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TEXTBOOK ECONOMICS IN AN ERA OF CHANGING  
MEDIA

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*Advisor:*  
Gary Pollice

*Submitted by:*  
Mehmet Ali Akmanalp

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## **Abstract**

This report focuses on the recent changes in technology and the effects of these changes on the textbook prices and market, such as the mainstream adoption of computers and the Internet, the rapid rise of e-books and e-book readers and the growth of online retail.

The report recognizes the following effects on the market: E-books and e-readers offer a plethora of improvements over traditional books, with several drawbacks that may be improved or eliminated in the future. Consequently, publishers are investing in creating e-textbooks. Online markets allow for much larger exposure even for relatively less publicized products. Self publishing is on the rise due to improvements in print technology that allow for low fixed costs for each print run and also the fact that authors can now more easily publicize themselves on the internet.

The report concludes the following: To maintain textbook prices at a reasonable level, students must research and utilize alternative sources of textbooks and professors must take price into consideration while choosing course required books. The new electronic medium is a completely different one with different possibilities that are still being discovered, and the book format does not make use of its strengths. Textbook publishing is too tightly coupled with print media, and what is needed is a more general form of educational company.

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# 1 Introduction

Textbooks have a prominent place in student life. Along with the educational quality of the textbooks, one must also consider the economics of textbooks. Indeed, it seems to be a common complaint that textbooks cost too much (or at least enough to invoke federal investigation by the Government Accountability Office (2005) and the invocation of the Higher Education Opportunity Act (2008)). Numerous studies have been conducted by government agencies and nonprofits, some of which will be discussed in depth in [section 3](#), that examine deeply into the world of textbook economics. However, it seems that their conclusions must be revisited because the conditions in which the studies were conducted are no longer current. As will be described in [section 5](#), the sale of print books in online retailers is now mainstream and a major competitor to brick-and-mortar bookstores. E-books are now a reality and e-book readers are becoming cheaper and ubiquitous, enough that some schools are considering switching to them (Sanders, 2010). Publishers feel forced to supply students and instructors with an increased amount of supplementary materials, a lot of them oriented towards electronic consumption, such as course slides, interactive course material and interactive homework problems. This research paper reviews the situation in light of recent changes.

## 2 Actors in the College Textbook Market

### 2.1 Overview

Even though textbook buyers only interact with the final vendor, the lifecycle of a textbook from the author to the end user is multi-stepped. These steps include publishers who guide the author through each step in taking their text and turning it into a viable, marketable and tangible product; distributors who are responsible for the distribution of the product to stores across the nation or world; book vendors who are responsible for selling the books to the end user. Each step is a separate entity which has its own financial concerns, and thus each step is an important driver of cost for the end user. This chapter sheds some more light into each step of the process and the factors which contribute to the final retail price of the product.

### 2.2 Publishers

Publishers are jacks of all trades that assist the authors in not just publishing but a variety of tasks including proofreading, peer review, finding distributors, marketing and printing. The process usually starts with a proposal from the author to the publisher, usually through an agent. If the work is accepted, the author and publisher must negotiate royalty percentages and intellectual

property rights. After this, the work is usually edited, proofread, peer-reviewed (if applicable) and sales research is done. Finally, the work is printed and distributed. Given the already laborious nature of authoring a work, publishers deliver an attractive value proposition: with the help of the publisher the author does not have to deal with any of these issues and may simply focus on completing their work.

Publishers are the money managers in the author-publisher relationship because of the nature of the division of work. To the publisher each work is an investment with a factor of risk associated with it, because the publisher must spend the majority of the costs associated with producing the work before any profit it makes any profit. While an educated guess about success of the book can be made by gauging interest from buyers and bookstores, the publisher cannot guarantee that it will turn a given amount of profit. Publishers may outsource parts of the process to different companies, commonly the printing and distribution and sometimes the design. Since each of the outsourced companies also has a profit interest, this might add to the cost. On the other hand, since each of these companies specialize in that specific area of work, it is possible for them to use this to streamline their costs, which brings the cost back down.

Royalties for authors will be around 5% to 15% of the net price of the book. One common practice is to increase the royalty rate in subsequent printings. This way, the publisher will suffer minimal damage if the work is a failure but the author will benefit if the work is a success. To sustain the author during the process of writing the work, some publishers will offer advance payments, usually on signing and on the completion of certain deliverables.

## 2.3 Distributors

Distributors make the work available to retailers across the country or world. For retailers, the value proposition is the convenience of having a single source for book orders rather than investigating and contacting publishers directly. Furthermore, distributors anticipate sales and keep books in stock, which reduces the wait time for retailers after ordering the book. For publishers, the value proposition is that they have a large distribution channel that will make the book available to a much larger audience (thus exposing the book to more potential customers, which in turn increase sales)

For distributors, the majority of the costs are in the storage and transportation of the books. This requires continuous investment in terms of vehicles, employment, property rent as well as contacts with publishers and retailers. As a result, the barrier to entry is very high. This is represented by the fact that the majority of college textbooks are distributed by only 4 large companies (Koch, 2006).

It is important to note that unlike publishers, the profit distributors make is not closely dependent on the success of any single book. Just as investors

keep a diversified portfolio of stocks in case of the disastrous failure of a single stock, distributors are protected in the same way. Their sales are much more dependent on the popularity of books overall as a medium, as well as the size of their contacts on either side of the supply chain (publishers and retailers), and their ability to fulfill demand completely.

## 2.4 Bookstores

The bookstores are the final retailers in the supply chain, and the only customer-facing companies. In the case of college bookstores, the college itself will sometimes operate the store but more often it's operated by a third party. This might be a small independent company or a large chain that primarily targets college bookstores, often also a distributor.

The majority of the costs for college bookstores is in acquiring the books wholesale and additional costs related to maintaining operations. Interestingly, the majority of profits is not from textbooks, but from other goods such as food, supplies and school branded clothes and accessories. (Koch, 2006) A significant source of income that college bookstores enjoy that are not available to publishers is used book buyback and sales, especially since some students are likely to only use a textbook for the length of a single term or a few terms, especially in the case of basic college requirements. However, publishers sometimes anticipate used book sales and add a fixed margin to the sale price of the book to account for this "lost" profit. This means that in the end, the initial buyers end up subsidizing the reduced cost of used books.

One important point is that the amount of space for new sellers in this field is fairly limited since there can only be as many bookstores as colleges. Furthermore, colleges do profit from bookstore sales so they are incentivized to direct students to their official bookstore, and thus the competition is disadvantaged.

Usually, regular bookstores will have to gauge customer interest in certain types of books. With college bookstores, however, this is not necessary since the books to be sold are pre-determined by professors. In some ways, college bookstores have a predictable profit because their client base is of a known size, and the number of books to be sold can be predicted in a reasonably accurate manner.

## 3 Previous Research

### 3.1 The GAO Report of 2005

The Government Accountability Office effectively serves as the congressional watchdog. It monitors the accountability of the federal government and reports on it. In 2005, congress requested a detailed review of the change in textbook

prices and the factors that contributed to it. The report found that over the last 20 years, college textbook prices increased at twice the inflation rate, at 6% each year since 1988. This rate is close to that of increases in tuition. The report goes on to explain that the increases in prices can be best explained by enhanced offerings such as web sites, slides, interactive software, etc. Other factors that affect the price are the demand for textbooks, the production costs and the availability of used books. They also note that instructors demand more supplements to aid teaching, but wholesalers and retailers think that the common practice of bundling supplementary materials with books limits students' ability to buy used books, which tend to be less expensive. Wholesalers and retailers also expressed concern that the revision rate for published material is higher than it used to be. Publishers agree but defend that it is a necessary measure. Finally, the report mentions how the same textbook might be cheaper overseas than in the United States, and that there are conditions set on retailers that limit reselling books from the overseas in the United States. Publishers claim that this is because after they spend the initial cost of making a book, reprinting and selling abroad is relatively cheaper. To be able to compete with local pricing conditions, the prices of textbooks might need to be lowered. ([United States Government Accountability Office, 2005](#))

### 3.2 The Koch Report

In 2006, Dr. James V Koch, Professor of Economics in Old Dominion University, published a report on request by The Department of Education's Advisory Committee on Student Financial Assistance. ([Koch, 2006](#)) The report talks about the textbook market and the conditions that affect pricing, and offers policies to restrain the prices to keep textbooks affordable. The report builds on the results of the GAO report of 2005, as well as containing a general overview of the textbook market itself with some surprising insights.

The report stresses the following reasons for the way the market currently is:

- The people who choose textbooks are not the same as the ones who buy them, and that faculty regularly receive free samples and only 58% are aware of the cost implications. Because of this, textbook demand is price inelastic.
- There are differences between the price of the same textbook depending on location, but there are contractual relationships between retailers and publishers to restrict re-importation.
- Need based financial aid in the United States includes textbook costs, so when textbook costs increase, the aid increases, in turn encouraging textbook costs to increase even more.

For the supply side of the market, the report describes the current climate:

- The report mentions that 5 large publishers, Thomson, McGraw-Hill, Wiley, Houghton-Mifflin and Pearson account for 80% of the market.
- There are also 4 wholesalers / distributors, Follett, Barnes and Noble, Nebraska Bookstore, College Bookstores of America, that sell to the majority of bookstores and also operate bookstores under contract.
- 50% of sales occur in the first year after publication.
- 50% of college bookstores are operated by the institutions they are tied to, 35% are operated by wholesalers and 15% by private and independent companies.
- A NACS study shows that when presented with the choice, 60% of students will choose to buy unbundled versions of textbooks.
- Some publishers such as MBS and Pearson have started releasing e-books but the books expire after several months and cannot be resold, thus gathering mixed reviews.
- There is also renewed interest in the textbook rental option, spurred by the recent increase in prices.

## 4 Driving Factors of Textbook Retail Prices

### 4.1 Supplementary Materials and Bundling

[United States Government Accountability Office \(2005\)](#) has suggested that publishers feel the need to add more supplementary materials to compete with other publishers, and that this is the major reason for the recent increase in textbook prices. They explain that this is because professors tend to deviate towards books that assist them in teaching the subject. The supplementary materials can range from a simple workbook or study guide to interactive CDs with animations, movies, video lessons, PowerPoint<sup>TM</sup> slides and even online homework systems such as Pearson's Mastering Physics<sup>TM</sup> that offer pre-created homework questions that correspond to the material and assist the student as needed. The cost of creating all this extra material is often subsidized by a practice called bundling, which means that the book is unavailable without supplementary materials, and the customer must buy them as a whole, regardless of whether they need it or not. This works because the initial cost of creating the material is relatively high but the marginal cost to the publisher is low or nonexistent.

Related to this is the consideration of *what* drives the increased amount of supplementary materials. While professors do appreciate supplementary materials, it is important to note whether the creation of such materials is fuelled directly on their request, or merely by the fact that competitors' textbooks are supplying such materials and there is a figurative arms race. Furthermore,



according to a study by the Connecticut Board of Governors for Higher Education, only 59% of professors were aware of the cost associated with the books they chose for their courses ([Connecticut Board of Governors for Higher Education, 2006](#)). One company, Thomson Learning, has taken the exact opposite approach by offering no frills black and white versions of their textbooks, named the Advantage™ series.

## 4.2 Revisions and Used Book Sales

Publishers have expressed the concern that they need to keep books up to date to reflect changing practices. ([United States Government Accountability Office, 2005](#)) However, there is a large amount of controversy regarding whether the revisions are indeed necessary or not. In a study conducted by Harris Interactive for the Nebraska Book Company, Harris found that 94% of bookstore managers believe new textbook editions come out too frequently, while 50% of professors agree. Furthermore, 89% of professors believe that newer editions of books only contain minor changes and students pay the price for these minor changes ([DeVito and Rempe, 2006](#)).

One alternate reason for why publishers keep releasing newer editions might be the used book market. As of 2010, used book sales account for 35% of all college bookstore sales ([National Association of College Stores, filed](#)). Bookstores can acquire used copies of books for cheaper, sell it to students for cheaper, and still make a profit. The publisher, however, will make no profit from the sale of the used book. This is also known as the durable goods problem. Releasing new editions of the book will likely result in professors updating to the newer edition, which directs purchases back to the publisher and effectively renders the older editions invalid.

## 4.3 Price Inelasticity

As ([Koch, 2006](#)) mentions, because textbooks are often required material for university courses, students have no choice but to buy them. Thus, as price increases, demand does not decrease significantly, as it does in other products. The measure of the change of demand relative to price change is called the price elasticity of demand of the product and textbooks are thus deemed “price inelastic”.

## 5 Changes Since The Previous Research That Affect The Textbook Market

### 5.1 Computer Ownership and Internet Access

One of the prime indicators of the acceptance of technological alternatives is the mainstream ownership of computers and internet access in the household. US Census data shows that there is a 7% point growth in household internet users from 2003 to 2007, and 7% again from 2007 to 2009 to 68.7% of the population ([U.S. Census Bureau, 2009](#)).

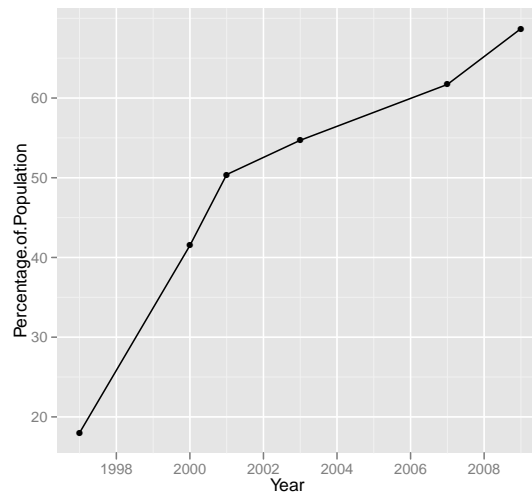


Figure 1: The growth in internet users in the US. ([U.S. Census Bureau, 2009](#))

This means that the growth rate of household internet use has effectively doubled between those time periods. Similarly, World Bank data shows 32% point increase in the number of overall internet users from 2000 to 2008, to 75.9% of the population ([World Bank, 2009](#)). Furthermore The Pew Research Center, a nonprofit think tank, has concluded that home broadband (which is a high speed form of internet associated with the ability to participate in advanced features of the internet, often used as an economic indicator) adoption has increased 15% from 2008 to 2009 ([Pew Research Center, 2009](#)).

### 5.2 E-Books and E-Book Readers

Another change that has occurred is the widespread popularity of e-books. E-books are a digital form of books which will be described in detail in [subsec-](#)

tion 6.2. The International Digital Publishing Forum calculates that the income from e-book sales has increased from \$1.5 million in Q1 2002 to \$11 million in Q1 2008 to \$90 million in Q1 2010 ([International Digital Publishing Forum, 2010](#)).

Likewise, in July 2010, Amazon (a major online retailer) released an announcement stating the following:

“In addition, even while our hardcover sales continue to grow, the Kindle format has now overtaken the hardcover format. Amazon.com customers now purchase more Kindle books than hardcover books—astonishing when you consider that we’ve been selling hardcover books for 15 years, and Kindle books for 33 months.” ([Amazon.com, 2010](#))

Furthermore, the Association of American Publishers says the following about e-book readers, specifically the Amazon Kindle:

“About one in five (22%) are aware of Kindle on an unaided basis, 9% on an aided basis. Among those aware, 3% own a Kindle (represents 1% of total respondent base projecting to 52,000 students. About one in five (22%) are Very or Somewhat interested in purchasing a Kindle (1.5 million students) and are willing to pay \$93 for the device.” ([Association of American Publishers, 2009](#))

All of this points to an increased preference in e-books and e-reader devices.

### 5.3 Online Retail

As online versions of services are appearing, retail is also undergoing a significant movement. The US Census Bureau estimates e-commerce going up from 0.9% of all retail trade sales in 2000 to 3.2% in 2007 to \$126 billion ([United States Census Bureau, 2007](#)). Forrester Research, an independent research company, projects that e-commerce will account for 8% of all retail sales in 2014 to \$250 billion ([Forrester, 2010](#)).

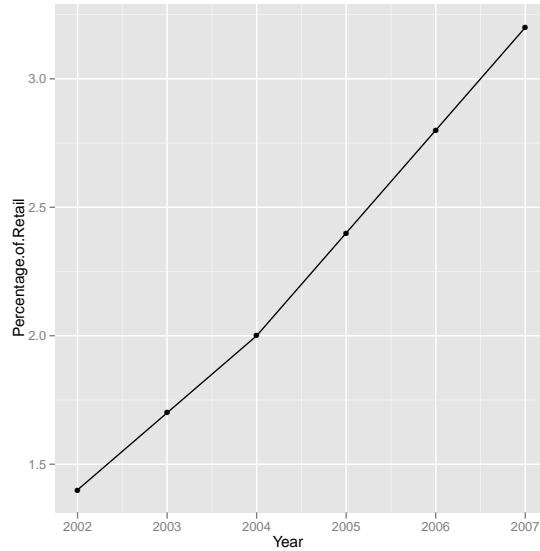


Figure 2: The growth in e-commerce in the US as percent of overall retail sales. (United States Census Bureau, 2007)

This marks a significant change in the dynamics of retail. Since online retailers have no "brick and mortar" store front presence, they do not have to pay for stores and the distribution and employees associated with them. Furthermore, the buyer often pays for the shipping costs. Finally, it is very easy for the customer to compare prices across retailers, and there are even websites that do so. This increases competition and reduces price elasticity on demand by a large amount unless all retailers simultaneously have a high price. Finally, the location of the retailer does not matter anymore, except for shipping costs. This means competition is now across the globe but it also means that small niche stores can reach a much larger customer group.

## 6 The Effects of The Changes Since Previous Research On The Textbook Market

### 6.1 Self Publishing

In traditional publishing, the process that happens between the conception of a book and its arrival into the hands of the customer is multi-layered. One needs the assistance of multiple parties. An emerging area of publishing is self-publishing, which encourages authors to take on the task of publishing themselves, without the involvement of a third party. Printing for these authors are

handled by POD (Print On Demand) companies. Because of digitization and modernized printing machinery the price and effort overhead required to prepare for a printing run is reduced greatly, and thus these companies are able to handle small printing runs without losing money. Furthermore, these companies accept texts in file formats that authors are likely to write in, such as Microsoft Word.

Self publishing enables the author to keep the majority of the profit as royalties (that would otherwise usually go to their publisher and agent) as well as keep the intellectual property rights. However, one problem with self publishing is that marketing the book is usually left to the author themselves, which means that it may never reach the number of professors that it normally would. Some companies are attempting to solve this by forming a “market” in which all the books that they publish are available for sale. The large amount of books in such combined markets makes it likely for a user to frequent the market, which is beneficial for all books in the market. Other companies such as Amazon and Barnes and Noble which already have a large online storefront presence are also starting to build their POD services. Finally, it is also possible for the author to partner with a 3rd party agency to handle marketing, as some publishers already do.

Another problem is that textbooks are often judged by which publisher they are published through, and a textbook that is published through a channel that accepts any book effectively has no credentials (unless it gains recognition somehow), regardless of the quality of its content. This method of rating, however, is unfair and outdated. With the recent rise of social media, it is possible for individual professors to rate and review books in a manner that is openly available to the public, and thus all that a good book needs to prevail is consensus among the target audience that the content is good. This way, it’s also likely that a much larger number of data points will be taken into consideration when a book is being rated.

## 6.2 E-Books and E-Readers

Another field that has been rapidly growing is that of e-books. E-books are books in such a form that can be read on electronic devices such as computers, phones, tablets and dedicated readers. It is becoming increasingly common for a new book to be released both in paperback and electronic form. There a multitude of benefits associated with e-books:

- With the increasing world population, space and waste management are both becoming major issues. A collection of e-books takes up no space, uses up no resources and generates no waste. It is possible for a single e-reader to contain thousands of e-books and an average computer can store tens to hundreds of thousands of e-books.
- The book is available in text form, which means that many technologies

that work with text are now available for books, such as search (which is especially useful in textbooks), machine translation and text to speech (which makes available books that previously were unavailable to the visually disabled, without requiring any additional work).

- There are currently over 3.5 million free e-books available ([World eBook Fair, 2010](#)). Furthermore, new e-books are priced lower than print books.
- E-books require fewer steps to reach the reader. There is no printing step involved and distribution is greatly simplified with the help of distribution sites that can be utilized by any computer user. This also means that e-books cost less to create.
- E-books are always available and never go out of print.
- E-books are safer and more likely to survive than print books, because they can be backed up electronically, and do not decay over time.

However, there are still a number of drawbacks associated with the current implementations of e-books:

- There is much fragmentation in the choice of e-book format between devices and software. Even though certain publishers and vendors offer multiple formats and the open PDF and EPUB formats are popular, readers for proprietary formats may become extinct.
- Not all titles are yet available in e-book form.
- E-readers have a high initial cost, compared to books, which do not require any additional devices to read. However, e-reader prices are declining rapidly. The first generation of devices cost around \$400, while the current generation costs around \$150. (An example of this would be the Amazon Kindle.) Additionally, it is possible to read e-books on other platforms, such as a computer, but this is not as convenient.

One must consider, however, that most of these drawbacks are not unsolvable flaws in the fundamental idea of e-books and are likely to be addressed over time.

### 6.2.1 E-Readers

The preferred way to consume e-book content is to use specialized devices called e-readers. Examples of popular e-readers include the Amazon Kindle<sup>TM</sup>, the Barnes and Noble Nook<sup>TM</sup> and the Sony Reader<sup>TM</sup>. The major advantage of these devices is that they have an e-ink<sup>TM</sup> screen which is more suitable for reading than normal LCD screens. E-ink is a proprietary technology that uses electrostatic charge and microscopic particles to imitate ink on paper, which does not rely on a backlight and is easier on the eyes. Currently, it is only commercially available in black and white but color e-ink has been developed

(E Ink Corporation, 2005) and touch screens are already appearing on some readers such as the Sony PRS-900<sup>TM</sup>. Another important side-effect of e-ink is that because of the way it works, once a certain image or page is displayed, it takes no additional power to keep displaying the image. Thus, the display consumes very little power, and it is not uncommon for an e-reader to last over a week on a single charge. The devices also usually offer additional functionality such as looking up words in a dictionary or encyclopedia and text to speech. Finally, some of the devices come with a Wi-Fi or 3G connection that allows the device to browse the web and retrieve books and content online.

### 6.2.2 E-Textbooks

E-textbooks already exist, and are gaining popularity. MBS, a textbook distributor, projects that by 2014 e-textbooks will account for more than 18% of the textbook market (Reynolds and Ioffe, 2010).

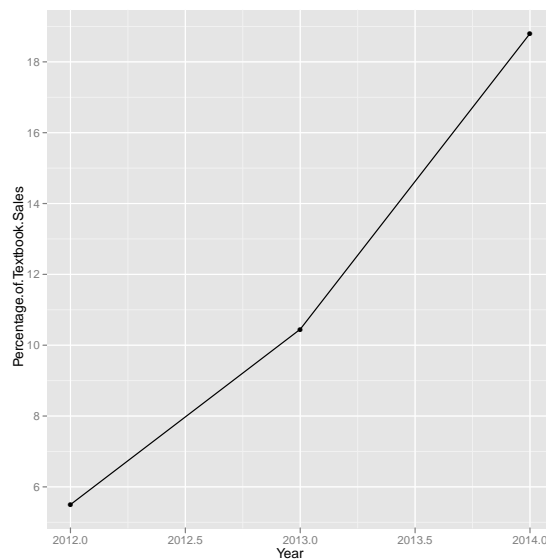


Figure 3: Growth projections for e-textbooks in the US. (Reynolds and Ioffe, 2010)

Companies such as CourseSmart, which is a joint venture between several traditional textbook publishers, have sprung up to satisfy demand as well as existing brands such as the Barnes and Noble Nook which have tailored software specifically, as with the Nook Study<sup>TM</sup>. These solutions usually run on the reader's computer, but some also support mobile devices, such as the Apple iPad<sup>TM</sup> (CourseSmart, 2010).

### 6.2.3 DRM

Since e-books are electronic, they eliminate the printing process and simplify distribution. Because of the electronic nature of the data, it is very simple to duplicate to share with other readers. Since publishers aim to sell a copy to each reader, this leads to a loss of potential profit. To solve this problem, publishers use a variety of access control technologies that are referred to under the umbrella term “DRM”, which stands for “Digital Rights Management” (although critics prefer “Digital Restrictions Management”). DRM attempts to limit the use of a certain copy of an e-book only to certain people, certain specific devices or certain types / models of devices. In this way, even though a book is duplicated, it will not work in other people’s devices, and each reader is forced to buy a copy.

One major issue with DRM is that most DRM formats are nonstandard and proprietary, which means that readers are locked into only using devices that the content owners specifically permit. The Electronic Frontier Foundation, a nonprofit dedicated to digital rights advocacy, maintains that this practice is anticompetitive ([von Lohmann, 2004](#)) since it doesn’t allow any other devices to contend with the original device. Furthermore, this clashes with the concept of private property rights. Under most property laws, if one owns a private property, they are allowed to do with it as they like, within reasonable limitations that protect the rights of others. However with current DRM implementations, legitimate needs such as copying for the purpose of backup or playing media on a different device may be disallowed. Furthermore, DRM requires dependence on the vendor after the product is bought. If the vendor decides to discontinue the software or hardware, the old content might be unavailable forever. An example of this happened in 2008 when Microsoft decided to discontinue their MSN Music store service, and the servers that held the licenses for the music were to be shut down. After the servers were shut down, the owners of the music could not transfer their music to, say, their new computer anymore, which limited the age of their music to the time they got their next computer ([Sullivan, 2008](#)). Another similar incident occurred when Major League Baseball changed their official DRM scheme, and stopped supporting videos published under the old scheme. The buyers were left with legitimately purchased content that they could not use ([Bangeman, 2007](#)). In conclusion, DRM gets in the way of the usability of e-books and universal compatibility between e-books and e-reader devices and software.

One might argue that DRM creates artificial scarcity. One of the fundamental problems in economics is the allocation of scarce resources. When something is demanded, a major factor that determines the price at which it should be sold is how easily it can be obtained. If something is very difficult to obtain, then it may be sold for a high price. Likewise, when something is ubiquitous, its worth is diminished greatly. When books are printed traditionally, it takes a certain effort to form the printed copy. Thus, assuming that there is demand for the



book, it is usual for the publisher, who controls supply, to name a certain price. Correspondingly, when books were hand-written and hand-bound, they used to be made in much smaller quantities and were much more expensive. Thus from a purely economical standpoint, in a world where the cost of duplicating an item is close to zero the value of the item is also close to zero since it is not scarce anymore. However, this argument can be countered by the moral argument that a significant amount of effort went into creating the book, and it would not be fair for the author not to profit from it. Furthermore, it can be argued that if the venture of writing books was not profitable, most authors would not write books in the first place. DRM restricts the duplicability of the e-book, which makes it artificially scarce and profitable again.

As a sidenote, following this logic, there is much debate and confusion as to what the price of an e-book must be. The best example for this is one that is the recent Amazon vs Macmillan controversy, where Amazon was capping prices for e-books at \$9.99 (paying for the price differential to publishers “out of the pocket” with the strategic benefit of selling more e-readers, a practice called loss-leading), while Macmillan, a major publisher, preferred to sell their books between \$12.99 and \$14.99. This resulted in a large dispute and Amazon temporarily removing the “Buy” button on their page from all Macmillan products, and Macmillan publishing a full-page newspaper ad stating that their newest book was “available in all bookstores except Amazon” (Fowler and Trachtenberg, 2010). An important factor in the determination of price is the consumer’s perceptions and expectations of the price. If the price of the e-book is higher than or very close to the price of the hardcover version, then the consumer is less likely to buy the e-book since the benefit of getting an e-book is not apparent. Consumers are aware that e-books do represent a significant cost reduction, but it is a matter of debate as to how much of this reduction should go to the publisher as profits and how much of it should end up as a reduction to the final retail price. In the Amazon - Macmillan controversy, one consideration for Macmillan might have been whether consumers’ price expectations are being lowered by Amazon’s prices, which might eventually set the bar for the market price of an e-book.

It is important to note that the idea of DRM has a major defect itself. All DRM is subject to a vulnerability dubbed the “analog hole” which follows the idea that for the user to be able to utilize the content, somewhere down the chain the data must be unencrypted, since the human brain is not able to interpret encrypted data. Therefore, when this unencrypted form is available, it can be copied. An example of this is when a user plays DRM protected music on their computer, and records it as it plays. Conveniently for circumventors, this can often be done within the computer itself, without even having to rely on the quality of speakers and microphones, causing a minimal loss of quality. Once a raw copy is obtained, it is trivial to distribute and duplicate it infinitely.

Even given the futility of such copy protection and the availability of illegal copies, companies that deal in the sale of infinitely duplicable goods (good

examples would be any online music, video and bookstore) have managed to turn a profit. This indicates that many people choose to legally pay for these goods even though they are unlikely to be caught and prosecuted for obtaining them illegally. This brings up the question of whether those who illegally obtain copies of the good (dubbed “pirates”) would actually buy it if they could not illegally obtain it. Whenever the answer is no, then those “pirates” are not potential customers, and therefore do not represent lost revenue. This makes DRM mostly pointless, because the people who do buy legal copies of the good do so in spite of illegal copies being available, and a portion of the pirates would not buy the good either way. Furthermore, DRM gets in the way of customer satisfaction by adding significant hurdles and incompatibilities to a simple process such as buying music. The reaction of consumers to the restrictions of DRM has manifested itself as the DRM-free movement. Two of the largest online music stores, Amazon MP3 and iTunes Music Store have switched to serving DRM free music, and some artists independently selling their music, notably Radiohead and Nine Inch Nails, are also proponents of DRM-free music (Bylund, 2007). Some publishers, such as O’Reilly, have also opted to serve their e-books DRM-free. O’Reilly subsequently saw a 104% increase in their e-book sales (Savikas, 2010).

#### 6.2.4 Difficulties In E-Book Adoption

As seen in the results of the WPI survey, only around 15% of students prefer e-books over print books.

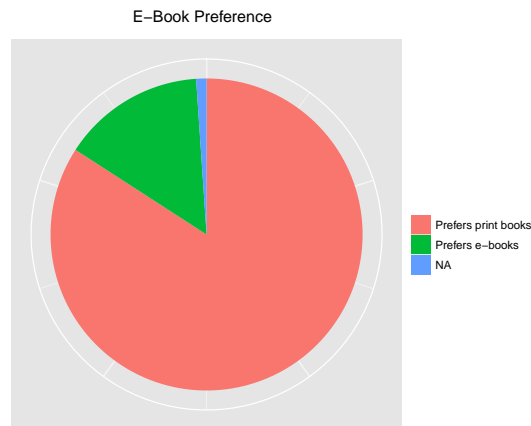


Figure 4: E-book preference at WPI.

Major reasons for this attitude include difficulties in taking notes and switching

between bookmarks. Taking notes is currently doable through a keyboard, which is more restrictive and impractical than a textbook, and doesn't allow drawing of figures or complicated notation that might not be doable with a keyboard. Bookmarks are also available but are still not as practical as real bookmarks. Furthermore, it is simple to lay out two or more print books out simultaneously and flip through pages quickly to browse through them, features which do not exist as of yet. However, it is probable that in the future, especially with the aid of improvements such as better e-ink refresh rates and touch screens, these common tasks will become closer in efficiency to textbooks.

### 6.3 Online Markets

With the advent of online stores, it is possible to have easier access to a much larger variety of items, and search and shop in a much more efficient manner. For sellers of books, such as publishers and retailers, this might have broad effects. For example, because of the universally accessible nature of online stores, the importance of local competition will diminish and give way to global competition. On the other hand, this supports the cause of niche stores that focus on a single area of focus. Each book has a much larger amount of exposure, but also much more competition. This means that when previously a customer might have not know that there is a better alternative and opted for a lesser book at the store, now they can know of all alternatives and thus the lesser books might not get enough of a chance to sell. (Of course, this is the case for books that can be objectively rated. With books whose rating depends on personal opinion, they might all get an equal chance depending on the audience they appeal to.) Some might argue that the need for physical stores is disappearing. According to a recent study by Millward Brown, 50% of respondents said they shop in stores rather than online because they like to see and touch items before they buy them, which might not be such a problem for books in general, because the expectation of quality is more dependant on the content. However, 42% said that they enjoy the atmosphere in the stores and 22% said they believe that taking the time to go to the store adds value to a gift. These are things that online stores currently can't supply, but might change over time as the thoughts preferences of people change. ([Millward Brown, 2010](#))

## 7 Conclusion and a Vision For The Textbook Industry

All the changes mentioned above point towards the improvement of the price conditions for students but the model is still dysfunctional. It must be noted that it's not the actions of a single ill-meaning entity that lies at the heart of the situation, as some would have us believe, but as evidenced here, a complex entanglement of interests. Even though a change in media is happening which

might eventually lead to reform, one cannot rely solely on reform to fix the situation or even for it to happen. For example, from the Amazon vs Macmillan debacle mentioned in [subsubsection 6.2.3](#), it can be inferred that the industry is fighting back to maintain old prices while also making use of the cost advantages of e-books. Rather, the actors in this situation need to be well informed and conscious about their choices and actions.

For example, professors still have no incentive to consider price in their book selection process or don't even recognize that the problem exists because they are not given book prices. A good reaction to this would be to mandate that when directly marketing a textbook to professors (as publishers usually do), the final retail price of the textbook must be clearly visible. An even better reaction would be to encourage and aid professors in considering alternatives, such as coming up with a definitive free-of-charge publication containing all new releases. In this way, professors would be less likely to take the path of least resistance, such as keeping the current book or using one of the books that was already sent to them. Or rather, if they do, it will hopefully be for the right reasons. Of course, a danger here is to overreact and put unreasonable measures on professors such as imposing conditions on their decisions or mandating certain books. It is the author's firm belief that people, especially highly trained university professors, will make the correct decision if they are truly informed and aware, without having to be coerced. Restrictions on textbooks are in effect restrictions on what can be taught, and thus in violation of First Amendment rights. Healthy competition along with informed decision is key.

The other party that must be informed is students themselves. As seen in the results of the WPI survey, an overwhelming 81% of respondents bought their books from the bookstore or the bookstore website when they arrived as freshmen. However, when looking at the distribution over *all years*, only 57% of respondents selected the campus bookstore and 27% selected the bookstore website as one of their usual buying methods. This sharp decline indicates perhaps that the encouragement towards the campus bookstore that the students (and their parents) is highly effective, or that it is simply the easiest option or the only known option available on the initial arrival to campus. However the students' preferences change once they've had the chance to learn about and explore other options. If this is indeed the trend, then it might be wise to inform students of all the options available before they have to make a decision.

What seems to be only recently catching on is the notion that the web and the electronic medium is entirely different than print. It has its own properties and its own advantages and disadvantages, which need to be taken into consideration. Whenever a new medium becomes popular, it is common that the practices of the old medium will be maintained for a while. The first examples of television programming would consist of a person appearing in front of the camera and reading the news from a piece of paper. It was hardly an improvement over radio. It did not occur to them that the limitations imposed onto them by the radio medium did not exist anymore. It wasn't an instant revela-

tion. Bit by bit, pioneers started exploring what could indeed be done, which evolved into television as we know it today, which has its own set of resources, processes, and skillsets needed that are completely different than those for radio. Similarly with the internet, there is so much more that can be done, but perhaps the realization hasn't come yet. Pearson's Mastering Physics website acts as a companion to textbooks, and tutors students individually by guiding them through problems step by step. This could be extended in many ways to a whole platform that explains topics, finds students' weaknesses and so on, eventually to replace textbooks altogether. Wikipedia, an online encyclopedia is by far the world's largest one with 3.4 million articles counting only the English ones, and it was written from scratch completely through volunteer work starting in 2001, and is freely available in its entirety. These two ventures alone are poised to invalidate the status quo, which does not make use of the advantages of this new medium.

So if such amazing things are doable, why do publishers limit themselves to the book format? Possibly, it's because they do not know any better. In their defense, there have been many attempts on part of the book industry to keep up to date. Publishers now all have their own websites and online stores, engage in e-mail marketing, and take part in social networks. However, it's difficult to distinguish which of these they do because they truly understand the need and which they do because "everyone else is doing it". Things that were once part of supplementary materials such as interactive software are now the main focus. Products like the Mastering Physics series from Pearson show some understanding of this concept. It is questionable, however, whether an entire industry whose core competencies are based in print media and whose leaders have not grown up with computers and the internet can understand and survive such a transition. An example of such a difference in book retail would be Amazon vs Borders. Borders is a company which has made an adequate effort to keep itself up to date. It is primarily a book retailer, which has an online outlet. Amazon on the other hand, has gone above and beyond what people expect from book retailers. Leveraging their deep understanding of the new internet medium, they revolutionized the business model using previously unheard of tactics such as having no storefront, offering free shipping (and free 2nd day shipping to students), pushing e-book adoption, creating their own e-reader. They are primarily a technology company with a focus on books. This distinction is very important. What we are hoping for from the textbook industry, which is currently tightly coupled with print, is a leap similar to what Amazon has made. Maybe what we have, the textbook industry, is different than what we require, which is the *education* industry.

## 8 Appendices

### 8.1 WPI Survey Methodology

#### 8.1.1 Overview

The survey was created through Google Forms, an online survey generator that allows for the mass download of the result data in CSV format as well as giving simple visualizations of the answers. It was then posted to the undergrads@wpi.edu and grads@wpi.edu mailing lists, the combination of which contains the whole of the student body. The survey questions were as follows:

#### 8.1.2 Survey Contents

1. What year are you?
  - Freshman
  - Sophomore
  - Junior
  - Senior
  - Graduate Student
2. What major are you? (Short Acronym)
3. Which do you prefer?
  - Print Books
  - E-Books
4. How do you buy books? (Multiple selection allowed)
  - Campus bookstore (From store)
  - Campus bookstore (Online)
  - Amazon.com
  - Other online retailer
  - Borrow from a friend
  - Don't buy the book
  - Get a scanned (PDF, etc) or photocopied version
  - Other (Please specify)
5. When you arrived at WPI as a freshman, did you buy your books at the bookstore? (Or buy them at the bookstore online before arriving?)

6. Are you more likely to buy books at the bookstore if a term is about to start?
  - Yes, I want them faster
  - No, I don't mind waiting a few extra days
  - Other (Please Specify)
7. What do you do with books after you're done with the classes you need it for? (Answer Never, Sometimes or Mostly for each)
  - Keep it
  - Sell it back to the campus bookstore
  - Sell online
  - Sell to a friend
8. Are you more likely to keep your books related to your major?
9. How do you think the following buying options are priced? (Answer Inexpensive, Normal or Expensive for each)
  - Retail Bookstores
  - Campus Bookstore
  - Online Bookstores
10. Would you use a website local to WPI where students can buy and sell their textbooks, similar to Craigslist or EBay?

### **8.1.3 Processing**

The data was initially pre-processed using OpenOffice Calc to get rid of redundancies that Google Forms created, such as having the text values “Yes” and “No” in the results rather than having a simple 1 or 0 to ease processing. Then, using scripts written in the Python programming language, the data was filtered again to normalize the majors the students had, such as having “CS” instead of “Computer Science” or grouping related majors into one large supergroup. Finally, the resulting normalized data was uploaded to a MySQL database. The data was then processed using the R statistical programming language with the ggplot2 library, to perform analyses and create graphs.

### **8.1.4 Results**

There were 774 responses to the survey (out of a campus population of about 4000), and the following conclusions were extracted:

- 84% of respondents prefer print books, 15% prefer e-books, 1% NA

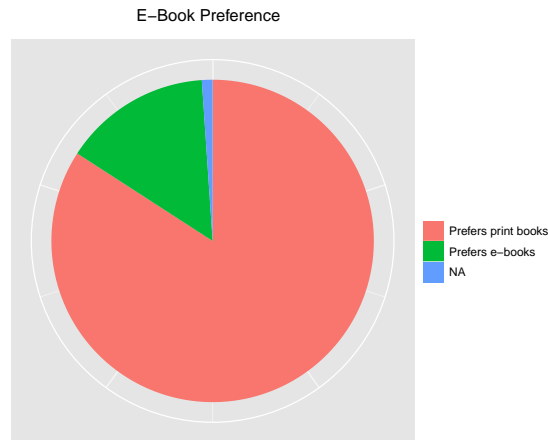


Figure 5: Pie chart of e-book preferences.

- Perceptions of price regarding different kinds of stores:

Store Type	Expensive	Normal	Inexpensive	NA
Retail Bookstores	53%	44%	2%	0.8%
College Bookstores	95%	4%	0%	0.3%
Online Bookstores	13%	47%	39%	0.3%

Table 1: Table of respondent price perceptions of different forms of stores

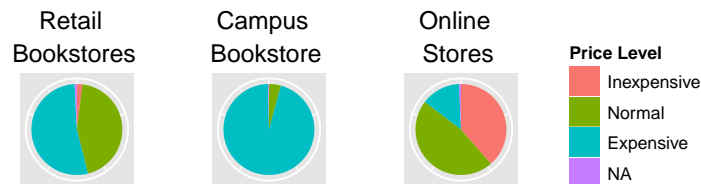


Figure 6: Pie chart of [Table 1](#).

The respondents are divided on whether retail bookstores are normal or inexpensive, but unanimously think college bookstores are expensive.



3. Most respondents prefer to keep textbooks related to their major.

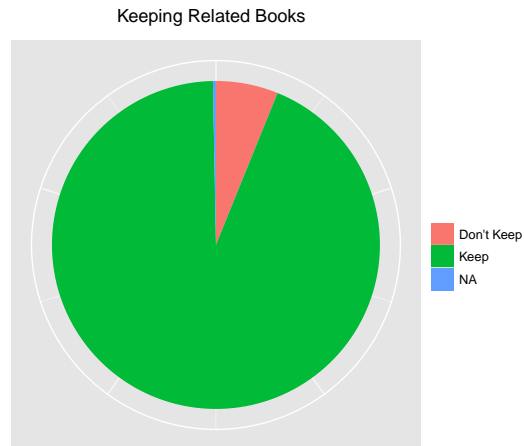


Figure 7: The percentage of respondents who keep textbooks related to their major.

4. About half of the respondents will not buy from the bookstore even if they are pressed for time (e.g. if the term is about to start).

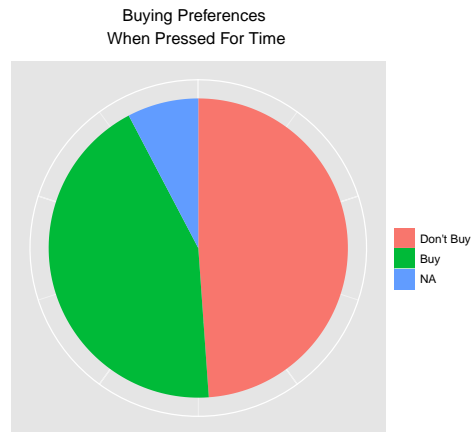


Figure 8: Buying preferences when pressed for time.

This indicates a strong preference against the bookstore by 48% of the

students, because it appears that they would rather risk being bookless than to buy at the bookstore.

5. Most respondents indicated that before they arrived at WPI or when they first arrived, they bought their books through the college bookstore.

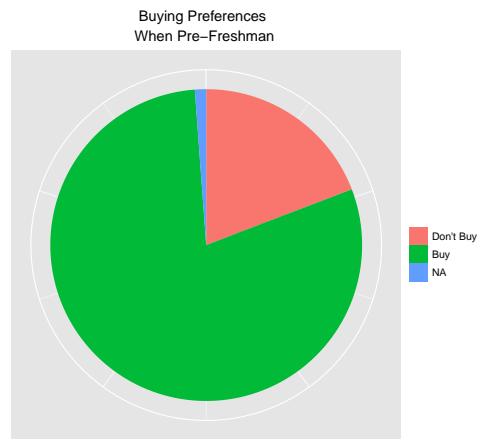


Figure 9: Buying from bookstore when freshman.

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