RAND Journal of Economics
Vol. 49, No. 1, Spring 2018
pp. 181–205

Dead poets' property—how does copyright influence price?

Xing Li*

Megan MacGarvie**

and

Petra Moser***

Copyrights create long-lived intellectual property in goods ranging from science, literature, and music to news, film, and software. The economic effects of copyright, however, are difficult to identify in modern settings. This article exploits an unintended differential increase in copyright length under the UK Copyright Act of 1814—in favor of books by dead authors—to examine the effects of longer copyright terms on price. We find that a doubling in copyright length was associated with a substantial (roughly 50%) increase in the price of books. Additional years of copyright improved publishers' ability to practice intertemporal price discrimination.

1. Introduction

■ Copyrights, which grant intellectual property (IP) in music, video, software, and other types of content, have become an increasingly important mechanism to encourage creativity and innovation. Between 1990 and 2011, for example, US employment in copyright-intensive industries such as computer systems design, books, and videos, increased by 46% (Blank and Kappos, 2012). Compared with patents, copyrights provide IP rights that are narrow, which avoid inefficiencies that are associated with broad patents. Yet copyrights are also extremely long-lived, with 95 years of exclusive rights for corporate owners in the United States and Europe.

* Peking University; xingli@gsm.pku.edu.cn.
** Boston University; mmacgarv@bu.edu.
*** New York University; pmoser@stern.nyu.edu.

We thank seminar participants at Berkeley, Chicago Economics and Booth, Columbia, Harvard Economics and HBS, KAIST, Michigan, Northwestern Economics and Kellogg, the NBER, Rutgers, Stanford, and Yale, as well as Ashish Arora, Kyle Bagwell, Tim Bresnahan, Bronwyn Hall, Paul Goldstein, Paul Heald, Scott Hemphill, Eric Hilt, Ryan Lampe, Paul Rhode, Lars Stole, Sotaro Shibayama, Joel Watson, Gavin Wright, Yiqing Xing, and Noam Yuchtman for helpful comments. Siyeona Chang, T.J. Hanes, and Ethan Shibutani provided excellent research assistance. We are also grateful for financial support through Stanford's Second Year Graduate Research Program, the NBER Program on the Economics of Copyright and Digitization, and the Kauffman Foundation. Moser gratefully acknowledges financial support from the Center for Advanced Study in the Behavioral Sciences (CASBS) and NSF CAREER grant no. 1151180.

The length of copyrights creates important policy trade-offs that operate through the price of copyrighted work. For example, a basic model of copyrights implies that a shift toward stronger copyrights raise profits for authors by increasing the price of copyrighted goods (Landes and Posner, 1989), which may, in turn, encourage creativity.[1] However, higher prices reduce consumer surplus by restricting the use of copyrighted goods (Handke, 2011), and they may even discourage reuse and the creation of follow-on innovations (Biasi and Moser, 2016; Nagaraj, 2016).

Despite the centrality of its implications, the effects of copyright length on price are poorly understood, and empirical evidence is inconclusive.[2] This is primarily due to two empirical challenges: the extreme length of modern copyright terms and a scarcity of experimental variation in modern policies. At current terms of 95 years, only goods that are exceptionally durable are still for sale when they come off copyright. Landes and Posner (2003), for example, show that less than 2% of 10,027 books published in 1930 were still in print in 2001. The resulting selection bias makes it difficult to identify the price effects of copyight length in modern data.[3]

A second challenge for identifying the effects of copyrights is that changes in modern copyrights typically occur in response to lobbying by the owners of particularly valuable and long-lived goods. The 1998 (Sonny Bono) US Copyright Act, for example, has been nicknamed the Mickey Mouse Protection Act because copyright for "Steamboat Willie" would have expired in 2003, and Disney "lobbied hard" for an extension (Lessig, 2000; Varian, 2005).[4] Similarly, Britain's 2011 law to extend copyright lengths for music is known as *Cliff (Richard)'s Law* (Halliday, 2011).

To address these empirical challenges, this article exploits an unanticipated and unintended differential increase in the length of copyrights—from low levels of existing copyright lengths. In 1814, Britain's Parliament passed the Copyright Act to clarify a requirement to deposit copyrighted books with research libraries. Due to the timely and opportunistic intervention of a member of parliament, however, who was also an author, the law also extended the length of copyrights in an unusual way. Until 1814, the length of copyright was 14 years (starting from the first edition) for books whose authors had died within 14 years since the first edition, and 28 years for books whose authors had survived the first 14 years. After 1814, copyright length increased from 14 to 28 years for books whose authors had died within 14 years since the first edition, and from 28 years to author's remaining years of life for books whose authors had survived the 14-year term. Given the life expectancies of romantic period authors, this change created no meaningful increase in copyright length for living authors, but it created a 14-year extension for books by dead authors.[5]

Our empirical design takes advantage of this differential increase in copyright length to compare changes in price after 1814 for books by *dead* and *living* authors. This difference-in-differences approach allows us to control for unobservable factors that may have changed the price of all books after 1814, irrespective of changes in copyright length. For example, books may have become more expensive after 1814 because the demand for reading increased with improvements in literacy. Book prices may also have declined as a result of technological progress that reduced production costs, for example, through the diffusion of continuous papermaking and

[1] Critics of intellectual property, however, argue that creative individuals can find other ways "to appropriate a large enough share of the social surplus generated by their innovations" without copyrights (Boldrin and Levine, 2005).

[2] Existing empirical analysis have focused on the effects of piracy. For example, Oberholzer-Gee and Strumpf (2007) have found that shifts toward file sharing had limited effects on record sales, and Waldfogel (2011) shows that file sharing has not reduced the supply of recorded music.

[3] Heald (2008) and Reimers (2017) examine books 75 years after publications: bestsellers published between 1923 and 1932 (still on copyright in 2006), and bestsellers first published between 1919 and 1922 (off copyright). Heald finds no price effects in his full sample, whereas Reimers finds that prices are higher for copyrighted works.

[4] The 1998 Act extended copyrights from 50 years to 70 years after an author's death for individual owners and from 75 years to 95 years for corporate owners.

[5] Section 2 presents life tables, which calculate life expectancies for romantic period authors in 1814, conditional on the author having reached 46, the age of the average author at the time of the first edition.

steam-powered printing.[6] An additional benefit of our approach is that death is easily observable, whereas other proxies for the remaining length of copyright are subject to measurement error.[7]

Unique historical data for 1,227 book editions published between 1790 and 1840 allow us to examine changes in price for recently published copyrighted books. These data include 989 editions of titles that were less than 14 years old, and therefore still on copyright and affected by the increase in copyright length. We have collected price information for these books from romantic period book catalogues, including the *London Catalogue of Books* (Brown, John's-Square, and Clerkenwell, 1799; Hodgson, 1855) and the *English Catalogue of Books* (Peddie and Waddington, 1914), and from *The Reading Nation in the Romantic Period* (St. Clair, 2004). For each of these editions, we construct controls for the age of the book, author fixed effects, physical characteristics (counts of volumes, page counts, and page size), and genre (novels, poetry, other fiction, and nonfiction).[8] To proxy literary quality, we match editions in our data with records of notable books: *Western Canon* (Bloom, 1994), *Greatest Books* (Sherman, 2009), and *Norton Anthology of English Literature* (Greenblatt and Abrams, 2012).

Difference-in-differences estimates of these data reveal a substantial increase in price in response to longer copyright terms. Controlling for the age of a book, author fixed effects, time fixed effects, and physical characteristics, the price of books by dead authors increased by an additional 7.19 shillings after 1814, compared with books by living authors. Relative to an average price of 19.38 shillings before 1814, this implies a 37% increase, roughly 3% for each additional year of copyright, and an elasticity of price with respect to copyright length of 0.45.

These results are robust to a broad range of alternative specification, including alternative controls for literary quality and for variation in price across genres.[9] Time-varying estimates yield no evidence of differential pretrends in the price of books by dead authors. A placebo test moves the post period to begin in 1809, five years before the Copyright Act, to check whether the change in copyright length may have been anticipated. This test indicates no differential increase in price before the 1814 Act. Estimates increase when we exclude books by Sir Walter Scott (1771–1832) and Lord Byron (1788–1824), two extremely popular authors who had died after 1814. More generally, results are robust to excluding books by recently deceased authors.

The main threat to the identification strategy is that books by dead authors may have become more expensive after 1814 as a result of changes in tastes or other unobservable factors that differentially increased the price of books by dead authors. To address this issue, we examine changes in price for books by dead authors that did *not* benefit from longer copyrights. Specifically, we exploit the fact that the 1814 Act had no effect on the length of copyright for books by authors who had died between 14 and 28 years after the publication of the first edition (because these books had already been protected for 28 years under the 1710 *Statute of Anne*). Placebo regressions for these books yield no evidence of a differential increase in price.

How did extensions in the length of copyrights increase price? Intuitively, copyrights increase price by extending the duration of the publishers' monopoly over a book title. If monopolistic publishers practice intertemporal price discrimination, additional years of copyright protection extend publishers' ability to price discriminate. In other words, publishers can sell to consumers with high willingness to pay, and delay sales to consumers with a lower willingness to pay because other publishers cannot enter with a cheaper copy.

[6] The switch from producing individual sheets of paper to the continuous roll process (patented in 1799) substantially reduced the price of paper, which accounted for two thirds of production costs at the beginning of the 19th century (Plant, 1974).

[7] For example, publishers may have had private information about the health of authors, which is unobservable today, or they may have applied heuristic rules to estimate remaining years of life. By comparing price for books by dead and living authors, our analysis is robust to this type of error.

[8] Nonfiction includes travel reports, along with historical, social, and economic analyses, such as the *Wealth of Nations*.

[9] Khan (2005) observes that pirated books by European authors sold for a higher price than copyrighted books by US authors between 1832 and 1858, because books by European authors were of higher literary quality.

Historical records suggest that variation willingness to pay, which publishers need to practice price discrimination, was substantial among buyers of romantic period books. Circulating libraries and wealthy individuals were the primary consumers. For example, St. Clair (2004) explains that roughly half of all first editions of Jane Austen's novels were sold to "members of the titled classes and gentry ... the others probably going to circulating libraries."[10] Libraries with an affluent readership, such as London's Minerva Press and Circulating Library, bought expensive books whereas smaller, less affluent provincial libraries often loaned books for a penny (Jacobs, 2006), and could only afford to buy the cheaper titles. We also collect systematic data on the size of library holdings for circulating libraries from the *Database of British Fiction, 1800–1829* (Garside, Belanger and Ragaz); these data document significant variation in the size of circulating libraries, which is consistent with variation in their budgets. Individual buyers also differed in their willingness to pay, and delayed book purchases to wait for cheaper editions (Romilly, 1905).

If publishers practiced price discrimination, the price for new editions of the same title should decline as the title approaches the end of its copyright term. Data on individual books with multiple editions, such as Thomas Moore's *Lalla Rookh*, confirm this pattern. We also estimate changes in price as a function of remaining years in copyrights for the full sample of 1,041 editions of 671 titles that were on copyright between 1790 and 1840. This test uses differences in authors' remaining years of life as a measure of the expected remaining length of copyright. Although this test is subject to more measurement error and selection bias than the main specifications, it confirms that publishers lowered price as a book approached the end of its copyright term, even controlling for book age.

This article is structured as follows. Section 2 describes the changes in copyright, as well as the negotiations that led to the 1814 Act. Section 2 also presents life tables, which estimate remaining years of life for romantic period authors. Section 3 describes the data. Section 4 presents difference-in-differences analyses and robustness checks. Section 5 presents a straightforward extension of models of intertemporal price discrimination and presents historical evidence on variation in consumers' willingness to pay for books. Section 6 concludes.

2. The Copyright Act of 1814

■ Copyright was first formalized in 1710, in the *Statute of (Queen) Anne*, which granted printers exclusive rights to sell books for 14 years, starting from the year of the first edition. This original length of copyright was fashioned after the length of patents under the *Statute of Monopolies of 1624* (Deazley, 2008a), which, in turn, was "based on the idea that 2 sets of apprentices should, in 7 years each, be trained in the new techniques" (Machlup, 1958). If the author was alive at the end of the 14th year after the first edition, the book remained on copyright for a full 28-year term.[11]

A system of fines ensured enforcement. In 1801, a printer who had violated copyright lost all infringing copies of his book and paid a fine of 3d (pence) per sheet, "half to the crown, and half to whoever sued for it" (Seville, 1999). Printers who imported infringing books were fined £10, roughly 20 times the average weekly wage of working-class men (Bautz, 2007). Customs authorities searched luggage for copies of copyrighted books (St. Clair, 2004).

□ **Clarifying the deposit requirement.** In return for granting temporary monopoly rights, the *Statute of Anne* required publishers to register all copyrighted books with the Stationers' Company and provide copies on "best paper" to the British Library and 10 university libraries. When a 1798 decision in *Beckford v. Hood* called this requirement into question, book deposits

[10] Before circulating libraries had emerged, readers shared books in "reading societies" (St. Clair, 2004). Public libraries emerged only after 1850 (Wiegand and Davis, 1994; Logan et al., 2014).

[11] Authors typically assigned both 14-year terms to the same publisher (St. Clair, 2004).

declined from 620 in 1798 to 379 in 1803.[12] In that year, barrister Basil Montagu (1770–1851) searched Cambridge University library for a report on *Beckford v. Hood* but could not find the book. Montagu then searched for the remaining 391 books that had been published in the same year and found only 22 of them in the Cambridge library (Deazley, 2007). Montagu (1805) argued for the importance of the deposit requirement in a widely read essay on "Enquiries and Observations respecting the University Library." His essay stirred heated debates, which reached Britain's House of Commons in 1808 (Deazley, 2008a).

Representatives of university libraries argued that "... continuing the delivery of all new works ... will tend to the advancement of learning, and to the diffusion of knowledge" (*Report of the Acts*, 1813). Publishers, however, countered that affirming the deposit requirement would "subject the petitioners to great expence (sic), and operate very seriously to discourage literature" (*London Booksellers' Petition* 1812).[13] The printer Richard Taylor argued that for some books, "the eleven copies would ... prevent their being printed at all" (*Minutes of Evidence*, 1813). Similarly, Sir Samuel Romilly, Britain's Solicitor General from 1806 to 1807, decried that the deposit requirement was "a tax upon authors" (*Hansard*, 1808). Charles Williams-Wynn, a member of parliament from 1797 to 1850 and a Privy Councillor (advisor) to the king from 1822 to 1850 observed that the Act was "injurious to [publishers'] interests" (*Hansard*, 1808). Faced with paper shortages as a result of the Napoleonic Wars (1803–1815) (Bautz, 2007), publishers were particularly concerned about the requirement to deposit copies on "best paper."[14] Passed on July 29, 1814, the Copyright Act affirmed the requirement to deposit copies with the library of the British Museum and 10 university libraries within 12 months of publication (§2). As a concession to publishers, the Act relaxed the requirement to deposit copies on "best paper" and required only one such copy for the British Museum (*Copyright Act*, 1814).

□ **Extension to 28 years or life of author.** In addition to clarifying the deposit requirement, the 1814 Act extended the length of copyright to "the Residue of [the author's] natural Life" (§4) for any book that was still under copyright in 1814.[15] This change resulted from an "opportunistic and timely intervention" on July 18 by a member of parliament, who was also an author, rather than a "principled or considered position adopted on the part of the legislature" (Deazley, 2007).[16] Draft bills between May 18 and July 15 maintained existing terms of "twenty-eight years ... and no longer" (Deazley, 2007). A July 19 draft was first to specify an extension of copyright to "the residue of [the author's] natural life."

The Act also simplified the law to create a uniform 28-year term for books by dead authors (§8), regardless of whether the author had survived the first 14-year term. This provision was added on July 26, 1814, "without any significant discussion" (Deazley, 2007).[17] Importantly, extensions did not apply to books whose copyrights had already expired. In 1818, a decision in *Brooke v. Clarke* (1818) confirmed that expired copyrights were not revived by the Act (Deazley, 2007).

[12] *Beckford v. Hood* (1798) allowed publishers to sue for infringement damages on copyrighted works, even if they had not registered the book (Deazley, 2008b).

[13] In the 19th century, bookseller was a commonly used synonym for publisher, because publishers had traditionally also sold books. Longman & Co. had abandoned their retail bookshop by 1810, but the *Minutes of Evidence* (1813) refer to Thomas Longman as a "bookseller."

[14] In 1813, Thomas Longman reported that the cost of paper accounted for two thirds of the entire production costs for a book edition of 500 copies (*Minutes of Evidence*, 1813).

[15] In 1818, a unanimous decision in *Brooke v. Clarke* (1818) confirmed that copyrights that had already expired should not be revived by the Act (Deazley, 2006).

[16] Sir Samuel Egerton Brydges (1762–1837) "occupied himself with literary work, issuing reprints of rare English pieces from the private press" and was an Member of Parliament from 1812 to 1818 (Venn, 2011).

[17] Uniform terms are only mentioned twice in the parliamentary records, in the *Petition of the Printers* (1813) and in the 1813 *Report from the Committee on the Copyright of Printed Books* (1818).

□ **Publishers and authors oppose the act until the 1820s.** Publishers and authors continued to express their opposition to the Act until the 1820s, arguing "that the extended term was of little interest or value to them ... [and that the Bill] did little other than service the needs and interests of the university libraries" (Deazley, 2007). For example, the publisher John Nichols wrote to author Rogers Ruding on March 12, 1818 that "Booksellers, Authors, and all persons interested, are making a strong push at present to endeavour to get redress from the onus of the Copyright Act."[18] In the same year, publisher Owen Rees argued that Longman had incurred production costs on the order of £3,000 to deliver library copies in the four years that had passed since the Copyright Act (*Report from the Select Committee*, 1818). Referring to the 14-year extension for books by dead authors, Rees testified:

> "Rather than pay the 11 copies, would you surrender the 14 years copyright given by the Act?
> Rees: Yes, we would ...
> The copyright of 14 years then, has been of no great avail to you?
> Rees: No" (*Report from the Select Committee*, 1818).

Similarly, Thomas Longman responded to member of parliament Davies:

> "Davies: As a principal bookseller, and a great purchaser of copy right, did you not consider an extension in the term of copy right, quite equivalent for the loss which they would sustain by the delivery of the eleven copies?
> Longman: I did not consider that" (*Minutes of Evidence*, 1813).

Demographic data on 19th-century life expectancies indicate that the extension to "life of author" implied a nominal extension for the average book by a living author. Data on publication years (which we describe below) show that the author of the average book was 46 years old at the time of the first edition, which starts the clock for copyright.[19]

□ **Copyright extensions implied by the 1814 act.** To estimate the remaining length of a romantic period author in the publication year of the first edition, we use demographic data for the 606 authors in the *Dictionary of Literary Biography* (Gale Research) who were born between 1700 and 1840, to predict the life expectancy of a romantic period author.[20] Life tables estimate remaining years of life *conditional* on an author's survival to a certain age and conditional on changes in life expectancies over time. Life tables predict the expected remaining years of life $R([a, a+4], [t, t+4])$ for an author at age bracket $[a, a+4]$ in intervals of five calendar years $[t, t+4]$ between 1790 and 1840. For the median author in an age bracket $[a, a+4]$, the expected remaining years of life are the average remaining years of life across all authors in the same age bracket and in the same time interval $[t, t+4]$. A 46-year-old author is the median author for the $[44, 48]$ age bracket. In the time interval 1810–1814, the expected remaining years of life for a 46-year-old author are $R(46, [1810, 1814]) = R([44, 48], [1810, 1814]) = 26.55$ years; for the adjacent interval 1815–1819, the expected remaining years of life are $R(46, [1815, 1819]) = R([44, 48], [1815, 1819]) = 24.98$ years.[21]

Thus, the 1814 Act did not substantially extend copyright length for the average living author. Yet, it increased copyrights for books by dead authors by 14 years from 14 to 28 years. Taken

[18] Nichols had published Ruding's *Annals of the Coinage of Great Britain* (1840).

[19] With a median of 44 years and a standard deviation of 16.41 years.

[20] The median author was born in 1795 and died in 1860.

[21] See Preston, Heuveline, and Guillot (2011) for a detailed description of the methodology. Scherer (2004) finds that 646 European composers between 1650 and 1849 lived 64.5 years on average, with a median of 66. Life table estimates exceed average age at death because they are conditional on survival to a specific age.

together, these changes imply a differential increase in copyright length of 14 years for books by dead authors. We use this change to examine the effects of longer copyright terms on price.

3. The data

■ To investigate the effects of longer copyright terms on price, we have collected a new data set on the prices of 1,227 new book editions in Britain between 1790 and 1840. In addition to price, these data include the age of each book title in the year of a new edition, the number of volumes in which the edition was published, its genre, alternative proxies for literary quality, and measures for physical characteristics (page counts and page size).

□ **Price of new editions, 1790–1840.** We first extract the names and all books of all 606 British and Irish authors who were born between 1700 and 1840 from the *Dictionary of Literary Biography* (Gale Research); 402 of these authors published at least one title that was on copyright between 1790 and 1840. Altogether, these 402 authors published 6,948 new titles (first editions) between 1763 and 1840 that were on copyright for at least one year between 1790 and 1840.

We search for information on the price of new editions for titles by these authors in historical book catalogues, online archives, and secondary sources.[22] We obtain price data for 1,227 new editions of 767 titles by 137 authors. Our data set includes price information for 811 new editions in the *English Catalogue of Books* (Peddie and Waddington, 1914) between 1801 and 1840.[23] For another 62 editions between 1790 and 1840, price data are available from the 1799 and 1851 versions of the *London Catalogue of Books* (Brown, John's-Square, and Clerkenwell, 1799; Hodgson, 1855). William St. Clair's (2004) *Reading Nation in the Romantic Period* provides prices for another 354 new editions between 1790 and 1840, which St. Clair collected from book catalogues, archives and correspondence of authors and publishers, and other historical sources.

These data indicate new editions sold for an average price of 18.35s (shillings). Relative to a weekly wage of 9 shillings for a working-class male (Bautz, 2007), this meant that most readers accessed books through one of several thousand circulating libraries that operated in Britain (e.g., Erickson, 1990).[24] With the diffusion of technical improvements such as continuous papermaking, average price declined from 21.17s for 395 editions between 1790 and 1814 to 17.01s for 832 editions between 1815 and 1840.

We use the author's year of death to distinguish books by dead and living authors. Among 1,227 editions, 1,016 are new editions of book titles by living authors (82.8%), and 211 are new editions of book titles by dead authors (17.2%). The share of editions by dead authors is 21.5% until 1814 and 15.1% afterward.

Information on the publication years of first editions allows us to distinguish books that had been in print for 14 years or less (and were therefore still on copyright). Among 1,227 editions, 989 had been in print for 14 years or less; these editions sold for an average price of 16.70s. We also calculate the age of each book title in the year of a new edition by subtracting the publication year of the first edition from the publication year of the new edition.

□ **Controls for literary quality and genre.** To control for variation in literary quality, we match titles in our data with 138 titles in Harold Bloom's (1994) *Western Canon of English Literature*.[25] Thirty-three of 767 titles (4.3%) entered the *Canon*; these titles account for 82

[22] We used a fuzzy matching algorithm to match authors in the *Dictionary of Literary Biography* and the *English Catalogue of Books*, and then checked all potential matches by hand to eliminate false positive.

[23] List prices are a good proxy for sales prices, because booksellers acted aggressively to prevent sales below list prices. In 1829, for example, the London Booksellers' Committee decreed to boycott retailers that had attempted to sell books below their list price (Barnes, 1964).

[24] Covers and book bindings accounted for a tiny fraction of the sales price because publishers sold books in cheap, temporary covers of plain paper or board. For example, binding a medium-sized octavo edition in boards cost 4d (Plant, 1974), roughly 2% of the average price of a new edition book.

[25] The *Canon* ranges from Wycherley's *Country Wife* (1675) to Smart's *Jubilate Agno* (1939).

new editions (6.7% of the data). An alternative measure for quality, Sherman's (2009) *Greatest Books*, includes 1,000 books that appear in at least one of 107 different compilations of best books.[26] Eight of 767 titles in our data are among the *Greatest Books*; seven of these titles are also in Bloom (1994), only excluding Byron's *Don Juan Cantos*. A third proxy for quality is the *Norton Anthology of English Literature* (Greenblatt and Abrams, 2012), the standard text for undergraduate courses; 47 books in our sample are in the *Anthology*; 22 of these books are also included in Bloom (1994).

As an additional control, we collect data on genres (following Suarez, 2009) from the *Dictionary of Literary Biography* and other reference books. Two thirds (764 of 1,227) of all editions between 1790 and 1840 are fiction, including 240 editions of poetry (such as Lord Byron's *Childe Harold's Pilgrimage*), 412 novels (including Jane Austen's *Pride and Prejudice*, and Mary Shelley's *Frankenstein*), and 112 children's books, plays, hymns, and songs. One third (463 of 1,227) of all editions are nonfiction, including travel reports, historical analyses, and the *Wealth of Nations*.[27]

□ **Page counts, page size, and volumes per edition.** Controls for physical characteristics capture variation in the size of books, measured by the number of pages, page size, and the number of volumes that form a new edition. We collect these data from editions from the *Dictionary of Literary Biography* (Gale Research), the *English Catalogue of Books* (Peddie and Waddington, 1914), the *London Catalogue of Books* (Brown, John's-Square, and Clerkenwell, 1799), and *The reading Nation in the Romantic Period* (St. Clair, 2004).

Page size is measured relative to a standard sheet of paper. Information on page size is available for 1,010 of 1,227 editions, including 822 of 989 editions that had been in print for 14 years or less. For example, folding a standard sheet of paper twice to reduce a page to one quarter of its size produces a quarto edition (4to); quartos account for 71 of 1,010 editions (7.03%). Folding once more to create one eighth of a sheet produces an octavo (8vo). Octavos are the most common format for a new book edition in our data: 626 of 1,010 editions are octavos (62.0%). Another 266 editions are duodecimos (12 mo, 26.3%), and 47 editions are sextodecimos (16 mo), octodecimo (18 mo, 3.7%), vingesimo quarto (24 mo), and trigesimo secundo (32 mo).[28]

Information on the number of pages are available for 664 of 1,227 new editions between 1790 and 1840, including 546 of 989 editions of titles that had been in print for 14 years or less.[29] On average, these 664 editions were 404 pages long (with a standard deviation of 345). Page counts varied across genres: the average novel was 532 pages long (with a standard deviation of 313), compared with 299 pages for poetry (with a standard deviation of 278). Other works of fiction were 163 pages long, on average (with a standard deviation of 134), whereas nonfiction titles were 482 pages long (with a standard deviation of 394).

Data on the number of volumes that form an edition are available for 799 of 1,227 editions, including 633 of 989 editions in print for 14 years or less.[30] Publishers offered roughly one third of all books in a single-volume edition (278 single-volume editions, 34.79% of all 799 editions). Another 199 editions (24.91%) were two-volume editions, 176 editions (22.03%) were

[26] This list is based on an algorithm that assigns more weight to book lists by authors and other industry experts. Available at thegreatestbooks.org/ , accessed March 3, 2016.

[27] This distribution across genres roughly matches the distribution in Bloom's (1994) *Canon*, which includes 77 novels, 15 volumes of poetry, and 32 works of nonfiction. The distribution of books across genres remains roughly constant after 1814, although there is a small increase in the share of fiction.

[28] Quarto editions sold for an average of 61.72s (with a standard deviation of 101.32s). Smaller octavo editions sold for 16.57s (with a standard deviation of 20.62s), and even smaller duodecimo editions sold for 13.57s (with a standard deviation of 10.96s).

[29] The average time between editions is 4.8 years, which corresponds to an average of three editions within the first 14 years.

[30] Volumes that publishers sold in separate years (such as Sir Walter Scott's *Tales of a Grandfather*, 1828, 1830, and 1831) enter the regressions as separate editions.

TABLE 1 Comparisons of Mean Price of New Editions

		Pre-1814	Post-1814	Difference
Author	Alive	19.30	14.93	−4.38
	(N = 940)	(48.52)	(17.93)	(2.15)
	Dead	20.50	28.02	7.52
	(N = 49)	(18.24)	(24.39)	(8.83)
Difference		1.20	13.09	11.89
		(7.03)	(5.77)	(9.09)

Notes: Price data for 989 new editions of 681 titles that had been in print for 14 years or less by 120 authors between 1790 and 1840; all of these editions are on copyright. Price data collected from *The London Catalogue of Books* (Brown, John's-Square, and Clerkenwell, 1799; Hodgson, 1855), *The English Catalogue of Books* (Peddie and Waddington, 1914), and St. Clair (2004). Book ages are calculated using data on first editions, which we collected from the online catalogues of the British Library and Google Books (available at explore.bl.uk and books.google.com/, accessed September 4–20, 2012). Demographic data are collected from the *Dictionary of Literary Biography* (various volumes). Standard errors are from a simple difference-in-differences regression without controls, and they are clustered at the author level, as in Table 3 below.

three-volume editions, 83 editions (10.39%) were four-volume editions, and 63 editions were published in five volumes or more (7.88%).

□ **Holdings of 19th-century libraries.** To investigate whether libraries varied in their ability to buy new books, we collect historical data on library holdings. Such data are available for a total of 24 libraries between 1800 and 1829 from *the Database of British Fiction, 1800–1829* (Garside, Belanger and Ragaz), including 19 circulating libraries (for-profit libraries that charged fees for borrowing books), and five subscription libraries (associations of upper-class males that allowed members to borrow books for free or at a reduced rate in exchange for a flat fee).[31] The average book in our sample was held by 1.5 libraries (with a standard deviation of 4.4).

4. Results

■ Summary statistics indicate a substantial increase in price after 1814 for new editions of copyrighted books by dead authors compared with books by living authors. For books that had been in print for 14 years or less, the price of new editions of books by dead authors increased from 20.50s until 1814 to 28.02s afterward (Table 1 and Appendix Figure A1; the Appendix is available online). At the same time, new editions by living authors became cheaper after 1814, with an average price of 19.30s until 1814 and 14.93s afterward.

Table 2 compares other observable characteristics for editions by living and dead authors before and after 1814. These data indicate that editions by dead and living authors were similar in age and quality, whereas editions by dead authors had roughly twice as many pages as editions by living authors.[32] The most remarkable difference relates to the number of volumes per edition. Until 1814, editions by dead and living authors cover roughly the same number of volumes, with 2.50 and 1.90 volumes per edition, respectively, and a p-value of 0.92. After 1814, the number of volumes per edition increases to 3.33 for dead authors and declines slightly for editions by living authors to 1.80. In the main specifications, volume fixed effects control for such variation. In Section 5, we examine how publishers and libraries incorporated volume formats in their strategies of price discrimination.

[31] For 14 of these libraries, we can observe holdings for two or more years (with an average of 2.57 years); for another 10 libraries, we observe only holdings in a single year.

[32] Some of this difference in size may be driven by a larger share of collected works for titles by dead authors, but the share of collected works does not change after 1814. We exclude collected works that include a biography of the original author, because the biography carries its own copyright term.

TABLE 2 Comparisons of Characteristics of New Editions

	1790–1814		1815–1840		*p*-Value: Pre-1814 Mean = Post-1814 Mean	
	Alive	Dead	Alive	Dead	Alive	Dead
Book age	2.27	2.00	2.23	2.83		
	(2.37)	(2.83)	(2.71)	(4.49)		
	p-value = 0.74		*p*-value = 0.13		0.81	0.64
Western Canon	0.10	0.00	0.08	0.17		
	(0.30)	(0.00)	(0.27)	(0.41)		
	p-value = 0.35		*p*-value = 0.47		1.00	0.24
Page number	439.24	1014.13	402.61	1067.83		
	(317.06)	(669.28)	(283.17)	(483.41)		
	p-value = 0.01		*p*-value = 0.00		0.05	0.98
Page size	8.81	8.00	9.07	8.67		
	(2.32)	(0.00)	(2.05)	(1.63)		
	p-value = 0.06		*p*-value = 0.38		0.00	0.05
Volumes per edition	1.90	2.50	1.80	3.33		
	(1.07)	(1.85)	(1.10)	(1.21)		
	p-value = 0.92		*p*-value = 0.00		0.23	0.21
Pages per edition	254.39	450.10	240.06	323.64		
	(203.71)	(105.48)	(166.00)	(104.00)		
	p-value = 0.00		*p*-value = 0.65		0.28	0.03

Notes: Book age is calculated as the difference between year of publication and year of first edition. Canon is the indicator for appearing in Bloom (1994). Year of first editions, page numbers, page size, and volume is collected from the *Dictionary of Literary Biography* (Gale Research), *The English Catalogue of Books* (Peddie and Waddington, 1914), *The London Catalogue of Books* (Brown, John's-Square, and Clerkenwell, 1799; Hodgson, 1851), and St. Clair (2004). The *p*-values are derived from *t*-tests of the hypothesis of no difference in means between living and dead authors within a period (columns 2–5) or *t*-tests of the hypothesis of no difference in means between the period until 1814 and the period after 1814 (columns 6–7).

□ **Changes in prices after 1814 for books by dead and living authors.** To systematically examine the effects of the copyright extension on the price of copyrighted books, we first estimate regressions of the type:

$$price_{it} = \alpha_0 + \alpha_1 dead_{st} + \alpha_2 dead_{st} * post1814_t + X_{it}\beta + \varepsilon_{it}, \quad (1)$$

where the outcome variable $price_{it}$ measures the price of a book edition i in year t. The variable $dead_{st}$ equals one if author s had died before year t. The indicator $post1814_t$ equals 1 for years between 1815 and 1840. Under the assumption that changes in price after 1814 would have been comparable for book editions by dead and living authors if there had been no change in copyright, the coefficient for $dead_{st}$ *$post1814_{it}$ estimates the causal effect of longer copyrights on price.

The vector X_{it} includes control variables for variation over time and for the characteristics of books. Five-year fixed effects control for changes in price that are shared across all books, for example, as a result of technical progress, which lowers the price of printing or of paper. Author fixed effects control for unobservable differences in consumers' willingness to pay across authors. Book age fixed effects control for variation in price across the life cycle of a book, including controls for first editions. Page size fixed effects control for variation in price across formats, for example, between the smaller octavo and larger quarto editions. Volume fixed effects control for variation in price across books that are published in one, two, three, four, or five or more volumes, with an additional dummy for observations with missing data. Standard errors are clustered at the author level to allow for correlation across editions of the same title and across titles by the same author.

Our estimates indicate that the price of books by dead authors increased by an additional 9.56s after 1814, compared with books by living authors (*p*-value 0.01, Table 3, column 1).

TABLE 3 OLS, Dependent Variable Is Price of New Editions

	(1)	(2)	(3)	(4)
Dead	−7.32**	−7.35***	−6.87**	−5.73**
	(2.83)	(2.80)	(2.64)	(2.59)
Post-1814 * dead	9.56**	9.60***	8.31**	7.19**
	(3.66)	(3.62)	(3.33)	(3.27)
Western Canon		−0.22	0.45	0.52
		(2.02)	(2.16)	(2.30)
Five-year FE	Y	Y	Y	Y
Author FE	Y	Y	Y	Y
Book age FE	Y	Y	Y	Y
Volume FE	Y	Y	Y	Y
Page size FE	Y	Y	Y	Y
Page count FE	N	N	Y	Y
Genre FE	N	N	N	Y
Observations	989	989	989	989
Adjusted R^2	0.901	0.900	0.902	0.903

Notes: Book age fixed effects control for first editions and for the number of years that have passed since the first edition. Genre fixed effects control for variation in price across novels, poetry, other fiction, and nonfiction. Price data for 989 new editions of 681 titles that had been in print for 14 years or less by 120 authors between 1790 and 1840; all of these editions are on copyright. Price data collected from *The London Catalogue of Books* (Brown, John's-Square, and Clerkenwell, 1799; Hodgson, 1855), *The English Catalogue of Books* (Peddie and Waddington, 1914), and St. Clair (2004). Book ages are calculated using data on first editions, which we collected from the online catalogues of the British Library and Google Books (available at explore.bl.uk and books.google.com, accessed September 4–20, 2012). Demographic data are collected from the *Dictionary of Literary Biography* (Gale Research). Standard errors are in parentheses and are clustered at the author level.
***Denotes significance at the 1%, **5%, and *10% level.

Relative to an average price of 19.38s until 1814, this implies a 50% increase, which is equivalent to a 3.59% increase in price for each additional year of copyright, and an elasticity of price with respect to copyright length of 0.45.[33] Alternative specifications with the natural logarithm of price per volume indicate a 77% increase (Appendix Table A1, column 1).

Estimates are robust to controlling for the literary quality of books. Regressions with controls for books in the *Western Canon* indicate that books by dead authors became 9.60s more expensive after 1814 (*p*-value 0.01, Table 3, column 2). The coefficient for books in the *Western Canon* is small and not significant (−0.22s, *p*-value 0.91, Table 3, column 2).[34] Robustness checks with alternative measures of quality (Appendix Table A2) confirm these results. Regressions with Sherman's (2009) *Greatest Books* as a quality control, indicate that books by dead authors became 9.63s more expensive after 1814 (*p*-value 0.01, Appendix Table A2, column 3). Specifications with Abrams and Greenblatt (2012) *Norton Anthology of English Literature* indicate a price increase of 9.55s (*p*-value 0.02, Appendix Table A2, column 5).

Including additional controls for the number—in addition to the size—of pages leaves the estimate at 8.31s (*p*-value of 0.01, Table 3, column 3). With a further control for variation in price across genres, estimates indicate a price increase of 7.19s (*p*-value 0.03, Table 3, column 4), 37% compared with the average price until 1814. Estimates are also robust to controlling for variation across publishers (Appendix Table A3), and excluding two expensive editions by dead authors in 1822 and 1823. Estimates that exclude these extremely expensive editions by dead authors indicate a price increase of 5.46s (*p*-value 0.07, Appendix Table A4, column 4).[35]

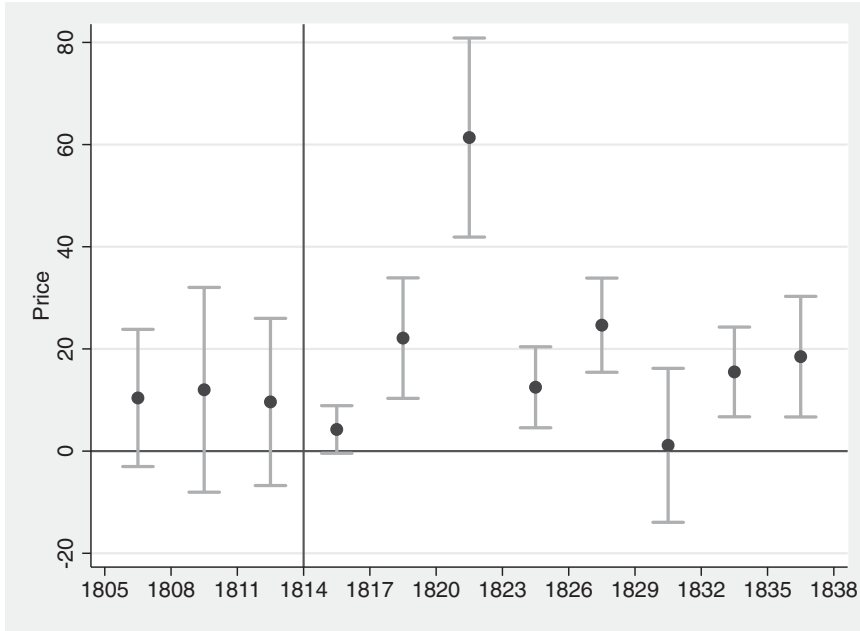
[33] The elasticity is the percent increase in price (9.75s/19.38s, the average price until 1814) divided by the percent increase in copyright (14 years/(14-2.45) years, where 2.45 is the average age of books by dead authors until 1814).

[34] Estimates for interactions between *Canon* and $dead_{s,t} * post1814_{i,t}$ are not statistically significant, and leave the estimate for $dead_{s,t} * post1814_{i,t}$ at 9.80s (and a *p*-value of 0.02).

[35] The two expensive editions by dead authors are Horace Walpole (1822), Fourth Earl of Orford: *Memoires of the Last Ten Years of the Reign of George the Second*, two volumes, sold at 105s, and William Hayley (1823): *Memoirs of the Life and Writings of William Hayley, Esq*., two volumes, sold at 84s.

FIGURE 1

TIME-VARYING ESTIMATES OF THE EFFECT OF COPYRIGHT ON PRICE



Notes: 95% confidence interval for β_t in the OLS regression $price_{it} = \alpha_0 + \alpha_1 dead_{s,t} * year_r + X_{it}\gamma + \varepsilon_{it}$, where $dead_{s,t}$ equals 1 if author s had died before year t; $year_r$ is an indicator variable to denote three-year intervals r for 1805–1808, 1809–1811, . . . , 1836–1838. The interval 1803–1805 is the excluded time period; X_{it} include age fixed effects, volume fixed effects, page size fixed effects, author fixed effects, and year fixed effects. Price data for 989 new editions of 681 titles that had been in print for 14 years or less by 120 authors between 1790 and 1840; all of these editions are on copyright. Price data collected from *The London Catalogue of Books* (Brown, John's-Square, and Clerkenwell, 1799; Hodgson, 1855), *The English Catalogue of Books* (Peddie and Waddington, 1914), and St. Clair (2004).

□ **Time-varying estimates of differential effects before and after 1814.** To investigate the timing of estimated effects, and to check whether prices for books by dead authors may have begun to increase *before the Act*, we estimate coefficients separately for three-year intervals beginning in 1800:

$$price_{it} = \alpha_0 + \alpha_1 dead_{st} + \beta_r dead_{st} * year_r + X_{it}\gamma + +\varepsilon_{it}, \quad (2)$$

where $year_r$ is an indicator variable to denote three-year intervals r for 1805–1808, . . . , 1836–1838; the interval 1803–1805 is the excluded time period, and all controls are identical to the main specification above and in Table 3, column 1. Coefficients β_r measure differences in price for books by dead compared with living authors for three-year intervals r 1805–1808, . . . , 1836–1838.

Time-varying coefficients yield no evidence of a *differential* increase in price until 1814. Between 1805 and 1814, coefficients are not statistically different from zero (Figure 1). After 1814, coefficients are positive and statistically significant for six of eight time intervals, with estimates ranging from 3.52s in 1815–1817 to 60.64s in 1821–1823. Alternative specifications with the natural logarithm of price per volume confirm the main result; estimates for the effects of the copyright extension range from 96% in 1833–1835 to 162% in 1821–1823, and they are statistically significant in seven of eight periods after 1814 (Appendix Figure A2).

□ **Excluding books by popular authors who died after 1814.** The most severe threat to our identification strategy is that the price of books by dead authors who died after 1814 may have

TABLE 4 Robustness Checks: OLS, Dependent Variable Is Price of New Editions

	Excluding Scott		Excluding Scott and Byron		Excluding Recently Deceased		Without Volume FE	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dead	−8.57**	−6.75**	−8.31**	−6.62**	−5.41**	−6.24**	−24.39**	−22.23***
	(3.63)	(2.93)	(3.69)	(3.01)	(2.89)	(2.80)	(9.34)	(7.39)
Post-1814 * dead	10.45**	7.88**	10.98**	8.63**	8.69**	8.50**	18.67*	16.45**
	(4.41)	(3.55)	(4.52)	(3.56)	(4.11)	(3.91)	(9.52)	(6.96)
Western Canon		1.92		1.40		0.53		3.02
		(3.16)		(4.55)		(2.34)		(2.71)
Number of pages		0.01**		0.01**		0.01**		0.01
		(0.00)		(0.00)		(0.00)		(0.01)
Number of pages nonmissing		−3.53***		−3.83***		−3.06***		−7.90***
		(0.88)		(0.91)		(0.93)		(1.89)
Book age FE	Y	Y	Y	Y	Y	Y	Y	Y
Page size FE	Y	Y	Y	Y	Y	Y	Y	Y
Author FE	Y	Y	Y	Y	Y	Y	Y	Y
Five-year FE	Y	Y	Y	Y	Y	Y	Y	Y
Volume FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	901	901	864	864	980	980	989	989
Adjusted R^2	0.903	0.906	0.902	0.905	0.900	0.903	0.278	0.293

Notes: Columns (1)–(2) exclude 88 book editions by Sir Walter Scott. Columns (3)–(4) exclude 88 editions by Scott and 37 editions by Lord Byron. Columns (5)–(6) exclude eight editions by authors who had died within one year of the publication year of the edition. Book age fixed effects control for first editions and for the number of years that have passed since the first edition. Genre fixed effects control for variation in price across novels, poetry, other fiction, and nonfiction. Price data for 989 new editions of 681 titles that had been in print for 14 years or less by 120 authors between 1790 and 1840; all of these editions are on copyright. Price data collected from *The London Catalogue of Books* (Brown, John's-Square, and Clerkenwell, 1799; Hodgson, 1855), *The English Catalogue of Books* (Peddie and Waddington, 1914), and St. Clair (2004). Book ages are calculated using data on first editions, which we collected from the online catalogues of the British Library and Google Books (available at explore.bl.uk and books.google.com, accessed September 4–20, 2012). Demographic data are collected from the *Dictionary of Literary Biography* (Gale Research). Standard errors are in parentheses and are clustered at the author level.
***Denotes significance at the 1%, **5%, and *10% level.

increased for idiosyncratic reasons—independently of copyright lengths. Author fixed effects control for variation in the level of prices across authors, but they cannot capture a differential increase in the price of books by popular authors who died after 1814.

The most popular romantic period author was Sir Walter Scott (1771–1832), who "sold more novels than all the other novelists of the time put together" (St. Clair, 2004). Scott's books were so expensive that even wealthy readers, such as Lord Dudley, complained about their exorbitant price (Romilly, 1905). Our sample includes 36 editions by Scott until 1814, and 52 editions after the Copyright Act, with average prices of 22.60s and 31.44s, respectively. The last edition by Scott is *Tales of My Landlord: Fourth and Last Series*, in 1831, one year before Scott's death. It sold for 42s. Excluding Scott increases the baseline estimates to 10.45s (p-value 0.03, Table 4, column 1). Relative to an average price of 18.96s (excluding Scott) before 1814, this implies a 55% increase. With a full set of controls, the estimate is 7.88s, or 42% (Table 4, column 2).[36]

Another superstar writer was George Gordon Lord Byron (1788–1824). Byron died at age 36, when he contracted a fever fighting for Greece's independence from the Ottoman Empire. A new edition of Byron's *Cain, A Mystery*, was published in 1830, six years after the author's death.[37] It sold for 10.5s, compared with an average 9.86s for seven of Byron's editions between 1790 and 1814, and 5.97s for 29 editions between 1815 and 1824. Excluding books by Scott and

[36] Estimates with the logarithm of price per volume indicate a 91% increase (Appendix Table A1, column 3).

[37] Overall the share of compilations among all editions by dead authors stays roughly constant with 39% until 1814 and 37% afterward.

Byron increases the estimate to 10.98s (p-value 0.03, Table 4, column 3), which implies a 57% increase, compared with an average price of 19.19s until 1814. With a full set of controls, the estimate is 8.63s, or 45% (p-value 0.02, Table 4, column 4).[38]

Books by Jane Austen (1775–1817) languished in "relative obscurity" in the romantic period (Bautz, 2007), and became cheaper after the author's death. Until 1814, a total of six editions of *Sense and Sensibility, Pride and Prejudice*, and *Mansfield Park* sold for an average of 14.83s. Between 1814 and Austen's death in 1817, three editions of *Emma, Mansfield Park*, and *Pride and Prejudice* sold for an average of 17.00s. After Austen's death in 1817, five editions of *Emma, Mansfield Park, Northanger Abbey, Pride and Prejudice*, and *Sense and Sensibility* sold for an average price of 8.07s.[39]

□ **Excluding books by recently deceased authors.** Books by dead authors may also have sold for a higher price—independent of copyright—if news of an author's death temporarily increased demand. For example, demand may surge after an artist's death if consumers race to acquire remaining works (Ekelund, Jr., Ressler, and Watson, 2000).

There does, however, not appear to be a similar effect for romantic period books, possibly because private collections of books were relatively rare (Plant, 1974). All results are robust to excluding editions by recently deceased authors. Baseline estimates indicate an additional price increase of 8.69s after 1814 for books by dead authors (p-value 0.03, Table 4, column 5). Compared with an average price of 19.31s until 1814, this implies a 45% increase. Estimates with a full set of controls indicate a price increase of 8.50s (p-value 0.02, Table 4, column 6).[40]

□ **Placebo: editions by dead authors that did not benefit from the extension.** To test whether changes in tastes or other unobservable factors raised prices for editions by dead authors after 1814, we estimate placebo regressions for editions by dead authors that experienced no extension in copyright terms. The 1710 *Statute of Anne* automatically awarded another 14 years to authors who survived the first 14-year term, so that books that were older than 14 years received no extension under the 1814 Act. Placebo regressions examine whether editions by dead authors became more expensive after 1814 for these titles. For 85 editions above the age of 14 years, the baseline estimate for $dead_{st} * post1809_t$ is negative, with −16.65 (p-value 0.04, Table 5, column 1). With a full set of controls, the estimate is negative but not significant (−12.19s, p-value 0.17, Table 5, column 2). These results suggest that unobservable factors that are common to books by dead authors cannot explain the differential price increase for these books after 1814.

An additional placebo test starts the *post* period in 1809—five years before the Copyright Act. Evidence from parliamentary records indicates that the differential increase in copyright length was unanticipated. By allowing the post period to begin in 1809, we can check whether the Act may in fact have been anticipated, or whether other unobservable factors that preceded the Act, caused the increase in price. The estimate for $dead_{st} * post1809_{it}$, however, is small and not statistically significant (3.19, p-value 0.33, Table 5, column 4).

5. Price discrimination

■ In this section, we explore whether publishers used the extra years of copyrights to practice price discrimination by selling books for a high price first, and delaying lower price sales to later years when the book was still on copyright. We present a simple model of intertemporal price discrimination whose key assumption is that consumers vary in their willingness to pay. Historical records validate this assumption for the two major groups of buyers, wealthy people and

[38] Estimates with the logarithm of price per volume indicate a 93% increase (Appendix Table A1, column 4).

[39] Mary Shelley (1797–1851), was 20 years old in the year of the first edition of her novel *Frankenstein* (1817), and survived the sample period. *Frankenstein* sold for an average of 12.13s between 1817 and 1840, about 80% of the average price (15.48s) of other editions in the same years.

[40] Estimates with the log of price per volume suggest a 99% increase in price (Appendix Table A1, column 6).

TABLE 5 Placebo: OLS, Dependent Variable is Price of New Editions

	Age of Book Editions			
	> 14 Years		≤ 14 Years	
	(1)	(2)	(3)	(4)
Dead	12.04	13.76	−4.40	−2.61
	(7.52)	(8.58)	(4.71)	(4.04)
Post-1814 * dead	−16.65**	−12.19		
	(7.81)	(8.81)		
Post-1809 * dead			5.67	3.19
			(4.88)	(4.15)
Western Canon		−13.07***		0.62
		(3.75)		(2.30)
Number of pages		0.03***		0.01**
		(0.01)		(0.00)
Number of pages nonmissing		−11.89**		−3.06***
		(5.08)		(0.92)
Five-year FE	Y	Y	Y	Y
Book age FE	Y	Y	Y	Y
Page size FE	Y	Y	Y	Y
Volume FE	Y	Y	Y	Y
Author FE	N	N	Y	Y
Genre FE	N	Y	N	Y
Observations	85	85	989	989
Adjusted R^2	0.829	0.853	0.900	0.902

Notes: Columns (1)–(2): OLS placebo regressions for 85 new editions between 1790 and 1840 of 58 titles that are still on copyright (to maintain comparability with the main specifications), but have been in print for more than 14 years (and therefore were not affected by the differential increase in copyright that affects the main specifications). Regressions include no author fixed effects due to the small number of observations. Columns (3)–(4): OLS placebo regressions with an earlier start-date for the Act for 989 editions of 681 titles that had been in print for 14 years or less by 120 authors between 1790 and 1840. Book age fixed effects control for first editions and for the number of years that have passed since the first edition. Genre fixed effects control for variation in price across novels, poetry, other fiction, and nonfiction. Price data for 989 new editions of 681 titles that had been in print for 14 years or less by 120 authors between 1790 and 1840; all of these editions are on copyright. Price data collected from *The London Catalogue of Books* (Brown, John's-Square, and Clerkenwell, 1799; Hodgson, 1855), *The English Catalogue of Books* (Peddie and Waddington, 1914), and St. Clair (2004). Book ages are calculated using data on first editions, which we collected from the online catalogues of the British Library and Google Books (available at explore.bl.uk and books.google.com, accessed September 4–20, 2012). Demographic data are collected from the *Dictionary of Literary Biography* (Gale Research). Standard errors are in parentheses and are clustered at the author level.
***Denotes significance at the 1%, **5%, and *10%, level.

circulating libraries. We also show that circulating libraries could charge more—and were willing to pay more—for multivolume editions. Publishers exploited this feature to increase revenue by offering pricey multivolume editions first and affordable single-volume editions later.

□ **Intertemporal price discrimination for a temporary monopoly.** Intuitively, an extension in the length of copyright improves the publisher's ability to practice intertemporal price discrimination. The extended period of the publishing monopoly allows publishers to offer high-priced editions first and delay the introduction of lower priced editions "for the purpose of exploiting differences in consumers' reservation price" (Stokey, 1979).[41]

To formalize this intuition, we extend existing models of intertemporal price discrimination for durable goods (Stokey, 1989; Tirole, 1988; Besanko and Winston, 1990) to allow for temporary monopoly rights. Suppose the initial length of copyrights is T years. Publishers' marginal cost

[41] In contrast to the the Coase (1972) conjecture, our model predicts that the monopolist can charge a price above marginal costs. The difference between is due to menu costs (for instance, for printing book prices in a catalogue). Stokey (1981) shows that menu costs allow publishers to commit to price for some time.

of publishing and distributing one additional copy of a book equals c. Consumers and publishers are forward-looking with a discount factor of δ.[42]

Consumers have distinct preferences over books, and consider them imperfect substitutes for each other. For simplicity, we assume that willingness to pay is distributed $v \sim \text{Uniform}[0, 1]$, so that the demand for books is linear in price. The prediction that price increases with copyright length, however, only depends on variation in willingness to pay across buyers, and it holds for any distribution of the willingness to pay.

Let T be the length of copyright, $p_{a,T}$ the price that publishers charge for a book a periods after the first edition. Let $v_{a,T}$ be the willingness to pay of the marginal consumer who is indifferent between buying in period a and waiting to buy in period $a+1$. In each period a, publishers choose price p to maximize the value function $H_{a,T}(v_{a-1,T})$, the sum of current-period profits and the discounted value of future profits

$$H_{a,T}(v_{a-1,T}) = \max_{p,v}\{(p-c)(v_{a-1,T}-v) + \delta H_{a+1,T}(v)\}, \tag{3}$$

subject to:

$$v - p = \delta(v - p_{a+1,T}(v)), \tag{4}$$

since consumers' willingness to pay is distributed $v \sim \text{Uniform}[0, 1]$, $v_{0,T} = 1$.

Once copyrights expire, competitors enter with cheap editions of the same book, and Bertrand competition reduces price to equal marginal cost c, so that $p_{T+1,T}(v) = c$. Historically, they are specialized publishers who entered to offer cheap editions of a title upon the expiration of copyrights. For example, Gall and Inglis' series, *Landscape Poets*, sold off-copyright works by Byron and Scott "at a price which will bring it within general reach" (Mackeson, 1882), and *Walker's British Classics*, offered off-copyright titles by Shakespeare and Thomson for one or two shillings each (St. Clair, 2004).

Then, following Besanko and Winston (1990), the pricing strategy in the subgame perfect Nash equilibrium is characterized by a sequence of intermediate values $\{A_t, \lambda_t\}$ that determine $\{v_{a,T}, p_{a,T}\}$ with $A_0 = \frac{1-\delta}{4}$, $A_t = \frac{(1-\delta+2\delta A_{t-1})^2}{4(1-\delta+\delta A_{t-1})}$, $\lambda_0 = \frac{1}{2}$, $\lambda_t = \frac{1-\delta+2\delta A_{t-1}}{2(1-\delta+\delta A_{t-1})}$, $v_{0,T} = 1$, $p_{a,T} = 2A_{T-a}v_{a-1,T} + (1-2A_{T-a})c$, $v_{a,T} = \lambda_{T-a}v_{a-1,T} + (1-\lambda_{T-a})c$.

First note that, if δ is large enough, the series of $\{A_t\}$ is well defined iteratively, and monotonically increasing to a stationary point $A^* = \frac{\sqrt{(1-\delta)}-(1-\delta)}{2\delta} < \frac{1}{2}$, so $p_{a,A}$ is a linear combination of $v_{a-1,T}$ and c. A^* solves $A = \frac{(1-\delta+2\delta A)^2}{4(1-\delta+\delta A}$, and the linear weight λ_t is increasing in A_{t-1}.

Now, consider an extension from T to $T+\Delta T$ periods. The price sequences for $\{v_{a,T}\}$ and $\{v_{a,T+\Delta T}\}$ both start from $v_{0,T} = v_{0,T+\Delta T} = 1$, and for any value of a, the linear weights

$$A_{T+\Delta T-a} > A_{T-a}, \lambda_{T+\Delta T-a} > \lambda_{T-a}.$$

Iteratively, $v_{1,T+\Delta T} > v_{1,T} \geq c$, $v_{2,T+\Delta T} > v_{2,T} \geq c, \ldots$, so that

$$p_{a,T+\Delta T} > p_{a,T}.$$

Importantly, this result is robust to declining costs of distribution, a key difference between the historical setting and today. For example, a technological shift toward the digital distribution of content has reduced publishers' marginal costs c. A simulation exercise demonstrates that such a change would increase the effects of copyright length in our model. With a shift from a positive marginal cost of distribution (setting a low level of $c = 0.2$, Appendix Figure A4) to a marginal cost of $c = 0$, the average price for books increases from 0.054 (with positive marginal costs $c = 0.2$) to 0.068 with zero marginal costs.

[42] Results also hold for the case of myopic consumers. In the Appendix, Figure A3 compares the simulated price path of a book title for the case of myopic consumers and the case of forward-looking consumers.

□ **Variation in willingness to pay.** A key assumption of our model is that consumers differ in their willingness to pay. In the romantic period, the main customers for books were circulating libraries that rented books to individual readers and wealthy people who bought books for their own use. As with 20th-century video stores, circulating libraries derived greater utility from a book than individual buyers, because they could rent the book to many readers (Roehl and Varian, 2001), similar to a platform in a two-sided market (Rochet and Tirole, 2003; Armstrong, 2006). Libraries charged a subscription fee of roughly twice the price of a three-volume novel (Jacobs, 2006), and a separate fee for each volume. "By 1800, most copies of a novel's edition were sold to the [circulating] libraries, which were flourishing businesses to be found in every English city and town . . . " (Erickson, 1990). St. Clair (2004) estimates roughly 1,000 circulating libraries in Britain in 1801, and 1,500 in 1821. Hamlyn (1946) notes that "not less than one thousand" circulating libraries operated in England by 1850.[43]

Data on library holdings indicate a large amount of variation in the ability of libraries to buy books. Wealthy urban libraries, such as A.K. Newman's Circulating Library in London, often held more than 1000 novels alone (Appendix Figure A5). Similarly, holdings of Newman's Circulating Library covered 1,137 novels in 1816. By comparison, provincial libraries, such as Macclesfield Subscription Library, were much smaller, with collections around 100 novels.[44]

Publishers practiced intertemporal price discrimination by offering new editions at a high price to wealthy circulating libraries first, and then reducing prices sell to provincial libraries and individual buyers. Historical letters show that individual readers waited for lower priced editions, even if they were extremely wealthy. For example, John William Ward, the first Earl of Dudley, wrote in 1810, "I have not read [Sir Walter Scott's new book] *The Lady of the Lake*, two guineas is too much for six cantos, and I shall therefore wait patiently for the [lower priced] 8vo" (Romilly, 1905).[45] Similarly, the English writer and philanthropist Hannah More (1745–1833) wrote in 1813, "I had ordered my bookseller to send me [Scott's poem] *Rokeby* as soon as it might be had for twelve shillings" (St. Clair, 2004).

The only way to avoid the wait for the lower priced editions was to borrow books from circulating libraries. Also, if readers expected to find new titles, the libraries' demand for new books would have been relatively inelastic. Contemporary advertisements show that libraries regarded new books as an important selling point. For example, Mudie's *Select Library* advertised in *The Reader*: "Subscribers to Mudie's Library are respectfully informed that arrangements have again been made with the leading publishers for an early and abundant supply of all the best forthcoming books."[46]

Circulating libraries, in turn, exploited variation in their readers' willingness to pay to discriminate on price. For example, Jacobs (2006) explains, "From the 1790s many libraries introduced a class system of fees, whereby those paying a higher rate had exclusive access to new books and/or could take out more books at a time. Generally, the limit was six [books at a time], but Lane's 1798 catalog specifies eighteen rentals at a time for three guineas (sixty-three shillings)."

□ **Libraries demand multivolume editions.** Circulating libraries were especially keen on editions that were split into two or more volumes, because they could charge readers separately for each volume of a book (Feather, 2006; Gaskell, 2007). Publishers and authors responded to the demand for multivolume editions. "Even if authors had to stretch and expand their work to meet a quota of pages, even if printers had to widen margins and lead pages to piece out suitable

[43] Data on library holdings also indicate that libraries were equally likely to hold books by dead and living authors: books by dead authors are included in 68.8% of all circulating libraries, and books by living authors are included in the holdings of 73.6% of all libraries. With a p-value of 0.526, this difference is not statistically significant.

[44] Dickens (1894) quotes a 1761 essay: "the reading female hires her novels from some country Circulating Library, which consists of about a hundred volumes." Also, see Jacobs (2006).

[45] *Lady of the Lake* sold for 42s in 1810, and for 9s for an octavo edition in 1830.

[46] *The Reader*, December 24, 1864, cited at www.victorianweb.org/economics/mudies1.jpg.

volumes, still the all-powerful libraries demanded, and got, their quota of three volumes" (Griest, 1965).

Publishers exploited this variation in demand by charging more for multivolume editions of the same book. Among 683 editions with volume data in the *Dictionary of Literary Biography*, multivolume editions sold for 28.25s, nearly three times the 9.88s price for single-volume editions. Gaskell (2007) explains how publishers used multivolume formats to discriminate on price: "The high price [of multivolume editions] enabled the publisher to produce a lengthy book in a small edition—he could always put out a cheap single-volume reprint later if it was successful."

With longer terms of copyright protection, publishers became more likely to split books by dead authors into separate volumes. Until 1814, 45% of editions by dead authors were single-volume editions, and the remaining 55% were two or more volume editions. After 1814, the share of multivolume editions increased to 89% for books by dead authors. By comparison, the share of multivolume editions stayed roughly constant for books by living authors, with 68% until 1814 and 60% afterward. Data on page counts suggest that publishers began to stretch books by dead authors to cover multiple volumes. Summing across volumes, total page counts for new editions by dead authors stay nearly constant with 709 pages until 1814, and 705 pages afterward, whereas page counts per volume decline from 510.5 until 1814 to 313.4 afterward. By comparison, page counts per volume for editions by living authors stay roughly constant with 242.1 until 1814 and 232.8 afterward.

If publishers used multivolume editions as a tool to discriminate on price, then controlling for volumes per edition should capture a significant share of the effect of price discrimination. To investigate this idea, we repeat the main specifications *without* volume fixed effects. As expected, excluding volume fixed effects increases the baseline estimate to 18.67s (p-value 0.07, Table 4, column 7), nearly twice the estimate of 9.56s with volume fixed effects (Table 3, column 1). Excluding volume fixed effects, however, lowers the adjusted R^2 estimates to 27.8%, compared with 90.1% in the main specification with volume fixed effects. This suggests that controls for volume fixed effects are critical to the quality of our estimates.

□ **Changes in price as books approach the end of copyright.** A final test for intertemporal price discrimination examines variation in the price of new editions as a book title approaches the end of its copyright term. If publishers practiced intertemporal price discrimination, the same book should sell for a higher price in the early years of the copyright term (when publishers serve consumers with a high willingness to pay) and become cheaper over time (when publishers serve consumers with a lower willingness to pay).

Individual observations confirm this pattern. Thomas Moore's poem, *Lalla Rookh*, for example, sold for 42s in 1817, for 14s until 1827, and for 5s after 1829 (Figure 2). By 1855, four years before *Lalla Rookh* came off copyright, it sold for 2.5s. In 1859, when *Lalla Rookh* came off copyright, two competing publishers, Gall & Inglis and Routledge, entered and offered off-copyright editions for 1.5s each (St. Clair, 2004).

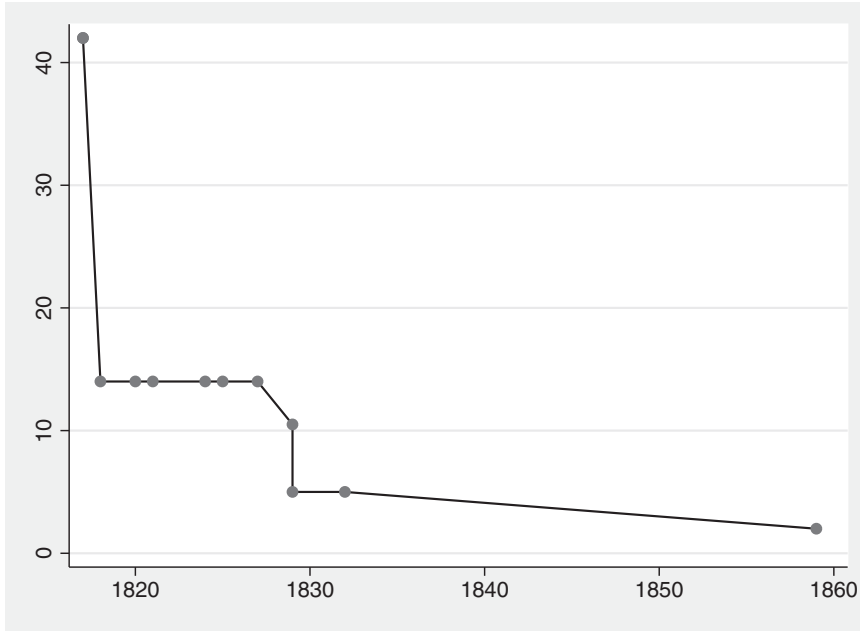
To systematically investigate such changes for the entire data set, we use data on authors' year of death to calculate the remaining years of life for each author in year t and estimate variation in price as a function of remaining years of copyright:

$$price_{it} = \beta_0 + \beta_r L_{it} + X_{it}\gamma + \varepsilon_{it}, \tag{5}$$

where $price_{it}$ measures price and L_{it} measures the remaining years of copyright for edition i in year t, which equals the difference between the final year of copyright T and calendar year t. For new editions of titles that had first been published in years until 1814, T equals the year of the first edition plus 14 years for authors who had died within 14 years of the first edition, and plus 28 years for authors who had survived the first 14 years. For editions of titles that had first been published after 1814, T equals the year of the first edition plus 28 years for authors who had died within 28 years, and plus the author's remaining life for authors who had survived the initial year

FIGURE 2

PRICE FOR THOMAS MOORE'S *LALLA ROOKH*



Notes: Price data for 10 editions of Thomas Moore's book title *Lalla Rookh* (1817), while *Lalla Rookh* was on copyright. The copyright term for *Lalla Rookh* expired in 1859; after that year, price declined again to 5s for two editions by competing publishers. We have collected these data from *The London Catalogue of Books* (Brown, John's-Square, and Clerkenwell, 1799; Hodgson, 1855), *The English Catalogue of Books* (Peddie and Waddington, 1914), and St. Clair (2004).

term.[47] Coefficients β_r are estimated separately for three-year periods r, observations in years $T - 28$ and above are the excluded category. The vector X_{it} includes control variables for books by dead authors, as well as time, author, volume, and genre fixed effects. Standard errors are clustered at the author level to allow for correlation across editions of the same title and across titles by the same author.

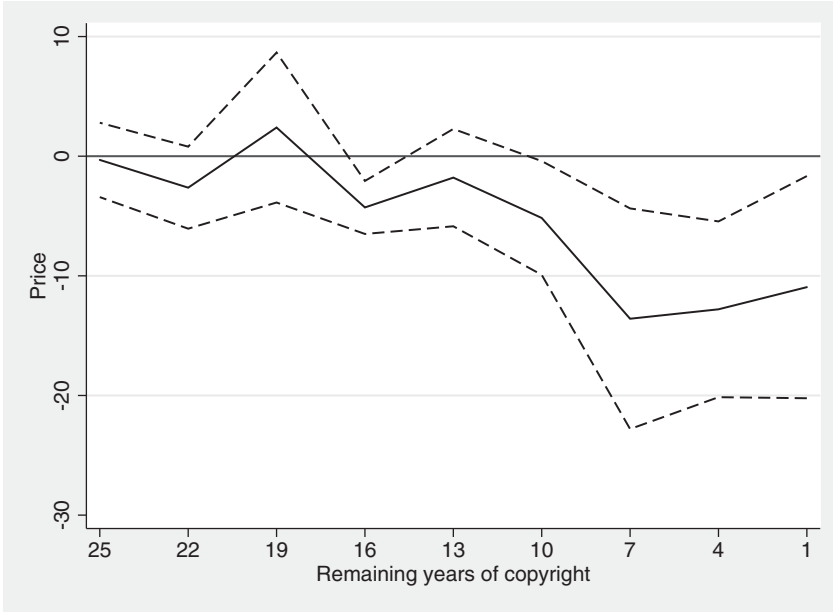
Estimates of β_r confirm that new editions become cheaper as titles approach the end of their copyright terms. In year $T - 1$, new editions of a book title sold for 10.46s less compared with prices in $T - 28$ to $T - 26$ and above (Figure 3, with a p-value 0.03), and new editions in $T - 4$ to $T - 2$ sold for 10.54s less (p-value 0.01). Results are robust to including controls for canonical books, page size, and page numbers (Appendix Figure A6). Selection bias may lead this test to underestimate the true decline in price, because books that continue to be in print nearly 28 years after their initial publication are especially durable and may sell for a higher price.

Summary statistics on changes in price confirm the role of copyright in determining the price of books. For example, the Reverend William Paley's (1743–1805) *A View of the Evidences of Christianity* (first edition in 1794, under copyright until 1808) sold for 12s in 1794, and then sold for 9s and 4.5s in 1820 and 1824, when it was off copyright. For the full data set of all 1,227 editions, summary statistics indicate a 15% decline in price as books enter the public domain, with a median price of 10.5s for editions on copyright, compared with 9.0s off copyright.

[47] Publishers may have incorporated private information they had about an author's health into their decision on the price of the author's book. To account for this, we use the actual remaining years of life for each author (rather than the life expectancy of the average author) to create a proxy for copyright length for the author's books.

FIGURE 3

ESTIMATES OF CHANGES IN THE PRICE OF NEW EDITIONS AS COPYRIGHTED TITLES APPROACH THE END OF THEIR COPYRIGHT TERM



Notes: 95% confidence interval for β_s in the OLS regression $price_{it} = \beta_0 + \beta_s L_{it} + X_{it}\gamma + \varepsilon_{it}$ where $price_{it}$ measures the price of title i in year t, L_{it} measures the remaining years of copyright for edition i in year t, which equals the difference between the final year of copyright T for a title i and calendar year t. For book titles with first editions before 1814, T equals the year of the first edition plus 14 years if the author died within 14 years of the first edition, and plus 28 years if the author died between 14 and 28 years after the first edition. For book titles with first editions after 1814, T equals the maximum of year of first edition plus 28 years and the author's remaining life. The matrix X_{it} includes controls for volume fixed effects, book age fixed effects, authors fixed effects, five-year fixed effects, and books by dead authors. We estimate five-year, rather than one- or two-year fixed effects, to increase statistical power. Price data for 989 new editions of 681 titles that had been in print for 14 years or less by 120 authors between 1790 and 1840; all of these editions are on copyright. Price data collected from *The London Catalogue of Books* (Brown, John's-Square, and Clerkenwell, 1799; Hodgson, 1855), *The English Catalogue of Books* (Peddie and Waddington, 1914), and St. Clair (2004). Book ages are calculated using data on first editions, which we collected from the online catalogues of the British Library and Google Books (available at explore.bl.uk and books.google.com, accessed September 4–20, 2012). Demographic data are collected from the *Dictionary of Literary Biography* (Gale Research).

□ **Changes in the distribution of print runs.** In addition to price, longer copyright terms may influence quantity, and in particular print runs, the number of copies in a new edition. There are two alternative channels for this change, a first-order direct *experimentation* effect and an indirect *niche title* effect through the effects of copyrights on price.

First, longer terms of exclusivity increase publishers' expected payoffs from identifying extremely popular books that will sell for a long time. If demand for popular books is difficult to predict *ex ante*, publishers have an increased incentive to experiment with longer copyright terms. This experimentation channel will increase the *dispersion* of print runs, because longer copyright terms increase expected payoffs for both small experimental batches and extremely large print runs.

A second, indirect effect of copyright length operates through price: a large enough increase in price may encourage the production of niche titles that were not profitable under the original copyright regime. This indirect niche-title effect increases the share of editions with smaller print runs *without increasing the share of large editions*.

To investigate changes in the distribution of print runs, we use St. Clair (2004) to collect data on the number of physical copies printed for each new edition. Data on the size of print

runs are available for 518 editions, including 418 editions that had been in print for 14 years or less.[48] Among these 418 editions, print runs range from 100 copies for William Godwin's *Lives of Edward and John Phillips* (1815) to 12,000 copies for Lord Byron's *Childe Harold's Pilgrimage* (1816, Appendix Figure A7).[49]

Consistent with a shift toward experimentation, the distribution of print runs becomes more dispersed for dead authors after 1814, but not for living authors (Appendix Figure A8).[50] For dead authors, print runs change from a unimodal distribution with an average of 1,667, a median of 1,750, and a standard deviation of 408, to a bimodal distribution with 70% of print runs between 500 and 2,500 copies, and 30% of print runs between 5,000 and 8,000 copies (Appendix Figure A8, Panel A). At the same time, the distribution of print runs for books by living authors remains nearly unchanged.[51] Albeit based on a small number of observations, these findings suggest that an extension in copyright length encouraged publishers to experiment with smaller print runs and publish larger editions of successful authors.

6. Conclusions

■ This article has examined the effects of an extension in the length of copyrights on price, as the fundamental lever by which stronger copyrights may encourage investments in creative works and limit their diffusion. A simple extension of existing models of intertemporal price discrimination implies that an increase in the length of copyright will increase the price of creative works.

Our empirical analysis has exploited a differential increase in the length of copyright—in favor of books by dead authors—to identify the causal effect of longer copyright terms on price. Difference-in-differences regressions, which compare changes in the price of books by dead and living authors, reveal a substantial increase in price in response to longer copyrights. Results are robust to a broad range of alternative specifications (including controls for genres, canonical books, and physical characteristics), and to excluding author fixed effects. They are also robust to excluding books by popular authors who had died after 1814, and to excluding books by recently deceased authors. Estimates of time-varying effects yield no evidence of differential pretrends. Placebo regressions for books by dead authors that did not benefit from the extension in 1814 indicate no differential price increase for books by dead authors.

We find that longer copyright terms raised prices by improving publishers' ability to practice intertemporal price discrimination. A straightforward extension of models of price discrimination (Stokey, 1989) to the case of *temporary* monopoly rights predicts that prices increase in response to longer copyrights. This result requires that consumers vary in their willingness to pay for books, which is consistent with the historical record. Commercial circulating libraries and wealthy individuals were the main buyers of romantic period books (Erickson, 1990). Circulating libraries had a higher willingness to pay than individual readers, because they could rent the same book to many readers. By the 1800s, more than 1,000 libraries operated in Britain (St. Clair, 2004). Publishers sold to wealthy libraries in London first, whereas smaller provincial libraries and individual buyers waited for lower priced editions. Personal letters reveal that even wealthy buyers, such as the Earl of Dudley, waited for prices to fall before they would buy a book.

[48] Our data cover authors who were successful enough to enter the *Dictionary of Literary Biography* (Gale Research); these authors may be less likely to produce niche titles. Print runs in our data are large, with a mean of 2,166 copies and a median of 1500 copies.

[49] We also estimate difference-in-differences regressions on the logarithm of print run. Estimates for a differential decline in print runs are not significant for the full sample (Appendix Table A5, column 1), but they become significant when we exclude Sir Walter Scott and Lord Byron, two extremely successful authors (columns 2–5).

[50] Data include 164 editions by 29 living authors until 1814 and 234 editions by living authors after 1814, and 6 editions by 2 dead authors until 1814 as well as 10 editions by 5 dead authors after 1814.

[51] With a mean of 2,152, a median of 1,405, and a standard deviation of 2,289 (Appendix Figure A8, Panel B). The *p*-value for Wilcoxon Test, the equality of two distributions, is 0.94.

Analyses of book-level price data over time confirm that publishers reduced the price of new editions as books approached the end of copyrights.

The 19th-century publishing industry shares many traits of publishing today, but marginal costs of distribution are approaching zero for e-books and online movies today. A simple extension of our model to the case of zero marginal costs of distribution confirms that extensions in copyright terms increase price. Another distinct feature of the historical setting is that resale markets were thin. For example, circulating libraries such as Mudie's "kept most of the books which had done their rounds in huge 'catacombs' for decades or longer" to prevent competition with used copies of their books (St. Clair, 2004). Today, textbooks and other types of books are traded in active resale markets, which can limit publishers' ability to practice intertemporal price discrimination (Chevalier and Goolsbee, 2009).[52] However, similar to 19th-century publishers, copyright owners take active steps to prevent resale, for example, by making it more difficult for students to use earlier editions of a textbook, or by distributing goods digitally through streaming or rentals (Shiller, 2013).[53]

Did longer copyright terms and higher book prices increase welfare? Accounting records show that publishers increased their payments to the authors of new fiction titles after 1814, even though payments increased most for a small set of literary superstars (MacGarvie and Moser, 2013). An empirical analysis of 19th-century operas indicates that the adoption of basic copyright laws—which increases payments to composers—can increase both the quantity and quality of creative work (Giorcelli and Moser, 2016).[54]

However, copyright extensions beyond 20 or 30 years are unlikely to encourage the creation of new work. For example, opera data indicate that even the most successful pieces are rarely played after the first 10 years, and copyright extensions beyond the life of authors have no clear effects on creativity (Giorcelli and Moser, 2016). Copyright policies that increase the price of copyrighted work may also discourage the creation of new work by limiting access to existing work. These costs can be particularly high for science, a field in which the creation of new knowledge depends critically on access to existing work (Biasi and Moser, 2016). Our findings in this article highlight the importance of price in determining the dynamic effects of copyrights on follow-on science, creativity, and innovation.

References

Hansard House of Commons Debate. Vol. 11, cc988-93 (22 June 1808).

"London Booksellers' Petition, Respecting Copyrights, &c." 16 December 1812, Hansard, 2nd Series, Vol. 24, 308–311. In L. Bently and M. Kretschmer, eds., *Primary Sources on Copyright* (1450–1900). Accessed September 1, 2015, www.copyrighthistory.org (1812).

"Minutes of Evidence Taken before the Committee on Acts of 8 Anne, and 15 & 41 Geo. III. for the Encouragement of Learning, By Vesting the Copies of Printed Books, in the Authors or Purchasers of Such Copies." 20 July 1813, (1812–1813) Paper no. 341, IV.1003–1040. In L. Bently and M. Kretschmer, eds., *Primary Sources on Copyright* (1450–1900). Accessed September 1, 2015, www.copyrighthistory.org (1813).

"Petition of the Printers of London and Westminster Respecting Copyright." 11 March 1813, Hansard, 2nd Series, Vol. 25, 10–16. In L. Bently and M. Kretschmer, eds., *Primary Sources on Copyright* (1450–1900). Accessed September 1, 2015, www.copyrighthistory.org (1813).

"Report of the Acts Respecting Copyright." 18 June 1813, Hansard, 2nd Series, Vol. 26, 708–710. In L. Bently and M. Kretschmer, eds., *Primary Sources on Copyright* (1450–1900). Accessed September 1, 2015, www.copyrighthistory.org (London, 1813).

[52] More generally, the existence of an active resale market can reduce the price of new versions of the good because they compete with used versions of the same good. For example, see analyses of markets for used cars in Esteban and Shum (2007); Chen, Esteban, and Shum (2013); Gavazza, Lizzeri, and Roketskiy (2014).

[53] Shiller (2013) estimates a dynamic discrete choice model of the video game market to evaluate the welfare impacts of shutting down the resale market for a good of which consumers tire with use.

[54] Longer terms may also improve overall welfare by mitigating the deadweight loss from copyright monopolies, as they improve publishers' ability to practice price discrimination (Scotchmer, 2004; Mortimer, 2007).

"Report from the Select Committee on the Copyright Acts of 8 Anne, c.19; 15 Geo.III, c.53; 41 Geo.III, c.107; and 54 Geo.III, c.116." (1818) Paper no. 402, IX.249–56. In L. Bently and M. Kretschmer, eds., *Primary Sources on Copyright* (1450–1900). Accessed September 1, 2015, www.copyrighthistory.org (London 1818).

Armstrong, M. "Competition in Two-Sided Markets." *RAND Journal of Economics*, Vol. 37 (2006), pp. 668–691.

Barnes, J.J. *Free Trade in Books: A Study of the London Book Trade since 1800*. Oxford: Clarendon Press, 1964.

Bautz, A. *The Reception of Jane Austen and Walter Scott: A Comparative Longitudinal Study*. London, New York: Continuum, 2007.

Besanko, D. and Winston, W.L. "Optimal Price Skimming By a Monopolist Facing Rational Consumers." *Management Science*, Vol. 36 (1990), pp. 555–567.

Biasi, B. and Moser, P. "Effects of Copyrights on Science: Evidence from the US Book Replication Program." Available at SSRN: https://ssrn.com/abstract=2542879. 2016.

Blank, R.M. and Kappos, D.J. "Intellectual Property and the US Economy: Industries in Focus." Available at www.uspto.gov/. 2012.

Bloom, H. *The Western Cannon: The Books and School of the Ages*. New York: Harcourt Brace, 1994.

Boldrin, M. and Levine, D.K. "Intellectual Property and the Efficient Allocation of Social Surplus from Creation." *Review of Economic Research on Copyright Issues*, Vol. 2 (2005), pp. 45–67.

Brown, M., John's-Square, S., and Clerkenwell. *The London Catalogue of Books with Their Sizes and Prices*. London: W. Bent and Paternoster Row, 1799.

Chen, J., Esteban, S., and Shum, M. "When Do Secondary Markets Harm Firms?" *American Economic Review*, Vol. 103 (2013), pp. 2911–2934.

Chevalier, J. and Goolsbee, A. "Are Durable Goods Consumers Forward-Looking? Evidence from College Textbooks." *The Quarterly Journal of Economics*, Vol. 124 (2009), pp. 1853–1884.

Coase, R.H. "Durability and Monopoly." *Journal of Law and Economics*, Vol. 15 (1972), pp. 143–149.

Deazley, R. *Rethinking Copyright: History, Theory, Language*. Cheltenham: Edward Elgar Publishing, 2006.

———. "Life of an Author: Samuel Egerton Brydges and the Copyright Act 1814." *Georgia State University Law Review*, Vol. 23 (2007), p. 809.

———. "Commentary on Beckford v. Hood (1798)." *Primary Source on Copyright (1450–1990)*, 2008a.

———. "Commentary on Copyright Act 1814." *Primary Source on Copyright (1450–1990)*, 2008b.

Dickens, C. *All the Year Round: A Weekly Journal*. Vol. XI of *Third*, London: Messrs, Chapman and Hall, 1894.

Ekelund, R.B., Jr., Ressler, R.W., and Watson, J.K. "The'Death-Effect'in Art Prices: A Demand-Side Exploration." *Journal of Cultural Economics*, Vol. 24 (2000), pp. 283–300.

Erickson, L. "The Economy of Novel Reading: Jane Austen and the Circulating Library." *Studies in English Literature, 1500–1900*, Vol. 30 (1990), pp. 573–590.

Esteban, S. and Shum, M. "Durable Goods Oligopoly with Secondary Markets: The Case of Automobiles." *RAND Journal of Economics*, Vol. 38 (2007), pp. 332–354.

Feather, J. *A History of British Publishing*. London and New York: Routledge, Taylor & Francis Group, 2d ed., 2006.

Gale Research, "Dictionary of Literary Biography," accessed December 20, 2017, https://www.gale.com/c/dictionary-of-literary-biography-complete-online.

Garside, P.D., Belanger, J.E., and Ragaz, S.A. "British Fiction, 1800–1829: A Database of British Fiction, 1800–1829: A Database of Production, Circulation & Reception." designer A. A. Mandal http://www.british-fiction.cf.ac.uk, accessed at September 1, 2015.

Gaskell, P. *A New Introduction to Biography*. New Castle: Oak Knoll Press, 2007.

Gavazza, A., Lizzeri, A., and Roketskiy, N. "A Quantitative Analysis of the Used-Car Market." *The American Economic Review*, Vol. 104 (2014), pp. 3668–3700.

Giorcelli, M. and Moser, P. "Copyright and Creativity: Evidence from Italian Operas." Available at SSRN: https://ssrn.com/abstract=2505776. 2016.

Greenblatt, S. and Abrams, M.H. *The Norton Anthology of English Literature*. (Vol. D: The Romantic Period). WW Norton & Company, 2012.

Griest, G.L. "A Victorian Leviathan: Mudie's Select Library." *Nineteenth Century Fiction*, Vol. 20 (1965), pp. 103–126.

Halliday, J. "Musicians Win Copyright Extension to 70 Years." *The Guardian*. 2011.

Hamlyn, H.M. "Eighteenth Century Circulating Libraries in England." *The Library*, Vol. 5 (1946), pp. 197–222.

Handke, C. "Economic Effect of Copyright: The Empirical Evidence So Far." Report for the National Academies of the Sciences, Rotterdam, 2011.

Heald, P.J. "Property Rights and the Efficient Exploitation of Copyrighted Works: An Empirical Analysis of Public Domain and Copyrighted Fiction Bestsellers." *Minnesota Law Review*, Vol. 92 (2008), 1031–1966.

Hodgson, T. *The London Catalogue of Books Published in Great Britain: With Their Sizes, Prices, and Publishers' Names*. London: T. Hodgson, 1855.

Jacobs, E. "Circulating Libraries." In *The Oxford Encyclopedia of British Literature*. Oxford: Oxford University Press, 2006.

Khan, B.Z. *The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790–1920*. Cambridge: Cambridge University Press, 2005.

Landes, W.M. and Posner, R.A. "An Economic Analysis of Copyright Law." *The Journal of Legal Studies*, Vol. 18 (1989), pp. 325–363.

Landes, W.M. and Posner, R.A. *The Economic Structure of Intellectual Property Law*. Boston: Harvard University Press, 2003.

Lessig, L. "Copyright's First Amendment." *UCLA Law Review*, Vol. 48 (2000), p. 1057.

Logan, P.M., George, O., Hegeman, S., and Kristal, E. *The Encyclopedia of the Novel*. New York: John Wiley & Sons, 2014.

MacGarvie, M. and Moser, P. "Copyright and the Profitability of Authorship: Evidence from Payments to Writers in the Romantic Period." In S.M. Greenstein, A. Goldfarb, and C. Tucker, eds., *The Economics of Digitization*. Chicago: University of Chicago Press, p. 357, 2013.

Machlup, F. *An Economic Review of the Patent System*. p. 15, US Government Printing Office, 1958.

Mackeson, C. *The Churchman's Shilling Magazine and Family Treasury, Vol. 1*. London: Houlston and Sons, 1882.

Montagu, B. *Enquiries and Observations Respecting the University Library*. F. Hodson, 1805.

Mortimer, J.H. "Price Discrimination, Copyright Law, and Technological Innovation: Evidence from the Introduction of DVDs." *The Quarterly Journal of Economics*, Vol. 122 (2007), pp. 1307–1350.

Nagaraj, A. "Does Copyright Affect Reuse? Evidence from the Google Books Digitization Project." Available at SSRN: https://ssrn.com/abstract=2810761. 2016.

Oberholzer-Gee, F. and Strumpf, K. "The Effect of File Sharing on Record Sales: An Empirical Analysis." *Journal of Political Economy*, Vol. 115 (2007), pp. 1–42.

Peddie, R.A. and Waddington, Q. *The English Catalogue of Books 1801–1836*. Sampson Low, Marston, 1914.

Plant, M. *The English Book Trade: An Economic History of the Making and Sale of Books*. London: Allen & Unwin, 1974.

Preston, S.H., Heuveline, P., and Guillot, M. *Demography: Measuring and Modeling Population Processes*. Hoboken: Blackwell Publisher, 2011.

Reimers, I. "Copyright and Generic Entry in Book Publishing." Available at SSRN: https://ssrn.com/abstract=2938072. 2017.

Rochet, J.C. and Tirole, J. "Platform Competition in Two-Sided Markets." *Journal of the European Economic Association*, Vol. 1 (2003), pp. 990–1029.

Roehl, R. and Varian, H.R. "Circulating Libraries and Video Rental Stores." *First Monday*, Vol. 6. 2001.

Romilly, S.H. *Letters to "Ivy" from the First Earl of Dudley*. London, New York: Bombay, Longmans, Green, 1905.

Scherer, F.M. *Quarter Notes and Bank Notes: The Economics of Music Composition in the Eighteenth and Nineteenth Centuries*. Princeton: Princeton University Press, 2004.

Scotchmer, S. *Innovation and Incentives*. Boston: MIT Press, 2004.

Seville, C. *Literary Copyright Reform in Early Victorian England: The Framing of the 1842 Copyright Act*. Cambridge: Cambridge University Press, 1999.

Sherman, S. "The Greatest Books." Available at thegreatestbooks.org. 2009.

Shiller, B.R. "Digital Distribution and the Prohibition of Resale Markets for Information Goods." *Quantitative Marketing and Economics*, Vol. 11 (2013), pp. 403–435.

St. Clair, W. *The Reading Nation in the Romantic Period*. Cambridge: Cambridge University Press, 2004.

Stokey, N.L. "Intertemporal Price Discrimination." *The Quarterly Journal of Economics*, (1979), pp. 355–371.

———. "Rational Expectations and Durable Goods Pricing." *The Bell Journal of Economics*, (1981), pp. 112–128.

———. *Recursive Methods in Economic Dynamics*. Harvard University Press, 1989.

Suarez, M.F. *The Cambridge History of the Book in Britain*. Cambridge: Cambridge University Press, 2009.

Tirole, J. *The Theory of Industrial Organization*. Boston: MIT Press, 1988.

Varian, H.R. "Copying and Copyright." *The Journal of Economic Perspectives*, Vol. 19 (2005), pp. 121–138.

Venn, J. *Alumni Cantabrigienses: A Biographical List of All Known Students, Graduates and Holders of Office at the University of Cambridge, from the Earliest Times to 1900*. Vol. 2, Cambridge: Cambridge University Press, 2011.

Waldfogel, J. "Bye, Bye, Miss American Pie? The Supply of New Recorded Music since Napster." NBER Working Paper no. 16882, 2011.

Wiegand, W.A. and Davis, G. D. *Encyclopedia of Library History*. Vol. 503, Routledge, 1994.

Supporting information

Additional supporting information may be found in the online version of this article at the publisher's website:

Table A1: Logarithm of Price: OLS, Dependent Variable Logarithm of Price per Volume for New Editions

Table A2: Quality Control: OLS, Dependent Variable is Price of New Editions

Table A3: Controlling for Publisher Fixed Effects: OLS, Dependent Variable is Price of New Editions