DEAD POETS’ PROPERTY-
DOES COPYRIGHT INCREASE THE PRICE OF CONTENT?

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This paper exploits a differential increase in copyright under the U.K. Copyright Act of 1814 in favor of books by dead authors – to examine whether policies that strengthen copyrights increase the price of content. Contrary to existing results, difference-in-differences analyses, which compare changes in price after 1814 for books by dead and living authors, reveal a substantial increase in the price of content. By comparison, placebo regressions for books by dead authors that did not benefit from stronger copyrights indicate no differential price increase. Historical evidence points to intertemporal price discrimination as a mechanism by which stronger copyrights increase price.

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Copyright is becoming increasingly important as a mechanism to protect intellectual property. For example, the U.S. Department of Commerce (2012, pp. 39-40) reports that employment in copyright-intensive industries, such as computer systems design, advertising, books, and video, increased by 46 percent between 1990 and 2011; by 2012, copyright-intensive industries accounted for a larger share of U.S. employment than patent-intensive industries such as machinery and electronic components. The optimal strength of copyright protection is the subject of intense debate. In the United States and Europe, copyright provides temporary monopoly rights for 70 years after the author’s death. In China, India, and other emerging economies, copyright lengths are substantially shorter, especially in terms of the effective protection that they provide, and pressure is mounting to switch to longer terms of effective protection.¹ Stronger copyrights are expected to increase the profitability of creative work (Liebowitz and Margolis 2005) at the cost of limiting its diffusion (Akerlof et al. 2002). There is, however, little empirical evidence to show that stronger copyrights increase the price of creative works, even though price is the fundamental mechanism by which stronger copyrights might encourage creativity and limit access to creative works.

An important challenge for empirical analyses is that modern copyright terms are already extremely long, and changes in terms typically occur in response to lobbying by the owners of valuable and long-lived goods. For example, the 1998 (Sonny Bono) U.S. Copyright Act became known as the Mickey Mouse Protection Act because copyright for the original Mickey Mouse movie “Steamboat Willie” was about to expire, and the Disney Company had

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¹ In China and India, copyright laws offer nominal protection for 50 and 60 years, respectively, but enforcement is weak. For example, a 2011 letter, which was signed by more than 50 Chinese authors, accused China’s top search engine Baidu of violating copyright by allowing users to post works without the authors’ permission (Lee 2011).
"lobbied hard" for an extension (Lessig 2001, Varian 2005, p. 127). Similarly, Britain's 2011 extension in the length of copyright for recorded music became known as Cliff (Richard)'s Law (Halliday 2011), and Germany's Internet Copyright Act of 2013 was passed after intense lobbying by large publishing houses and news aggregators (e.g., Bierman 2013).

Existing empirical evidence suggests negative correlations between stronger copyrights and price. Liebowitz (1985) shows that academic journals increased subscription prices for libraries after 1959, when libraries began to install copy machines, which allowed patrons to copy journal articles in violation of copyright. Khan (2005, pp. 268-269) documents that pirated books by European authors sold for a higher price in the United States compared with copyrighted books by U.S. authors, possibly because U.S. readers preferred European authors. Heald (2008, p.1043) finds that bestsellers first published between 1919 and 1922 - and therefore off copyright in 2006 - sold for nearly the same price in 2006 as bestsellers published between 1923 and 1932 - and therefore still on copyright in 2006. Comparisons of modern prices on and off copyright may, however, be subject to selection bias, because a book that remains in print for more than 70 years after its author's death is likely to be exceptionally

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2 The 1998 Act extended copyright from 50 to 70 years after the death of an author and from 75 to 95 years for corporate owners. Estimates of a structural model of the demand for books imply that the 1998 extension has reduced the range of books that are available to consumers (Reimers 2013).

3 The most direct evidence on the causal effects of copyright comes from analyses of piracy in the U.S. music industry, which have documented limited effects of file sharing on record sales (Oberholzer-Gee and Strumpf 2007) and on the production of new songs (Waldinger 2011). Empirical evidence on the effects of the 1995 U.S. Copyright Act is inconclusive. For example, the number of movie releases per year in the United States did not increase in 1999 and 2000 compared with in nine years between 1990 and 1998 (Hui and Png 2002).

4 Liebowitz (1985) argues that this increase in price reflects an increase in the benefits that libraries derived from having access to the content of a journal, which can now be copied. See Varian (2005) for an intuitive model of pricing strategies with copying.

5 For 750 books that Ticknor and Fields published in the United States between 1832 and 1858.
popular and durable. For example, Landes and Posner (2003, p. 212) document that only 174 of 10,027 books published in 1930 were still in print in 2001.\textsuperscript{6}

To help address this empirical challenge and systematically investigate the causal effects of copyrights, we exploit an unintended and unanticipated differential increase in the length of copyright in favor of dead authors. This increase occurred as a result of the U.K. Copyright Act of 1814, which was intended to clarify a requirement that publishers deposit copies of copyrighted books with 11 research libraries. Until 1814, the length of copyright was 14 years (starting from the first edition) for books whose author had died within 14 years of the first edition, and 28 years for books whose author had survived the first 14 years. The 1814 Copyright Act extended the length of copyright from 14 to 28 years for books whose authors had died within 14 years of the first edition, and from 28 years until the authors’ death for books by authors who survived the 28-year term. We show that, given historical life expectancies, this change created no substantial increase for books by living authors, compared with a 14-year extension for books by dead authors.\textsuperscript{7}

Our empirical approach takes advantage of this differential extension to compare changes in price after 1814 for books by dead authors (which experienced an extension of 14 years) with changes in price after 1814 for books by living authors (which experienced no effective extension). This difference-indifferences approach allows us to control for unobservable factors that may have influenced the price of all books after 1814, irrespective of changes in copyright. For example, books may have become more expensive after 1814 because the demand for reading increased with advances in literacy, or books may have

\textsuperscript{6} Landes and Posner (2003) argue for copyrights of indefinite length, with extensions that depend on the authors’ initiative to renew the copyright.

\textsuperscript{7} Section I.D presents life tables, which calculate life expectancies for Romantic period authors in 1814, conditional on the author having reached the age of 42, which is the age of the average author at the time of the first edition.
become cheaper with the diffusion of continuous papermaking and steam-powered printing, which reduced production costs. An additional benefit of our approach is that death is easily observable, whereas other proxies for the remaining length of copyright are measured with more error. We use these measures in a separate test.

A newly collected data set of book prices for 1,072 editions published between 1790 and 1840 allows us to examine the effects of copyright on the price of – literary - content. These data include 902 editions of titles within 14 years of their first edition, which were affected by the differential increase in copyright. Price data are drawn from book catalogues, including the London Catalogue of Books (Brown 1799; Hodgson 1855) and the English Catalogue of Books (Peddie and Waddington 1914), and from St. Clair’s (2004) literary history of the Romantic Period. To control for variation in price across the life cycle of a book, we have collected additional data on the publication years of first editions from Google Books. To control for variation in willingness to pay, production costs, and other unobservable characteristics that may vary across genres, we classify all books into novels, poetry, other fiction, and non-fiction. To proxy for literary quality we use Harold Bloom’s (1994) Western Canon. To control for physical characteristics, which may influence both production costs and consumers’ willingness to pay, we collect data on page counts and dimensions from Google Books and the British Library.

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8 For example, 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, pp. 269-279 and 329-340).

9 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. Difference-in-differences regressions, which compare changes for books by dead and living authors, are robust to this type of error.


11 Non-fiction includes travel reports, historical analyses, and Adam Smith’s Wealth of Nations.
In contrast to previous analyses, difference-in-differences estimates indicate a large and robust increase in price in response to stronger copyrights. Controlling for the age of books and for variation across authors, the price of books by dead authors increased by an additional 20.02 shillings after 1814 compared with books by living authors. Relative to an average price of 17.79 shillings after 1814, this implies an 8 percent increase for each additional year of copyright.\(^{12}\) Results are robust to controlling for canonical works, for variation across genres, and to excluding author fixed effects.

Time-varying estimates yield no evidence of differential pre-trends in the price of books by dead authors. Archival records suggest that publishers and authors continued to oppose the Act until the 1820s. Consistent with these records, estimates begin to increase after 1824, which is the death year of Lord Byron (1788-1824). Results are robust to excluding books by Byron, as well as Sir Walter Scott (1771-1832), another popular author who had died after 1814. Results are also robust to excluding books by recently deceased authors, and to controlling for page numbers and physical dimensions.

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 the price of 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 original law). Placebo regressions for books that did not benefit from stronger

\(^{12}\) This implies an elasticity of price with respect to copyright length of 0.89 (calculated as the ratio between the estimated percentage change in price and the percentage increase in copyright).
copyrights yield no evidence of a differential increase in price after 1814 for books by dead authors.

What are the mechanisms by which extensions in copyright increase price? Empirical analyses of modern industries have investigated intertemporal price discrimination as a welfare-improving strategy in monopolistic industries with forward-looking consumers who differ in their willingness-to-pay (e.g., Mortimer 2007; Chevalier and Goolsbee 2009; Hendel and Nevo forthcoming; Lazarev 2013). Movie studios, for example, have traditionally released new films to theaters for an exclusive “window” of several months, before making them available for home viewing. Improvements in file-sharing technologies threaten this strategy by allowing end-users to view new films immediately after their initial release, thereby reducing the expected length of copyrights.

To investigate the link between copyright length and price, we examine historical evidence on purchasing decisions of wealthy customers and circulating libraries. Intuitively, extensions in the expected length in copyright from $T$ to $T+c$ may increase the price of original content by preventing competitors from entering with cheaper copies for an additional number of years $c$. If a large enough share of buyers who are willing to delay their purchase until copyrights expire in period $T$ are unwilling to delay until $T+c$, the extension allows copyright owners to charge a higher price. Historical evidence indicates that 19th-century buyers - circulating libraries and wealthy individuals - delayed book purchases to wait for cheaper editions, depending on variation in their budgets and in their readers’ demand for current reading.

To test for intertemporal price discrimination, we use variation in authors’ remaining years of life as a measure of the expected remaining length of copyright. With the caveat that this test is subject to more measurement error and
selection bias than the main specifications,\textsuperscript{13} it suggests that publishers lowered the prices of books as they approached the end of copyright, even controlling for the age of books and for time fixed effects.

The remainder of this paper is structured as follows. Section I describes the changes as a result of the Copyright Act, as well as the negotiations that led to the Act, and presents demographic data for Romantic Period writers and life table calculations to estimate authors' remaining years of life. Section II describes the data, and discusses sources of measurement error. Section III presents results of difference-in-differences analyses and robustness checks. Section IV presents tests for intertemporal price discrimination, and section V concludes.

\section{I. The Copyright Act of 1814}

Copyright was first formalized in 1710, in the \textit{Statute of (Queen) Anne}, which granted printers exclusive rights to sell books for 14 years starting from the publication year of the first edition. This original length of copyright was modeled after the length of patent grants under the Statute of Monopolies of 1624 (Deazley 2008b), 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, p. 9).\textsuperscript{14} If the author of a book was alive at the end of the 14\textsuperscript{th} year after the first edition, it remained on copyright for a full 28-year term.\textsuperscript{15}

\textsuperscript{13} Specifically, this analysis may underestimate the true decline in price in the final years of copyright because books that have been in print for 25 years or more may sell for a higher price because they are more successful.

\textsuperscript{14} A system of steep fines ensured enforcement. In 1801, for example, a printer who had violated copyright lost all infringing copies of his book and paid a fine of 3d per sheet, "half to the crown, and half to whoever sued for it" (Seville 1999, p. 239). Printers who imported infringing books were fined £10, roughly 20 times the average weekly wage of working-class men in the early 1800s (Bautz 2007, p. 12). Customs authorities searched travellers' luggage for illicit copies of copyrighted books (St. Clair 2004, pp. 200 and 299).

\textsuperscript{15} Authors typically assigned both 14-year terms to the same publisher (St. Clair 2004, p. 161).
A. Clarifying the Deposit Requirement

The Statute of Anne also required publishers to register all copyrighted books with the Stationers’ Company and provide copies on “best paper” to the British Library and ten university libraries. When a 1798 decision in Beckford v. Hood called this requirement into question, book deposits declined from 620 in 1798 to 379 in 1803. 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 the library for 391 other books that had been published in the same year, and found only 22 of them (Deazley 2007, p. 817). Montagu (1805) then 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, p. 817).

Proponents of the deposit requirement, such as Montagu, 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, p. 709). Publishers, however, countered that affirming the deposit requirement would “subject the petitioners to great ex pense (sic), and operate very seriously to discourage literature” (London Booksellers’ Petition 1812, p. 310).17 The printer Richard Taylor argued that for some books “the eleven copies would...prevent their being printed at all” (Minutes of Evidence 1813, p. 30). Similarly, Sir Samuel Romilly, Britain’s Solicitor General from 1806 to 1807, decried that the deposit requirement was “a tax upon authors” (Hansard 1808, § 990). Charles

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16 Beckford v. Hood 1798 allowed publishers to sue for infringement damages on copyrighted works, even if they had not registered the book (Deazley 2008b).
17 Bookseller was a commonly used term for publishers in the 19th century because publishers had previously also sold books in retail bookshops. For example, Longman & Co. had abandoned their retail bookshop by 1810, but the Minutes of Evidence (1813) continue to refer to Thomas Longman, (as well as William Davies of the publishing firm Cadell and Davies), as “booksellers.”
Williams-Wynn, a Member of Parliament from 1797 to 1850 and an advisor (Privy Councillor) to the King from 1822 to 1850 observed that the Act was “injurious to [publishers’s] interests” (Reports of the Acts 1808, p. 990). Faced with paper shortages as a result of the Napoleonic Wars (1803-1815, Bautz 2007, p.12), booksellers were particularly concerned about the requirement to procure deposit copies on “best paper.”

Passed on July 29, 1814, the Copyright Act affirmed the requirement to deposit copies with the British Museum (which later became the British Library) 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 1 such copy for the British Museum (Copyright Act 1814, § 3).

B. Extension to 28 Years or Life of Author

In addition to clarifying the deposit requirement, the 1814 Act also extended the length of copyright to “the Residue of [the author’s] natural Life” (§ 4). Historical accounts suggest that this change resulted from an “opportunistic and timely intervention” on July 18 by Samuel Egerton Brydges, a Member of Parliament who was also a writer, rather than a “principled or considered position adopted on the part of the legislature” (Deazley 2007, p. 839).

Draft bills between May 18 and July 15 maintained existing terms of “twenty-eight

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18 The publisher Thomas Longman reported that the costs of paper accounted for two-thirds of the costs of producing an edition with 500 copies (Minutes of Evidence 1813, p. 11).
19 Although the law required publishers to deposit only books that libraries requested “libraries rarely exercised any discretion in the demands that they made” (Deazley 2007, p. 837).
20 Sir Samuel Egerton Brydges (1762-1837) “occupied himself with literary work, issuing reprints of rare English pieces from the private press established at Lee Priory,” and was an MP from 1812 to 1818 (Alumni Cantabrigienses 2013).
years...and no longer” (Deazley 2007, p. 839). A July 19 draft first specified 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, p. 840).²¹

C. 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, p. 837). 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.”²² Similarly, publisher Thomas Longman responded to questioning by 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, p. 11-12)

Referring to the 14-year extension for books by dead authors, bookseller Owen Rees testified in 1818:

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²¹ Our search of parliamentary records reveals two prior mentions of uniform terms, which were largely ignored in the debates. The *Petition of the Printers* (1813, pp. 11-12) refers to uniform terms as a mechanism to reduce “hardships to the families of authors,” and the 1813 *Report from the Committee on the Copyright of Printed Books* (1818, Appendix, p. 7) observes that “no adequate reason can be given for this contingent reversion....”

²² Nichols had published Ruding’s *Annals of the Coinage of Great Britain...*(1840).
"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."

D. Differential Increase in Copyright for Books by Dead Authors 

Publishers may have opposed the Act because the extension to "life of author" implied only a nominal extension in copyright given the life expectancies of Romantic Period authors. Data on publication years (which we describe in more detail below) show that the average author was 42 years old in the publication year of the first edition, which marks the beginning of the copyright term. 

To estimate the remaining length of an author's life at age 42, we have collected demographic data for all 947 British writers in the Dictionary of Literary Biography who were born between 1700 and 1840 and created life tables for British writers across age brackets and over time. This approach makes it possible to estimate remaining years of life conditional on changes in life expectancies over time and on authors' survival to age 42 (which exceeds life expectancy at birth). 

Life tables predict the expected remaining years of life $R([a, a+4], [t, t+4])$ for a British writer 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 in the same time interval $[t, t+4]$. A 42-year...

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23 Report from the Select Committee (1818, p. 9). In 1818, Brooke v. Clarke (1818) confirmed that copyrights that had expired should not be revived by the Act (Deazley 2006, pp. 35-36). 
24 With a standard deviation of 13 and a median of 40 for 105 authors of 436 first editions between 1790 and 1840; data on first editions were collected from Google Books September 4-20, 2012. 
old author is the median author for the [40,44] age bracket; in the time interval 1815-1819 the expected remaining years of life for a 42 year-old author are \( R(42, [1815,1819]) = R([40,44],[1815,1819]) = 28.42 \) years.\(^{26}\)

By comparison, the switch to a uniform 28-year term for dead authors increased copyright by 14 years for books by dead authors, which implies a differential increase in copyright of nearly 14 years (Appendix Table 1).

II. THE DATA

To investigate the potential effects of copyright on the price of books, we have collected a new data set on the prices of 1,072 book editions that were published between 1790 and 1840. The data also include controls for book age, genre, literary quality and physical characteristics.

A. Prices for Book Editions, 1790-1840

Price data are drawn from historical book catalogues and from St. Clair's (2004) historical account of *The Reading Nation in the Romantic Period.*\(^{27}\) St. Clair (2004) includes price data for 534 book editions between 1790 and 1840, collected from book catalogues, author biographies, letters between publishers and authors, and other types of archival sources. Through a search of historical book catalogues, we have been able to collect price data for another 429 editions between 1801 and 1840 (from the *English Catalogue of Books*, Peddie and

\(^{26}\) These estimates exceed estimates of life expectancies that are based only on authors' age at death because they are conditional on authors' survival to age 42. Scherer (2004, p. 8) finds that 646 European composers between 1650 and 1849 lived 64.5 years on average, with a median of 66 year. If the author's age does not equal the median age of the age bracket, remaining years of life are calculated as the as the weighted average of two adjacent age brackets, using the difference between author's age and median age of adjacent age brackets as weights (e.g., Preston, Heuveline, Guillot 2001). For example, a 40 year old author could expect to live another 29.22 years in 1815 \( R(40,[1815,1819]) = 0.6 * R([40,44],[1815,1819]) + 0.4 * R([35,39],[1815,1819]) \)

\(^{27}\) In 1829, some retailers attempted to sell books below list prices, and the London Booksellers' Committee decreed that they would no longer be supplied with books (Barnes 1964, p. 1).
Waddington 1914) and for another 109 editions between 1790 and 1840 (from the 1799 and 1851 editions of the *London Catalogue of Books*; Brown 1799 and Hodgson 1851).

In this data set of 1,072 book editions between 1790 and 1840, the average edition sold for 17.71s (shillings).\(^{28}\) Compared with a weekly wage of roughly 9 shillings for a typical working-class male (Bautz 2007, p. 12), this suggests that direct purchases from working class customers were rare, and that wealthier individuals and circulating libraries (Roehl and Varian 2001), accounted for the majority of demand. Consistent with the idea that technical progress, such as continuous paper-making, reduced the price of books, new editions became cheaper over time. The average price of new editions declined from 18.05s for 365 editions between 1790 and 1814 to 17.54s between 1815 and 1840.

**B. Book Age and Authors Identifiers**

To distinguish books that had been in print for 14 years or less (and were affected by the differential change in copyright) and to control for variation in the life cycle of books, we calculate the age of each book edition. Specifically, we collect the publication year of first editions from the online catalogues of the British Library and Google Books, and calculate the age of a book title in the publication year of an edition by subtracting the year of the first edition from the publication of the edition for which we observe price. These data indicate that 902 of 1,072 editions were editions of book titles that had been in print for 14 years or less. On average, these 902 editions sold for a price of 17.72.

To control for idiosyncratic differences in popularity across authors we also create identifiers for individual authors by matching author names for all

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\(^{28}\) For books that were published in multiple volumes, prices are for the set of volumes if the volumes were sold together. If volumes were sold separately, such as Sir Walter Scott’s *Tales of a Grandfather* (1828, 1830 and 1831), each volume is treated as a separate observation.
1,072 editions with author names in the Dictionary of Literary Biography. Errors as a result of optical character recognition (OCR), such as recording Jane Austen as Jane Auslen, may prevent true matches in a fully automated search that captures exact matches only. To address this issue, we create a fuzzy matching algorithm that uses Levenshtein distances to identify probable matches, and check all probable matches individually to eliminate false positives.29 This process creates unique identifiers for 137 authors of 1,072 editions, including 116 authors of 902 editions of books that had been in print for 14 years or less.

C. Literary Quality and Genre

To control for variation in literary quality and across genres, we match editions with 138 book titles in Harold Bloom’s (1994) Western Canon of English Literature.30 Twenty-seven of 609 titles (4.3 percent) entered the Canon; these titles account for 102 editions (9.5 percent). We consult the Dictionary of Literary Biography and other reference works to distinguish novels, poetry, other fiction, and non-fiction (following the classification of genres in Suarez 2009).

Two thirds (703 of 1,072) of all editions printed between 1790 and 1840 are fiction; fiction includes 392 volumes of poetry (such as Lord Byron’s Childe Harold’s Pilgrimage), 260 novels (such as Jane Austen’s Pride and Prejudice, and Mary Wollstonecraft Shelley’s Frankenstein), and 51 works of children’s literature, plays, hymns, and songs. One third (369 of 1,072) of all editions are

29 Levenshtein distances measure the minimum number of insertions, deletions, or substitutions that make two strings of characters identical. For example, a misspelling of “Jane Austen” as “Jane Auslen” has a Levenshtein distance of 1. We include matches that have a Levenshtein distance of 0 or 1 after checking each match and eliminating false positives.
30 The first entry in the Canon is William Wycherley’s Country Wife (1675); the most recent entry is Christopher Smart’s Jubilate Agno (1939).
non-fiction, including Adam Smith's (1776) *Wealth of Nations*, and travel reports, such as William Hazlitt's (1826) *Notes of a Journey through France and Italy*.\(^{31}\)

The distribution of books across genres remains roughly constant after 1814. Until 1814, 16.71 percent of 365 editions were novels, 34.79 percent were poetry, 4.11 percent other fiction, and 44.38 percent non-fiction. After 1814, 28.15 percent of 707 editions were novels, 37.48 percent were poetry, 5.09 percent other fiction, and 29.28 percent non-fiction.

**D. Page Numbers and Size**

To control for variation in the physical characteristics of books, we collect data on page numbers from the online catalogues of the British library and from Google Books. This search yields page numbers for 795 of 1,072 editions between 1790 and 1840, including 692 editions of 902 editions that had been in print for 14 years or less.\(^{32}\)

Among all 795 editions with data on page numbers, the average book was 404 pages long (with a median of 331 and a standard deviation of 365). Among 692 editions in print for 14 years or less, the average book was 397 pages long (with a median of 325 and a standard deviation of 360). Novels were 613 pages on average, with a standard deviation of 433, and a median of 455. Volumes of poetry included 281 pages on average, with a standard deviation of 259 and a median of 237. Other works of fiction, such as children's books and hymns, were

\(^{31}\) Fifteen of 27 titles in the *Canon* (48 editions) are novels, such as Jane Austen's (1813) *Pride and Prejudice*; 8 titles (18 editions) are poetry, such as Byron's 1807 *Poems on Various Occasions* and 4 titles (36 editions) are non-fiction. These shares roughly match shares of genres in the *Canon* (77 novels, 15 volumes of poetry, and 32 works of non-fiction).

\(^{32}\) For 17 editions, page numbers are available in the catalogues of the British library (http://explore.bl.uk, accessed September 4-20, 2012); for 675 editions, page numbers are available in Google Books, which combines records for 21 libraries (http://books.google.com/, accessed September 4-20, 2012). For 249 editions with missing data, page numbers are available for at least one edition of the same book title within 10 years of an edition in our data.
shorter than novels and volumes of poetry (with 169 pages, a standard deviation of 135, and a median of 114). Works of non-fiction were only slightly shorter than novels, with an average of 459 pages, a standard deviation of 378 and a median of 331. In the baseline empirical analysis, author and genre fixed effects control for such variation; a robustness check controls explicitly for the number of pages.

Information on physical dimensions is measured relative to the size of a standard sheet of paper; these data are available for 777 of 1,072 editions. 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 45 of 777 editions (5.8 percent). Folding once more to create one eighth of a sheet produces an octavo (8vo); 529 editions are octavos, accounting for 68.1 percent of 1,072 editions. Another 197 editions are duodecimos (12mo, 25.4 percent), 3 editions are sextodecimos (16mo, 0.4 percent) and 1 edition each correspond to decimo octavo (18mo), vingesimo quarto (24mo), and trigesimo secundo (32 mo). We use this information to perform robustness checks with controls for physical dimensions.

III. RESULTS

Summary statistics indicate a substantial increase in price after 1814 for 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 nearly doubled after 1814, increasing from 17.69s between 1790 and 1814

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33 With an average price of 38.90, quartos editions were twice as expensive as duodecimos (with an average price of 18.33 and a standard deviation of 19.11). Octavos, which accounted for the majority of editions, sold for an average of 15.0s (with a standard deviation of 17.64).
to 33.39s between 1815 and 1840 (Table 1 and Appendix Figure 1). By comparison, the price of books by living authors declined from 17.64s to 17.13s.\textsuperscript{34}

\textbf{A. Changes in Prices after 1814 for Books by Dead and Living Authors}

Baseline difference-in-differences OLS regressions estimate

\[ price_{it} = \alpha_0 + \alpha_1 \text{dead}_{st} + \alpha_2 \text{dead}_{st} \times \text{post1814}_i + \varphi_a + \delta_i + f_s + e_{it} \]

where the outcome variable \( price_{it} \) measures the price of a book edition \( i \) in year \( t \). The variable \( \text{dead}_{st} \) equals one if author \( s \) had died before year \( t \); \( \text{post1814}_i \) 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 \( \text{dead}_{st} \times \text{post1814}_i \) estimates the causal effect of longer copyrights on price. Book age fixed effects \( \varphi_a \) control for variation in price across the life cycle of a book. Five-year fixed effects \( \delta_i \) control for unobservable variation in price over time that is common across all types of books, e.g., as a result of technical progress or changes in the demand for reading. Author fixed effects \( f_s \) control for unobservable differences in price across authors that are constant over time.

Standard errors are clustered at the level of authors to allow for correlation across editions of the same title and across titles by the same author.

Difference-in-differences analyses confirm the differential price increase for books by dead authors. Baseline estimates indicate that books by dead authors became 20.02s more expensive after 1814 compared with books by living authors (with a p-value of 0.01, Table 2, column 1). Relative to an average price of

\textsuperscript{34} Data on print runs – physical copies per edition – are only available data for 518 editions. Interestingly, these data indicate that publishers began to print more copies of books by dead authors after 1814. For books by dead authors, print runs increase by 78 percent from 1,594 physical copies until 1814 to 2,833 afterwards. For books by living authors, print runs increase by less than 22 percent from 1,842 physical copies until 1814 to 2,242 afterwards.
17.79s for editions printed after 1814, this implies a 112 percent increase, which
is equivalent to an 8 percent increase for each additional year of copyright.\textsuperscript{35}
Estimates for dead authors are not statistically significant (with a p-value of 0.43,
Table 3, column 1).\textsuperscript{36}

This differential price increase is robust to controlling for canonical books
and for genres. Estimates with a control for books in the Western Canon indicate
that books by dead authors became 20.22s more expensive after 1814 compared
with books by living authors (with a p-value of 0.01, Table 2, column 2).
Estimates for books in the Western Canon are small and not statistically
significant (2.48s, with a p-value of 0.34 Table 2, column 2).\textsuperscript{37} Estimates with
genre fixed effects indicate a price increase of 17.76s (with a p-value of 0.07,
Table 2, column 3).

Specifications with author fixed effects (Table 2, columns 1-3) exploit
variation in price for 341 editions by 17 authors whose books were published
before and after the author’s death. Intuitively, difference-in-differences
estimates with author fixed effects measure a differential increase after 1814 in
the price of new editions by the same author after the author’s death. Our data
include 15 editions by 3 of these 17 authors - Erasmus Darwin (1731-1802),
Joseph Priestley (1733-1804), and Rev. William Paley (1743-1805) – until 1814.
For each of these authors, the average book sold for a higher price while the

\textsuperscript{35} Implying an elasticity of 0.89, calculated as the percent increase in price (20.02 relative to the
pre-1814 average price of 17.69s for books by dead authors) relative to the percent increase in
copyright (13.58 years relative to 13.58-2.89, where 2.89 is the pre-1814 mean age of books by
dead authors). This elasticity is proportional to IV estimates from a regression of the change in
price on the change in copyright term post-1814, using death as an instrument for changes in
copyright. Baseline IV estimates imply an increase of 8.85s for each additional year of copyright
(with a p-value of 0.08), slightly above baseline OLS estimates.

\textsuperscript{36} Estimates with quadratic trends indicate that books by dead authors became 19.08s more
expensive after 1814 (with a p-value of 0.03), which implies a 108 percent increase.

\textsuperscript{37} Estimates for interactions between Canon and dead\textsubscript{a} * post1814\textsubscript{a} are not statistically significant,
and leave the estimate for dead\textsubscript{a} * post1814\textsubscript{a} at 21.68 (and a p-value of 0.01).
author was alive (44.25s, 17.25s and 12.00s) and for a lower price after the author's death (30s, 7.5s and 7.7s). The data also include 326 editions by the remaining 14 authors (whose books were published before and after the author's death) after 1814.\textsuperscript{38} For 12 of these 14 authors, who account for 293 of 326 editions, the average book sold for a higher price after the author's death. For example, new editions by Robert Bloomfield (1776-1823, 10 editions) sold for an average of 9.25s after his death, compared with an average of 7.13s before.\textsuperscript{39} Other authors whose books were published after 1814 before and after the author's death include John O'Keeffe (1747-1833), William Hazlitt (1778-1830), Jane Austen (1775-1817), Matthew Gregory Lewis (1775-1818), Felicia Hemans (1793-1835), Percy Bysshe Shelley (1792-1822), Samuel Taylor Coleridge (1772-1834), Letitia Landon (1802-1838), George Crabbe (1754-1832), Ann Radcliffe (1764-1823), Lord Byron (1778-1824), Walter Scott (1771-1832), and William Hayley (1745-1820).

Robustness checks, which exclude author fixed effects, confirm the main estimates. Specifications without author fixed effects indicate a price increase of 17.15s (with a p-value of 0.08, Table 2, column 4), implying a 99 percent increase, compared with a 112 percent increase for specifications with author fixed effects (Table 2, columns 1). Results are also robust to winsorizing observations above the 99\textsuperscript{th} percentile of price, with an estimate of 23.55 for $\text{dead}_d * \text{post1814}_d$ (with a p-value of 0.00, Table 2, column 5).\textsuperscript{40}

\textsuperscript{38} The data include no posthumous editions by the same author before and after 1814.
\textsuperscript{39} The share of posthumous editions is small throughout the sample, with 5.86 percent until 1814 and 4.03 percent afterwards.
\textsuperscript{40} Nine observations above the 99\textsuperscript{th} percentile include Scott's \textit{Collected Verse Writings} (126s in 1806 and 249s in 1813), his \textit{Novels and Tales by the Author of Waverley} (144s, 120s, and 144s, respectively in 1819, 1821, 1822) and \textit{Poetical Works} (120s in 1821 and 1830), as well as Robert Southey's \textit{History of Brazil} (1819, 155s) and Anna L. Barbauld's \textit{British Novelists} (1812, 252s).
B. Time-varying Estimates of Differential Effects before and after 1814

We also estimate time-varying coefficients to investigate whether unobservable factors, which had been in place before the Copyright Act, may have caused the differential changes in price after 1814. For example, publishers may have anticipated the differential change in copyright and begun to charge higher prices for books by dead authors before 1814, even though parliamentary records in Section I indicate that the change was unanticipated. We estimate

\[ \text{price}_{it} = \beta_0 + \beta_r \text{dead}_i + \varphi_a + \delta + \epsilon_{it} \]

where coefficients \( \beta_r \) measure differences in price for books by dead compared with living authors for 5-year intervals \( r \) beginning in 1805 (the publication of Montagu’s essay); 1810-14 is the excluded interval.

Time-varying coefficients yield no evidence of a differential increase in price before 1814. Coefficients are close to zero and precisely estimated between 1805 and 1819 (Figure 1). Confirming historical accounts of publishers’ continued opposition to the Act (e.g., Deazley 2007, p. 437) estimates begin to increase in the mid 1820s, after the death of Lord Byron in 1824. After this change, time-varying estimates remain significant for the remainder of the sample.

C. Excluding Books by Popular Authors Who Died after 1814

The most important potential threat to the empirical strategy is that the price of books by dead authors who died after 1814 may have increased for idiosyncratic reasons - independently of the increase in copyright. Author fixed effects mitigate this problem, but may not be sufficient to control for the influence of exceptionally popular authors who died after 1814. Most significantly, Sir Walter Scott (1771 – 1832) “sold more novels than all the other novelists of the time put together” (St. Clair 2004, p. 221), and even wealthy readers, such as
Lord Dudley, complained about exorbitant prices for Scott’s books (Romilly 1905, p. 104). Scott’s *Tales and Romances by the Author of Waverley* fetched a record 108s in 1833, 1 year after the authors’ death. The data include 36 editions by Scott until 1814, 92 editions between 1815 and Scott’s death in 1832, and 4 editions after his death, with average prices of 30.92s, 36.94s, and 78.38s, respectively.

Excluding Scott, estimates remain large and statistically significant across all specifications. Baseline estimates with controls for book age and author fixed effects indicate that books by dead authors became 19.94 additional shillings more expensive after 1814, compared with books by living authors (with a p-value of 0.001, Table 3, column 1). Compared with an average price (excluding Scott) of 13.73s after 1814, this implies a 145 percent increase. Estimates are also robust to including genre fixed effects (Table 3, column 2) and to controls for canonical books (not reported).

Lord George Byron (1788-1824) was the second literary super-star of the Romantic Period; Byron’s career was cut short by a fever at age 36. Byron’s posthumously published *Works and Life* (first published in 1832) is the second most expensive book in the data (with 85s in 1840, 8 years after the first edition), suggesting that Byron’s publisher John Murray did in fact recognize and exploit the increase in copyright for books by dead authors. Estimates are also robust to excluding books by Scott and Byron. Baseline estimates indicate that books by dead authors became an additional 20.42 shillings more expensive after 1814 (with a p-value of 0.01, Table 3, column 3), implying a 115 percent increase.

Books by Jane Austen (1775-1817), another prominent author who died after 1814, languished in “relative obscurity” throughout the Romantic Period (Baultz 2007, p. 2), and became cheaper after the author’s death. Until 1814, a total of seven editions of *Sense and Sensibility*, *Pride and Prejudice*, and *Mansfield Park* sold for an average of 15.29s. 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 the author’s death on July 18, 1817, five new editions of *Emma, Mansfield Park, Northanger Abbey, Pride and Prejudice, and Sense and Sensibility*, sold for a low average price of 8.07s between 1817 and 1832, the last year with a new edition by Austen.41

D. Excluding Books by Recently Deceased Authors

Another alternative mechanism for the observed price increase is that books by recently deceased authors may have sold for higher prices – independent of copyright - because news of an author’s death increased demand for his work. For example prices may increase after the death of an author because there will be no further additions to the author’s body of works, and customers may be willing to pay more for the author’s works to complete their collections. Consistent with this idea, paintings become more expensive shortly after the artist’s death (Ekelund, Ressler, and Watson 2000). If books by recently deceased authors are more expensive, and if observations on prices by recently deceased authors are more influential after 1814, then the differential increase after 1814 may be driven by a temporary increase in price for books by recently deceased authors.

Price data confirm that books by recently deceased authors sold for a higher price. The average edition of a book that had been in print for 14 years or less by an author who had died within a year sold for 36.18s, compared with 17.13s for books by living authors, and 28.36s for books by authors who had died more than one year ago. Fourteen of 42 editions by dead authors were published within one year of the author’s death, including 3 editions until 1814 and 11 after 1814.

41 Mary Shelley (1797-1851) survived the sample period, and her novel *Frankenstein* was first published in 1818. It sold for an average of 9.16s between 1818 and 1840, compared with an average of 17.79s for all 595 editions between 1818 and 1840.
Excluding book editions by recently deceased authors increases the size of 
the estimates (because the proportional price increase after 1814 is smaller for 
books by recently deceased authors). Baseline estimates imply that the price of 
new editions of books by dead authors (excluding the recently deceased) 
increased by an additional 24.47s after 1814 (with a p-value of 0.003, Table 3, 
Column 5). Compared with an average price of 17.38s for editions after 1814, 
this implies an increase of 140 percent. Estimates are robust to including controls 
for books in the Western Canon as well as for genres, and to excluding author 
fixed effects (Table 3, columns 6).

E. Controlling for Page Numbers and Page Size

We also investigate whether the differential increase in price for books by 
dead authors may be due to variation in physical characteristics, such as page 
numbers and physical dimensions. For example, books with additional pages may 
be more valuable to readers and cost more to produce. If page counts increased 
more for books by dead authors, books by dead authors may have become more 
expensive after 1814 independently of changes in copyright.

Regressions with controls for page numbers indicate that the price of 
books by dead authors increased by 20.27s after 1814 compared with books by 
living authors (with a p-value of 0.03, Table 4, column 1). Results are robust to 
controlling for genre fixed effects and for canonical books, with estimates of 
13.19 (with a p-value of 0.14, Table 4, column 2) and 20.34 (not reported), 
respectively. Regressions with controls for physical dimensions (quarto, octavo, 
duodecimo, etc.) imply a larger price increase, albeit for a smaller sample of 665 
editions. Baseline estimates indicate that the price of books by dead authors

\[^{42}\text{Compared with an average price of 15.96s after 1814 for 888 editions with information on page numbers, this implies a 127 percent increase, exceeding the baseline estimate of 112 percent.}\]
increased by 32.47s more than books by living authors after 1814 (with a p-value of 0.01, Table 4, column 3). Results are robust to controlling for genre fixed effects and for canonical books, with estimates of 27.20 (with a p-value of 0.02, Table 4, column 4) and 31.91 (not reported).

Variation in bindings, as another characteristic of books, is unlikely to have influenced price because publishers sold books in a temporary cover of plain paper boards, leaving customers to add the covers that they liked. A medium-sized octavo volume could be bound in boards for as little as 4d (Plant 1974, p. 342), roughly 2 percent of the average price of a book.

Data on illustrations are too scarce to allow for systematic analyses. Records, which we collected from Google Books and the British library, indicate that 117 in 1072 books included at least one illustration, but this illustration was often an image of the author. Until 1814, none of the 58 editions of books by dead authors include illustrations; after 1814, 6 of 98 editions (6.1 percent include illustrations). By comparison, 44 of 307 editions of books by living authors (14.3 percent) include illustrations until 1814, compared with 57 of 609 editions (9.4 percent) by living authors.

F. Placebo for Editions by Dead Authors without Longer Copyrights

To test whether changes in tastes or other unobservable factors may have caused books by dead authors to become more expensive after 1814, we estimate placebo regressions for books by dead authors that did not benefit from an extension in copyrights. Specifically, we exploit the fact that, under the 1710 Statute of Anne, books whose authors had survived the first 14-year term remained under copyright for another 14 years (so that the total length of copyright was 28 years even before 1814). Placebo regressions test whether these editions, which did not benefit from the extension, but would have been affected
by changes in tastes and other unobservable factors, experienced a differential increase after 1814.

With the caveat that placebo regressions are based on a substantially smaller sample than the main specifications, they yield no evidence of a differential price increase for books by dead authors. In a data set of 63 editions on copyright that had been in print for more than 14 years, the estimate for $\text{dead}_{it} \times \text{post1814}$ is small at 3.30s and not statistically significant (with a p-value of 0.84, Table 5, column 1). Placebo regressions that include controls for genre and exclude author fixed effects similarly fail to produce significant estimates (with 9.05s and -7.60s, and p-values of 0.61 and 0.43, respectively, Table 5, columns 2-3). In a larger sample of 87 editions that includes books off copyright, the estimated increase is 0.86 (not statistically significant, not reported).

IV. INTERTEMPORAL PRICE DISCRIMINATION AS A MECHANISM

What is the mechanism by which the extension in copyright may have increased the price of books by dead authors? One potential explanation is that an extension in the duration of monopoly rights may improve the ability of copyright owners to practice intertemporal price discrimination, by offering successive generations of a new good at a lower price “for the purpose of exploiting differences in consumers’ reservation price” (Stokey 1979, p. 355).

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43 In the main specifications of the placebo test, we restrict the sample to books on copyright to keep the sample comparable with the baseline estimates in the sample of books below 14 years of age (which are all on copyright as well). Alternative specifications of the placebo test including books on copyright, however, also yield results that are small and not significant.

44 More broadly, Coase (1972) conjectures that a monopolist who sells durable goods to forward-looking consumers sets price at marginal cost beginning with the first sale because consumers anticipate that the monopolist will reduce price over time and can delay their purchases. McAfee and Wiseman (2008) show that monopolists may be able to commit to limits on future price reductions by restricting production capacity, if increasing capacity incurs at least a small cost. Ericson and Pakes (1995) provide an empirical framework with forward-looking firms and forward-looking consumers; Doraszelski and Pakes (2007, p.1960) explain that empirical analyses
Empirical analyses of modern industries have shown that intertemporal price discrimination may be a welfare-improving strategy if consumers, who vary in their willingness to pay, are forward-looking and able to delay their purchase. For the video industry, Mortimer (2007) shows that intertemporal price discrimination, by which movie studios first sell at a higher price to video stores and then at a lower price to end consumers, is a pricing strategy that can improve overall welfare.\textsuperscript{46} For textbooks, Chevalier and Goolsbee (2009) find that sales prices stay roughly constant over the life of a textbook, because students cannot delay purchasing textbooks for a class, even though they are forward-looking and adjust their willingness to pay in response to variation in resale value.\textsuperscript{47}

Technological improvements in the ability to copy and distribute content, such as movies and books, may however, threaten the ability of copyright owners to practice intertemporal price discrimination by reducing the expected length of copyright. To investigate this issue, we examine historical evidence on purchasing decisions and changes in the price of new editions as books approach the end of copyright.

\textit{A. Forward-looking Consumers and Variation in Willingness to Pay}

Historical evidence suggests that book buyers were forward-looking and expected prices to fall after books had come off copyright. Contemporary series, such as \textit{Walker's British Classics}, offered off-copyright titles by William

\footnotesize
with forward-looking firms and consumers are rare because the approach is “likely to increase the burden of computing equilibria significantly.”

\textsuperscript{46} This strategy is possible, because the First Sale Doctrine of U.S. copyright law allows video stores to buy movies from studios and rent them at a profit to end consumers. For video games, Nair’s (2007) simulations of a model with forward-looking consumers imply that, given the First Sale Doctrine, producers reduce the price of video games over time.

\textsuperscript{47} For carbonated soft drinks, Hendel and Nevo (forthcoming) show that price discrimination maximizes both profits and welfare, if some consumers are forward-looking and price elastic and others are myopic and price inelastic. Lazarev (2013) documents
Shakespeare and James Thomson for one or two shillings each (St. Clair 2004, pp. 204 and 713). Gall and Inglis’ *Landscape Poets* offered the work of Byron, Scott, Coleridge, and Wordsworth and other successful authors after it had come off copyright “at a price which will bring it within general reach” (Mackeson 1882, p. 436).

Personal letters document that wealthy consumers would delay book purchases to wait for cheaper editions. For example, John William Ward, the first Earl of Dudley, wrote in 1810 when Scott first published *Lady of the Lake* “I have not read 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, p. 104). Letters also indicate that buyers placed conditional orders to purchase books as soon as price had dropped below a specified amount. For example, 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, p. 201).

Variation in willingness to pay may have been particularly high for libraries, depending on their readerships and budgets. Roehl and Varian (2001) document the important role of circulating libraries, which purchased books and rented them to readers, anticipating the business model of video stores (analyzed by Mortimer 2007). By 1761 “the reading female hires her novels from some country Circulating Library, which consists of about a hundred volumes”

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48 A 1809 edition of *Tom Jones* (pp. 525-27) includes an advertisement for Walker’s editions of Thomson’s *Seasons* (1730), Milton’s *Poetical Works*, Swift’s *Gulliver’s Travels* (1726), Bunyan’s *Pilgrim’s Progress* (1678) and other books that had come off copyright, with a modal price of 4s.

49 Until the emergence of circulating libraries, readers had to rely on their own private libraries and those of their friends, and “the few collections of which there is any record were almost entirely composed of works of a serious nature” (Plant 1974, pp. 263-64). Free public libraries emerged after 1850 (Wiegand and Davis 1994, p. 608).

50 The primary revenue flows from both circulating libraries and video stores are rental fees, with minimal fees for membership (Roehl and Varian 2001).
(Dickens 1894, p. 490). According to Hamlyn (1946, p. 198) "not less than one thousand" circulating libraries operated in England by 1850.\footnote{St. Clair (2004) estimates that roughly 1,000 circulating libraries operated in Britain in 1801, and 1,500 in 1821.}

**B. Changes in Price as Books Approach the End of Copyright**

Publishers appear to have exploited such variation in willingness to pay by first selling for higher prices to consumers with higher willingness to pay, and then covering the rest of the market at declining prices over time. For example, Thomas Moore's poem *Lalla Rookh* sold for 42s in 1817, for 14s until 1827, and for 5s after 1829 (Appendix Figure A2). 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, pp. 198 and 620).

To systematically investigate such changes, we use data on authors' year of death to calculate their remaining years of life in year \( t \) -- which helps determine the length of copyright - and estimate variation in price as a function of remaining years of copyright:

\[
price_{it} = \beta_0 + \beta_r L_{it} + \phi_a + \delta_i + \varepsilon_{it}
\]

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 \( t \).

The final year of copyright \( T \) depends on year of the first edition for a book title, and the remaining life span of the author. For new editions of titles that had first been published 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. 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. We use actual remaining years of life to create a proxy for copyright length \( T \). Publishers’ decisions about price may be influenced by private information they have about the authors’ life expectancy, which is unobservable to the empirical researcher, but correlated with the actual remaining years of life.

Coefficients \( \beta_r \) are estimated separately for three-year periods \( r \), observations in years \( T-28 \) and above are the excluded category. The variable \( \varphi_a \) controls for book-age fixed effects, \( \delta \) controls for five-year fixed effects, and author fixed effects \( f_a \) controls for unobservable variation across authors. Standard errors are clustered at the level of authors to allow for correlation across editions of the same title and across titles by the same author.

Estimates of \( \beta_r \) confirm that new editions become cheaper as books approach the end of copyright. In year \( T-1 \) new editions of a book title sold for 16.24s less than in \( T-28 \) to \( T-26 \) and above (Figure 2, with a p-value 0.067), and new editions in \( T-4 \) to \( T-2 \) sold for 19.23s less (Figure 2, with a p-value of 0.016). Results are robust to including controls for canonical books, dropping genre fixed effects, and including author fixed effects (not reported). Selection bias may lead this test to under-estimate the true decline in price, because books that continue to be in print as they approach the end of copyright are likely to be especially durable and sell for a higher price (e.g., Heald 2008).

Summary statistics on changes in price confirm the role of copyright in determining the price of books. For the full data set of all 1,072 editions, summary statistics indicate a 15 percent 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. For example, the Reverend William Paley’s (1743-1805) *View
of 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.

V. Conclusions

Although price is the fundamental lever by which stronger copyrights encourage the creation and limit the diffusion of new works, systematic evidence on the effects of stronger copyright terms on price is scarce. To address this issue, this paper has exploited a differential increase in the length of copyright - in favor of books by dead authors - to systematically investigate the effects of stronger copyrights on price.

In contrast with results of previous analyses, which were primarily descriptive, difference-in-differences regressions indicate a substantial increase in price in response to stronger copyrights, controlling for the age of books, author, and time fixed effects. Results are robust to excluding author fixed effects, controlling for canonical books, page numbers, and page size, as well as excluding books by popular authors who had died after 1814, and books by recently deceased authors. Estimates of time-varying effects yield no evidence of differential pre-trends and suggest that price increased with some delay, which is consistent with the timing of publishers’ opposition to the Act. Placebo regressions for books by dead authors that did not benefit from the extension indicate no differential price increase for books by dead authors after 1814.

We also find that extensions in copyright may have increased price by extending the length of monopoly rights for publishers and improving their ability to practice intertemporal price discrimination. Similar to modern buyers, Romantic period buyers were forward-looking, and often delayed their purchases to wait for cheaper editions of a book. Book buyers, which included circulating libraries and individual buyers, also differed in their willingness to pay,
depending on variation in their budget constraints and needs for current reading. Historical price data indicate that publishers of copyrighted books exploited this variation to serve high-valuation customers first, and then reduced prices to serve lower-valuation customers as books approached the end of copyright.

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TABLE 1 – DIFFERENCES IN THE MEAN PRICE OF BOOK EDITIONS FOR DEAD AND LIVING AUTHORS BEFORE AND AFTER 1814 FOR BOOK TITLES IN PRINT FOR 14 YEARS OR LESS

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<thead>
<tr>
<th></th>
<th>Pre-1814</th>
<th>Post-1814</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alive</td>
<td>17.64</td>
<td>17.13</td>
<td>-0.50</td>
</tr>
<tr>
<td></td>
<td>(26.16)</td>
<td>(19.16)</td>
<td>(1.59)</td>
</tr>
<tr>
<td>Dead</td>
<td>17.69</td>
<td>33.39</td>
<td>15.69</td>
</tr>
<tr>
<td></td>
<td>(15.74)</td>
<td>(30.83)</td>
<td>(6.84)</td>
</tr>
<tr>
<td>Difference</td>
<td>0.06</td>
<td>16.25</td>
<td>16.19</td>
</tr>
<tr>
<td></td>
<td>(5.33)</td>
<td>(4.57)</td>
<td>(7.02)</td>
</tr>
</tbody>
</table>

Note: Price data for 902 book editions of 548 titles that had been in print for 14 years or less by 116 authors between 1790 and 1840. Price data from St. Clair (2004), the London Catalogue of Books (Brown et al. 1799; Hodgson 1851) and the English Catalogue of Books (Peddie and Waddington 1914). Demographic data from the Dictionary of Literary Biography (various volumes). Standard errors, clustered at the author level, are for coefficients $a_0, a_1, a_2$ in the OLS regression $Price_{it} = a_0 + a_1 Dead_{it}$ + $a_2 Post1814_{it} + a_3 Dead_{it} * Post1814_{it} + e_{it}$. Standard errors, clustered at the author level are for coefficients $\beta_1, \beta_2$ of $Price_{it} = \beta_0 + \beta_1 Alive_{it} + \beta_2 Post1814_{it} + \beta_3 Alive_{it} * Post1814_{it} + e_{it}$.

TABLE 2 – OLS, DEPENDENT VARIABLE IS PRICE OF BOOK EDITIONS BETWEEN 1790 AND 1840 FOR BOOK TITLES IN PRINT FOR 14 YEARS OR LESS

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dead</td>
<td>-6.03</td>
<td>-6.16</td>
<td>-4.09</td>
<td>-1.03</td>
<td>-9.38***</td>
</tr>
<tr>
<td></td>
<td>(7.69)</td>
<td>(7.64)</td>
<td>(9.30)</td>
<td>(5.87)</td>
<td>(2.76)</td>
</tr>
<tr>
<td>Post-1814 * dead</td>
<td>20.02**</td>
<td>20.22**</td>
<td>17.76*</td>
<td>17.15*</td>
<td>23.55***</td>
</tr>
<tr>
<td></td>
<td>(7.75)</td>
<td>(7.73)</td>
<td>(9.81)</td>
<td>(9.68)</td>
<td>(5.74)</td>
</tr>
<tr>
<td>Western Canon</td>
<td>-2.48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>9.37***</td>
<td>11.27***</td>
<td>10.03***</td>
<td>7.67**</td>
<td>9.38***</td>
</tr>
<tr>
<td></td>
<td>(2.71)</td>
<td>(3.65)</td>
<td>(2.87)</td>
<td>(3.00)</td>
<td>(2.45)</td>
</tr>
<tr>
<td>Book age fixed effects</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Genre fixed effects</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Author fixed effects</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Five year fixed effects</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Observations</td>
<td>902</td>
<td>902</td>
<td>902</td>
<td>902</td>
<td>902</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.24</td>
<td>0.24</td>
<td>0.25</td>
<td>0.05</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Standard errors clustered at the level of authors.

*** denotes significance at the 1 percent, ** 5 percent, and * 10 percent, level.

Note: Book age fixed effects control for the number of years that have passed since the first edition. Genre fixed effects control for variation in the price of books across novels, poetry, other fiction, and non-fiction. Price data for 902 editions of 548 titles that had been in print for 14 years or less by 116 authors between 1790 and 1840, from St. Clair (2004), the London Catalogue of Books (Brown et al. 1799, Hodgson 1851) and the English Catalogue of Books (Peddie and Waddington 1914). Column (5) winsorizes the price of editions at 99% level.
<table>
<thead>
<tr>
<th></th>
<th>(1) Excluding Scott</th>
<th>(2)</th>
<th>(3) Excluding Scott and Byron</th>
<th>(4)</th>
<th>(5) Excluding recently deceased</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(4.11)</td>
<td>(3.42)</td>
<td>(3.51)</td>
<td>(3.08)</td>
<td>(5.94)</td>
</tr>
<tr>
<td>Post-1814 * dead</td>
<td>19.94***</td>
<td>16.05***</td>
<td>20.42***</td>
<td>16.14***</td>
<td>24.47***</td>
</tr>
<tr>
<td></td>
<td>(6.05)</td>
<td>(5.45)</td>
<td>(5.40)</td>
<td>(4.87)</td>
<td>(8.14)</td>
</tr>
<tr>
<td>Constant</td>
<td>8.79***</td>
<td>9.62***</td>
<td>8.06***</td>
<td>8.91***</td>
<td>7.81***</td>
</tr>
<tr>
<td></td>
<td>(2.61)</td>
<td>(2.68)</td>
<td>(2.67)</td>
<td>(2.68)</td>
<td>(2.74)</td>
</tr>
<tr>
<td>Book age fixed effects</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Genre fixed effects</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Author fixed effects</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Five year fixed effects</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Observations</td>
<td>775</td>
<td>775</td>
<td>732</td>
<td>732</td>
<td>888</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.39</td>
<td>0.41</td>
<td>0.39</td>
<td>0.41</td>
<td>0.34</td>
</tr>
</tbody>
</table>

Standard errors clustered at the level of authors. *** denotes significance at the 1 percent, ** 5 percent, and * 10 percent, level.

Note: Column (1) – (2) exclude 127 book editions by Sir Walter Scott. Columns (3) – (4) exclude 127 editions by Scott and 43 editions by Lord Byron. Columns (5) - (6) exclude 14 editions by authors who had died within one year of the publication year of the edition. Book age fixed effects control for the number of years that have passed since the first edition of a book. Genre fixed effects control for variation in price across novels, poetry, other fiction, and non-fiction. Price data from St. Clair (2004), the London Catalogue of Books (Brown et al. 1799; Hodgson 1851) and the English Catalogue of Books (Peddie and Waddington 1914). 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 http://explore.bl.uk and http://books.google.com/, accessed September 4-20, 2012). Demographic data for authors are from the Dictionary of Literary Biography (various volumes).
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dead</td>
<td>-6.61***</td>
<td>-1.58</td>
<td>-15.65</td>
<td>-10.80</td>
</tr>
<tr>
<td></td>
<td>(2.51)</td>
<td>(3.95)</td>
<td>(9.93)</td>
<td>(7.03)</td>
</tr>
<tr>
<td>Post-1814 * dead</td>
<td>20.27**</td>
<td>13.19</td>
<td>32.47**</td>
<td>27.20**</td>
</tr>
<tr>
<td></td>
<td>(9.08)</td>
<td>(8.89)</td>
<td>(12.40)</td>
<td>(11.66)</td>
</tr>
<tr>
<td>Number of pages</td>
<td>0.02***</td>
<td>0.02***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.00)</td>
<td>(0.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-13.56**</td>
<td>-5.66</td>
<td>21.56**</td>
<td>27.32***</td>
</tr>
<tr>
<td></td>
<td>(5.69)</td>
<td>(5.10)</td>
<td>(4.91)</td>
<td>(3.98)</td>
</tr>
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<td>Page size fixed effects</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Genre fixed effects</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Author fixed effects</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Five year fixed effects</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Observations</td>
<td>692</td>
<td>692</td>
<td>665</td>
<td>665</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.55</td>
<td>0.56</td>
<td>0.54</td>
<td>0.57</td>
</tr>
</tbody>
</table>

Standard errors clustered at the level of authors. *** denotes significance at the 1 percent, ** 5 percent, and * 10 percent, level.

**Note:** Column (1) - (2) include controls for the number of pages in a book; data on page numbers are available for 692 book editions of 430 book titles by 107 authors between 1790 and 1840; column (3) – (4) include fixed effects for page sizes, which publishers define by the number of pages a piece of paper is folded to create the pages of a book. Data on page sizes are available for 665 editions of 420 book titles by 106 authors. Book age fixed effects control for the number of years that have passed since the first edition of a book. Genre fixed effects control for variation in price across novels, poetry, other fiction, and non-fiction. Price data from the London Catalogue of Books (Brown et al. 1799; Hodgson 1851) and the English Catalogue of Books (Peedie and Waddington 1914). 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 http://explore.bl.uk and http://books.google.com/, accessed September 4-20, 2012). Demographic data for authors are from the Dictionary of Literary Biography (various volumes).
TABLE 5 – OLS – DEPENDENT VARIABLE IS PRICE OF EDITIONS BETWEEN 1790 AND 1840 FOR BOOKS IN PRINT FOR MORE THAN 14 YEARS (PLACEBO)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dead</td>
<td>-11.25</td>
<td>-18.20</td>
<td>4.85</td>
</tr>
<tr>
<td></td>
<td>(21.91)</td>
<td>(28.52)</td>
<td>(7.97)</td>
</tr>
<tr>
<td>Post-1814 * dead</td>
<td>3.30</td>
<td>9.05</td>
<td>-7.60</td>
</tr>
<tr>
<td></td>
<td>(16.28)</td>
<td>(17.39)</td>
<td>(9.44)</td>
</tr>
<tr>
<td>Constant</td>
<td>22.26</td>
<td>0.28</td>
<td>22.26</td>
</tr>
<tr>
<td></td>
<td>(41.33)</td>
<td>(50.16)</td>
<td>(41.33)</td>
</tr>
<tr>
<td>Book age fixed effects</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Genre fixed effects</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Author fixed effects</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Five year fixed effects</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Observations</td>
<td>63</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.84</td>
<td>0.85</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Standard errors clustered at the level of authors.

*** denotes significance at the 1 percent, ** 5 percent, and * 10 percent, level.

Note: Price data for 63 book editions of 44 book titles on copyright that had been in print for more than 14 years (and therefore were not affected by the differential increase in copyright) by 31 authors between 1790 and 1840. We have collected these from St. Clair (2004) the London Catalogue of Books (1799, 1851) and the English Catalogue of Books (Peddie and Waddington 1914). Demographic data for 124 authors are from the Dictionary of Literary Biography (various volumes).
Figure 1 - Time-Varying Estimates of the Effect of Price on Copyright

Note: 95% confidence interval for $\beta_1$ in the OLS regression $Price_{it} = \beta_0 + \beta_1 Years_{it} + X_{it} + \epsilon_{it}$, where the variable $Years_{it}$ indicates 5-year intervals for 1805-09, 1815-19, 1820-24, 1825-29, 1830-1834, and 1835-1839; the interval 1810-1814 is the excluded time period. Price data for 902 book editions of 548 book titles that had been in print for 14 years or less by 116 authors between 1790 and 1840. We have collected these data from St. Clair (2004), the London Catalogue of Books (Brown et al. 1799; Hodgson 1851), and the English Catalogue of Books (Peddie and Waddington 1914). Book ages are measured as the number of years since the first editions; we collected years of first editions from the online records of the British Library and Google Books (available at http://explore.bl.uk and http://books.google.com/, accessed September 4-20, 2012). Demographic data are from the Dictionary of Literary Biography (various volumes).
Figure 2 – Estimates of changes as book titles approach the end of copyright

Note: 95% confidence interval for $\beta_3$ in the OLS regression $\text{price}_{it} = \beta_0 + \beta_1 t + \beta_2 L_t + \beta_3 \gamma_t + \varepsilon_{it}$, where $\text{price}_{it}$ measures the price of title $i$ in the year $t$, $L_t$ 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 book titles with first editions before 1814, $T$ equals the year of the first edition + 14 if the author died within 14 years of the first edition, and + 28 if the author died within 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 + 28 and or the authors remaining life. The matrix $X_i$ includes controls for genres, book age fixed effects, five-year fixed effects, and books by dead authors. Price data include 970 editions of 563 book titles on copyright from St. Clair (2004), the London Catalogue of Books (Brown et al. 1799; Hodgson 1851), and the English Catalogue of Books (Peddie and Waddington 1914). Book ages are calculated using data on first editions, which we collected from the records of the British Library and Google Books. Demographic data on survival status of authors are from the Dictionary of Literary Biography (various volumes).
<table>
<thead>
<tr>
<th>Alive</th>
<th>Pre-1814</th>
<th>Post-1814</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected length</td>
<td>14 years or 28 years if author survived first 14-year term</td>
<td>28 years or life of author if author survived the 28-year term</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28.00</td>
<td>28.42</td>
<td>0.42</td>
</tr>
<tr>
<td>Dead</td>
<td>14.00</td>
<td>28.00</td>
<td></td>
</tr>
<tr>
<td>Expected length</td>
<td>14.00</td>
<td>28.00</td>
<td>14.00</td>
</tr>
<tr>
<td>Difference</td>
<td>Expected length</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-14.00</td>
<td>-0.42</td>
<td>13.58</td>
</tr>
</tbody>
</table>

**Note:** The expected length of copyright for living authors is calculated as the expected remaining length of life for a 42-year old author at the passing of the 1814 Copyright Act. Forty-two is the age of the average author in the publication year of the first edition, which starts the clock for copyright length. Data on age of authors are available for 484 first editions between 1790 and 1840 were written by 142 authors. To estimate the expected remaining years of life for a 42-year old author in 1814, we collect demographic data for all 947 British writers with birth years between 1700 and 1800 from the *Dictionary of Literary Biography*. Life tables predict the expected remaining years of life $R([a, a+4], [t, t+4])$ for a British writer at age bracket $[a, a+4]$ in five-(calendar) year intervals $[t, t+4]$ between 1790 and 1840. For the median author in an age bracket, expected remaining years of life are calculated as the average across all authors in the same age bracket at the same time. A 42-year old author is the median author for the $[40,44]$ age bracket; in the time interval 1815-1819 the expected remaining years of life for a 42 year-old author are $R(42, [1815,1819]) = R([40,44],[1815,1819]) = 28.42$ years.
Appendix Figure A1 - Price data for book editions between 1790 and 1840 of book titles in print for 14 years or less, dead versus living authors

Note: Price data for 902 book editions of 548 book titles that had been in print for 14 years or less by 116 authors between 1790 and 1840. We have collected these data from St. Clair (2004), the London Catalogue of Books (Brown et al. 1799; Hodgson 1851) and the English Catalogue of Books (Peddie and Waddington 1914). Book ages are calculated using data on first editions, which we collected from British Library and Google Books (available at http://explore.bl.uk and http://books.google.com/, accessed September 4-20, 2012). Demographic data on survival status of authors are from the Dictionary of Literary Biography (various volumes).
APPENDIX FIGURE A2 – PRICE FOR THOMAS MOORE’S LALLA ROOKH

Note: Price data for 10 editions of Thomas Moore’s book title *Lalla Rookh* (1817). The copyright term for *Lalla Rookh*’s expired in 1859; after that year, price declined again to 5s for two editions by competing publishers. We have collected these data from St. Clair (2004), the *London Catalogue of Books* (Brown et al. 1799; Hodgson 1851), and the *English Catalogue of Books* (Peddie and Waddington 1914).