Secretariat

An Empirical Study of the Impact of Library E-Lending on the Book Economy

As Public Libraries Prioritize eBook Formats, Harm to Commercial Markets Across All Formats is Quantifiable and Significant

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Secretariat Advisors

Prepared for the

Association of American Publishers (AAP) and Authors Guild

Citation Format

An Empirical Study of the Impact of Library E-Lending on the Book Economy: As Public Libraries Prioritize eBook Formats, Harm to Commercial Markets Across All Formats is Quantifiable and Significant, by Jéssica Dutra and Robert Stoner of Secretariat, August 2026, available at https://secretariat-intl.com/wp-content/uploads/2026/08/An-Empirical-Study-of-the-Impact-of-Library-E-Lending-on-the-Book-Economy.pdf

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About the Study

This study is the work product of Jéssica Dutra, Ph.D. and Robert Stoner, Ph.D. of Secretariat Advisors. Undertaken at the request of the Association of American Publishers and the Authors Guild, the study's empirical analyses and all findings belong entirely to Secretariat Advisors. Secretariat Advisors is a global expert witness, litigation consulting, and economic advisory firm trusted to address complex legal, risk, and regulatory matters. Read more at secretariat-intl.com.

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Authors' Acknowledgements

Dr. Pablo Salinas, Marshall Deng, Pranick Chamlagai, and Andrew Cohen of Secretariat performed much of the computer programming and analysis required to complete this study.

Executive Summary

This study offers a rigorous, empirical analysis of the impact of public library lending of electronic literary works, which has grown steadily over the last decade, on the commercial book marketplace. Indeed, digital checkouts for e-books and audiobooks have exploded in recent years as libraries have reformulated their spending to prioritize digital formats, and patrons have discovered the ease of digital borrowing made possible through frictionless library apps. As demonstrated by this study, these shifts in the library marketplace have affected consumer behavior and commercial markets. Even where print remains the preferred format for purchase, some readers may still shift to reading digitally when library access makes the digital option easy, immediate and free. Through multiple separate but complementary regression analyses, the research in this study, which focused on the impact of e-book lending, identified one recurring conclusion: increased digital library access to e-books is consistently associated with a statistically significant reduction in retail sales of books across formats.

Publishers, authors, and libraries share the goal of maximizing reading at all levels of society and often work together closely to promote and protect the freedom to read. In addition to this shared mission, libraries are important market participants, serving as key customers and established distribution channels for both physical books (hardcover and paperback) and digital formats. They are, however, one part of a larger book economy in which publishers and authors rely primarily on sales to consumers and commercial booksellers for financial success, including large online platforms, national chains, and independent bookstores.

Books are an original copyright market in the United States, dating to the founding of the country and the Copyright Act of 1790. Today, copyright governs all kinds of creative expression as well as the means by which it is lawfully delivered, including the digital formats, downloads and streaming that are popular features of the 21st century. Just like other creative sectors that continuously manage pricing, timing, and format decisions related to and between market channels (e.g., decisions that affect movies, theater releases, and streaming platforms), publishers rely on their legal rights as copyright owners to assess and adjust details that pertain to the visibility and profitability of their books, consistent with their duty to the books' authors and to their duty to shareholders. As discussed in this report, to the extent e-lending is likely to significantly decrease book sales, economic theory would expect market forces to account for that through negotiations over the scope and extent of restrictions on library lending of e-books in licensing agreements. An important policy question is to ask whether there is any "market failure" when it comes to market-based e-book licensing outcomes, but there is little evidence of one, given that in recent years the quantity of digital materials in libraries has increased significantly, and libraries' costs per license have fallen.

Nevertheless, in recent years, some state legislatures in the United States have formulated legislative proposals that would impose licensing terms for e-books and audiobooks as between copyright owners and libraries, a remarkable intervention into national markets that would not only largely conflict with federal law but would also prove deleterious to the revenue streams that support authors, produce new titles for consumers to enjoy, and sustain the overall book economy. Their proposals would, for example, impose government terms for pricing, duration, and number of licenses, as well as timing. State legislative proposals are largely designed to increase the reach of library budgets,

but would also eliminate or shorten the wait that some patrons experience for certain titles, or put another way, would reduce the friction of borrowing that has acted as a balancing protection for copyright owners. To understand the short- and long-term effects of these proposals, this report analyzes their impact on consumer markets.

As the study details, an empirical factor that is relevant to these state legislative efforts is that, during the time period studied, the overall share of library budgets dedicated to collections has remained small, while public libraries have simultaneously steadily directed more of these budgets to expanding their digital offerings. For purposes of this study, library collections include all materials purchased or licensed by the library system to be loaned to patrons, such as print books, e-books, audiobooks, newspapers, magazines, CDs, DVDs, and other media. Spending on total collections is currently estimated at only about ten percent of operational expenses for most libraries, with increased levels going to digital versus physical formats. This finding suggests that many libraries are cannibalizing print collections and structurally altering their traditional lending practices. If this trend continues, it brings into question the necessity for physical premises and the role of libraries as 'cornerstones of their communities'.[1]

Some state legislative efforts also seek to prevent windowing—the practice of delaying library access to certain titles, particularly new releases and bestsellers, during the period when reader demand is most time-sensitive and the willingness of readers to pay is highest. From an economic perspective, windowing is a rational distribution option available to publishers, because making those titles available immediately through a low-friction, no-cost channel is likely to displace the sales that are most commercially valuable to publishers and their authors. As such, windowing is one potential way a publisher might choose to manage near-term market substitution and displacement during the early stages of a book's lifecycle while preserving broader access through libraries over time. Windowing is consistent with the exclusive rights of copyright owners under federal copyright law to determine and exercise distribution decisions. As further documented in this study, windowing is widely used in other creative industries, including film, music, and video games, to balance early-stage commercial demand with longer-run access, and is an established feature of e-book licensing regimes in several European book markets.

First Analysis: The first and broadest empirical analysis in this study, which was based on a model spanning multiple states and years, concludes that consumer print sales decline by approximately 0.85 to 1.0 percent for every one-percentage-point increase in the share of e-books in public libraries, with adult fiction being at the upper end of this range. This finding establishes that shifts toward more digitally intensive library holdings are systematically associated with measurable reductions in print sales.

Second Analysis: The second analysis, which reviewed detailed title-level data from the Seattle Public Library carefully matched with local physical retail sales, examined consumer behavior. It demonstrates that there is robust and economically meaningful evidence of direct, within-title substitution between library e-lending and retail sales, especially early in the lifecycle of a book. A 25 percentage-point increase in e-book share of a title, holding total checkouts constant, is associated with up to a 7 percent decline in retail sales, varying by genre and intended audience (i.e. Adult or Young Adult).

1 *See* American Library Association, *Libraries: An American Value*, adopted February 3, 1999, available at: https://www.ala.org/advocacy/intfreedom/americanvalue.

Third Analysis: The third analysis expands the geographic scope of the second analysis to nationally bestselling titles and shifts the focus from physical book sales to e-book sales. Focusing on bestsellers allows the estimated statistical association between retail sales and title lending at the Seattle Public Library to be more representative of other library systems in the U.S. In addition, the model incorporates Google Trends search intensity to control for time-varying consumer demand. The results further confirm the pattern of substitution found in the previous two analyses as to e-books. Specifically, they indicate that with respect to bestsellers, library e-lending is not serving as a channel for discovery but rather is substituting for retail e-book sales at the national level.

IMPLAN Analysis: If state laws could limit the economic control over licensing decisions that are afforded to copyright owners by federal copyright law, they would not only jeopardize the streams of necessary returns to authors and publishers. There would be economy-wide impacts, as well. The chart below shows the economic impact of a hypothetical 2.5% reduction in trade book sales stemming from increases in e-book lending.

In sum, this study provides new empirical evidence on the relationship between the format composition of public library collections and private book markets, an issue that has become increasingly relevant to the broader publishing ecosystem as libraries expand digital lending, shift purchasing from print to digital formats, and invariably compete with consumer channels, especially during the early window of a book's commercial potential.

Key Economic Impacts

(From a 2.5% Reduction In Trade Book Sales)

- $2.81 billion in lost output.
- $1.65 billion in lost value added (GDP equivalent).
- 11,992 jobs eliminated.
- $911.09 million in lost labor income.

I. Introduction

With limited and narrowly defined exceptions, U.S. copyright law provides authors with the exclusive rights to their creative and intellectual expression, including the exclusive rights to reproduce and distribute these works to the public during the term of copyright protection. Most authors exercise these rights by licensing them to publishers, who invest in and make books available to the public through a variety of markets and formats, including both the sale of physical copies and the digital transmission of e-books and audiobooks. Subject to specific limitations set forth by Congress, copyright owners have broad legal authority to determine when, to whom, and on what terms to make their works available to the public, and to make corresponding decisions about timing, formats, pricing, territories, and distribution channels. These decisions can make or break the economic viability of a book, especially for new releases.

The U.S. copyright framework derives directly from the U.S. Constitution, which authorizes Congress to encourage and reward authorship for the benefit of the public by granting authors marketable exclusive rights for a limited period of time.[2] As such, copyright is a key driver of free expression.[3] The nation's first Congress enacted the nation's first Copyright Act in 1790, followed by significant revisions and amendments over time, particularly to address new technologies. Because digital formats are more vulnerable to piracy and otherwise different from physical copies, the law treats them differently at times. For example, Section 109 of the Copyright Act codifies the first sale doctrine, which allows the owner of a physical copy of a work to "sell or otherwise dispose of" it without the copyright owner's permission, but this provision does not permit the unauthorized transfer of digital formats.[4]

Policy Tension

Both booksellers and public libraries are important, and always have been, to the publishing ecosystem, which strives to make authorship discoverable, impactful, and financially successful. But in recent years, as total library spending on books has slightly declined as a percentage of operational expenses and, within that reduced spending, libraries have shifted more towards e-books and mobile transmission apps, library e-book lending has begun to affect consumer behavior and commercial revenue to the detriment of a book's overall financial success, which is often dictated by the extent of sales during a brief window of time at the outset of publication.

2 U.S. CONST. art 1, §8, cl. 8 (known as the "Copyright Clause" or Intellectual Property Clause"); *see* Eldred v. Ashcroft, 537 U.S. 186, 212 n.18 (2003)(holding that "copyright law serves public ends by providing individuals with an incentive to pursue private ones"); Mazer v. Stein, 347 U.S. 201, 219 (1954) (explaining that "encouragement of individual efforts by personal gain is the best way to advance public welfare through the talents of authors and inventors").

3 Harper & Row, Publishers Inc. v. Nation Enterprises, 471 U.S. 539, 558 (1985) (stating that "[I]t should not be forgotten that the Framers intended copyright itself to be the engine of free expression. By establishing a marketable right to the use of one's expression, copyright supplies the economic incentive to create and disseminate ideas").

4 17 U.S.C. §109(a).

While overall library funding has remained relatively stable in recent decades,[5] libraries have significantly altered their budget priorities. The landscape of library services and material acquisition has undergone fundamental transformation, with a notable decrease in collections budgets as spending on buildings, salaries, and other priorities have taken precedence. Where libraries do spend on collections, they have increasingly favored digital content. Once a marginal component of library collections, e-books and audiobooks now command a growing share of library expenditures,[6] paralleling the increasing share of electronic materials in total circulation wowide.[7] Electronic circulation now accounts for almost 30 percent of all public library lending and sometimes more.[8]

This transition to digital formats has intensified longstanding policy debates around library purchasing and licensing models. Libraries play a critical role in facilitating access to books, supporting literacy, and broadening readership beyond what the retail market alone would reach. At the same time, free digital access is a significant departure from traditional lending, not only displacing some consumer purchases, but also raising legitimate concerns among publishers and authors about the long-term sustainability of library practices that increasingly impact key consumer channels. These concerns are exacerbated by a host of recent legislative efforts by states, which generally seek to regulate e-book pricing structures and access models to the detriment of authors and publishers. This tension is a central challenge in contemporary information policy.

Numerous states (e.g., Connecticut, Maryland, and New York among several others)[9] have attempted to legislate special treatment for library e-books that appears to contravene the Copyright Act's preemption of state law by capping or otherwise interfering with licensing fees, removing controls on the number of copies available to libraries, and/or forbidding economically rational practices such as windowing that are widespread in other creative content industries. In 2022, a federal district court enjoined a Maryland e-book law because it contravened and was preempted by the Copyright Act and was therefore unenforceable.[10]

Fundamentally, the issues at stake involve a multi-sided economic welfare tradeoff among several parties: (a) libraries that lend physical books and e-books to library patrons for free as a community service at predominantly taxpayer expense; (b) publishers/authors, who receive compensation from sales of physical books and licensing of e-books; (c) book consumers, both physical book or e-book borrowers from libraries as well as purchasers of physical books and e-books; and (d) booksellers, small and large. Distributors, or so called "aggregators," who sell access to borrowing platforms to libraries and facilitate the licensing agreements between publishers and libraries, are

5 *See* Dimitrije Curcic, "Library Funding Statistics," *WordsRated*, March 8, 2023, available at: https://wordsrated.com/library-funding-statistics/. *See also* Figure 1.

6 *See* Figure 2.

7 For additional circulation statistics, *see* "IMLS Releases Annual Data on American Public Libraries," Institute of Museum and Library Services, July 21, 2022, available at https://www.imls.gov/news/imls-releases-2020-data-american-public-libraries.

8 The Sacramento Public Library system, for example, reports that in fiscal 2025 patrons checked out roughly 4.8 million electronic items, comprising about 54% of total circulation, while electronic items made up only about 26% of circulation in fiscal 2019. *See* Phillip Reese, "Sacramento library regulars choosing electronic options over old-school books," Abridged, April 13, 2026, available at https://www.abridged.org/news/sacramento-library-regulars-choosing-electronic-options-over-old-school-books/.

9 These additional states include Hawaii, Illinois, Iowa, Kentucky, Massachusetts, Minnesota, Missouri, New Hampshire, New Jersey, Rhode Island, Tennessee, Utah, Vermont, and Virginia, where the status and outcomes of different bills vary.

10 Association of American Publishers v. Frosh, 586 F. Supp. 3d 379, 389 (D. Md. 2022) (explaining that under the Copyright Act publishers have the exclusive right "to decide whether, when, and to whom to distribute").

also implicated in this trade-off. As the "middle-men" between author/publishers and libraries, aggregators answer to several parties since their viability depends on successful outcomes for both content owners and libraries (and ultimately, library patrons). Complicating this welfare tradeoff is a difference in demographics between readers who typically obtained their books from public libraries and readers who have only more recently discovered the ease of borrowing e-books and audiobooks from libraries, at least some of which they might previously have purchased.

This Study

This study will proceed as follows. First, we will present background information on the present state of library operations, including the size and composition of their print and digital collections, their operating costs and budgets, their sources of funds and how much they spend on collections. We will also include background information obtained from publicly available sources and commercially available industry databases on the state of trade (consumer books) sales, showing trends in trade sales as library e-lending has increased. Second, we will assess empirically the impact of library lending (both of physical and digital books) on commercial book sales. This will involve a review of the relevant economic literature on the impact of different e-book library licensing terms on commercial sales of physical and digital books. We will also present our own quantitative analyses of the relationship between the growth of library e-book lending and commercial book sales and revenues, carrying out these analyses on a book-level basis. Third, using these results and applying them economy-wide using an input-output model (IMPLAN), we will present an analysis of the likely economic welfare effects of pending or intended statewide legislation regulating e-book licensing terms to libraries. The welfare analysis will assess the impact of the proposed legislation on each of the actors in the publishing ecosystem, including libraries/aggregators, commercial booksellers, and publishing houses/authors.

II. Background Information on Library E-Lending and Trade Book Sales

To situate the empirical analysis that follows, we first describe the legal framework governing library lending and then present background on the structure of the contemporary library and trade book markets.

A. Legal and Institutional Framework Governing Library Lending

When it comes to physical books, the welfare tradeoff discussed above among libraries, publishers, and authors is directly governed by copyright's first sale doctrine, which permits the lawful owner of a physical copy of a copyrighted work to sell, lend, or otherwise dispose of that specific physical copy without the copyright owner's permission. The first sale doctrine is originally derived from the laws for tangible property more generally but has been embodied in Section 109 of the Copyright Act; it applies to individuals as well as libraries and bookstores and is the legal basis by which used bookstores and lending libraries operate to distribute the physical copies of copyrighted works they have purchased. The principle underlying the first sale doctrine is that the copyright owner's right to control the distribution of a particular tangible copy is exhausted after its initial authorized sale. Critically, the first sale doctrine is a limitation on the copyright owner's exclusive right of distribution but not a limitation on their exclusive right to control reproductions. This legal tenet is easily appreciated by most people, whether patrons or consumers, who understand that, while they do not need permission of the copyright owner to lend, gift, or resell the physical books they have purchased or otherwise possess, they may not themselves make reproductions of these physical books, nor lend, sell, or transmit such *reproductions* to others.

Courts have reinforced that the first sale doctrine does not apply to the transmission of digital files,[11] which necessarily involves making digital reproductions that are legally separate from the question of reselling or redistributing tangible property. Further, they have confirmed that any changes to the doctrine are solely the domain of Congress to decide.[12] In federal studies, both the U.S. Copyright Office and U.S. Patent and Trademark Office have squarely concluded that extending the first sale doctrine to digital transmissions would undermine the incentives and operation of the Copyright Act.[13] These rules apply equally to everyone in the copyright ecosystem, not just libraries but also private collectors and individual consumers. In short, whereas the owners of physical books face no restrictions on subsequent use or lending, the legal treatment of digital files is different by statutory design.

There are also key economic differences between physical and digital library circulation. Compared to digital copies, a library's lending of physical books has historically presented a limited potential to undermine *sales* of physical books in bookstores and online, because libraries traditionally spread their budgets across many titles, purchasing a limited number of any one title, each of which can only be taken out by one person at a time, and because patrons faced inconvenience factors, for example, having to wait for a copy to be available and needing to travel to and from the library during hours of operation.

The welfare tradeoff between copyright owners, on the one hand, and libraries and patrons on the other is, more complex for e-books than for physical books. Many of the natural frictions associated with physical lending are reduced in the digital environment, making library e-books a closer substitute for retail purchases. As a result, publishers and authors have a stronger economic interest in licensing terms that govern pricing, duration, and circulation limits. Questions regarding the economic viability of these arrangements, in turn, implicate copyright policy, which provides the legal framework through which copyright owners can protect and enforce their interests in the digital marketplace.

In sum, copyrights and the exclusive authorities that define them are the means by which authors and publishers create, invest in, get paid for, and cultivate new works, new voices, new formats, and new readers. Copyright is the engine that powers the creative economy, of which libraries are one part.[14] Like booksellers, which are equally integral to communities and local economies,

11 *See* Capitol Records, LLC v. ReDigi Inc., 910 F.3d 649, 657–59 (2d Cir. 2018); Disney Enters. v. VidAngel, Inc., 869 F.3d 848, 856 (9th Cir. 2017); Hachette Book Grp., Inc. v. Internet Archive, 664 F. Supp. 3d 370, 385 (S.D.N.Y. 2023), ("IA argues that although 'Section 109 does not expressly encompass the reproduction right, neither does it abrogate the common-law principle favoring the ability of the owner of a copy to freely give, sell, or lend it.' … In *ReDigi*, the Court of Appeals plainly held that the first sale doctrine has now been codified in Section 109(a), that it does not include a right of reproduction, and that any broader scope of the first sale doctrine should be sought from Congress, not the courts."), *aff'd*, 115 F.4th 163 (2d Cir. 2024).

12 As discussed during implementation of the Digital Millenium Copyright Act, Congress recognized that (a) digital transmission inherently involves creating new copies, violating the "reproduction" right, and (b) the original physical copy's unique nature is lost, as digital files don't degrade, making "used" copies indistinguishable from new ones, increasing the likelihood that there would be sales losses of new books. *See* Copyright Gov, "Executive Summary: Digital Millenium Copyright Act Section 104 Report," https://www.copyright.gov/reports/studies/dmca/dmca_executive.html; *see also* Jenkins, Jennifer, "Last Sale?: Libraries' Rights in the Digital Age," *Association of College & Research Libraries*, Vol. 75, No. 2 (2014), available at: https://crln.acrl.org/index.php/crlnews/article/view/9068/9923, and https://authorsguild.org/news/reselling-a-digital-file-infringes-copyright/.

13 See "Report to Congress: Study Examining 17 U.S.C. Sections 109 and 117 Pursuant to Section 104 of the Digital Millennium Copyright Act" (2001), and U.S. Dep't of Commerce, "Internet Pol'y Task Force, Copyright Policy, Creativity, and Innovation in the Digital Economy" (2013).

14 For a discussion and documentation on the contribution of copyright to the U.S. economy, *see* Jéssica Dutra and Robert Stoner, *Copyright Industries in the U.S. Economy*—2024 Report (2025).

libraries want to survive in the digital age and ideally meet their customers' demands for both physical and digital books. And consumers, who generally have an ability to substitute between physical and digital books as well as between library borrowing and retail purchase, want to continue to have the full panoply of these choices, while enjoying a sustainable stream of new authors and titles. These goals are mutually compatible if copyright is allowed to function as intended in the free market, but are in conflict if policy choices curtail it.

B. Public Libraries in the Contemporary Book Market

Public libraries act as key intermediaries in the U.S. book ecosystem serving nearly every community through more than 9,000 public library systems and over 17,000 physical locations.[15] Beyond their cultural and educational mission, libraries represent a large, publicly funded purchaser of books and a major channel through which readers access literary works.

Although many municipalities face budgetary pressures, this study notes that overall library funding has remained relatively stable in real terms over the past decade.[16] However, stability at the national level masks significant variation across states and localities: some libraries benefit from consistent public investment, while others experience stagnation or gradual erosion in operating budgets. These disparities reflect the decentralized structure of library financing in the United States, where revenue typically depends on a mix of local taxes, state appropriations, and federal grants. Such differences also mask shifts in how libraries deploy those budgets across various categories of expense, including declines in spending on collections. As a result, libraries operate in vastly different fiscal environments from one another, shaping their respective abilities to acquire materials, expand programming, and modernize digital services. Ultimately, library acquisition decisions influence title exposure, readership patterns, and the effective availability of books within local markets.

Figure 1 shows that the share of library operational expenses spent on collections (encompassing printed, electronic, and other formats)[17] represents only a small portion of total library operating expenses—roughly one-tenth over the period shown—indicating that acquisitions budgets remain constrained even as libraries are expected to maintain both print and digital collections.[18]

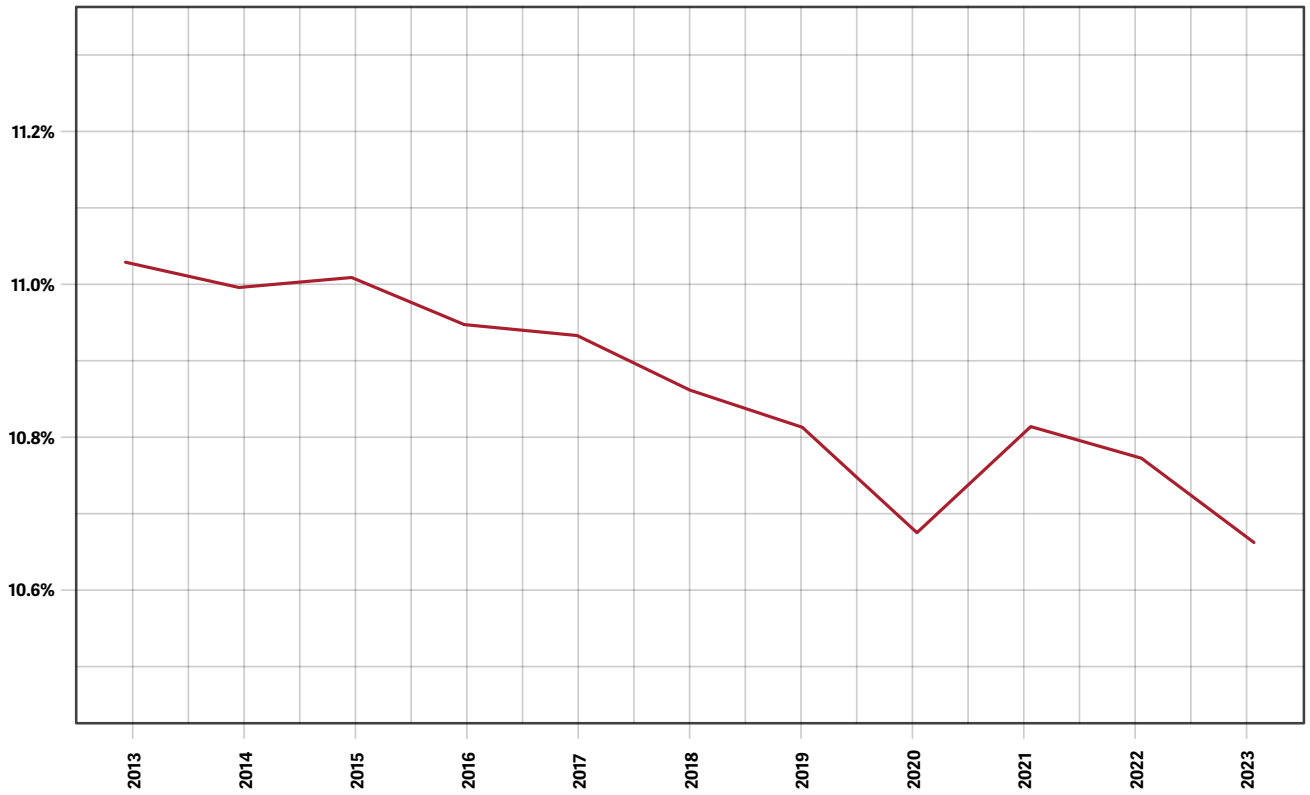
15 "IMLS Releases Annual Data on American Public Libraries," Institute of Museum and Library Services, July 21, 2022, available at https://www.imls.gov/news/imls-releases-2020-data-american-public-libraries.

16 *See supra* note 5.

17 These other formats include newspapers, microform, audio and video physical units, CD's, DVD's, and materials in new formats.

18 During the COVID-19 pandemic, IML-supported public libraries experienced widespread closures, with 90% of library systems reporting closed buildings in FY 2020 and 57% in FY 2021. To accommodate patrons, nearly two-thirds of libraries shifted to digital services, allowing online vs in-person registration and offering outside Wi-Fi access to their communities. See "Changes in Public Library Services as the COVID-19 Pandemic Continued Through FY 2021", April 29, 2024, available at https://www.imls.gov/news/imls-releases-research-library-services-during-second-year-covid-19).

Figure 1: Share of Libraries Operational Expenses Spent on Collections (2013 – 2023)
Source: IMLS Data



C. Structural Differences Between Print and Digital Lending

The traditional mission of libraries is to make literary materials available to the public at no charge to the reader as a complement to the commercial marketplace, providing access to books and other content to their communities, facilitating broad access to information, and reducing barriers faced by individuals who might otherwise not be able to obtain such materials. Although, in theory, libraries intend both print and digital collections to serve the same public mission,[19] the two formats differ along several economically meaningful dimensions. These differences suggest that format composition within libraries may influence the degree to which library access substitutes for retail purchases.

19 *See* the American Library Association's statement of libraries as a public good, "About ALA & Our Mission", April 11, 2026, available at https://www.ala.org/aboutala.

1. Access Frictions and Transaction Costs

Over the past decade, libraries worldwide have substantially increased their investments in digital materials, including e-books, audiobooks, and streaming media with digital checkouts steadily increasing to more than 820 million last year, while expenditures on physical copies have steadily declined as a share of collections.[20] This shift is partly demand-driven: digital content is particularly attractive for patrons seeking convenience, accessibility, and remote access. The share of electronic material in U.S. public libraries' collections began to rise in 2012, driven in part by the earlier introduction of the Kindle in 2007,[21] the iPad in 2010,[22] and the addition of Kindle compatibility on OverDrive, a leading aggregator of e-book content, in 2011.[23]

Print borrowing is subject to physical and geographic constraints. Patrons must travel to a branch (or request interlibrary transfer), and each physical copy can typically be used by only one patron at a time. Moreover, unlike e-books, physical copies eventually degrade over the course of extended lending and popular works in a collection may need to be periodically replaced.

According to the Institute of Museum and Library Services (IMLS), e-books have surpassed printed materials in library collections since 2020, as shown in **Figure 2.** By 2023, e-books accounted for 48 percent of the total items in public library collections. Electronic materials now also constitute a significant and growing share of total library checkouts, with e-book and audiobook borrowing rising steadily each year.[24]

20 OverDrive, "Libraries Break Digital Lending Records in 2025 with Over 820 Million Checkouts and Over 1 Billion Minutes Streamed", January 21, 2026, available at https://company.overdrive.com/2026/01/21/libraries-break-digital-lending-records-in-2025-with-over-820-million-checkouts-and-over-1-billion-minutes-streamed/. *See also* Figure 3 below.

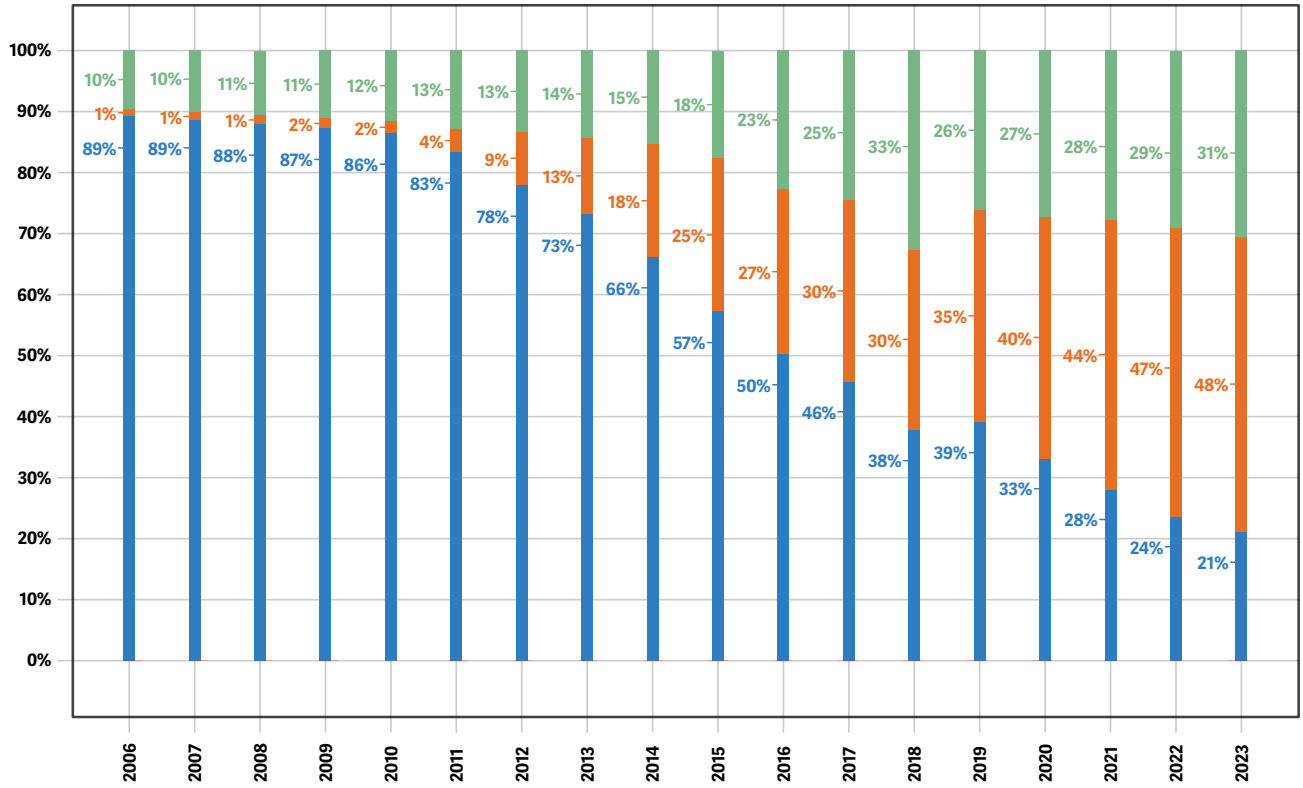
21 About Amazon, "A Look Back at 10 Years of the Amazon Kindle," 11/21/2017, https://www.aboutamazon.com/news/devices/a-look-back-at-10-years-of-the-amazon-kindle/.

22 IGN, "Every iPad Generation: A Full History of Release Dates," 10/16/2025, https://www.ign.com/articles/all-ipad-release-dates-in-order/.

23 GlobeNewswire Press Release, "OverDrive and Amazon Launch Kindle(R) Compatibility With Library eBooks," 9/21/2011, https://www.globenewswire.com/news-release/2011/09/21/1077410/0/en/OverDrive-and-Amazon-Launch-Kindle-R-Compatibility-With-Library-eBooks.html/.

24 IMLS Press Release, "Increased Public Library Usage Shown by IMLS Survey Data," 9/2/2025, https://content.govdelivery.com/accounts/USIMLS/bulletins/3f09e4a/.
The IMLS is an independent federal agency that supports libraries, archives, and museums in the United States. The IMLS is responsible for administering grants to U.S. museums and libraries. As an independent federal agency, the IMLS administers the Public Libraries Survey (PLS), which provides data on the status of public libraries in the United States. These data are supplied annually by public libraries across the country and provide information that policymakers and practitioners can use to make informed decisions about the support and strategic management of libraries. The survey draws on responses from 9,000 public libraries with approximately 17,000 individual public library outlets in the United States and outlying territories. These data include information about library visits, circulation, size of collections, public service hours, staffing, electronic resources, operating revenues and expenditures and number of service outlets. Because the PLS is collected annually, covers the universe of U.S. public libraries, and is administered via state data coordinators using consistent definitions and processes, it is a highly reliable source for analyzing the status and trends of library services in the United States. The PLS is designed to provide national-level statistics on the status of public libraries, encompassing visits, circulation, collection size, service hours, staffing, revenues, expenditures and outlets. These data support planning, evaluation and policy making by federal, state and local stakeholders, enabling them to monitor how libraries evolve over time and respond to changing community needs. *See* IMLS Website, Public Library Survey (PLS), https://www.imls.gov/research-evaluation/surveys/public-libraries-survey-pls/ (accessed 1/15/2026).

Figure 2: Public Library Collections by Material Type



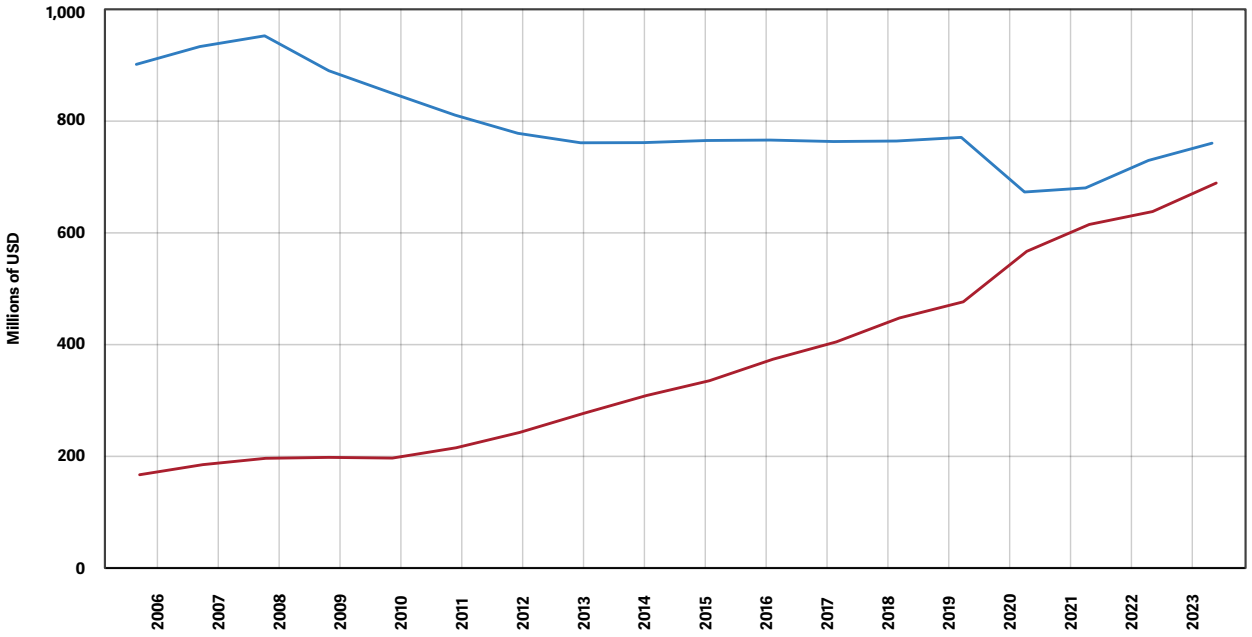
- **Share of Printed Materials**
- **Share of E Books**
- **Share of Audio and Video Materials**

Source: IMLS Data

This shift toward a digital intensive collection has caused expenditure by libraries to substantially shift, as shown in **Figure 3**. Overall, public libraries held about 650 million printed materials and 1.5 billion electronic materials in 2023. Growing by 11% on average from 2006 to 2023, library expenditures on electronic materials in the United States increased sharply from $125 million in 2006 to $673 million in 2023. In contrast, library expenditures on printed materials fell by 1% per year on average during the same period, from $900 million in 2006 to $751 million in 2023, with the sharpest year-to-year decline coinciding with the COVID-19 pandemic in 2020 (a 13.6% drop).[25]

25 Data from the Public Libraries Survey (PLS) which is collected annually by the IMLS, accessed January 30, 2026, available at, https://www.imls.gov/research-evaluation/surveys/public-libraries-survey-pls.

Figure 3: Total Expenditures on Printed Materials vs. Electronic Materials by Public Libraries



Printed Materials Expenditure

Electronic Materials Expenditure

Source: IMLS Data

The relative decline in printed materials affects how library patrons consume books. For example, waitlists for print books are tied to the number of physical copies owned.[26] These features introduce time and transportation costs that may reduce the probability that a patron substitutes a library loan for a retail purchase, particularly when demand is time-sensitive.

26 Waitlists are also true of electronic media, but they occur for different reason. For physical media, the waitlist is a concrete result arising from scarcity: demand exceeds supply and the library is unable or unwilling to keep more copies on its shelves. For electronic media, the waitlist is generated by limiting the number of licenses available at any point in time.

Digital lending substantially reduces these frictions. E-books can be borrowed remotely and delivered instantaneously to a patron's device. Geographic constraints are largely eliminated within a library's service area, and borrowing can occur at any time. While e-books are typically licensed under one-copy/one-user rules or similar circulation limits, the absence of travel and handling costs lowers the effective transaction cost of borrowing, making it relatively more appealing compared to purchase.

Standard economic theory predicts that lowering non-monetary transaction costs of an option like e-lending increases take-up. Holding total library scale constant, a collection that is more digital-intensive will therefore increase the likelihood that a consumer substitutes a library loan for a retail purchase, particularly for marginal or impulse consumption.

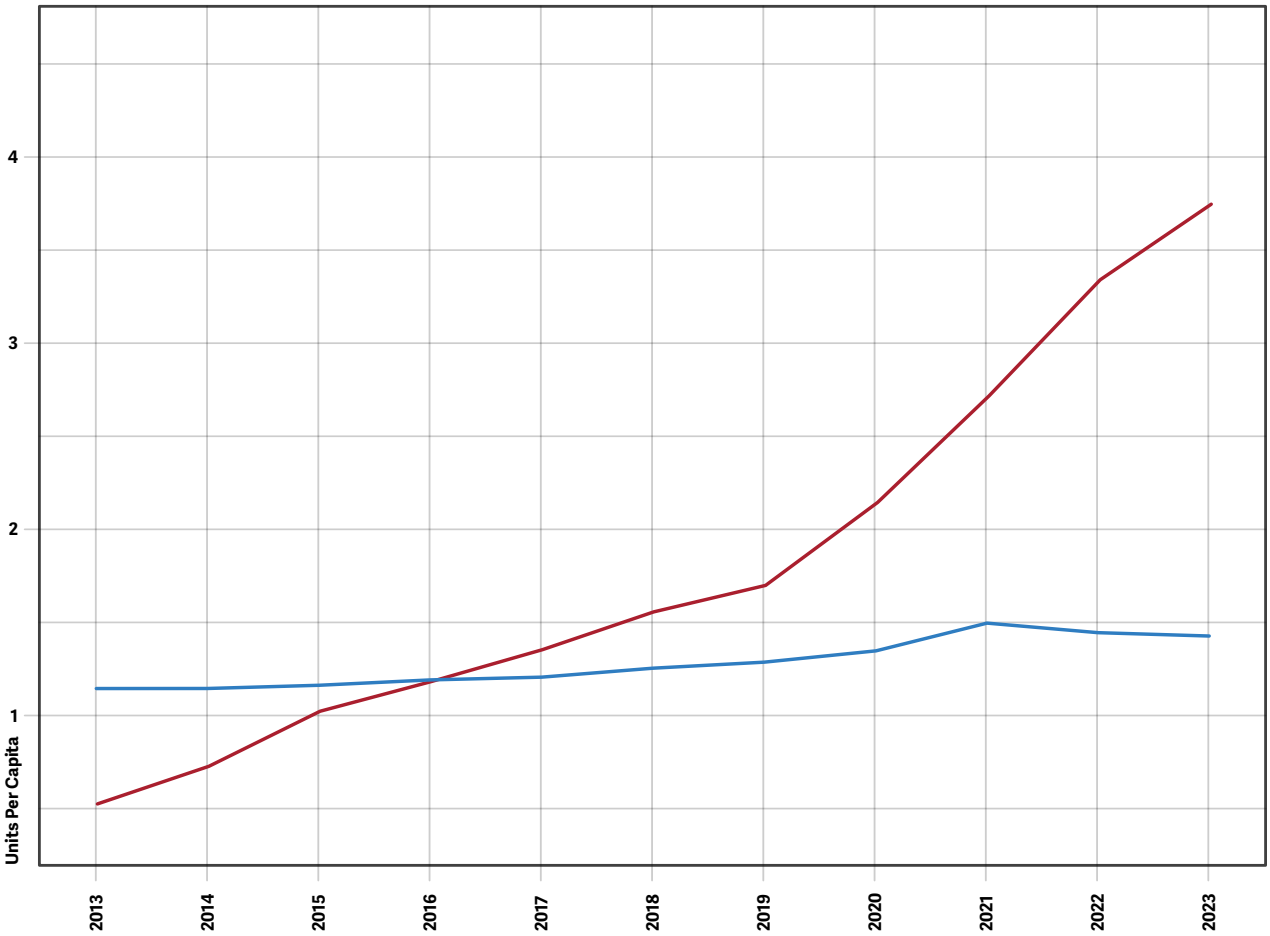
2. Scarcity, Timing, and Demand Elasticity

The shift from all print to print plus digital lending has significantly altered the economics of libraries as well as the trade book market. As discussed above, libraries typically own physical copies of print books after purchase and can lend them repeatedly without requiring additional permission under copyright law once a valid first sale has been made. However, print lending is limited by physical inventory, transportation, and wear. In contrast, e-books are rarely sold outright to libraries. Instead, publishers and aggregators typically offer multiple licensing models (often on time-limited or use-limited terms) that determine how many times or for how long a library may lend a title. As a result, "availability" in the digital context reflects several factors, including the number of licenses held, the limitations attached to those licenses, and whether licenses expire or must be repurchased. Libraries manage these constraints by adjusting the number of licenses they hold for each title, often in response to budget cycles, anticipated demand, and platform requirements. These institutional features are central to understanding how library access to physical and digital inventory has changed over time and how readers experience availability in practice.

Because e-books can be downloaded instantly and accessed remotely, they are likely to substitute for retail purchases more readily than print lending. This difference makes it easier for readers to substitute between borrowing and buying when digital access is available, especially for popular or time-sensitive titles. On the other hand, the limited number of licenses and restrictions on those licenses can often result in longer wait periods, which can limit the extent to which e-book borrowing will substitute for purchases. For libraries, digital collections often involve higher upfront costs per title but lower ongoing handling costs. For local bookstores, digital access may reduce some in-person purchases while also potentially expanding readership and discovery for authors. These opposing forces mean that the net effect of library e-book availability and lending on book sales and local economic activity is ultimately an empirical question rather than one that can be answered by theory alone.

Nonetheless, the rising incidence of e-lending has coincided with periods in which physical book sales have been largely flat or, more recently, declining, suggesting that library e-lending may well have contributed to the difficulties in the physical book trade sector.

Figure 4: Historic Print Unit Sales Per Capita vs. E-Book Library Collection Per Capita (2013-2023)



Source: IMLS Data, Circana BookScan Data

Figure 4 above shows that between 2013 and 2023, U.S. print book sales per capita fluctuated within a relatively stable range—approximately 1.2 to 1.7 units annually per person.[27] Over the same period, however, the digital holdings of public libraries expanded dramatically. Library e-book collections per capita increased from approximately 0.42 units in 2013 to 4.6 units in 2023—an increase of more than tenfold within a decade, as shown

27 From point-of-sale data for physical books covering approximately 85% of trade print books sold in the U.S. through major retailers, independent bookstores, online retailers, and others. Circana BookScan data, accessed in February 2026, available at https://www.circana.com/industries/books.

in **Figure 4** above. By 2023, the per-capita size of public library e-book collections substantially exceeded annual print sales per capita. This shows that frictionless library lending from these rapidly growing collections has the capability to "swamp" print sales, depending on consumer choices and other factors.

Viewed in isolation, the relative stability of retail book sales might suggest limited competitive interaction between libraries and retail markets. However, such a comparison risks overlooking the relevant counterfactual. The key policy question is not whether sales declined in absolute terms during a period of digital expansion, but rather what retail sales would have been in the absence of such a significant increase in publicly funded digital supply. Rapid growth in library e-book availability increases the choice set of consumers for whom borrowing is a low-friction substitute for purchasing, particularly for time-sensitive or convenience-oriented demand.

The coexistence of stable retail sales and rapidly expanding digital lending is therefore not dispositive evidence of limited substitution. Instead, it underscores the importance of estimating the marginal effect of digital library intensity on retail outcomes while holding overall demand conditions constant. Only by explicitly modeling this relationship can policymakers assess whether shifts in library format composition alter the equilibrium balance between public access and private market activity.

Retail cannibalization, in this context, refers to the substitution of a library loan for a retail book. The degree of cannibalization depends on consumer preferences, timing considerations, income constraints, and the relative costs—monetary and non-monetary—of operating through each channel.

A 2026 Pew Research Center survey reports that use of e-books has grown significantly over the past decade.[28] However, physical books continue to be the preferred format for many readers, including millennials and Gen Z, who nonetheless still borrow e-books from public libraries.[29]

The Author's Guild conducted a survey of book readers and audiobook listeners in October/November 2025 to assess how digital library lending affects readers' overall book sourcing and purchasing behavior.[30] The survey reported that overall library borrowing for e-books and print books accounted for nearly 30% of books read in October 2025. During the same period, library e-book borrowing was more than twice the volume of readers who purchased new e-books. Importantly, the survey found that non-library users were significantly more likely to read books from paid sources like bookstores than active library users, suggesting

28 Pew Research Center, "Americans still opt for print books over digital or audio versions; few are in book clubs," April 9, 2026, available at: https://www.pewresearch.org/short-reads/2026/04/09/americans-still-opt-for-print-books-over-digital-or-audio-versions-few-are-in-book-clubs/

29 American Library Association, "Gen Z and Millennials: How They Use Public Libraries and Identify Through Media Use," September 2023, at p. 6, available at: https://www.ala.org/sites/default/files/advocacy/content/tools/Gen-Z-and-Millennials-Report%20%281%29.pdf. ("It's clear that Gen Z and millennials use libraries for their physical book collections and other resources, but what about their digital books? The survey found that only 37% of Gen Z and millennials borrowed from library digital collections. 80% of those borrow ebooks and audiobooks 2–7+ times per year.")

30 The Author's Guild, "Digital Library Book Lending Market Report," January 20, 2026. The survey was conducted in October/November 2025 and included responses from 1,998 book readers and/or audiobook listeners 18 and older. A "book reader" is considered a person who read one or more books in the previous month or four or more books in the previous 12 months.

substitutability/cannibalization between library e-book borrowing and book sales.[31] Specifically, non-library users got 50% of the books they read in the relevant period from paid sources, while active library users got only 28% of the books they read from paid sources. Additionally, among the respondents who are registered public library users, 30% reported using their memberships more frequently than in the previous year. Further reflecting the digital shift in libraries, the survey concluded that 37% of participants preferred to borrow library audiobooks, the most common source for audiobook listening.

These results indicate that libraries continue to evolve and public interest in library borrowing remains strong. In other words, even as fewer patrons may be relying on brick-and-mortar library use, more readers appear to be using libraries as a no-cost channel for accessing digital. Despite the decline in the number of registered library users after the pandemic, the collection and circulation patterns at U.S. libraries reflect a digital transformation in the past decade.

Most prior discussions of library effects focus on overall library scale: whether greater library availability increases or decreases retail sales. However, scale and composition are distinct dimensions. Two library systems with identical total expenditures or total circulation (i.e., scale) may differ substantially in the share of resources devoted to digital versus print formats. None of the quantitative analyses included in this study imply that digital investment is undesirable. Rather, they suggest that format composition may influence the competitive interaction between public lending and retail markets in systematic ways.

D. The Evolving Trade Book Market and Consumer Choice

The U.S. trade book market has shifted from a predominantly print-and-store ecosystem to a multi-format, multi-channel environment in which consumers routinely choose among print, e-books, and audiobooks; and among physical bookstores and e-commerce (with libraries also a possible book source), based on convenience, timing, and price. In 2024, total U.S. book publishing revenue across formats was estimated at over $32 billion, reflecting ongoing demand for both print and digital content.[32] Within this total, general interest trade books such as nonfiction and fiction—novels, poetry, biographies, children's books (as opposed to academic, professional, educational, and specialized publishing books)—comprise a large share of activity, with print sales still accounting for the majority of units sold in the U.S., and digital formats contributing notable but smaller shares.[33]

This multi-format context matters because consumer decisions are often sequential. A reader typically first decides *whether* to engage with a title at all, driven by factors such as author reputation, genre preference, reviews, and discoverability through browsing or recommendation platforms. Next, conditional on interest, a consumer chooses among channels—including physical bookstores, online retailers, and libraries—based on relative convenience,

31 The inference is based on the observation that active library users obtain a substantially smaller share of their reading from paid sources than non-library users. While the survey does not by itself establish causation, this pattern is consistent with library borrowing substituting for at least some retail purchases.

32 Association of American Publishers, *CY 2024 StatShot Annual Report*: U.S. book publishing revenue exceeded $32 billion across print and digital formats, indicating sustained market activity and demand.

33 U.S. print unit sales remain large highlighting the continued prominence of print even as digital formats persist. According to AAP CY 2024 *StatShot Annual Report*, 98% of trade sales associated with bookstores were print and 2% were digital in 2024. For the same year, 77% of trade sales associated with e-commerce were print and 23% were digital.

price, immediacy, and search costs. Finally, the format choice (print, e-book, audiobook) reflects use-case considerations: print is often preferred for immersive or collectible reading, e-books for portability and instant delivery, and audiobooks for listening during multitasking activities.[34]

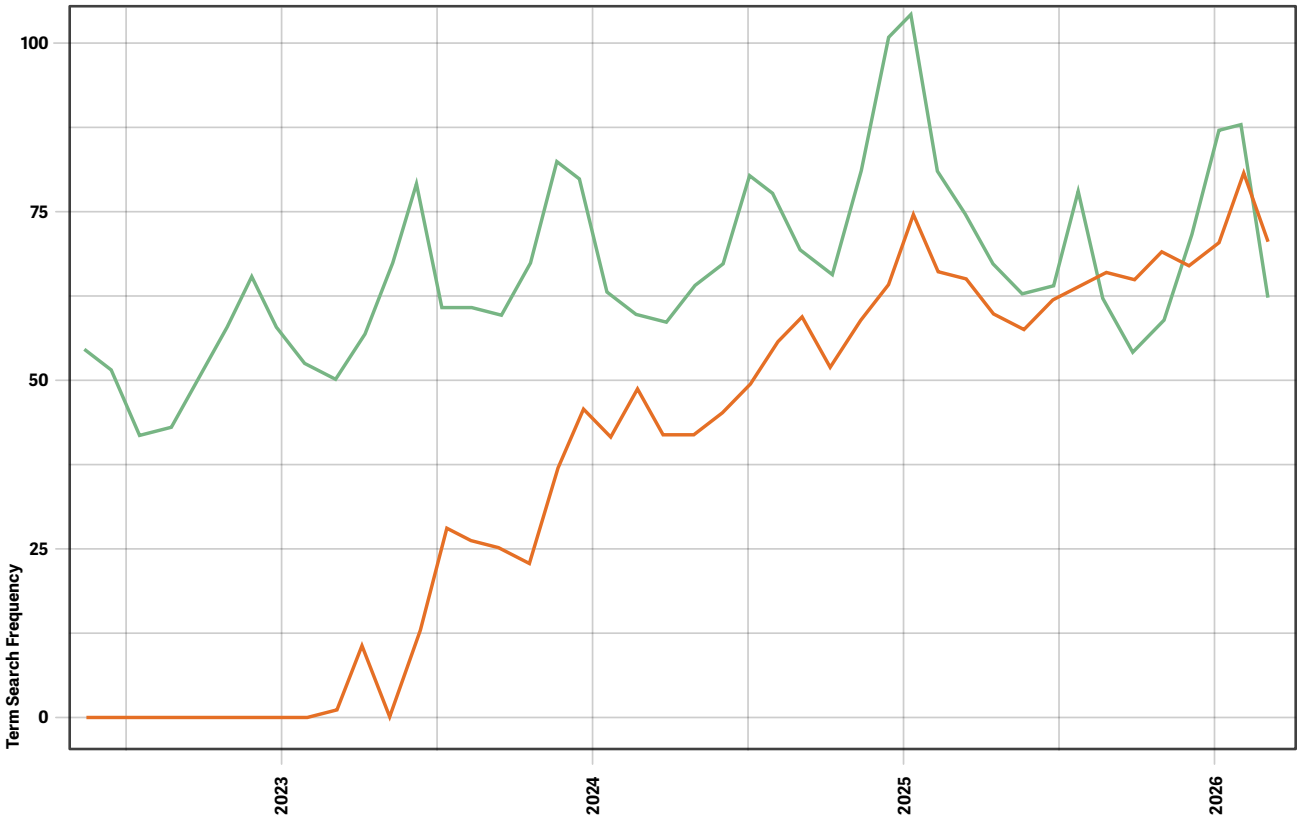
Channel decisions are shaped by the generalized cost to consumers, a concept that blends monetary price with non-monetary components such as time, effort, and delay. Brick-and-mortar bookstores offer curated discovery and immediate possession of print but entail travel and browsing time. E-commerce platforms offer vast inventories and rapid delivery or digital fulfillment but prioritize price and convenience over physical browsing experiences. Libraries, by contrast, provide zero direct cost access but borrowing historically involved non-monetary frictions—travel to branches, limited physical inventory, and waitlists—especially for high-demand print titles.

Digital library access reduces many of these frictions: e-book lending platforms allow remote borrowing at no cost without travel and can deliver titles instantaneously, narrowing the gap between library access and retail digital purchases, although wait times may still arise because libraries' digital lending capabilities remain constrained by acquisitions and budgets. These lower non-monetary and monetary costs may affect both channel choice and format choice. Even where print remains the preferred format for purchase, some readers may still shift to reading digitally when library access makes the digital option easy, immediate, and free. As these friction differentials shrink, the relative position of libraries within consumers' channel choice set strengthens, particularly for time-sensitive demand.

Over time, digital library platforms have become increasingly visible within consumers' search behavior. **Figure 5** below presents Google Trends data comparing search interest in "Libby"—the primary e-lending application used by public libraries—and "Kindle Unlimited," the subscription-based e-book service offered by the largest U.S. online book retailer. The results indicate that search frequency for Libby has grown at a substantially faster pace in recent years. Moreover, during several months in the past year, search interest in Libby exceeded that of Kindle Unlimited. While search data do not directly measure usage or transactions, they provide a useful proxy for consumer awareness and consideration. The relative growth and periodic dominance of Libby-related searches suggest that digital library platforms now occupy a prominent and expanding position within the broader e-book discovery and access ecosystem.

34 Pew Research Center reports that a substantial share of U.S. adults read e-books in the past year and that multi-format reading behavior is common, suggesting that format choice is often contextual rather than exclusive. *See* Michelle Faverio and Andrew Perrin, "Three-in-ten Americans now read e-books," Pew Research Center, January 6, 2022, available at https://www.pewresearch.org/short-reads/2022/01/06/three-in-ten-americans-now-read-e-books/ and Pew Research Center, "Book Reading 2021—Methodology" (survey conducted Jan. 25–Feb. 8, 2021) available at https://www.pewresearch.org/wp-content/uploads/2022/01/Book-Reading-2021-Methodology.pdf.

Figure 5: Search Interest Trends of "Libby" and "Kindle Unlimited" (2022–2026)



Kindle Unlimited

Libby

Source: Google Trends

The discussion in this section highlights the institutional and economic mechanisms through which library lending, particularly in digital formats, may interact with commercial book markets. However, theory and descriptive trends cannot by themselves establish the net effect on sales, revenues, or broader economic welfare. To assess these questions rigorously, we now turn to empirical evidence, reviewing the existing literature and presenting new state-level and book-level analyses of the relationship between library lending and commercial outcomes.

III. Quantifying Commercial and Library Book Relationship

This section analyzes the relationship between library book lending of physical books and e-books, on the one hand, and commercial book sales on the other. Importantly, such an inquiry needs to model consumer behavior with respect to substitution between e-books and print in both a library borrowing and commercial sales setting. Understanding the parameters of how commercial sales and different types of library book borrowing substitute for one another is imperative to assessing the welfare impacts on each party of different e-book library licensing schemes or of legislative efforts to impact e-book pricing and accessibility to libraries. We begin with a review of the existing literature that touches on these issues. In what follows, we present our empirical analysis of substitutability/complementarity between library e-book lending and trade sales.

In the descriptive sections, we refer to electronic materials broadly, consistent with how public library budgets and collections are reported in IMLS data. In contrast, all empirical models in this study isolate e-book availability specifically, as e-books are the format most directly comparable to retail book purchases and the margin along which substitution with commercial sales is expected to operate.

A. Literature Review

There is significant existing economics literature that explores consumer behavior in library markets, the impact of windowing on print and digital sales, as well as the economic impact of library lending of e-books on book sales with and without windowing. This literature generally supports the conclusion that raising e-book prices to libraries and putting some restrictions on e-book access for libraries would increase sales volume and revenue in consumer book markets with positive economic impact for authors, publishers, and bookstores while simultaneously shifting library patrons toward borrowing physical books and encouraging libraries to invest more heavily in their print collections.

It bears emphasizing that while windowing is not currently prevalent in the licensing of e-books in the United States, it is common in European e-book licensing markets (see, for example, the German study summarized below). It is also widely used in the United States in the context of copyrighted materials in other industries, such as movie entertainment. Windowing in movies is a distribution method used by media companies to release content across different platforms, (e.g., theaters vs. streaming) in a staggered, sequential manner in order to preserve high revenue platforms like theaters. As such, any ban on windowing of e-books to libraries would disallow the use of a widely-utilized business practice employed by copyright holders worldwide and in different U.S. industries to maintain their intellectual property.

Reimers & Waldfogel (2024)[35] use 2013-2019 panel data from 8,418 US library systems on library holdings, circulation, visits, as well as the population and income levels of the service area to derive welfare findings regarding the library ecosystem. While this study does not directly address substitution between library e-book lending and sales of books, it does test library patron substitutability between physical and e-book formats. Adopting and then testing quantitatively a structural model of the library market (i.e., both libraries and their patrons), the article finds that because book consumers

35 Imke Reimers and Joel Waldfogel, "The First Sale Doctrine and Public Library Provision of Print and Electronic Books," *Review of Economics and Statistics* (2024), available at: https://direct.mit.edu/rest/article-abstract/doi/10.1162/rest_a_01488/124137/The-First-Sale-Doctrine-and-Public-Library/.

are willing to substitute among physical and electronic books, and attach particular value to physical books, raising e-book prices and restricting e-book access would have limited effects on library patron utility, and would also increase library visits and attendant community involvement. According to these findings, higher e-book prices would induce libraries to substitute physical for electronic holdings, with little or no decrease in library patron welfare. This is particularly important for library patrons in rural and low-income communities where most library borrowing still involves physical books. The findings of this study suggest that if there is a significant demonstrated negative impact of frictionless library e-book borrowing on publishers and authors due to lower sales (*see* Cuccu *et al*. discussion directly below), restrictions on library e-book lending that limit these negative publisher/author impacts will not have significant offsetting deleterious welfare effects on libraries or their patrons.[36]

Cuccu *et al.* (2024)[37] is a study that examines the economic impact of library lending of e-books on e-book and print sales in Germany, with an emphasis on the impact of windowing. This study uses both a comprehensive database of German library lending titles and panel data on German consumer buying behavior to investigate these issues at a book level. Important findings of this study include: (a) the intensity with which e-books are lent out is up to 3 times greater than for print books, even with lending restrictions such as that only one e-book copy is to be lent out at a time and e-book licenses are for a set duration; (b) windowing increases sales volume and revenues in the consumer market for both e-books by an estimated 9.9% and print books by an estimated 3.5% (with precise impact varying by genre), while removal of windowing would lower sales volume and sales revenue by similar percentages; (c) the economic impact of removing windowing would be strongly negative for authors, publishers, and booksellers, but slightly positive for aggregators, with these impacts increasing over time; and (d) library users have above-average income and higher levels of education, and while this is true of all book buyers, it is especially true of e-borrowers, such that when this group started increasing their e-book borrowing they began to spend less in the consumer book market, buying 20% fewer books and spending 5% less on books. We adopt a methodology similar in some ways to the Cuccu et. al study (which is the most sophisticated and relevant study to date) but applied to U.S. data, and reach similar conclusions, as discussed below.

A 2025 comprehensive European Commission report[38] has similar findings to the German study above. The report finds that although licensing models for e-books can produce challenges for public libraries regarding allocation of resources and access to certain works, "the evidence collected suggests that, for certain categories of works, such as trade books, and notably bestsellers, the 'windowing' practices contained in licenses are necessary for rightholders to

36 Negative impacts on library patron would be minimal because (a) less affluent library users have a proven preference for borrowing physical books (b) more affluent library users have the wherewithal to purchase books that they want to read immediately after publication; and (c) the books most likely to be windowed are bestsellers, not classic or other types of books, and small delays in reading bestsellers should not cause significant harm, since users having an immediate need to read the book can either substitute physical borrowing or simply purchase the book. These issues are discussed more fully in Section V ("Welfare Evaluation of State Legislative Initiatives") below.

37 Liliana Cuccu, et al., "The Economic Impact of E-lending in Public Libraries on the Consumer Book Market," *Deutsches Institut für Wirtschaftforschung* (2024), available at: https://www.econstor.eu/bitstream/10419/325295/1/193328465X.pdf/.

38 Office of the European Union, "Copyright in Distance Education and Research: Exploring the Role of Copyright in Facilitating Access to Digital Collections of Libraries and Other Public Interest Institutions," 2025, available at: https://op.europa.eu/en/publication-detail/-/publication/c689fa8b-cf2b-11f0-8da2-01aa75ed71a1/language-en/.

protect other streams of revenues and maintain the balance of rights, as removing windowing (as suggested by some PII [public interest institution] associations) would substantially damage rightholders' incomes."[39] The study suggests that windowing of new releases could be a potentially effective licensing option in the United States.

> While libraries argue that windowing creates social imbalances, as users who cannot afford to buy books are forced to wait longer to read certain titles, evidence presented indicates that windowing is a necessary element for the balance of rights. Copies lent via e-lending are identical to e-book copies that are made available for sale, and as such windowing is the only option available to protect the sale of new editions at the point in time when these editions generate the most revenue. Data from recent studies discussed point to a significant loss of sales for publishers if windowing were to be removed.[40]

Much of the economic literature on the impact of e-book distribution on print format has been limited to analyzing this relationship *within* the trade channel, such as Lee, Han, and Lee (2020), and Sharma (2019). This literature does not account for the unique role of libraries, particularly the fact that library e-book lending is free and potentially unlimited. Under these conditions, the effect of library e-book lending on physical book sales would be expected to be significantly greater than the effect of e-book sales on physical book sales.[41] This omission is especially important given that libraries provide the majority of the United States unit book consumption.[42] Even setting this limitation aside, the results in the trade-based literature are mixed regarding the degree to which growth in e-book sales has impacted physical book sales.

Lee, Han, and Lee (2020)[43] examine physical book and e-book sales records over a four-year period for hundreds of randomly chosen book files, finding that e-book releases led to a 10.7% *reduction* in print sales over an 8-week estimation period. Using a different methodology but getting a similar result, Sharma (2019)[44] finds that Amazon's platform strategy of introducing its own Kindle e-reading device lead to a 30% *decline* in print sales within adult fiction, with lesser decreases in other book categories. The impact of library e-book lending on print book sales, since such lending is free to the user and potentially frictionless, would be expected to be significantly greater than impacts of increased e-book sales on print sales.

39 *Id.* at p. 16.

40 *Id.* at pp. 251-252.

41 This trade-based literature also does not address the community role which has aways been associated with physical books, meaning library e-book lending in some fundamental way works against libraries' community function.

42 *For example,* Reimers and Walfogel (2024) report (fn. 1) that in 2018, "US libraries reported print circulation of 1.87 billion units, while Nielsen reported 698 million print unit sales. Libraries reported ebook circulation of 294 million, compared with Nielsen's 108 million ebook [unit] sales.

43 Kyunghee Lee, Kunsoo Han, and Byungtae Lee, "Heterogeneous Effects of Ebook Distribution on Print Sales: The Role of Distribution Strategies and Book Characteristics," *Social Science Research Networks* (2020), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3559782/.

44 Siddhartha Sharma, Rahul Telang, and Alejandro Zentner, "The Impact of Digitization on Print Book Sales: Analysis using Genre Exposure Heterogeneity," *Social Science Research Networks* (2024), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3579521/.

B. Results from Empirical Analyses

To assess how the digital composition of library collections affects commercial book sales, we implement three complementary empirical models, each operating at a different level of aggregation and identification. These models measure related but distinct aspects of the relationship between library format intensity and retail performance, allowing us to evaluate potential substitution effects using progressively more granular data while addressing concerns about robustness and external validity.

Specifically, we estimate the real-world effects of increased e-book availability in public libraries by examining how changes in library collections correspond to changes in retail unit book sales. We do this based on multiple regression analysis, which measures the statistical relationship between an outcome variable (the dependent variable) and multiple explanatory variables (independent variables), with the goal of isolating the impact of the independent variable of interest. Depending on data availability and identification strategy, our analyses focus either on unit print sales alone or on both unit print and e-book sales. By exploiting variation in the timing and composition of library holdings, we assess whether expanded library e-book access is associated with measurable shifts in commercial purchasing. The results of these models inform our subsequent analysis of broader economic impacts discussed in **Section V.**

1.State-Level Format Intensity and Print Book Sales

Our first model examines whether states that shift the *format composition* of their public library collections toward more digitally intensive holdings experience changes in print book sales. Importantly, this analysis does not focus on total collection size. Instead, we isolate changes in format mix (*i.e.*, for a given overall collection size, what happens when libraries allocate a larger share of their holdings to digital formats?). The outcome (or dependent) variable is state-level print book *unit* sales in categories typically associated with library collections.[45] We also ran an alternative formulation where the dependent variable is state-level book *revenues* in these categories. Book sales (both unit sales and revenue) for each state are obtained from Circana BookScan. Library collections' data are obtained through IMLS' comprehensive annual data on public library operations nationwide.[46] The overall date range of the regression data for this model specification is from 2013 to 2023. The unit of observation is state-by-year. The key explanatory (independent) variable is a measure of digital intensity within each state's public library system (*i.e.*, the share of holdings or acquisitions in digital formats). This model effectively asks: holding constant the size of the collection and other observable factors such as state socio-demographic indicators, do states that reallocate their holdings toward digital formats experience different trends in print sales relative to their own prior levels? Further details on how these state-level model specifications are set up as well as the regression output for each choice of dependent variable can be found in **Appendix 1.A.**

We found that the relationship between e-book share of library collections and state-level print book sales is negative, meaning that a larger e-book share of library collections is associated

45 We only included Adult Fiction, Adult Non-Fiction, Young Adult Fiction, and Young Adult Non-Fiction sales, as those titles are more plausibly substitutable between libraries and retail channels. We did not include Juvenile titles, as consumers of this literature are seldom the decision makers at the time of book lending and/or book purchase, with this choice being made by adults in their lives.

46 While IMLS contains data on library services in several U.S. territories, this study focuses exclusively on U.S. fifty states plus the District of Columbia.

with *lower* state-level print book sales. This result held after controlling for average household income as well as the number of available brick-and-mortar bookstores.[47] **Figure 6** below shows our estimates for the unit sales regression. Our estimates imply that a one percentage point increase in the share of e-books in library collections is associated with approximately an 0.85 to 0.90 percent *decrease* in the sale of print books as measured by units sold for all four relevant genres combined, holding constant state and time effects and other relevant covariates. **Figure 7** shows very similar estimates, both in terms of magnitude and statistical significance, apply to a model using state-level print book revenue, rather than unit sales.

For each of the unit sales and revenue models presented in **Figure 6** and **Figure 7** below, respectively, we also estimate an additional specification in which the outcome (dependent) variable is restricted to sales of Adult Fiction titles. While our primary analysis pools across genres to estimate the average substitution effect, we additionally examine adult fiction to illustrate the underlying economic mechanism, as this category is most plausibly characterized by discretionary consumption and direct format substitution.

Adult readers are more likely to make purchasing decisions for themselves, face binding budget constraints, and decide whether to borrow or buy based on price, convenience, and availability. Adult fiction titles are also more likely to be recent releases and are typically marketed heavily and made available simultaneously across formats (hardcover, paperback, e-book, and audiobook), increasing the scope for substitution across formats.

In contrast, choices surrounding young adult titles are often jointly influenced by school curricula, reading assignments, or parental preferences, introducing additional confounding factors not directly related to consumer choice. Moreover, demand for adult fiction is more clearly shaped by consumer-driven discovery and engagement channels such as book clubs, online recommendation systems, social media discussions, and bestseller lists. Adult fiction also represents a substantial share of trade publishing revenue, making it a particularly relevant segment in which to examine economically meaningful substitution effects.

We estimate that a one-percentage-point increase in the share of e-books in public library collections (aggregated across the four relevant e-book categories) is associated with an approximately 0.95 to 1.0 percent decrease in unit sales of Adult Fiction print books, with similar magnitudes observed in the revenue specification. While these estimates are slightly larger than those obtained from models pooling across genres, they are closely aligned in magnitude and direction, which is consistent with economic intuition and supports the interpretation that adult fiction represents a setting where the underlying substitution mechanism is most transparent. Importantly, the similarity between the adult-fiction estimates and the pooled-genre results suggests that the latter are not drivenby genre composition.

47 The number of bookstores is obtained using annual number of establishments from County Business Patterns (CBP) produced by the U.S. Census.

Figure 6: State level estimates of impact of increased e-book share of collection on print book retail units sold

	Model	Estimate
Adult Fiction and Non-Fiction, Young Adult Fiction, and Non-Fiction	E-book share – Base	-0.90%
	+ Bookstore	-0.85%
	+ Household Income	-0.90%
Adult Fiction	E-book share – Base	-1.00%
	+ Bookstore	-0.95%
	+ Household Income	-0.99%

Figure 7: State level estimates of impact of increased e-book share of collection on print book retail revenue

	Model	Estimate
Adult Fiction and Non-Fiction, Young Adult Fiction, and Non-Fiction	E-book share – Base	-0.88%
	+ Bookstore	-0.83%
	+ Household Income	-0.88%
Adult Fiction	E-book share – Base	-0.94%
	+ Bookstore	-0.89%
	+ Household Income	-0.93%

Importantly, both the magnitude and statistical significance of substitution/cannibalization remain stable as additional controls are introduced to the base model, suggesting that the estimated relationship is not driven by omitted variation in bookstore access or household income. In our specification, the number of bookstores and average household income enter positively and significantly in both the unit and revenue models, consistent with greater retail access and higher purchasing power being associated with stronger print demand.

We found that the estimated coefficient for e-book library share is similar in magnitude whether we use unit sales or revenue as the dependent variable. This validates a focus on unit sales of physical books as it suggests that publishers are not meaningfully raising prices to offset unit losses. Put differently, because

revenue is price times quantity, the similarity of the estimated coefficients for both specifications suggests that the effect of library e-book share on physical book sales operates primarily through the change in quantity, not a change in price. As a result, our estimated effect of lower units sold is the result of a genuine offset of physical books by library e-books, not fewer units sold resulting from higher prices.

We have also run model specifications that controlled for additional measures such as *i*) difference in level of urbanization of a state by including share of rural population in a state in any given year; *ii*) general library availability by including the sum of hours libraries were open, or the number of libraries per capita. While *a priori* we could hypothesize about how each of these variables could influence book sales, ultimately, they were not statistically significant unlike the format composition of library book collections. The results described in previous paragraphs hold even if we include these other potential explanatory factors, again indicating the robustness of the relationship. Taken together, all these model specifications provide broad, externally valid evidence reflecting how format decisions correlate with commercial outcomes across the entire country.

However, the causal interpretation is necessarily indirect. Although fixed effects and controls reduce omitted variable bias, digital intensity may still be correlated with unobserved changes in demand for reading or technology adoption, i.e., digital intensity might not truly be exogenous. Accordingly, this model establishes robust and economically meaningful associations, but the model cannot, by itself, fully resolve concerns about the effect of unobserved factors. Additional modeling efforts described below greatly alleviate these concerns.

Linking the empirical estimates to policy scenarios: The regression results in this section quantify the *marginal relationship* between public libraries' e-book share and retail print outcomes under observed market conditions. However, the *ultimate* impact of any proposed policy change depends on several additional factors that are not pinned down by the reduced-form estimates alone. These include (i) the magnitude of the policy-induced change in the relative effective cost of e-books to libraries (including licensing terms); (ii) the degree to which libraries respond by shifting their collection composition toward e-books (which may vary across libraries depending on baseline digital intensity and responsiveness to relative costs); and (iii) the extent to which such shifts in digital access translate into changes in consumer channel and format substitution, including through reductions in borrowing frictions such as wait times.

For transparency, we therefore present policy-relevant simulations of aggregate economic impacts in **Section IV.B,** which report economy-wide outcomes under alternative assumed levels of sales displacement (1%, 2.5%, and 5%). In addition, **Appendix 2** provides a worked example showing how the empirical estimates in this section can be mapped into an illustrative displacement scenario under explicit assumptions about library price sensitivity and resulting changes in digital intensity.

2. Title-Level Analysis Using Seattle Public Library Data

The second model shifts from aggregate state-level analysis to the level at which substitution is most likely to occur: the individual title. Using monthly title-level data from the Seattle Public Library (SPL) and retail sales data for the Seattle-Tacoma designated market (from Circana),[48] we construct a large data panel spanning January 2017 through December 2024, covering approximately 122,000 distinct titles and roughly 2.2 million title-month observations. For each month in our sample we observe retail physical sales and the share of library usage involving e-books.

The title-level framework enables a direct test of format-level substitution. The model asks whether, conditional on a title's overall library engagement, a higher share of library usage occurring via e-books is associated with lower retail physical sales. This would be evidence of format cannibalization from library e-book lending rather than discovery or market expansion.

Because variation occurs at the title level, this model provides a tighter alignment between library access and commercial outcomes. The inference is more direct than in the state-level model as it evaluates the relationship between digital availability and sales for the exact same title. The model is designed to reflect shifts in format mix of library usage rather than changes in overall demand for a given title since the latter is noisier and harder to control for.

The main explanatory variable of interest is the share of e-books in the SPL collection for a given title in a given year-month. All specifications control for the total volume of SPL checkouts for a title at any point in time. Our specifications additionally control for vintage (back or front list), a title's age in years since publication, the genre, and library patrons' average choice of format medium for a title at the SPL. The model specification, as well as the results, are explained in detail in **Appendix 1.B.**

The baseline specification provides a gross estimate of monthly within-title cannibalization by relating physical unit sales to the e-book share of total SPL usage while controlling for total SPL checkouts of that title. This specification does not control for title vintage.

The baseline specification finds a negative relationship between e-book share and physical sales. This is reported in the first row of **Figure 8** below.[49] The baseline model implies that a 25-percentage point increase in the e-book share of library usage is associated with roughly a 2 percent decline in retail physical sales, holding overall library engagement constant.

48 As with the state-level regression, we limit our sales data to Adult Fiction, Adult Non-Fiction, Young Adult Fiction and Young Adult Non-Fiction. Young Adult Non-Fiction is taken as the base case for the regression analysis so this category is omitted from the results presented below.

49 Appendix 1.B. shows that this estimated relationship is statistically significant.

Figure 8: Percent Change in Seattle-Tacoma Unit Sales from a 25 Percent Increase in E-Book Share at the Seattle Public Library

Model	Front List	Back List
Baseline	-2.1%	-2.1%
Add Heterogeneity		
Adult Fiction	-3.5%	-5.1%
Adult Non-Fiction	-2.3%	-3.9%
Young Adult Fiction	-7.0%	-9.0%
Add Print Intensity		
Adult Fiction	-3.2%	-4.7%
Adult Non-Fiction	-2.9%	-4.2%
Young Adult Fiction	-6.2%	-8.5%

Note: All estimates are statistically significant at the 0.1% level.

A second model specification introduces a richer economic structure by allowing the substitution/cannibalization effect to vary by adding heterogeneity (in genre, vintage, and publication age in years), and by permitting a nonlinear (quadratic) relationship between e-book share and sales. Once this heterogeneity is introduced, the implied effects begin to vary meaningfully across titles. The results of the second model specification are reported in rows three through five of **Figure 8** above.

Because the second model specification allows nonlinear effects and heterogeneity by vintage and publication age, the implied impact of a change in e-book share depends on the starting level of e-book usage and title characteristics. Therefore, we report an illustrative effect for a representative scenario of an e-book share shifting 25 percentage points (i.e., from one-quarter to one-half of library usage of a title being e-books). We distinguish the estimated effects for front list titles, testing whether substitution/cannibalization between library e-books and retail print sales is different for front list vs. back list titles. All effects are reported at the average publication age for front list titles in each genre.

The model with heterogeneity shows that front list titles are less exposed to cannibalization than back list titles, suggesting greater resilience to substitution for newer releases given the greater urgency of demand.[50] This is consistent with the fact that front-list demand is more time-sensitive and current library access remains constrained by wait times and other lending frictions, which reduce substitution for newer releases. Moreover, as we demonstrate in the methodology section in **Appendix 1.B**. the negative effect of e-book library share attenuates as titles age, implying that cannibalization is strongest earlier in a title's lifecycle.[51]

The quadratic structure of this model specification implies diminishing marginal cannibalization over the relevant range of e-book shares observed in the data. In other words, early increases in the title's e-book share at the SPL have larger effects on sales, while additional increases have progressively smaller impacts once substitution is already widespread. This is an intuitive result. For a typical Adult Fiction front list title, a 25 percentage point increase in e-book share at the SPL is associated with approximately a 3.5 percent reduction in physical sales, larger than the effect implied by the baseline model. For front list Young Adult Fiction titles, the cannibalization effect is even stronger; the same 25-point increase is associated with a 7 percent decline in physical sales. Front list Adult Non-Fiction titles exhibit smaller effects; a 25-point increase in e-book share is associated with a 2.3 percent decline in physical sales, closer to but just above the baseline model.

The differences across genres estimated in this model specification with heterogeneity are also economically intuitive. Young Adult Fiction is more consumptive, time-sensitive, and budget-constrained than other genres, making library e-books a closer substitute for retail purchases than for genres where usage is more time-insensitive and reference-oriented.

The third model specification, whose estimated impact for different genres are reported in rows seven, eight, and nine of Figure 8 above, additionally controls for the interaction between e-book share and print intensity of the title at the library, measured as the average share of SPL usage for that title occurring via physical format. Print intensity captures whether a title has historically been consumed in print at the library, averaged across all periods. Including this variable in the model conditions the effect of increased e-book availability on titles with an established

50 In this specification with rich heterogeneity—and in fact across all specifications described further below that control for print intensity and are revenue-weighted—we consistently find that back list titles exhibit greater substitution than front list titles, suggesting this is a robust behavioral pattern rather than a statistical artifact or a consequence of low sales volumes. This result can be seen as intuitive: front list titles face more urgent, time-sensitive demand and higher willingness to pay, making library e-book access a weaker substitute than for back list titles, where demand has matured and readers are more patient and more likely to discover titles through libraries. Importantly, this finding does not diminish the economic relevance of front list access or the economic rationale for windowing, as front list releases are the primary stage at which publishers can influence pricing and timing, and where reader impatience and other dynamic considerations may trump contemporaneous substitution.

51 The model specification is flexible enough to distinguish between front/back-list status and the aging of a title. These are related but distinct concepts. Holding age constant, back-list titles exhibit greater substitution than front-list titles because demand is less time-sensitive and readers are more willing to rely on library access. Separately, within either front-list or back-list titles, substitution declines as a title ages because much of the initial demand has already been exhausted, leaving fewer potential purchases to divert. Cannibalization weakens at substantially lower e-book shares for front-list Young Adult fiction (~66%) than for back-list titles (~84%), consistent with stronger demand for new releases and near-pure substitution/cannibalization for older titles. In other words, readers remain willing to substitute library e-books for purchases across a much wider range of e-book usage for back-list titles than for front-list titles. Front-list demand contains a core group of eager purchasers (but certainly not all front-list purchasers) who continue buying despite extensive library e-book availability. In contrast, back-list demand behaves much more like a direct ownership vs borrowing decision, so substitution remains strong until e-book usage becomes very dominant.

base of library print readers. This specification helps distinguish titles for which print and e-book formats are especially close substitutes because it allows the cannibalization effect to be larger for titles whose readers consistently choose print. For these titles, expanding e-book availability lowers the cost of substituting towards library consumption of a title instead of purchasing a physical copy, resulting in a larger negative effect on physical sales.

Controlling for a title's historical print circulation (print intensity) shows that our estimated e-book substitution effect is not simply capturing book popularity or library embeddedness. The substitution persists even among titles with similar print-borrowing histories. For example, as seen in Figure 8, for Front List Adult Fiction titles, a 25 percentage point increase in e-book share corresponds to roughly a 3.2 percent decline in physical sales which is consistent with the result of the model that does not control for average share of SPL usage via print copies. Similarly, for Front List Young Adult Fiction titles, the same 25 percentage point shift corresponds to a 6.2 percent decline in physical sales. Front List Adult Non-Fiction again exhibits a smaller decline in physical sales of 2.9 percent physical. This is slightly larger than but consistent with the impact estimated by the model that does not control for SPL usage of print copies. In summary, the negative effect of e-book availability on physical sales is largest for titles historically consumed in print at the library, consistent with increased library digital access reallocating consumption from print sales to library e-book borrowing rather than expanding readership.

To validate the findings of our empirical model we focus our attention on titles with more commercial interest by re-estimating the regression models after weighing observations by retail sales. The core finding that higher e-book share is associated with lower physical sales remains intact, with magnitudes that are comparable or larger for high-grossing titles. While the interaction with print intensity differs when focusing on top sellers, the presence of cannibalization is robust to focusing on high-revenue titles.[52]

In sum, across a wide range of specifications that take into account title-specific demand, common time effects (including seasonal demand patterns), and overall library engagement, we find robust and economically meaningful evidence of within-title substitution between library e-book usage and retail physical sales. As reported in Figure 8 above, for a range of models, a 25 percentage point shift toward e-books at the library is associated with a 2 percent decline in physical sales for the average title, and a 6.2–7 percent decline for front-list Young Adult Fiction. The estimated effects are strongest earlier in a title's lifecycle and when print usage is high. These patterns are consistent with genuine format substitution rather than library e-book share being associated with book discovery or market expansion.

The title-level design strengthens causal inference by narrowing the comparison to within-title variation over time. It also allows us to estimate heterogeneous effects by genre and category—results that are theoretically expected, as substitution should differ between, for example, adult fiction and young adult titles.

Importantly, the estimated effects are broadly consistent with findings from prior research examining digital lending and retail substitution (e.g., studies documenting measurable cannibalization in certain segments while finding limited effects in others).[53]

52 Across all revenue-weighted specifications presented in Appendix 1.B., substitution remains strong, increasing for fiction and young adult titles, but it is markedly weaker for front-list adult non-fiction in the model that controls for print intensity. This suggests that even among high-revenue titles, adult non-fiction e-books are a relatively poor substitute for ownership, consistent with these books being valued as durable or reference goods rather than purely consumptive ones.

53 See, for example Cuccu *et al*. (2024), which is discussed in Section IV.A above.

3. Bestseller Model Using PubTrack and Google Trends

The third model is designed to bridge the gap between national scope and title-level precision. We combine PubTrack national e-book sales data from Circana with Seattle Public Library data like the title-level data described previously but restrict the sample to nationally recognized fiction *bestsellers*.[54] The rationale for focusing on bestsellers is that these titles tend to exhibit similar demand patterns across markets. As argued in prior research,[55] bestsellers behave more uniformly nationwide, reducing concerns that localized variation in Seattle drives the results.

> Every single [New York Public Library] top-10 book lies in the SPL top-60 for the same year, and falls in the top 0.01% of most checked out volumes. In other words, the most popular books remain popular in both library systems.[56]

By limiting the total number of titles in the dataset to bestsellers, it was possible to pursue a more innovative identification strategy that leverages Google Trends. Google Trends is a free, publicly available tool developed by Google that measures the popularity of search queries using real time and historical data.[57] It enables analysis of interest in bestseller titles over time, comparison of relative search volumes, and examination of geographic variation in consumer attention. Incorporating Google Trends data provides a direct control for time varying demand shocks. When a title becomes more popular nationally, both retail sales and library borrowing may rise simultaneously. Search intensity therefore serves as a proxy for underlying consumer interest, helping to isolate the causal effect of digital library availability from shifts in title popularity.

54 *Bestsellers* were defined in this study as titles that were in the top 750 most sold e-books on PubTrack from 2017-2024 in terms of revenue. Only titles with Supercategory *Adult Fiction* or *Young Adult Fiction* were included in the search.

55 *See, for example*, Neel Gupta, David Christensen, and Melanie Walsh. "Seattle Public Library's Open Checkout Data: What Can It Tell Us About Readers and Book Popularity More Broadly?" *Journal of Open Humanities* Data 11.1 (2025).

56 Gupta *et al.*, Section 7.2.1.

57 "Google Trends", accessed on March 15, 2026, available at https://trends.google.com/trends/.

Figure 9: Relative Popularity of Three Best Sellers as Measured by Google Trends (March 2021–February 2026)

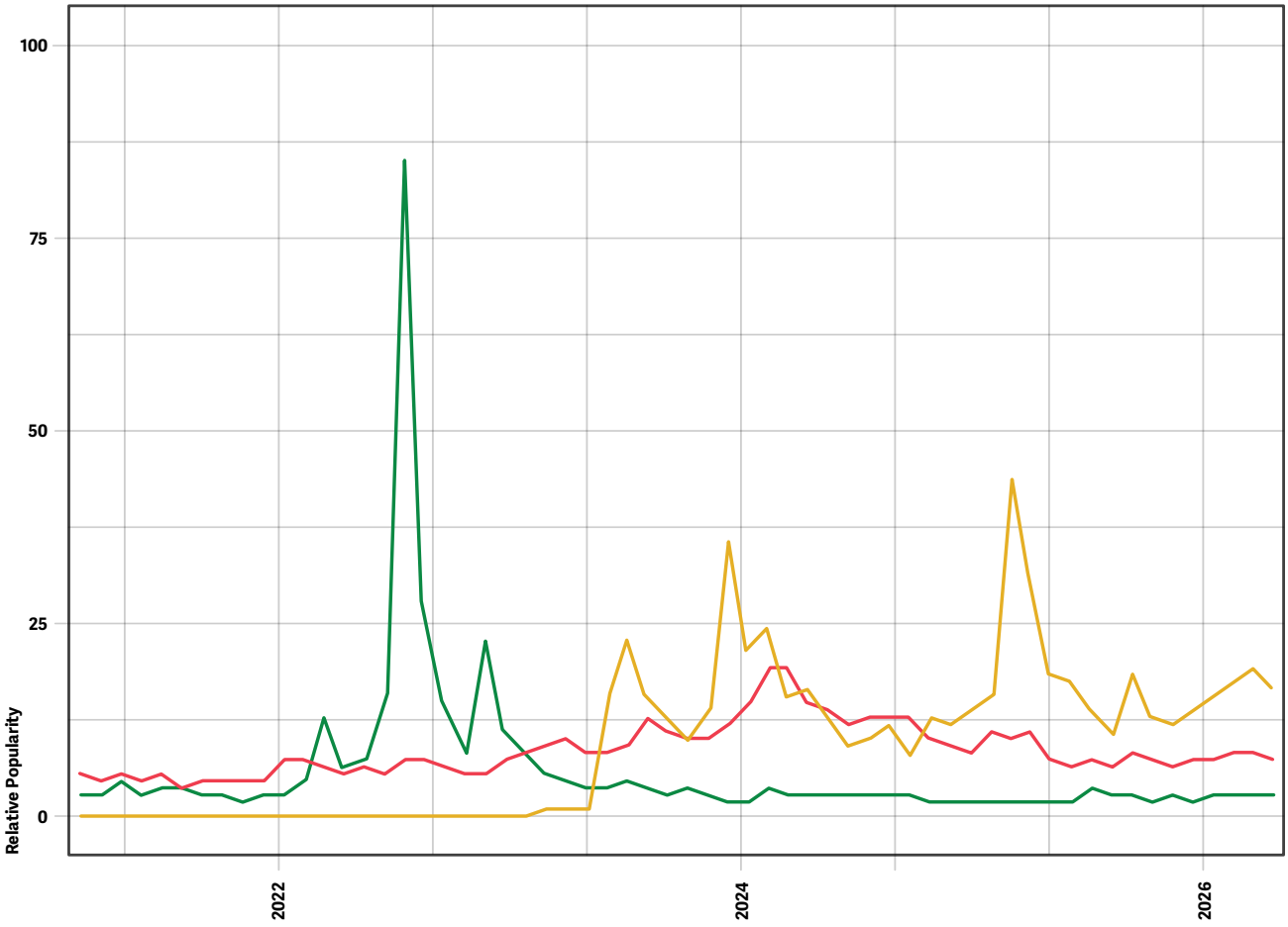


Figure 9 illustrates how this measure of relative interest based on search queries operates in practice, by pulling five years of Google Trends data for *A Court of Thorns and Roses* by Sarah J. Maas, *Fourth Wing* by Rebecca Yarros, and *Where the Crawdads Sing* by Delia Owens. These data show how the relative popularity of bestselling titles can fluctuate over time in response to the release of new installments or motion picture adaptations of a title. A key feature of Google Trends data is that it does not

report the absolute number of searches. Instead, both search intensity over time and comparisons across titles are expressed in relative terms. The most searched title–time combination within the selected set (which turned out to be *A Court of Thorns and Roses*)[58] is normalized to a value of 100, and all other observations are scaled proportionally relative to this benchmark. A brief description of the trends for each of these titles follows.

- *Where the Crawdads Sing* was originally published in 2018 and therefore qualifies as backlist title during the period observed in the data. Despite this status, it reaches the maximum level of relative popularity in July 2022, coinciding with the release of the motion picture adaptation of the book. This peak also shows notable extended effects, with elevated search intensity in the months leading up to the film's release and some persistence of interest in the subsequent months that slowly subsides.[59]

- *Fourth Wing* was originally published in May 2023 and therefore cannot be observed in the earliest periods of the dataset. It is also the first installment in *The Empyrean* series, followed by *Iron Flame* released in November 2023, and *Onyx Storm* released in January 2025. Although our analysis includes only search terms for the first installment and the author – intentionally excluding terms that would directly capture searches for the broader series or subsequent volumes—the resulting patterns reveal a well documented phenomenon in media markets: demand for multi title series is often tightly anchored to the popularity of the initial installment. Even as later books are released, search intensity for the first title remains a central proxy for overall consumer interest in the series.

- *A Court of Thorns and Roses* displays a notably stable pattern of relative search interest over a relatively long observation window starting with first publication in May 2015. Search intensity remains consistently positive throughout the period, with only a modest increase in early 2024 and no sharp spikes comparable in magnitude to those seen in the books above. Rather than exhibiting event driven surges, the title maintains a steady level of national attention across time. This stability is consistent with the series' maturity and market position. A steady stream of subsequent installments in the *A Court of Thorns and Roses* series after its first 2015 publication, combined with Sarah J. Maas's broader success across related series, likely has sustained baseline interest without producing explosive increases in search activity, entering the data as an established and commercially successful franchise. In the absence of major external demand shocks (*e.g.*, a film or flagship streaming adaptation) the search profile reflects stable, ongoing consumer engagement rather than episodic bursts of popularity.

58 *A Court of Thorns and Roses* was chosen as the control title for Google Trends relative popularity searches in our methodology. For more details, refer to Appendix 1.C.

59 Although quantitative analyses often raise concerns about whether search activity reflects interest in a book or its screen adaptation, this distinction is less problematic in the present context. Media adaptations can plausibly stimulate renewed demand for the underlying book, even when the publication itself occurred several years earlier. Nonetheless, to ensure that our measure captures search behavior explicitly tied to the book rather than the motion picture alone, we restrict attention to queries that include both the book title and the author's last name. Therefore, to the extent that increased interest in a title matches screen adaptation, that is still book search behavior.

Using monthly title level panel data of best selling fiction titles, we estimate that making a title available in public library digital collections is associated with a modest but statistically meaningful reduction in retail performance. Across specifications shown in **Figure 10** and **Figure 11**, library availability is estimated to lower outcomes by between 0.19 percent and 0.28 percent, with this effect appearing consistently whether the dependent (outcome) variable is units sold or total sales revenues.

An additional consideration in interpreting the magnitude of these estimates is that the bestseller model combines national sales data with library availability measured in a single, albeit large and representative, library system. To the extent that Seattle Public Library holdings are an imperfect proxy for national library access, this geographic mismatch introduces classical measurement error in the treatment variable, which would tend to attenuate estimated coefficients toward zero. The fact that the estimated effects remain negative and statistically significant despite this attenuation reinforces the conclusion that library e-book availability is associated with reduced retail sales, and suggests that the reported magnitudes are likely conservative.

In estimating these effects, we compare similar books by accounting for release timing (frontlist versus backlist status), reader attention as proxied by search activity, and broader market trends that shift over time, while author fixed effects absorb persistent differences in author-level popularity. Additional specifications further account for heterogeneity across fiction subcategories and for variation in product positioning by including list price per page as a measure of a title's premium status. The stability of the estimated effect across both outcome measures and increasingly rich specifications indicates that the observed sales response is not driven by shifts in genre composition, pricing, or contemporaneous popularity trends, but instead reflects a direct substitution effect between library access and retail purchasing. Further details the model specifications and regression output are provided in **Appendix 1.C.**

Figure 10: Individual Bestseller Fiction Title E-book Unit Sales Impact of E-book Availability at the Seattle Public Library

Model	Estimate
E-Book Availability at Library Base Model	-0.19%
+Subcategory*	-0.28%
+List Price Per Page**	-0.28%

* 2,675 observations removed because of missing subcategories values
** 4,219 observations removed because of missing list prices or number of pages

Figure 11: Individual Bestseller Fiction Title E-book Revenue Sales Impact of E-book Availability at the Seattle Public Library

Model	Estimate
E-Book Availability at Library Base Model	-0.19%
+Subcategory*	-0.27%
+List Price Per Page**	-0.25%

* 2,675 observations removed because of missing subcategories values
** 4,219 observations removed because of missing list prices or number of pages

4. Integrating the Evidence Across Models

The three empirical models presented above are designed to address the same policy question from different vantage points: whether increasing the digital intensity of public library collections affects commercial book sales. Each model operates at a different level of aggregation and relies on distinct identifying variation. Considered individually, each provides informative but incomplete evidence. Considered jointly, they form a coherent and mutually reinforcing body of findings that strengthens both internal and external validity.

The state-level analysis offers the broadest perspective. By examining within-state changes over time in the format composition of library collections, this analysis establishes that shifts toward more digitally intensive holdings are systematically associated with measurable reductions in print sales. Because this model spans multiple states and years, it provides strong external validity and reflects patterns at a scale directly relevant to policymakers. At the same time, its aggregate nature limits the precision with which individual mechanisms can be isolated.

The title-level analysis using Seattle Public Library data narrows the lens considerably. By matching sales outcomes to the digital share of the same title within the library's collection, the model provides a more direct test of substitution between library access and retail purchases. Title fixed effects absorb persistent differences in popularity, while time controls capture broader market trends, substantially strengthening internal validity. This design also allows for the estimation of heterogeneous effects across genres and publication vintages. Its primary limitation is geographic scope: because the analysis is localized to a single library system, questions may remain about generalizability to other markets.

The bestseller model addresses this limitation directly. By focusing on nationally recognized best-selling fiction titles and combining national sales data with library e-book availability, this specification reduces the likelihood that localized demand conditions drive the results. Interpreting the magnitude of these effects also requires attention to the institutional features governing how library e books are accessed in practice.

An important contextual feature of these estimates is that they are identified within the current institutional environment of public library e book lending, where prevalent licensing models place some limits on the extent of digital availability and the most popular titles often face substantial waitlists. As a result, library access is not completely frictionless: readers effectively "pay" for library books by waiting rather than by price. This congestion likely dampens the degree of substitution observed in the data. The estimates in our models therefore capture contemporaneous substitution under conditions of constrained access, rather than outcomes under a fully frictionless digital lending regime. In a counterfactual setting in which e book pricing and lending constraints were relaxed—leading to shorter or nonexistent wait times—the displacement effects documented here would likely be larger, as borrowing would become a closer substitute for retail purchase. In this sense, the estimated effects should be interpreted as reflecting substitution on the current margin of digital access rather than as measures of the potential impact of expanded library e book availability.

Viewed together, the models reflect a deliberate empirical progression. The state-level analysis establishes that reallocating library collections toward digital formats correlates with sales outcomes at scale. The Seattle title-level model demonstrates that similar patterns emerge when examining individual titles and provides a clearer mechanism consistent with substitution. The bestseller specification extends these findings to nationally salient titles, combining broad market relevance with title-level precision and an explicit control for popularity shocks.

Each model compensates for the limitations of the other models. The breadth of the state-level evidence offsets the geographic specificity of the Seattle analysis. The title-level designs address endogeneity concerns that are more difficult to resolve in aggregate data. The bestseller framework reduces the likelihood that results are driven by local market characteristics and confirms that the estimated effects persist among titles with national demand and high visibility.

Most importantly, the consistency of findings across these distinct empirical strategies strengthens confidence in the conclusions. When estimates converge across models that differ in aggregation, identifying variation, and data sources, the probability that the observed effects are artifacts of any single specification is greatly reduced. This convergence provides policymakers with a robust evidentiary basis for evaluating the economic implications of increasing digital intensity in public library collections. While these models collectively provide robust evidence of contemporaneous substitution effects, they are not designed to capture broader cross title or genre level displacement that may arise when readers substitute across books rather than between library and retail access for a specific title.

In short, the combined evidence does not rely on any single model or dataset. Instead, it reflects a layered analytical approach designed to test the same question under multiple, complementary conditions—enhancing credibility, interpretability, and policy relevance.

IV. Welfare Evaluation Of State Legislative Initiatives

A. Qualitative Evaluation of Current Licensing Models

The empirical results just presented feed directly into an evaluation of public policy choices confronting publishers and libraries regarding digital content. Currently, various licensing models govern e-book transactions between intermediaries known as "aggregators" and public libraries. The variety of *licensing* models available to libraries, and the differences in models offered to intermediaries by different publishers, reflect a market process in which the exact model chosen depends on the specifics of each negotiation. The most prevalent types of licensing models offered to public libraries include: (a) Perpetual Access, where the library pays a one-time fee to own the content license permanently; (b) Metered Access/Time-Limited Licenses, where the library licenses a title for a set period, commonly two years, or a maximum number of circulations (e.g., 26 or 52 loans), with license repurchase necessary once one of these limits is reached; and (c) Patron-Driven Acquisition, where a library makes a large pool of publisher titles available in its catalog and a usage fee is triggered only after a patron accesses the content a certain number of times or for a set duration, ensuring that the library only pays for content its patrons actually use.

Specific terms and pricing within these licensing models vary by publisher, with publishers adopting and combining different models through ongoing experimentation.[60] Importantly, as suggested above, libraries and publishers typically work through aggregators—chosen by the libraries—like OverDrive, hoopla, EBSCO, or ProQuest who facilitate the precise terms, acting as intermediaries between publishers and libraries.

An initial policy question is to ask what is the "market failure," if any, with this negotiated market-based licensing outcome? Clearly the amount of digital material in libraries has increased significantly, and costs per license have fallen, which doesn't suggest market failure in licensing. In addition, why would we expect the outcome of the licensing negotiation to be skewed against the best interest of any specific party once the different welfare consequences are balanced?

A society that reads is ultimately one that purchases more books and supports more authors. In an important sense, the goals of publishers and authors largely align with the goals of libraries, especially in the longer run sense. (This is true even when there are short term consequences on sales from increases in library e-book lending.) That alignment should be evident in the present outcomes of licensing terms. And to the extent that library e-book lending, more so than the lending of physical books, is likely to significantly decrease book sales at least in the short term, economic theory predicts that market forces would account for that in negotiations over the scope and extent of restrictions on library lending of e-books in licensing agreements.

60 Publishers use disparate combinations within these model choices. A "perpetual access" model, for example, where the library pays a flat, one-time fee for a permanent access, could be combined with higher license fees. Or the e-book license could be for one or two year terms, but with lower licensing fees than the library is paying for perpetual licenses. There could also be different licensing arrangements for new releases/bestsellers vs. backlist titles. Finally, some element of windowing is also an option, potentially bundled with lower licensing fees and/or longer licenses." *See* The Author's Guild, "A New Twist in Ebook Library Licensing Fees," June 21, 2019, https://authorsguild.org/blog/a-new-twist-in-ebook-library-licensing-fees/.

Viewed through this lens, efforts through state legislation to control the process and mandate pricing and terms for licensing of e-books and audiobooks from publishers and authors to libraries (e.g., prohibiting windowing or limits on the number of copies licensed; requiring multi-user library licenses at the same price as individual personal-use licenses; requiring same terms and pricing for digital books as print books; prohibiting restrictions on duration of license or number of checkouts) are likely to disrupt the market process and lead to decreases in the incentive for new creative works. For example, mandating licensing terms that have been shown to hurt sales and author remuneration could lead publishers to withhold library licenses altogether,[61] or limit such licensing, resulting in a worse outcome than market-based licensing.

Such an approach also would work against a more natural market-based evolution of licensing models as publishers better understand the wider impacts of e-book lending on trade sales and libraries assess the future of physical books compared to e-book lending. For instance, libraries might well be able to substitute increased physical book purchase/lending for e-lending (consistent with the Reimers & Waldfogel article in our literature review above), and thereby solve some of the frustrations with wait times for e-books, while still having enough e-book support to serve patrons that cannot get to the library. In any event, libraries have long operated with a model that revolved around the lending of physical books, including wait times for popular physical books. Such an outcome would support the community role of libraries rather than turning them into remote e-book check-out stations, while still allowing those who are not able to get to a library, such as older or disabled patrons or those far from a library, to check-out e-books.

The empirical findings in this study suggest that windowing—the practice of delaying library access to certain titles, particularly new releases and bestsellers, during the period when reader demand is most time-sensitive and willingness to pay is highest—should be understood as a relevant policy option within library e-book licensing negotiations, because making those titles available too quickly through a low-friction, no-cost channel is likely to displace the sales that are most commercially valuable to authors and publishers. Across multiple empirical approaches, we find consistent evidence that library e-book availability substitutes for retail purchases, with the largest substitution effects occurring for back-list titles and titles earlier in their sales lifecycle. In this context, windowing represents a potential mechanism for managing near-term displacement while preserving broader access through libraries over time.

Windowing is widely used in other creative industries, including film, music, and video games, to balance early-stage commercial demand with longer-run access, and it is also an established feature of e-book licensing regimes in several European book markets.[62] The authors of this study take no position on whether or to what extent any particular publisher, or publishers more generally, should incorporate windowing into their licensing strategy—marketing approaches which in any event are the province of individual decision-making. The evidence reported here indicates, however, that state laws that foreclose even the possibility of windowing remove an otherwise lawful option that has demonstrated relevance in settings where timing and format substitution materially affect sales outcomes.

[61]Under the Copyright Act, there is nothing that compels a copyright owner to license their work. Copyright owners possess exclusive rights, including reproduction, distribution, and public display, which means they are not compelled to license their creative products. The owner maintains the right to decide how the work is used, preventing unauthorized use or refusing licensing requests. (Section 106 of the Copyright Act of 1976 (17 U.S.C. § 106))

As such, the various state legislative initiatives seem likely to do more harm than good in balancing the economic welfare of different stakeholders. Based on the analysis in this study, including our empirical results, these initiatives are likely to (a) contravene the Copyright Act and limit the ability of publishers and authors to exercise their independent business judgments as to how best to try to recoup the costs of their creative efforts through the sale of physical books and e-books; (b) shortchange the traditional community-building role of libraries by shifting emphasis away from physical books, which still account for the vast majority of library borrowing and a solid majority of the books consumed economy-wide; and (c) bring consumers and patrons little benefit, aside from potentially helping specific groups, such as people who are unable to visit the library, for whom alternative, less-injurious policy changes would likely provide better solutions.

B. Economic Impact of Proposed Legislation

This section will present an empirical analysis of the wider economic impact that could occur from the loss of trade sales emanating from e-book legislation to revise e-book pricing and related terms to libraries, such as has been proposed in a number of states.[63] In what follows, we estimate how initiating policy changes in one part of the economy (i.e., legislation impacting consumer book sales) affects overall economic activity, including jobs, labor income, value added, and output. The relationship between the increased share of e-books in public libraries and decreases in trade book sales has been demonstrated in Section III above. The purpose of the present analysis is to quantify how initial policy changes impacting trade book sales by different simulated amounts are likely to propagate through the broader economy. We quantify the overall economic impact assuming such a policy change occurred in all states and the District of Columbia.[64]

To conduct this analysis, we used the IMPLAN economic modeling platform, a widely adopted input-output modeling tool that captures the interdependence among industries within a specific geographic area. IMPLAN allows us to translate the initial effects of the policy-related drop in trade book sales into a broader set of consequences.

The reduced form estimates presented in the previous section consistently indicate that public library e book availability is associated with a reduction in retail book sales under current market conditions. These effects reflect contemporaneous substitution identified within the existing institutional environment, where digital lending is constrained by licensing limits and borrowing frictions. While the empirical models differ in their level of aggregation—ranging from state level analyses of library format composition to title level analyses of individual books—they are all designed to capture short run responses to changes in library access rather than longer run adjustments in consumption behavior. By construction, the title level specifications focus on own title effects, measuring how access to a

62 Windowing of books to libraries is widespread in Europe. Even in countries with strong library systems like the Netherlands and Germany, significant time lags (6 to 12 months) for library access to new e-books exist. *See, for example,* Porter Anderson, "Germany's E-Lending Round Table: 'A Constructive Process.'" Publishing Perspectives, 31 Oct. 2024, publishing-perspectives.com/2024/10/germanys-e-lending-round-table-a-constructive-process/; "Deal on eLending in the Netherlands: Interview with the Dutch Public Library Association." *IFLA*, 31 Oct. 2018, https://www.ifla.org/news/deal-on-elending-in-the-netherlands-interview-with-the-dutch-public-library-association/.

63 *See* Section II.

64 While not every state has at present proposed legislation to regulate e-book licensing to libraries, it is useful to see what the impact of a nationwide policy change would entail. Moreover, it would be possible to conduct a similar analysis for a single state or a group of states if that became the relevant policy question.

given book through the library affects purchases of that same book, while the state level model captures broader contemporaneous shifts in sales without isolating substitution across specific titles or authors. As a result, none of the quantitative model estimates fully incorporate cross title or cross author displacement that may arise when readers substitute toward library borrowing more generally, nor do they capture dynamic effects that unfold as expectations and reading habits adjust over time.

In practice, readers may make purchasing decisions within genres or categories rather than exclusively at the level of individual titles. A library patron who initially intends to borrow a particular science fiction book from the library instead of purchasing that book may still forego purchase even if that particular book is not available at the library, but easy borrowing of another appealing science fiction book is an option. Such substitution effects impact retail demand but are not identifiable in title level regressions that condition on sales of specific books. As a result, the reduced form estimates we make are likely to understate the total displacement that could arise if policy changes substantially expand digital library access and reduce borrowing frictions.

The economic impact scenarios therefore serve a complementary purpose to our modeling above. The empirical models in the previous section identify contemporaneous substitution effects under current institutional conditions and at different levels of aggregation; they do not, by themselves, specify how a particular legislative change would shift library format choices or eliminate borrowing frictions. The impact scenarios in this section, on the other hand, explore plausible aggregate outcomes under alternative assumptions about reader behavior and library access conditions. The simulated effects should be interpreted not as point predictions derived from the reduced form estimates, but as illustrative bounds that reflect additional channels of substitution—across titles, authors, and time—that are difficult to identify directly using observational sales data.

The ultimate drop in trade book sales resulting from any assumed policy change reducing frictions in library lending will ultimately depend on numerous factors that are not fully captured in the quantitative analysis in the previous section, including the extent to which digital lending constraints are relaxed, associated changes in borrowing wait times, reader willingness to substitute across titles or genres, and the persistence of substitution over time as expectations and reading habits adjust. Because these mechanisms are inherently difficult to estimate directly, we present the resulting economic impacts stemming fromsubstitution under a range of plausible initial sales displacement assumptions. Specifically, we simulate scenarios in which the policy change in question leads to an initial 1 percent, 2.5 percent, or 5 percent reduction in trade book sales, which together span conservative to more pronounced substitution responses and provide a transparent framework for evaluating the potential magnitude of aggregate effects. Appendix 2 provides a worked example showing how the state-level revenue elasticity in Section III.B can be translated into the mid-range 2.5% sales-displacement case used below under explicit assumptions about library price sensitivity and resulting changes in digital intensity; the IMPLAN results reported in this section are presented directly for the 1%, 2.5%, and 5% scenarios.

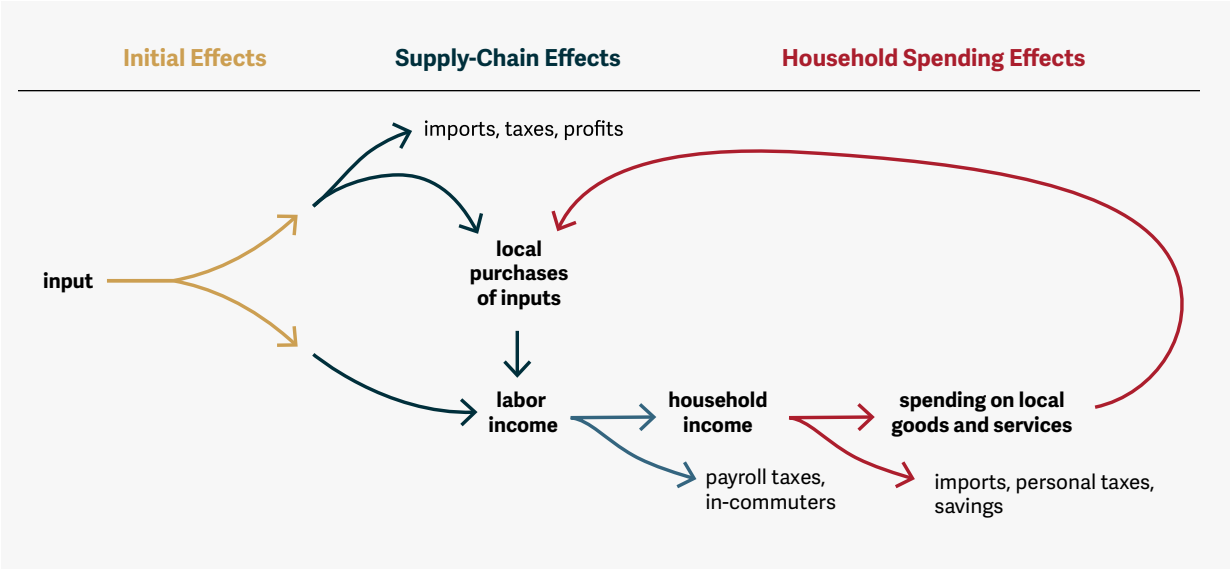
1. How Declining Book Sales Propagate Through the U.S. Economy

Figure 12 below is a graphic representation of the analysis, and shows how the losses resulting from the initial reduction in book sales do not affect only the directly impacted businesses (brick-and-mortar bookstores and e-commerce) but also the interconnected network involved in the production of books (publishers, authors, distributors, graphic designers, editors, book manufacturers, etc.) Bookstores and e-commerce retail facing fewer patrons may also scale back their expenditures in some goods and services (marketing, real estate, utilities, data services, etc.). These relationships represent the **supply-chain effects** of the initial economic shock of decreased book sales.

In addition to supply-chain linkages, affected businesses also reduce wages and employment, resulting in lower household income. A portion of this labor income is lost to taxes, savings, but the remainder is spent internally—on groceries, services, retail, and other household needs. In juxtaposition, when household income is reduced, households have to make difficult decisions in which spending will be foregone. This foregone spending constitutes the **household spending effects** of the economic shock, also demonstrated in **Figure 12** below. The income lost and foregone expenditure by households further destroys economic activity, generating a **multiplier effect** that circulates through the local economy.

This multiplier process continues in successive rounds of foregone expenditure, but with diminishing intensity, as each round experiences further leakages. Eventually, the ripple effects are fully absorbed by the economy. The IMPLAN model captures the total economic impact across all these channels—initial, supply-chain, and household spending—and quantifies the consequences in terms of employment, labor income, output, and value added for the entire U.S. economy.

Figure 12: IMPLAN Calculation Process



2. Assumptions Underlying the Economic Impact Analysis

This analysis relies on several assumptions regarding author income distribution and royalty structures. Reductions in author earnings were allocated across household income groups using nationally representative survey data on writers and authors, aligned with IMPLAN household income categories.[65] While the percentage reduction in earnings was assumed to be proportional across authors, the total impact was distributed according to the observed income distribution of author households. In addition, royalty rates were assumed to equal 25 percent of retail price for e-books and 6 percent for print books, reflecting commonly cited industry benchmarks.[66] These assumptions enable the translation of retail sales declines into changes in author labor income and the associated household spending effects captured in the model.

Publisher revenue and sales channel distribution were based on the Association of American Publishers (AAP) *CY 2024 StatShot Annual Report*.[67] Using reported trade sales data, revenues were allocated between e-commerce and physical bookstores and further divided between print and digital formats. Where necessary, category totals were derived from published tables to isolate format- and channel-specific sales.[68]

Retail markups for print and e-book formats were estimated using comparative pricing data. Specifically, average net unit prices (ANUP) reported in the AAP *CY 2024 StatShot Annual Report* were compared with publicly available average retail prices used by libraries to evaluate return on investment (ROI).[69] These comparisons were used to approximate format-specific markups necessary to translate retail sales into publisher revenue within the model.

65 Author household income distribution was derived from the 2024 American Community Survey (ACS) 1-Year Estimates Public Use Microdata Sample (PUMS), using Housing Unit Weights (WGTP) and filtering for the occupation code corresponding to Writers and Authors. Observations were aggregated into household income brackets corresponding to IMPLAN household income categories.

66 The e-book royalty rate (25 percent of retail price) reflects standard industry contract terms for digital formats, while the 6 percent rate for print books represents a simplifying assumption consistent with commonly cited paperback royalty rates (*see* https://spines.com/author-book-royalties-how-much-do-authors-get-paid/).

67 Revenue data were obtained from the Association of American Publishers (AAP) CY 2024 *StatShot Annual Report*.

68 Online retail trade sales were drawn from Table 3.3. Total trade retail sales by format were drawn from Table 2.1. Online print sales were calculated by summing hardback and paperback revenues reported in Table 3.3. Physical bookstore e-book sales were estimated as the difference between total e-book revenue (Table 2.1) and online e-book revenue (Table 3.3). Similarly, physical bookstore print sales were calculated as the difference between total hardback and paperback revenues (Table 2.1) and the corresponding online print revenues (Table 3.3).

69 Average net unit prices (ANUP) for paperback and e-book formats were obtained from the AAP *CY 2024 StatShot Annual Report*. Retail price benchmarks were drawn from publicly available pricing information from the Massachusetts Library Association and Chelmsford Public Library, which publish average price figures for ROI calculations (*see* https://www.swissarmylibrarian.net/librarycalculator/valuecalc_costs.html). Markups were calculated as the proportional difference between average retail prices and ANUP for each format.

3. Estimated Economic Impacts of Reduced Trade Book Sales

The economic impact of reduced trade book sales can be expressed in terms of lost economic output.[70] In this analysis, *output* refers to the total value of goods and services produced across the U.S. economy as a result of trade book sales activity. It captures not only the direct revenue generated by bookstores and publishers, but also the business-to-business purchases that support production and the household spending supported by wages in the industry.

Under the model, a 1 percent decline in trade book sales results in an estimated **$1.12 billion** reduction in U.S. output; a 2.5 percent decline results in a **$2.81 billion** reduction; and a 5 percent decline results in a **$5.62 billion** reduction. **Figure 12** presents these estimated losses, reflecting the full ripple effects of reduced book sales throughout the broader economy. Across all scenarios, the total reduction in economic output substantially exceeds the initial decline in trade book sales, underscoring the importance of ripple effects in the book ecosystem. This pattern reflects the industry's deep integration with upstream suppliers and downstream household spending, meaning that even relatively modest initial shocks to retail book sales propagate broadly through the economy.

70 In input–output modeling, "output" represents the total value of industry production, including intermediate goods and services purchased along the supply chain. As a result, output is broader than gross domestic product (GDP) or value added, which exclude intermediate inputs and measure only the net contribution to the economy (labor income, profits, and taxes on production).

Figure 13: Output Loss ($ Million)

	1% Drop	2.5% Drop	5% Drop
Inital Effects	$264.03	$660.08	$1,320.16
Supply-Chain Effects	$468.21	$1,170.53	$2,341.07
Household Spending Effects	$390.98	$977.44	$1,954.88
Total	$1,123.22	$2,808.05	$5,616.11

Another key measure of economic impact is **value added**, which captures the net contribution of each sector to the economy by measuring the difference between gross output and the cost of intermediate inputs. Unlike output, which includes the total value of all sales and transactions, value added reflects the portion retained by businesses and workers in the form of wages, profits, and taxes. It closely aligns with gross domestic product (GDP).

Figure 14 below details the estimated losses in value added across industries in the United States with the sensitivity analyses. Value added is projected to decline by **$659.28 million** considering a 1 percent drop in trade book sales, **$1.65 billion** with a 2.5 percent decline, and **$3.30 billion** with a 5 percent decline.

Figure 14: Value Added ($ Million)

	1% Drop	2.5% Drop	5% Drop
Inital Effects	$155.47	$388.67	$777.34
Supply-Chain Effects	$273.26	$683.15	$1,366.30
Household Spending Effects	$230.55	$576.37	$1,152.73
Total	$659.28	$1,648.19	$3,296.37

The reduction in trade book sales are expected to significantly affect employment. Under a 1 percent decline in trade book sales, the analysis estimates a loss of **4,797 jobs**; a 2.5 percent decline is associated with an estimated loss of **11,992 jobs**; and a 5 percent decline is projected to result in **23,984 jobs** lost across the United States. **Figure 15** presents the estimated employment impacts for each scenario. The near proportional scaling of output, employment, and income losses across the three scenarios reflects the linear structure of input–output linkages captured by the IMPLAN framework. This proportionality implies that larger initial disruptions to trade book sales generate correspondingly larger economic losses, rather than dissipating through offsetting adjustments elsewhere in the supply chain.

Figure 15: Employment

	1% Drop	2.5% Drop	5% Drop
Inital Effects	1,007	2,518	5,036
Supply-Chain Effects	2,088	5,219	10,438
Household Spending Effects	1,702	4,255	8,510
Total	4,797	11,992	23,984

The long-term reduction in trade book sales is expected to have uneven effects across the labor market, with some occupational groups bearing a disproportionate share of the employment losses. **Figure 16** presents the estimated distribution of these impacts by occupation group,[71] detailing the effects in terms of jobs lost, hours reduced, and employee compensation. The most heavily affected group is **Sales and Related Occupations (41-0000)**, which accounts for **16.4 percent** of the total job losses—highlighting the severe disruption to the sales and related industries.[72] The second most impacted group is **Office and Administrative Support Occupations (43-0000)**, representing **12.4 percent** of lost employment, reflecting the downturn in administrative support services. **Transportation and Material Moving Occupations (53-0000)** follow with **10.5 percent** of job losses, while **Management Occupations (11-0000)** experienced **9.1 percent** of the impact. These figures and the occupational distribution of employment losses highlights that the economic effects of reduced trade book sales extend well beyond authors and publishers. The concentration of losses in sales, administrative support, transportation, and management occupations demonstrates how downstream retail activity and logistics amplify the initial shock across the broader labor market. This dispersion effect underscores that policies affecting digital library lending can have ripple effects in sectors that are not conventionally viewed as part of the publishing industry.

71 Employment is allocated into standardized occupation codes to enable consistent classification and comparison of job types across industries and geographic areas. This system, known as the Standard Occupational Classification (SOC), groups workers based on the nature of their job duties and the type of work performed. More information about each occupation code, including detailed descriptions and examples of included roles, can be found on the U.S. Bureau of Labor Statistics website at www.bls.gov/soc.

72 The 'Sales and Related Occupations (41-0000)' category follows the U.S. Bureau of Labor Statistics Standard Occupational Classification (*see* footnote 65) and includes retail salespersons, cashiers, and sales representatives involved in the distribution of goods to consumers and businesses. This group is particularly affected because reductions in trade book sales directly lower demand for retail and distribution activities.

Figure 16: Occupation Specific Impact

Occupation Code(s)	Occupation Group	Employment	Hours Worked	Employee Comp.
41-0000	Sales Related Occupations	16.39%	14.59%	10.37%
43-0000	Office and Administrative Support Occupations	12.35%	12.20%	8.91%
53-0000	Transportation and Material Moving Occupations	10.54%	10.68%	7.04%
11-0000	Management Occupations	9.10%	10.75%	20.30%
13-0000	Business and Financial Operations Occupations	8.64%	9.33%	12.03%
15-0000	Mathematical Occupations	7.81%	8.46%	13.82%
29-0000 - 31-0000	Healthcare Practioners and Technical Occupations	6.44%	6.35%	6.14%
35-0000	Food Preparation and Serving Related Occupations	6.31%	4.96%	2.57%
51-0000	Production Occupations	4.28%	4.53%	2.94%
27-0000	Arts, Design, Sports, and Media Occupations	3.50%	3.41%	3.75%
All Others		17.53%	17.41%	13.42%

In addition to job losses, the drop in in trade book sales is projected to reduce labor income across affected sectors. Total labor income losses are estimated at **$364.44 million** with a 1 percent decline in trade book sales, **$911.09 million** with a 2.5 percent decline, and **$1.82 billion** with a 5 percent decline, reflecting decreased wages, salaries, and proprietor earnings tied to reduced economic activity. **Figure 17** below outlines the annual and cumulative labor income effects resulting from the drawdown. Comparing the employment and labor-income impacts reveals that the reduction in trade book sales affects not only the number of jobs, but also the intensity of earnings losses among remaining workers.

Declines in labor income reflect a combination of job separations, reduced hours, and lower proprietor earnings, indicating that the economic impact extends beyond headline employment figures to broader household financial stability.

Figure 17: Labor Income ($ Million)

	1% Drop	2.5% Drop	5% Drop
Inital Effects	$56.46	$141.15	$282.31
Supply-Chain Effects	$185.35	$463.36	$926.73
Household Spending Effects	$122.63	$306.58	$613.16
Total	$364.44	$911.09	$1,822.20

Notably, a substantial share of the projected tax revenue losses accrues at the local level, where budgets are often most constrained and where public libraries are most directly funded. The drop in trade book sales may result in a total loss of approximately **$140.61 million** in tax revenues for a 1 percent reduction, **$351.53 million** for a 2.5 percent reduction, and **$703.07 million** for a 5 percent reduction. Of this total, an estimated **$106.39 million** represents foregone local taxes—revenues that would have otherwise supported essential county and municipal services, including public libraries. **Figure 18** below details the estimated annual and cumulative tax revenue impacts over the drawdown period.

The estimated reductions in tax revenue shown in **Figure 18** also raise an important fiscal feedback consideration. Public libraries rely heavily on government funding—particularly from local and state sources—to support acquisitions, staffing, programming, and capital investments. When trade book sales decline, the resulting contraction in economic activity reduces income, sales, and business tax revenues that flow to these same public budgets. To the extent that libraries are funded out of general revenues rather than earmarked streams, the policy induced erosion of the tax base may ultimately constrain future appropriations for library systems themselves. In this sense, part of the intended benefit of expanded digital library access may be offset by diminished fiscal capacity to sustain or enhance library services over time.

More broadly, foregone tax revenues impose opportunity costs that extend well beyond libraries. Lost public revenues reduce governments' ability to fund a wide range of services and investments, including in education, public safety, transportation, health services, and social programs. Because

Figure 18: Foregone Tax Revenue ($ Million)

	1% Drop	2.5% Drop	5% Drop
Local	$21.27	$53.19	$106.39
State	$28.41	$71.02	$454.64
Federal	$90.93	$227.32	$142.04
Total	$140.61	$351.53	$703.07

these services are often complementary to workforce participation and household well being, reductions in public spending can generate additional indirect economic effects that compound the initial shock from reduced book sales. While these downstream impacts are not explicitly modeled in the present welfare analysis, the magnitude of the estimated tax revenue losses underscores that policy changes affecting digital library lending have implications that reach beyond the publishing ecosystem, shaping the fiscal environment in which multiple public services operate.

4. Economic Impact Specific to Foregone Author Royalties

In addition to estimating impacts on the publishing ecosystem itself, this analysis isolates the household-level effects attributable specifically to foregone author royalty income, which should be viewed as a component of the broader labor-income impacts reported above, rather than as an additional, separately additive impact. Royalty payments constitute a source of household income for authors and creative professionals, and reductions in these payments translate into lower purchasing power for those households. Because royalty income is often discretionary, uneven, and weakly insured, reductions in author earnings may translate more directly into immediate changes in household consumption than equivalent income losses in more stable wage-based occupations. To capture these downstream effects, we model the decline in consumption that would occur if authors received less royalty income under the policy scenario being evaluated.

Using the IMPLAN input–output framework, the analysis begins with the estimated reduction in royalty income received by authors. Because authors receive royalties as household income rather than through an industrial production process, the loss of royalties is modeled as a reduction in household income.[73] IMPLAN then applies empirically derived household spending patterns to estimate how this income loss translates into reduced expenditures across different sectors of the economy. These estimated reductions represent the direct decline in consumer spending by authors that would occur in the but-for scenario in which royalty payments are lower.

To illustrate how these spending reductions would affect the broader economy, the modeled decreases in household expenditures are grouped into major categories reflecting common areas of consumption. These include **Housing and Real Estate; Healthcare; Monetary Authorities, Finance, and Insurance; Transportation; Restaurants; Retail; Data and Telecommunications; Education; Entertainment;** and **Other household expenditures**, and our estimated impacts are shown in **Figure 19** below. These groupings correspond to clusters of industries within the IMPLAN framework that collectively represent the types of goods and services typically purchased by households.

73 In the IMPLAN modeling framework, reductions in household income are treated as induced (household spending) effects, because they originate from changes in household earnings rather than from an industry production function. In this analysis, the estimated reduction in author royalties is modeled as a decline in household income for authors. IMPLAN applies household expenditure patterns to translate this income change into reductions in consumer spending across industries. The resulting direct spending estimates represent the decline in author consumption associated with lower royalty income, while additional indirect and induced effects capture the broader economic adjustments generated as affected businesses and workers reduce their own spending.

Figure 19: Impact Specific to Foregone Author Royalties ($ Million)

Industry	Output
Housing and Real Estate	$7.08
Healthcare	$6.03
Monetary Authorities, Finance, and Insurance	$5.99
Transportation	$3.24
Restaurants	$3.12
Household Retail	$3.08
Data and Telecomunication	$2.33
Education	$0.86
Entertainment	$0.33
All Others	$20.96

Figure 19 illustrates that the consumption effects of reduced author royalty income are widely dispersed across core household spending categories rather than concentrated in any single sector. The largest output effects occur in housing and real estate, healthcare, and financial services—categories that reflect essential or quasi-fixed household expenditures—indicating that income losses constrain spending even in areas that are difficult to adjust in the short run. At the same time, meaningful reductions in transportation, restaurants, retail, and telecommunications underscore how discretionary spending contracts in response to reduced earnings.

This broad distribution of impacts highlights that declines in creative-sector income reverberate throughout the economy, affecting industries with no direct connection to publishing or the arts. Reduced household spending by authors translates into lower revenues for businesses across these sectors, which in turn dampens demand for intermediate inputs and labor, further propagating the initial income shock through supply chains and the broader economy.

V. Conclusion

Against a backdrop of modest declines in library collection spending and a substantial shift from purchasing physical books to licensing e-books, this report presents a detailed, multi-faceted empirical analysis of state legislative proposals that would impose government-set restrictions on licensing agreements for electronic literary works between publishers, aggregators, and libraries with the aim of expanding frictionless e-book lending. This research demonstrates that increased frictionless lending of electronic literary works has a statistically significant negative impact on consumer book markets. It shows that there is robust and economically meaningful evidence of direct substitution between library e-lending and retail sales, particularly early in a title's lifecycle. Based on these findings, and the experience in book markets outside the US and in the markets for other types of creative content both in the US and in other countries, windowing, in conjunction with other freely negotiated licensing terms, represents an economically rational method a publisher might choose to employ as part of its overall strategy to recover reasonable consideration for the copyrighted works they publish.

In addition, the report notes that while libraries play an important role in providing access to literature and fostering literacy, increased frictionless lending that allows patrons to access materials at the push of a button is a dramatically different model for libraries that potentially threatens their traditional role as community centers.[74]

These findings suggest that state legislative efforts related to public library e-lending, however well-intentioned, present significant negative consequences for the publishing ecosystem and consumers by exacerbating substitution between e-lending and retail sales, which threatens to destabilize the commercial book market. The impact of these legislative efforts will be felt by authors and their publishers whose livelihoods and business models depend on robust and sustainable revenue streams, by independent bookstores and state and local economies that will suffer lost revenues, and by consumers who will ultimately suffer from reduced supply.

The evidence-based analysis provided in this study will hopefully inform policy decisions related to public library e-lending, to the benefit of libraries, their patrons, authors and their publishers, and the entire reading public.

74 *See* the American Library Association's statement of libraries as a public good, "About ALA & Our Mission", April 11, 2026, available at https://www.ala.org/aboutala.

Appendix 1—Methodology For Empirical Analysis

A. State-Level Format Intensity and Print Book Sales

The key explanatory variable is a measure of digital intensity within each state's public library system (*i.e.*, the share of holdings or acquisitions in digital formats).

The empirical analysis can be expressed as

$$\log(Sales_{s,t}) = \beta_1 EbookShareLib_{s,t} + X_{s,t} + \gamma_s + \delta_t + \epsilon_{s,t}$$

where $\log(Sales_{s,t})$ is the natural logarithm of print unit sales in state s at year t;[75] δ_t is a vector of dummy variables for each year (year fixed effects)[76] with 2013 being the base year-month; γ_s is a vector dummy for each state (state fixed effects);[77] $EbookShareLib_{s,t}$ is the share of e-books in library collections for state s and year t; $X_{s,t}$ is a matrix of covariates, which includes state socio-demographics (the exact demographic measures included vary by specification, but among these are average household income), as well as available brick-and-mortar bookstores. This model effectively asks: holding constant the size of the collection and other observable factors, do states that reallocate their holdings toward digital formats experience different trends in print sales relative to their own prior levels?

As shown in **Figure A1**, across all estimated models, the estimated coefficient for the e-book share of library collection on unit sales is negative and statistically significant, with point estimates ranging from −0.899 to −0.852. These estimates imply that a one percentage point increase in the share of e-books in library collections is associated with approximately an 0.85 to 0.90 percent decrease in the sale of print books, holding constant state fixed effects, year fixed effects, and other covariates.

The magnitude and significance of the estimated substitution effect is robust to the inclusion of additional variables that control for the number of physical bookstores and purchasing power. The added controls are statistically significant and have a positive effect on overall unit sales which further validates that the model is estimating a genuine substitution effect from larger e-book shares of library collections. In addition, all models exhibit high explanatory power, with R^2 values exceeding 0.81, indicating that the specifications explain a substantial share of the variation in print sales revenue and units sold over time and across states.

75 An alternative specification replaces the print sale units by print sales revenue, both of which are obtained from Circana BookScan. In neither specification do we include e-book sales as those are observed on a national level through Circana PubTrack digital and cannot reliably be attributed to particular states. Our estimates of the effect of e-book licensing share on print book sales is likely quite conservative, as Cuccu et al. 2024 find that changes in e-book licensing policies have significantly higher impacts on e-book sales than on print sales.

76 Year fixed effects aim to capture unobservable characteristics that may make book sales in one year inherently different from another year—for example, a change in behavior that affected reader behavior in a particular year that fundamentally changed book purchasing behavior that couldn't readily be linked to changes in GDP, population, or any other things we can easily measure.

77 State fixed effects aim to capture unobservable characteristics that may make book sales levels in one state inherently different from another state (baseline reading culture, demographic composition, long-standing retail infrastructure, etc.).

Figure A 1: State Level Regression Output—Log Units Sold

Variable	Model (1)Baseline	(2)Bookstore Access	(3)Purchasing Power
E-Book Share of Library Collection	-0.899**	-0.852**	-0.895**
Number of Bookstores	-	0.007**	0.007**
Log (Average Income)	-	-	2.054**
Observations	516	516	516
R^2	0.813	0.817	0.819
State Fixed Effect	Yes	Yes	Yes
Year fixed Effect	Yes	Yes	Yes
	*+p<0.1,*p<0.05,**p<0.01,***p<0.0001*		

Figure A2 re-estimates the baseline, bookstore access, and purchasing power models, but uses the log of revenues instead of the log of units sold as the dependent variable. The estimated coefficient for the e-book share of library collection on unit sales is negative and statistically significant, with point estimates ranging from −0.883 to −0.833. These estimates are similar in magnitude to the model using the log of units sold as the dependent variable which suggests that the estimated decline in unit sales is a genuine substitution effect and not a decline in sales from higher prices.

As with the unit sales model, the added controls in the revenue model are statistically significant and have the expected sign. Moreover, the R^2 values exceed 0.81 across all models suggesting the specifications explain a substantial share of the variation in revenues from physical book sales across time and states.

Figure A 2: State Level Regression Output—Log Revenue

	Model		
Variable	**(1) Baseline**	**(2) Bookstore Access**	**(3) Purchasing Power**
E-Book Share of Library Collection	-0.883**	-0.833**	-0.879**
Number of Bookstores	-	0.007**	0.007**
Log (Average Income)	-	-	1.952**
Observations	516	516	516
R^2	0.816	0.820	0.822
State Fixed Effect	Yes	Yes	Yes
Year fixed Effect	Yes	Yes	Yes

*+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

B. Title-Level Analysis Using Seattle Public Library Data

For each title-month, we observe retail physical sales and the composition of library usage, including the share occurring through e-books. Because detailed monthly title-level e-book usage data are only available for SPL, the analysis focuses on SPL and corresponding local retail sales. All specifications include title fixed effects, which absorb time-invariant differences in title popularity or quality, and month fixed effects, which capture seasonality and aggregate market trends.

The unit of observation is title-by-time. The key explanatory variable is the digital intensity of that same title within SPL's collection. To isolate this mechanism, all models control for the *total volume* of SPL checkouts for a title in a given month.

The empirical analysis can be expressed as

$$\log(Sales_{i,t}) = \beta_1 EbookShareLib_{i,t} + \beta_2 EbookShareLib^2_{i,t} + \beta_3 ln(TotalCheckouts_{i,t}) + \beta_4 Vintage_{i,t} + \beta_5 (Genre_i \times EbookShareLib_{i,t}) + \beta_6 (Vintage_{i,t} \times EbookShareLib_{i,t}) + \beta_7 (PublicationAge_{i,t} \times EbookShareLib_{i,t}) + \beta_8 (PrintIntensity_i \times EbookShareLib_{i,t}) + \gamma_i + \delta_t + \epsilon_{i,t}$$

where $\log(Sales_{i,t})$ is the natural logarithm of print unit sales of title i in month t, δ_t is a vector of dummy variables for each year-month (year-month fixed effects) with January 2017 being the base year-month,[78] γ_i is a vector dummy for each title (title fixed effects),[79] $EbookShareLib_{s,t}$ is the share of e-books in library collections for title i and year-month t which also enters as a squared term to capture diminishing effects as the e-book share increases, in $(TotalCheckouts_{i,t})$ is

78 Time fixed effects should be able to capture national demand shocks and publishing cycles.

79 Title fixed effects should be able to absorb time-invariant characteristics such as inherent popularity, genre, author reputation, and franchise effects.

the natural log of total checkouts to account for total demand for a title, $Vintage_{i,t}$ is an indicator variable that marks whether a title i is front or back list at time t, $PublicationAge_{i,t}$ is the age in years since publication, $Genre_i$ is an indicator variable for genre of title i (Adult Fiction, Adult Non-Fiction, Young Adult Fiction, Young Adult Non-Fiction), and $PrintIntensity_i$ measures choice of print medium for a title by readers of a title at the Seattle Public Library averaged over time.[80] Title characteristics such as genre and format mix are fixed for each title over the sample (and thus captured by book fixed effects), so they are interacted with the e-book share variable to measure the effect that changes in e-book share have for different types of titles. Because variation occurs at the title level, this model provides a tighter alignment between library access and commercial outcomes. The inference is more direct than in the state-level model: it evaluates the relationship between digital availability and sales for the exact same title.

The baseline specification relates log physical unit sales to the e-book share of total SPL usage, controlling for total SPL checkouts and a simple vintage indicator distinguishing front list from back list titles. The baseline results are reported in column (1) of **Figure A3** below. We find a negative and statistically significant relationship between e-book share and physical sales. The estimated coefficient implies that a 25 percentage point increase in the e-book share of library usage is associated with roughly a 2 percent decline in retail physical sales, holding overall library engagement constant.

Column (2) of **Figure A3** adds heterogeneity by allowing the estimated effect to vary by genre, vintage, and publication age in years, and by permitting a nonlinear (quadratic) relationship between e-book share and sales. Column (3) of **Figure A3** additionally controls for the interaction between e-book share and print intensity of the title at the library, measured as the average share of SPL usage for that title occurring via physical copies.

Figure A4 re-estimates the baseline, heterogeneity, and print intensity specifications, but gives more influence to high-revenue by additionally weighing observed unit sales by revenue. The substitution effects implied by each specification are summarized in **Figure A5** below. Notably, cannibalization effects are substantially larger for these titles, implying that from a revenue perspective, substitution is much more severe. commercial outcomes. The inference is more direct than in the state-level model: it evaluates the relationship between digital availability and sales for the exact same title.

The baseline specification relates log physical unit sales to the e-book share of total SPL usage, controlling for total SPL checkouts and a simple vintage indicator distinguishing front list from back list titles. The baseline results are reported in column (1) of **Figure A3** below. We find a negative and statistically significant relationship between e-book share and physical sales. The estimated coefficient implies that a 25 percentage point increase in the e-book share of library usage is associated with roughly a 2 percent decline in retail physical sales, holding overall library engagement constant. Column (2) of **Figure A3** adds heterogeneity by allowing the estimated effect to vary by genre, vintage, and publication age in years, and by permitting a nonlinear (quadratic) relationship between e-book share and sales. Column (3) of **Figure A3** additionally controls for the interaction between e-book share and print intensity of the title at the library, measured as the average share of SPL usage for that title occurring via physical copies.

80 Age in years since publication varies by year, but not enough to be separately identified from the year-month fixed effects. Therefore, this variable only enters the regression interacted with e-book share.

Figure A 3: Title-Level Regression Output

	Model		
Variable	**(1) Baseline**	**(2) Add Heterogeneity**	**(3) Add Print Intensity**
$EbookShareLib_{i,t}$	-0.083***	-0.513***	-0.278***
$ln(TotalCheckouts_{i,t})$	0.270***	0.287***	0.286***
$Vintage_{i,t}$(Front List)	0.509***	0.449***	0.450***
$EbookShareLib^2_{i,t}$	-	0.327***	0.240***
$AdultNonFiction_i$ x $EbookShareLib_{i,t}$	-	0.050***	0.039***
$YoungAdultFiction_t$ x $EbookShareLib_{i,t}$	-	-0.145***	-0.135***
$YoungAdultNonFiction_t$ x $EbookShareLib_{i,t}$	-	0.097**	0.104**
$Vintage_{i,t}$ x $EbookShareLib_{i,t}$	-	0.124***	0.122***
$PublicationAge_{it}$ x $EbookShareLib_{i,t}$	-	0.007***	0.007***
$PublicationIntensity_i$ x $EbookShareLib_{i,t}$	-	-	-0.311***
Number of observations	2,172,735	2,172,735	2,172,735
Adjusted R-squared	0.671	0.672	0.672
Within R-squared	0.078	0.080	0.080
Title fixed effects	Yes	Yes	Yes
Month × year fixed effects	Yes	Yes	Yes

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Figure A4 re-estimates the baseline, heterogeneity, and print intensity specifications, but gives more influence to high-revenue by additionally weighing observed unit sales by revenue. The substitution effects implied by each specification are summarized in **Figure A5** below. Notably, cannibalization effects are substantially larger for these titles, implying that from a revenue perspective, substitution is much more severe.

Figure A 4: Title-Level Revenue-Weighted Regression Output

Variable	Model (1) Baseline	(2) Add Heterogeneity	(3) Add Print Intensity
$EbookShareLib_{i,t}$	-0.278***	-1.448***	-1.846***
$ln(TotalCheckouts_{i,t})$	0.396***	0.434***	0.434***
$Vintage_{i,t}$(Front List)	0.560***	0.386***	0.381***
$EbookShareLib^2_{i,t}$	-	0.708***	0.871***
$AdultNonFiction_i$ x $EbookShareLib_{i,t}$	-	0.502***	0.525***
$YoungAdultFiction_t$ x $EbookShareLib_{i,t}$	-	0.185*	0.169**
$YoungAdultNonFiction_t$ x $EbookShareLib_{i,t}$	-	0.724**	0.735**
$Vintage_{i,t}$ x $EbookShareLib_{i,t}$	-	0.334***	0.337***
$PublicationAge_{it}$ x $EbookShareLib_{i,t}$	-	0.134***	0.013***
$PublicationIntensity_i$ x $EbookShareLib_{i,t}$	-	-	0.459**
Number of observations	2,172,728	2,172,728	2,172,728
Adjusted R-squared	0.846	0.848	0.848
Within R-squared	0.154	0.164	0.165
Title fixed effects	Yes	Yes	Yes
Month × year fixed effects	Yes	Yes	Yes

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Figure A 5: Revenue-Weighted Percent Change in Seattle-Tacoma Unit Sales from a 25 Percent Increase in E-Book Share at the Seattle Public Library

Model	Front List	Back List
Baseline	-6.7%	-6.7%
Add Heterogeneity		
Adult Fiction	-13.5%	-18.3%
Adult Non-Fiction	-2.0%	-7.2%
Young Adult Fiction	-9.4%	-15.3%
Add Print Intensity		
Adult Fiction	-14.5%	-19.3%
Adult Non-Fiction	-1.7%	-7.4%
Young Adult Fiction	-11.1%	-16.7%

Note: All estimates are statistically significant at the 0.1% level.

C. Bestseller Model Using Pubtrack and Google Trends

We estimate title-month panel regressions of national e-book sales on library circulation intensity observed in the Seattle Public Library system. Specifications include author fixed effects to absorb time-invariant heterogeneity and year-month fixed effects to capture aggregate shocks. The control matrix includes flexible lifecycle controls, retail pricing measures, attention proxies (Google Trends), and format-level sales controls where available.

$$\log(Sales_{i,t}) = \alpha_a + \delta_t + \beta \log(LibSeattle_{i,t}) + X'_{i,t}\gamma + \epsilon_{i,t}$$

Where i is title, t = month/year, α_a is author fixed effect, δ_t is time fixed effect, $LibSeattle_{i,t}$ indicates whether title i is available at the Seattle Library at time t, $X_{i,t}$ is a matrix of control variables that includes frontlist versus backlist status, title specific popularity as proxied by Google Trends search intensity (the construction of this variable is explained subsequently), fiction subcategories, and, to measure the degree of a title's premium status, list price per page.

This model combines:

- National sales data (improving external validity),
- Title-level variation (improving precision),
- A demand proxy (reducing simultaneity bias),
- A focus on bestsellers (mitigating geographic idiosyncrasy).

We started by identifying the titles that occupied the top 750 most sold e-books on PubTrack (Circana) from 2017-2024 in terms of revenue. Only titles with Supercategory *Adult Fiction* or *Young Adult Fiction* status were included in the search.

As part of the preparation for this model we have also conducted a tokenization process in which we parse titles and authors' names, and strip them of any accents, extra spaces, or punctuation marks that may interfere with conducting a proper string search on a platform such as Google Trends. We have also removed any unnecessary articles that may complicate the identification of search terms (for example, for the franchise *The Lord Of The Rings* we would consider searches with "lord" + "rings" without requiring the additional articles to be included in the search. Moreover, we would require both of these terms to be included in the search in this order, to avoid unrelated searches, such as people looking exclusively for rings).

The included titles are further restricted to minimize measurement error by including author's last name as the last search term, and by only keeping relatively unambiguous search terms. For example, titles such as *Harry Potter* are unlikely to generate unrelated searches, whereas more generic phrases (e.g., *Catching Fire*) may produce noise due to non-book-related queries. By limiting the sample to titles with distinctive search terms and capping the total number of titles, we improve the reliability of the popularity control.

Google Trends restricts each query to a maximum of five search terms. Because our analysis requires search interest for all bestseller titles to be measured on a common scale, it was necessary to split the full set of titles across multiple Google Trends queries. To ensure comparability across these separate queries, we included the same reference title in every query and subsequently normalized all search-intensity measures relative to that title. This approach allows search interest for all titles to be placed on a consistent, unified scale despite the query limitation. Queries were also limited to those in the United States.

The choice of reference title is therefore crucial. The normalization title must (i) exhibit continuous search activity throughout the entire sample period and (ii) display relatively stable search behavior, without sharp spikes, troughs, or missing observations that could distort relative scaling. Based on these criteria, *A Court of Thorns and Roses* was selected as the control title: it maintains consistent national search interest across the full-time horizon, lacks event driven popularity shocks, and contains no gaps in the Google Trends series, making it a reliable baseline for normalization.[81]

The final analytic sample consists of 600 best selling fiction titles selected to remain broadly representative of the contemporary fiction market. Publication years span from 2000 to 2023,[82] capturing both established backlist titles and more recent releases. The distribution of book length is wide, with an average of 364 pages, a first quartile at 261 pages, a third quartile at 480 pages, and a maximum length of 1,192 pages. The sample includes works from 93 distinct authors and covers nine major fiction subcategories: general fiction, suspense/thriller, mystery/detective, fantasy, romance,

81 See discussion around Figure 9.

82 The missing data for titles that were published later than the beginning of our data have been appropriately dealt with in econometrics modeling and causal analysis, such as recommended in Brantly Callaway and Pedro HC Sant'Anna. "Difference-in-differences with multiple time periods." *Journal of Econometrics* 225.2 (2021): 200-230; Brantly Callaway, Andrew Goodman-Bacon, and Pedro HC Sant'Anna. "Event studies with a continuous treatment." *AEA Papers and Proceedings*. Vol. 114. 2014 Broadway, Suite 305, Nashville, TN 37203: American Economic Association, 2024; Andrew Baker et al. "Difference-in-differences designs: A practitioner's guide." *arXiv preprint arXiv:2503.13323* (2025).

science fiction, action/adventure, classics, and horror/occult/psychological. Taken together, this breadth across publication timing, length, authorship, and genre supports the external validity of the analysis by ensuring that estimated effects are not driven by a narrow subset of titles but are informative about demand patterns in best selling fiction more broadly.

As shown in **Figure A6**, across all specifications, making a bestseller fiction title available through a library digital collection is associated with a statistically significant decline in sales outcomes. In the baseline model (A6.1), library availability is linked to a 0.187 percent reduction in sales, holding constant title popularity (measured using Google Trends), frontlist versus backlist status, author fixed effects, and month and year fixed effects. When subcategory fixed effects are added in Model (A6.2), the estimated effect increases in magnitude to −0.276 percent, suggesting that part of the baseline estimate was attenuated by unobserved genre level heterogeneity. The effect remains highly statistically significant and grows slightly further in Model (A6.3), where price per page is included as an additional control, yielding an estimated sales reduction of 0.283 percent. The stability and monotonic increase in magnitude across specifications indicate that the negative association between library availability and sales is robust to increasingly rich controls.

Figure A7 reinforces these findings using state level variation in log sales revenue. The estimated effects at the state level closely mirror the title level results, with coefficients ranging from −0.196 percent in the baseline model (A7.1) to −0.267 percent when subcategory fixed effects are included (A7.2), and −0.249 percent when controlling for price per page (A7.3). The similarity in magnitude across levels of aggregation suggests that the observed relationship between library access and sales is not driven by idiosyncratic title level noise but instead reflects a broader pattern that persists when exploiting geographic variation in retail outcomes. Model fit improves substantially in both figures as additional controls are introduced, with R^2 rising from 0.469 to 0.614 in the title level regressions and from 0.506 to 0.683 in the state level specifications, indicating that genre composition and pricing explain a meaningful share of residual variation.

Across all models, the estimated coefficients on control variables are economically intuitive and stable. Title popularity is strongly and positively associated with sales in all specifications, confirming the importance of controlling for time varying demand shocks. Frontlist titles consistently exhibit substantially higher e-book sales than backlist titles, although the magnitude of this effect declines as subcategory and price controls are added, reflecting overlap between release timing, genre, and product positioning. In **Figure A6**, price per page enters negatively and significantly, indicating lower sales for more premium priced titles, while at the state level the coefficient is small and statistically insignificant, suggesting that pricing effects operate more strongly at the title level than through cross state variation. Taken together, the alignment of results across units sold measures, revenue outcomes, and levels of aggregation provides robust evidence that public library digital availability displaces an economically meaningful share of retail e-book sales, rather than reflecting spurious correlations driven by popularity, genre, pricing, or author level heterogeneity.

Figure A 6: State Level Regression Output—Log Units Sold

	Model		
Variable	**(A6.1) Baseline**	**(A6.2) Subcategory**	**(A6.3) Price Per Page**
E-Book Available At Library Collection	-0.187***	-0.276***	-0.283***
Popularity (GTrends)	0.022***	0.016***	0.027***
Vintage (Front List)	0.964***	0.841***	0.767***
$EbookShareLib^2_{i,t}$	-	0.708***	0.871***
Price Per Page	-	-	-0.056***
Observations	9880	7205	5661
R^2	0.469	0.599	0.614
Author FE	Yes	Yes	Yes
Month FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Subcategory FE	No	Yes	Yes

*+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

Figure A 7: State Level Regression Output—Log Revenue Sold

	Model		
Variable	**(A7.1) Baseline**	**(A7.2) Subcategory**	**(A7.3) Price Per Page**
E-Book Available At Library Collection	-0.196***	-0.267***	-0.249***
Popularity (GTrends)	0.022***	0.017***	0.029***
Vintage (Front List)	1.172***	0.983***	0.864***
$EbookShareLib^2_{i,t}$	-	-	0.018
Price Per Page	-	-	-0.056***
Observations	9880	7205	5661
R^2	0.506	0.656	0.683
Author FE	Yes	Yes	Yes
Month FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Subcategory FE	No	Yes	Yes

*+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

Appendix 2—Price-Sensitivity Model Of Library Digitization And An Implied Revenue Impact

This appendix provides an illustrative calibration showing how the state-level revenue elasticity in Section III.B can be mapped into the mid-range 2.5% sales-displacement scenario used in Section IV.B under explicit assumptions about library price sensitivity and resulting changes in digital intensity; the economy-wide outcomes for the 1%, 2.5%, and 5% scenarios are reported in Section IV.B.

Let $\mathbf{s}_i \in (0,1)$ denote library system i's digital intensity, measured as the share of e-books in total books (e-books divided by total books). This is the same conceptual "e-book share" object used as the key explanatory variable in the state-level regressions.

Let $m \equiv {}^{P_E}/_{P_p}$ denote the relative effective price of e-books to print books faced by libraries. "Effective price" is meant broadly to include any policy-driven changes in license terms, renewals, or other features that affect the cost of sustaining e-book access, not just sticker price. A policy that makes e-books relatively cheaper for libraries corresponds to m < 1.

We model each library's post-policy digital intensity as a bounded response to relative prices:

$$s_i(m;\ \eta) = \frac{s_i^0 \ \cdot\ m^{-\eta}}{s_i^0 \ \cdot\ m^{-\eta} \ +\ \left(1 \ -\ s_i^0\right)}$$

where: s_i^0 is library i's baseline (pre-policy) digital intensity; η > 0 is a price sensitivity parameter. This functional form is convenient because it respects the fact that digital intensity is a bounded share: for any *0 < s_i^0 < 1*, the implied post-policy share remains between zero and one and therefore cannot exceed full digitization. Taking log-odds, we have:

$$ln\left[\frac{s_i}{1-s_i}\right] \ = \ ln\left[\frac{s_i^0}{1-s_i^0}\right] \ - \ \eta \ \cdot \ ln(m)$$

so that η can be interpreted as governing how strongly a library's digital-vs.-print balance responds to changes in relative effective costs. Differentiating with respect to ln(m) gives:

$$\frac{\partial s_i}{\partial ln(m)} \ = \ -\eta \ \cdot \ s_i(m;\ \eta) \ \cdot \ [1 \ - \ s_i(m;\eta)]$$

which makes clear that the magnitude of the response depends on the current share. The term $s(1-s)$ is largest around s=0.5 and shrinks toward zero as s approaches either bound.[83] In practical terms, libraries that are already highly digital have less room to increase their digital intensity further, while libraries at very low digital shares respond less in levels unless the price change is large. Baseline digitization is therefore central to the implied aggregate shift.

This calibration is motivated by the same broader economic reasoning discussed in the report's literature review: library acquisition choices can respond to changes in e-book terms, and library users may substitute across formats when relative access conditions change. At the same time, the appendix does **not** estimate η from the data used in the report. Instead, η is treated as a sensitivity parameter, and the exercise is used only to illustrate how the estimated state-level relationship can be mapped into a policy-style scenario under explicit assumptions.

83 That is, it shrinks toward zero as s → 0 or $\boldsymbol{s}$ → 1.

The empirical anchor for the exercise is the state-level log(revenue) specification in Section III.B. In the full-sample specification with household income included, the estimated effect of increasing e-book share is approximately $\beta \approx -0.879$, reported as roughly a -0.88% change in revenue per +1 percentage point increase in e-book share. We use the log-linear mapping:

$$\Delta ln(Revenue) \approx \beta \cdot \Delta s$$

where Δs is measured on a 0-1 scale (so 0.01 equals 1 percentage point). To align this appendix with the mid-range scenario used in Section IV.B, we impose a 2.5% revenue decline such that Δln("Revenue")=ln(0.975). This implies:

$$\Delta s = \frac{ln(0.975)}{\beta}$$

Using $\beta = -0.879$ yields $\Delta s \approx 0.0288$, i.e., an increase of approximately 2.88 percentage points in average e-book share. This step should be understood only as a bridge between the magnitude of the estimated elasticity in Section III.B and the illustrative 2.5% displacement case used in Section IV.B. It is not a separate reduced-form estimate.

Because library-level baseline values are not observed individually in this appendix, we approximate the national distribution using summary information for e-books over total books and then solve, for each value of η, for the relative effective price change that would generate the illustrative Δs=0.0288. The resulting calibration is shown below. These values are intended only to illustrate the implied size of the relative price shift under alternative assumptions about library responsiveness; they are not themselves estimated from the regressions in Section III.B.

Figure A 8: Implied Relative E-Book Price Decrease Required to Generate the Illustrative 2.5% Sales-Displacement Scenario

Lower sensitivity	Price Sensitivity	Implied Relative Price Decrease
Libraries are less responsive to relative price changes, so you need a larger price change to get the same aggregate digitization shift.	(η = 0.5)	27.6%
Unit elastic/moderate sensitivity		
digital-vs.-print odds ratio responds proportionally to relative prices.	(η = 1.0)	14.9%
Higher sensitivity		
libraries are more responsive, so a smaller relative price change is enough to generate the same shift in digital intensity. That is exactly why the table shows smaller implied price decreases as η rises.	(η = 1.5) (η = 2.0) (η = 3.0)	10.2% 7.8% 5.2%

Note: The parameter η measures the responsiveness of the digital-versus-print holdings balance to changes in relative e-book cost: when η=1, the odds of digital holdings relative to print change proportionally with the relative effective price of e-books, while larger values imply greater responsiveness and smaller values imply weaker responsiveness.

The intuition is straightforward: when libraries are more price-sensitive (higher η), a smaller change in relative effective e-book prices is needed to generate a given aggregate shift toward digital holdings. Conversely, when price sensitivity is lower, a larger change in relative terms is required to produce the same increase in digital intensity.

Importantly, this appendix does **not** convert this illustrative mapping into dollar impacts or full economy-wide outcomes. The economy-wide impacts corresponding to the 2.5% sales-displacement scenario—as well as the analogous results for the 1% and 5% scenarios—are reported in Section IV.B.

Appendix 3—References

1. About Amazon. "A Look Back at 10 Years of the Amazon Kindle." November 1, 2017. https://www.aboutamazon.com/news/devices/a-look-back-at-10-years-of-the-amazon-kindle/.
2. Reese, Phillip. "Sacramento Library Regulars Choosing Electronic Options over Old-School Books." *Abridged*. April 13, 2026. https://www.abridged.org/news/sacramento-library-regulars-choosing-electronic-options-over-old-school-books/.
3. American Library Association. "About ALA and Our Mission." Accessed April 11, 2026. https://www.ala.org/aboutala.
4. American Library Association. Digital Public Library Ecosystem 2023. 2023. https://www.ala.org/sites/default/files/advocacy/content/ebooks/Digital-PL-Ecosystem-Report%20%281%29.pdf.
5. American Library Association. Gen Z and Millennials: How They Use Public Libraries and Identify Through Media Use. September 2023. https://www.ala.org/sites/default/files/advocacy/content/tools/Gen-Z-and-Millennials-Report%20%281%29.pdf.
6. American Library Association, *Libraries: An American Value*, adopted February 3, 1999, available at: https://www.ala.org/advocacy/intfreedom/americanvalue.
7. American Library Association's statement of libraries as a public good, "About ALA & Our Mission", April 11, 2026, available at https://www.ala.org/aboutala
8. Anderson, Porter. "Germany's E-Lending Round Table: 'A Constructive Process.'" *Publishing Perspectives*, October 31, 2024. https://publishingperspectives.com/2024/10/germanys-e-lending-round-table-a-constructive-process/.
9. CY 2024 StatShot Annual Report. Association of American Publishers (AAP), August 22, 2025. https://publishers.org/news/aap-statshot-annual-report-publishing-revenues-totaled-32-5-billion-for-calendar-year-2024/.
10. Association of American Publishers v. Frosh, 586 F. Supp. 3d 379, 389 (D. Md. 2022).
11. Authors Guild. "A New Twist in Ebook Library Licensing Fees." June 21, 2019. https://authorsguild.org/blog/a-new-twist-in-ebook-library-licensing-fees/.
12. Authors Guild. Digital Library Book Lending Market Report. December 9, 2025. https://authorsguild.org/app/uploads/2026/06/Codex-Authors-Guild-Digital-Library-Lending-Study-Updated-Report-12925-003.pptx-Read-Only-1.pdf.
13. Baker, Andrew, et al. "Difference-in-Differences Designs: A Practitioner's Guide." *arXiv preprint* arXiv:2503.13323 (2025).
14. Callaway, Brantly, and Pedro H. C. Sant'Anna. "Difference-in-Differences with Multiple Time Periods." *Journal of Econometrics* 225, no. 2 (2021): 200–230.
15. Callaway, Brantly, Andrew Goodman-Bacon, and Pedro H. C. Sant'Anna. "Event Studies with a Continuous Treatment." *AEA Papers and Proceedings* 114 (2024).
16. Capitol Records, LLC v. ReDigi Inc., 910 F.3d 649, 657–59 (2d Cir. 2018).
17. Chen, Hailiang, Yu Jeffrey Hu, and Michael D. Smith. "The Impact of E-book Distribution on Print Sales: Analysis of a Natural Experiment." *Management Science* 65, no. 1 (2019). https://www.cmu.edu/entertainment-analytics/documents/technology-impact-on-entertainment/the-impact-of-ebook-distribution.pdf.
18. Circana. BookScan and PubTrack Digital Data. Accessed February 2026. https://www.circana.com/industries/books.

Appendix 3—References

19. Cuccu, Liliana, et al. "The Economic Impact of E-lending in Public Libraries on the Consumer Book Market." *Deutsches Institut für Wirtschaftsforschung*, 2024. https://www.econstor.eu/bitstream/10419/325295/1/193328465X.pdf.

20. Dimitrije Curcic, "Library Funding Statistics," *WordsRated*, March 8, 2023, available at: https://wordsrated.com/library-funding-statistics/.

21. Disney Enterprises, Inc. v. VidAngel, Inc., 869 F.3d 848, 856 (9th Cir. 2017).

22. Dutra, Jessica, and Robert Stoner. Copyright Industries in the U.S. Economy—2024 Report. 2025.

23. Eldred v. Ashcroft, 537 U.S. 186, 212 n.18 (2003).

24. Faverio, Michelle, and Andrew Perrin. "Three-in-Ten Americans Now Read E-books." Pew Research Center, January 6, 2022. https://www.pewresearch.org/short-reads/2022/01/06/three-in-ten-americans-now-read-e-books/.

25. GlobeNewswire. "OverDrive and Amazon Launch Kindle(R) Compatibility with Library eBooks." September 21, 2011. https://www.globenewswire.com/news-release/2011/09/21/1077410/0/en/OverDrive-and-Amazon-Launch-Kindle-R-Compatibility-With-Library-eBooks.html/.

26. Google Trends. Accessed March 15, 2026. https://trends.google.com/trends/.

27. Gupta, Neel, David Christensen, and Melanie Walsh. "Seattle Public Library's Open Checkout Data: What Can It Tell Us About Readers and Book Popularity More Broadly?" *Journal of Open Humanities* Data 11, no. 1 (2025).

28. Hachette Book Group, Inc. v. Internet Archive, 115 F.4th 163 (2d Cir. 2024).

29. Hachette Book Group, Inc. v. Internet Archive, 664 F. Supp. 3d 370, 385 (S.D.N.Y. 2023).

30. Harper & Row, Publishers, Inc. v. Nation Enterprises, 471 U.S. 539, 558 (1985).

31. IFLA. "Deal on eLending in the Netherlands: Interview with the Dutch Public Library Association." October 31, 2018. https://www.ifla.org/news/deal-on-elending-in-the-netherlands-interview-with-the-dutch-public-library-association/.

32. IGN. "Every iPad Generation: A Full History of Release Dates." October 16, 2025. https://www.ign.com/articles/all-ipad-release-dates-in-order/.

33. IMPLAN Group LLC. IMPLAN System (Data and Software). 2024 data, using inputs provided by the user. Huntersville, NC: IMPLAN Group LLC, 2024. https://www.IMPLAN.com.

34. Institute of Museum and Library Services. "Changes in Public Library Services as the COVID-19 Pandemic Continued Through FY 2021." April 29, 2024. https://www.imls.gov/news/imls-releases-research-library-services-during-second-year-covid-19.

35. Institute of Museum and Library Services. "IMLS Releases Annual Data on American Public Libraries." July 21, 2022. https://www.imls.gov/news/imls-releases-2020-data-american-public-libraries.

36. Institute of Museum and Library Services. "Increased Public Library Usage Shown by IMLS Survey Data." September 2, 2025. https://content.govdelivery.com/accounts/USIMLS/bulletins/3f09e4a/.

37. Institute of Museum and Library Services. Public Library Survey (PLS). Accessed January 15, 2026. https://www.imls.gov/research-evaluation/surveys/public-libraries-survey-pls/.

38. Jenkins, Jennifer. "Last Sale? Libraries' Rights in the Digital Age." *College & Research Libraries News* 75, no. 2 (2014). https://crln.acrl.org/index.php/crlnews/article/view/9068/9923.

Appendix 3—References

39. Lee, Kyunghee, Kunsoo Han, and Byungtae Lee. "Heterogeneous Effects of Ebook Distribution on Print Sales: The Role of Distribution Strategies and Book Characteristics." *SSRN*, 2020. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3559782.

40. Massachusetts Library Association and Chelmsford Public Library. "Library Use Value Calculator." https://www.swissarmylibrarian.net/librarycalculator/valuecalc_costs.html.

41. Mazer v. Stein, 347 U.S. 201, 219 (1954).

42. OverDrive. "Libraries Break Digital Lending Records in 2025 with over 820 Million Checkouts and over 1 Billion Minutes Streamed." January 21, 2026. https://company.overdrive.com/2026/01/21/libraries-break-digital-lending-records-in-2025-with-over-820-million-checkouts-and-over-1-billion-minutes-streamed/.

43. Pew Research Center. "Americans Still Opt for Print Books over Digital or Audio Versions; Few Are in Book Clubs." April 9, 2026. https://www.pewresearch.org/short-reads/2026/04/09/americans-still-opt-for-print-books-over-digital-or-audio-versions-few-are-in-book-clubs/.

44. Pew Research Center. Book Reading 2021—Methodology. Survey conducted January 25–February 8, 2021. https://www.pewresearch.org/wp-content/uploads/2022/01/Book-Reading-2021-Methodology.pdf.

45. Publications Office of the European Union. Copyright in Distance Education and Research: Exploring the Role of Copyright in Facilitating Access to Digital Collections of Libraries and Other Public Interest Institutions. 2025. https://op.europa.eu/en/publication-detail/-/publication/c689fa8b-cf2b-11f0-8da2-01aa75ed71a1/language-en/.

46. Reimers, Imke, and Joel Waldfogel. "The First Sale Doctrine and Public Library Provision of Print and Electronic Books." *Review of Economics and Statistics* (2024). https://direct.mit.edu/rest/article-abstract/doi/10.1162/rest_a_01488/124137/The-First-Sale-Doctrine-and-Public-Library/.

47. Report to Congress: Study Examining 17 U.S.C. Sections 109 and 117 Pursuant to Section 104 of the Digital Millennium Copyright Act. 2001.

48. Sharma, Siddhartha, Rahul Telang, and Alejandro Zentner. "The Impact of Digitization on Print Book Sales: Analysis Using Genre Exposure Heterogeneity." *SSRN*, 2024. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3579521.

49. U.S. Bureau of Labor Statistics. "Standard Occupational Classification." Accessed January 19, 2026. https://www.bls.gov/soc/.

50. U.S. Const. art. I, § 8, cl. 8.

51. U.S. Copyright Office. Copyright Act of 1976. 17 U.S.C.

52. U.S. Copyright Office. "Executive Summary: Digital Millennium Copyright Act Section 104 Report." https://www.copyright.gov/reports/studies/dmca/dmca_executive.html.

53. U.S. Department of Commerce, Internet Policy Task Force. Copyright Policy, Creativity, and Innovation in the Digital Economy. 2013.

54. Wang, Xindi, Burcu Yucesoy, Onur Varol, Tina Eliassi-Rad, and Albert-László Barabási. "Success in Books: Predicting Book Sales before Publication." *EPJ Data Science* 8, no. 31 (2019). https://doi.org/10.1140/epjds/s13688-019-0208-6.

55. Yucesoy, Burcu, Xindi Wang, Junming Huang, and Albert-László Barabási. "Success in Books: A Big Data Approach to Bestsellers." *EPJ Data Science* 7, no. 7 (2018). https://doi.org/10.1140/epjds/s13688-018-0135-y.