

# DEAD POETS' PROPERTY- HOW DOES COPYRIGHT INFLUENCE PRICE?\*

XING LI, STANFORD UNIVERSITY  
MEGAN MACGARVIE, BOSTON UNIVERSITY AND NBER, AND  
PETRA MOSER, STANFORD UNIVERSITY AND NBER

NOVEMBER 29, 2014

This article exploits a differential increase in copyright under the UK Copyright Act of 1814 - in favor of books by dead authors – to examine the influence of longer copyrights on price. Difference-in-differences analyses, which compare changes in the price of books by dead and living authors, indicate a substantial increase in price in response to an extension in copyright length. By comparison, placebo regressions for books by dead authors that did not benefit from the extension indicate no differential increase. Historical evidence suggests that longer copyrights increase price by improving publishers' ability to practice intertemporal price discrimination.

JEL codes: O3, K00, N33

Keywords: Copyright, creativity, innovation, information goods, intertemporal price discrimination.

---

\* Xing Li, Department of Economics, Stanford CA, [xingli@stanford.edu](mailto:xingli@stanford.edu), Megan MacGarvie, Boston University School of Management, [mmacgarv@bu.edu](mailto:mmacgarv@bu.edu), and Petra Moser, Department of Economics, Stanford CA, [pmoser@stanford.edu](mailto:pmoser@stanford.edu), 650-723-9303 (corresponding author). 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 1151180.

## 1. Introduction

Copyright is becoming increasingly important as a mechanism to protect intellectual property. For example, US employment in copyright-intensive industries such as computer systems design, books, and video increased by 46 percent between 1990 and 2011, and by 2012, copyright-intensive industries accounted for a larger share of employment than patent-intensive industries (US Department of Commerce 2012, pp. 39-40). Compared with patents, copyrights offer intellectual property rights that are narrower (protecting an individual expression rather than the underlying concept of a work) and longer lasting. The optimal length of copyright is the subject of intense debates within and across countries. In the United States and Europe, copyright provides temporary monopoly rights for 70 years after the author's death, and for 95 years to corporate owners. In China, copyrights create nominal exclusivity for 50 years after the initial publication, but enforcement is weak so that the expected length of copyright is relatively short.<sup>1</sup>

Extensions in the length of copyright are intended to increase the profitability of creative work, albeit at the cost of limiting access and diffusion. Intuitively, an increase in the price of copyrighted content is the fundamental mechanism by which an extension in the length of copyrights may increase profits and limit diffusion. To formalize this intuition, we present a straightforward extension of existing models of intertemporal price discrimination to the case of a *temporary* monopoly, as provided by copyrights. This model predicts an increase in price in response to longer copyrights. Intuitively, extensions in copyright length from  $T$  to  $T+c$  may increase price by preventing competitors from entering with cheaper copies for an additional number of years  $c$ . Endowed with a longer period of monopoly rights, copyright owners can better exercise intertemporal price discrimination by serving buyers with a high willingness to pay first, and delaying sales to buyers with lower willingness to pay until later periods. Systematic empirical evidence on

---

<sup>1</sup> US companies may have lost more than \$15 billion in 2009 due to copyright theft, including 3.5 billion due to software infringement in China (Reuters, January 10, 2012). In 2013, a Chinese court ordered Apple to pay a total of \$118,000 to bestselling author Mai Jia and two other authors for failing to secure permission to sell their books in Apple's App Store (Bostic 2013).

the causal effects of copyright terms, however, continues to be scarce. The most direct evidence comes from analyses of piracy, which have found a limited effect of file sharing on record sales (Oberholzer-Gee and Strumpf 2007), and on the supply of recorded music (Walfogel 2011).<sup>2</sup>

A major empirical challenge arises from the extreme length of modern copyrights, which implies that extensions may affect none but the most long-lived intellectual assets. This issue results in selection bias because information goods that are for sale nearly 100 years after their creation - when modern copyrights expire - are likely to be exceptionally durable. For example, Landes and Posner (2003, p. 212) report that only 174 of the 10,027 books published in 1930 (less than 2 percent) were still in print in 2001.<sup>3</sup> It therefore becomes difficult to identify price effects in modern data, even though copyrights have been shown to influence the availability of new editions of existing works. Heald (2008, p. 1040-43) finds that bestsellers first published between 1923 and 1932 (and therefore still *on* copyright in 2006) sold for roughly the same price in 2006 compared with bestsellers first published between 1919 and 1922 (and therefore *off* copyright). Bestsellers *on* copyright, however, were in print at significantly lower rates compared with bestsellers *off* copyright, with more editions per book. Similarly, Reimers (2013) finds that bestsellers first published between 1923 and 1936 (and therefore still *on* copyright in 2011) sold for nearly the same price in 2011 compared with bestsellers first published between 1910 and 1922 (and therefore *off* copyright), whereas books *on* copyright were published in substantially fewer editions.<sup>4</sup>

An additional challenge for empirical analyses is that changes in modern copyrights typically occur in response to lobbying by the owners of particularly valuable and long-lived works. For example, the 1998 (*Sonny Bono*) US Copyright Act is commonly known as the *Mickey Mouse*

---

<sup>2</sup> Liebowitz (1985) shows that academic journals increased subscription prices for libraries after 1959, when libraries began to install copy machines. Intuitively, the ability to photocopy increased the value of journal content for libraries, and journals exploited this change to charge a higher price. See Varian (2005) for a model of pricing strategies for information goods in the presence of copying.

<sup>3</sup> To reduce the transaction costs associated with finding the owners of extremely durable books, Landes and Posner (2003) propose a registration system with indefinite terms that are subject to renewal.

<sup>4</sup> Selection bias may also affect historical analysis of piracy. For example Khan (2005, pp. 268-9) argues that pirated books by European authors sold for a higher price compared with copyrighted books by US authors between 1832 and 1858, because pirated books tended to be better.

*Protection Act* because copyright for “Steamboat Willie” would have expired in 2003, and Disney had “lobbied hard” for an extension (Lessig 2001, Varian 2005, p. 127).<sup>5</sup> 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 (Bierman 2013). Lobbying, however, makes it difficult to attach a causal interpretation to changes in price that follow modern copyright extensions.

To address these empirical challenges, this article exploits an unanticipated and unintended differential increase in the length of copyrights, which increased copyrights starting from low pre-existing levels. This differential increase occurred with the UK Copyright Act of 1814, which was primarily intended to clarify a requirement to deposit copyrighted books with research libraries, but also changed the length of copyrights. 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 authors remaining years of life for books whose authors had survived the 14-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.<sup>6</sup>

Our empirical approach takes advantage of this differential increase in copyright length 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 only a small extension). 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. For example, books may have become more expensive after 1814 because the demand for reading

---

<sup>5</sup> 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.

<sup>6</sup> Section II.D presents life tables, which calculate life expectancies for Romantic period authors in 1814, conditional on the author having reached 42, the age of the average author at the time of the first edition.

increased with advances in literacy. Book prices may also have declined with reductions in production costs as a result of the diffusion of continuous papermaking and steam-powered printing.<sup>7</sup> 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.<sup>8</sup>

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 price. 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 Romantic Period 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. To control for variation in price across the life cycle of a book, we collect additional data on the publication years of first editions. To control for idiosyncratic differences in popularity and consumers' willingness to pay across authors, we construct unique identifiers to distinguish the 137 authors of the 1,072 editions in our data. We also control for unobservable characteristics that may vary across genres, and classify all books into novels, poetry, other fiction, and non-fiction.<sup>9</sup> To proxy for literary quality we use Harold Bloom's (1994) *Western Canon*. To control for physical characteristics, which may influence production costs and consumers' willingness to pay, we collect additional data on page counts and dimensions.

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 26.28 shillings after 1814 compared with books by living authors. Relative to an average price of 17.79 shillings after 1814, this implies a 147 percent increase in price, roughly 10 percent for each additional year of

---

<sup>7</sup> 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 19<sup>th</sup> century (Plant 1974, pp. 269-279 and 329-340).

<sup>8</sup> 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.

<sup>9</sup> Non-fiction includes travel reports, historical analyses, and Adam Smith's *Wealth of Nations*.

copyright, and an elasticity of price with respect to copyright length of 1.17. Results are robust to controlling for canonical books, 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. Results are robust to excluding books by Sir Walter Scott (1771-1832) and Lord Byron (1788-1824), two extremely popular authors 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 1710 *Statute of Anne*). Placebo regressions for these books yield no evidence of a differential increase in price.

To investigate the potential for intertemporal price discrimination, we examine historical records on the purchasing decisions of book buyers in the Romantic Period. These records indicate a significant amount of variation in consumers' willingness to pay and show that at least a subset of buyers delayed their purchases to wait for cheaper editions. We also investigate whether publishers reduced the price of books as book titles approached the end of their copyright terms. This analysis exploits 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, it confirms that publishers lowered the prices of books as they approached the end of copyright, even controlling for the age of books.<sup>10</sup>

The remainder of this article is structured as follows. Section I presents a straightforward extension of models of intertemporal price discrimination, which predicts a price increase in response to longer copyrights. Section II describes the changes in copyright, as well as the negotiations that led to the 1814 Act. Section II also presents life tables, which estimate remaining years of life for Romantic Period authors. Section III describes the data. Section IV presents difference-in-differences analyses and robustness checks. Section V examines evidence for intertemporal price discrimination as a potential mechanism by which longer copyrights may increase price, and section VI concludes.

## 2. Theoretical Predictions

To formalize predictions about the effects of longer copyrights on price, we first present an extension of existing models of intertemporal price discrimination for durable goods (e.g., Stokey 1989; Tirole 1988, p. 80; Scotchmer 2004, pp. 37-38) to the case of *temporary* monopoly rights. Suppose a publisher monopolist owns the exclusive rights to publish a book title  $i$  for  $T$  years, the duration of copyright. The publisher's marginal cost of producing an additional copy equals  $c$ , which includes the costs of paper, as well as the costs of printing another copy. After copyrights expire at time  $T$ , entry drives price to equal marginal cost  $c$ . The publisher is forward-looking and discounts future profits by a factor of  $\delta$ . Books are imperfect substitutes for each other so that a consumer, whose willingness to pay is below price in period  $t$ , does not buy other books instead. Consumers are myopic, and, for tractability, we assume that their willingness to pay is distributed  $v \sim$

---

<sup>10</sup> This test may underestimate a decline in price in the final years of copyright because content that has been in print for 25 years or more may be particularly valuable and sell for a higher price.

uniform[0,1].<sup>11</sup> The key assumption of this model is that consumers differ in their willingness to pay. Historical evidence, which we present in more detail in Section V, supports this claim. Buyers of Romantic Period books ranged from wealthy individuals (St. Clair 2004, pp. 201, 245) to more than a thousand circulating libraries, which covered readers from a broad range of social classes and locations. Circulating libraries acquired books from publishers and rented them for a fee to individual readers, anticipating the business model of 20<sup>th</sup> century video stores (Mortimer 2007, Roehl and Varian 2001). Erickson (1990, p. 573) explains that “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...”

Under these conditions, the publisher monopolist sets a separate price in each period  $a$ . Let  $p_{a,T}$  be the price that the publisher charges per copy of a new edition of the book at age  $a$  when the length of copyright is  $T$ . The publisher monopolist chooses prices  $(p_1, p_2, \dots, p_T)$  to maximize

$$\sum_a \delta^{a-1} (p_a - c) q_a$$

where the residual demand curve at time  $t$  given  $p_{a-1}$  is  $q_a = (p_{a-1} - p_a)$  for  $a > 1$  and  $q_1 = 1 - p_1$ .

Under the original copyright length  $T = 1$ , demand in period 1 equals

$$D(p) = \Pr(v \geq p) = 1 - p$$

and the monopolist maximizes profits  $\pi = (p - c) \cdot D(p)$ . Then, the profit-maximizing price is

$$p_{1,1} = \frac{1 + c}{2}$$

If copyright is extended to  $T = 2$ , the publisher chooses prices  $(p_1, p_2)$  in periods 1 and 2. In period 2, the monopolist publisher faces a residual demand of  $D_2(p) = p_1 - p$ , and the profit-

---

<sup>11</sup> The assumption of a uniform distribution of consumers’ willingness to pay and the corresponding linear demand function allows us to illustrate the predictions of the model through a closed-form pricing scheme. The main prediction of the model (that price increases in the length of copyright) only depends on the existence of variation in consumers’ willingness to pay, and holds for any downward-sloping demand function.



maximizing price  $p_2 = \frac{p_1+c}{2}$  yields profits of  $\pi_2 = \frac{(p_1+c)^2}{4}$ . Given demand in period 2, the monopolist chooses a profit-maximizing price  $p_1$  to maximize

$$(p_1 - c) \cdot (1 - p_1) + \delta \cdot \frac{(p_1 + c)^2}{4}$$

For period 2, the profit-maximizing price is  $p_{2,2} = \frac{1+3c}{4-\delta}$  and for period 1, it is

$$p_{1,2} = \frac{2+(\delta+2)c}{4-\delta} > p_{1,1} = \frac{1+c}{2}$$

An extension to the case of forward-looking consumers with discount factors below 1 also predicts a price increase; this price increase is smaller than the price increase for myopic consumers.

Compared with modern settings, the case of Romantic Period book publishing shares many characteristics, and differs in two important aspects. First, technical advances in distribution have reduced the marginal cost of selling extra copies to nearly zero for many types of creative goods, including e-books and online movies. If  $c = 0$ , the model above predicts a profit-maximizing first-period price  $p_{1,1}$  of  $\frac{1}{2}$  when  $T = 1$ , and a profit-maximizing second-period price of  $p_{1,2} = \frac{2}{3}$  when  $T = 2$ , such that  $p_{1,1} < p_{1,2}$ .

Historical evidence also suggests that resale markets for books were relatively thin. For example, St. Clair (2004 p. 240) writes in his exhaustive survey of publishing in the Romantic Period, “I cannot find any references to reading from second-hand circulating library copies.” Circulating libraries prevented competition from the secondary market by keeping books out of circulation for decades after they had been used. For example, “Mudie [of Mudie’s Circulating Library] kept most of the books which had done their rounds in huge ‘catacombs’ for decades or longer” (St. Clair 2004 p. 241). In modern industries, resale markets are thin or non-existent for non-durable goods, such as airline tickets (Lazarev 2013) and soft drinks (Hendel and Nevo 2012), and for certain types of durable goods, which consumers tend use to the end of their useful life, such as video games (Nair 2007). For college textbooks, however, resale markets play an important role, which severely impacts the ability of publishers to price discriminate (Chevalier and Goolsbee 2009).

### 3. 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 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).<sup>12</sup> If the author was alive at the end of the 14<sup>th</sup> year after the first edition, the book remained on copyright for a full 28-year term.<sup>13</sup>

#### Clarifying the Deposit Requirement

In return for granting temporary monopoly rights, 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.<sup>14</sup> 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) 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).

---

<sup>12</sup> 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 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 (Bautz 2007, p. 12). Customs authorities searched travellers’ luggage for illicit copies of copyrighted books (St. Clair 2004, pp. 200 and 299).

<sup>13</sup> Authors typically assigned both 14-year terms to the same publisher (St. Clair 2004, p. 161).

<sup>14</sup> *Beckford v. Hood* 1798 allowed publishers to sue for infringement damages on copyrighted works, even if they had not registered the book (Deazley 2008b).

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, p. 709). 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, p. 310).<sup>15</sup> 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 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" (*Reports of the Acts* 1808, p. 990). Faced with paper shortages as a result of the Napoleonic Wars (1803-1815, Bautz 2007, p.12), publishers were particularly concerned about the requirement to deposit copies on "best paper."<sup>16</sup>

Passed on July 29, 1814, the Copyright Act affirmed the requirement to deposit copies with the British Museum (now 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).

### **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) for any book that was still under copyright in 1814.<sup>17</sup> 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

---

<sup>15</sup> In the 19<sup>th</sup>-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."

<sup>16</sup> In 1813, Thomas Longman reports that the costs of paper accounts for two-thirds of the costs of producing an edition with 500 copies (*Minutes of Evidence* 1813, p. 11).

<sup>17</sup> 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, pp. 35-36).

adopted on the part of the legislature” (Deazley 2007, p. 839).<sup>18</sup> Draft bills between May 18 and July 15 maintained existing terms of “twenty-eight 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).<sup>19</sup>

### **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.”<sup>20</sup> 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, p. 3). 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, p. 9).

Similarly, Thomas Longman responded to Member of Parliament Davies:

---

<sup>18</sup> Sir Samuel Egerton Brydges (1762-1837) “occupied himself with literary work, issuing reprints of rare English pieces from the private press” and was an MP from 1812 to 1818 (*Alumni Cantabrigienses* 2011).

<sup>19</sup> Uniform terms are only mentioned twice in the parliamentary records, in the *Petition of the Printers* (1813, pp. 11-12) and in the 1813 *Report from the Committee on the Copyright of Printed Books* (1818, Appendix, p. 7). In 1818, a decision in *Brooke v. Clarke* (1818) confirmed that copyrights that had expired should not be revived by the Act (Deazley 2006, pp. 35-36).

<sup>20</sup> Nichols had published Ruding’s *Annals of the Coinage of Great Britain...*(1840).

“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).

Demographic data on 19<sup>th</sup>-century life expectancies indicate that the extension to “life of author” implied at best a nominal extension in copyright length for the average author. 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.<sup>21</sup>

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.<sup>22</sup> We use these data to construct life tables for Romantic Period authors to estimate remaining years of life *conditional* on changes in life expectancies over time and on authors’ survival to age 42. 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 in the same time interval  $[t, t+4]$ . 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.<sup>23</sup> 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 A1).

---

<sup>21</sup> With a standard deviation of 13 and a median age of 40 years for 105 authors of 436 first editions between 1790 and 1840; data on first editions were collected from Google Books, September 4-20, 2012.

<sup>22</sup> The *Dictionary* is available at <http://www.gale.cengage.com/>, accessed September 20-24, 2012.

<sup>23</sup> See Preston et al. (2001) for a detailed description of the methodology. Scherer (2004, p. 8) 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.

#### 4. The Data

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

##### **Price Data for New 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*.<sup>24</sup> St. Clair (2004) compiled information on price for 534 book editions between 1790 and 1840 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 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).

These data cover a total of 1,072 book editions of 609 titles by 137 authors between 1790 and 1840. Price data indicate that books were extremely expensive. Between 1790 and 1840, the average new edition sold for 17.71s (shillings), compared with a weekly wage of roughly 9 shillings for a working-class male (Bautz 2007, p. 12). Books were sold in a temporary cover of plain paper boards, leaving buyers to add a permanent cover to suit their tastes and budgets.<sup>25</sup> Consistent with evidence on technical improvements, which reduced production costs, average price declined from 18.05s for 365 editions between 1790 and 1814 to 17.54s for 707 editions between 1815 and 1840.

---

<sup>24</sup> Anecdotal evidence suggests that booksellers acted aggressively to discourage retailers from selling books below their listed price. In 1829, the London Booksellers' Committee decreed to boycott retailers that had attempted to sell books below their list price (Barnes 1964, p. 1). The practice of underselling could compromise our estimates if it changed differentially for books by dead and living authors after 1814; there is no evidence for such changes.

<sup>25</sup> A medium-sized octavo volume could be bound in boards for 4d (Plant 1974, p. 342), roughly 2 percent of the average price of a book. 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.

### **Controls for First Editions, Book Age, and Variation across Authors**

To distinguish books that had been in print for 14 years or less, and were therefore 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 in the year in which we observe the price of a new edition. We collect publication years of first editions from Google Books, and calculate the age of a book by subtracting the year of the first edition from the publication of the edition for which we observe price.<sup>26</sup> We use these data to construct book age fixed effects, which allow us to control for first editions and for the number of years that have passed since the first edition of a book. In our data, 902 of 1,072 editions were new editions of book titles that had been in print for 14 years or less. On average, these 902 editions sold for a price of 17.72s.

To control for idiosyncratic differences in consumers' willingness to pay across authors, we create identifiers for individual authors by matching author names for all 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. To minimize such errors, we create a fuzzy matching algorithm that uses Levenshtein distances to identify probable matches, and check all probable matches by hand to eliminate false positives.<sup>27</sup> 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.

### **Controls for Literary Quality and Genre**

---

<sup>26</sup> Available at <http://books.google.com/>, accessed September 6-14, 2012.

<sup>27</sup> 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.

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*.<sup>28</sup> 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 Suarez's 2009 classification of genres).

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 Shelley's *Frankenstein*), and 51 children's books, plays, hymns, and songs. One third (369 of 1,072) of all editions are non-fiction (including Adam Smith's *Wealth of Nations*) and travel reports (such as William Hazlitt's *Notes of a Journey through France and Italy*).<sup>29</sup>

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.

### **Controls for Physical Characteristics**

To control for variation in physical characteristics, 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.<sup>30</sup>

---

<sup>28</sup> The *Canon* ranges from Wycherley's *Country Wife* (1675) to Smart's *Jubilate Agno* (1939).

<sup>29</sup> The distribution of our sample across genres roughly matches the distribution in Bloom's (1994) *Canon*, which includes 77 novels, 15 volumes of poetry, and 32 works of non-fiction.

<sup>30</sup> For 17 editions, page numbers are available from the British Library (<http://explore.bl.uk>, accessed September 4-20, 2012); for 675 editions, page numbers are available from Google Books, which combines records for 21 libraries (<http://books.google.com/>, accessed September 4-20, 2012). For another 249 editions, page numbers are available for at least 1 edition of the same title within 10 years.



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 169 pages long on average (with 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 (and a standard deviation of 378 and a median of 331). In the baseline tests, author and genre fixed effects control for such variation; a robustness check controls explicitly for the number of pages.

Physical dimensions are 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 are octodecimo (18mo), vingesimo quarto (24mo), and trigesimo secundo (32 mo).<sup>31</sup> We use these data in robustness checks with controls for physical characteristics.

## 5. 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 nearly doubled after 1814, increasing from 17.69s between 1790 and 1814 to 37.56s between 1815 and 1840 (Table 1 and

---

<sup>31</sup> Octavos sold for an average of 15.70s (with a standard deviation of 17.64), compared with 38.90 (46.41) for the larger quarto editions, and 18.33 (46.61) for duodecimo editions.

Appendix Figure A1). By comparison, the price of books by living authors declined from 17.58s to 16.85s.

### Changes in Prices after 1814 for Books by Dead and Living Authors

Baseline difference-in-differences OLS regressions estimate

$$price_{it} = \alpha_0 + \alpha_1 dead_{st} + \alpha_2 dead_{st} * post1814_t + \varphi_a + \delta_r + f_s + \varepsilon_{it}$$

where the outcome variable  $price_{it}$  measures the price of a book edition  $i$  in year  $t$ . All editions are on copyright because they are new editions that have been in print for 14 years or less.<sup>32</sup> The variable  $dead_{st}$  equals one if author  $s$  had died before year  $t$ ;  $post1814_t$  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 a change in copyright length on price. Book age fixed effects  $\varphi_a$  control for variation in price across the life cycle of a book. Five-year fixed effects  $\delta_r$  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 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.<sup>33</sup>

Difference-in-differences analyses confirm the differential price increase for books by dead authors. Baseline estimates indicate that books by dead authors became 26.28s 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 17.79s for editions after 1814, this implies a 147 percent increase, which is

---

<sup>32</sup> Alternative specifications with the natural logarithm of price yield similar results with an estimated differential price increase for books of 108 percent (Appendix Table A2, Column 1-3).

<sup>33</sup> Price data for 2 or more editions are available for 202 titles, which is insufficient to estimate difference-in-differences within titles. Price is observable while the author is dead and alive for 28 titles, including 3 with editions before and after the author's death until 1814, and 16 after 1814.

equivalent to a 10 percent increase for each additional year of copyright, and an elasticity of price with respect to copyright length of 1.17.<sup>34</sup> Estimates for *dead* authors are not statistically significant (with a p-value of 0.44, Table 3, column 1).<sup>35</sup>

This differential price increase is robust to controlling for canonical books and for variation across genres. Estimates with a control for books in the *Western Canon* indicate that books by dead authors became 26.46s 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 (-3.34s, with a p-value of 0.22 Table 2, column 2).<sup>36</sup> Estimates with genre fixed effects indicate a price increase of 23.93 (with a p-value of 0.03, Table 2, column 3).

Specifications with author fixed effects (Table 2, columns 1-3) exploit variation in price for 344 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 authors whose books were published before and after the author's death, and whose posthumous editions were all published until 1814: Erasmus Darwin (1731-1802), Joseph Priestley (1733-1804), and Rev. William Paley (1743-1805). For each of these authors, the average book sold for a higher price while the 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 329 editions by the remaining 14 authors (whose books were published before and after the author's death) after 1814: William Hayley (1745-1820), John O'Keefe (1747-1833), George Crabbe (1754-1832), Ann Radcliffe (1764-1823), Robert Bloomfield (1766-1823), Sir Walter Scott (1771-1832), Samuel

---

<sup>34</sup> Calculated as the percent increase in price (26.28 relative to the pre-1814 average price of 17.70s for books by dead authors) relative to the percent increase in copyright length (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 copyrights, using death as an instrument for the change in copyrights. IV estimates imply an increase of 14.16s for each additional year of copyright (with a p-value of 0.05), only slightly larger than the OLS.

<sup>35</sup> Estimates with quadratic trends indicate that books by dead authors became 26.49s more expensive after 1814 (with a p-value of 0.02), which implies a 149 percent increase.

<sup>36</sup> Estimates for interactions between *Canon* and *dead<sub>st</sub> \* post1814<sub>it</sub>* are not statistically significant, and leave the estimate for *dead<sub>st</sub> \* post1814<sub>it</sub>* at 21.68 (and a p-value of 0.01).

Coleridge (1772-1834), Jane Austen (1775-1817), Matthew Lewis (1775-1818), Lord Byron (1778-1824), William Hazlitt (1778-1830), Percy Shelley (1792-1822), Felicia Hemans (1793-1835), and Letitia Landon (1802-1838). For 12 of these 14 authors, whose books account for 296 of 329 editions, the average book sold for a higher price *after* the author's death.<sup>37</sup>

Robustness checks, which exclude author fixed effects, confirm the main estimates. Specifications without author fixed effects indicate a price increase of 21.18s (with a p-value of 0.02, Table 2, column 4), implying a 119 percent increase, compared with a 147 percent increase for specifications with author fixed effects (Table 2, columns 1). Results are also robust to winsorizing observations above the 99<sup>th</sup> percentile of price, with an estimate of 29.77 for  $dead_{st} * post1814_{it}$  (with a p-value of 0.00, Table 2, column 5).<sup>38</sup>

#### **Time-varying Estimates of Differential Effects before and after 1814**

To investigate the timing of effects, we estimate difference-in-differences coefficients separately for three-year intervals beginning in 1800:

$$price_{it} = \alpha_0 + \alpha_1 dead_{st} + \beta_r dead_{st} * year_r + \varphi_a + \delta_r + f_s + \varepsilon_{it}$$

where  $year_r$  is an indicator variable to denote 3-year intervals  $r$  for 1800-1802, ..., 1836-1838; the interval 1812-1814 is the excluded time period. Coefficients  $\beta_r$  measure differences in price for books by dead compared with living authors for three-year intervals  $r$  1800-1802, ..., 1809-1811, 1815-1817, ... 1836-1838. Similar to the previous specification,  $\varphi_a$  controls for age fixed effects,  $\delta_r$  controls for three-year fixed effects, and  $f_s$  controls for author fixed effects.

Time-varying coefficients yield no evidence of a differential increase in price until 1814. Between 1800 and 1811, coefficients are statistically significant for the first interval from 1800 to

---

<sup>37</sup> The share of posthumous editions is small, with 5.86 percent of editions until 1814 and 4.03 percent afterwards. There are no posthumous editions by the same author before and after 1814.

<sup>38</sup> Nine observations above the 99<sup>th</sup> percentile include Scott's *Collected Verse Writings* (126s in 1806 and 249s in 1813), his *Novels and Tales by the Author of Waverley* (144s, 120s, and 144s, respectively in 1819, 1821, 1822) and *Poetical Works* (120s in 1821 and 1830), as well as Robert Southey's *History of Brazil* (1819, 155s) and Anna Barbauld's *British Novelists* (1812, 252s).

1802, and not statistically different from zero for the following three intervals from 1803 to 1811 (Figure 1, Panel A). After 1814, coefficients are positive and statistically significant for seven of eight time intervals, with estimates ranging from 23.10s in 1836-1838 to 101.56s in 1830-1832.

Data for 1830-1832 include the first posthumous edition of Lord Byron's *Works and Life* (1832, 85s) and *Letters and Journals of Lord Byron*, (1830, 84s).<sup>39</sup> Along with Scott, Byron was one of the Romantic Period's literary superstars. His career was cut short in 1824, when the 36-year old poet died of a fever in Missolonghi, Greece, where he had helped to train troops to fight for independence from Turkey. Byron's *Works and Life* (1832) is among the most expensive books in our data, suggesting that Byron's publisher John Murray may have recognized and exploited the extension that the 1814 Act provided for books by dead authors. To examine whether our estimates are driven by books by Lord Byron, we re-estimate time-varying effects after excluding Byron's books. Estimates are robust to excluding Byron (Figure 1, Panel B).

### **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

---

<sup>39</sup> An 1833 edition of Byron's *Letters and Journals* sold for 45s, slightly more than half the original price. In the main specification, book age fixed effects  $\varphi_a$  control for changes in price across editions; robustness checks below control for variation in price for authors who had been dead for one year or less.

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 28.68s additional shillings more expensive after 1814, compared with books by living authors (with a p-value of 0.00, Table 3, column 1). Compared with an average price (excluding Scott) of 13.74s after 1814, this implies a 209 percent increase. Estimates are also robust to including genre fixed effects (Table 3, column 2), using the natural logarithm of price as dependent variable (Appendix Table A2, Column 4) and to controls for canonical books (not reported).

Estimates are also robust to excluding books by Scott and Byron. Baseline estimates indicate that books by dead authors became an additional 20.44 shillings more expensive after 1814 (with a p-value of 0.00, Table 3, column 3), implying a 149 percent increase.<sup>40</sup> Books by Jane Austen (1775-1817), another prominent author who died after 1814, languished in "relative obscurity" throughout the Romantic Period (Bautz 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 an average price of 8.07s between 1817 and 1832, the last year with a new edition by Austen.<sup>41</sup>

### **Excluding Books by Recently Deceased Authors**

---

<sup>40</sup> Estimates are robust to using the natural logarithm of price (Appendix Table A2, Column 5).

<sup>41</sup> Another prominent author, Mary Shelley (1797-1851), was 21 years old in the year of the first edition of her novel *Frankenstein* (1818), and survived the sample period. *Frankenstein* sold for an average of 9.16s between 1818 and 1840, roughly half the average price of other editions in the same years.

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 the author’s 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. For paintings, Ekelund, Ressler, and Watson (2000) have shown that price increases after the artist’s death. If books by recently deceased authors are also 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 an 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 17.10s for books by living authors, and 26.65s for books by authors who had died more than one year ago. Fourteen of 45 editions by dead authors were published within one year of the author’s death, including 3 editions until 1814 and 11 after 1814.

Excluding 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 37.61s 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 216 percent. Estimates are robust to controlling for genre (Table 3, column 6), as well as to including controls for canonical books and to excluding author fixed effects (not reported).

### **Controlling for Physical Characteristics**

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 more costly 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 27.79s after 1814 compared with books by living authors (with a p-value of 0.00, Table 4, column 1).<sup>42</sup> Results are robust to controlling for genre fixed effects and for canonical books, with estimates of 20.55s (with a p-value of 0.01, Table 4, column 2) and 20.50s (with a p-value of 0.01, not reported). Regressions with controls for page size imply a larger price increase, albeit for a smaller sample of 665 editions. Baseline estimates indicate that the price of books by dead authors increased by 36.94s more than books by living authors after 1814 (with a p-value of 0.00, Table 4, column 3).<sup>43</sup> Results are robust to controlling for genre fixed effects and for canonical books, with estimates of 31.47 (with a p-value of 0.00, Table 4, column 4) and 31.52 (with a p-value of 0.01, not reported), and to using log price as dependent variable (Appendix Table A2, Column 6).

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.

### **Placebo: Editions by Dead Authors that did not Benefit from the Extension**

To test whether changes in tastes or other unobservable factors may have caused the observed increase in price for books by dead authors, we estimate placebo regressions for editions by dead

---

<sup>42</sup> 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.

<sup>43</sup> This increase in the estimate is driven primarily by the restriction of the sample to 665 observations for which data on page sizes are available. Re-estimating the baseline specification without controls for page size for the smaller sample of 665 observations with data on page size indicates that the price of books by dead authors increased by 32.54s more compared with books by living authors after 1814 (with a p-value of 0.001, not reported).



authors that did not benefit from longer copyrights. 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 by dead authors, which did not benefit from the 1814 extension but would have been affected by changes in tastes and other unobservable factors, experienced a differential increase in price 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 68 editions on copyright that had been in print for more than 14 years, the estimate for  $dead_{st} * post1814_t$  is small at 3.30s and not statistically significant (with a p-value of 0.85, 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 0.62 and 0.44, respectively, Table 5, columns 2-3).<sup>44</sup> In a larger sample of 87 editions that includes books off copyright, the estimated increase is 0.86s (not statistically significant, not reported).

An additional placebo test moves the *post* period to begin in 1809, 5 years before the Copyright Act. Evidence from parliamentary records indicates that the differential increase in copyright length was unanticipated. If, however, it had been anticipated, or if the price of books by dead authors increased as a result of other factors that were in place before 1814, estimates for the interaction between  $dead_{st}$  and  $post1809_{it}$  should be positive and statistically significant. Consistent with the historical evidence, however, the estimate for  $dead_{st} * post1809_{it}$  is close to zero and insignificant: 1.869 (with a standard error of 6.911, Table 5, column 4).

## 6. Mechanism: Intertemporal Price Discrimination

---

<sup>44</sup> To keep estimates comparable with the baseline (Table 2), we estimate placebo regressions for editions on copyright. The placebo sample includes 5 books above 28 years of age. Results are robust to dropping these observations.

Empirical analyses of modern industries have investigated intertemporal price discrimination as a welfare-improving strategy in monopolistic industries with forward-looking consumers (Mortimer 2007; Chevalier and Goolsbee 2009; Hendel and Nevo 2013; 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. For movies, books, and other types of information goods, which are costly to produce but cheap to replicate (Shapiro and Varian 1999; Varian 2005), the ability to pursue intertemporal price discrimination depends on the expected length of copyright.<sup>45</sup>

A stylized model of intertemporal price discrimination with *temporary monopoly rights* (in Section I) predicts that price will increase in response to longer copyright terms. Intuitively, an extension in the length of copyright can improve the ability of publishers to practice intertemporal price discrimination, in which a monopolist offers successive generations of a new good at lower prices “for the purpose of exploiting differences in consumers’ reservation price” (Stokey 1979, p. 355).<sup>46</sup>

Our model predicts that the monopolist earns positive profit from intertemporal price discrimination, whereas the Coase (1972) conjecture predicts zero profit. The difference arises because the Coase conjecture assumes that consumers are forward-looking (and can predict the complete price path) and that, in a continuous time model, the monopolist cannot commit to maintaining price at a high level. In contrast, our model assumes that consumers are not completely forward-looking (and *cannot* predict the complete price path for each title) and, in a discrete time model, monopolistic publishers can commit to maintaining price at a high level *within one period* (as

---

<sup>45</sup> Shapiro and Varian (1999, p. 3) define “information goods” as anything that can be digitized, or converted into a stream of bits, including books, magazines, music, databases, and web pages.

<sup>46</sup> 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 with forward-looking firms and consumers are rare because the approach is “likely to increase the burden of computing equilibria significantly.”

in Stockey 1981). Intuitively, menu costs that arise from publishing may prevent publishers from adjusting prices within one period.

In this section we present historical evidence on the market for 19<sup>th</sup> century books, which indicates significant differences in consumers' willingness to pay for books. We also exploit variation in the remaining years of copyright for book titles in the year of a new edition to examine whether publishers reduced the price of new editions as books approached the end of copyright.

### **Variation in Willingness to Pay**

Wealthy individuals and commercial lending libraries accounted for the majority of the market for Romantic Period books. For example, St. Clair (2004, p. 245) 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."

St. Clair (2004, p. 237) estimates that roughly 1,000 circulating libraries were operating in Britain in 1801, and 1,500 in 1821. According to Hamlyn (1946, p. 198) "not less than one thousand" circulating libraries operated in England by 1850. Anticipating the business model of video stores (Mortimer 2007), most circulating libraries derived their revenues primarily from rental fees, with minimal fees for membership (Roehl and Varian 2001).<sup>47</sup> Libraries varied in their willingness to pay for books depending on variation in the incomes of their members, which covered a broad range of locations and social classes. The London *Minerva Press and Circulating Library*, for example, charged an annual fee of 2 guineas or 504 pence in 1804 to access a collection of roughly 20,000 volumes, whereas provincial circulating libraries rented books to readers for a penny per volume and often held less than 200 volumes (Jacobs 2006, pp. 5-6).<sup>48</sup>

---

<sup>47</sup> Until circulating libraries emerged, readers had purchased books to share in "reading societies" (St. Clair 2004 p. 246-247). Private libraries were rare (Plant 1974, pp. 263-64); public libraries emerged after 1850 (Wiegand and Davis 1994, p. 608).

<sup>48</sup> In an essay on the circulating libraries, Charles Dickens (1894, p. 490) quotes an essay from 1761 "the reading female hires her novels from some country Circulating Library, which consists of about a hundred volumes.' The ordinary 'reading female' would soon exhaust this limited amount of provender."

Even members of the titled classes and gentry appear to have considered book prices in their purchasing decisions and sometimes 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).

Once a book came off copyright, competitors entered and sold books for a lower price. Contemporary series, such as *Walker’s British Classics*, offered off-copyright titles by William Shakespeare and James Thomson for one or two shillings each (St. Clair 2004, pp. 204 and 713).<sup>49</sup> Gall and Inglis’ *Landscape Poets* sold off-copyright works by Byron, Scott, Coleridge, and Wordsworth “at a price which will bring it within general reach” (Mackeson 1882, p. 436).

### **Changes in Price as Books Approach the End of Copyright**

Variation in the price of new editions also indicates that publishers exploited differences in buyers’ willingness to pay by selling to buyers with higher willingness to pay first, and covering the remainder of the market at declining prices – while books remained on copyright. For example, Thomas Moore’s poem *Lalla Rookh* 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, pp. 198 and 620).

---

<sup>49</sup> 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.

To systematically investigate such changes, we use data on authors' years of death to calculate their remaining years of life in year  $t$  and estimate variation in price as a function of remaining years of copyright:

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

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 term.<sup>50</sup> Coefficients  $\beta_r$  are estimated separately for three-year periods  $r$ , observations in years  $T-28$  and above are the excluded category. The matrix  $X_{it}$  includes control variables for books by dead authors, as well as age, genre, and time fixed effects. 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 titles approach the end of their copyright terms. In year  $T-1$ , new editions of a book title sold for 20.74s less compared with prices in  $T-28$  to  $T-26$  and above (Figure 3, with a p-value 0.039), and new editions in  $T-4$  to  $T-2$  sold for 21.87s less (with a p-value of 0.011). 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 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*

---

<sup>50</sup> 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 about an author's life expectancy.

*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 1,072 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.

### **Changes in Quantities**

The welfare implications of longer copyrights depend on their effects on quantities sold, in addition to price. Although historical sales data are not available for our sample, we are able to observe information on print runs for a subset of 518 editions, including 418 of 210 titles that had been in print for 14 years or less. These data cover books by 46 authors, including 16 editions by 7 dead authors.

Data on print runs are highly skewed (Appendix Figure A2), ranging from 100 copies for a 1817 edition of William Godwin's *Lives of Edward and John Phillips* (1815) to 12,000 copies for a 1816 edition of Lord Byron's *Childe Harold's Pilgrimage* (1816). The average print run was 2,166 copies (with a standard deviation of 2,284.35). The median print run was 1,500 copies; 48 editions had a print run of 1,500 copies. Seventy-five percent of all print runs included fewer than 2,000 copies, and 90 percent of all editions included fewer than 5,000 copies.

To examine changes in print runs, we estimate:

$$\ln PrintRun_{it} = \alpha_0 + \alpha_1 dead_{st} + \alpha_2 dead_{st} * post1814_t + \varphi_a + \delta_r + f_s + \varepsilon_{it}$$

where the natural logarithm helps to address the skewness of the print run data. For the full sample, these regressions indicate a 55 percent decline in print runs after 1814 for titles by dead authors ( $1 - e^{-0.59} = 55\%$  with a p-value of 0.28, Table 6, column 1). Excluding books by Sir Walter Scott estimates indicate a 68 percent decline in the average size of print runs for titles by dead authors ( $1 - e^{-1.13}$  with a p-value of 0.01, Table 6, column 2). Excluding both Scott and Byron indicates a

74 percent decline in print runs for titles by dead authors ( $1 - e^{-1.34}$  with a p-value of 0.05, column 4).

These results indicate that the extension in copyrights was associated with a reduction in quantities, which implies that the copyright extension reduced overall welfare. They also indicate that the reduction in quantities was mitigated for books by literary superstars, such as Sir Walter Scott. For example, 10 first editions by Scott (including *Rob Roy*, *Ivanhoe*, and *The Pirate*) had print runs of 10,000 copies each. In our data, these books account for a small portion of the sample, whereas analyses of modern price data include a larger share of these books.

## 7. 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 pre-trends. 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.

Historical evidence supports the idea that an extension in copyright may increase price by improving publishers' ability to practice intertemporal price discrimination. Wealthy individuals and

a large number of commercial circulating libraries accounted for the majority of book buyers in Romantic period England. Purchasing instructions suggest that these customers timed their book purchases to wait for lower priced editions. Historical records also suggest that there was a significant amount of variation in consumers' willingness to pay. For example, the spectrum of circulating libraries ranged from libraries in London that charged high fees to access current readings, to provincial libraries with small holdings of older books. Estimates of changes in the price of new editions as titles approached the end of their copyright terms are also consistent with intertemporal price discrimination. Even controlling for the age of book titles, publishers reduced the price of new editions of a title as it approached the end of its copyright term.

Empirical analyses of modern data indicate that – starting from copyright lengths of 75 years – further extensions in copyrights may reduce welfare by limiting access to copyrighted works (Heald 2008; Reimers 2013). Even if the ability to practice intertemporal price discrimination mitigates the dead weight loss from copyright (Scotchmer 2004, pp. 36-39, Mortimer 2007), the welfare effects of these extensions are likely to be negative. For example, Akerlof et al. (2002) caution that the 1998 extension from 75 to 95 years should not be expected to strengthen the incentives to create new works, whereas it may discourage creative work that uses existing materials.

By comparison, our findings imply that extensions that start from low levels of pre-existing copyrights may improve welfare by increasing the profitability of creative work. This implication is corroborated by a rare historical data set on payments to the authors of 208 UK fiction titles between 1800 and 1830, which documents a significant increase in payments to authors in response to longer copyrights (MacGarvie and Moser 2013). The empirical setting of our study is most directly comparable to modern countries, such as China and India, where effective levels of copyright protection continue to be low. For these countries, our historical findings suggest that strengthening copyrights may encourage creativity and innovation.



## References

- “An Act to amend the several Acts for the Encouragement of Learning, by securing the Copies and Copyright of Printed Books, to the Authors of such Books or their Assigns [Copyright Act], 1814, 54 Geo.III, c.156” in *Primary Sources on Copyright (1450-1900)*, L. Bently, and M. Kretschmer, eds.
- “Free Mickey Mouse: Lawrence Lessig wants less copyright protection, including for Disney's famous rodent,” *The Economist*, (Oct 10th, 2002).
- “London Booksellers' Petition, Respecting Copyrights, &c.” 16 December 1812, Hansard, 2nd Series, vol. 24, 308-311 in *Primary Sources on Copyright (1450-1900)*, L. Bently, and M. Kretschmer, eds.
- “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, (1812-13) Paper No.341, IV.1003-1040 in *Primary Sources on Copyright (1450-1900)*, L. Bently, and M. Kretschmer, eds. (1813).
- “Petition of the Printers of London and Westminster respecting Copyright”, 11 March 1813, Hansard, 2nd Series, vol.25, 10-16 in *Primary Sources on Copyright (1450-1900)*, L. Bently, and M. Kretschmer, eds.
- “Report from 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, 17 June 1813, (1812-13), Paper No.292, IV. 999-1002,” in *Primary Sources on Copyright (1450-1900)*, L. Bently, and M. Kretschmer, eds. (1813).
- “Report of the Acts Respecting Copyright,” 18 June 1813, Hansard, 2nd Series, vol.26, 708-710,” in *Primary Sources on Copyright (1450-1900)*, L. Bently, and M. Kretschmer, eds. (London, 1813).
- “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 *Primary Sources on Copyright (1450-1900)*, eds L. Bently & M. Kretschmer, www.copyrighthistory.org (London 1818).
- Akerlof, George A., Kenneth J. Arrow, Timothy Bresnahan, James M. Buchanan, Ronald Coase, Linda R. Cohen, Milton Friedman, et al. 2002. “The Copyright Term Extension Act of 1998: An Economic Analysis,” *Washington DC: AEI-Brookings Joint Center for Regulatory Studies*.
- Barnes, James J. 1964. *Free Trade In Books: A Study of the London Book Trade Since 1800*, Oxford: Clarendon Press.
- Bautz, Annika. 2007. *The Reception of Jane Austen and Walter Scott: A Comparative Longitudinal Study*, Continuum.
- Biermann, Kai. 2013. “Um Googles Willen,” *Die Zeit*, March 1, 2013.
- Bloom, Harold. 1994. *The Western Canon: The Books and School of the Ages*, New York: Harcourt Brace.
- Bostic, Kevin. 2013. “Chinese court fines Apple \$118K over e-book copyright violations.” *AppleInsider*, April 25, 2013.
- Brown, Mathew. 1999. *The London Catalogue of Books With Their Sizes and Prices*, St. John's-Square and Clerkenwell.
- Coase, Ronald H. 1972. "Durability and Monopoly," *Journal of Law and Economics* 15 (1): 143-149.
- Chevalier, Judith, and Austan Goolsbee. 2009. "Are Durable Goods Consumers Forward-looking? Evidence From College Textbooks," *The Quarterly Journal of Economics* 124 (4): 1853-1884.
- Deazley, Ronan. 2006. *Rethinking Copyright: History, Theory, Language*, Edward Elgar Publishing, 2006.
- . 2007. “The Life of an Author: Samuel Egerton Brydges and the Copyright Act 1814,” *Georgia State University Law Review* 23: 809-846.

- . 2008a. "Commentary on Beckford v. Hood (1798)," in *Primary Sources on Copyright (1450-1900)*, L. Bently, and M. Kretschmer, eds.
- . 2008b "Commentary on Copyright Act 1814," in *Primary Sources on Copyright (1450-1900)*, L. Bently, and M. Kretschmer, eds.
- . 2008c. "Commentary on the Statute of Monopolies 1624," in *Primary Sources on Copyright (1450-1900)*, L. Bently, and M. Kretschmer, eds.
- Dickens, Charles. 1894. *All the Year Round: A Weekly Journal*, Vol XI, third series, no. 282, Saturday May 26, 1894. London: Messrs. Chapman and Hall.
- Doraszelski, Ulrich, and Ariel Pakes. 2007. "A Framework for Applied Dynamic Analysis in IO," *Handbook of Industrial Organization 3: 1887-1966*.
- Ekelund, Robert B., Rand Ressler, and John Watson. 2000. "The "Death-Effect" in Art Prices: A Demand-Side Exploration," *Journal of Cultural Economics* 24: 283-300.
- Erickson, Lee. 1990. "The Economy of Novel Reading: Jane Austen and the Circulating Library," *Studies in English Literature, 1500-1900*, Vol. 30, No. 4, Nineteenth Century (Autumn, 1990), pp. 573-590
- Ericson, Richard, and Ariel Pakes. 1995. "Markov-perfect Industry Dynamics: A Framework for Empirical Work," *The Review of Economic Studies* 62 (1): 53-82.
- Halliday, Josh. 2011. "Musicians Win Copyright Extension to 70 Years," *The Guardian*, September 12, 2011.
- Hamlyn, Hilda M. 1946. "Eighteenth-century Circulating Libraries in England," *The Library*: 197–222.
- Hansard. 1808. *House of Commons Debate* 22, June 1808 vol 11
- Heald, Paul J. 2008. "Property Rights and the Efficient Exploitation of Copyrighted Works: An Empirical Analysis of Public Domain and Copyrighted Fiction Bestsellers," *Minnesota Law Review* 2007-2008 (4): 1031 – 1063.
- Hendel, Igal, and Aviv Nevo. 2013. "Intertemporal Price Discrimination in Storable Goods Markets," *The American Economic Review* 107 (7): 2722-2751.
- Hodgson, T. 1855. *The London Catalogue of Books Published in Great Britain: With Their Sizes, Prices, and Publishers' Names. 1816 to 1851*, Hodgson, Thomas.
- Hui, Kai-Lung, and Ivan P. L. Png. 2002. "On the Supply of Creative Work: Evidence from the Movies," *The American Economic Review* 92 (2): 217-220.
- Jacobs, E. 2006. "Circulating Libraries", in David Scott Kastan (ed.). *The Oxford Encyclopedia of British Literature*, Oxford University Press.
- Khan, Zorina B. 2005. *The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920*, Cambridge University Press.
- Landes, William M. and Richard A. Posner. 2003. *The Economic Structure of Intellectual Property Law*. Cambridge, Mass.: Harvard University Press.
- Lazarev, John. 2013. "The Welfare Effects of Intertemporal Price Discrimination: An Empirical Analysis of Airline Pricing in US. Monopoly Markets," Working Paper
- Lessig, Lawrence. 2001. "Copyright's First Amendment," *UCLA Law Review* 48: 1057.
- Liebowitz, Stan J. 1985. "Copying and Indirect Appropriability: Photocopying of Journals," *Journal of Political Economy* 93 (5): 945-957.
- MacGarvie, Megan and Petra Moser. 2013. "Copyright and the Profitability of Authorship: Evidence from Payments to Writers in the Romantic Period," in Shane M. Greenstein, Avi Goldfarb, and Catherine Tucker (eds.) *The Economics of Digitization*, University of Chicago Press.
- Machlup, Fritz. 1958. *An Economic Review of the Patent System*, US Government Printing Office.
- Mackeson, Charles. 1882. *The Churchman's Shilling Magazine and Family Treasury*, Vol. 1, London: Houlston and Sons.
- McAfee, Preston R., and Thomas Wiseman. 2008. "Capacity Choice Counters the Coase Conjecture," *The Review of Economic Studies* 75 (1): 317-331.
- Montagu, Basil. 1805. *Enquiries and Observations Respecting the University Library*, F. Hodson.

- Mortimer, Julie Holland. 2007. "Price Discrimination, Copyright Law, and Technological Innovation: Evidence from the Introduction of DVDs," *The Quarterly Journal of Economics* 122 (3): 1307-1350.
- Nair, Harikesh. 2007. "Intertemporal Price Discrimination with Forward-looking Consumers: Application to the US Market for Console Video-games," *Quantitative Marketing and Economics* 5 (3): 239-292.
- Oberholzer-Gee, Felix, and Koleman Strumpf. 2007. "The Effect of File Sharing on Record Sales: An Empirical Analysis," *Journal of Political Economy* 115 (1): 1-42.
- Plant, Marjorie. 1974. *The English Book Trade*, London: Allen & Unwin.
- Peddie, Robert A., and Quintin Waddington. 1914. *The English Catalogue of Books* (Including the Original 'London' Catalogue) 1801-1836, Sampson Low, Marston.
- Preston, Samuel H., Patrick Heuveline, Michel Guillot. 2011. *Demography: Measuring and Modeling Population Processes*, Blackwell Publishers.
- Reimers, Imke. 2013. "I Got You Babe: Welfare Effects of the Sonny Bono Copyright Extension," Working Paper.
- Reuters. 2012. "Microsoft sues China's Gome for alleged copyright infringement." January 12, 2012.
- Roehl, Richard, and Hal R. Varian. 2001. "Circulating Libraries and Video Rental Stores," *First Monday* 6 (5).
- Romilly, Samuel H. 1905. *Letters to 'Ivy' from the First Earl of Dudley*, Longmans, Green, and Co.
- Scherer, Frederic M. 2004. *Quarter Notes and Bank Notes: The Economics of Music Composition in the Eighteenth and Nineteenth Centuries*, Princeton University Press.
- Scotchmer, Suzanne. 2004. *Innovation and Incentives*. Cambridge, MA, MIT Press.
- Seville, Catherine. 1999. *Literary Copyright Reform in Early Victorian England: The Framing of the 1842 Copyright Act*, Cambridge University Press.
- Shapiro, Carl and Hal Varian. 1999. *Information Rules: A Strategic Guide to the Network Economy*, Harvard Business School Press.
- St. Clair, William. 2004. *The Reading Nation in the Romantic Period*, Cambridge University Press.
- Suarez, Michael F. 2009. *The Cambridge History of the Book in Britain*, Michael F. Suarez, and Michael L. Turner, eds., Cambridge University Press.
- Stokey, Nancy L. 1979. "Intertemporal Price Discrimination," *The Quarterly Journal of Economics* 93 (3): 355-371.
- Stokey, Nancy L. "Rational expectations and durable goods pricing." *The Bell Journal of Economics* (1981): 112-128.
- Stokey, Nancy L. 1989. *Recursive methods in economic dynamics*. Harvard University Press
- Tirole, Jean. 1988. *The Theory of Industrial Organization*. MIT press.
- Varian, Hal R. 2005. "Copying and Copyright," *The Journal of Economic Perspectives* 19 (2): 121-138.
- Venn, John and J.A. Venn (eds.). 2011. *Alumni Cantabrigiensis: A Biographical List of All Known Students, Graduates and Holders of Office at the University of Cambridge, from the Earliest Times to 1900*, Cambridge University Press.
- Waldfoegel, Joel. "Bye, bye, Miss American Pie. The Supply of New Recorded Music Since Napster." NBER Working Paper No. 16882, March 2011.
- Wiegand, Wayne A. and Donald Gordon Davis. 1994 *The Encyclopedia of Library History*, Taylor & Francis.

TABLE 1 – COMPARISONS OF MEAN PRICE OF NEW EDITIONS FOR DEAD AND LIVING AUTHORS BEFORE AND AFTER 1814 FOR COPYRIGHTED TITLES IN PRINT FOR 14 YEARS OR LESS

		Pre-1814	Post-1814	Difference
Author	Alive	17.58	16.85	-0.74
	(N=857)	(26.13)	(18.76)	(1.58) <sup>a</sup>
	Dead	17.69	37.56	19.87
	(N=45)	(15.74)	(32.02)	(6.64) <sup>b</sup>
Difference		0.11	20.72	20.61
		(5.3) <sup>a</sup>	(4.3) <sup>b</sup>	(6.82) <sup>a</sup>

Note: 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; all of these editions are on copyright. 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).<sup>a</sup> Standard errors, clustered at the author level, are for coefficients  $\alpha_0, \alpha_1, \alpha_2$  in the OLS regression  $Price_{it} = \alpha_0 + \alpha_1 Dead_{it} + \alpha_2 Post1814_{it} + \alpha_3 Dead_{it} * Post1814_{it} + \varepsilon_{it}$  <sup>b</sup> Standard errors, clustered at the author level, are for coefficients  $\beta_1, \beta_2$  of.  $Price_{it} = \beta_0 + \beta_1 Alive_{it} + \beta_2 Post1814_{it} + \beta_3 Alive_{it} * Post1814_{it} + \varepsilon_{it}$

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

	(1)	(2)	(3)	(4)	(5)
Dead	-6.42	-6.59	-4.68	-1.00	-9.77***
	(8.25)	(8.19)	(9.76)	(5.90)	(2.30)
Post-1814 * dead	26.28***	26.46***	23.93**	21.18**	29.77***
	(9.82)	(9.72)	(10.99)	(9.10)	(7.04)
Western Canon		-3.34			
		(2.72)			
Book age fixed effects	Y	Y	Y	Y	Y
Genre fixed effects	N	N	Y	N	N
Author fixed effects	Y	Y	Y	N	Y
Five year fixed effects	Y	Y	Y	Y	Y
Observations	902	902	902	902	902
Adjusted R-squared	0.24	0.24	0.25	0.06	0.32

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 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 non-fiction. Price data for 902 editions of 548 titles on copyright 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 price at 99 percent.

TABLE 3 – ROBUSTNESS: OLS EXCLUDING EDITIONS BY SCOTT, BYRON, AND RECENTLY DECEASED AUTHORS  
 DEPENDENT VARIABLE IS PRICE OF NEW EDITIONS BETWEEN 1790 AND 1840 FOR COPYRIGHTED TITLES IN PRINT FOR 14 YEARS OR LESS

	Excluding Scott		Excluding Scott and Byron		Excluding Recent Deceased	
	(1)	(2)	(3)	(4)	(5)	(6)
Dead	-11.64*** (2.98)	-8.42*** (2.83)	-13.27*** (3.03)	-10.70*** (2.91)	-16.47*** (5.76)	-17.60*** (6.22)
Post-1814 * dead	28.68*** (9.10)	24.22*** (7.98)	20.44*** (5.03)	17.28*** (4.65)	37.61*** (12.53)	37.76*** (12.29)
Book age fixed effects	Y	Y	Y	Y	Y	Y
Genre fixed effects	N	Y	N	Y	N	Y
Author fixed effects	Y	Y	Y	Y	Y	Y
Five year fixed effects	Y	Y	Y	Y	Y	Y
Observations	775	775	729	729	888	888
Adjusted R-squared	0.27	0.28	0.26	0.27	0.23	0.23

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 46 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 first editions and 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* (Pddie 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 are collected from the *Dictionary of Literary Biography* (various volumes).

TABLE 4– ROBUSTNESS: OLS CONTROLLING FOR PAGE NUMBERS AND SIZE;  
DEPENDENT VARIABLE IS PRICE OF NEW EDITIONS BETWEEN 1790 AND 1840  
FOR COPYRIGHTED TITLES THAT HAVE BEEN IN PRINT FOR 14 YEARS OR LESS

	(1)	(2)	(3)	(4)
Dead	-7.36** (2.85)	-2.83 (4.19)	-15.97 (9.87)	-11.36 (6.94)
Post-1814 * dead	27.79*** (9.07)	20.55** (7.99)	36.94*** (12.13)	31.47*** (10.86)
Number of pages	0.02*** (0.00)	0.02*** (0.00)		
Page size fixed effects	N	N	Y	Y
Book age fixed effects	Y	Y	Y	Y
Genre fixed effects	N	Y	N	Y
Author fixed effects	Y	Y	Y	Y
Five year fixed effects	Y	Y	Y	Y
Observations	692	692	665	665
Adjusted R-squared	0.45	0.47	0.43	0.46

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 size*, which publishers define by the number of times 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 first editions and 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* (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 are from the *Dictionary of Literary Biography* (various volumes).

TABLE 5– PLACEBO, OLS  
DEPENDENT VARIABLE IS PRICE OF NEW EDITIONS BETWEEN 1790 AND 1840

Age of book title	> 14 years			≤ 14 years
	(1)	(2)	(3)	(4)
Dead	-11.25 (22.76)	-18.20 (29.64)	4.85 (8.28)	14.610 (8.681)
Post-1814 * dead	3.30 (16.91)	9.05 (18.06)	-7.60 (9.81)	
Post-1809 * dead				1.869 (6.911)
Book age fixed effects	Y	Y	Y	Y
Genre fixed effects	N	Y	N	N
Author fixed effects	Y	Y	N	Y
Five year fixed effects	Y	Y	Y	Y
Observations	68	68	68	902
Adjusted R-squared	0.83	0.84	0.07	0.36

Standard errors clustered at the level of authors.

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

*Note:* Columns 1-3: Price data for 68 new editions between 1790 and 1840 of 47 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). Columns 4: Price data for 902 editions of 548 titles on copyright that had been in print for 14 years or less, by 116 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 of a book. Price data from St. Clair (2004), the *London Catalogue of Books* (1799, 1851) and the *English Catalogue of Books* (Peddie and Waddington 1914). These editions are by 32 authors; demographic data for authors are from the *Dictionary of Literary Biography* (various volumes).

TABLE 6 – OLS, DEPENDENT VARIABLE IS LOG SIZE OF PRINT RUNS FOR NEW EDITIONS BETWEEN 1790 AND 1840 FOR COPYRIGHTED TITLES IN PRINT FOR 14 YEARS OR LESS

	Whole Sample	Excluding Scott		Excluding Scott and Byron	
	(1)	(2)	(3)	(4)	(5)
Dead	0.90** (0.35)	1.20*** (0.25)	1.21*** (0.26)	1.09*** (0.27)	1.11*** (0.27)
Post-1814 * dead	-0.59 (0.54)	-1.13*** (0.33)	-1.13*** (0.36)	-1.34** (0.54)	-1.41** (0.61)
Western Canon			0.08 (0.10)		0.16 (0.16)
Book age fixed effects	Y	Y	Y	Y	Y
Genre fixed effects	N	N	Y	N	Y
Author fixed effects	Y	Y	Y	Y	Y
Five year fixed effects	Y	Y	Y	Y	Y
Observations	418	342	342	293	293
Adjusted R-squared	0.38	0.36	0.36	0.44	0.43

Standard errors clustered at the level of authors.

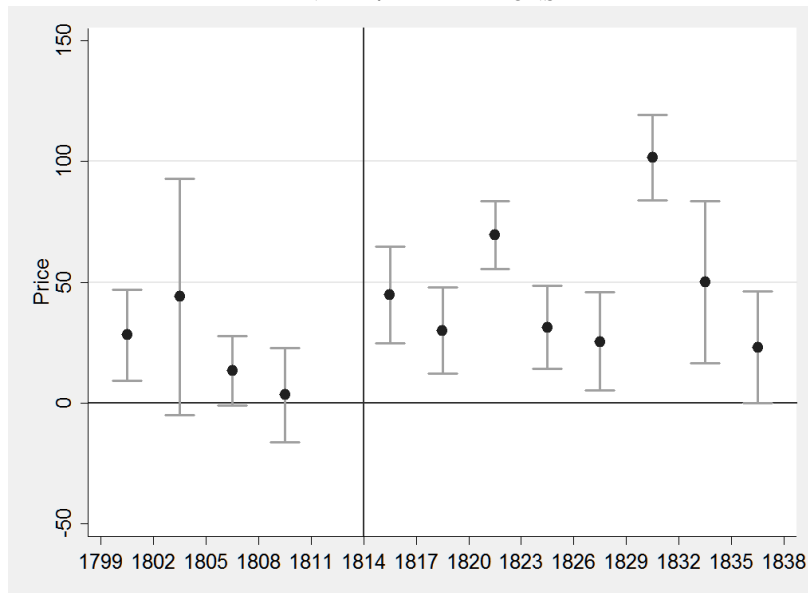
\*\*\* denotes significance at the 1 percent, \*\* 5 percent, and \* 10 percent, level.

*Note:* Book age fixed effects control for 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 non-fiction. Data for print run of editions that had been in print for 14 years of less are collected from St. Clair (2004). Column (1) includes 418 editions of 210 titles by 46 authors. Column (2) – (3) excludes 76 book editions of 27 titles by Sir Walter Scott. Column (4) – (5) excludes 76 book editions of 27 titles by Sir Walter Scott and 49 book editions of 19 titles by Lord Byron.

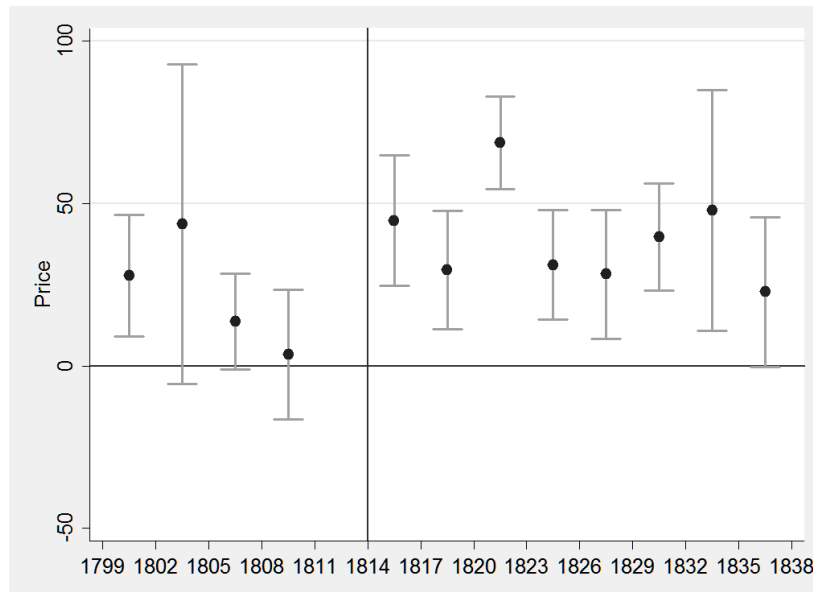


FIGURE 1 - TIME-VARYING ESTIMATES OF THE EFFECT OF COPYRIGHT ON PRICE

PANEL A: ALL EDITIONS

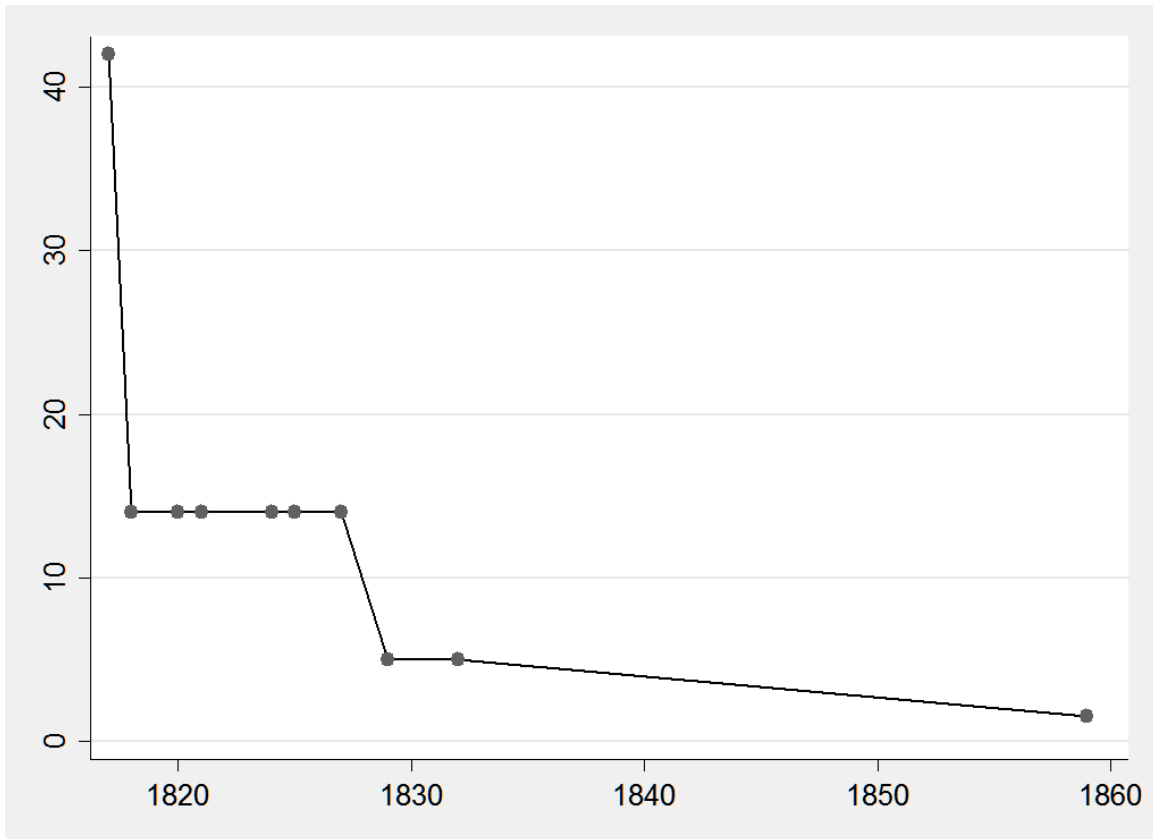


PANEL B: EXCLUDING EDITIONS BY LORD BYRON



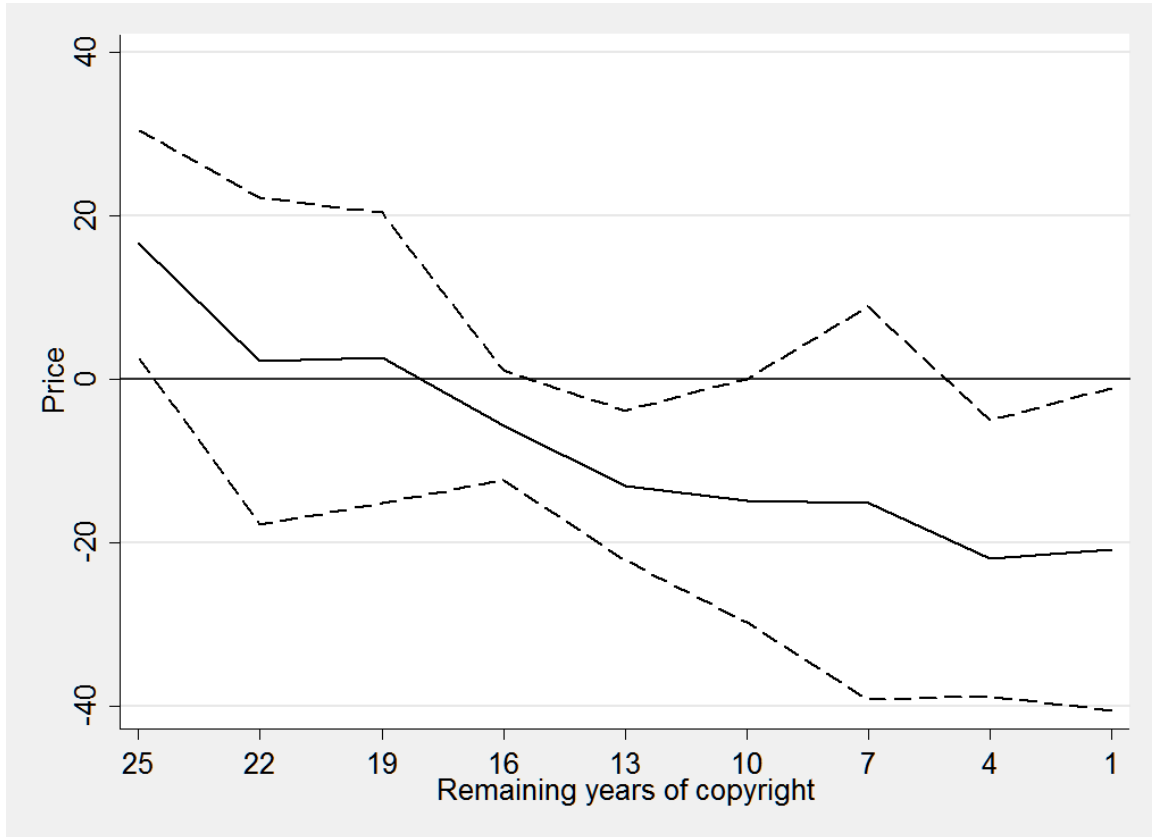
Note: 95% confidence interval for  $\beta_r$  in the OLS regression  $price_{it} = \alpha_0 + \alpha_1 dead_{st} + \beta_r dead_{st} * year_r + \varphi_a + \delta_r + f_s + \varepsilon_{it}$ , where  $dead_{st}$  equals 1 if author  $s$  had died before year  $t$ ;  $year_r$  is an indicator variable to denote three-year intervals  $r$  for 1800-1802, ... 1809-1811, 1815-1817, ... 1836-1838; 1812-1814 is the excluded time period;  $\varphi_a$  are book age fixed effects that control for first editions and for the number of years that have passed since the first edition;  $\delta_r$  are three-year fixed effects;  $f_s$  are author fixed effects. Price data for 902 book editions of 548 copyrighted book titles that had been in print for 14 years or less by 116 authors between 1790 and 1840.

FIGURE 2 – PRICE FOR THOMAS MOORE’S *LALLA ROOKH*



Note: 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*’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).

FIGURE 3 – ESTIMATES OF CHANGES IN THE PRICE OF NEW EDITIONS AS COPYRIGHTED TITLES APPROACH THE END OF THEIR COPYRIGHT TERM



Note: 95% confidence interval for  $\beta_s$  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 genres, book age 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 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 are collected from the *Dictionary of Literary Biography* (various volumes).

APPENDIX – NOT FOR PUBLICATION

APPENDIX TABLE A1 – EXPECTED LENGTH OF COPYRIGHT  
FOR TITLES THAT HAVE BEEN IN PRINT FOR 14 YEARS OR LESS IN THE YEAR OF THE FIRST EDITION

		Pre-1814	Post-1814	Difference
Alive	$T$	14 years or 28 years if author survived first 14-year term	28 years or life of author if author survived the 28-year term	
	Expected length	28.00	28.42	0.42
Dead	$T$	14.00	28.00	
	Expected length	14.00	28.00	14.00
Difference	Expected length	-14.00	-0.42	13.58

*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 ages of authors are available for 484 first editions by 142 authors published between 1790 and 1840. 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 TABLE A2  
 OLS, DEPENDENT VARIABLE IS THE LOGARITHM OF PRICE FOR NEW EDITIONS BETWEEN 1790 AND 1840  
 OF COPYRIGHTED TITLES THAT HAVE BEEN IN PRINT FOR 14 YEARS OR LESS

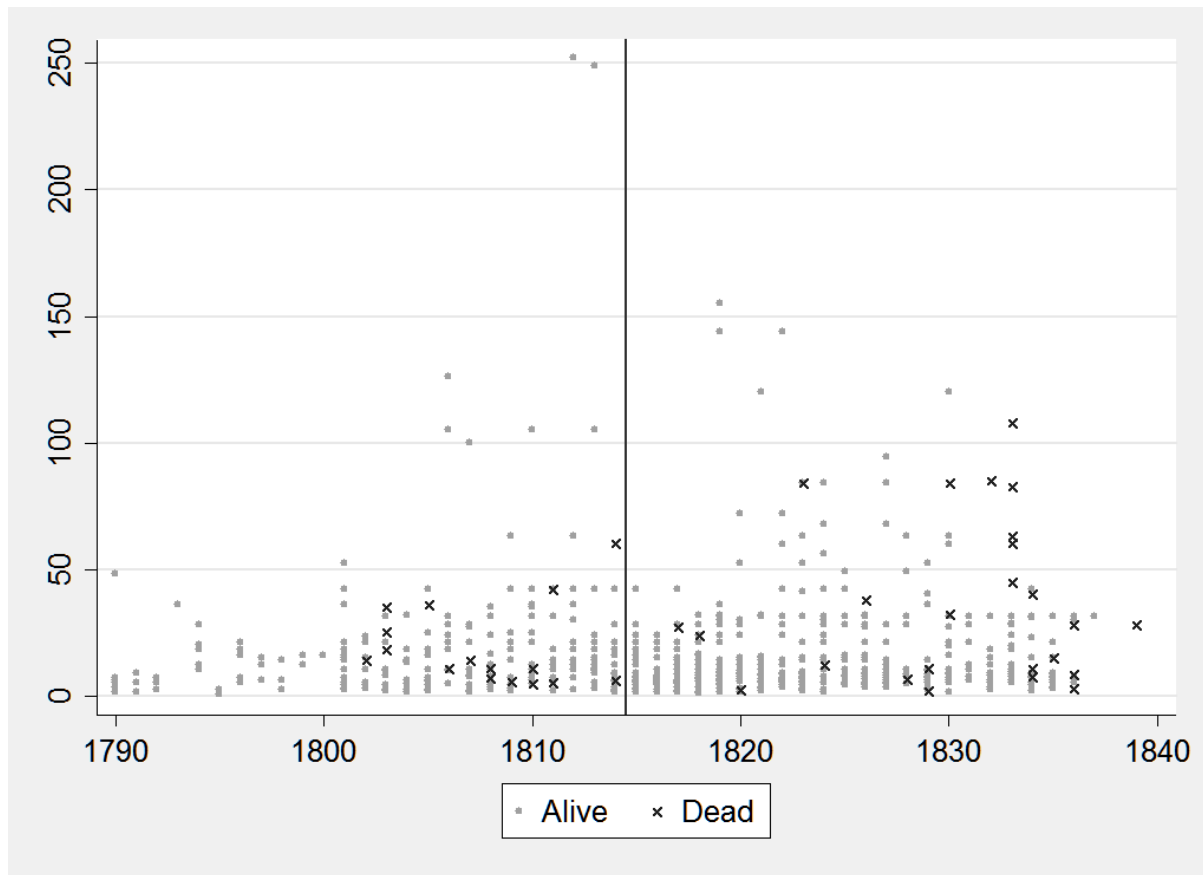
	Editions by all authors			Excl. Scott	Excl. Scott and Byron	Excl. recently deceased
	(1)	(2)	(3)			
Dead	-0.46** (0.21)	-0.45** (0.20)	-0.39 (0.24)	-0.41* (0.24)	-0.42 (0.29)	-0.63* (0.34)
Post-1814 * dead	1.08*** (0.35)	1.06*** (0.34)	0.97*** (0.34)	0.94** (0.39)	0.69** (0.32)	1.19* (0.60)
Western Canon		0.21 (0.20)				
Constant	2.42*** (0.19)	2.26*** (0.25)	2.45*** (0.20)	2.43*** (0.21)	2.43*** (0.22)	2.37*** (0.21)
Book age fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Genre fixed effects	No	No	Yes	Yes	Yes	Yes
Author fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Five year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	902	902	902	775	729	888
Adjusted R-squared	0.42	0.42	0.45	0.39	0.41	0.44

Standard errors clustered at the level of authors.

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

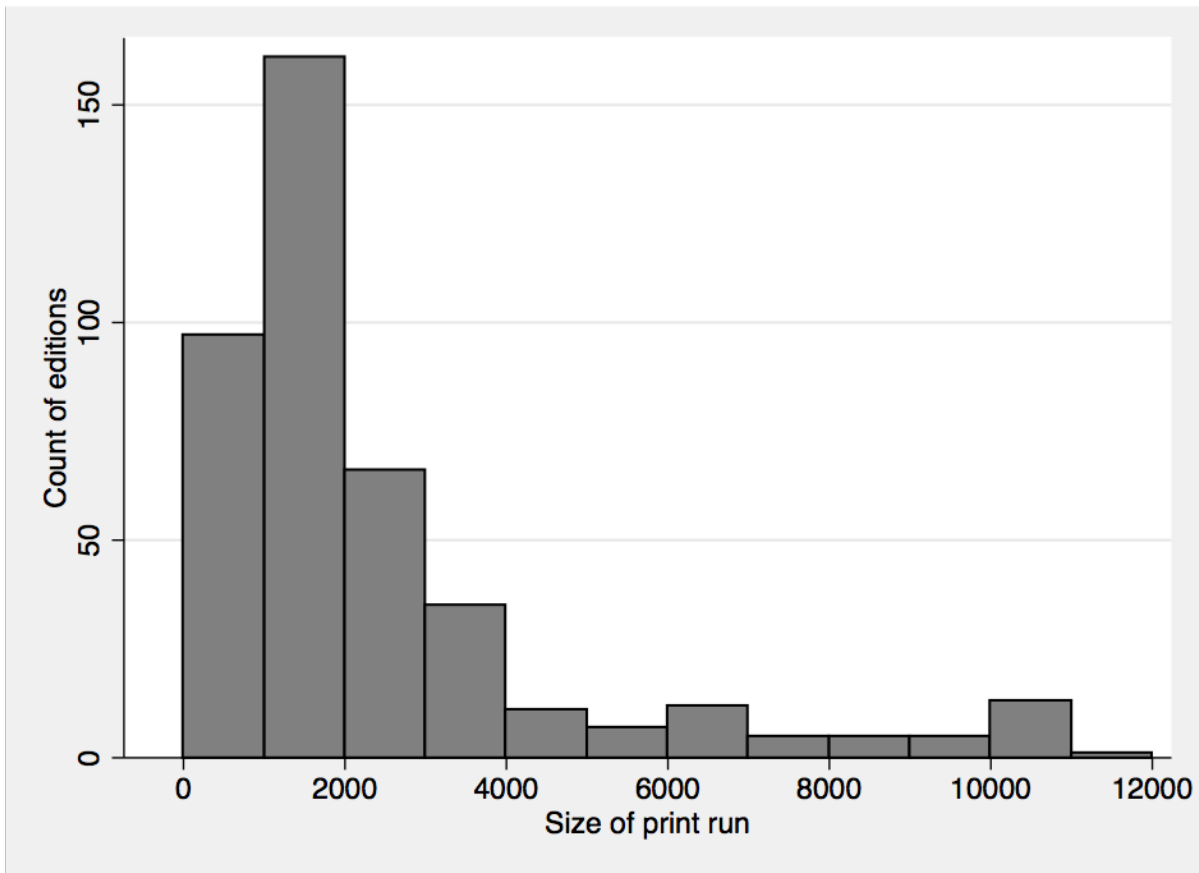
*Note:* Book age fixed effects control for the number of years that have passed since the first edition. Genre fixed effects control for variation in the price of books across novels, poetry, other fiction, and non-fiction. Price data for 902 editions of 548 titles on copyright by 116 authors that had been in print for 14 years or less between 1790 and 1840 from the *London Catalogue of Books* (Brown et al. 1799, Hodgson 1851), and the *English Catalogue of Books* (Peddie and Waddington 1914), and St. Clair (2004). Column (5) winsorizes price at the 99th percentile.

APPENDIX FIGURE A1 - PRICE DATA FOR NEW EDITIONS BETWEEN 1790 AND 1840 OF COPYRIGHTED TITLES IN PRINT FOR 14 YEARS OR LESS, DEAD VERSUS LIVING AUTHORS



Note: Price data for 902 book editions of 548 book titles on copyright by 116 authors that had been in print for 14 years or less between 1790 and 1840 from the *London Catalogue of Books* (Brown et al. 1799; Hodgson 1851), *the English Catalogue of Books* (Peddie and Waddington 1914), and St. Clair (2004). Book ages are calculated using data on first editions collected from the 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 from the *Dictionary of Literary Biography* (various volumes).

APPENDIX FIGURE A2 – SIZE OF PRINT RUNS FOR NEW EDITIONS BETWEEN 1790 AND 1840 FOR COPYRIGHTED TITLES IN PRINT FOR 14 YEARS OR LESS



*Note:* Data for print run of 418 editions that had been in print for 14 years of less are collected from St. Clair (2004).