Digital Economics: What Music Streaming Can Teach us About Economics and Life

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A journey through the music industry

A story about how digitization changed:

— what gets created

— what gets heard

— who has power

From piracy to streaming platforms

Act I - Bad News:
Music Piracy and Revenue Collapse

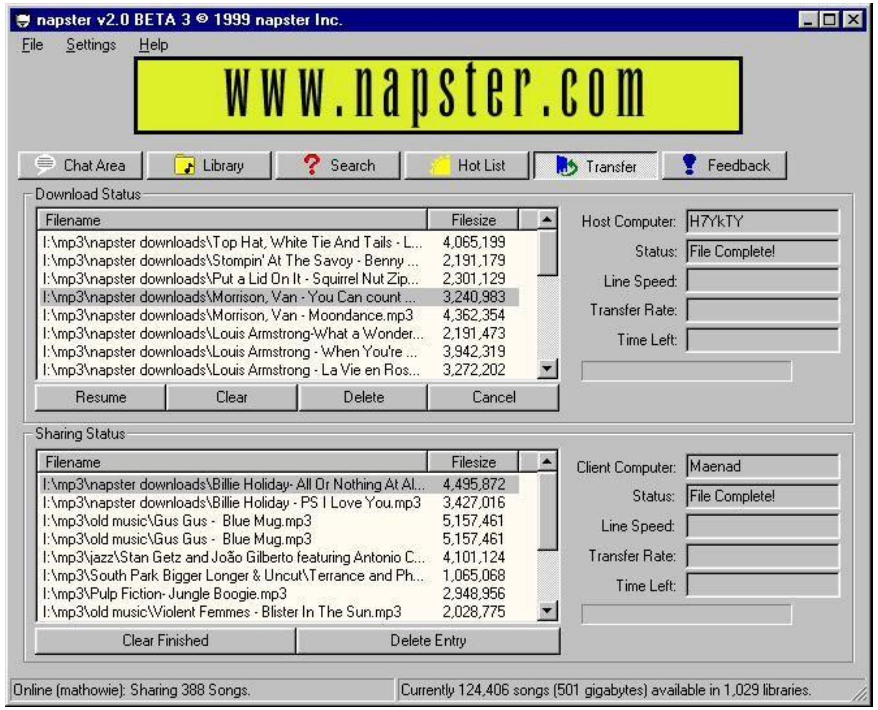
Digitization first brought “Bad News”

Digitization means turning music into digital files.

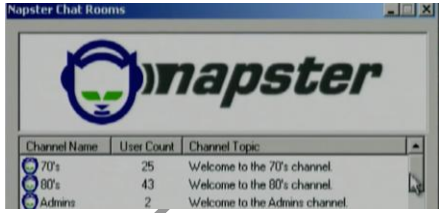
—Digital files are easy to copy and share

—Around 1999, this enabled widespread online music piracy

—Consumers could easily access music without paying!



Recorded music revenues fell sharply after 1999

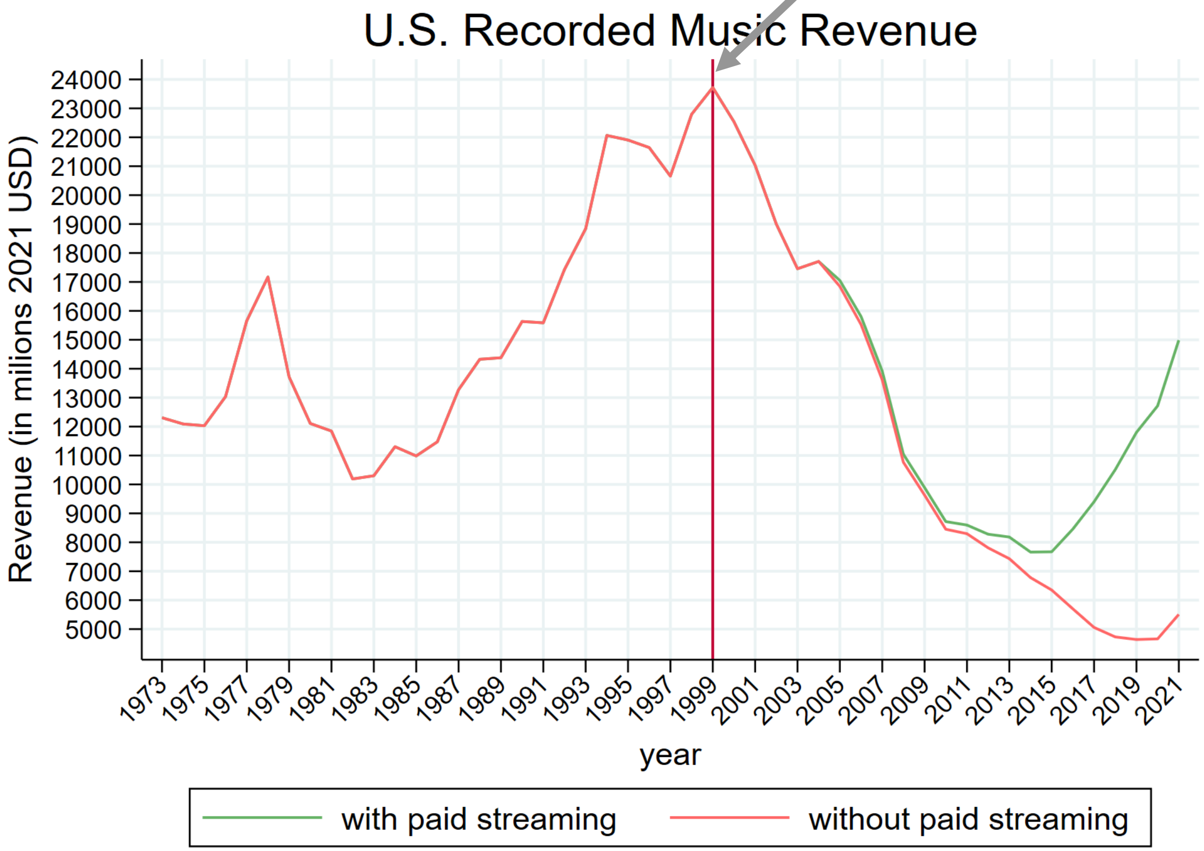


— Recorded-music revenue peaked around the Napster period.

— Revenues then declined dramatically

  — In the US, but also worldwide

— Looked like an **existential threat** to the industry



Did piracy cause the decline?


The Daily Journal
VOL. CCLXXVIII No. 48,952 TUESDAY, MAY 27, 2025 $2.00
Bad News!
Markets Drop as Uncertainty Rises Around the World
Global markets fell sharply today amid growing concerns about the economy and rising geopolitical tensions. Investors are bracing for more volatility ahead.
Stocks declined in major indexes as data showed slower growth and persistent inflation. Experts warn that challenges could persist in the months ahead.
Oil prices also slipped today, while gold climbed to a three-week high as investors sought safety in uncertain times.
Leaders from around the world are expected to meet later this week to discuss ways to address the mounting risks.
Dark clouds loom over the financial district.
POLITICS
Lawmakers Clash Over New Spending Bill
PAGE 3
NATION
Study: Consumer Confidence Falls to Five-Year Low
PAGE 6
SPORTS
Championship Hopes Fade After Costly Loss
PAGE 10

The answer is not as obvious as it sounds...

—People may pirate instead of buying, but

—Some pirated music would probably not have been purchased anyway

—Piracy could also increase music discovery and stimulate sales

Hard to tease out causal effects from correlations!

Several years of research showed that **piracy was the cause of the lion’s share of the decline in music sales**.

Why do revenues matter?

—Artists and labels invest time and money to create music

—If piracy lowers expected revenues, may lead to a decline in music **production!**

—Lower revenues is not only bad news for producers, but **bad news for all!**

The natural response: protect revenues!

- —If piracy reduced sales, the natural response was to **fight piracy**
- —Strong push for more online copyright enforcement
  - —Lawsuits, takedowns, site blocking, anti-piracy campaigns
- —Goal: protect recorded-music revenues

Hadopi
Haute Autorité pour la diffusion des œuvres et la protection des droits sur internet

MEGAUPLOAD

SOPA
STOP ONLINE PIRACY ACT

The right question

—For society as a whole, producer revenue is not the final objective.

—Revenues only matter insofar as they provide ***incentives to create***.

—If digitization reduced revenues, did it also reduce creative output?

Did we get less music?

—Time for some good news…

Act II - Good News:
Lower Costs, More Experiments

Digitization made music cheaper to create

—Creating and releasing music has become ***much cheaper*!**

—Lower costs mean more artists and labels can try.

The result? A dramatic increase in creative output!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Good News!

Optimism Grows as Progress Brings Hope for the Future

Encouraging signs across the economy and beyond are lifting spirits. Communities, businesses, and individuals are finding new opportunities and building a brighter tomorrow.

Job growth accelerated last month, with strong gains in key industries and rising wages boosting household confidence.

Consumer spending rose as inflation eased, supporting businesses and setting the stage for continued expansion.

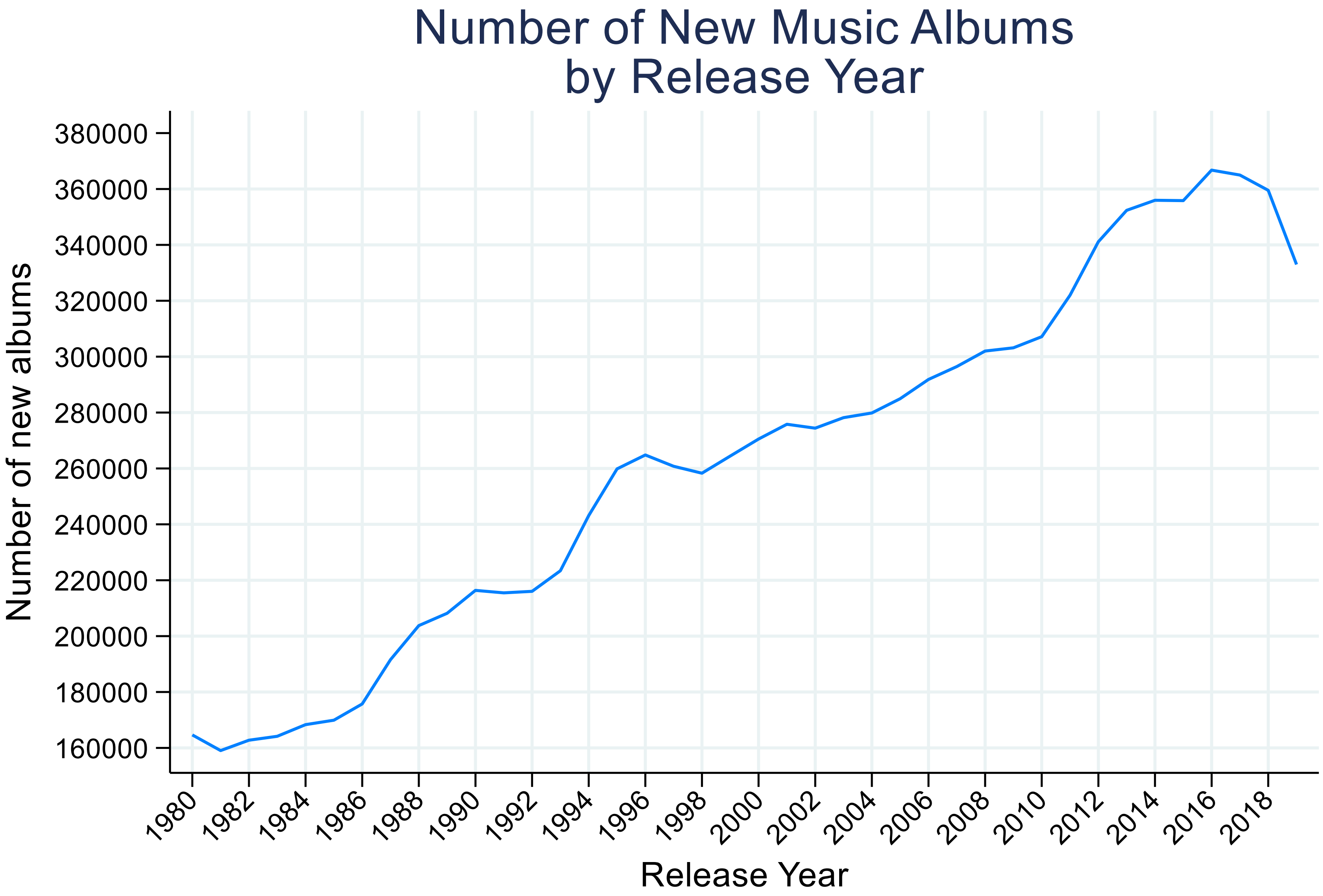
Leaders are investing in innovation and infrastructure to build stronger communities and create lasting opportunity.

Sunshine returns over the city as brighter days ahead inspire hope.

BUSINESS
Companies Report Strong Earnings and Outlook
PAGE 3

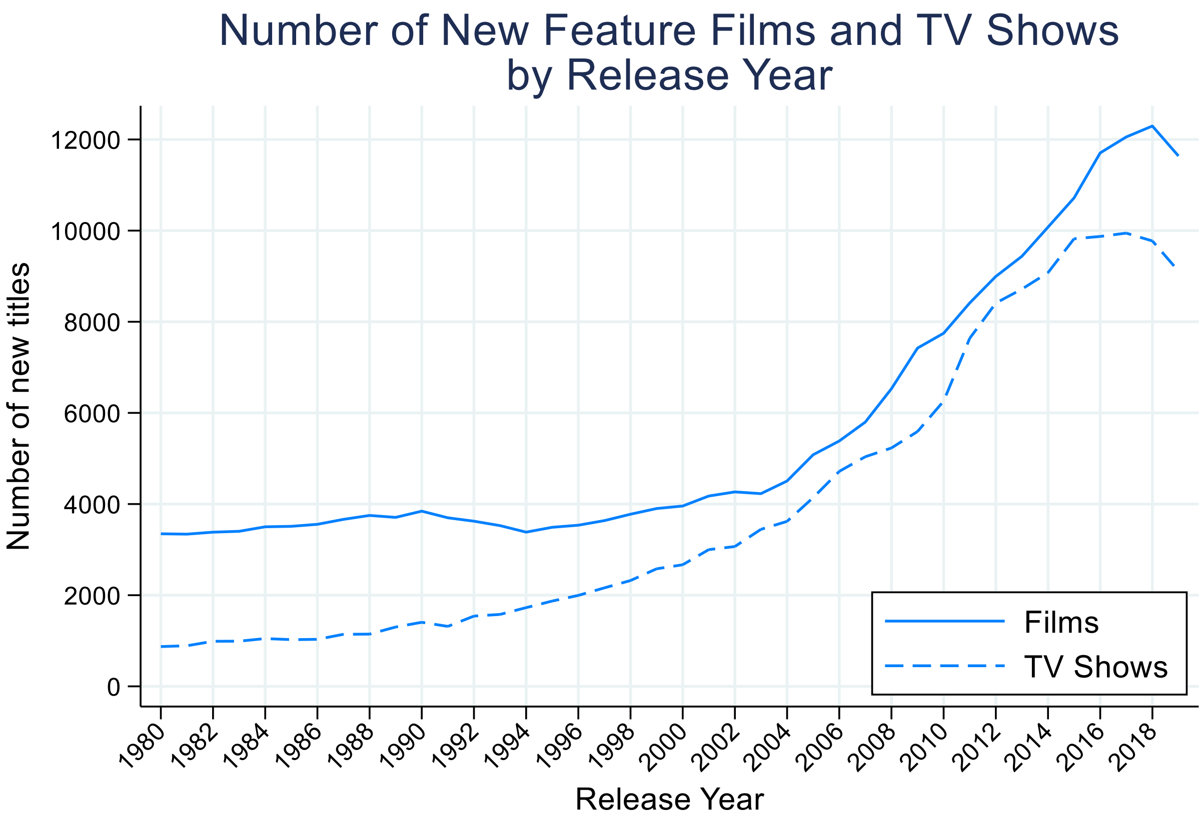
NATION
Communities Come Together to Build a Better Future
PAGE 6

LIFESTYLE
Health, Happiness, and Balance Top the List in 2025
PAGE 10

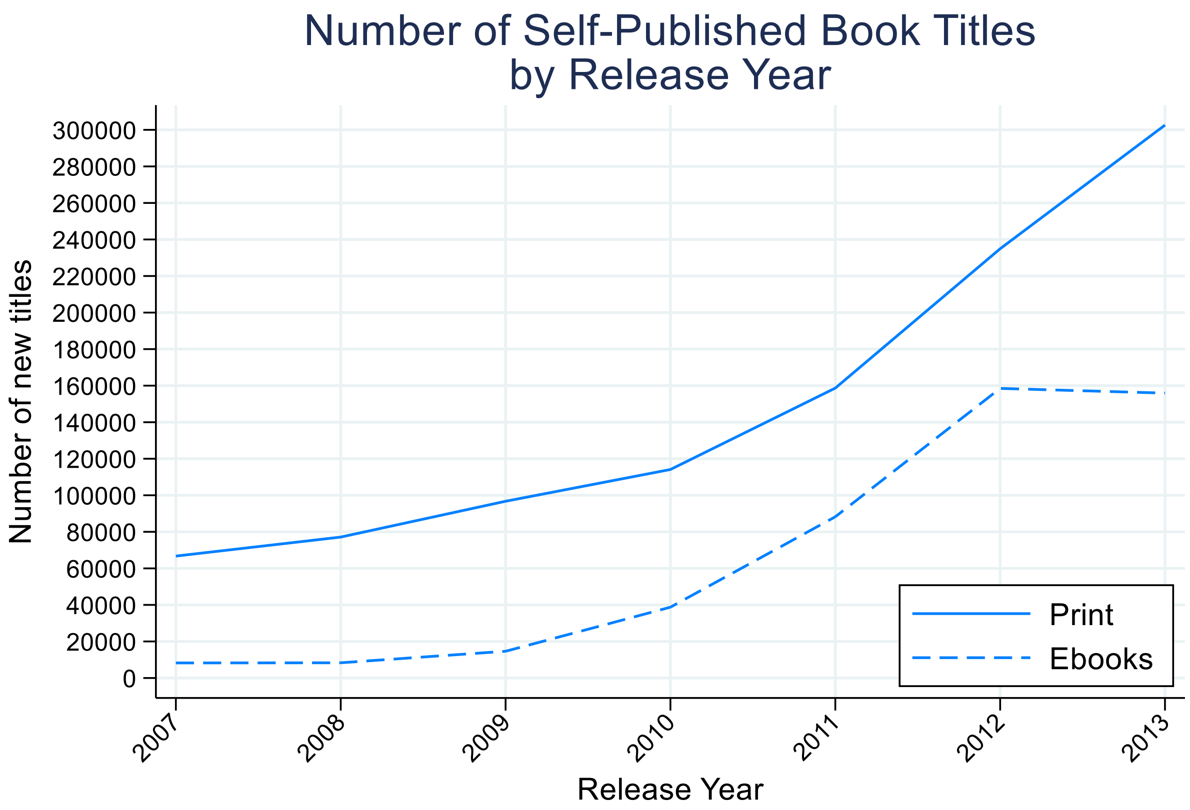


Source: Discogs.

Movies & Books



Source: IMDb.



Source: Bowker.

Is more music necessarily better?

It depends!

—If the additional songs have low appeal, the benefits are limited

—If some of them are hidden gems, the benefits can be large

Before digitization: labels had to choose winners

Releasing music is costly, so labels select artists they **expect to succeed**

—Artists with ***expected revenue*** higher than costs will be released.

—Many artists had to be rejected.

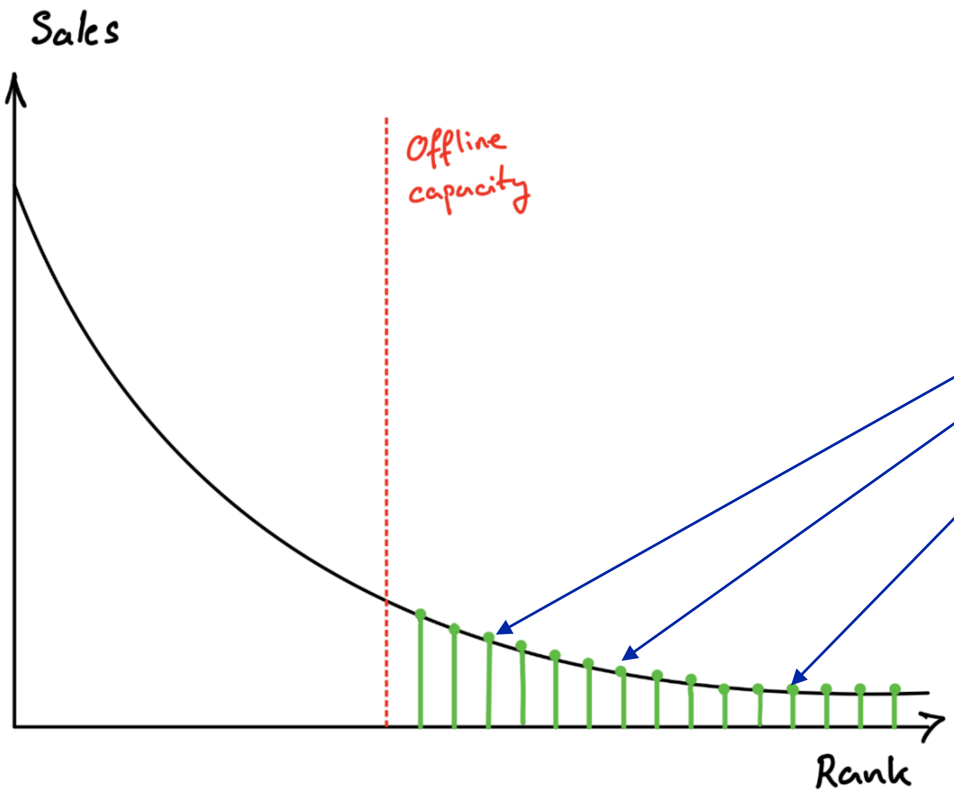
With digitization and lower costs, some of the artists that would previously have been rejected will be released.

World 1: Labels can predict success

Labels already release the best artists

—The newly released artists (the “expected losers”) have limited appeal

—Digitization brings in (lots of) **lower value releases** to market.



“Expected losers” have relatively low appeal: Limited benefits.

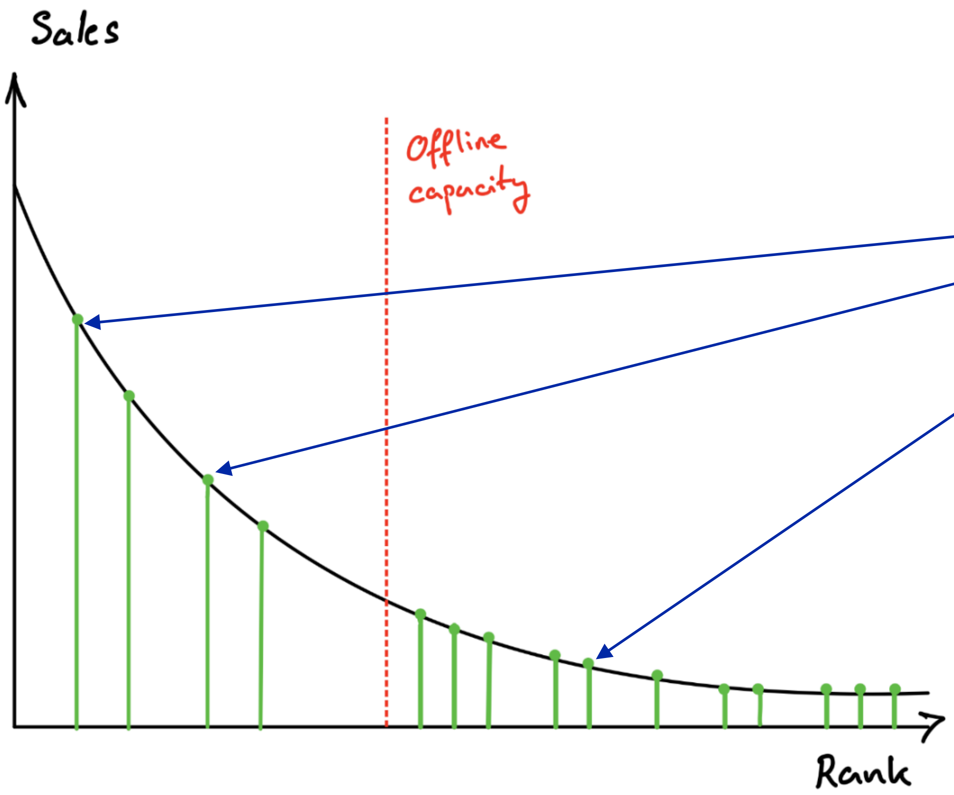
World 2: Success is hard to predict

Some of the **“expected losers”** become hits

—Lower costs allow more “experiments”

—More experiments reveal valuable products

—Digitization can therefore create large benefits



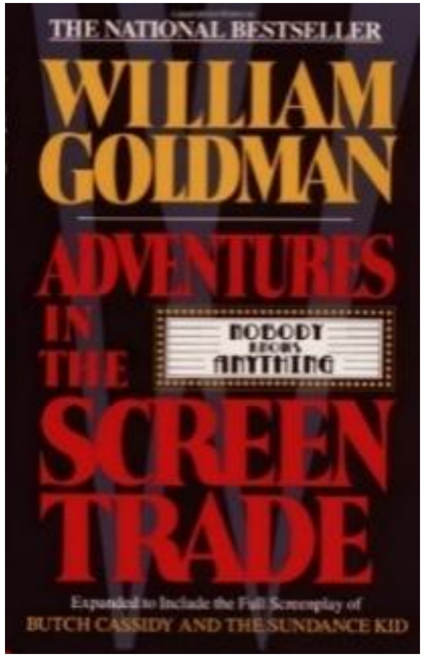
Some “expected losers” turn out to be high-value songs:
Large benefits

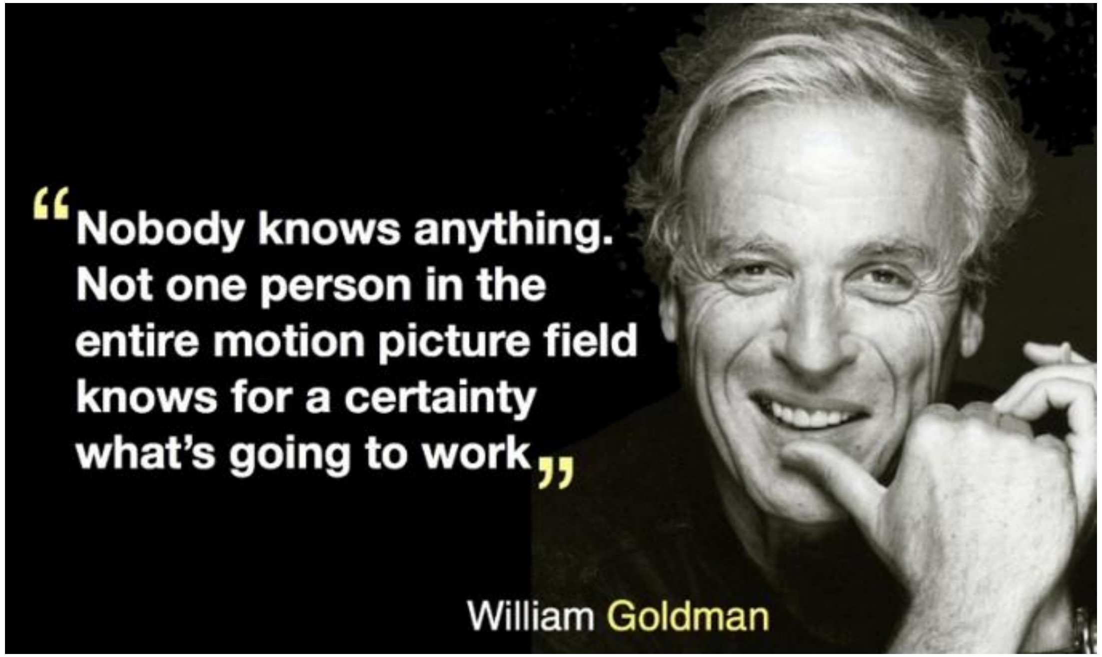
So, what world do we live in?

—Predicting commercial appeal of new releases is **hard**!

—“Major records do well if one in ten of their records ends up covering its costs” (Krueger, 2019)

—Generic feature of creative industries: music, movies, TV, books,..





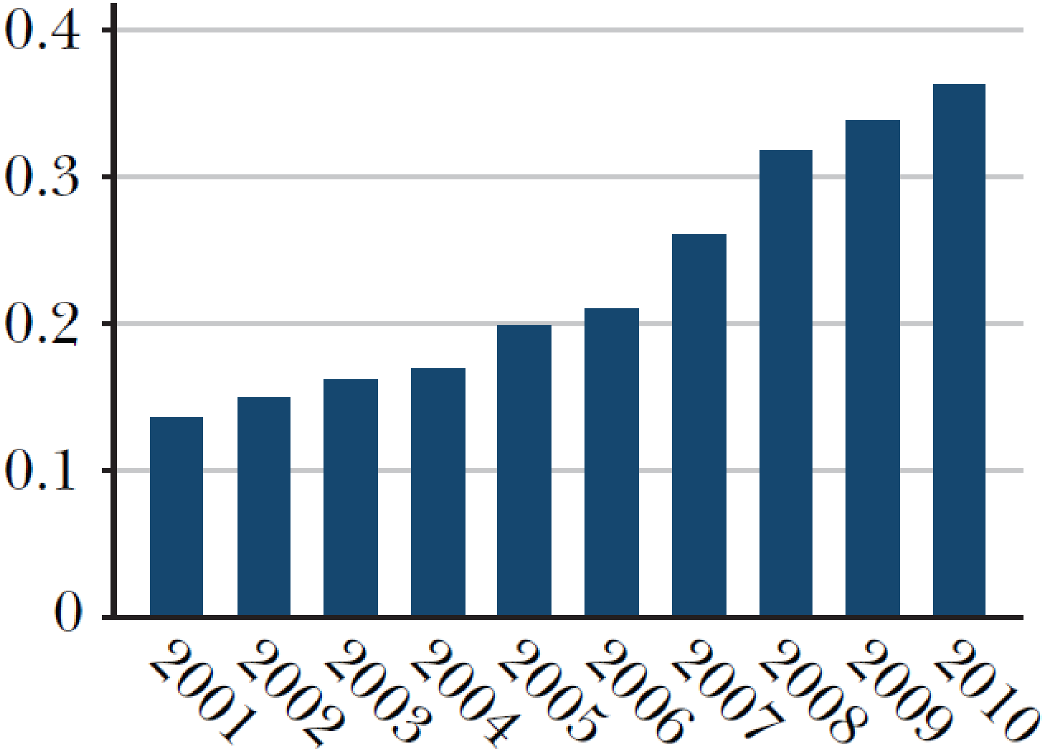
Some “Expected Losers” become hits

Indie artists can be considered “expected losers”

—Were not considered promising enough to be signed by major labels

—Digitization delivered high appeal music that would otherwise not have been released!

Share of indie artists appearing in the US Top 200, by year



Source: Waldfogel (2017)

Lower costs + unpredictable success = large benefits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GREAT ~~Good~~ News!

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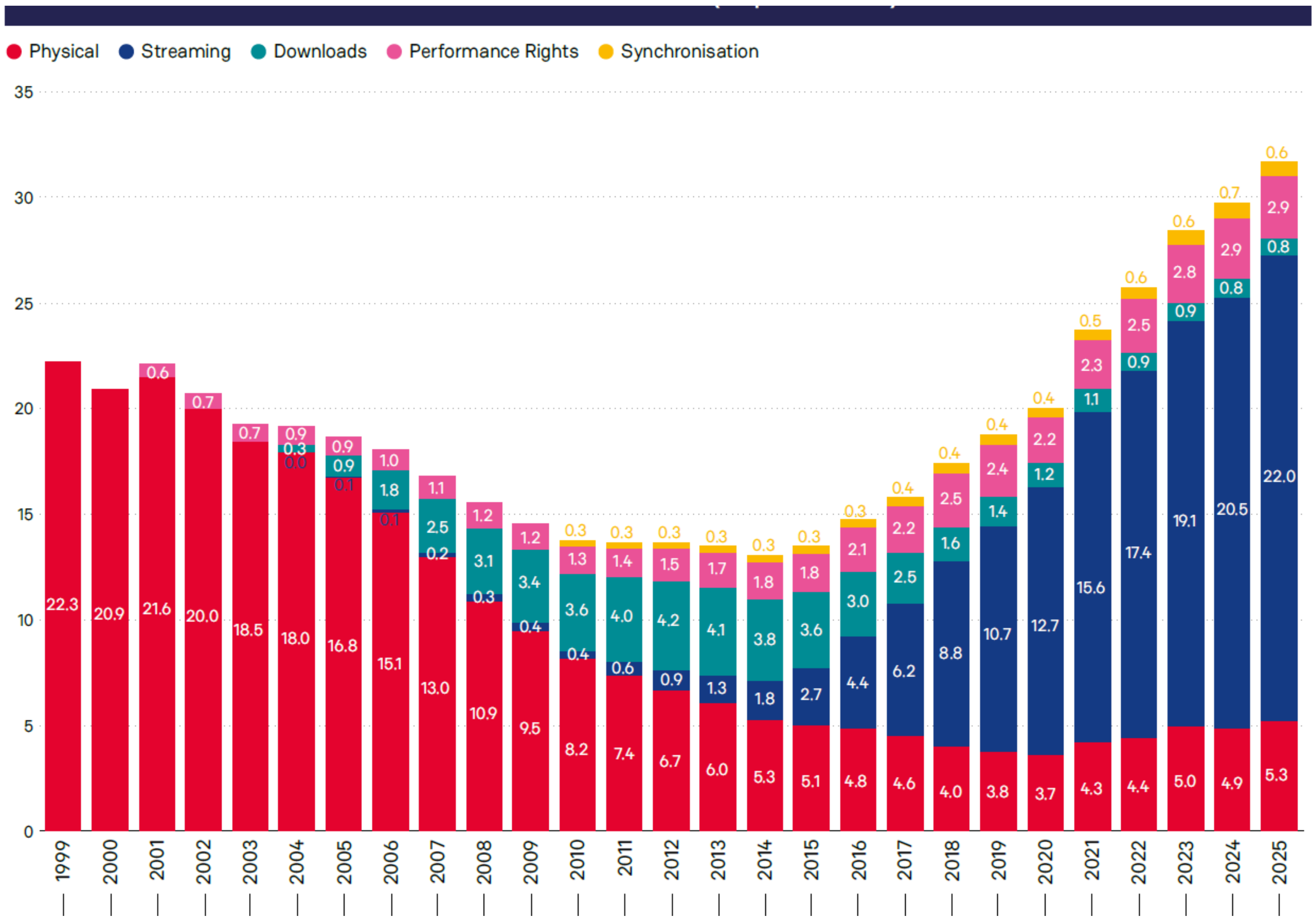
Digitization created more chances to discover value

Act III - Music Streaming: Recovery, Discovery, and Power

Streaming helped the music industry regain profitability



- **1999**: Piracy and Napster lead to revenue collapse
- **2003**: iTunes creates legal digital sales
- **2008-2011**: Spotify pioneers bundled sales with subscription to streaming

Before streaming: major labels as gatekeepers

Old world (pre-digitization):

—Upstream: Major record labels controlled most recorded-music revenue

—Downstream: Thousands of radio stations (promotion) and record stores (sales)

Offline world had limited shelf space: need to stock “winners”

—Few songs promoted on radio

—Expensive to stock products in stores

→ Majors had **strong gatekeeping power**: they determined what was produced, promoted, and eventually consumed.

Streaming platforms: digital distribution and promotion

Digitization:

—Few streaming platforms now **collectively dominate promotion & distribution**

—Replace thousands of radios & record stores

Spotify® MUSIC

—Distribute digitally, with "**unlimited shelf space**":

—New songs can enter at very low cost

—Indie artists can easily reach the market

—+100 million songs on Spotify, +100K adds per week

STREAMING 7/12/2023

112,000 NEW TRACKS ARE UPLOADED TO STREAMING SERVICES DAILY

According to Luminate's Midyear report, the first six months of 2023 saw a nearly 20% increase in new uploads.

By **Glenn Peoples**

Flood of content creates a discovery problem

—More entry is valuable only if appealing music can be **discovered**!

Streaming platforms as discovery machines

Streaming platforms can:

1. Carry **wide selections of songs** (no shelf-space constraints)
2. Experiment by “testing” songs and learn from listeners’ reactions → **discover appealing songs**.
   - —This is valuable because product appeal is hard to predict.
3. Promote songs and potentially **steer consumers toward new discoveries**

Music consumption & discovery at Spotify

Playlists are an important consumption channel

—Anyone can create a playlist:

—Spotify, major labels, indie labels, individuals,..

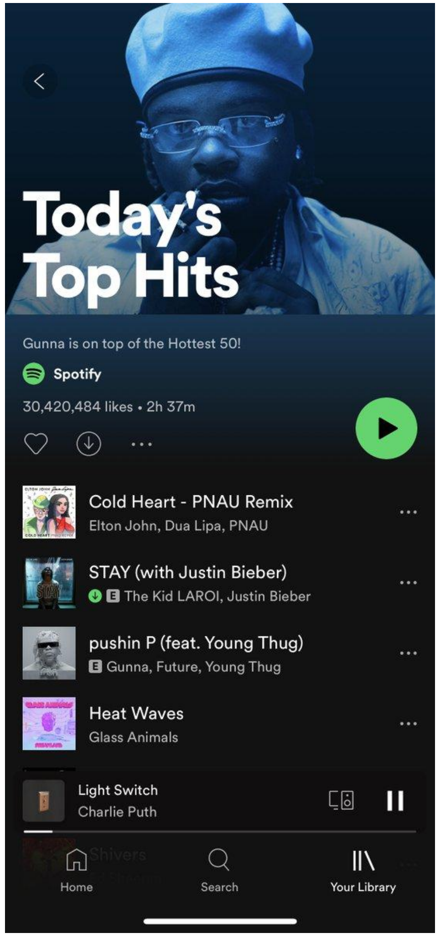
—But Spotify controls the biggest audiences

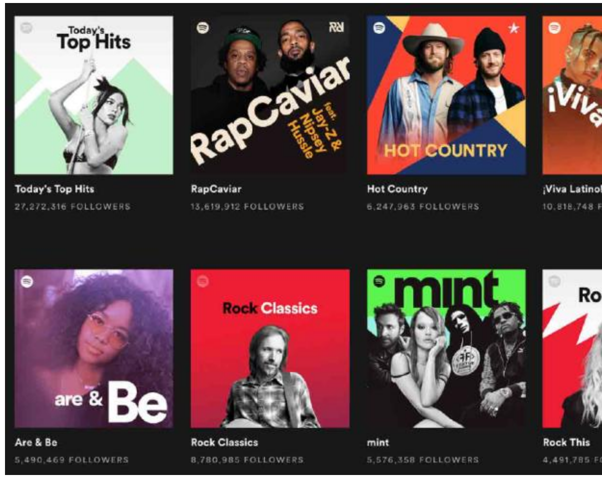
—operates the largest playlists (+30M followers)

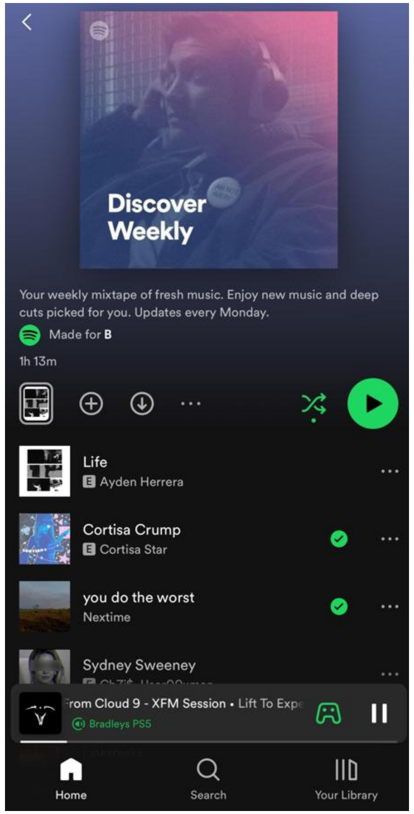
—controls ≈ 80% of playlist followers

—Algorithmic/personalized playlists

—Spotify controls a key access to listeners’ attention.







Playlists as a tool for experimentation and discovery

For Spotify, playlists have 2 main distinct functions:

1. **Experimentation** and discovery of appealing music:

—Spotify can test new songs by placing them on playlists

—Spotify can learn from users' responses (skips, likes,…) from ***all*** lists.

—Unpredictability of music appeal makes experimentation valuable

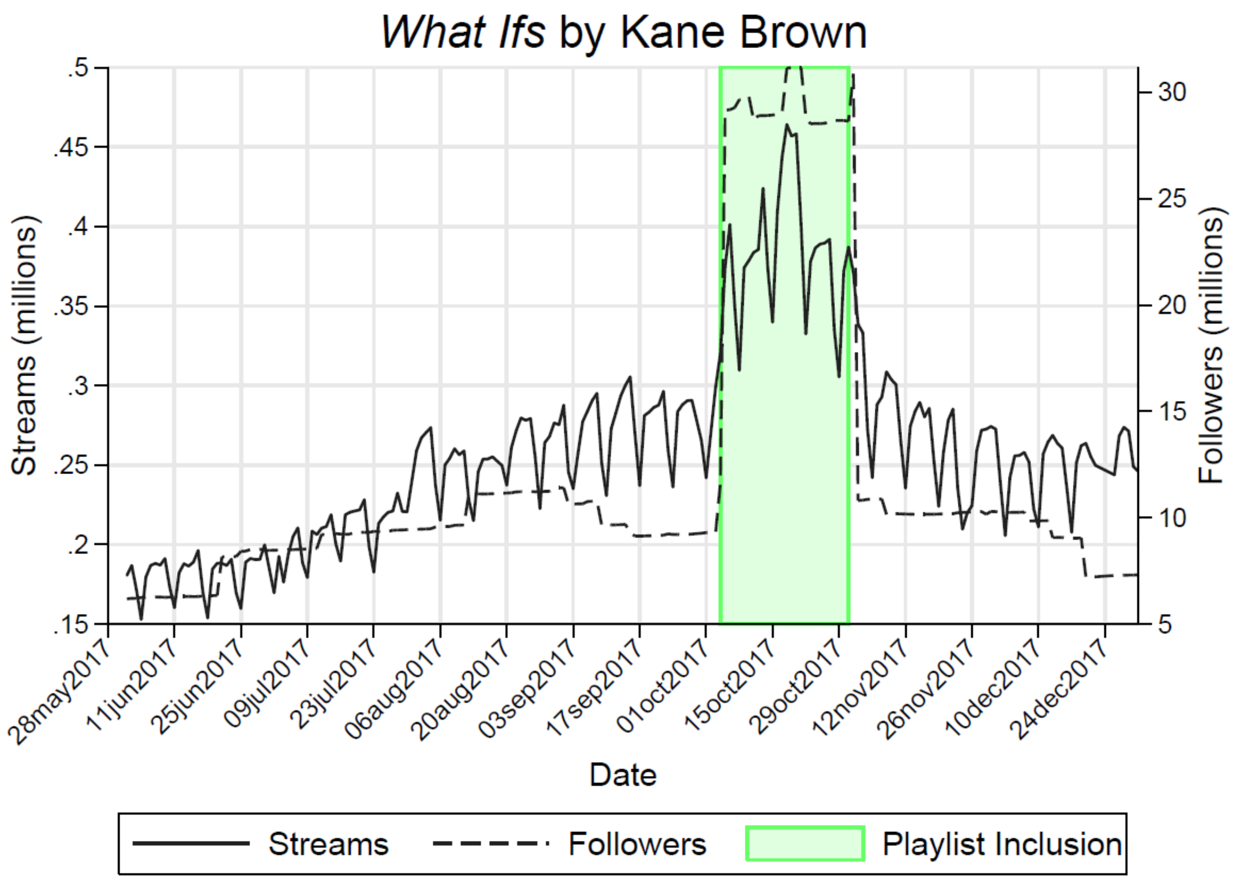
2. **Promotion of discoveries**

—Spotify can promote its discoveries on widely-followed lists and give them more exposure

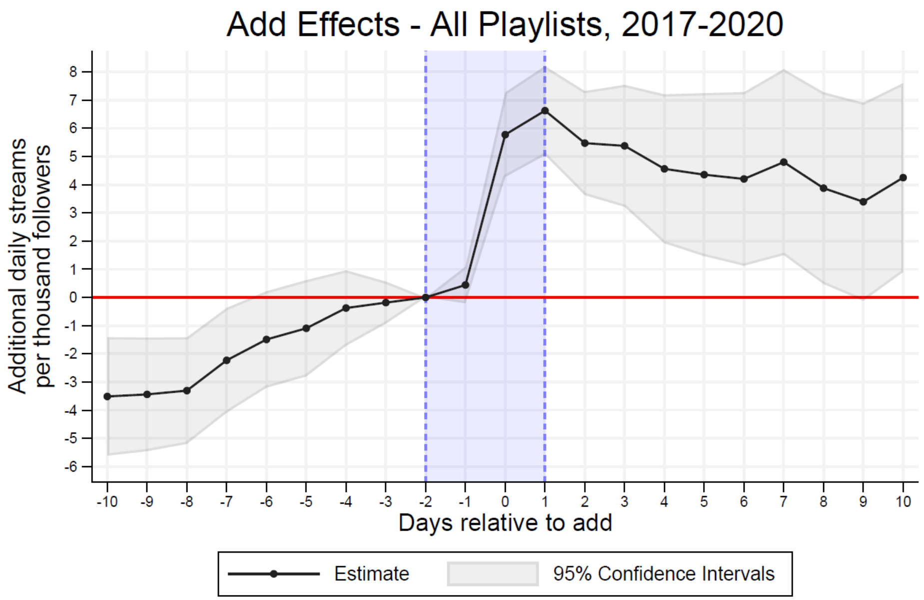
—Turn discoveries into hits, if playlists influence consumption.

Playlists affect listening

Daily Followers and US Streams for a Song added to Today's Top Hits.



Sources: Aguiar and Waldfogel (2021); Aguiar, Waldfogel, Zeijen (2024).



Note: Jumps defined as daily changes in followers of 250'000 or more. Estimates within the blue bands correspond to partially treated days.

Streaming and changes in industry power

—Prior to digitization, major labels had strong gatekeeping power

—Streaming platforms now control a key route to listeners' attention

  —Playlists and recommendations help determine which songs get attention.

—This **shifts power from traditional gatekeepers to platforms**

    —Spotify can influence what listeners discover and what ultimately succeeds

Streaming and changes in industry power

—Spotify has additional incentives to discover and promote **indie** music

—Music royalties are Spotify’ big expense, and **major-label music is more expensive**

—Spotify has been shifting its testing and promotional capacity toward indie music

—Promotes competition and weakens incumbent majors

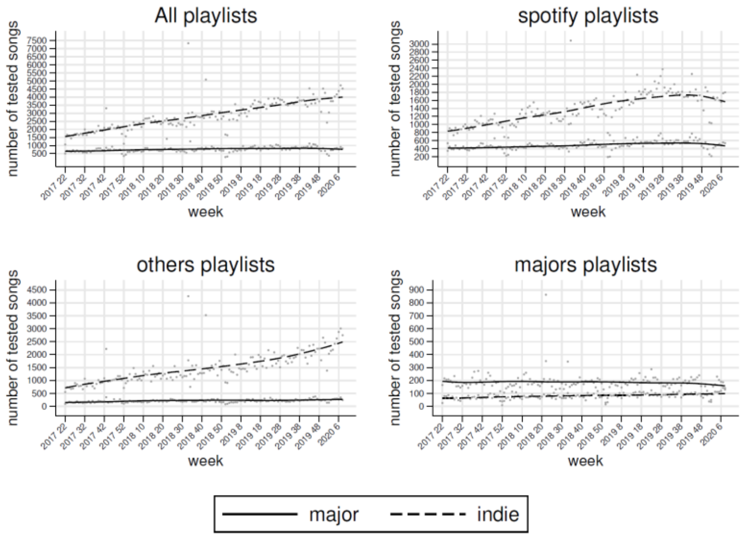
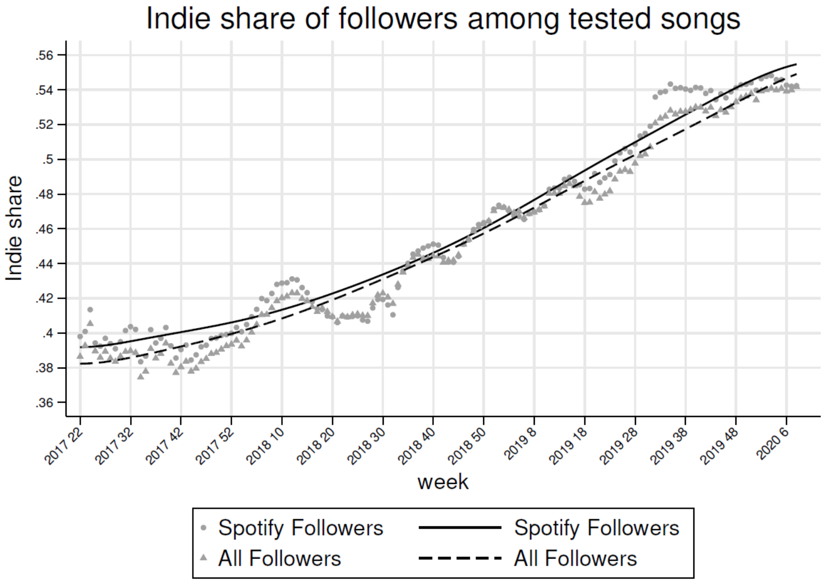


Figure 1: Major and indie song testing

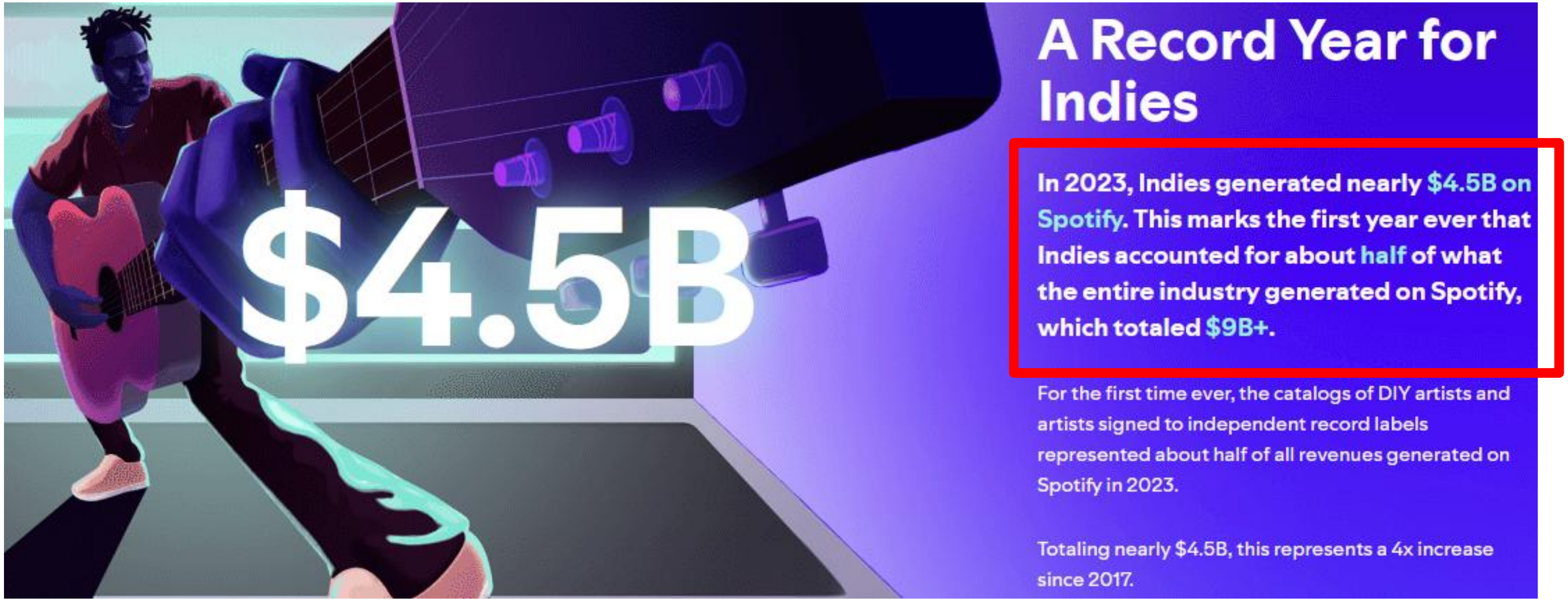


Source: Aguiar, Waldfogel, Zeijen (2024).

Majors' dominance on Spotify is in decline

—In 2023, indie artists and labels accounted for half of Spotify's $9 billion payout to music industry

—Partly resulting from Spotify's increasing power via its playlists



Conclusion

—Digitization generated an explosion of new cultural products.

—Given the unpredictability of appeal, it led to major welfare gains for consumers.

  —Allowed for the entry of valuable products that would otherwise not exist!

—Digitization shifted gatekeeping power of major-labels to streaming platforms.

  —Platforms and playlists allow for the discovery and promotion of valuable songs

  —Spotify can use playlists' influence to save costs in short-run and attempt to lower royalty rates in long-run.

—Platform power can hurt certain suppliers but may also promote competition

Thank you!