Digitization, access to information, and their impacts on traditional institutions

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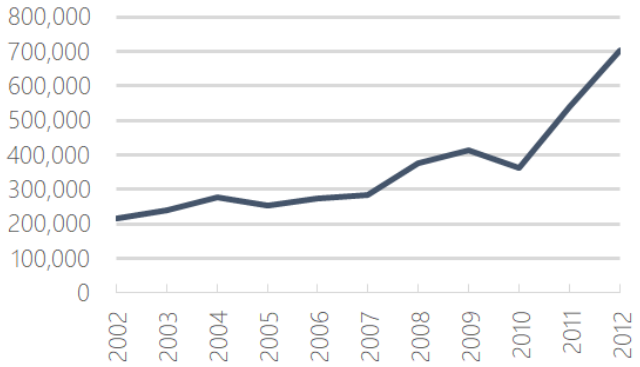
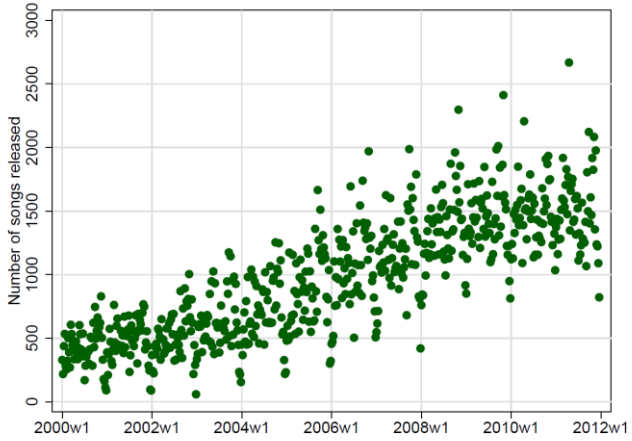
Giessen Workshop on the Economics of FBP Systems

Digitization…

- … has lowered costs of production and distribution
  - Many more products available
  - Potential welfare benefits, especially to consumers, are substantial



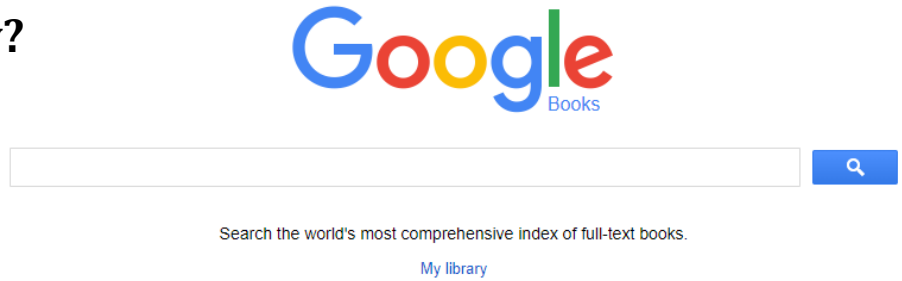


- … but how are traditional institutions affected by the changes?

How does digitization impact existing institutions?

- Changes in how authors can reach consumers (**self-publishing**)
  - How are traditional publishers affected?
  - **Can they benefit from entry?**

- Digitization of existing work (e.g. **Google Books**)
  - How are sales of traditional formats affected?
  - **Can digitization aide discovery?**



Digital Disintermediation and Efficiency in the Market for Ideas

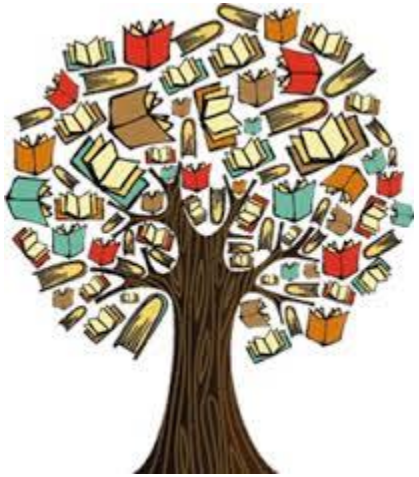
With Christian Peukert (ETH Zurich)

Circumventing the gatekeepers

- Inventors
  - Venture capital vs. Kickstarter

- Academics
  - Academic journals vs. own website, SSRN, etc.

- Book publishing
  - **Traditional publishers vs. self-publishing**



The Martian

Novel by Andy Weir
Self-published in 2011
re-published by Crown Publishing in 2014

Imkes Tagebuch (German Edition) Kindle Edition

by Chunying Xie (Translator)

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Length: 1 pages | Enhanced Typesetting: Enabled | Language: German

Product Details

File Size: 138 KB
Print Length: 1 pages
Simultaneous Device Usage: Unlimited
Publication Date: October 21, 2010
Language: German
ASIN: B0048EL5OO
X-Ray: Not Enabled
Word Wise: Not Enabled
Lending: Not Enabled
Enhanced Typesetting: Enabled
Amazon Best Sellers Rank: #2,939,423 Paid in Kindle Store (See Top 100 Paid in Kindle Store)
#1624 in Kindle Store > Kindle eBooks > Foreign Languages > German > **Biographies, Diaries & True Accounts**
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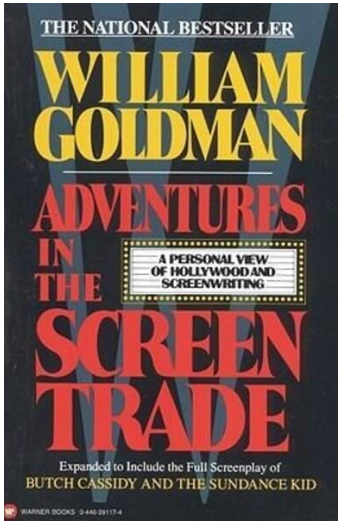
Key issue

Digital self-publishing platforms are challenging traditional gatekeepers

- How does it impact *license payments*?
  - Better outside option for authors – upward pressure on license fees

- Can it improve *efficiency*?
  - More books in the market
  - These may help publishers better predict ex-post appeal

- We test this with data on 90,000 license deals, 2002-2015



Data on expected and realized appeal

Expected appeal:

- **License deals** reported on Publishers Marketplace (2002 – 2015)
  - Author, working title, editor, publisher, genre
  - 5 size categories (<49k to >500k)

Realized appeal:

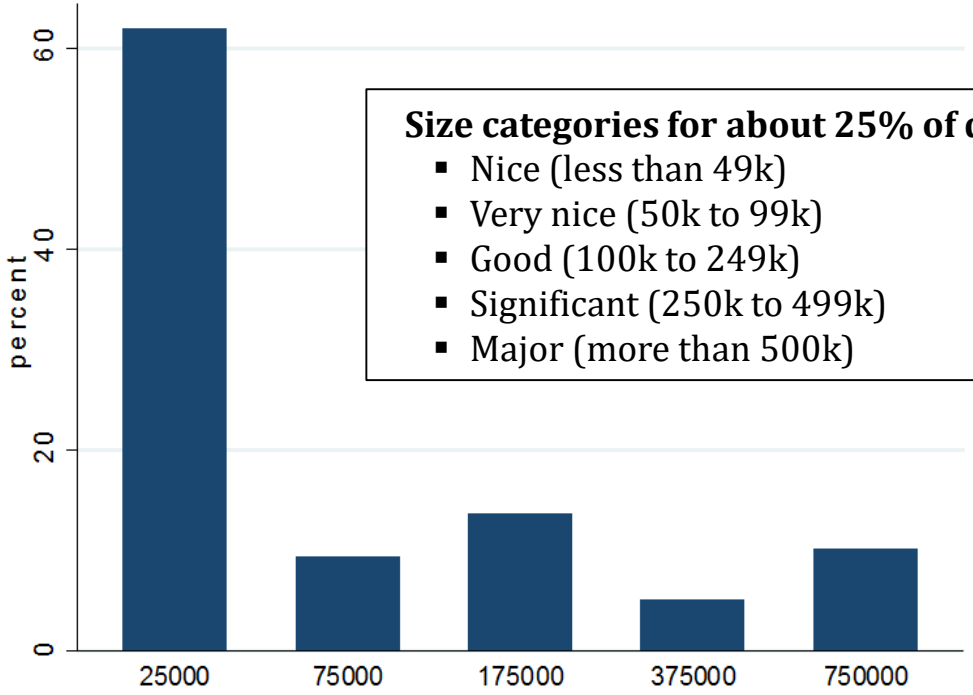
- **Unit sales** inferred from Nielsen Bookscan and USA Today (2002 – 2016)
  - Snapshots of weekly top 100 bestsellers

License deal data

- 52,000 book deals
- 40,000 rights deals

12/04/2006. Fiction: General/Other

Lynn York's second novel, a follow up to her debut The Piano Teacher, to Trena Keating at Plume, in a very nice deal, by Suzanne Gluck at the William Morris Agency.



Size categories for about 25% of deals

- Nice (less than 49k)
- Very nice (50k to 99k)
- Good (100k to 249k)
- Significant (250k to 499k)
- Major (more than 500k)

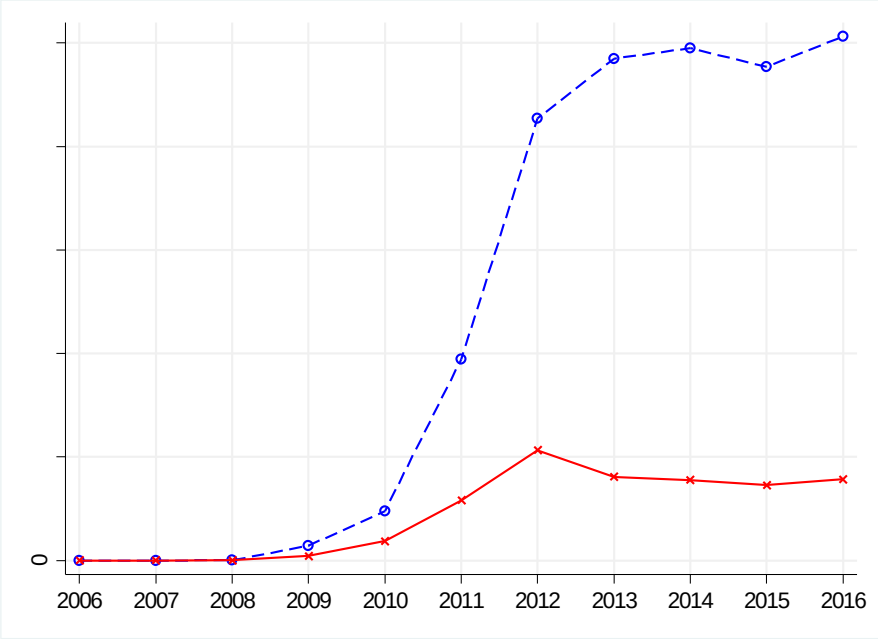
Identification and estimation

Identifying the effect of self-publishing

- **Problem**: digitization happened for all authors at the same time
  - Amazon's Kindle (and KDP): November 2007
  - Apple's iPad (Apr 2010); self-publishing platforms

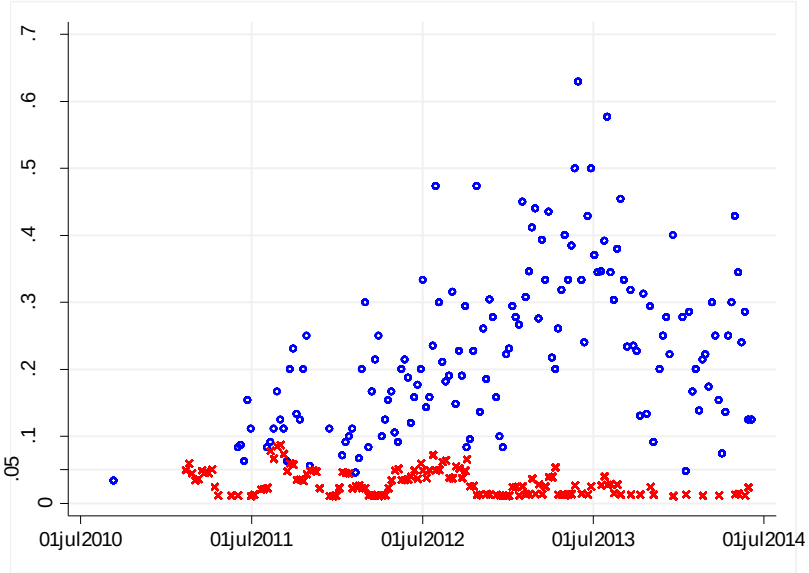
Romance books are more appealing for self-publishing than other genres…

- Low costs of entry into self-publishing
- Relatively high demand for e-book editions



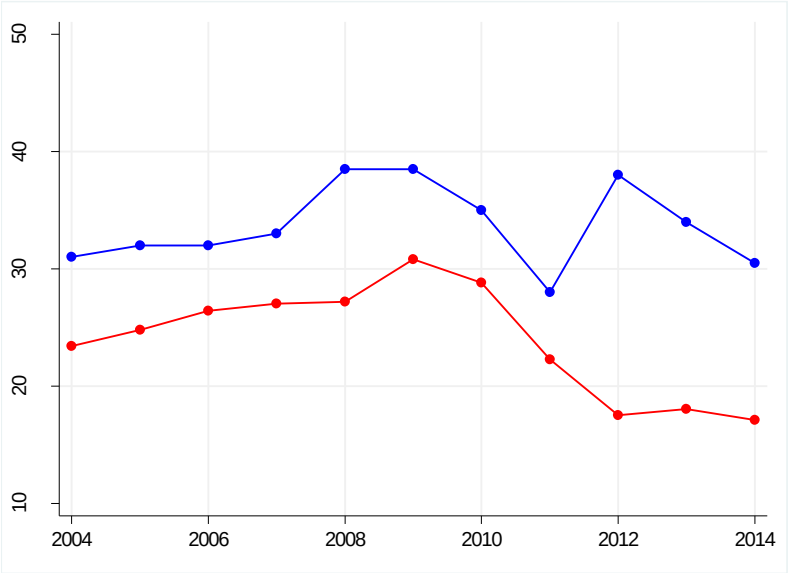
Romance authors as the treatment group

Self-publishing is particularly popular



Share of originally self-published books in Top 100
o Romance, × Non-Romance

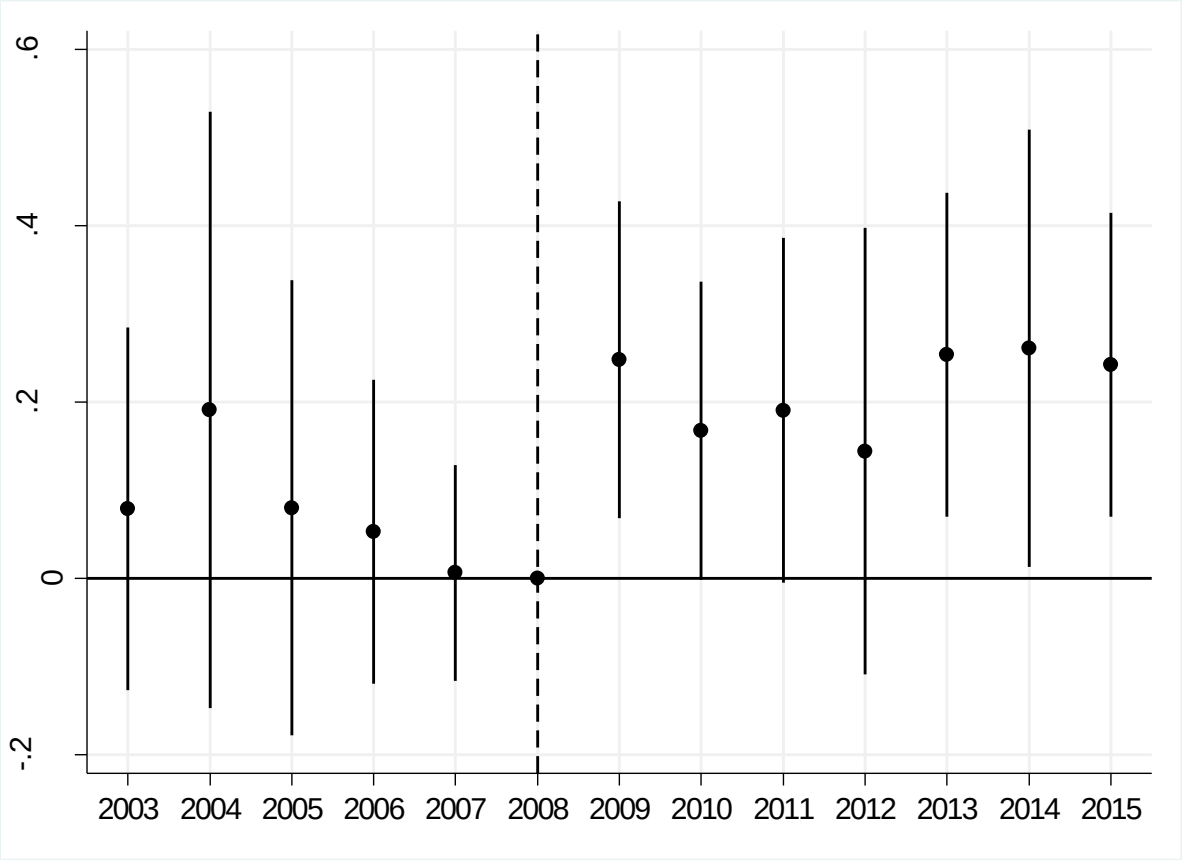
Traditional demand did not increase



Total unit sales per genre
o Romance, o Non-Romance

1) Do license deals increase?

Romance deals increase significantly



Notes: OLS estimates of annual differences in *LogSize* between the treatment group (romance authors) and the control group. The omitted year is 2008 – the first year of recorded e-reader ownership. Standard errors are clustered on the genre-level, and bars indicate 90% confidence bands.

Romance deals increase significantly

Table 2: Results: Changes in license deals

	(1) DV: Log(Size)		(2) DV: Size		(3) DV: Deal category	
Romance	-0.138**	(0.050)	-22.895**	(7.669)	-0.156**	(0.055)
After2008 × Romance	0.140***	(0.037)	31.990***	(8.202)	0.167***	(0.042)
Acclaimed	0.151***	(0.030)	27.112***	(4.486)	0.175***	(0.032)
Prev. bestseller	0.984***	(0.082)	201.510***	(12.368)	1.158***	(0.089)
Contested	0.670***	(0.070)	117.900***	(13.810)	0.766***	(0.081)
Debut	0.046	(0.054)	15.997	(10.790)	0.063	(0.062)
Orig. self-published	0.405*	(0.189)	92.313**	(33.069)	0.481*	(0.217)
Sequel	0.161***	(0.047)	26.972**	(11.614)	0.181**	(0.058)
Observations	14771		14771		14771	
R^2	0.541		0.410		0.526	

Notes: Editor, month-year fixed effects, and constant not reported.
Standard errors in parentheses, clustered on the genre-level. * $p<0.10$, ** $p<0.05$ *** $p<0.01$

TV/movie and international rights

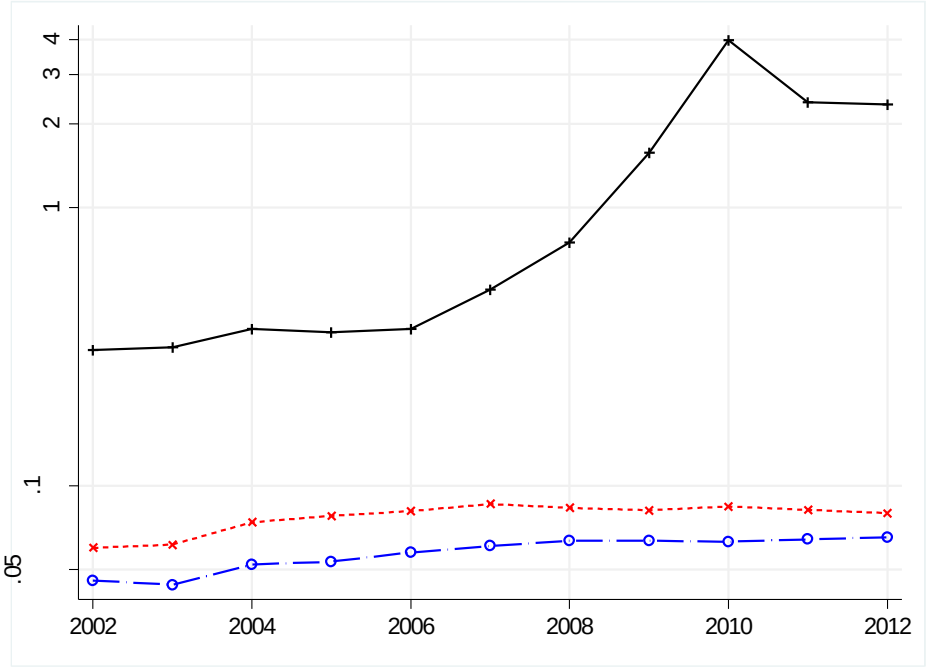
- No competition from self-publishing
- So we *shouldn't* see an effect there

Table 3: Results: Changes in rights deals (placebo exercises)

	(1) DV: Log(Size)	(2) DV: Size	(3) DV: Category
After2008 × Romance	-0.061	-2.487	-0.062
	(0.109)	(19.223)	(0.123)
Observations	8194	8194	8194
R^2	0.527	0.423	0.515

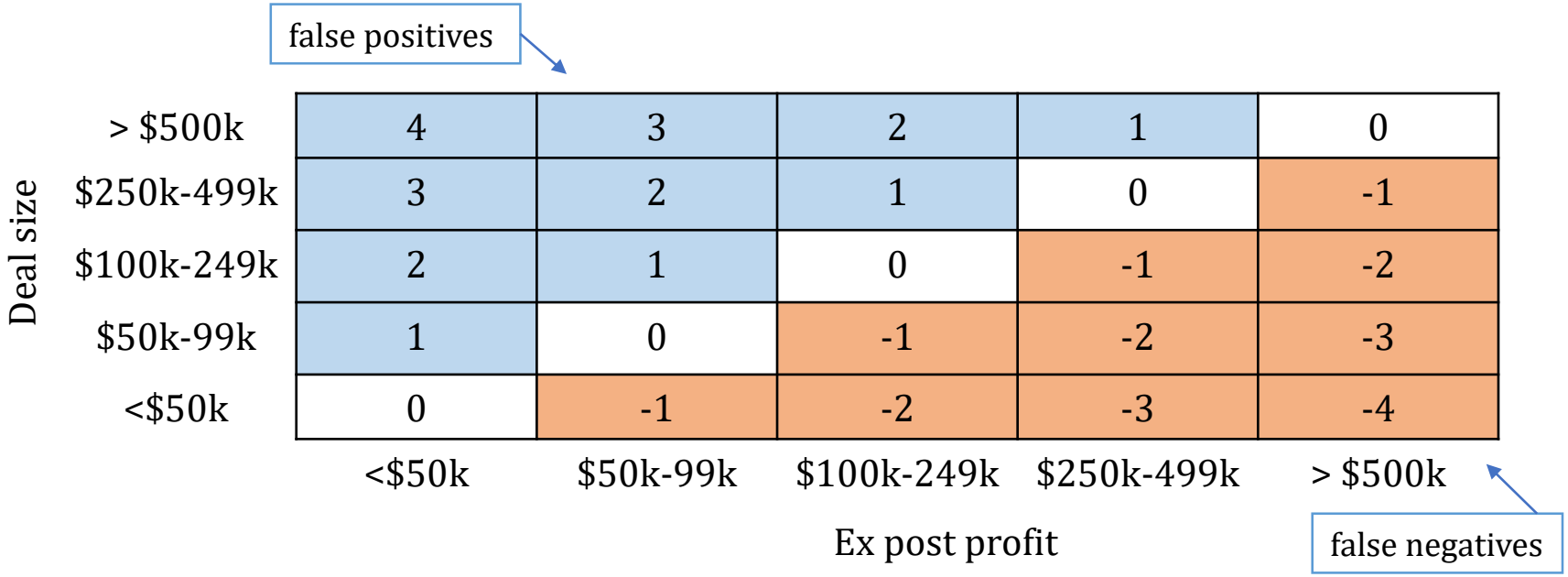
Notes: Editor and month-year fixed effects and coefficients of control variables not reported. Standard errors in parentheses, clustered on the genre-level. * $p<0.10$, ** $p<0.05$ *** $p<0.01$

2) Do predictions become more precise with additional entry?



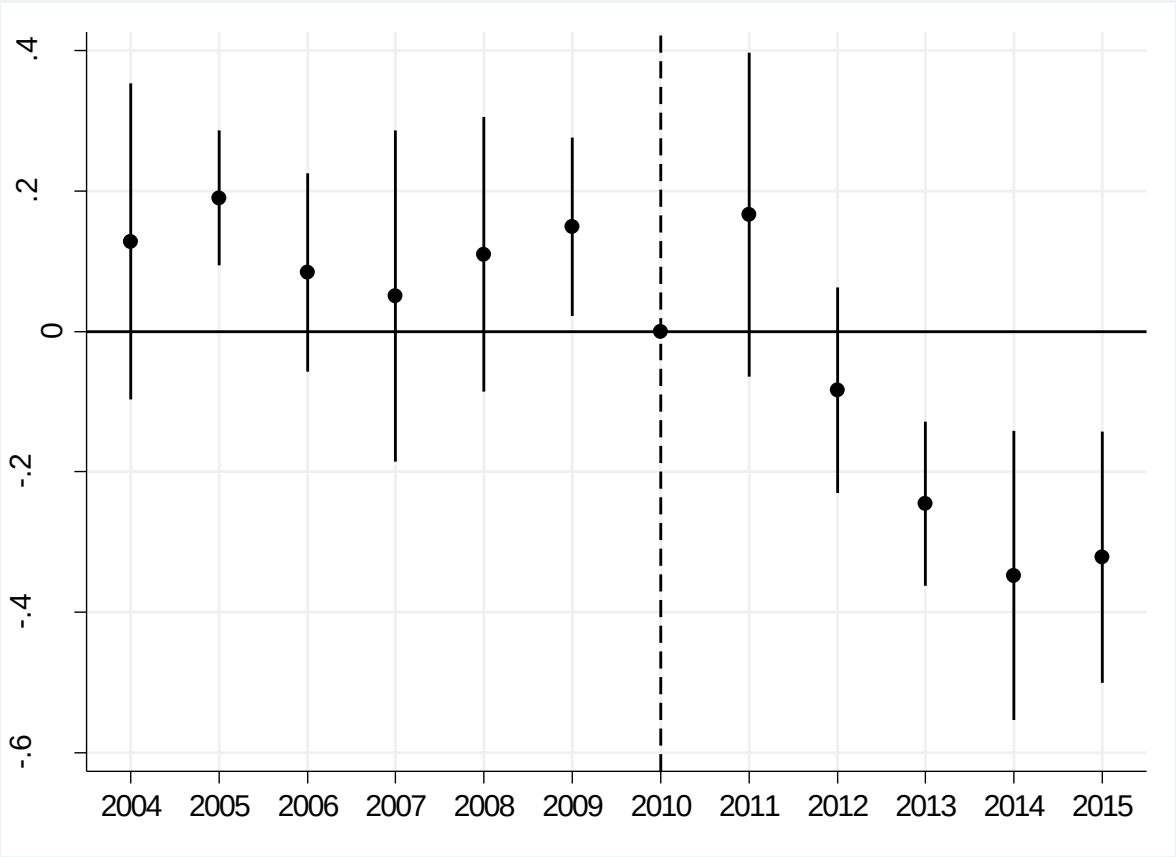
Defining prediction error

- We compare license deals (ex-ante predictions) to future profits (ex-post appeal)
  - (Anecdotal information: publisher profits are ~35% of revenues)



- The absolute value of this gives us the dependent variable in the next regressions

Prediction error decreases significantly



Notes: OLS estimates of annual differences in |*error*| between the treatment group (romance authors) and the control group. The omitted year is 2010 – the first year of significant differences in SP-supply. Standard errors are clustered on the genre-level, and bars indicate 90% confidence bands.

Publishers make fewer errors

Table 3: Results: Changes in predicting ex-post appeal

	(1) Abs(error)	(2) I(error)	(3) error^2	(4) False neg.	(5) False pos.
After 2010 × Romance	-0.236*** (0.070)	-0.091*** (0.011)	-0.643* (0.299)	-0.046** (0.017)	-0.045*** (0.011)
Observations	14771	14771	14771	14771	14771
R^2	0.336	0.380	0.231	0.076	0.396

Notes: Editor, month-year fixed effects, controls and constant not reported.
Standard errors in parentheses, clustered on the genre-level. * $p<0.10$, ** $p<0.05$ *** $p<0.01$

- Fewer "false negatives"
  - 81.9% decrease at the mean
  - could be due to a shift in bargaining power: authors get better deals
- Fewer "false positives"
  - 13.4% decrease at the mean
  - can't be explained by shifts in bargaining power

To summarize: the market for ideas

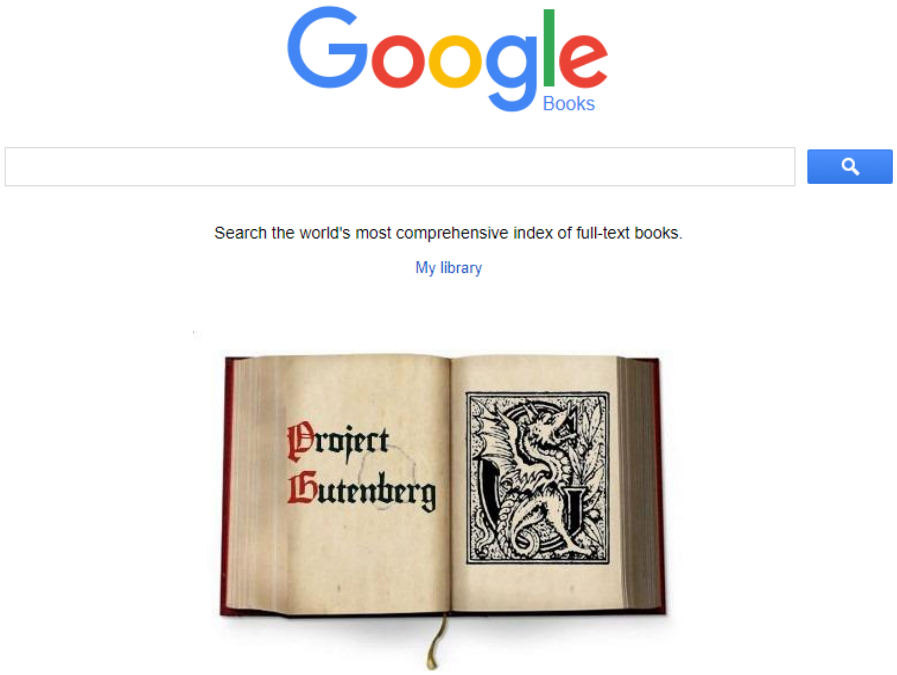
- Greater variety of available titles (at lower prices)
  - Could improve consumer welfare
- Larger license fees for authors
  - Increased incentives to produce?
- Better prediction of ex-post appeal
  - Reallocation of resources could benefit (almost) everyone
- **Self-publishing and traditional publishers as <u>complements</u>**

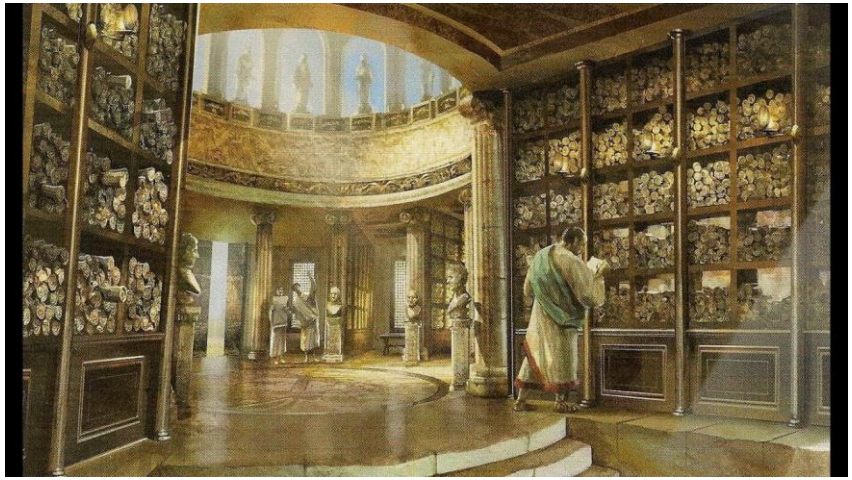
Digitization and the Demand for Physical Works: Evidence from the Google Books Project

With Abhishek Nagaraj (UC Berkeley)

Large-scale digitization efforts

- Digitization has expanded access to existing works
- Possibility of a (searchable) repository of all knowledge in digital form





Large-scale digitization efforts

- Digitization has expanded access to existing works
- Possibility of a (searchable) repository of all knowledge in digital form

No. 15-849

IN THE

Supreme Court of the United States

THE AUTHORS GUILD, *et al.*,
Petitioners,

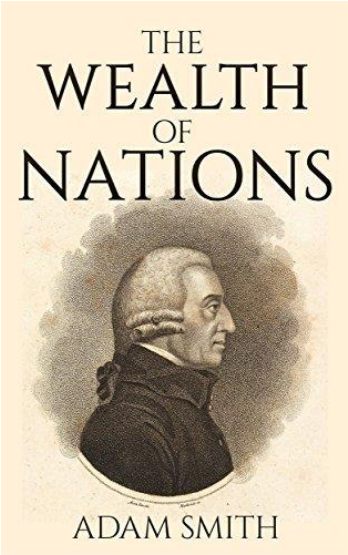
v.

GOOGLE INC.,
Respondent.

ON PETITION FOR A WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT

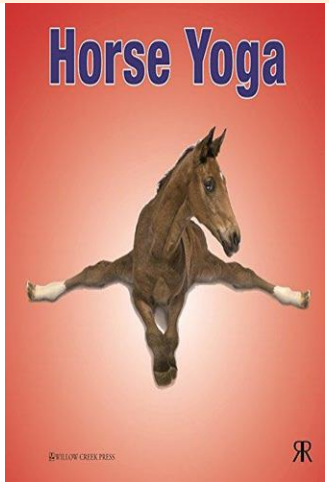
Key question

What is the impact of digitization on demand for physical works?



Digitization as a substitute for physical copies – it decreases demand

- Especially for popular books



Digitization could enable discovery – it increases demand

- Especially for obscure books

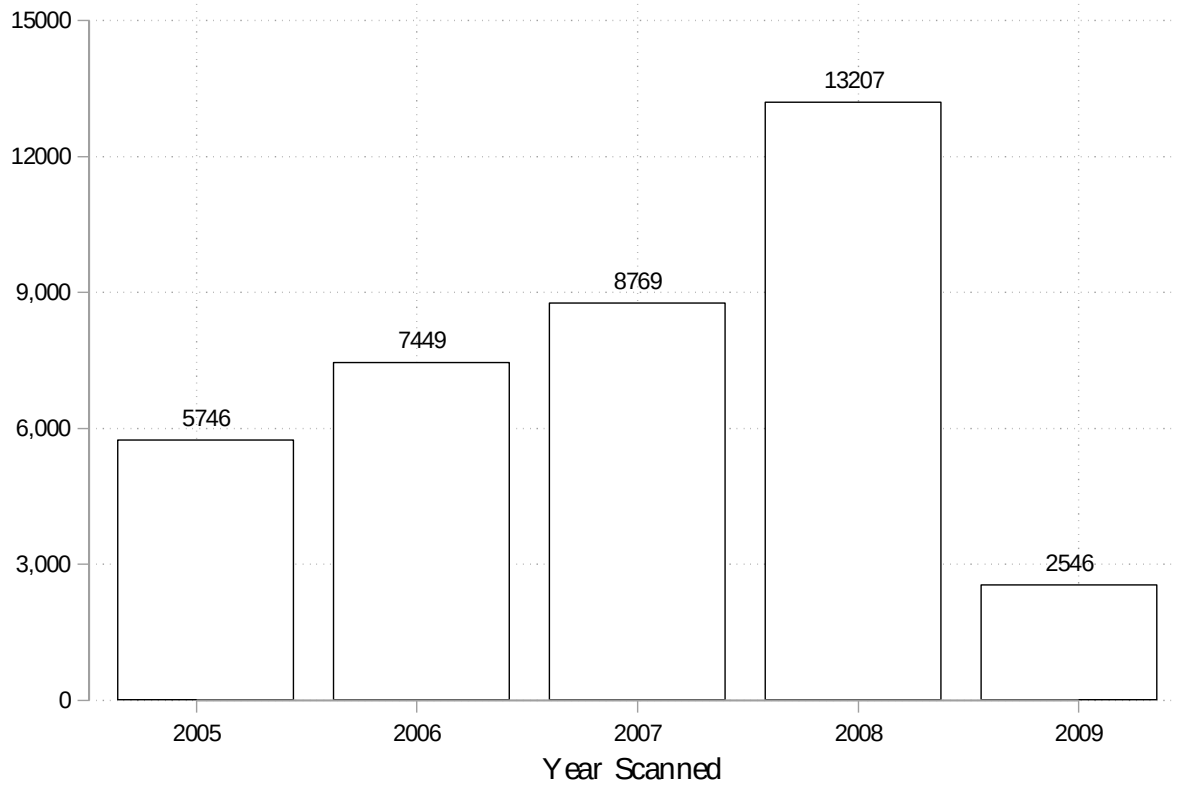
NOTE: most of the digitized books are “old” and “academic”

Empirical setting and data

A natural experiment: Harvard libraries

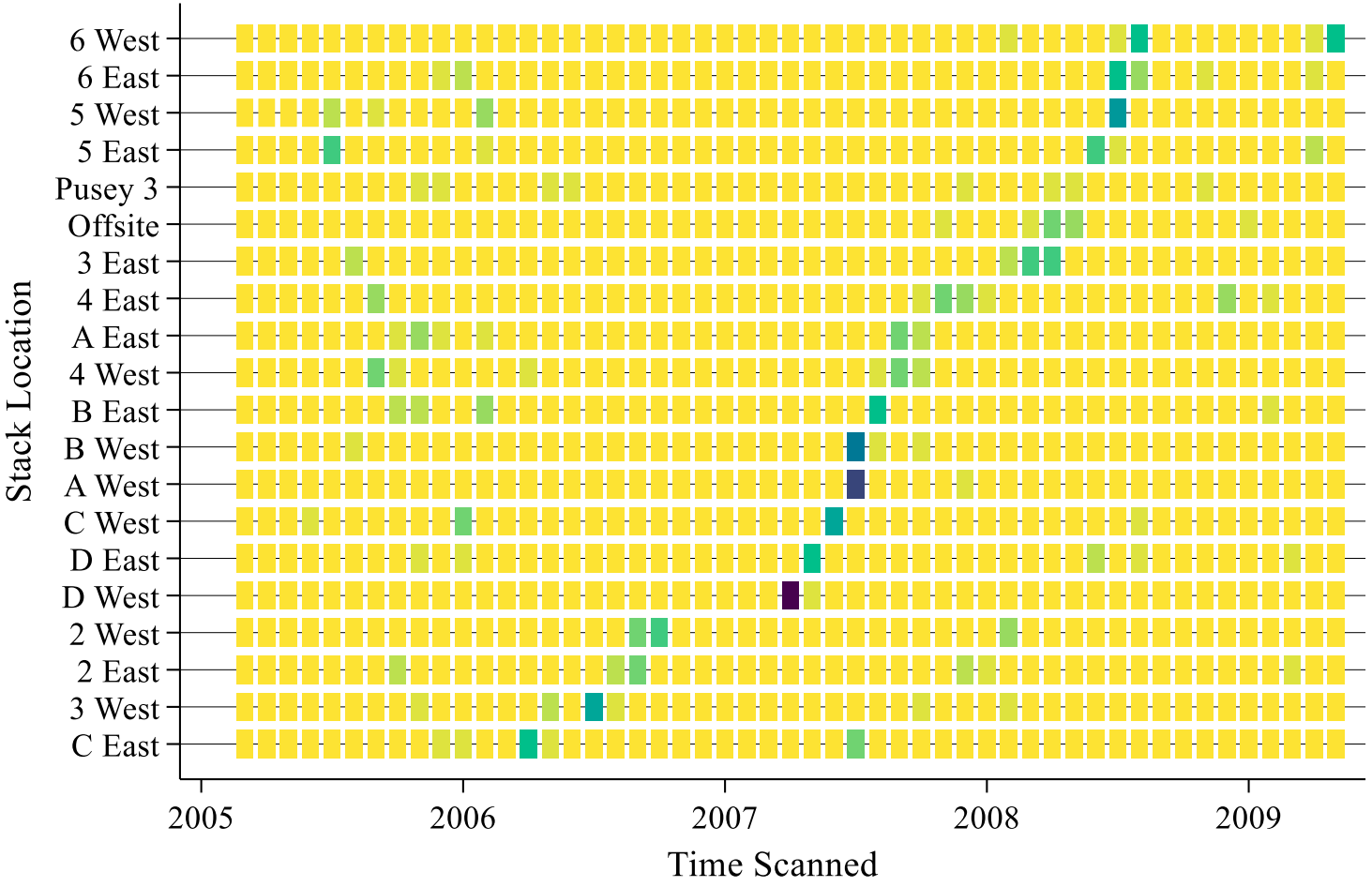
- Harvard was among the first few libraries to join forces with Google Books
  - Google Books digitized all *out-of-copyright* works from Harvard's Widener library
  - (digitization – and searchability – of entire books, rather than snippets)
  - 43% of titles were digitized
- Digitization of Harvard's catalog was labor- and time-intensive
  - It took (at least) five years, from 2005 to 2009
- Books were digitized on a *shelf-by-shelf* basis
  - Convenience, rather than popularity

Digitization was time-intensive



37,743 books were digitized, 50,263 were not

Shelf-by-shelf digitization



Digitization for most locations was very concentrated

Data: sales, loans, and availability

We observe sales for ~9200 books from the Harvard libraries from 2003 to 2011

- **Loans**: Harvard Widener library
  - Digitization date through borrower codes
  - ~88,000 books have at least 1 loan
  - 0.25 loans per year

- **Sales:** NPD (Nielsen) Bookscan
  - All titles English-language titles with >3 loans
  - 802 sales per year
  - (median annual sales are 0)

- **Availability:** Bowker Books-in-Print
  - All ISBNs for each title
  - 1.08 new editions per year

Estimation and results

Research design

- How did demand change for digitized books
- compared to those that are not (yet) digitized

$$sales_{it} = \alpha \times PostScan_{it} + \gamma_i + \mu_t + \epsilon_{it}$$

- $PostScan_{it} = 1$ in years after book i has been digitized
- (Book and year fixed effects)

- Estimated via Poisson and linear probability models
  - (but OLS works too)

Impacts on sales

Estimates for the impact on sales by popularity

	Sales (Poisson)	**Any Sales (LPM)**	**Sales (Poisson)**	**Any Sales (LPM)**
Post-scanned	0.297*	0.078***	0.349**	0.067***
	(0.153)	(0.005)	(0.190)	(0.006)
Post-scanned × popular			-0.201	0.024***
			(0.221)	(0.009)
Book FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓
N	82,836	82,836	82,836	82,836

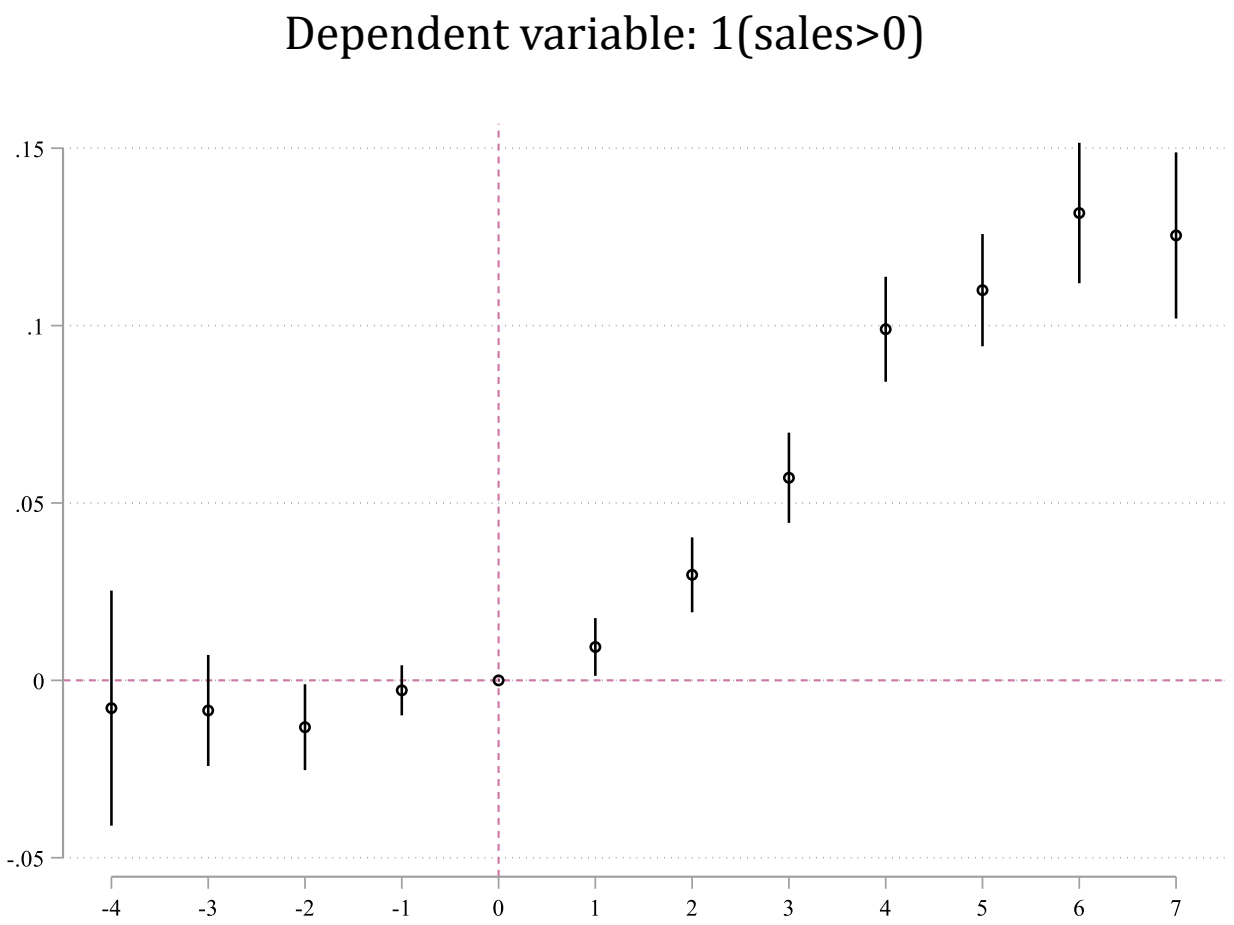
- "Popular" books: checked out at least once in 2003 + 2004

Summarizing the coefficients

Impact on sales:

- Digitization increased sales by about 34%
- It increased the likelihood of a sale by 7.8 percentage points
    - Or 92% at the mean
- 16% increase for popular books; 42% for less popular books

Estimated effects over time: sales

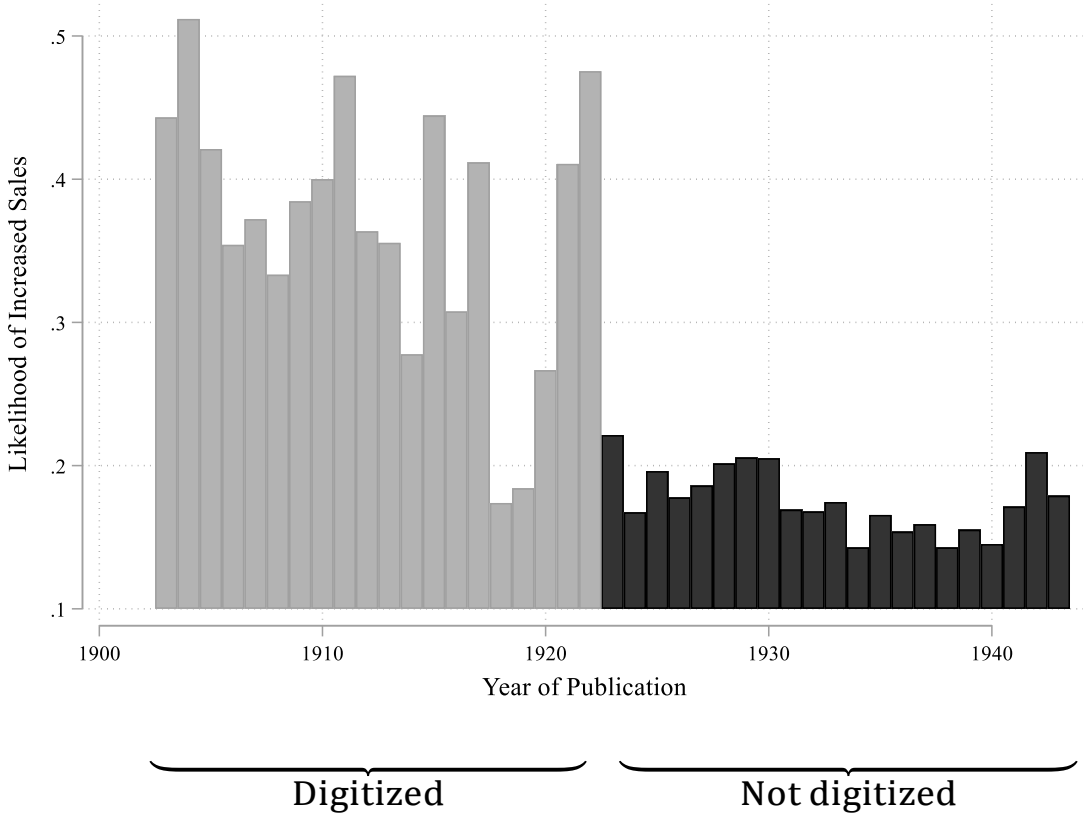


Discovery, or availability?

- **Did digitization lead to an increase in in-print editions?**
  - Yes, the prob. of being available increases by 19 percentage points
- **Did digitization lead to decreases in prices?**
  - No evidence of this
- **Are the impacts driven by these changes?**
  - No. All effects remain strong after controlling for availability

Additional evidence: sales by publication date

% of books from each vintage that had more sales in 2010/11 than in 2003/04



Likelihood of *increased sales* is much <u>larger</u> for digitized books

To summarize: demand for physical editions

- Digitization can increase physical demand under two conditions
  - A book is not otherwise well known
  - Consumers like physical versions
- **This seems to be the case for most works**

- Caveat: we only observe digitization of a specific set of books
  - We can't say much about recent bestsellers

To summarize: effects of digitization

- Digitization brings about information that…
  - Can help allocate resources to the best books
  - Can increase awareness of existing works

It's not all bad for traditional institutions

Thank you!