (and necessarily simplified) picture of costs attendant on publishing a print versus an e-book (see Table 1).

⁴ However, at least one U.K. publisher has proposed that library patrons be required to be onsite in order to access e-books from libraries (Watters [2010] citing the CEO of Faber and Faber).

⁵ Although we recognize that some visits to a library may be for purposes other than borrowing or returning an individual book—browsing the collection, reading periodicals, using e-government resources, and attending library events, for example—the fact remains that the time costs involved in borrowing an e-book are lower than those involved in borrowing a print book.

Table 1. Costs of Publishing Typical Print and E-books

	Typical hardcover	Typical e-book
Retail price	\$26.00	\$12.99
Bookseller's fee/"take" (typically 50% for hardcovers and 30% for e-books)	\$13.00	\$ 3.90
Gross revenue to publisher	\$13.00	\$ 9.09
Printing, storing, shipping	\$ 3.25	
Cover design, typesetting and copy-editing (and in the case of e-book, converting it to digital file)	\$ 0.80	\$ 0.50
Marketing (on average)	\$ 1.00	\$ 0.78
Royalty to author	\$ 3.90	\$ 2.27-3.25
Net revenue to publisher (covers overhead, office space, electricity, writing off unearned advances, and profit)	\$ 4.05	\$ 4.56-5.54

Source: Adapted from Rich (2010).

Michael Hyatt, Chairman of Thomas Nelson Publishers, in a recent blog (Hyatt, undated), offered a further perspective on why e-books "cost so much." Manufacturing and distribution expenses account for only about 12% of a print book's retail price, so eliminating these costs does not greatly reduce total publishing costs. Moreover, publishers are faced with three new costs: digitized preparation (in multiple formats), quality assurance ("QAing" the book), and digital distribution to several different distributors or retailers, with varying upload protocols and digital asset management systems. Nonetheless, the cost of producing an *additional copy* of an e-book is undoubtedly substantially lower than the cost of producing an *additional copy* of a print book.⁶

How E-books Are Distributed

In addition to selling e-books directly to consumers, publishers sell e-books through a variety of suppliers, including wholesale distributors, such as Ingram, and retailers, such as Amazon, Apple, and Barnes & Noble. Until 2010, publishers generally used a "wholesale" model for e-book sales. This model emulated the print world where publishers establish a "retail" price and then "sell" the book to an intermediary at a large discount (50% is typical). In this model, the retail price for e-books was often linked to the lowest price established for the print book. For example, if the book was only available in a hardcover edition, a publisher would set the e-book price at or close to the hardcover price. The publisher would then lower the e-book price when the paperback edition became available. The key feature of the wholesale model was that the publisher did not determine the price at which the intermediary offered it to consumers and, in fact, some retailers offered e-books at prices that were substantially lower than the so-called retail price. Some smaller publishers continue to use the wholesale model for e-books.

⁶ Wischenbart (2011: 34) provides a comparison of the average discounted print price and the average e-book price of the top 10 fiction U.S. bestsellers in the United Kingdom (U.K.), U.S., France, and Germany. The average e-book price ranges from 9 percent lower (U.K.) to 23 percent lower (Germany) than the comparable print book price.

In early 2010, some publishers, in a deal with Apple, which was introducing its new Apple Tablet, switched to an “agency” model for e-book sales. Michel Shatzkin, a consultant to publishers who writes on issues related to publishing and pricing, noted in a blog posted on January 19, 2010:

The “agency” model is based on the idea that the *publisher* is selling to the consumer and, therefore, setting the price, and any “agent”, which would usually be a retailer but wouldn’t have to be, that creates that sale would get a “commission” from the publisher for doing so. Since Apple’s normal “take” at the App Store is 30% and discounts from publishers have normally been 50% off the established retail price, publishers can claw back margin even if they don’t get Apple to concede anything from the 30%.

So making this change, if it works, accomplishes three things for big publishers. The obvious two are that they gain a greater degree of control over e-book pricing than they ever had over print book pricing and they get to rewrite the supply chain splits of the consumer dollar.

But the third advantage for the big guys is the most devilish of all: they may gain a permanent edge over smaller players on e-book margins. That is one that, truth be known, was already playing out as Amazon used its leverage to reduce the share smaller publishers got from Kindle sales. But this could institutionalize it (Shatzkin, 2010).

The shift from the “wholesale” to the “agency” model has been challenged in a number of lawsuits claiming that Apple and a number of trade book publishers adopted the agency model in order to force Amazon to abandon its low-pricing policies for e-books.⁷ Indeed, the U.S. Department of Justice filed a civil lawsuit against Apple and 5 publishing houses—Hachette, HarperCollins, Macmillan, Penguin, and Simon & Schuster—alleging that the agency model was a conspiracy to push up prices of e-books.⁸

U.S. Attorney General Eric Holder has stated that “as a result of this alleged conspiracy, we believe that consumers paid millions of dollars more for some of the most popular titles.”⁹ At the time of this writing, Hachette, HarperCollins, and Simon & Schuster agreed to settle the lawsuit. Apple, Macmillan, and Penguin are planning to fight the government in court.¹⁰

In the case of sales to libraries, publishers often employ specialized e-book aggregators such as OverDrive, ebrary, and EBSCO Publishing, which recently acquired the NetLibrary e-book platform. These aggregators operate under the same business models that retailers and wholesale distributors do—the wholesale or the agency model, depending on the publisher.

⁷ See Rosenblatt (2011) and Beckett (2011).

⁸ *United States v. Apple, Inc., et al.*, U.S. Department of Justice, Antitrust Division, April 11, 2012 (accessed April 26, 2012), <http://www.justice.gov/atr/cases/applebooks.html>.

⁹ U.S. Department of Justice. *Justice News* “Justice Department Reaches Settlement with Three of the Largest Book Publishers and Continues to Litigate Against Apple Inc. and Two Other Publishers to Restore Price Competition and Reduce E-book Prices,” April 11, 2012, (accessed July 12, 2012), <http://www.justice.gov/opa/pr/2012/April/12-at-457.html>.

¹⁰ Declan McCullagh, *CNET News*, “DOJ announces three e-book settlements, but not with Apple,” April 11, 2012 (accessed July 12, 2012), http://news.cnet.com/8301-13578_3-57412452-38/doj-announces-three-e-book-settlements-but-not-with-apple/?tag=mncol;txt.

The individual consumer and library markets for e-books also employ different delivery methods. As Grigson (2011: 20-21) points out:

The consumer market is dominated by the sales of e-book downloads.Downloads are sold outright for the user to keep, although further use may be controlled by DRM [Digital Rights Management] software. Consumer e-books therefore follow a retail model similar to online music sales and the role of the supplier is essentially limited to the sales transaction.

In contrast, the library market focuses more heavily on an online e-book supply model. Instead of buying e-book downloads and then making the files available for users to access offline at any time, the library pays for access to e-books that are hosted on a third-party website.

...

[F]or libraries, the e-book model for acquiring content and supplying it to users is fundamentally different from the print model. The supplier is no longer simply selling books to the library— they are also selling the service that supplies them directly to the library’s users.

Aggregators supply content from a range of publishers, licensing content from them and then selling directly to libraries using their own platforms, rather than the publishers’ websites, to host the e-books. The content that aggregators can offer is limited by the licenses they obtain. Some publishers offer their content through a single aggregator, some offer some or all of their content through all of the major aggregators, and some choose not to supply content to libraries at all.

Grigson points out that the use of aggregators appeals to libraries because it fits the model of third-party hosting of e-resources, already well-established for e-journals and databases, and avoids the difficulties and costs of maintaining the technical infrastructure needed for hosting e-books. It also appeals to publishers because it gives them “greater control over the distribution and use of their content than if downloaded files were simply sold to libraries, something that is of particular concern given the size and value of the consumer market for books” (2011: 21).

The major concerns of libraries regarding e-books include the lack of access to some or all of the content of some publishers; access to content not provided by the major aggregators (for example, specialized books or books from independent publishers) or situations in which access is delayed by publishers until after an e-book has been available from retailers for some time; the high prices charged by some publishers; the use of patron-driven content acquisition (which may be heavily weighted towards popular trade books, in the case of public libraries);¹¹ and preservation and archiving of content, especially when contracts with aggregators that host their digital content are terminated.¹²

¹¹ Some have argued, however, that patron-driven acquisition can provide substantial savings to libraries by eliminating purchases of books that relatively few people read, although these kinds of savings have been documented largely in academic libraries (Kolowich, 2011).

¹² This was the subject of a dispute between the Kansas State Librarian and OverDrive claiming that, because its contract with OverDrive uses the phrase "content purchased," the state library has a basis for claiming ownership of the content (Kelley, 2011b). The ownership question will undoubtedly be debated and revisited for some time to come and contracts with new vendors and aggregators will be carefully scrutinized for clarity about access to content when contracts are terminated.

The Introduction of E-books and the Library Demand for Books¹³

In purely economic terms, the value of a book to a library's patrons reflects both the utility that the patrons obtain when they read the book and the additional costs that they must incur in order to do so.¹⁴ The introduction of e-books reduces the costs incurred when library patrons borrow a book because they no longer must make trips to the library either to check out or to return a book, although some patrons may still choose to do so.¹⁵ This, in turn, increases the value of a book to the patrons.¹⁶ We also assume that the value of a book to a library reflects the value to its patrons, so that the increase in the value to its patrons increases the willingness of a library to pay for a given book.¹⁷ That is, because the cost of borrowing an e-book is less than the cost of borrowing a print book, the value of an e-book to a library's patrons is greater than the value of a comparable print book. We conclude, therefore, that, other things equal, a library's willingness to pay for an e-book is greater than that for a print book.¹⁸

¹³ Our analysis initially assumes that libraries purchase individual titles. We briefly discuss subscription models, where libraries acquire access to a number of books in a single transaction, in a later section.

¹⁴ We present a somewhat more formal economic analysis in Appendix A.

¹⁵ Of course, borrowers must incur the cost of purchasing an e-reader (and its periodic replacement as technology advances or if the unit is lost, stolen, or broken) and the cost in time of learning how to use a new model in order to be able to borrow e-books from their libraries. However, once that cost is incurred, the additional cost of borrowing an e-book will be less than the additional cost of borrowing the same book in print form. We are ignoring the case in which a library loads e-books onto library-owned e-readers, which are then loaned to its patrons. Grigson notes (2011: 21) that "the appeal of this model may be limited, both for the library that has to manage e-book reader devices, and for the user who has to visit the library in person in order to borrow the reader." We are also ignoring the costs associated with moving e-book content to another e-reader, which may happen when e-reader providers use proprietary digital rights management to prevent transfer, and the costs that readers incur when publishers require patrons to visit the library to borrow e-books as a means of increasing the "friction" (personal costs) of library borrowing (Kelley, 2012).

¹⁶ We are implicitly assuming that patrons equally value a given title as a print or electronic book, although some may prefer the convenience of an electronic book, which means they place a higher value on it.

¹⁷ In order to offer e-books to their patrons, libraries must incur certain fixed costs to host their own e-book lending sites or contract with a distributor like OverDrive to provide the hosting service. [A potentially offsetting factor is that the costs of storing e-books are likely to be far less than those incurred in providing shelf space and other processing for print books.] However, once a library incurs these costs, they do not affect the willingness of a library to pay for any given book. Nonetheless, such costs could affect the number of e-books books that a library purchases if they are paid from the same (limited) budget that is used to pay for e-books.

¹⁸ However, it is worth noting that libraries obtain most of their digital materials from rights holders or intermediaries under licensing agreements, which are governed by state contract law. Typically, in these agreements, libraries must negotiate for fair use and other copyright exceptions and these rights are often difficult, costly, or impossible to obtain. This tends to reduce the value an e-book relative to that of a print book, where these rights are typically conveyed.

Nonetheless, the price that a library actually pays for an e-book, which is determined by the publisher or, in the case of the wholesale model, the aggregator or vendor, may be either higher or lower than that of a comparable print book. Whether the introduction of e-books raises or lowers the price of a book to a library depends on a number of factors in addition to the effect on the willingness to pay of libraries. One such factor is the relative costs of producing a copy of an e-book and a print book. Another is the nature of the restrictions that are placed on the use of e-books by publishers, an issue that we discuss in some detail below.

The Effect of Added-value Features of E-books on Library Willingness to Pay

Some types of e-books—for example, some textbooks—have important characteristics that are not shared by print books and these characteristics can increase the value of e-books to library patrons and, in turn, to the libraries themselves. These added-value features include “note taking...built in definitions, interactive exercises, rotating or enlarging images, and varying the data on which a graph is based...”¹⁹ In addition, unlike print books, e-books “allow classes or reading groups to read, comment upon and discuss an e-book communally in real time.”²⁰ To the extent that library patrons value these features, the willingness of a library to pay for a comparable e-book also increases.

The Effects of Usage Restrictions on a Library’s Willingness to Pay

Many publishers place restrictions on the manner in which libraries provide e-books to their patrons. For example, as Grigson notes (2011: 31), “most business models impose a cap on usage, limiting either the number of users who can access the e-book at the same time, or the number of times the book can be accessed within a set time period.” Some publishers place limits on the ability of users to download or print all or sections of an e-book. This section examines the effects on various types of restrictions on a library’s willingness to pay.²¹ Throughout our discussion, we assume that the same restrictions are imposed on all libraries. However, publishers could choose to offer a “menu” of licenses, which differ with respect to both license terms, prices, and content from which libraries could choose. We restrict our attention to for-profit publishers, although we recognize that the behavior of not-for-profit publishers, such as university presses, may be different.

¹⁹ See Armstrong and Lonsdale (2011: XXIV). They also note (2011: XXXVII) the importance of “Convenience – including portability and 24/7 access, availability when heavily used print books are unobtainable, ease of search, and the ability to highlight and to copy and paste” whereas “there is little evidence of downloading of full text for later reuse or the use of the e-textbook facility for note-taking.” Watters (2011) reports that “Amazon will let you annotate your library books...These notes will be uniquely yours; the next library patron won’t see them. But you’ll be able to access them again if you check the book out again or purchase it.” E-books with added-value features are sometimes referred to as “enhanced” e-books. For a discussion of this phenomenon, see Weinman (2010).

²⁰ Armstrong and Lonsdale (2011: XXV).

²¹ For a convenient (but somewhat dated and incomplete) comparison of contract provisions that have been imposed by a number of aggregators and a single publisher (Wiley) see <http://guides.lib.ku.edu/content.php?pid=156297&sid=1325618>.

Restrictions on Simultaneous Usage. Suppose that a publisher restricts the number of simultaneous users of an e-book (sometimes referred to as the “one copy, one user” model).²² This has two implications. First, it raises the costs of borrowing, either because the e-book may be unavailable when a patron requests it or because the e-book has been placed on “hold” and the patron may have to wait to reach the top of the waiting list. This tends to reduce the amount that an individual library is willing to pay for a single copy of the book as compared to the case in which there is no restriction. Second, some libraries may choose to purchase multiple copies of the e-book in order better to accommodate their patrons, which is more likely to be the case for large libraries than for small ones. This implies that small libraries may actually benefit from restrictions on simultaneous use because these restrictions tend to lower the price of a copy of an e-book relative to the price that would be charged for a copy if there were no restrictions.²³

Finally, note that the amount that a library is willing to pay for an e-book can be higher than that of a comparable print book even if there are restrictions on simultaneous use. For example, e-book usage may be higher than that of print books because e-books can be “returned” to libraries as soon as they are read whereas print books require a trip to the library when the reader is done with them.²⁴

Restrictions on Total Usage. Now consider the effect of a limit placed by the publisher on the total number of times that an e-book may be checked out, whether or not the uses are simultaneous.²⁵ This will not affect the value of the book to a library for which the limit is not reached (i.e., a library for which

²² This appears to be the predominant model currently used by publishers. For a discussion of this restriction in some OverDrive licenses see Boehret (2011), although we understand that some OverDrive licenses contain “simultaneous use, always available” provisions. Grigson (2011: 31) gives MyiLibrary and NetLibrary as examples of other distributors that offer licenses that place limits on simultaneous use. A publisher may limit simultaneous use both in order to increase its profits from sales to libraries and to encourage the purchase of the book by individuals.

²³ A smaller library is less likely to need simultaneous access, whereas the price of such a license will reflect this capability.

²⁴ A countervailing force is that some libraries make it easy for patrons to purchase e-books for which there are extended waiting lists. For example, OverDrive (2010) describes LibraryBIN (Buy It Now) through which patrons of partner libraries can purchase e-books, with the proceeds divided among OverDrive, the publisher, and the participating library. It also describes the results of a library patron survey that indicated that a significant percentage of patrons would consider purchasing an e-book if the title were unavailable at their library (see also Jackson, 2011). Just as lower production costs tend to lower the prices of e-books, the availability of a convenient way for patrons to make direct purchases through library websites will, by increasing a publisher’s revenues, have a similar effect.

²⁵ HarperCollins’ licenses require a library to re-purchase an e-book after it has been checked out 26 times (Bosman, 2011a) if the library wishes to continue lending the title. Grigson (2011: 31) gives Dawsonera and EBL as examples of distributors that limit the number of times that a book can be viewed during a certain period of time, but do not place limits on simultaneous usage. On this type of arrangement see Algenio and Thompson-Young (2005: 118) and Grigson (2011: 28). As Grigson notes (2011: 27), “purchasing e-books is usually more expensive than paying for a subscription,” which is not surprising since a purchase permits the book to be loaned in perpetuity whereas a subscription does not.

the number of uses is less than the limit imposed by the publisher). For other libraries, however, the value of an e-book with a limit on the number of uses will be less than the value of a comparable print book without a limit.²⁶ The effect of a limit on the number of uses is thus to reduce the amount that those libraries are willing to pay below the price of a comparable e-book with no limit. If publishers recognize this and offer a lower price for an e-book with restrictions, some libraries that would not have purchased an e-book at the higher price may do so, so that the revenues of the publisher may increase despite the reduction in price. Recognizing that the “value” of the second copy to libraries is lower than that of the first, HarperCollins offers additional copies at a discount,²⁷ which may mean that more libraries will purchase additional licenses once the limit is reached.²⁸

As in the case of restrictions on simultaneous use, restrictions on total use are likely to result in lower prices for a copy of an e-book than if there were no restrictions. Moreover, as in the case of restrictions on simultaneous use, the effect of a limit on total use is likely to induce large libraries to purchase additional copies of an e-book and to cause small libraries to purchase some e-books that they would not otherwise have purchased. In effect, the limitation permits the publisher to charge different prices to different libraries for the same e-book—large libraries pay more for the e-book because they purchase multiple copies. Thus, like a restriction on simultaneous use, a limit on total use permits the publisher to engage in price discrimination among different types of libraries, discrimination from which small libraries benefit.

Restrictions on the Duration of E-book Licenses. An alternative to limiting the number of times that an e-book can be borrowed before an additional “copy” must be purchased is to limit the period of time during which a library can lend a book before it must make an additional “purchase.” That is, publishers

²⁶ Armstrong and Lonsdale (2011: XXVI) note that “purchase gives perpetual access at higher per title cost.”

²⁷ During a recent panel discussion at BookExpo America on challenges facing libraries, Michael Santangelo, an electronic resources specialist at the Brooklyn Public Library noted, “I love that HarperCollins is the only one who really gives a discount on ebooks. That’s one positive thing I can say about it. They give a good discount, and, especially on the second copy, they’ve been putting out paperback pricing for some of their ebooks” (Kelley, 2011a).

²⁸ However, some libraries will find that the value of additional copies does not justify their purchase, despite the discount. Although restrictions on total use are sometimes justified by analogy to print books, where libraries purchase additional copies to replace books that are worn out, since e-books do not wear out, that cannot be the reason for imposing such restrictions. According to HarperCollins, the 26-loan limit was arrived at after considering several factors, including the average lifespan of a print book, and wear and tear on circulating copies (Hadro, 2011). Assuming that a popular print book will generally be checked out of the library 26 times for two-week periods during its first year on the market, this is equal to one year’s use for the book. Grigson (2011: 30) notes that publishers may impose usage limits because of concerns that unlimited usage may result in reduced sales of multiple copies to libraries, as well as sales to end-users. We understand that some libraries will purchase additional copies of an e-book when the number of users on the waiting list relative to the number of copies that are owned exceeds some threshold or when the number of times an e-book is accessed exceeds a given number. This is sometimes referred to as a “demand-driven” or a “patron-driven” acquisition model. For a discussion see Grigson (2011: 29-30).

may place limits not on the *number* of times that an e-book may be borrowed before a new copy must be purchased but on the amount of time that a library's borrowers may have access to an e-book before a new purchase is required, that is on the *duration* of an e-book license (e.g., an annual subscription). However, the effects of the two types of restrictions are similar.

Limits on total usage require libraries with large numbers of users to purchase more copies than libraries with relatively few users and some small libraries may purchase an e-book that would not have done so at the higher price that would have prevailed if there were no limits on usage. As already discussed, limits on total usage permit publishers to, in effect, discriminate in the prices that they charge to large and small libraries, with large libraries paying higher prices *per title*. By contrast, under an arrangement in which there are time limits, libraries regardless of size pay the same price for a license of any given duration. Because large libraries are likely to be able to accommodate large numbers of users during any time period, their cost *per use* will be lower than that for smaller libraries.²⁹ Thus, limits on total use and time limits on use have different implications for the costs incurred by libraries of different sizes.

Pure "Metering." Still another way in which a publisher might charge libraries for e-books is not to impose an initial charge but to charge by the use, what may be thought of as a pure "metering" model.³⁰ In this case, large libraries will pay more *per book* than will small libraries, because the number of uses at large libraries will be greater. In this model, it may be more difficult to predict how quickly the library's e-book budget would be expended, so that a library could charge the patron a fee for e-book borrowing in order to supplement its budget. At the same time, this approach is likely to change fundamentally the relationship between libraries and their patrons, although there have been times in the past that some libraries did charge fees for loans of new formats (e.g., during the introduction of VHS videotapes).

Other License Terms. There are also a number of possible variations in the types of licenses that are likely to affect the value that library patrons, and hence libraries, place on e-books. One is whether the license permits library patrons to download and/or print an e-book or limits them to online reading.³¹ The ability to download and/or print in e-book is likely to raise the price that publishers charge to the library for two reasons. First, library patrons are likely to place greater value on books that they can print or download than on those that they must read online and, as a result, libraries will place greater

²⁹ If the publisher also imposes a limit on simultaneous use, the difference between the *per use* costs of large and small libraries will be smaller than if there is no such limit.

³⁰ Library Ideas, LLC announced a business model in which libraries pay a per use fee instead of making an upfront payment (PR Newswire, 2011). Grigson (2011: 29) describes a similar "rental model" in which "If the user sees a title they wish to read that is not owned by the library, they can request a rental. The library then pays a fee and the user is granted temporary access to the book for a set number of days or weeks." Note that the HarperCollins license is a kind of "impure" metering in that the price of an additional use is zero until the limit on total use is reached at which point the library must purchase an additional copy or set of uses if it wishes to continue to be able to lend the book.

³¹ Grigson (2011: 20): "In some cases, the e-books must be accessed fully online at the website...In other cases, the library user may be able to download the e-book from the website to be read offline...."

value on them, as well. Second, the ability of patrons to download is likely to increase the extent to which a book is accessed by multiple readers in a single transaction, which has the same effect.³²

A second aspect of an e-book license that is likely to affect the willingness to pay of a library is the extent to which restrictions are placed on the identities of users to whom a library is authorized to lend. For example, authorized users of a university library may extend to “alumni, external members, business users and visitors or non-members.”³³ This is a less significant issue in the case of print books since patrons must work or reside in proximity to a library in order to be able to borrow from it.³⁴ In any event, the existence of restrictions on to whom an e-book can be loaned will, other things equal, reduce the willingness of a library to pay for it.

Although some publishers limit the availability of e-books to users of an individual library or consortium and prohibit interlibrary loans to other institutions,³⁵ some libraries have formed consortia to deal with publishers, aggregators, or vendors. For example, public libraries in Maine and Kansas have joined together with academic libraries to form a state consortium that negotiates with OverDrive and other vendors for content and access. These libraries then pay a fee, generally based on circulation or population, and content is shared across the member libraries.³⁶ Some publishers may acquiesce in such arrangements, especially if they are limited to small libraries that might otherwise not purchase the same books.

Budget Constrained Libraries

To this point, we have implicitly assumed that a library can and will purchase every book for which total surplus—the excess of reader valuations over borrowing costs—exceeds the price charged by the publisher. However, libraries generally will not have sufficient resources to purchase every such book.³⁷ In that case, a library that is maximizing the net value of its collection will adopt the following simple rule: Array books according to the *ratio* of total surplus to price and purchase books starting with the highest ratio and continue until its budget is exhausted.³⁸

³² For example, a borrower may lend the book to others before “returning” it to the library. For a discussion of e-book lending “clubs,” see Woo (2011).

³³ See Grigson (2011: 33).

³⁴ We are ignoring the possibility of interlibrary loans.

³⁵ See Algenio and Thompson-Young (2005: 120). All four of the licenses described in <http://guides.lib.ku.edu/content.php?pid=156297&sid=1325618> forbid transfers of an entire electronic book through interlibrary loans.

³⁶ Under these arrangements, libraries can choose to pay for additional services, depending on their patrons’ demands and one library mentioned paying the additional fee to obtain maximum access for a subset of the titles that is limited to its patrons.

³⁷ It is theoretically possible, of course, that a library will have sufficient resources to purchase not only books for which the total surplus exceeds the price set by the publisher but also books for which the price exceeds the surplus. We regard that case as unlikely.

³⁸ This assumes that the net values of books are independent of one another. The rule that we describe is analogous to that employed by firms when they make investment decisions but are constrained in the amount of investible funds. There, investment projects are arrayed by the ratio of their present values

The Effect of the Existence of Demand by Individuals

Publishers may be concerned that the availability of e-books through libraries will cause many users to substitute borrowing from the library for individual purchases. For example, the CEO of Faber and Faber is quoted as saying that lending of e-books by libraries could “undo the entire market for e-book sales.”³⁹ There are many ways in which publishers might respond to this concern.

First, a publisher might simply to refuse to sell e-books to libraries. Grigson (2011: 22) notes that “some publishers may be reluctant to make [e-books] available to libraries for fear of a negative impact on sales.” Owen (2011) notes that Macmillan and Simon & Schuster do not make any of their e-books available to libraries. Bosman (2011b) quotes a spokesman for Simon & Schuster as saying “Our e-books are not currently available in libraries because we haven’t yet found a business model with which we are comfortable and that we feel properly addresses the long-term interests of our authors.” However, Grigson (2011: 22) also notes that “other publishers see e-book availability as a driver for print book sales.” Even more recently, Penguin Group USA stopped making new e-books available to libraries citing “concerns about the security of [its] digital editions....” (Italie, 2011) and other reasons (Kelley, 2012).

Second, publishers might choose to delay library access to new titles for a period of time while making those same titles available to consumer markets. This is similar to an existing publisher practice called “windowing” where publishers release the hardcover format of a title before the paperback format is available. Delaying the release of the e-book format to libraries may be a strategy that publishers adopt in order to preserve e-book sales to individuals.

Third, a publisher might set certain e-book prices based more or less exclusively on the demand by libraries, leading to relatively few purchases by individuals. That is, a publisher may set a price so high that it expects few, if any, sales to individuals. This is more likely in the case of reference books particularly in the scientific, technical, and medical fields. In that case, we would expect e-book prices to be substantially above the prices of the print books that they replace, reflecting the fact that publishers are attempting to appropriate the value of their books not directly through the prices charged to individuals but indirectly through the prices that they charge to libraries.⁴⁰ Of course, as discussed above, the magnitude of the resulting price increase will depend on whether, and the extent to which, the publisher places restrictions on simultaneous and/or total use, with the increase being smaller the tighter are these restrictions.

Fourth, a publisher might attempt to charge higher prices to libraries than to individuals (i.e., to engage in price discrimination). The most prominent example of this practice involves Random House and its pricing of e-books. Another example may be found in academic journals, where it is customary

to their initial capital costs. An additional consideration is that the fixed costs that a library must incur in order to be able to provide e-books to its patrons will reduce the amount available to purchase e-books, and thus the number of e-books that the library purchases, if they are paid from the same (limited) budget.

³⁹ Quoted in Watters (2010). However, the same article quotes the director of channel marketing for Springer Verlag as saying that “Libraries buy direct from us and own the content. Once users download content, they can give it out, share, whatever. They own it. Some of our competitors are afraid to do this, but we say, free the content.”

⁴⁰ On “indirect appropriability” generally, see Besen and Kirby (1989).

for libraries to be charged prices that are several multiples of the prices for individual subscriptions.⁴¹ Whether this is feasible will depend both on whether a publisher can identify the different types of purchasers and prevent those who purchase at low prices from reselling to those who would otherwise purchase at high prices.

Fifth, some publishers or vendors might offer a subscription model, where a large variety of content is offered to a library for an annual fee, with the ability to monitor usage and update content as required. This could be offered as a tiered service so that budget-constrained or smaller libraries could opt for the more basic service while others could choose greater or more varied access. Publishers could also make available a “menu” of choices so that the aggregator could allow the library to choose a subscription model for some content, a “purchase” model for others, and a per use or limited usage model for still others.

Sixth, a publisher might adopt the “bookshelf” model under which it selects a number of titles available for libraries to purchase and retain the use of only for a limited period of time. At the end of the period, the books are “returned.” If the library subscribes again, another, possibly different, set of books is made available. A library’s willingness to pay for such books is limited both because the set may contain titles that it would not otherwise acquire and because the period of use is limited. That is, both bundling and restrictions on use serve to reduce somewhat the willingness to pay and, thus, the number of books purchased by the library.

Finally, publishers can ignore the existence of the library market and continue to set prices based exclusively on the demand by individuals. That practice was apparently adopted by the Walt Disney Company for pre-recorded videocassettes that it classified as “collectibles” (i.e., ones that many individuals would be expected to desire to own and replay often). In that case, video rental stores, such as Blockbuster, were able to purchase the videocassettes at relatively low prices despite the fact that they would rent them to a large number of individuals. By analogy, libraries would obtain “collectible” e-books at prices that are substantially lower than those that would exist if they were the only purchasers. In this case, libraries become just another set of customers.

Looking to the Future

Table 2 provides a summary of the large number of countervailing forces that affect the prices and availability of e-books both to libraries in general and to particular types of libraries.

Table 2. Summary of Findings

<p>Factors that Raise the Willingness of Libraries to Pay for an E-Book</p>	<ul style="list-style-type: none"> ● Lower borrowing costs than for a print book ● Value added features (e.g., note-taking) ● Simultaneous access ● Perpetual access ● Simultaneous release of content to library and consumer market
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⁴¹ For a quantitative analysis of this practice see Liebowitz (1983) and Issman-Weit and Shy (2003).

<p>Factors that Lower the Willingness of Libraries to Pay for an E-Book</p>	<ul style="list-style-type: none"> ● Restrictions on simultaneous use ● Restrictions on total use ● Restrictions on duration of use ● Restrictions on printing and downloading ● Restrictions on the set of authorized users and on interlibrary lending ● Delay in availability ● Requirement that patrons must be in the library to download
<p>Factors that Lower the Price Demanded by Publishers from Libraries for an E-book</p>	<ul style="list-style-type: none"> ● Lower cost of producing a copy than for a print book ● Availability of a purchase link on a library web site
<p>Factors that Benefit Small Libraries Relative to Large Ones</p>	<ul style="list-style-type: none"> ● Restrictions on simultaneous use ● Restrictions on total use ● Restrictions on duration of use ● Ability to form library consortia and/or engage in interlibrary lending

The large number and complexity of these factors helps to explain why libraries, publishers, and aggregators/vendors are all struggling to find workable licensing models that balance the need to cover publisher costs, reward authors, and respect intellectual property rights with the need to provide quick, easy, and inexpensive access to digital content. E-books have significantly increased the complexity of the work of librarians who are attempting to stay abreast of changes in platforms, complicated contractual questions regarding ownership and access of digital content, and issues of collections management. Similarly, publishers are pursuing a wide range of approaches with some continuing to offer e-books to libraries in much the same way that they offer print books, some others have chosen not to offer e-books to libraries at all, and yet others choosing a different path.

To further add to this complexity, the e-book market is fast-changing and traditional roles are being subject to challenge. As just one example, Amazon has established its own publishing business, announcing plans to publish books in an array of genres, in both print and e-book form, which places it in competition with traditional publishers (Streitfeld, 2011). Amazon has also entered into e-book lending—through its Kindle Owners’ Lending Library, a program that permits Amazon Prime subscribers to borrow, from a limited selection of titles, one e-book at a time up to one title per month for no additional charge,⁴² which places it in competition with traditional libraries.

In addition to the new realities of e-books, libraries are also struggling to define themselves in a digital world where patrons increasingly do not need to come to a brick-and-mortar library to obtain books or information. A set of papers commissioned by the Council on Library and Information

⁴² See Greenfield (2011).

Resources and summarized in Smith (2005) examined the role of libraries—primarily academic libraries—in an age when users can obtain information from any location and what this implies on how best to create and design library space. One paper argues for a library that can serve as a research center, a museum, and a venue for special collections, art exhibits, and performances, so that it can support scholarship and engagement with it. The Welch Memorial Medical Library at Johns Hopkins partners with clinical, research, and teaching teams to bring the library’s resources to patients and clinical staff, and designs audio-video materials on disease prevention and treatment for use in clinics. Smith concludes: “Some common themes connect the essays: the value of the library in supporting the social dimensions of learning, facilitating interdisciplinary work, serving as a media broker, and offering—in their staff—partners in learning, teaching, and research.” Public libraries face many of the same challenges.

Librarians are clearly destined to live in “interesting times.”

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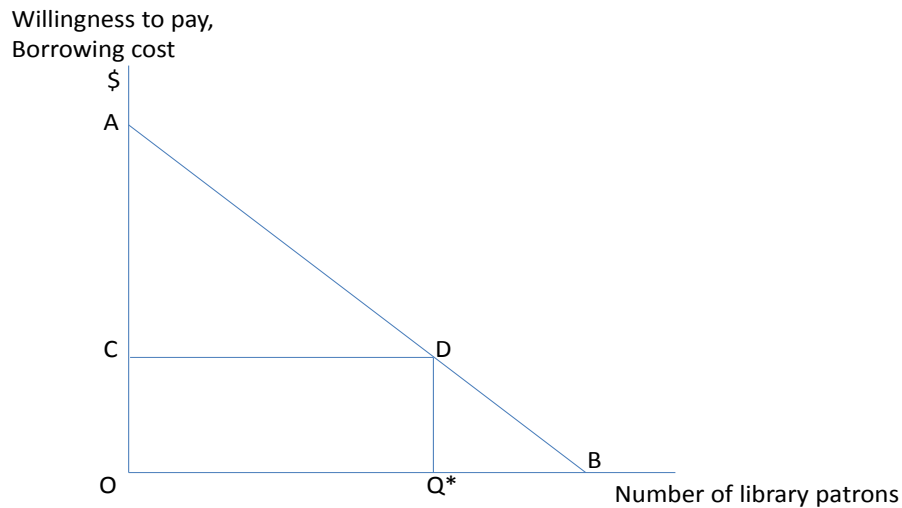
APPENDIX A. DERIVATION OF A LIBRARY’S WILLINGNESS TO PAY FOR A BOOK

In order to analyze how the existence of e-books can change the relationships among libraries, their patrons, and publishers, we begin by considering a world in which there are only print books and that there are no restriction on the number of times that a library can lend a book or on the time period over which loans can be made.⁴³

Figure A. 1 arrays potential borrowers at a given library according to the value that they place on a particular book. Thus, the first potential borrower values the book at OA and the second consumer at something less than OA and so on. Patrons place different values on having access to a given book but they also face costs (time and travel costs primarily) of \$C in going to the library to borrow and returning the book (given by the height OC in the figure). The maximum price that a given library is willing to pay for a book is assumed to be equal to the area between the reader valuation curve and the marginal cost of borrowing. At various points, we refer to this maximum price as the “surplus” that the library’s patrons receive if the library purchases the book or, alternatively, the library’s “willingness to pay.”

As shown in the figure, the patron that places the highest value on the book obtains a surplus of (OA – OC) or AC. Note that, because library patrons are arrayed according to the values that they place on the book and are assumed to face the same borrowing costs, the surplus obtained other patrons is smaller. Indeed, after Q*, the “surplus” becomes negative because the value that these patrons place on the book is less than the “cost” of borrowing the book. The total surplus, or maximum willingness to pay, of the library is thus equal to the area ACD.

Figure A.1. Willingness to Pay and Borrowing Cost for Library Patrons: Print Book



⁴³ Armstrong and Lonsdale (2011: XXV) refer to this as “perpetual access.”

To illustrate how the “surplus” of a given library, and thus its maximum willingness to pay for a copy of a book, can be calculated, assume that the value that each of five potential borrowers places on the book is as shown in Table A.1. In this example, the first patron places a value of \$10, the second \$9, and so on. Assume, further, that each patron incurs a cost of \$7 in order to borrow the book. In this case, the “surplus” or maximum willingness to pay of the library is \$6 = ((10-7) + (9-7) + (8-7)). If the library purchases the book, which it will if the price of the book is equal to or less than \$6, patrons A, B, C, and (perhaps) D will borrow the book. Patrons E and F will not borrow the book even if the library purchases it because the value that they place on the book is less than their borrowing cost.

Table A.1. Derivation of Library Surplus: An Illustration

Patron	Value	Borrowing cost	Surplus
A	\$10	\$7	\$3
B	\$ 9	\$7	\$2
C	\$ 8	\$7	\$1
D	\$ 7	\$7	\$0
E	\$ 6	\$7	--
F	\$ 5	\$ 7	--

Other libraries will calculate their surplus in the same way. Thus, one library may be willing to pay \$10, a second \$9, and so on. If the price of the book is set at \$7, this particular library will not purchase the book despite the fact that the total valuation placed on the book by its patrons exceeds the cost of borrowing incurred by these patrons, i.e. that the total surplus is positive, because the surplus, the library’s maximum willingness to pay, is less than the price of a copy. Moreover, even when a library purchases a copy, only readers whose valuation exceeds their borrowing costs will borrow it. Finally, some libraries will purchase multiple copies of a book in order to permit more than one user to access it at the same time if the value placed on it by their patrons is especially high.

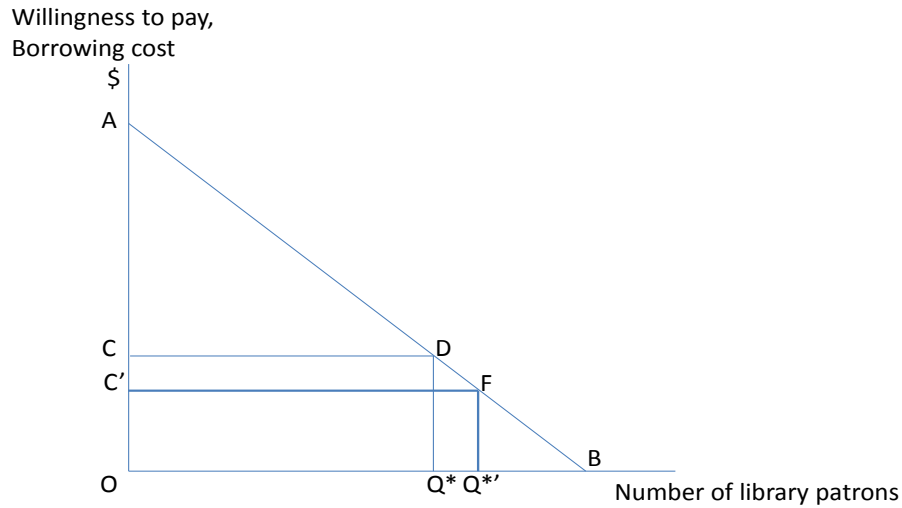
To illustrate how the replacement of a print book by an e-book affects the surplus, of a given library, suppose that the borrowing cost of an e-book is \$6, instead of \$7, the borrowing cost of a print book that was assumed in the previous example and the value that borrowers place on the book is unchanged. As a result, the surplus of this library is now \$10 = ((10-6) + (9-6) + (8-6) + (7-6)). If the library purchases the e-book, patrons A, B, C, D, and (perhaps) E will borrow the book but patron F will not.⁴⁴

Figure A.2 illustrates how the effect of the lower costs that are incurred by library patrons when they borrow an e-book than when they borrow a print book affects the library’s surplus, and thus its willingness pay of a library. We assume that borrowing cost declines from C to C’, so that the total surplus is now AC’F, which is greater than ACD. Moreover, the number of borrowers increases from Q*

⁴⁴ If the value that patrons place on the e-book exceeds that of a comparable print book because of greater convenience of use, e.g., the fact that it is more easily transported, the valuation curve would shift upward, further increasing the library’s willingness to pay.

to Q^* because there are a larger number of library patrons who value the book at more than their cost of borrowing.

Figure A.2. Willingness to Pay and Borrowing Cost for Library Patrons: Print vs. E-book



Finally, we consider the effect of introducing enhancements to e-books. This shifts the consumer valuation curve upward, as illustrated in Figure A.3, from AB to MN. If the cost of borrowing remains at C' , this further increases the library's willingness to pay, to $MC'J$, and further increases the number of borrowers, to Q^* .⁴⁵

⁴⁵ Algenio and Thompson-Young (2005: 119) note that “publishers could increase the price because of value-added features – e.g., XML markup for full-text searching capabilities.”

Figure A.3. Willingness of Pay and Borrowing Cost of Library Patrons: Print vs. Enhanced E-books

