

Books as Capital Assets

By Rachel Soloveichik

Abstract

In 2007, I estimate that authors and publishers created original books with a value of \$9.1 billion. These books were first sold starting in 2008, and will continue to be sold for decades to come. Because of their long working life, the international guidelines for national accounts recommends that countries classify production of books and other entertainment, literary and artistic originals as an investment activity and then depreciate those books over time. However, BEA did not capitalize this category of intangible assets until the July 2013 benchmark revision. In order to change the national accounts, I collected data on book production from 1900 to 2010. I then calculated how GDP statistics change when books are classified as capital assets.

To preview, my main empirical result are: 1) Books have a useful lifespan of at least 50 years, with an annual depreciation rate of 12% per year; 2) Nominal book investment has hovered around 0.06% of nominal GDP from the 1930's until 2010. Therefore, nominal GDP growth does not change much when book production is classified as an investment activity; 3) After 1970, book investment prices rose faster than overall GDP prices. Accordingly, average inflation rises slightly when book production is classified as investment. Before 1970, book investment prices roughly track overall GDP prices.

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Introduction

In 2007, I estimate that authors and publishers created original books with a value of \$9.1 billion. There are two possible methods for BEA to account for this \$9.1 billion: method 1 treats book production as a current or intermediate expense; method 2 treats book production as a capital investment. Method 1 is generally used for items with a useful lifespan of less than one year. According to method 1, final revenue from the sale of original texts is all that matters for gross domestic production (GDP), and the BEA does not need to track production costs for books separately than other costs such as printing or advertising. Until the July 2013 benchmark revision, BEA used method 1 to account for the \$9.1 billion spent producing books.

In contrast, method 2 is generally used for items with a useful lifespan of more than one year. According to method 2, initial production costs for books are a capital investment, and added to GDP as part of private investment. That new capital investment in books is then added to the pre-existing capital stock of books to get the total capital stock of book originals. This capital stock of book originals then returns a flow of value to its owner, and that flow is counted in GDP as part of capital services. By including both the flow of value and the initial investment, GDP double-counts investment. As a result, GDP is always higher when a good is changed method 1 to method 2. Finally, the total capital stock of book originals is depreciated, which is known as consumption of fixed capital. In addition to the well-known GDP, BEA also estimates net domestic production. Net domestic production equals GDP minus consumption of fixed capital. Because net domestic production does not double-count investment, it is generally viewed as a better long-term measure of the total sustainable productivity of an economy.

In this paper, I will show that it is possible to calculate GDP when book production is treated as a capital investment (method 2). Unlike physical capital, I can't directly observe the total amount of book capital or the flow of services it provides. Nevertheless, I can observe the revenues earned by a book original over time. Therefore, the value of a book is simply the net present value of the future revenues it will earn for its owner, starting from the first time the book is published and ending when consumers lose interest and switch to newer books. I also cannot directly observe the amount of

money authors and publishers spend creating their works. Instead, I assume that authors and publishers spend \$1 creating a book for every \$1 in revenue they earn. These creation costs include not only out of pocket expenses, but also time and energy spent by authors writing the books. As a result, it is possible to account for book production and book depreciation in the same framework that is already used to account for physical capital production and depreciation. This is the framework recommended by the international guidelines for national accounts, System of National Accounts 2008, for all expenses related to the production of entertainment, literary and artistic originals (SNA 2008 10.115).

In order to provide a more accurate depiction of the book industry, I collected data on book production and calculate GDP when book production is classified as an investment activity. To preview, my empirical results are:

1) New books have a useful lifespan of at least 50 years, but they earn most of their profits in the first few years. On average, books lose 12% of their value each year.

2) Nominal book investment has hovered around 0.06% of nominal GDP from the 1930's until 2010. Therefore, nominal GDP growth does not change much when book production is classified as an investment activity;

3) After 1970, book investment prices rose faster than overall GDP prices. Accordingly, average inflation rises slightly when book production is classified as investment. Before 1970, book investment prices roughly track overall GDP prices.

My efforts to capitalize book production are part of a broader effort by the BEA to improve the treatment of intangible assets in the national income and product accounts. Other researchers at the BEA have developed a satellite account measuring the annual investment and capital value of R & D (Robbins and Moylan 2007), educational investments (Fraumeni, Reinsdorf, Robinson and Williams 2008) and the role of intangible assets in foreign direct investment (Bridgman 2008). I have companion papers that estimate investment, prices and capital stock for theatrical movies, long-lived television programs, music and miscellaneous artwork (Soloveichik 2013a, b, c and d).

This paper will consist of three sections. In section 1, I describe my data on nominal revenues earned by the book industry and calculate the nominal value of book production back to 1929. In section 2, I create a price index for books back to 1929, and

then use that price index to calculate real production of books back to 1929. In section 3, I describe my data on book revenue and advertising costs by quarter since publication. I then use that data to estimate the depreciation schedule for books. Finally, I use that depreciation schedule to construct a historical time series measuring the aggregate value of book originals from 1929 to 2010.

1. Nominal Book Production

What is a Book?

In this paper, I track the production of original books. I define original books as any work that could reasonably be published in a book, regardless of what form it is actually published in. This definition includes not only printed books, but also audio books, digital books and books licensed to magazines for serial publication.¹ There is no requirement for literary critics to approve of the book – I include Harlequin romances and textbooks along with great literary works. I also include works such as short stories, poetry, etc. that could be collected and published in books.

On the other hand, I do not include texts with a short useful lifespan in my analysis. For example, newspaper articles and magazine non-fiction are rarely republished in books or any other medium. As a result, I exclude all revenue earned by newspaper publishers and virtually all revenue earned by magazine publishers from the industry definition. I also exclude licensing revenue earned by authors from movies, television programs or other entertainment originals because those revenues are counted in the value of movies, television programs, etc.

At first glance, my choice to include some magazine revenue seems contrary to OECD's recommendation to exclude newspapers and magazines entirely from the category 'literary original' (OECD 2010 33.5). However, my treatment is in fact consistent if we imagine a two stage process: first the author writes an original book, and then he or she makes money by licensing that pre-existing book to a magazine for

¹ I don not include comic strips published in newspapers because comics republished in books account for a relatively small fraction of total comic revenue. Newspaper comic strips and comic books are rarely republished, so they are considered a short-lived asset. Just like soap operas, comic strip formats are long-lived even though each individual strip is short-lived. Capitalizing formats is a project for another paper.

publication. This is similar to the treatment of music played on the radio. In the United States, radio programs are very rarely replayed – and so radio programs are not considered long-lived entertainment originals. Nevertheless, I count the revenue from licensing music for radio airplay in the total value of a song (Soloveichik 2013b). The song exists in its own right, and earns money from multiple sources. The fact that some of the revenue sources are not long-lived entertainment originals is irrelevant.

Later in the paper, I will show that magazine licensing accounted for 40% of revenues earned by authors from 1929 to 1945. After 1945, fiction magazines were mostly replaced by paperback books (Goulart 1972). The new paperback books often published the same type of material as fiction magazines had published previously and were sold in the same retail outlets (Greco 2005). As a result, the switch from magazine licensing to paperback printing had little impact on the creation of book originals. I would significantly overestimate real growth of book writing 1940 to 1950 if I excluded magazine licensing revenue from the industry definition. At the present time, magazine licensing accounts for less than 3% of revenues earned by US authors.²

Tracking Nominal Book Revenues over Time

I use four main datasets to track book revenue from 1929 to 2010: a) The 2007 Economic Census; b) The Service Annual Survey from the Census Bureau; c) The American Association of Publishers (AAP) survey and d) The periodic Census of Manufactures survey. The 2007 Economic Census reports book sales in 2007. Those sales statistics is used to calibrate all the other numbers in this paper. The Service Annual Survey reports book sales from 2004 to 2010. The AAP survey reports annual sales of books from 1986 to 2008. The Census of Manufactures was conducted less frequently. I use the surveys from 1929, 1931, 1933, 1935, 1937, 1939, 1947, 1954, 1958, 1962, 1967, 1972, 1977 and 1982 to track nominal sales from 1929 to 1982 (interpolating between years with missing data).³ Because of interpolation, my sales numbers before 1985 are artificially smooth. This does not affect my estimates of

² Magazine licensing may increase in the near future. Over the last decade, graphic novels have dramatically increased their sales. Most of these graphic novels are reprints of non-US comic magazines (mostly Japanese), but some are US comics.

³ The Census Bureau provides its own interpolations after 1949. I use those interpolations when available.

average production, but it may change year to year production estimates significantly. Finally, I benchmarked all estimates to the 2007 Economic Census.

I use a variety of datasets to estimate the revenue from licensing books for magazine publication. I first used the Service Annual Survey, industry data and the Census of Manufactures to estimate the total value of magazines sold for every year from 1929 to 2010. I then used data from the Audit Bureau of Circulation and a stratified sample of magazine titles to estimate the annual market share for magazine fiction (versus non-fiction like news).⁴ Finally, I benchmarked my estimates to the 1947 Census of Manufactures, which reported magazine revenues by category.⁵

Figure 1 shows the annual sales of books for every year from 1929 to 2010. At first glance, the most striking result from Figure 1 is the steady increase in nominal sales from 1950 onwards. However, nominal GDP has also risen steadily over this time period. In fact, the share of nominal GDP devoted to book sales has remained relatively steady from 1950 to 2010.

Because my paper is focused on the production of new book manuscripts, I would like to measure revenue by the year of first publication rather than year of sale. For example a 2012 reprint of “Lord of the Rings” is attributed to 1937 – not 2012. Of course, I don’t know how much books released in 2007 will earn in 2017. I use data on current market shares for new books and old books to predict future earnings. This data is described further in section 3. Given my predicted earnings, I calculate the net present value (NPV) of new books:

$$\text{Investment} = (\text{Sales of New Books}) * [(\text{NPV of all Sales}) / (\text{Sales in First Year})]$$

In section 3, I calculate that new books account for 38% of total industry sales.⁶ I also calculate that the net present value (NPV) of all future sales is 2.07 times sales in the first year (at 7% real discount rate).⁷ Therefore, I calculate:

⁴ Many magazines published both fiction and non-fiction. I assumed that these mixed magazines had the same breakdown as the overall industry. For example, suppose that 1/3rd were straight fiction, 1/3rd were straight non-fiction and 1/3rd were mixed.

⁵This method treats all fiction magazine revenue as book licensing revenue. In fact, much of magazine revenue is spent to pay printing costs, sales costs, etc. However, the same holds true for book publishing revenue. For simplicity, I assume that magazine publishers had the same sales costs as book publishers.

⁶ In a previous version of this paper, I estimated the ratio of new book sales to total industry sales for each year from 1929 to 2008. My formula predicted that new books had very low sales during recessions and high sales during recoveries. Since then, I collected more data on sales after the financial crisis of 2008. I found that the market share for new books is relatively steady over the business cycle.

Investment = (Total Industry Sales)*.38*2.07 = 79% of Total Industry Sales.

At first glance, it might seem strange that investment is always lower than total industry sales. However, this is a natural consequence of my discount rate. Original books are long-lived assets, so many authors must wait five, ten or even fifty years before they earn money. These future revenues occur far in the future, so they are discounted heavily when valuing a newly created book original.

Book Revenues After Subtracting Manufacturing and Advertising Costs

Of course, book revenues are not equal to returns on the original manuscript. Publishers must pay for printing, sales and marketing before they can pay any royalties to authors. According to the AAP survey data, manufacturing, shipping and billing accounts for 45% of a book's wholesale price. The AAP survey only applies to printed books. Based on my research for music CDs and digital music, I estimate that audio books spend 18% of their wholesale price on manufacturing and sales and e-books spend 1% of their wholesale price on physical costs (Soloveichik 2013b). E-books have grown rapidly from 2009 to 2012, so the share of book revenue spent on physical costs has fallen. After subtracting physical costs, the AAP survey reports that publishers spend 27% of their revenue on marketing. I assume that the ratio of marketing costs to revenue after physical costs is the same for printed books, audio books and e-books.

The remaining 33%-72% of wholesale book revenue is used to pay copyright holders for the right to print their book. This includes publisher profits as well as author royalties. It might seem that only author royalties should be counted when valuing book copyrights. In practice, publishers are often unacknowledged contributors to the production. For example, editors select pictures and lay-out text for clear reading and other necessary editorial tasks. These editorial tasks cost money - and so it is not unreasonable for publishers to keep a portion of the profits from book sales to cover their costs. I assume that publishers own 50% of books targeted towards the general public

⁷The 7% discount rate deflates future sales by the PCE deflator, **not** the book price index. Over the past 20 years, wholesale book prices have grown faster than the PCE. However, I believe investors holding book copyrights are concerned with revenues relative to GDP, not revenues relative to the book industry.

and independent authors own 50%.⁸ Specialty books like textbooks or technical manuals are often produced by entirely by publishers. I assume that publishers own 100% of those books. Books targeted towards the general public account for approximately half of the book industry, so I calculate that independent authors account for 25% ($50\% * 50\%$) of book investment. The remaining 75% of new investment is produced and owned by publishing companies.⁹

As a robustness check on the AAP's cost data, I also used retail price data for books off copyright to estimate marketing costs and copyright owner profits. According to standard monopoly theory, copyright owners maximize profits by selling their books at a significant mark-up over manufacturing costs. In contrast, any publisher can print books off copyright, and so those classic books should sell for approximately the manufacturing costs plus bookstore costs.¹⁰ About 50% of the suggested retail price goes to the bookstore for store costs (Greco 2005).¹¹ Furthermore, the AAP cost data suggest that physical costs account for about 22% of the suggested retail price. Therefore, prices for classics off copyrights should be approximately 72% of copyrighted classic prices. I checked this prediction with sales data from Nielsen Bookscan. I found that average prices for classics off copyright are approximately 75% of average prices for copyrighted classic prices. Heald (2007) also found similar results when he compared prices for a sample of extremely popular classics on and off copyright.

The AAP cost survey runs from 1986 to 2007. Over that time period, printing costs plus marketing costs are relatively steady around 64%. I was not able to find comparable cost data before 1986. In the remainder of the paper, I will assume that marketing costs plus manufacturing have been a constant share of publisher revenues

⁸ Authors typically retain legal ownership of their book copyright for fiction books. However, they are often contractually required allow publishers to reprint those books for a set time period in return for a set royalty. Therefore, the true economic ownership of a book is shared between authors and publishers. In contrast, it is common for publishers to hire writers for references books and textbooks. Because the authors are employees of the publisher, the publisher keeps ownership of the copyright.

⁹I assume independent authors own all books licensed for magazine publication

¹⁰Because each publisher has a small share of the classic book market, no single publisher is likely to advertise much.

¹¹ Many bookstores offer substantial discounts from the suggested retail price. I include those discounts in the 50% store costs.

from 1929 to 2007.¹² This assumption is consistent with the industry literature. For example, a 1920 Atlantic article (Brett) on the book industry describes the cost breakdown for a sample book. In that example, royalties were 25% of publisher revenue and overhead costs were another 25%. If I attribute half of the overhead to book production (deciding which books to produce, editing book manuscripts, etc.), then I calculate that profits to the copyright holder were 37.5% of publisher revenues in 1920.¹³ This is extremely close to the 36% share given by the AAP data.

Figure 2 show the net present value of book production by year of initial release. I calculate that the NPV of new books was \$9.1 billion in 2007. Between 1929 and 2010, the nominal value of new books rose by 5.7% per year. Unsurprisingly, I find that the shape is very similar to the shape of Figure 1. The only difference is that Figure 2 is always lower than Figure 1 because capital services from book originals are less than book revenue.

Imports and Exports of Books

All of the sales data in Figure 1 are based on the Census survey of American publishers. As a result, I miss royalties earned by US authors who license their works to foreign publishers. Conversely, I improperly include the sales revenue from books written by foreign authors and then printed by American publishers. In theory, the best way to adjust data would be as follows:

$$\begin{aligned} (\text{US Production in Year X}) &= (\text{Value of Books printed in US}) * (\% \text{ US Authors in Year X}) \\ &+ (\text{Future Value of Foreign Royalties Earned in Year X}). \end{aligned}$$

In practice, I have not been able to find any good data on the % US authors over time. I experimented with constructing my own estimates of % US authors over time using USA Today's bestseller lists and Wikipedia, but that attempt only works for

¹² The industry source "Books In Print" lists all editions for a particular book and their suggested retail price. I tried comparing suggested retail prices for books on and off copyright back to 1948. However, the results suggested that copyrighted books were actually cheaper. I believe that the problem is caused by collectors' editions for classic books. These luxury printings sell very few copies, so they have little impact on average consumer prices. But they represent a larger percentage of ISBN numbers listed.

¹³ Relative to revenue, advertising was lower in 1920 and manufacturing was more, and the changes cancel.

authors famous enough to have Wikipedia pages.¹⁴ I have also been unable to find good data on foreign royalties over time. The best data on foreign royalties that I could find was a hypothetical profit breakdown for a high profile trade hardcover (Vogel 2004). However, that hypothetical breakdown was for a single point in time, and so could not be used to construct a reliable time series.¹⁵

I used Abebooks.com to get a rough idea of whether international trade in royalties has changed over time. Abebooks is a website that allows potential booksellers to list their used books and buyers to browse the used book listing. It is customary for booksellers to post a brief description of the book containing any information they think buyers might be interested in. I searched for descriptions containing the phrases: “American author”, “English author”, “British author”, etc. for every year from 1914 to 2008. I then calculated the percentage American authors for US booksellers and non-US booksellers over time. I found that neither percentage changed significantly over time.¹⁶ In other words, American authors now account for the same market share in the U.S. and abroad as they did in the 1920s.¹⁷

Based on the stability seen in the Abebooks data, I can use US publisher sales as a proxy for US author sales. As discussed earlier, U.S. publishers are not the same as U.S. authors, and so my estimate may be biased. However, the potential bias from using U.S. publisher data is the same for 1929, 1969 and 2009. Therefore, the growth rate of U.S. writing over time should be correctly estimated.

Quarterly Book Production

This paper counts book investment when the book is first released, **not** when the book was originally written. I make this choice for two related reasons: 1) It is extremely

¹⁴ I got pretty good coverage for recent books and top bestsellers, but authors who appeared lower on the list were very hard to track.

¹⁵ BEA does track book royalties in the trade in services survey. However, that survey is targeted towards large multinational companies and might not include independent authors.

¹⁶ Identified Americans account for 50% of books published by American publishers and 20% of books published by foreign publishers. I believe that these absolute statistics are skewed by the fact that American booksellers are more likely to mention nationality for foreign authors. I only look at changes over time.

¹⁷ Based on a linear regression from 1914 to 2008, with years clustered. I also experimented with splitting the sample at 1960. I found no significant trend before 1960, but a slight decrease in % American for foreign countries after 1960. For simplicity, I ignore the slight change.

difficult to measure book writing in real time. Accordingly, my quarterly numbers would be too speculative to include in the NIPAs; 2) Conceptually, unreleased books could be counted in inventories as “work in progress,” similar to the treatment of uncompleted manufactured goods. This paper does not count unreleased books in inventory. Instead, this paper is focused on how GDP changes when books are reclassified as capital assets.

2. Real Production

Defining A Price Index

In this analysis, I only consider the price of books sold. Therefore, I ignore free digital books like fan fiction or blogs. I also ignore pirated books like illegal Xeroxes or illegal transfers of electronic books. This definition is consistent with BEA’s general practice of excluding illegal activity from the National Income statistics. At the present moment, book piracy is relatively rare in the United States, so excluding pirated books makes little difference. However, book piracy is rapidly increasing with the introduction of digital books (Rich 2009), and so the treatment of pirated books may eventually become important.

It is difficult to develop a price index for books. Each book is a unique artistic creation, and so I can never compare the cost of producing two identical books over time. Furthermore, the main input to producing a book is an author’s writing talent. Stephen King can produce a far better story in one month than I could over my whole lifetime. In this paper, I use producer price indexes (PPI) from the Bureau of Labor Statistics (BLS) to create a price index for books from 1985 to 2007. I then use a variety of retail price indexes for books to extend my time series back to 1929.

In my analysis, I assume that the quality of books has remained constant over time. However, I do not assume that the quality of book consumption has remained fixed. For example, audio books and electronic books have recently become very popular. Similarly, modern textbooks often include websites, CD supplements and other non-book elements. I believe that these changes are improvements in copying and disseminating books. But the underlying book original is almost unaffected by the new

technology. In practice, this assumption is relatively mild. Book technology has not changed nearly as much as other entertainment options such as music or television.

Recent Price Trends

Figure 3 shows the BLS's producer price index for book publishers over time. On average, the wholesale price of books rises by 3.9% per year. This inflation rate is slightly higher than the overall inflation rate in the service sector, which averaged 3.2% per year. The higher inflation rate is consistent with low productivity growth in the book industry. After all, an author's time is the main input to a great work of literature. Computers and e-mail might make a few subsidiary tasks easier, but they don't help an author actually sit down and write the book. Furthermore, wages for highly skilled workers have risen faster than low skilled wages in the last 20 years. As a result, prices for services using highly skilled workers like authors and professors have risen faster than services using low skilled workers like restaurant meals or cleaning.

As Figure 3 shows, the BLS's PPI index does not match either of BEA's pre-existing price indexes for books. Recreation book prices are nearly flat from 1995 to 2010. In contrast, educational book prices rise very fast.¹⁸ When I weight the two consumer price indexes by their wholesale revenue share, the BLS PPI tracks average book prices reasonably closely. As a robustness check, I also collected wholesale price data from the American Association of Publishers (AAP) has a yearly survey where they ask publishers about wholesale prices for books. This yearly survey produces a wholesale price index for consumer books that matches closely with the BLS's PPI.

¹⁸The main reason for the different price trends is different inputs. Educational book authors tend to be highly skilled individuals. This group has experienced larger wage gains than the overall public. In contrast, recreational book authors are often ordinary people. Furthermore, recreational books benefited from chain book sales and internet sales driving down the average retail mark-up. Educational books are often sold directly to schools, so they had much less competition (Raff 2000). In addition, educational book prices may have been increased to compensate for used book sales. Finally, the BLS's consumer book index uses a matched model technique to calculate inflation for books. This technique has been shown to underestimate inflation in other industries (Reinsdorf, Liegey and Stewart 1996).

Historical Price Trends

The BLS does not report book publisher's PPI data before 1985.¹⁹ I will therefore use a variety of price indexes as a proxy for wholesale book prices. From 1980 to 1984, I use the BLS's PPI for magazine publishers as a proxy for book publisher prices. From 1929 to 1979, I take my price indexes from BEA's pre-existing deflators for recreational books and educational books.²⁰ Both price indexes are published in Table 2.4.4, (line 17 and line 22). The BEA's deflators track retail prices, so they are not a perfect proxy for wholesale book prices. As a robustness check, I experimented with calculating a price index from the Census of Manufactures data. Overall, the Census of Manufactures produced similar inflation to BEA's price index, but the price series was more volatile and only covered Census years.

Figure 4 combines the wholesale price index from Figure 3 and BEA's retail prices to create a time series from 1929 to 2010. The most striking result from Figure 4 is that inflation rates have not been constant over time. Between 1929 and 1959, book prices rose by only 2.1% per year – about the same as the overall economy. Between 1959 and 1989, book prices rose by 5.3% per year – 0.8% higher than overall GDP prices. Between 1989 and 2010, book prices rose by 3.7% per year – 1.5% higher than overall GDP prices. The results after 1959 are consistent with Baumol's cost disease hypothesis. According to that hypothesis, the price for goods with zero productivity growth should rise much faster than overall inflation (Towse 2003). Before 1959, printing technology improved rapidly (Genesove 1999) so book prices were able to stay low. Between 1960 and 2005, printing technology did not change much. As a result, book prices rose faster than overall inflation. In the past few years, e-readers like Kindle have started to change the book industry. The new technology might lower book prices going forward.

As a robustness check, I compared newspaper prices with my book price index. I found that quality-adjusted newspaper prices track book prices closely. The match is not always perfect, but they are generally close. These results are available upon request.

¹⁹ Between 1980 and 1985, the BLS reports a PPI for magazine publishers, but not book publishers. These two PPIs track very closely. I use the magazine PPI from 1980 to 1984.

²⁰ Recreational books and educational books have very different price trends. Educational books are approximately half of the book market – so I average the two price series to get a single inflation rate.

Real Book Production

In Figure 5, I estimate real book production by combining the nominal production index in Figure 2 with the price index in Figure 4. The most important result from Figure 5 is that real book production rose very slowly from 1970 to 2010. Over the same time period, real GDP grew by 207%. Average GDP growth falls by 0.0014% (real) per year when book production is classified as an investment activity. Between 1929 and 1970, real book production rose at approximately the same rate as real GDP.

At first glance, the stagnant book production from 1970 to 2010 seems surprising. US population grew by nearly 50% over that time period - so it might be expected that the number of authors would also grow by 50%. In fact, technology changes have dramatically changed the demand for books. Since 1970, the technology for listening to music, watching movies and television has improved dramatically. Video games did not even exist in 1970. Over the same time period, the technology for writing books, printing books and enjoying books has changed little. Some creative people may have responded to the new technologies by redirecting their energies from book writing to other forms of entertainment. Newspapers have also experienced declining real sales and stagnant readership since 1965 (Newspaper Association of America 2009).

Section 3: Depreciation of Book Originals Over Time

In this paper, I define the value of a book original as the expected present value of future revenues minus future costs. I define the depreciation schedule as the rate at which a book copyright declines in value over time. There are many possible reasons why a book original might decrease in value over time. For example, all consumers in a target market might have already bought the book. Alternatively, a book might fall out of fashion because of cultural change. In this paper, I will not attempt to distinguish between the various reasons a consumer might stop buying an old book. I simply attempt to estimate the schedule at which authors and publishers earn money from their books, and the costs associated with those revenues. In order to simplify my analysis, I track

only future sales of a particular book, and ignore the possible value of sequel rights or movie licensing. I do not know if including sequel rights in my analysis would change the depreciation schedule for books.

Which Books Are Used in My Sample?

My depreciation schedule is based only on the sales of non-revisable books. I define a non-revisable book as one that is written once and then remains unchanged for its entire lifespan. For example, Mark Twain wrote “Tom Sawyer” in the 1800’s, and publishers have been reprinting the book since then.²¹ Similarly, a popular history book like ‘John Adams’ by David McCullough can be reprinted year after year. In contrast, many genres are revised frequently. For example, textbook publishers generally publish a new edition every few years. The new edition might be 90% the same as the old edition – but it has all new page numbers and a few new chapters. Similarly, a self-help book might reprint the same basic advice with a few new anecdotes.

It would be very hard to calculate depreciation rates for revisable books. The new edition might be virtually the same as an old book, or it might be completely different. There’s no way to tell without reading both books side by side. In this analysis, I assume that revisable books follow the same depreciation profile as non-revisable books. Because publishers are periodically editing the revisable books, the future revenues are always higher for revisable books – but so are the future costs.²²

Datasets Used

My main dataset for estimating sales over time is Nielsen’s Bookscan data. This dataset provides weekly sales data for a sample of more than seven hundred thousand separate books. Nielsen’s Bookscan data is based on store scanner data, and so it tracks

²¹ Many publishers do minor edits like updating spelling, removing controversial words or adding pictures. I used my judgment to date translations. For off copyright books like the Bible, I dated the book to the date of translation. For newer books, I dated it to the original publication.

²² In other words, suppose that \$1 spent writing a mystery book in 2009 produces \$0.75 revenue net of sales costs in 2010, \$0.38 revenue net of sales costs in 2011, \$0.19 revenue net of sales costs in 2012, etc. An encyclopedia writer might spend \$1 researching in 2009 for a brand-new encyclopedia and then earn \$0.75 in 2010 from the first edition. In 2010 he’ll spend \$0.50 updating the new encyclopedia and then earn \$0.75 from the 2011 version, etc. This revenue stream could be explained by the same depreciation profile for encyclopedia writing as for mystery books.

actual retail sales across the US. The Bookscan data includes online retailers like Amazon, physical bookstores like Barnes & Nobles and non-traditional bookstores like Starbucks or Toys R' Us.²³ Furthermore, Bookscan data includes audio books as well as printed books.²⁴ Early in the sample, Nielsen was rapidly adding stores to their dataset, and so data across time may not be consistent. I therefore focus on sales since 2004, when Nielsen stabilized their sample. In my empirical analysis, I selected a stratified subsample of approximately 7,000 books, with an over sample of popular book editions. I then downloaded weekly sales for the books in my sample.

Nielsen Bookscan reports the publication date for a particular book edition, but **not** the original publication date for the book itself. In many cases, editions are published well after the book was first released. For example, publishers responded to the 'Narnia' movies by printing new editions with cover art taken from the movie. However, the actual text of those new editions is the same as the classic Narnia books. I used a variety of online sources to determine the original publication date for each book in my sample.

Market Share by Book Vintage

In my analysis, I use current market shares as a proxy for future revenues. For example, suppose that books written in 1997 earn \$100 million dollars in 2007. I assume that books written in 2007 will earn around \$100 million in 2017. This assumption may produce misleading results in a rapidly changing economy. For example, the complete lack of iPhones from 2000 does not prove that iPhones always break after 10 years. However, section 2 showed that real book sales have grown very slowly since 1970. Therefore, it seems reasonable to expect flat sales in the future.

Figure 6 shows the market share²⁵ by quarter since publication for books published recently. The most striking result from Figure 6 is that sales decline rapidly at first. Immediately after release, brand new books account for 16% of the total market. In the next quarter, sales decline to 10% of the total market. One quarter later, sales decline

²³Wal-Mart does not participate in the Nielsen data, and so it might not be nationally representative.

²⁴Nielsen does not include books licensed for magazine publication and seems to exclude digital books. My dataset covers the period 2004-early 2009, so digital book sales and magazine sales were very small.

²⁵ I weight books by the suggested retail price. I do not observe actual retail prices or wholesale prices. As a robustness check, I also tried imputing wholesale prices from format and genre. Results were similar.

further to 5%. After the first year, sales stabilize and the depreciation rate becomes much smaller. Because I use means, these results are heavily influenced by a few successful books. The “typical” book sells only a few copies right after publication and then disappears forever (Greco 2005). However, I believe it is appropriate to focus my attention on the small number of successful books. These books account for the majority of industry revenue and profits. Accordingly, depreciation for those books accounts for the majority of total industry depreciation.

Figure 7 shows the market share by quarter for slightly older books. I find that sales decrease slower than in Figure 6, but still reasonable fast. Between age 3 and age 13, sales decrease by more than 80%. This is equivalent to a depreciation rate of 15% per year. After age 13, the depreciation rate slows significantly. Figure 8 shows the market share for a fixed sample of books published before 1990. Between 2004 and 2008, sales for these classic books drop from 14% of the total market to 10% of the total market. This works out to a depreciation schedule of 7% per year. Results are similar if I graph the market share for older books at a single point in time.

The main sample used in this paper tracks book sales from January 2004 to early 2009. The economy was booming over that time period, and so book sales were relatively high. Book sales dropped dramatically when the financial crisis hit and have been down since then. It is possible that depreciation schedules are different in a booming economy and a bust economy. To check, I downloaded a smaller sample of book sales from January 2004 to May of 2010. I found that the market share for new books was almost identical in the 2009 as in better economic times. Therefore, my depreciation schedule is not sensitive to the time period studied.

Sales Costs by Book Vintage

According to the American Association of Publishers, marketing accounts for 19% of total publisher costs.²⁶ I use advertising data from Kantar Media to track marketing expenses over time. Kantar Media tracks advertising \$'s by individual book editions and non-specific advertising by publishing houses. In my empirical analysis, I

²⁶ The American Association of Publishers probably counts publishers' costs for author tours, but not the value of author's time. Marketing costs might be higher if those time costs were included.

selected a stratified sample of 1,000 separate items and then looked up the publication date for each individual book edition. Kantar Media does not track non-advertising marketing like author tours, salesmen visiting retail stores or catalogues featuring a new book. Kantar Media also omits within-company advertising such as sample chapters in the back of a book. In my analysis, I assume that all marketing has the same profile over time as out-of-pocket advertising for individual books.

Figure 9 shows the market share for advertising by quarters since release. I find that 68% of marketing occurs in the first quarter after release and 87% of marketing occurs within the first year.²⁷ After the first year, there is a steady trickle of marketing.

According to the American Association of Publishers, book production and sales account for 45% of wholesale prices for print books. I do not have any direct data on printing costs by book vintage. However, hardcover books (which are mostly new) and paperbacks (which are often older) spend approximately the same percentage of revenue on printing. In my analysis, I assume that production spending is 45% of revenue for every quarter from release until the copyright expires.

Figure 10 calculates the depreciation schedule for book originals. Book originals depreciate rapidly regardless of whether I track revenue or profits. When I track revenue, book originals lose 80% of their value in the first five years of life. Depreciation is slightly slower when I track profits, but original books still lose 64% of their value in the first five years of life. In the national accounts, I approximate the depreciation schedule shown in Figure 10 with a geometric depreciation rate of 12.06% per year. This geometric rate produces similar estimate of aggregate capital stock

At first glance, the short lifespan for book originals suggests that almost nobody reads classic books. In fact, book copies are durable goods. Accordingly, a library might purchase a book copy soon after release, and then lend it for decades to come. Similarly, consumers who discover an old author can often buy used copies of his or her works without the author or publisher making any new money. In this paper, I am focused on

²⁷ This includes marketing before a book is released.

estimating the lifespan of a book original to the author or publisher. The lifespan of an already purchased book in the consumer's library is irrelevant to my research.²⁸

Figure 11 calculates the total capital stock of books from 1929 to 2010 using the real production estimates given in Figure 6 and the depreciation schedule given in Figure 11. I find that the real capital stock grew rapidly from 1929 to 1965, grew slowly from 1965 to 1990 and then stabilized at around \$66 billion real from 2001 to 2007. Both the geometric rate and the complex depreciation schedule produce similar trends over time.

Conclusion

In this paper, I constructed NIPA estimates when production of original books is treated as an investment activity rather than an intermediate expense. This change helps bring the NIPAs in line with SNA 2008, which recommended that entertainment originals be treated as capital assets.

In order to construct the NIPAs, I collected a great deal of data. I first estimated the nominal production of books from 1929 to 2010. I then constructed a price index for books from 1929 to 2008. Finally, I estimated the depreciation schedule for books.

To review, my empirical results were

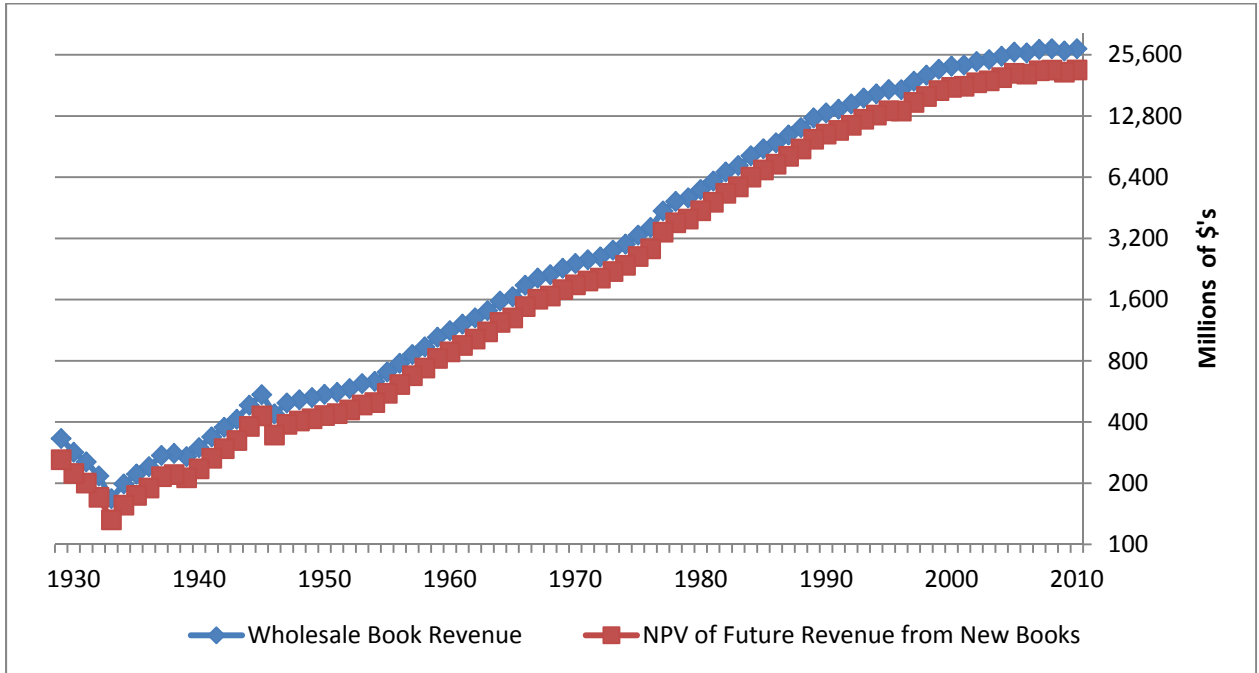
- 1) New books have a useful lifespan of at least 50 years, but they earn most of their profits in the first few years. On average, books lose 12% of their value each year.
- 2) Nominal book investment has hovered around 0.06% of nominal GDP from the 1930's until 2010. Therefore, nominal GDP growth does not change much when book production is classified as an investment activity;
- 3) After 1970, book investment prices rose faster than overall GDP prices. Accordingly, average inflation rises slightly when book production is classified as investment. Before 1970, book investment prices roughly track overall GDP prices.

²⁸ BEA calculates the capital stock of consumer durables. In order to do this, BEA estimates consumer purchases of books and their lifespan. This lifespan was estimated using very different techniques than described in my paper.

Table 1: List of Main Datasets Used and How They Are Used

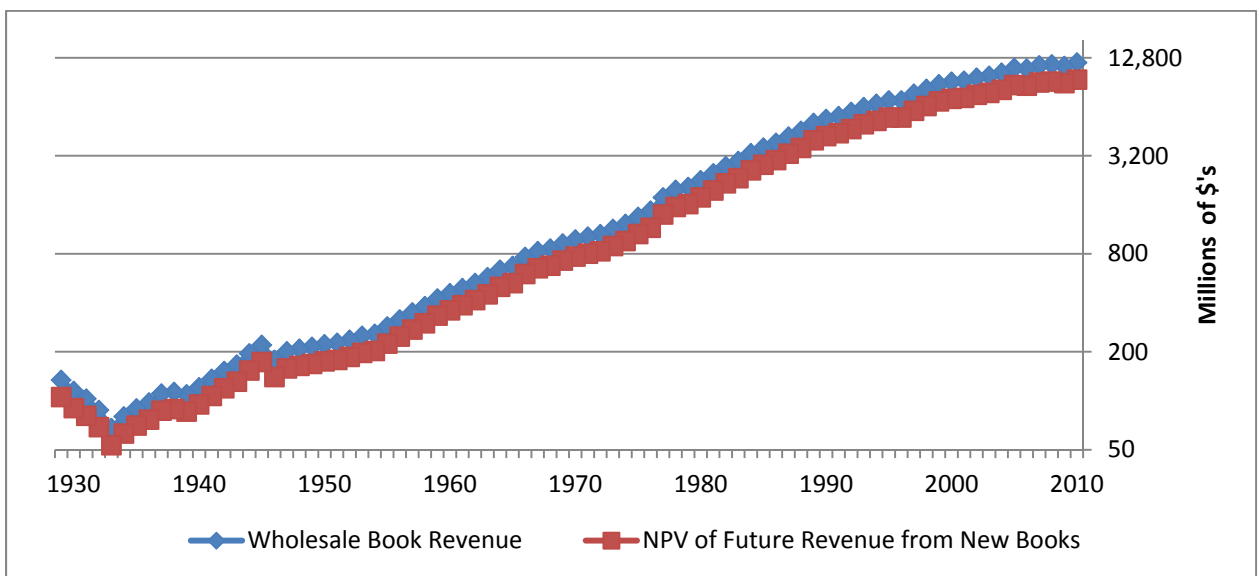
Dataset	Description of Dataset	Used to Create
Service Annual Survey	This survey is conducted by the Census every year from 2004 onwards. It reports revenues for the book industry	Nominal Book Sales
Census of Manufactures	This survey was conducted periodically by the Census. I interpolate between missing years to get annual sales of books	Nominal Book Sales
2007 Economic Census	This survey reports book sales in 2007. All the investment numbers are benchmarked against this survey	Nominal Book Sales
American Association of Publishers Surveys	This survey is conducted by the American Association of Publishers for every year from 1985 onwards. It reports annual sales, cost of production, average prices for books and other information.	Nominal Book Sales, Nominal Book Production
Nielsen Bookscan	This dataset tracks consumer book sales from 2000 to 2009.	Depreciation Schedules, Nominal Production, Real Production
Audit Bureau of Circulation	This dataset tracks magazine sales from 1914 to 2009. They also give information about the magazine's genre, average price, etc.	Revenue from Books Licensed to Magazines
Online databases, including Amazon, Barnes & Nobles and Wikipedia	These databases were used to determine the original publication dates for books in my Nielsen sample.	Depreciation Schedules

Figure 1: Nominal Books Sales Over Time



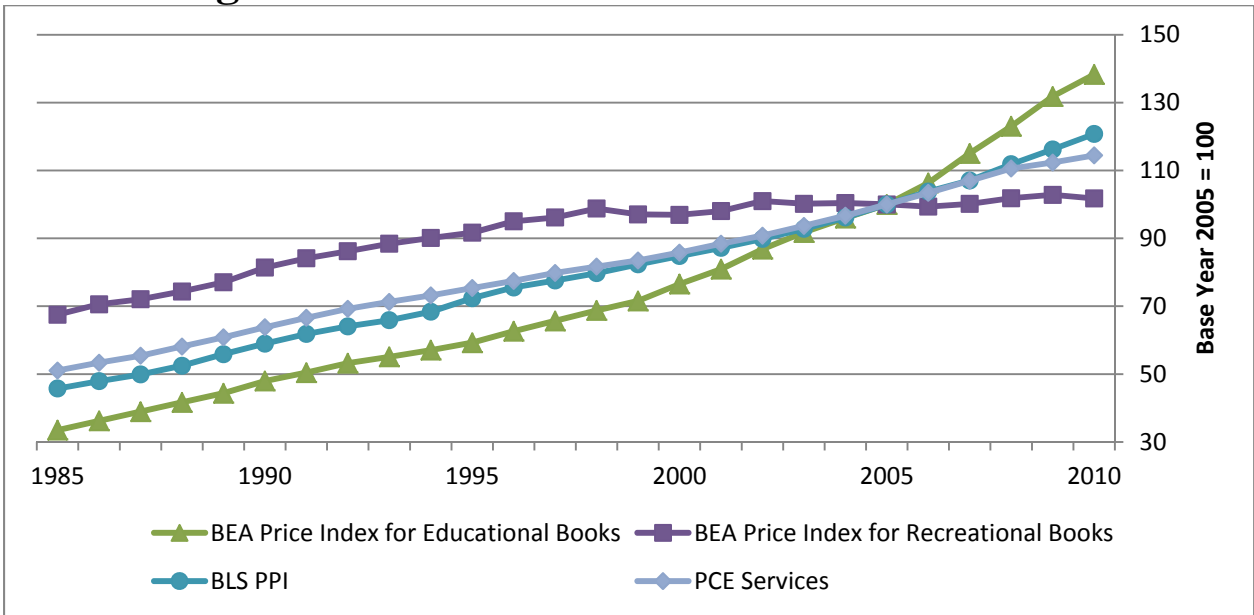
Source Data: AAP, Surveys of Manufacturers, Service Annual Survey, Audit Bureau of Circulation

Figure 2: Book Revenues Over Time (Nominal)



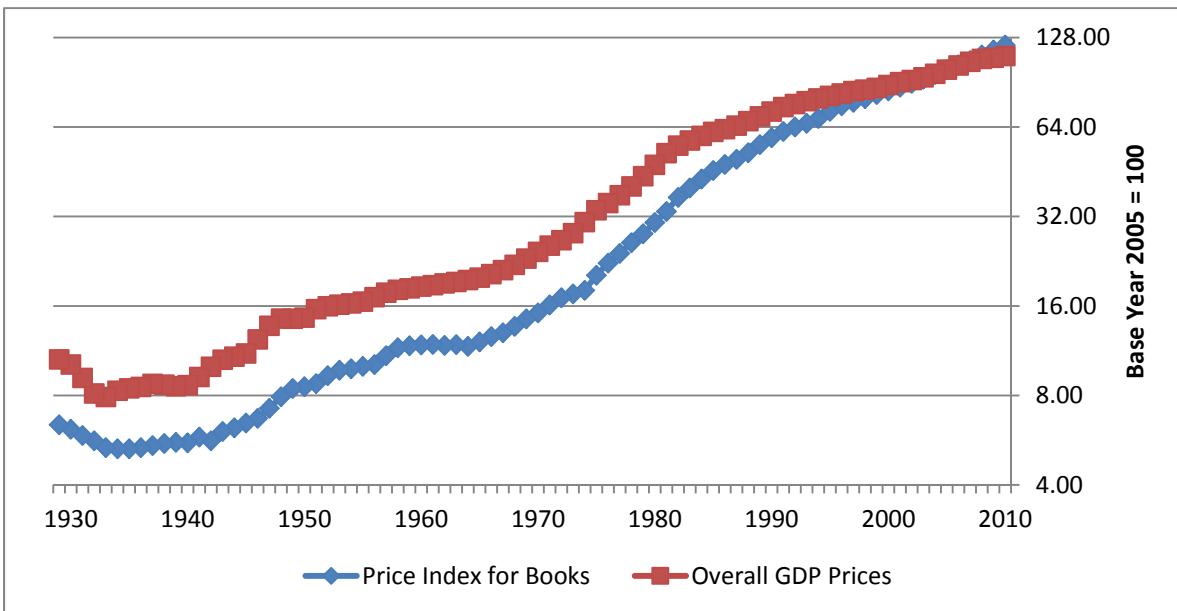
Source Data: Figure 1 revenues, printing costs from the AAP surveys and other cost research

Figure 3: Book Prices from 1985 to 2010



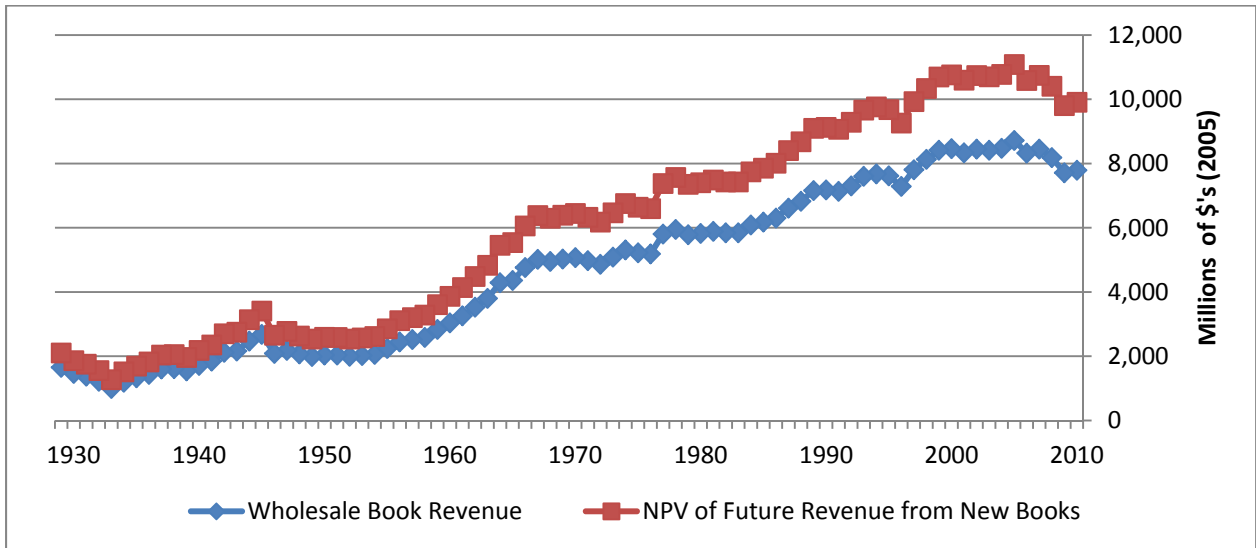
Source Data: BLS website, BEA website

Figure 4: Book Prices from 1929 to 2010



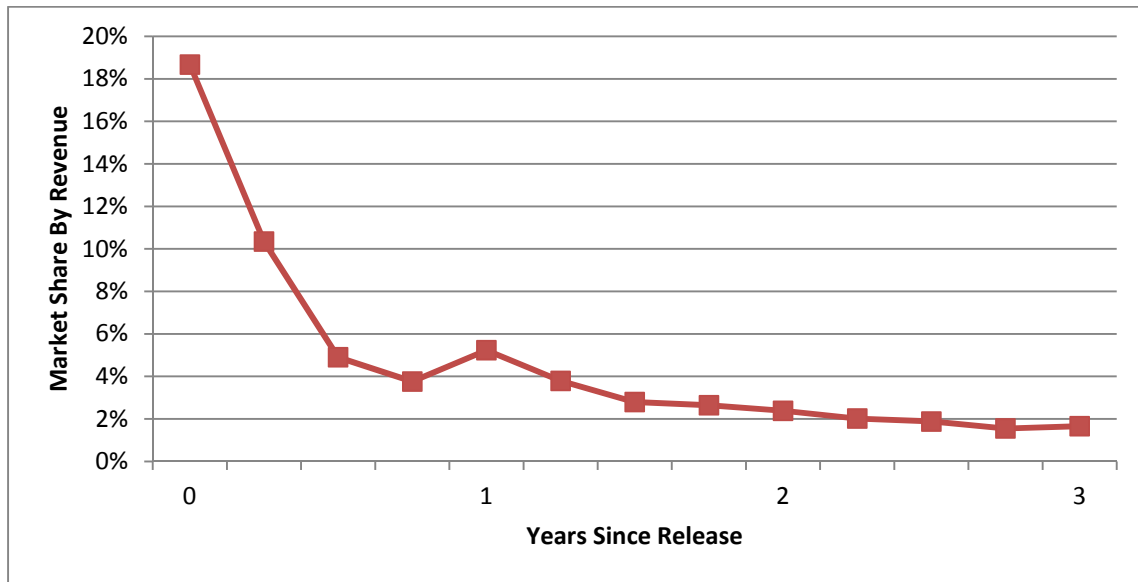
Source Data: BLS website, BEA website

Figure 5: Real Book Revenues Over Time



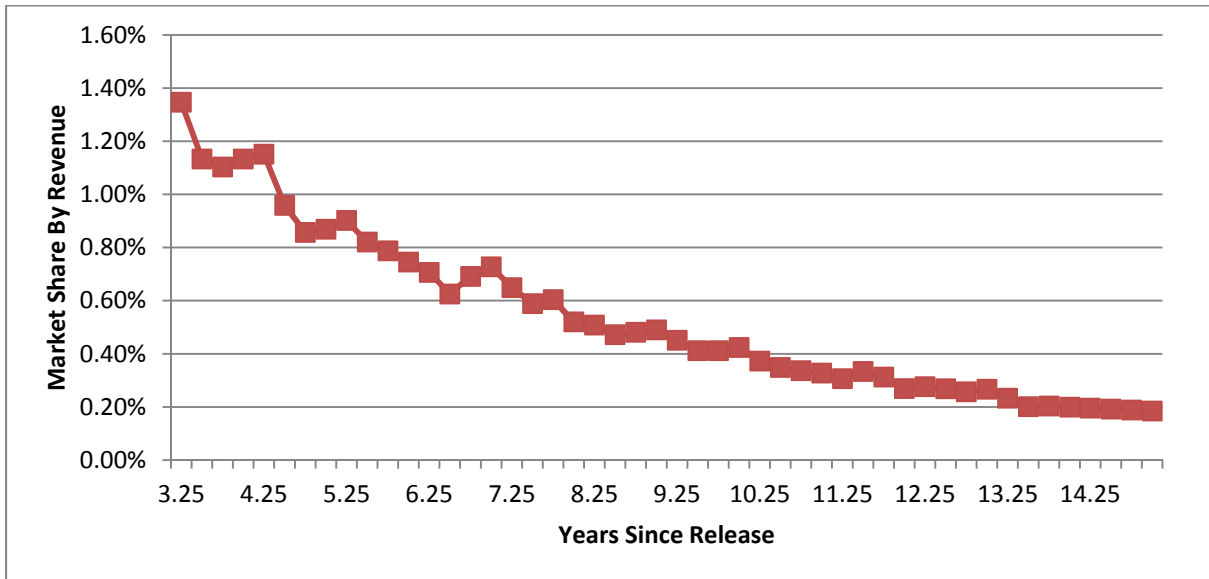
Source Data: Nominal production from Figure 2. Price Index from Figure 5

Figure 6: Lifecycle for New Books



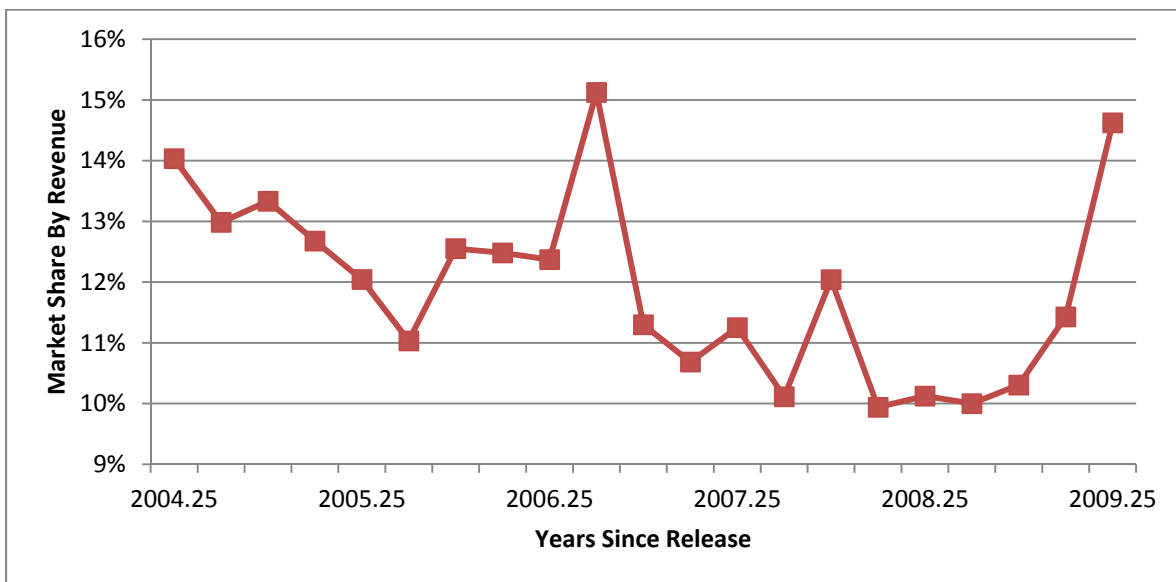
Source Data: Nielsen Bookscan Data for sales. I use a variety of online databases for publication date.

Figure 7: Lifecycle for Older Books



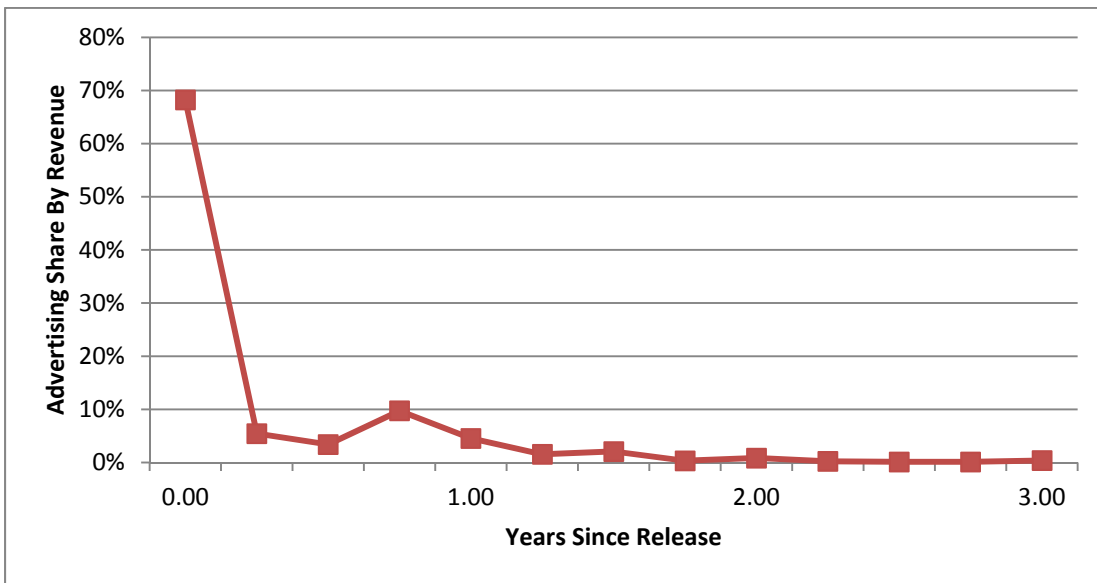
Source Data: Nielsen Bookscan Data for sales. I use a variety of online databases for publication date.

Figure 8: Market Share for Pre-1990 Books



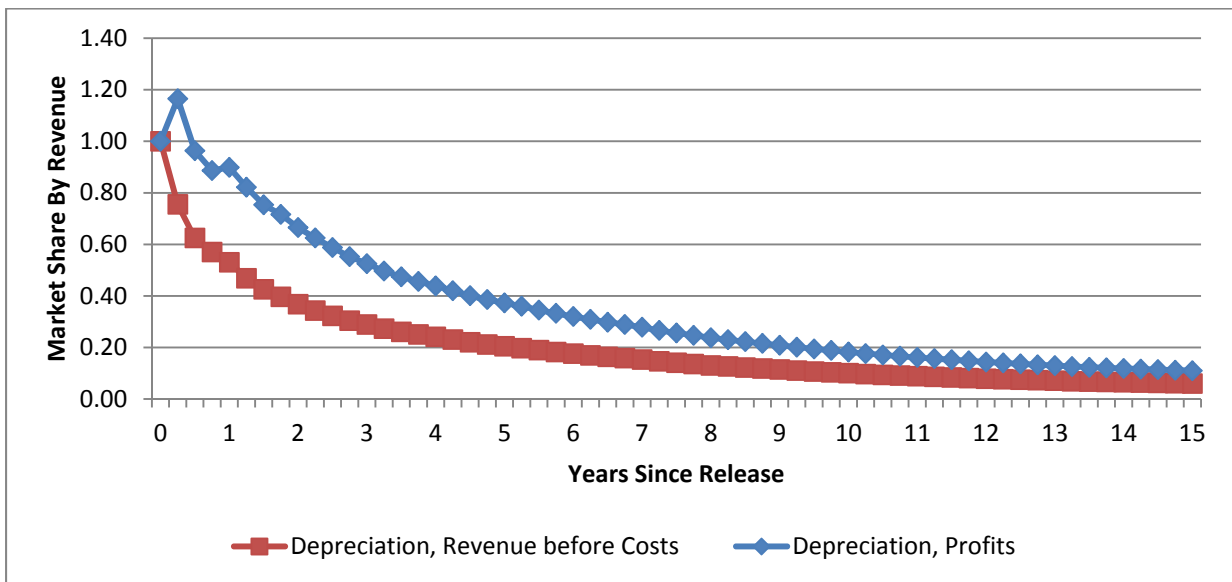
Source Data: Nielsen Bookscan Data for sales. I use a variety of online databases for publication date.

Figure 9: Lifecycle of Advertising for Recent Books



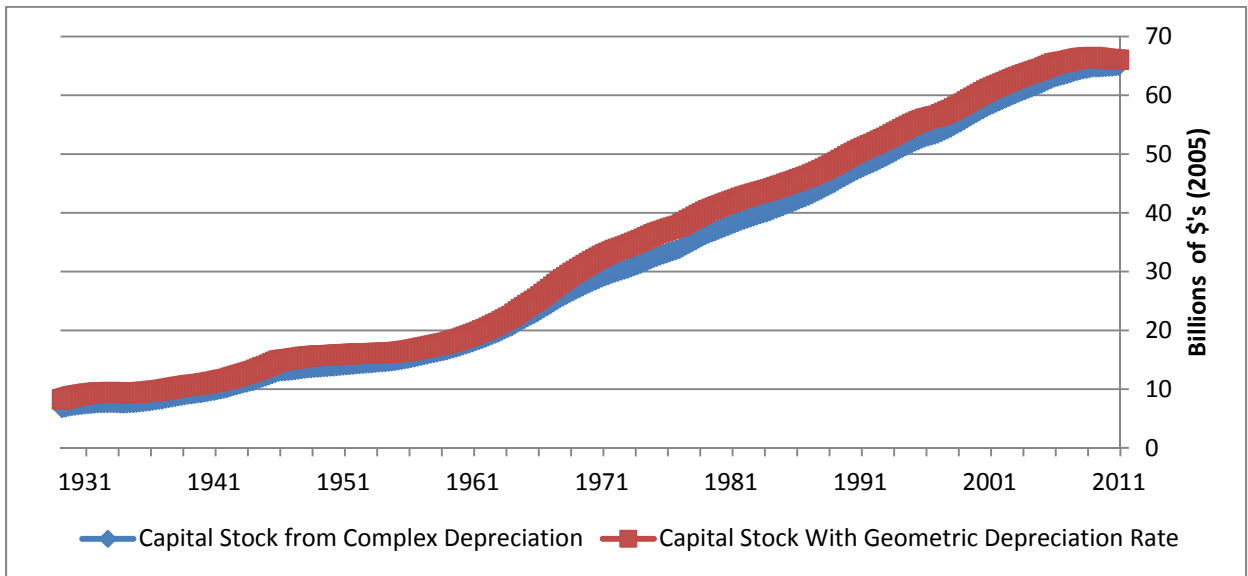
Source Data: Kantar Media for marketing. I use a variety of online database for publication date.

Figure 10: Depreciation Schedule for Books



Source Data: Sales data from Figure 6-8, marketing data from Figure 9, printing costs from industry data.

Figure 11: Real Capital Stock of Book Originals



Source Data: Real sales from Figure 5, depreciation schedule from Figure 9

Bibliography

- Brett, George. (1920). Making of Many Books *The Atlantic Monthly*, October, 471-476
- Bridgman, Benjamin. (2008). Do Intangible Assets Explain High U.S. Foreign Direct Investment Returns? BEA Working Paper 2008-06
- Fraumeni, Barbara, Robinson, Brooks, Reinsdorf, Marshall and Williams, Matthew. (2008). Price and Real Output Measures for the Education Function of Government: Exploratory Estimates for Primary and Secondary Education. NBER Working Paper 14099.
- Genesove, David. (1999). The Adoption of Offset Presses in the Daily Newspaper Industry in the United States NBER Working paper 7076
- Goulart, Ron. (1972). *Cheap Thrills: An Informal history of the Pulp Magazines* Arlington House Production
- Greco, Albert. (2005). *The Book Publishing Industry, Second Edition* Lawrence Erlbaum Associates
- Heald, Paul. (2007). Property Rights and the Efficient Exploitation of Copyrighted Fiction Bestsellers. chapter in *New Directions in Copyright Law*. Edward Elgar Press
- Newspaper Association of America. (2009). Trends & Numbers. Accessed June 30, 2009. <http://www.naa.org/>
- OECD. (2010). Handbook on Deriving Capital Measures for Intellectual Property Production. Accessed May 15, 2013. <http://www.oecd.org/std/na/44312350.pdf>
- Raff, Daniel. (2000). Superstores and the Evolution of Firm Capabilities in American Bookselling. *Strategic Management Journal*, 21, 1043-1059

Reinsdorf, Marshal, P. Liegey and K. Stewart. (1996). New Ways of Handling Quality Changes in the US Consumer Price Index. BLS Working Paper No. 276

Rich, Motoko. (2009). With E-Readers Comes Wider Piracy of Books. *New York Times*. May 12, 2009. Accessed May 15 2013.

<http://www.nytimes.com/2009/05/12/technology/internet/12digital.html>

Robbins, Carol and Moylan, Carol. (2007). Research and Development Satellite Account Update. *Survey of Current Business* October 2007, 16-27

Soloveichik, Rachel. (2013a). Long-Lived Television Programs As Capital Assets. manuscript

Soloveichik, Rachel. (2013b). Music As Capital Assets. manuscript

Soloveichik, Rachel. (2013c). Miscellaneous Artwork As Capital Assets. manuscript

Soloveichik, Rachel. (2013d). Theatrical Movies as Capital Assets. manuscript

Towse, Ruth. (2003). *A Handbook of Cultural Economics*. Edward Elgar Publishing

United Nations Statistics Division. (2008). Updated System of National Accounts 2008. Accessed May 19 2013. <http://unstats.un.org/unsd/nationalaccount/sna2008.asp>