

# Digitization and the Quality and Quantity of New Music, Books, and Movies

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# Introduction

- Digitization and media industries: a two-part story
  - Bad news on demand side
    - Napster, BitTorrent, etc
  - Cost reduction on supply side
    - Reduced costs of production, distribution, promotion
- ...along with “nobody knows” effect
- Revolutionary effects on recorded music, books, movies, television,...
  - Lots of new products, many of which are consequential

# My additional goals today

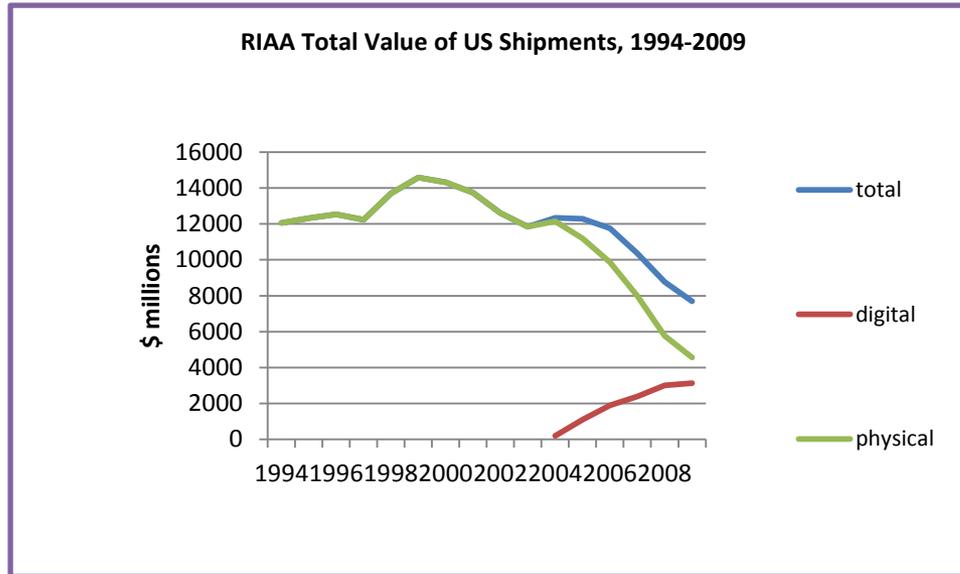
- While piracy is interesting/important, we should focus more research energy on whether the supply of new products remains robust
- Rethink which evidence addresses whether copyright is fulfilling its function
- Are we experiencing a crisis?
  - Evidence on music, books, movies, & television
- Copyright research needs more and better data
  - Data availability woes necessitate flexibility

# Outline

- Music quality since Napster: rising or falling?
- Why?
- Then revisit the relevant questions in book, motion picture, and other creative sectors
- *...in the order of the evolution of my understanding*

# Digitization in music, round 1

- The standard music paper motivation since '99: “the sky is falling!”



# Research Response

- Mostly a kerfuffle about whether file sharing cannibalizes sales
- Surprisingly hard question to answer
  - » Oberholzer-Gee and Strumpf (2006), Rob and Waldfogel (2006), Blackburn (2004), Zentner (2006), and more
- ...but most believe that file sharing reduces sales

# My Epiphany



- Revenue reduction, interesting for producers, is not the most important question
- Instead: *will flow of new products continue?*
  - (We should worry about both consumers and producers)
- RIAA, IFPI: reduced investment will lead to an audio stone age

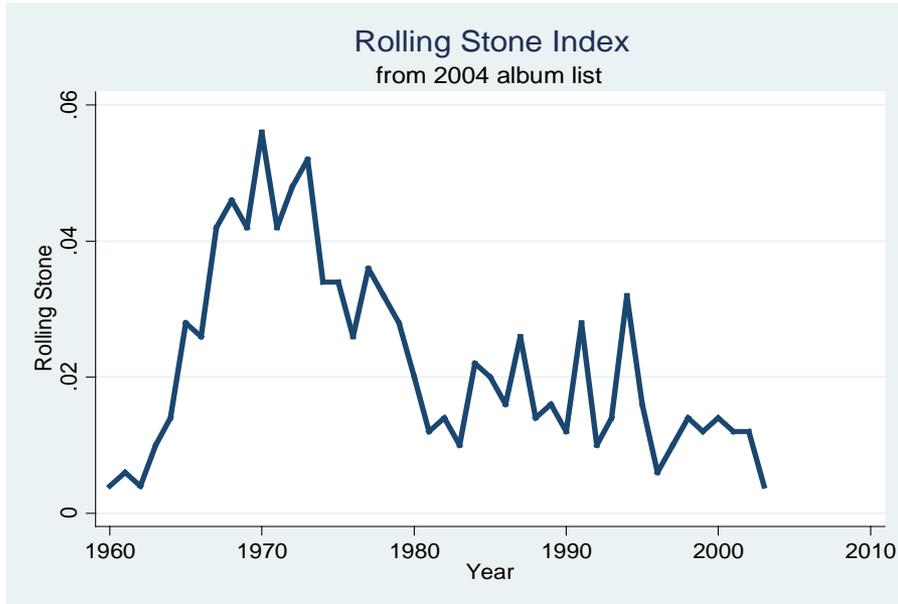
# File sharing is not the only innovation

- “Compound experiment”
  - Costs of production, promotion, and distribution have also fallen
  - Maybe weaker IP protection is enough
- What has happened to the “quality” of new products since Napster?
  - Contribute to an evidence-based discussion on adequacy of IP protection in new economy

# Hard problem: assessing quality/service flow of work over time

- 2 approaches:
- Critics' best of lists
  - E.g. Number of albums on a best-of-the-decade list from each year
  - Retrospective: to be on list, album's quality must exceed a constant threshold
- Usage information by time and vintage

# Rolling Stone's 500 Best Albums (2004)



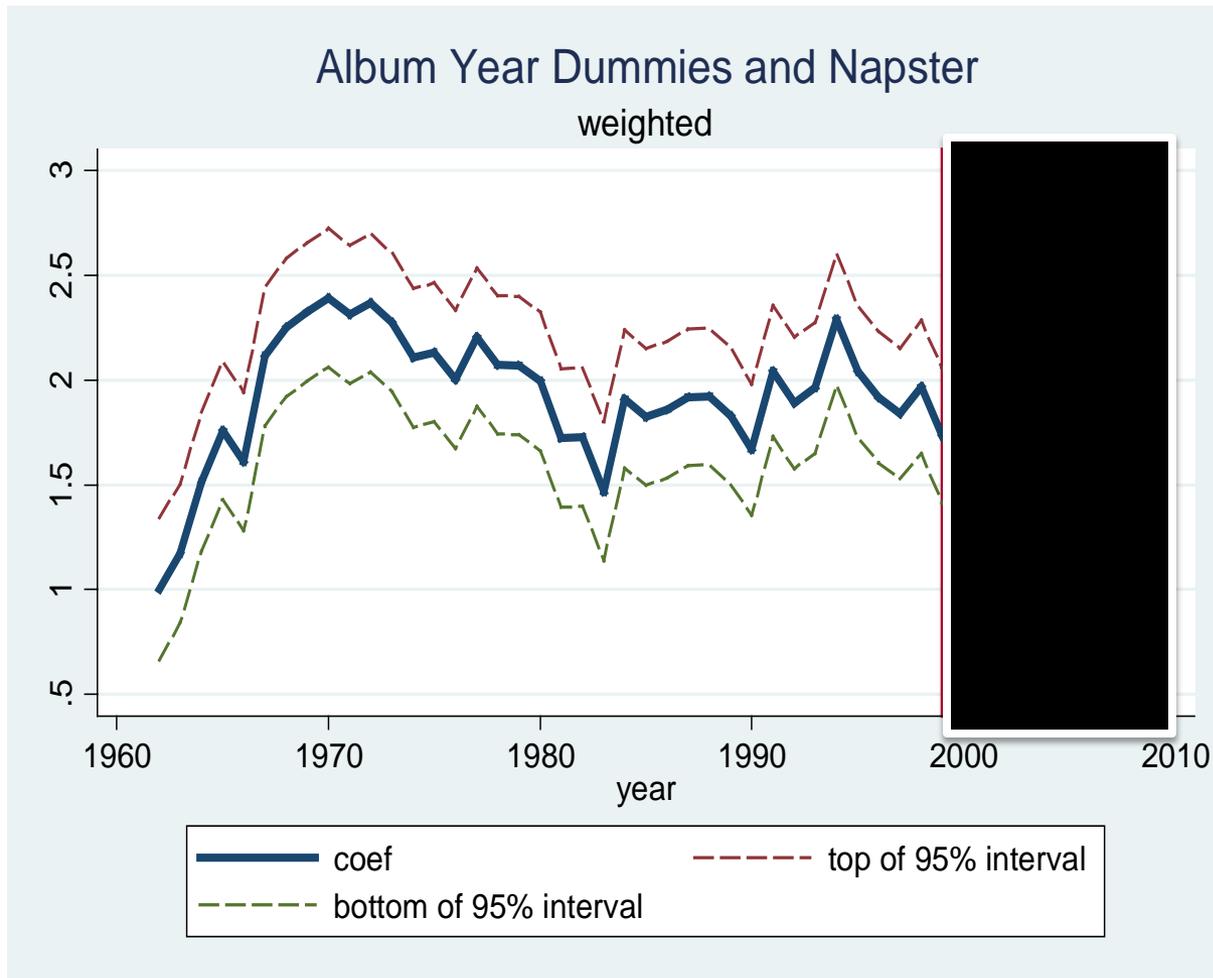
- Regression:

$$\ln(y_{it}) = \mu_i + \theta_t + \epsilon_{it}$$

- Plot  $\theta$ 's

“Splice”  
together to  
create overall  
index, covering  
pre- and post-  
Napster era.

# And voila: Index of vintage quality



Index is falling prior to Napster

Post-Napster constancy is, if anything, a relative increase

# Approach #2

- Measure of vintage “quality” based on service flow/consumer decision
  - Sales and airplay
- Idea: *if one vintage’s music is “better” than another’s, its greater appeal should generate higher sales or greater airplay through time, after accounting for depreciation*

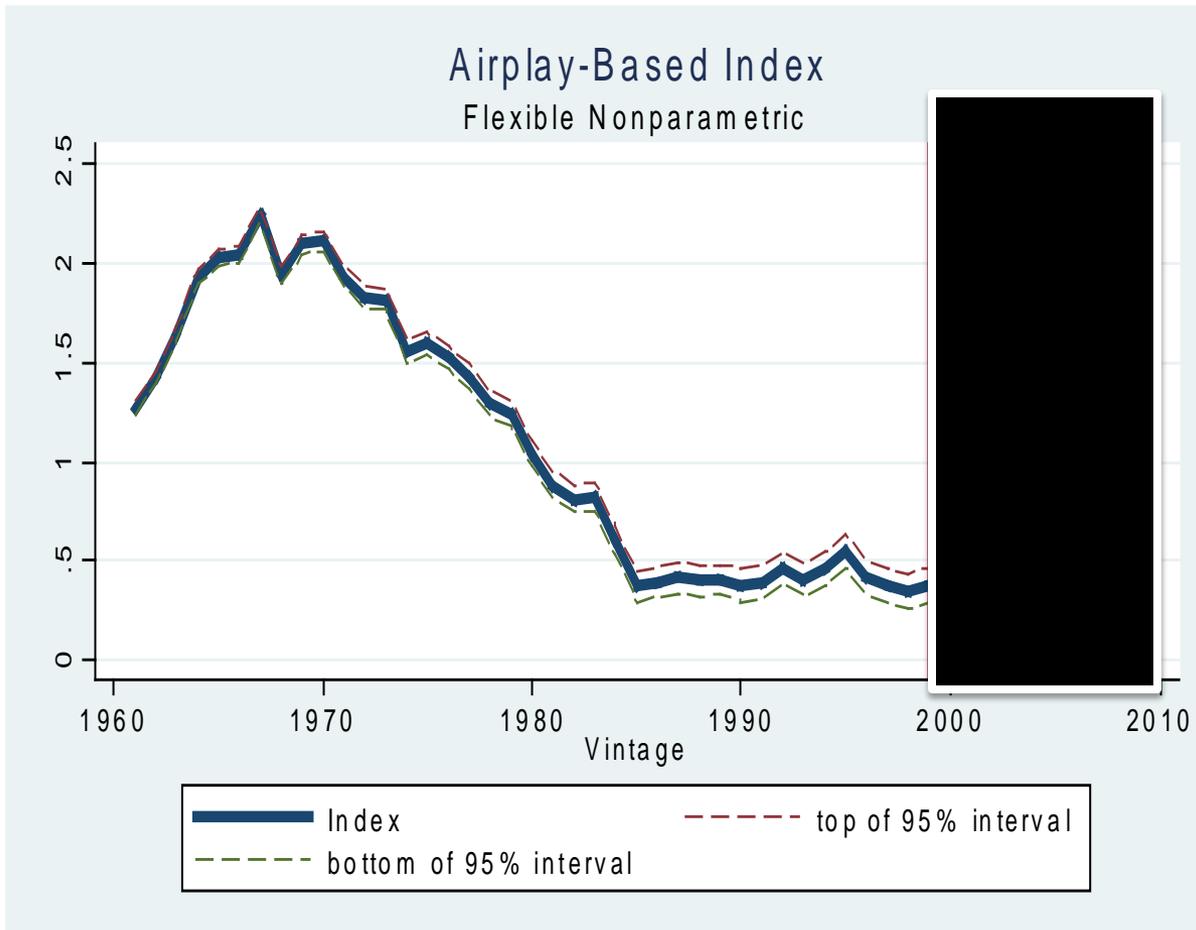
# Data

- Airplay 2004-2008 by vintage
- Sales 1970-2010, by vintage
  - From RIAA certifications

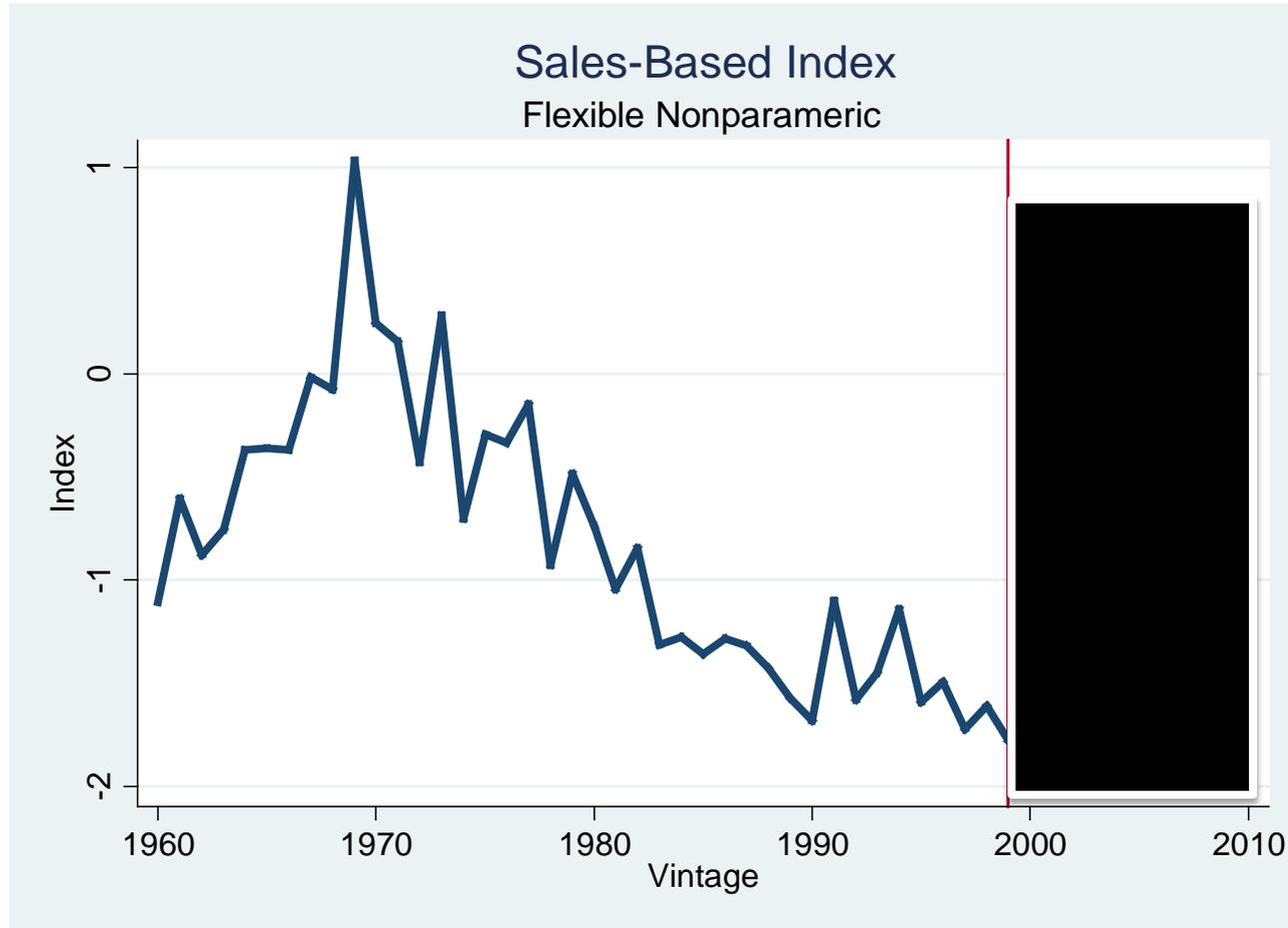
# Regression approach

- Define  $s_{t,v}$  = share of vintage  $v$  music in the sales or airplay of music in period  $t$ .
  - For a given year  $t$ ,  $s$  varies across vintages because of depreciation and **variation in vintage quality**
- Regress  $\ln(s_{t,v})$  on age dummies, vintage dummies.
  - Allow flexible depreciation pattern
- ***Then: vintage dummies are index of vintage “quality”***

# Resulting Airplay Index



# Sales-Based Index



# Bottom line

- No evidence that vintage quality has declined
- More compelling evidence that it has increased
- Hard to know what it might otherwise have been
- Big contrast to IFPI/RIAA view
- *Puzzle: why continued quality despite revenue collapse?*

# Fundamental features of creative products

- “nobody knows anything” (Caves/Goldman)
  - Hard to predict success at time of investment
  - Perhaps 10 percent succeed
- Traditionally, it has been expensive to “experiment” (Tervio)
  - Must bring a product to market to learn whether it will succeed
  - Music:  $\approx$ \$1 million using traditional means
  - So bet on a few artists with ex ante promise

# Along comes digitization

- (...and demand: piracy)
- ...and supply
  - Obvious effects on production and distribution
    - Recording, distribution are now inexpensive
  - Promotion too?
    - Traditionally, radio is a bottleneck
    - Now Internet radio and online criticism
- It has become cheaper to “experiment”
  - Do we end up discovering more artists with ex post value?

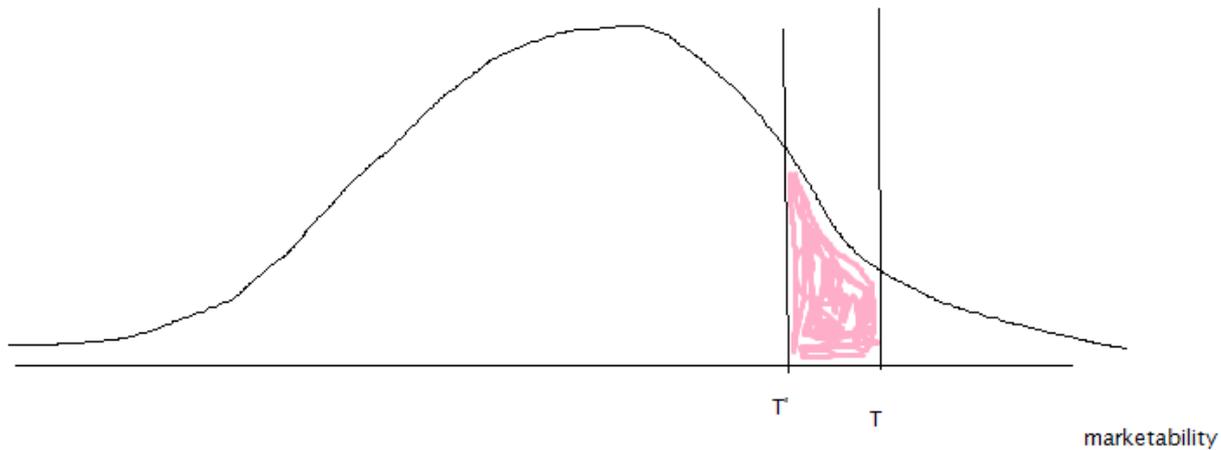
# How could quality improve?

“Model” inspired by Goldman (“nobody knows”)

- Label forms estimate of album marketability  $q'$  as truth + error:  $q' = q + \epsilon$
- Bring a product to market if  $q' > T$ .
- Cost reduction trumps piracy, so that on balance, *digitization reduces  $T$ , raising the number of projects that can be brought to market.*
- Big question: what happens to the volume of “good” work available to consumers?

# Suppose marketability were predictable

- Then reduction in  $T$  brings more products
- But they are of modest quality:  $T' < q < T$



# With unpredictability

- Release all products with expected quality above  $T'$
- Result: more products with quality  $> T$
- *Release of products with less ex ante promise leads to a greater number of products with ex post success/value*

# Is this explanation right?

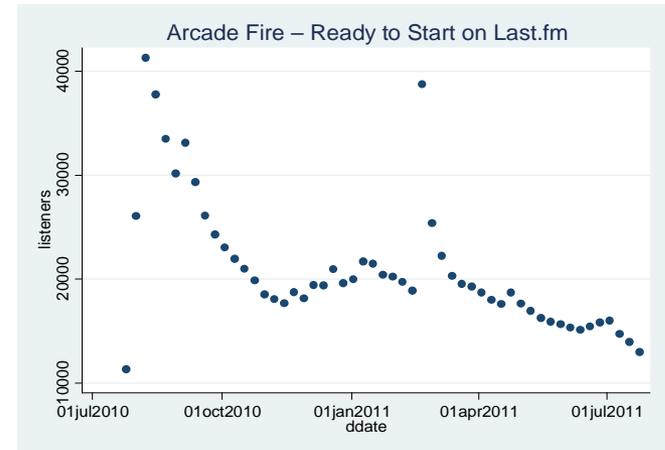
Some questions:

- More new products?
  - ...including “indies” with less ex ante promise?
- Do consumers have ways to learn about a proliferation of new products?
  - Changing roles of traditional radio, Internet, and critics
- Do the products with less ex ante promise – e.g. indie artists who would not have been released before digitization – account for a rising share of ex post success?

# Illustrative Anecdote: Arcade Fire's *The Suburbs*



- Released by indie Merge Records August, 3, 2011
- Critical acclaim
  - Metascore=87 (top 5%)
- Little conventional airplay
  - Not on BB Airplay Chart
  - But big on Internet radio
- Success
  - Sold >0.5 million copies
  - Best Album Grammy for 2011



# Answers

- **Growth in releases?**
  - Yes. Nielsen: 35k in 2000, 100k in 2010
- Changing information environment
- Ex ante promise and ex post success

# Answers

- Growth in releases?
- **Changing information environment**
- Ex ante promise and ex post success

# Changing Information Environment

- Traditional radio
  - BB airplay – top 75 songs by week
    - 3,900 listings per year
  - But only about 300 distinct artists
- Traditional vs Internet radio
  - Compare BB list with last.fm top 420 songs of the week in 2006
  - Little overlap – 10 percent

Top 2006 BB Airplay Artists not on  
Last.fm Weekly Top 420

| ARTIST         | BB airplay index |
|----------------|------------------|
| MARY J. BLIGE  | 14.3             |
| BEYONCE        | 12.0             |
| NE-YO          | 10.3             |
| CASSIE         | 9.8              |
| CHRIS BROWN    | 9.8              |
| YUNG JOC       | 8.2              |
| SHAKIRA        | 6.9              |
| LUDACRIS       | 6.0              |
| CHAMILLIONAIRE | 5.7              |
| AKON           | 5.2              |

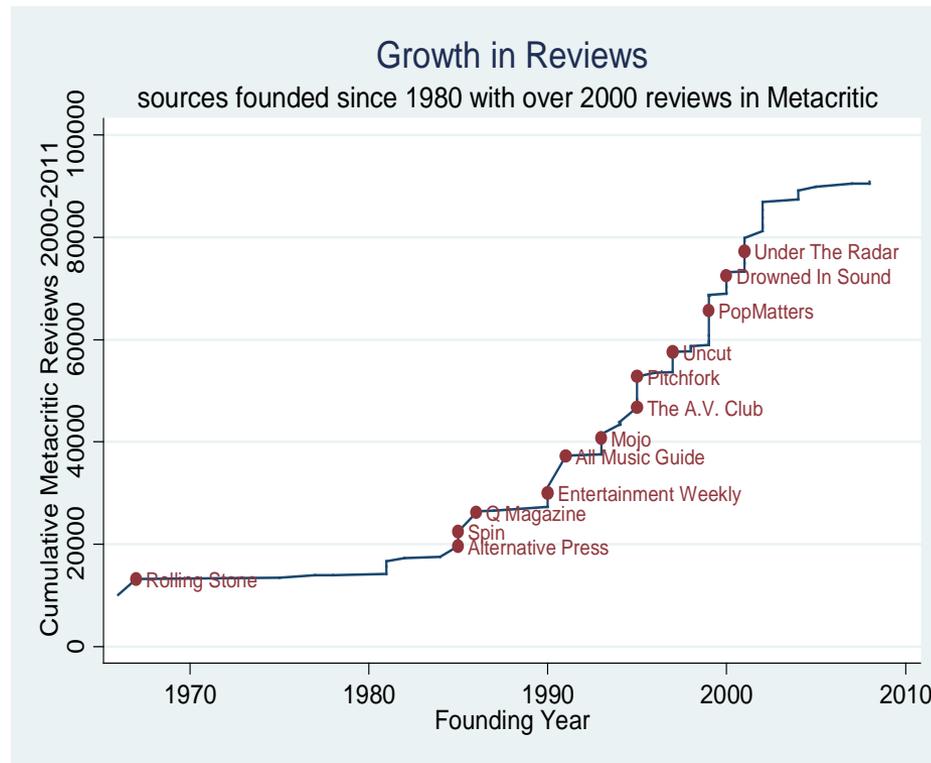
Top Artists on Last.fm in 2006 without BB  
Airplay

| ARTIST              | listeners |
|---------------------|-----------|
| DEATH CAB FOR CUTIE | 5,200,000 |
| COLDPLAY            | 5,200,000 |
| RADIOHEAD           | 4,700,000 |
| MUSE                | 3,900,000 |
| ARCTIC MONKEYS      | 3,000,000 |
| THE POSTAL SERVICE  | 2,800,000 |
| THE BEATLES         | 2,400,000 |
| SYSTEM OF A DOWN    | 2,300,000 |
| BLOC PARTY          | 2,100,000 |
| NIRVANA             | 1,900,000 |
| THE ARCADE FIRE     | 1,900,000 |

***Takeaway: Internet radio allows  
promotion for artists with less  
promotion on traditional radio***

# Second, growth in criticism

- Much of it online

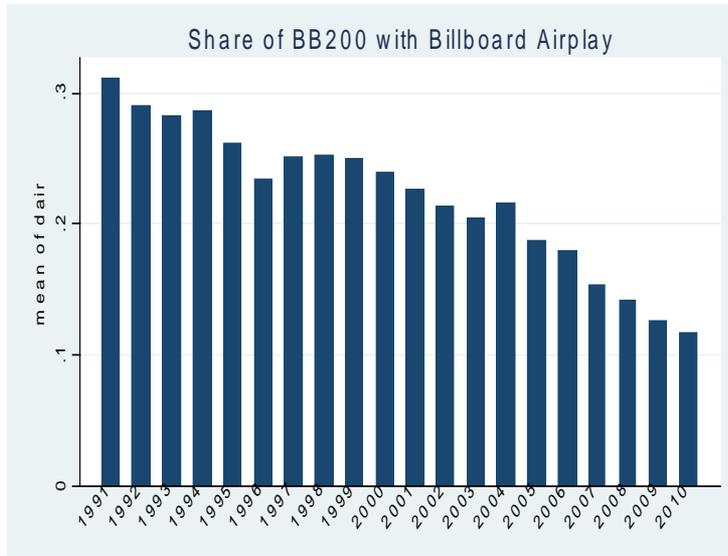


# Success and promotional channels

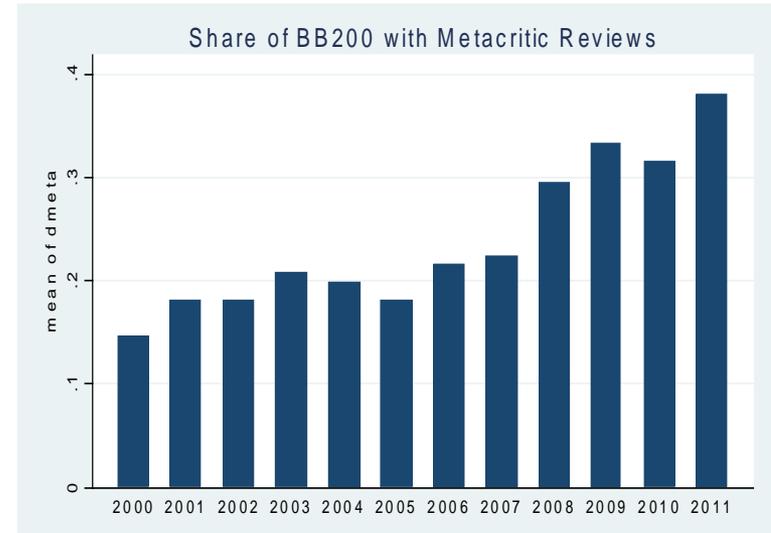
- What's happening to the role of traditional airplay among successful artists?
- What's happening to the role of critics?

# Learning from critics vs radio

## Of commercial successes:



Declining share with airplay, especially since 2000



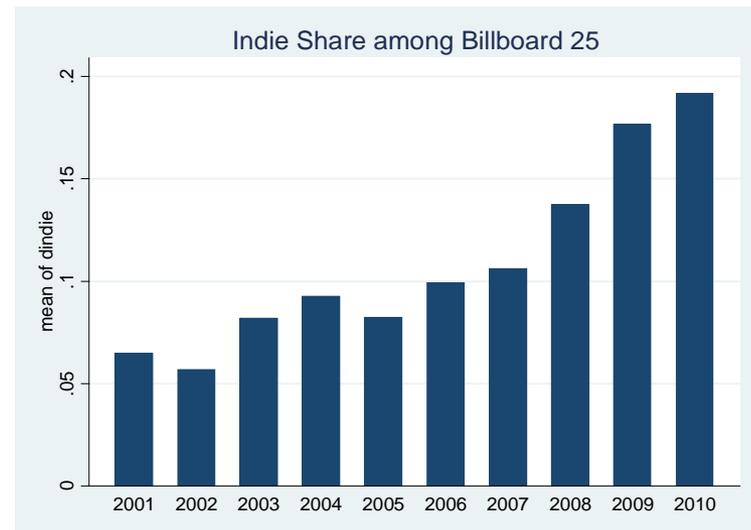
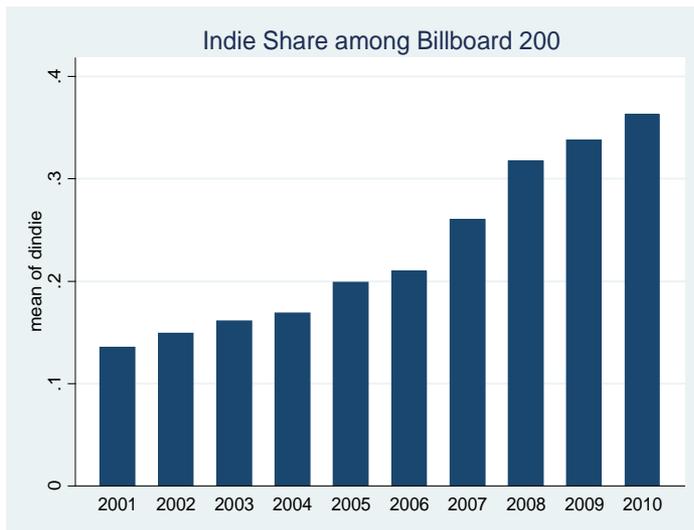
By contrast: increasing share with critical attention

# Answers

- Growth in releases?
- Changing information environment
- **Ex ante promise and ex post success**

# Ex ante promise and ex post success

- Do artist with less ex ante promise – who would not have made it to market prior to digitization – now achieve sales success?
- Specifically, do indies account for a growing share of sales?



“Even the losers get lucky sometimes”

# Summing up music

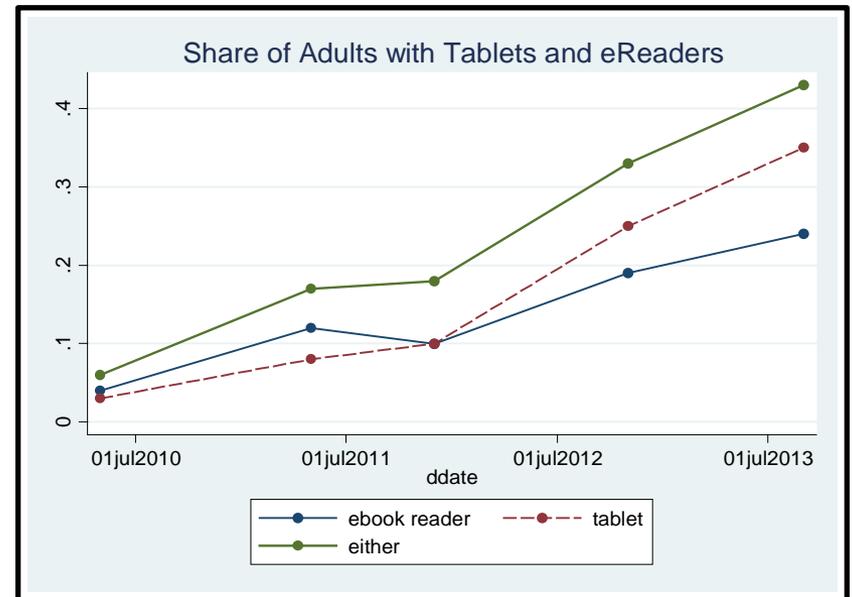
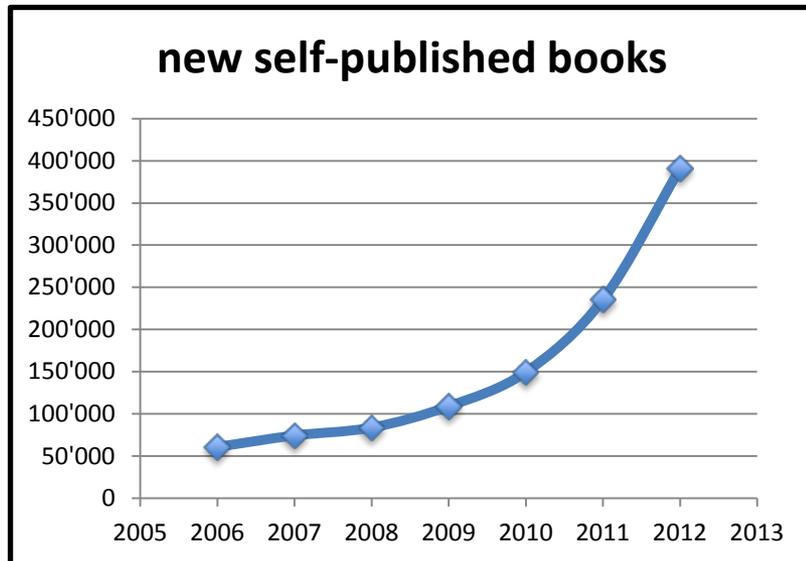
- Digital disintermediation provides possible explanation for increased “quality”
- Given unpredictability, more “experimentation” leads to discovery of additional “good” music
  - Ex ante loser become ex post winners
- Much of which would not have come to market before digitization

# What about other cultural products?

- **Books, motion pictures, television,...**
- Of each, ask the questions (when possible):
  - More products?
  - Ways to learn about new products?
  - Changing sales concentration
  - Growing success of ex ante “losers”?
  - Are the new vintages “good”?

# Books

- Growth in new products, “ecosystem”?

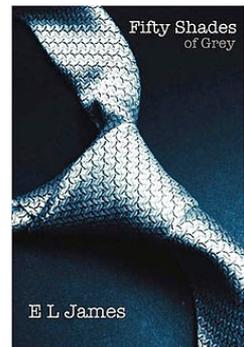


- Yes, especially self-published e-books, supported by diffusion of tablets & e-readers

# Commercial success of ex ante losers



- From *Storming the Gatekeepers*, Waldfogel and Reimers (2013)



# Movies

- Different?
  - More costly: \$100m for an average MPAA title
- An important US export industry
  - “Jobs, jobs, jobs”

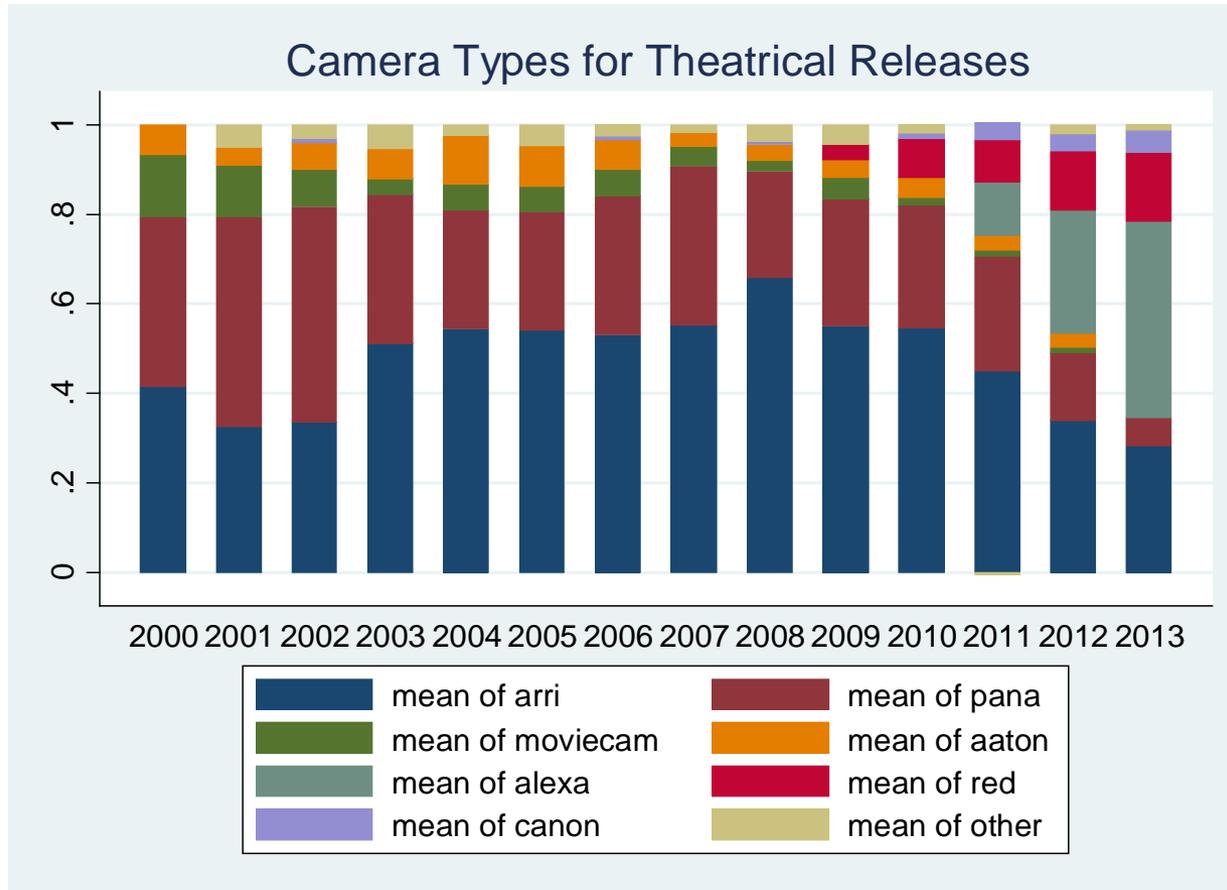
# Digitization and cost reduction in motion pictures

- Production
  - Digital cameras that are cheap and good
- Distribution
  - Digital sales (iTunes, Netflix, Amazon,...)
- Promotion
  - Lots of movies reviewed online + user-generated reviews
- *....raising the possibility of 1) new movies that 2) might be discovered by, and of interest to, consumers.*
- **True?**

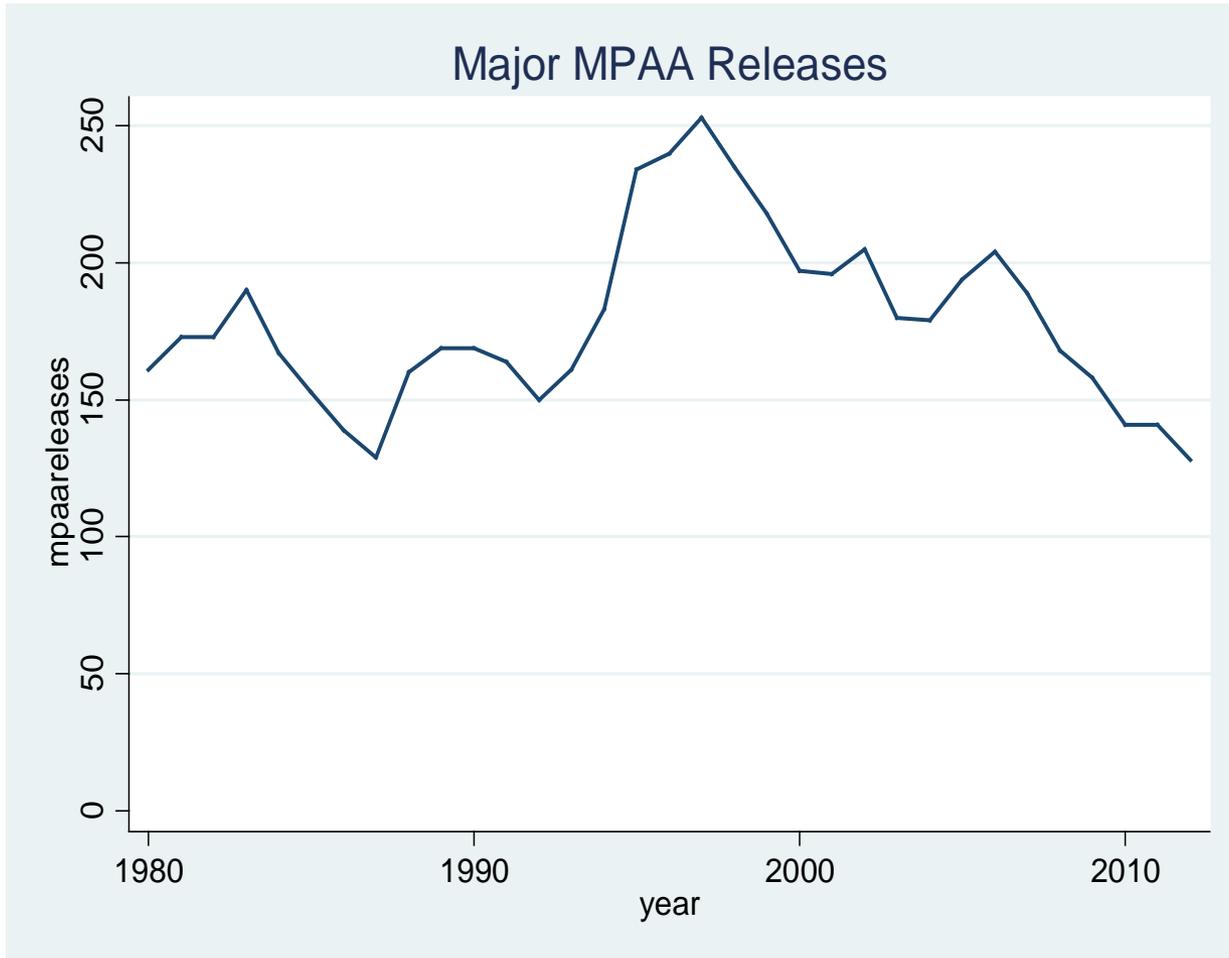
# Production

- Digital cameras introduced around 2000
  - Widely adopted by even major productions ca 2009
  - Arri Alexa, Red One, Canon 5D, Canon 70D
  - Prices: \$250,000, \$50,000,...,\$2,000
  - Creates opportunity for indie film makers

# (Attack of the digital clones)

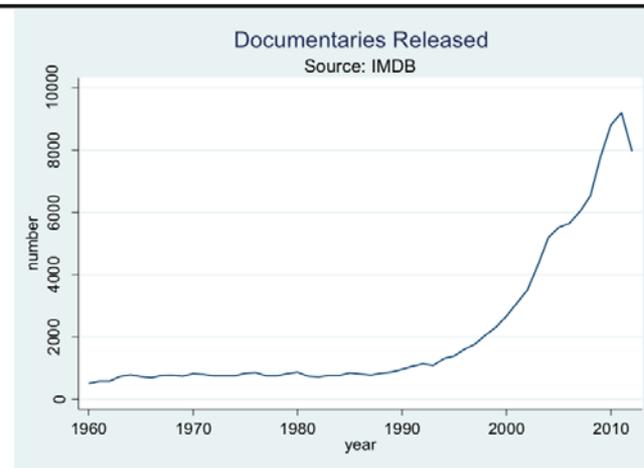
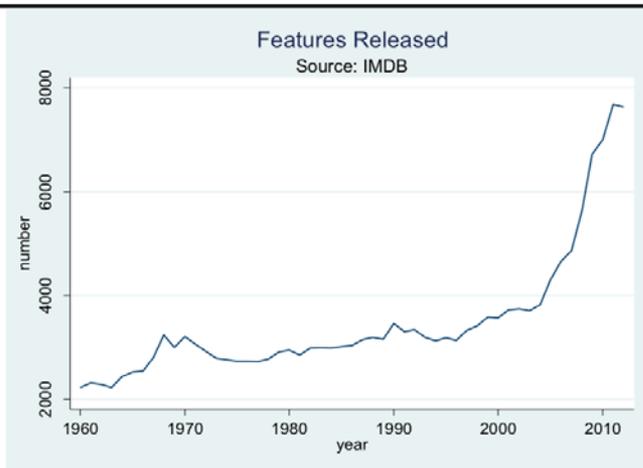
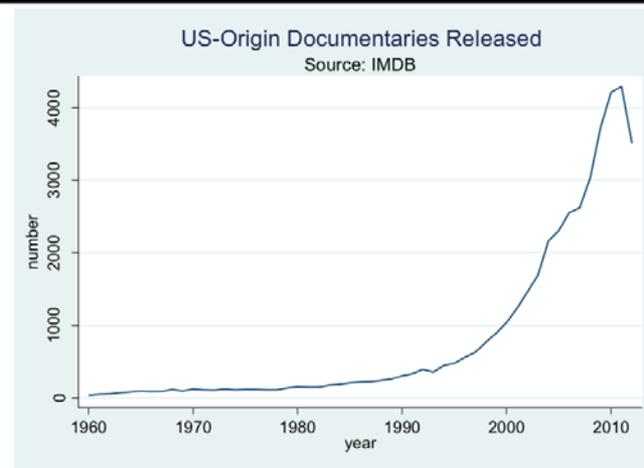
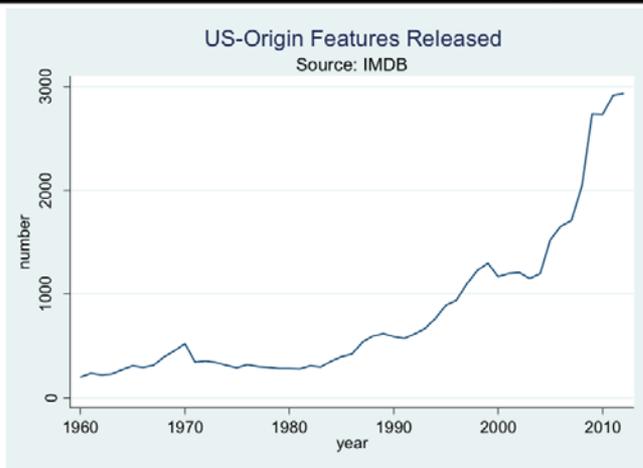


# Major titles are steady, even declining



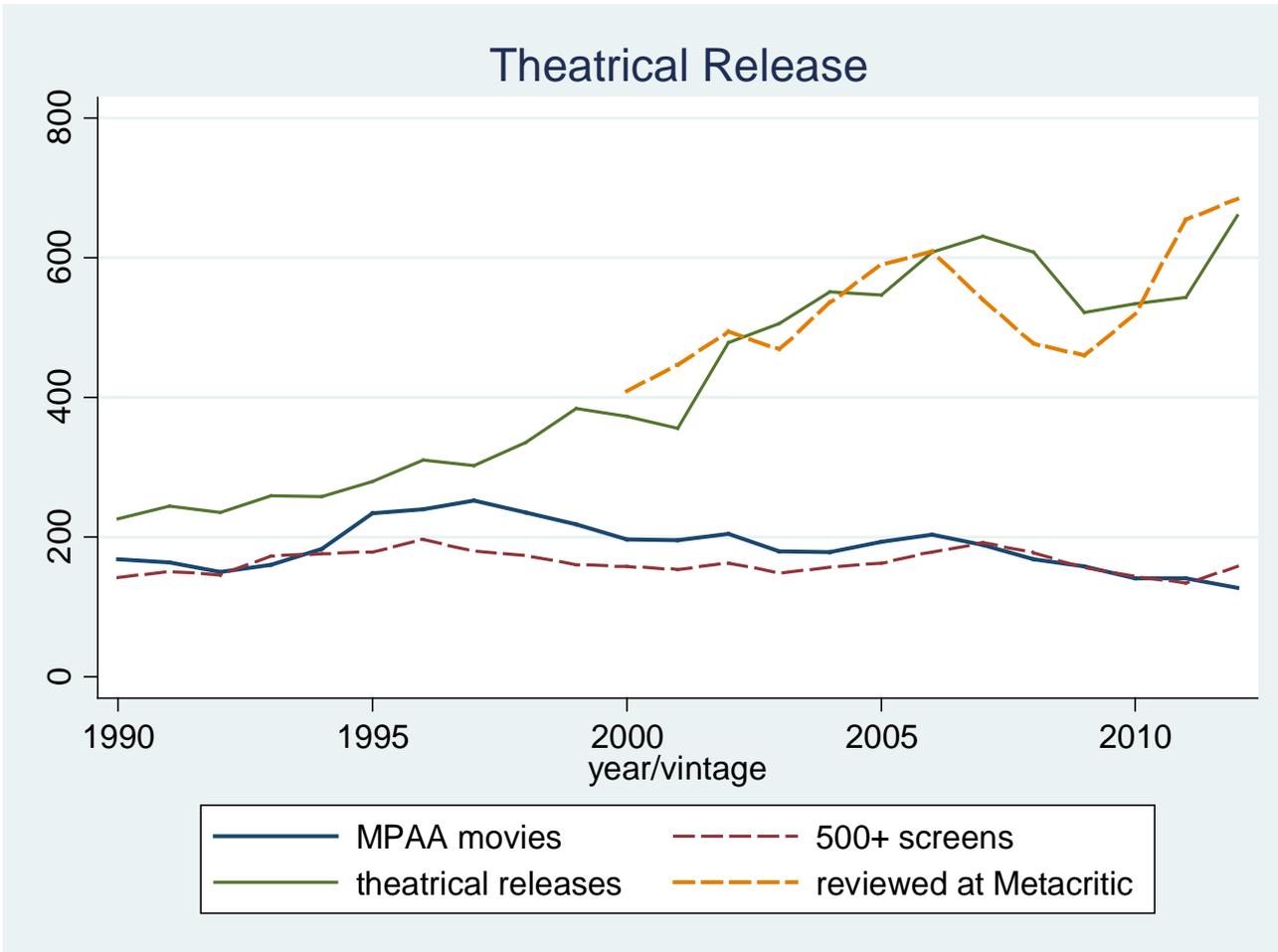
Source: MPAA

# ...but huge growth in overall production



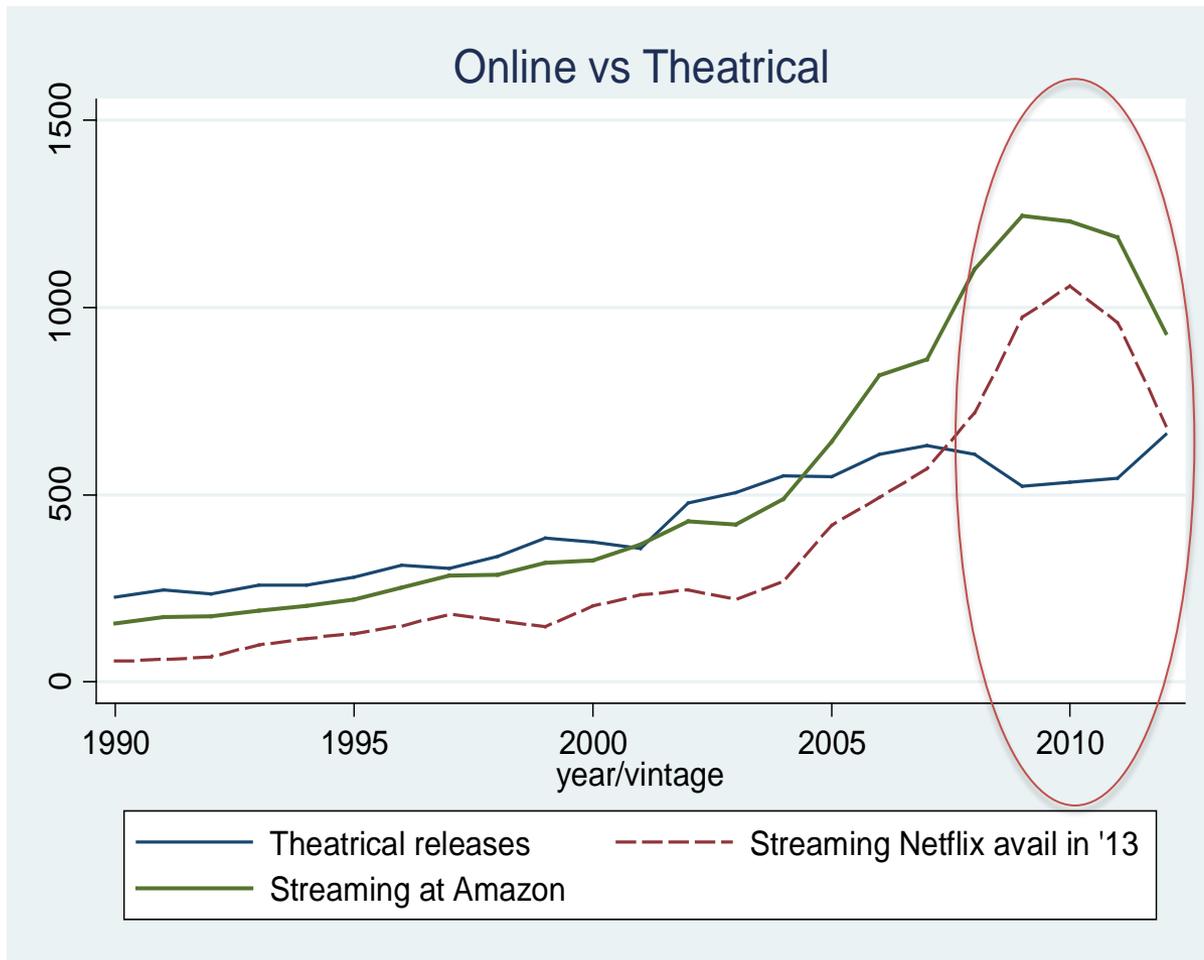
Movies with IMDb pages as of August 2013

# Growth in small-scale theatrical release



Sources: MPAA, Box Office Mojo, Metacritic

# More movies “released” to digital streaming services



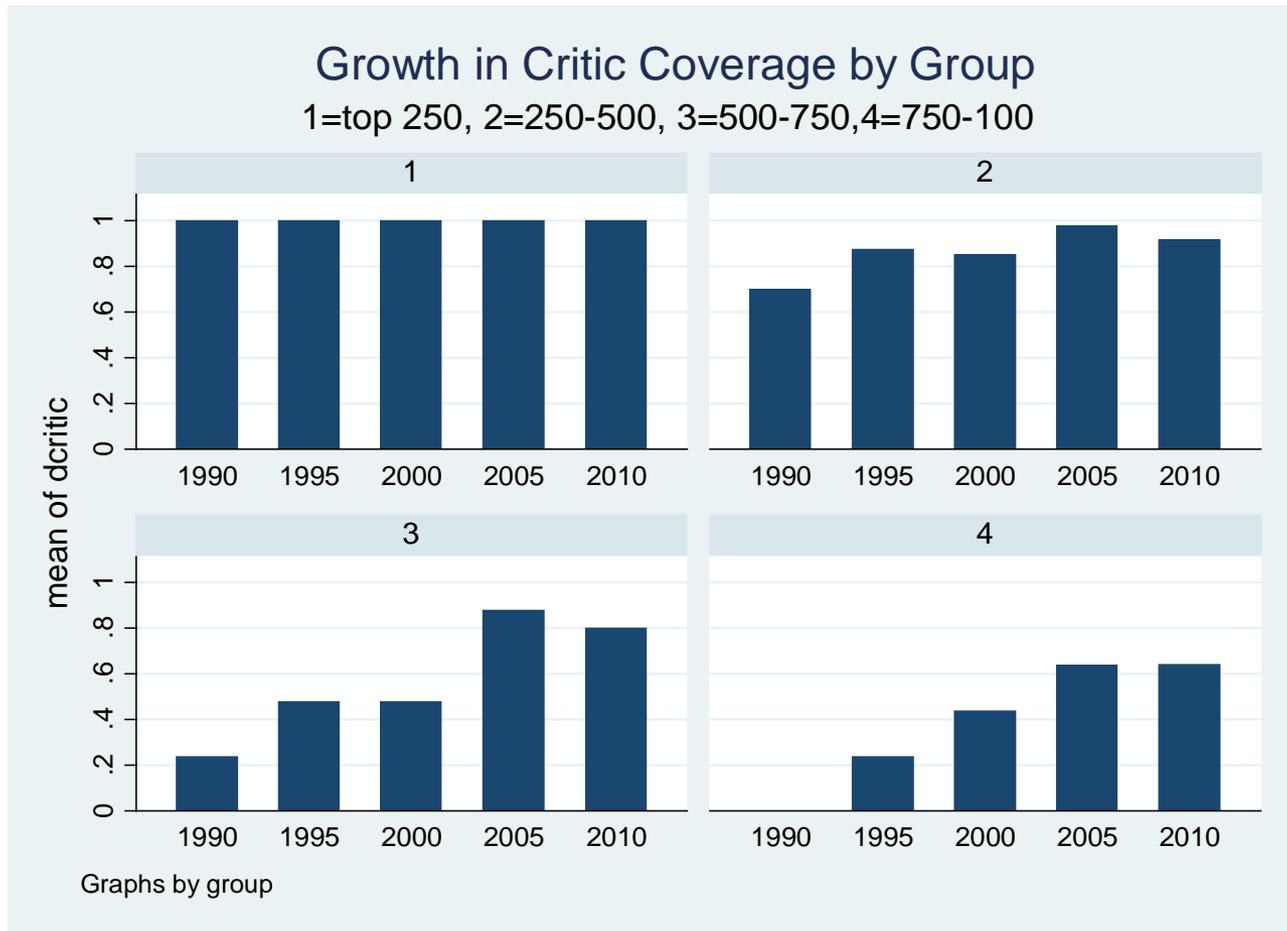
In 2013, over 1000 vintage-2010 movies available on streaming Netflix, over 1,200 at Amazon Instant

Sources: IMDb, Instatwatcher.com, Box Office Mojo

# Product discovery

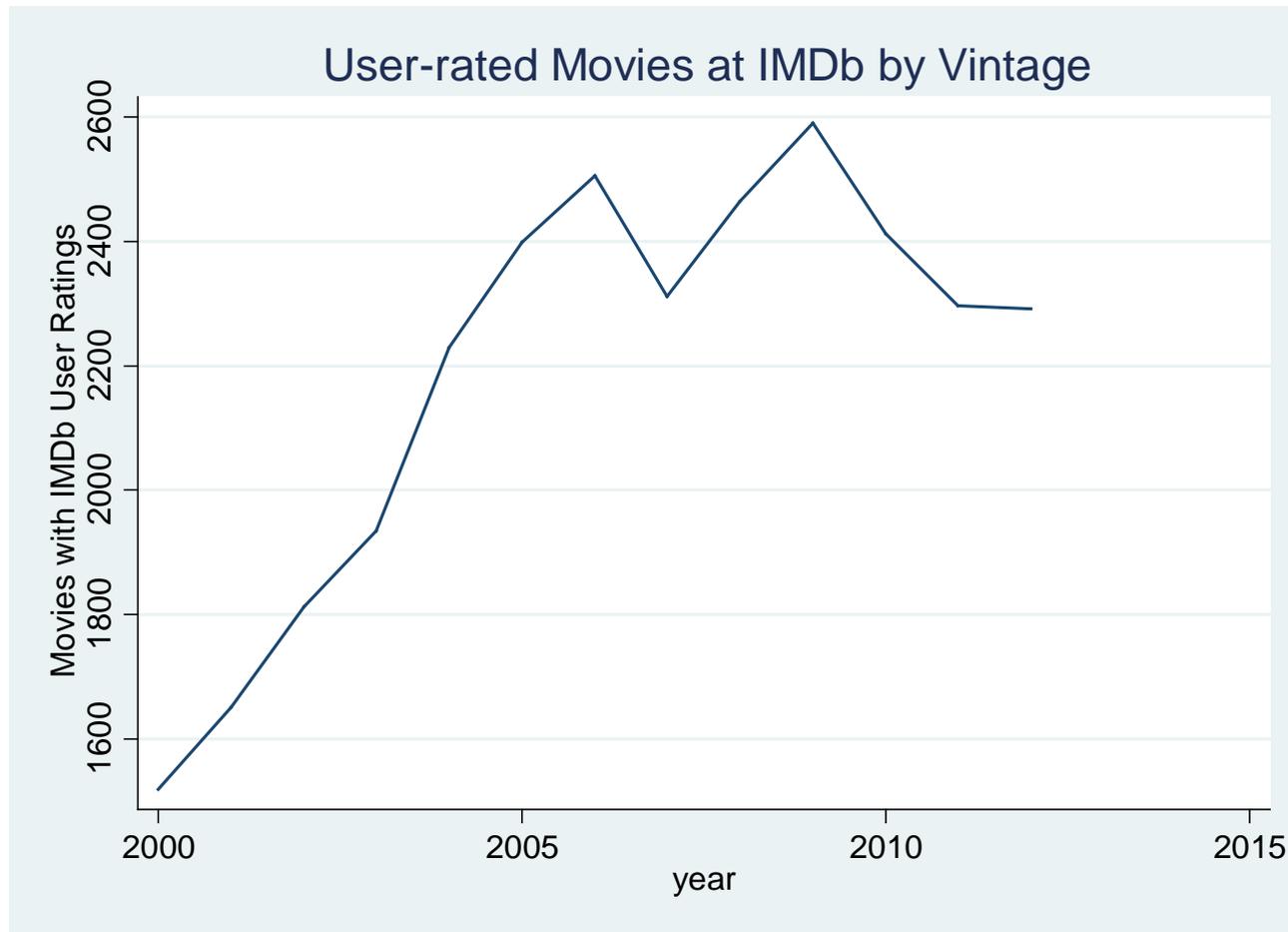
- Significant growth in review provision and availability
- A range of “professionals” plus amateurs

# Pro review availability goes deeper



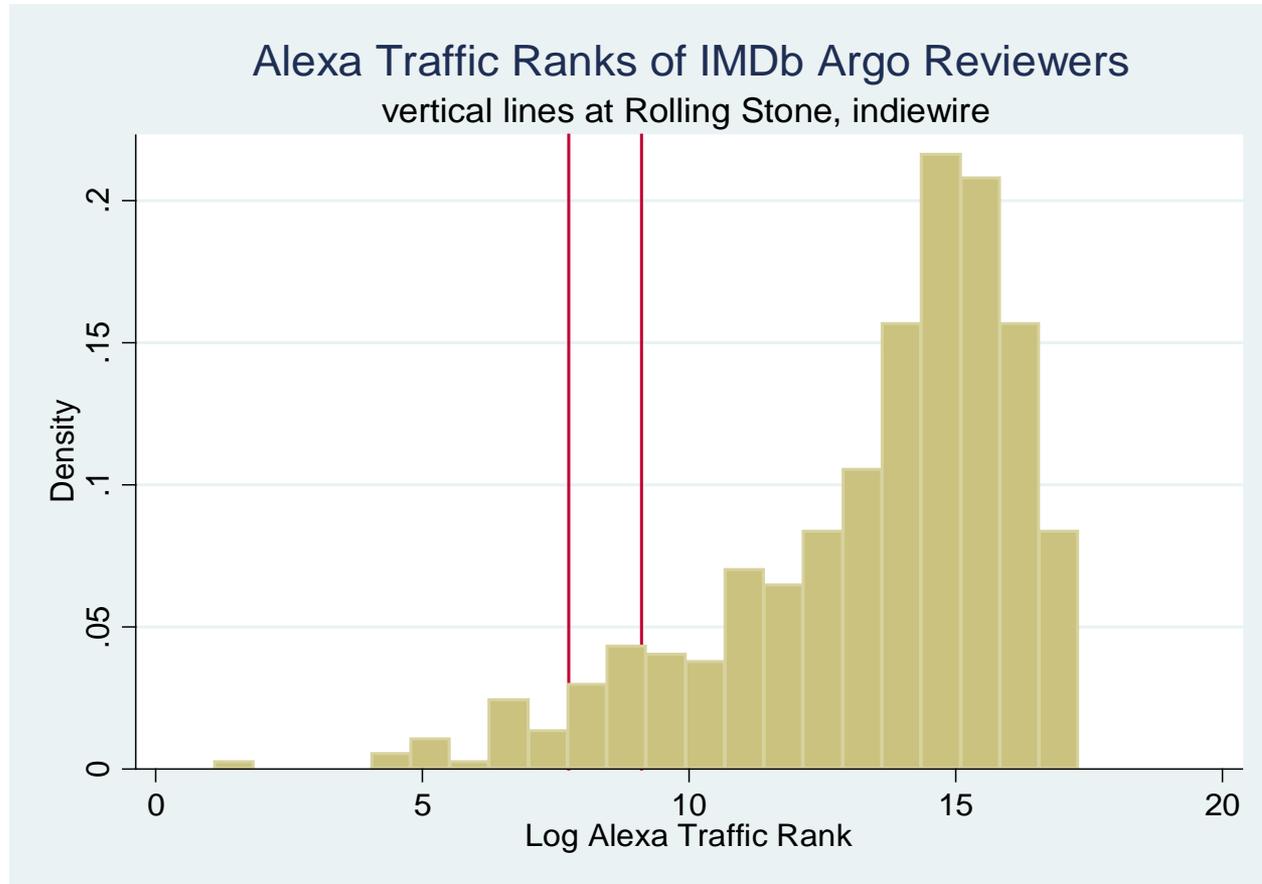
Reviews of selected movies at IMDb

# Many movies have user ratings at IMDb



Source: IMDb, movies with 5+ user ratings

# “Argo” example: wide range of “pros”

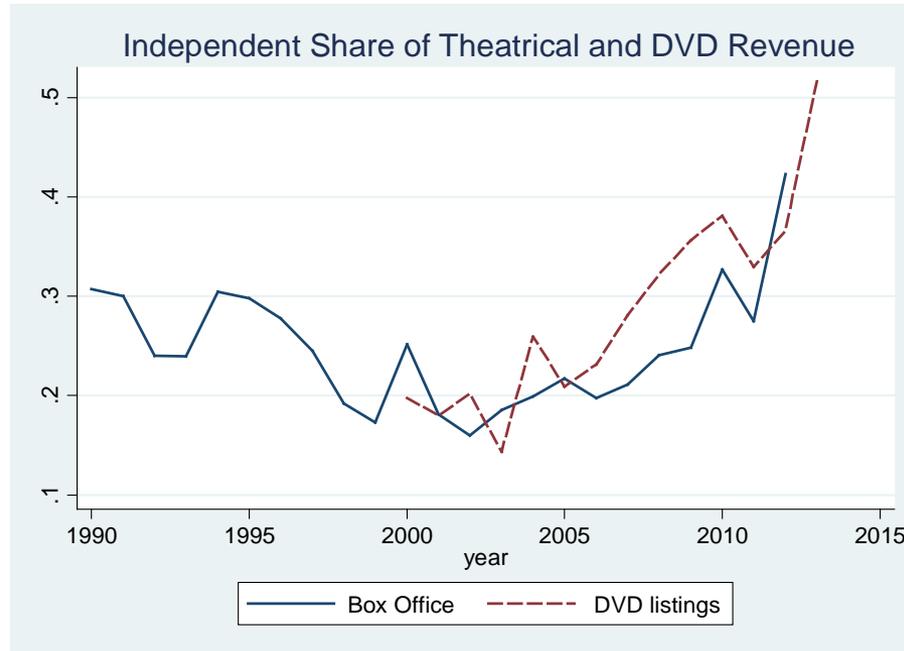


588 reviews  
and the Alexa  
ranks of their  
sources.  
Median rank:  
1.6 million

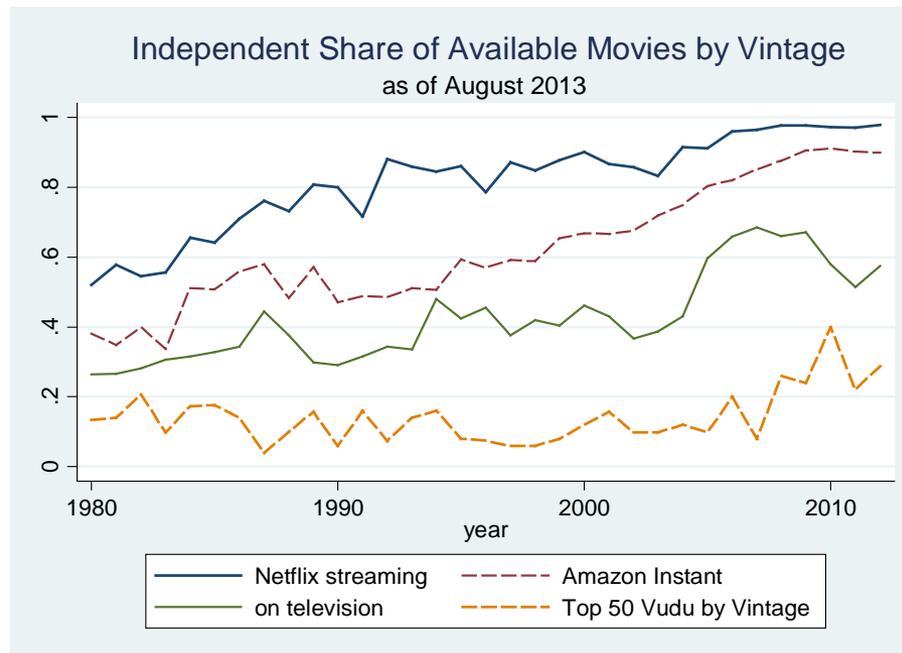
# Do independent movies succeed?

- What is “independent”?
  - “I know it when I see it”
    - Independent Spirit
  - Limited appeal
    - Indiewire
  - **Not produced by major studio**

# Indies are growing share of box office and DVD revenue



# ...and a growing share of what's available through various channels

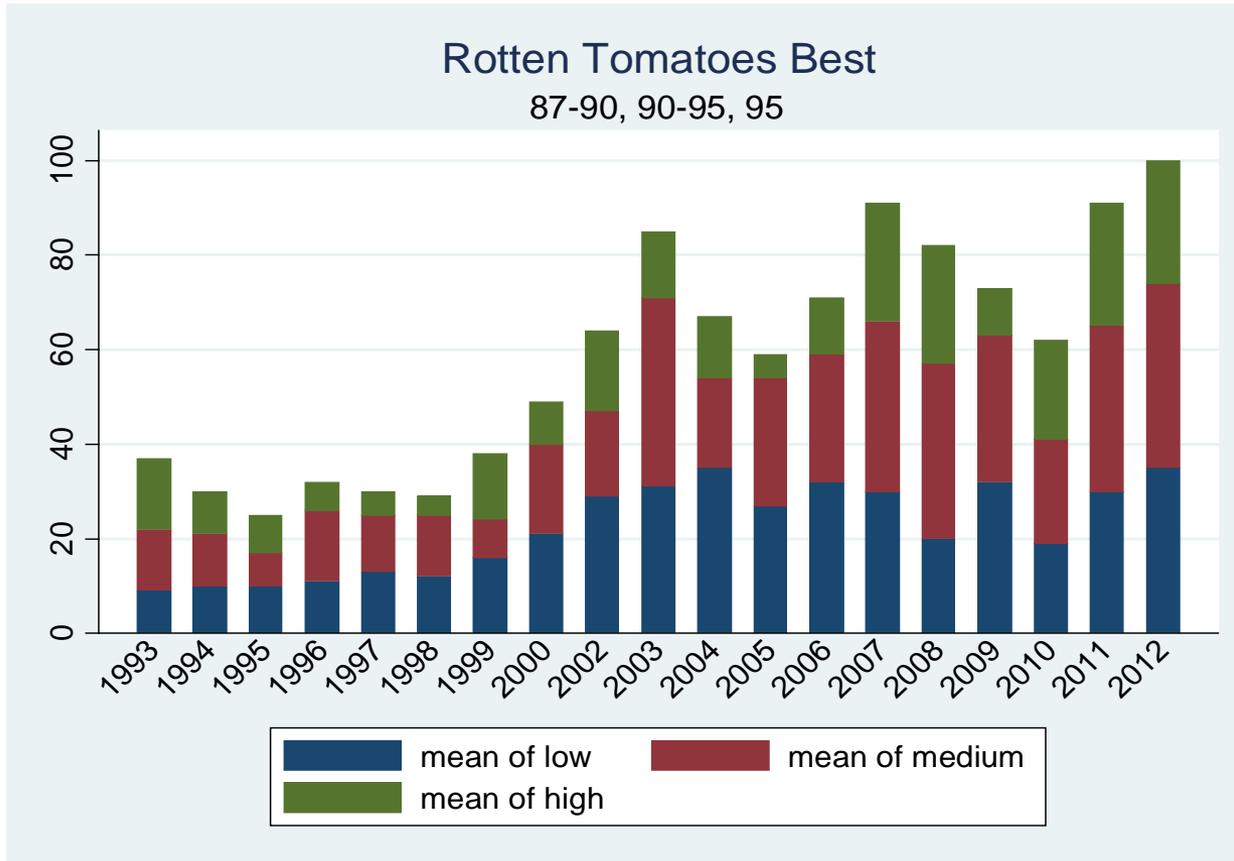


- *Growth in independent movies by many measures*

# Are the new movies “good”

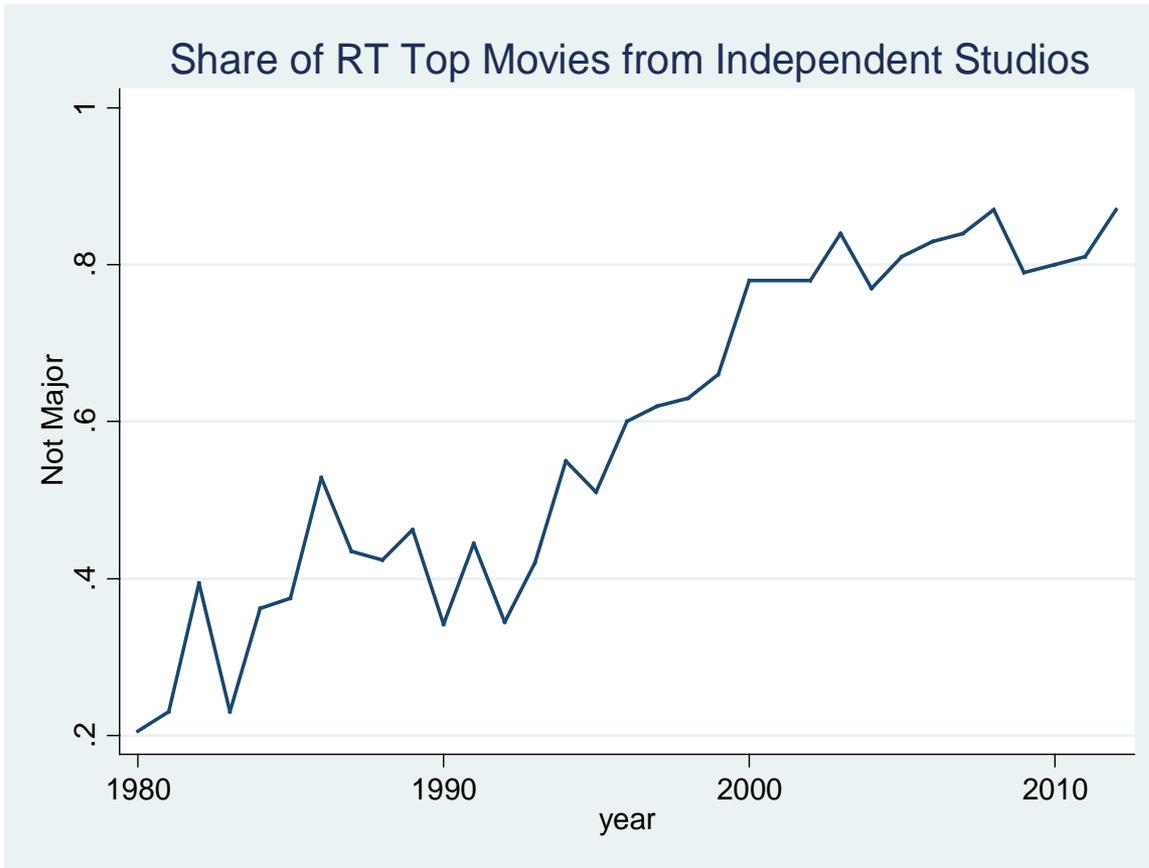
- Two kinds of approaches, based on critics and usage

# Rotten Tomatoes

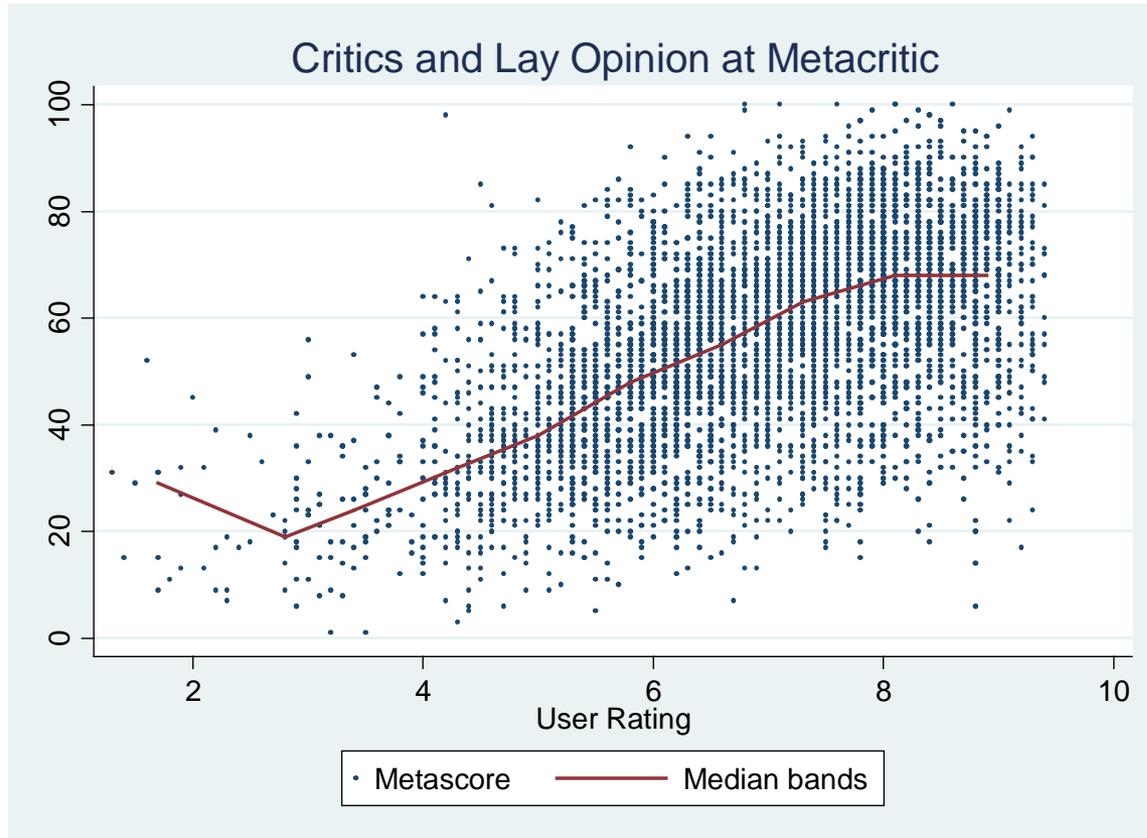


Absolute number of movies with high grades has risen a lot

# Independent movies account for growing share of RT-top movies



# Btw: pro and amateur opinions are positively correlated

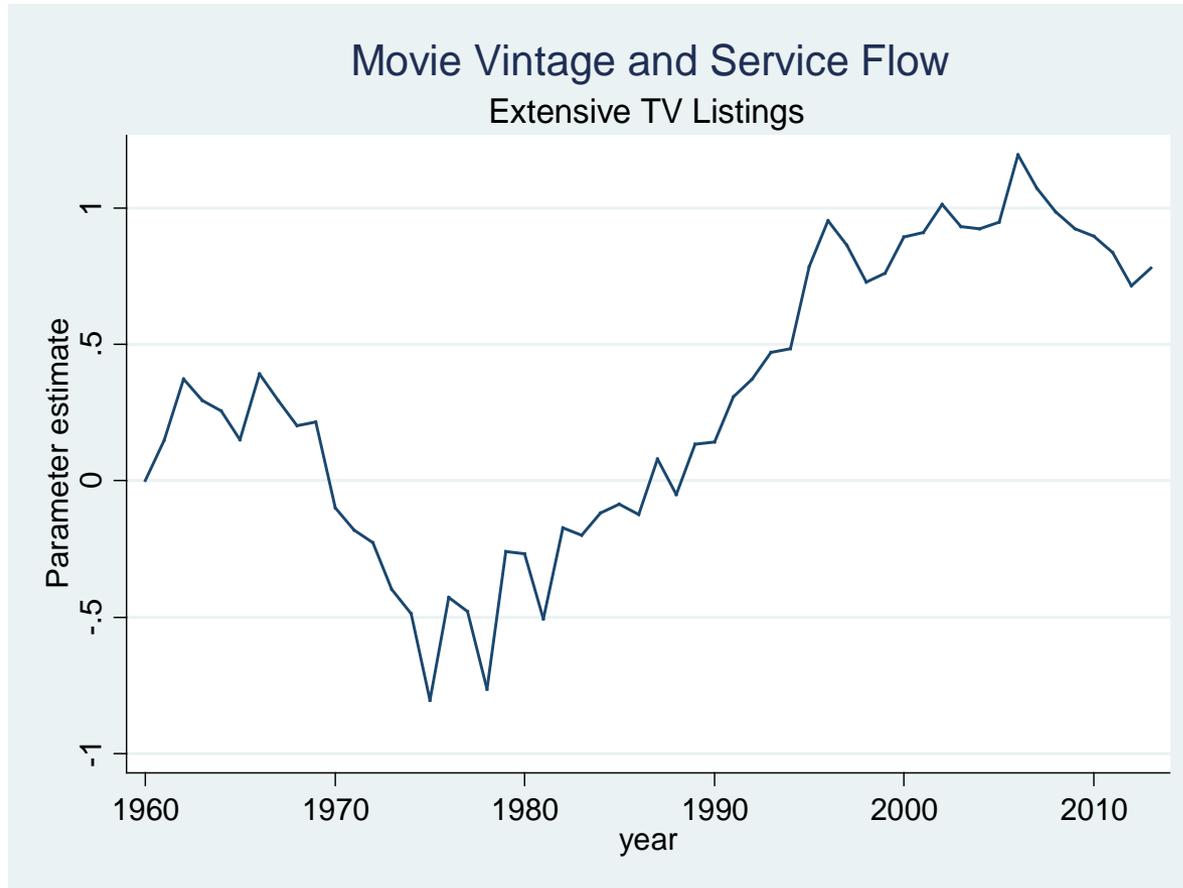


# Are new vintages “good”?

## Usage evidence

- *As before:*
- Regress  $\ln(s_{t,v})$  on age dummies, vintage dummies.
  - Allow flexible depreciation pattern
- ***Then: vintage dummies are index of vintage “quality”***

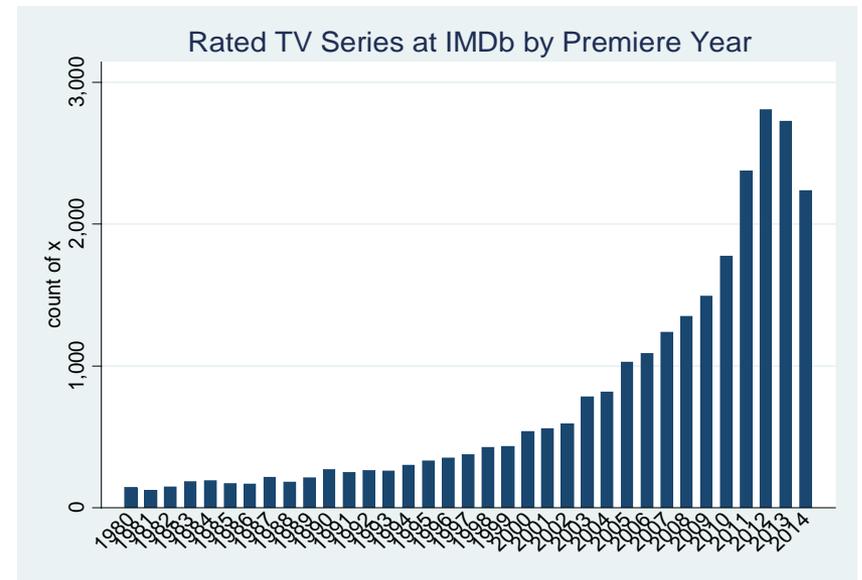
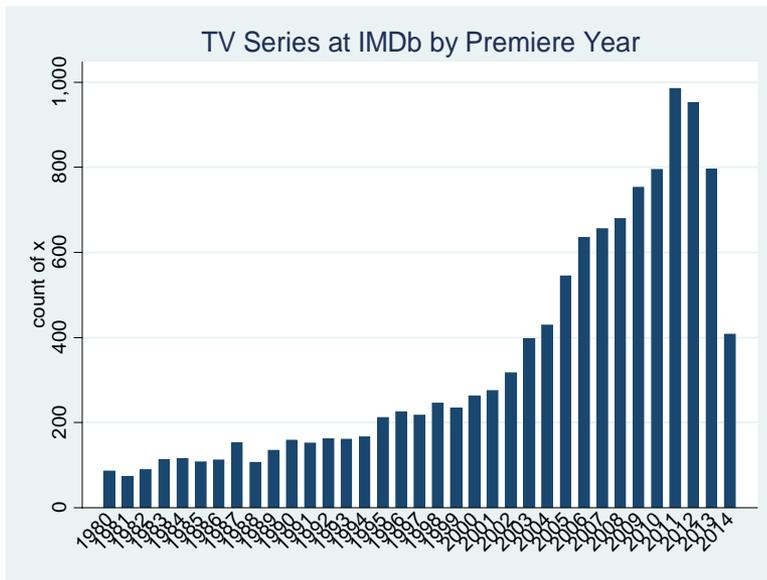
# Movies have been getting better



Mixed result: no apparent increase in vintage service flow during most recent growth, since 2005

# Television

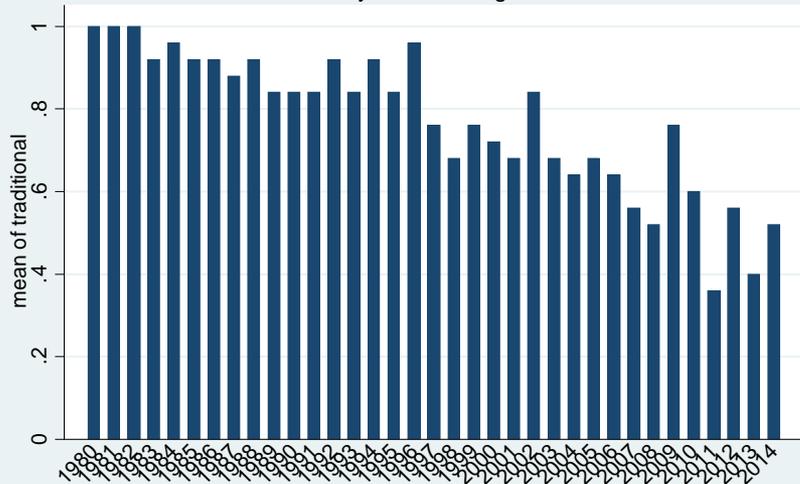
- Growth in products?



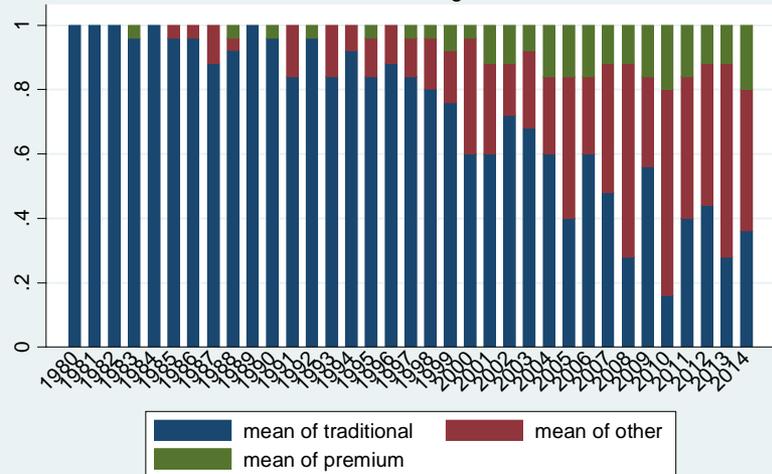
- Yes: more “draws”

# Falling traditional-network share of acclaimed shows

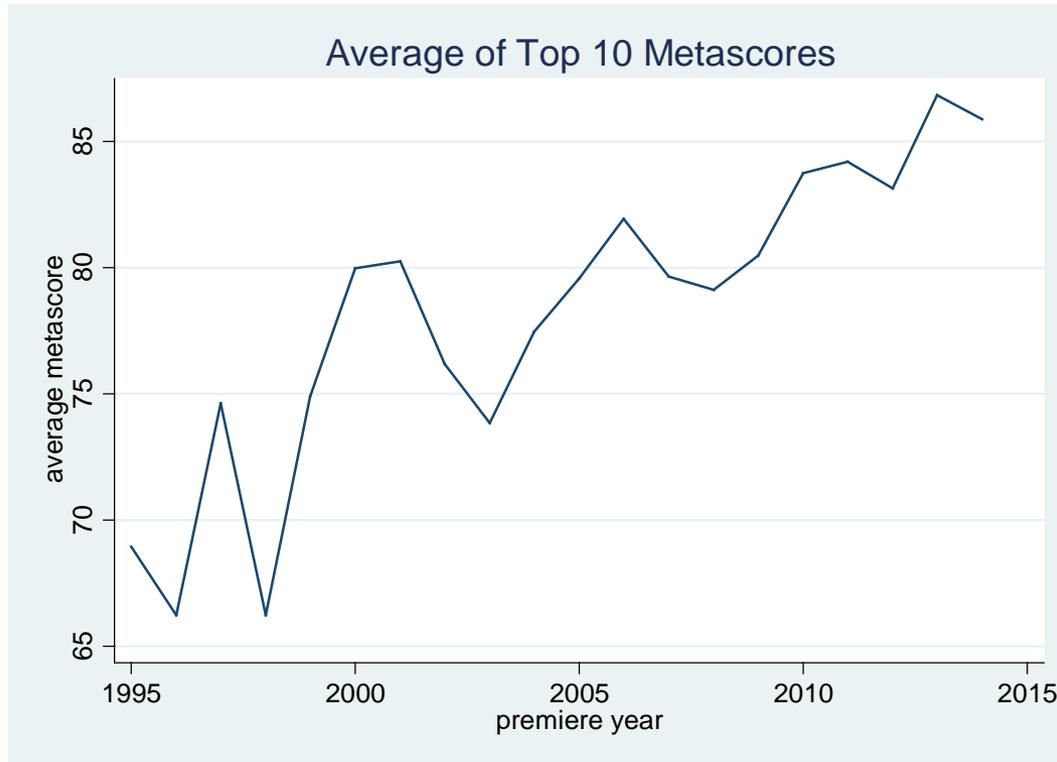
Traditional Broadcast Network Share of Metacritic top 25  
by series vintage



Top Shows by Vintage and Source  
IMDb ratings



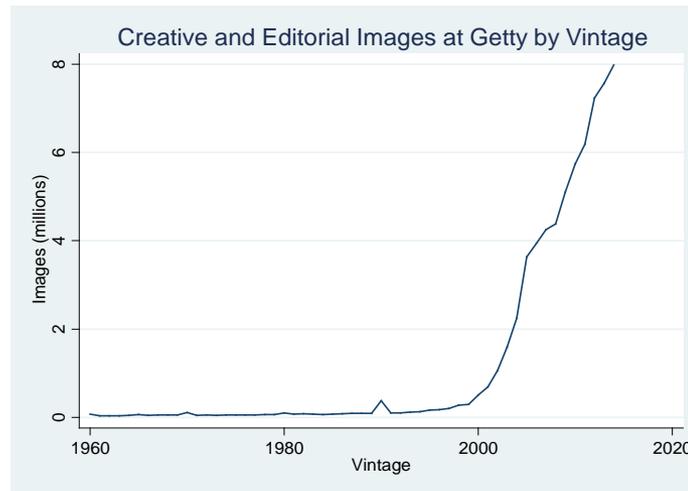
# The best new shows are “good” compared to history



The Golden Age of television is now

# Where else?

- Video games?
- Photography?
  - Democratization of means of production



# Conclusion

- While new digital technology brought threats to creative industries (piracy), it also brought opportunities
- Huge growth in new products and distribution
- And “new products” make up large and growing share of successful
- Threats to revenue are real, but
  - no sign of diminished output
  - and works are better

# Public Policy

- Rights holders are concerned about declining revenue from some sources
  - Understandable
- Copyright exists to provide incentives for creative activity
- Despite revenue performance in recorded music and newspapers, and fears in movies, ***there is no crisis in creative activity***

# Underlying works

- “Piracy on the High C’s..”, with Rob, JLE 2006
- “Copyright...”, JLE 2012
- “And the Bands Played on..” NBER volume 2015
- “Storming the Gatekeepers...” with Reimers, IEP 2015
- “Cinematic Explosion...” forthcoming, JIE
- Digital Renaissance, Princeton Univ Press, 2016?
- “Even the Losers...” with Aguiar, forthcoming, IEP
- “Quality Predictability...” with Aguiar