The Effect of Graduated Response Anti-Piracy Laws on Music Sales:
Evidence from an Event Study in France

Brett Danaher
Mike Smith
Rahul Telang
Siwen Chen

FTC Microeconomics Conference
Music Industry in Decline

- Global recorded music licensing plunged from $27B in 2000 to $15B in 2010
- U.S. revenues alone dropped 46%
- Some countries have witnessed a coinciding decline in investment in local repertoire
- Studies attribute 1/5 to all of this decline to online filesharing
- Other media industries show signs of trouble
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why is it

that people are willing to pay £3.50 for a cup of coffee
• that cost pennies to make
• takes minutes to prepare
• and is gone forever after one use

but won’t pay 99p for a song
• that cost thousands to record
• took years of practice to create
• and will last a lifetime?

RESPECT THE ARTIST
BUY THE MUSIC
Motivation

- How should we change copyright policy in the digital age?

- A lot of debate over which sorts of policies are too draconian and which aren’t, but less conversation over what is actually effective.

- Economics literature has spend 10 years quantifying losses to piracy but no literature examining the effectiveness of various anti-piracy policies / actions.
Government Intervention

- What works and what doesn’t? We don’t know.
- Lack of clean experiments
- Difficult to simulate the counterfactual
- Few anti-piracy laws passed worth studying
  - Hard to pass these… example: SOPA
What is Hadopi?

- “Creation and Internet Law” in France

- Law empowers Hadopi government agency to send warnings to identified copyright infringers on the Internet
  - 1\textsuperscript{st} “strike” – email warning to infringer
  - 2\textsuperscript{nd} “strike” – registered mail warning to the infringer
  - 3\textsuperscript{rd} “strike” – infringer subject to penalties such as a fine and loss of Internet access for a month

- “Graduated response”
Highly Controversial

- Cost of Hadopi thought to be high
- Hadopi may violate net neutrality principle and thus have intangible costs
- Hadopi may hold Internet users responsible for hijacked Internet connections (shifting burden of security)
- Some members of UN declared Internet access a “human right” and thus implicitly condemned Hadopi
Politically Charged
Hadopi’s History

- **June-October 2008**: Bill presented to Senate, passed
- **March 2009**: Bill supported then rejected at National Assembly
- **May 2009**: Assembly and Senate back a revised Hadopi
- **June 2009**: Constitutional Council rejects main portion of Bill
- **October 2009**: Constitution Council backs amended Bill
- **September 2010**: Initial first wave notices begin to go out
- **Spring 2011**: Initial second wave notices go out
Previous Research – Piracy and Sales

- Hui and Png (2002)
- Peitz and Waelbroeck (2004)
- Zentner (2005)
- Oberholzer-Gee and Strumpf (2007)
- Rob and Waldfogel (2004); (2006)

- Waldfogel 2007
- Smith and Telang (2007)
- Danaher et al (2010)
- Danaher and Waldfogel (2011)
- Oh and Hann (2011)
Previous Research – Strategic Deterrance

**Lawsuits:**
- Blackburn (2004)
- Bhattacharjee et. Al. (2008)

**DRM:**
- Vernik (2009)
- Sinha et. al. (2010)
- Kemerer, Liu, and Smith (2011)

**Poisoning:**
- Christine et. al. (2005)

**Pricing:**
- Danaher (2011)

**Digital Distribution:**
- Danaher et. al. (2010)
Methodology

• Difference-in-difference model

• Use average trend of similar European countries to simulate France’s sales in the absence of Hadopi
  • Italy, Spain, UK, Germany, Belgium
  • Provided the best control group based on pre-Hadopi matching

• Hadopi effect could begin with passage of law, with notices, or with salience of law in the media
  • We allow the data to inform this question

• Additional DDD evidence based on genre
Data

- Panel data on weekly iTunes unit sales for the 4 major music labels in each country between July 2008 and May 2011
  - iTunes is an established digital platform
  - Reduced piracy would most likely affect digital sales before physical
  - Digital data are cleaner
  - But… this means we can’t estimate the overall benefit of the law

- Data can be split by musical genre (2 labels only)

- Google Trends Relative Index on “Hadopi” in France
## Descriptive Stats

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean</th>
<th>Median</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>133.4</td>
<td>130.1</td>
<td>21.3</td>
</tr>
<tr>
<td>Germany</td>
<td>728.1</td>
<td>691.6</td>
<td>148.9</td>
</tr>
<tr>
<td>Spain</td>
<td>65.7</td>
<td>64.1</td>
<td>11.6</td>
</tr>
<tr>
<td>France</td>
<td>447.7</td>
<td>473.9</td>
<td>96.6</td>
</tr>
<tr>
<td>Italy</td>
<td>183.9</td>
<td>187.7</td>
<td>37.1</td>
</tr>
<tr>
<td>UK</td>
<td>2899.3</td>
<td>2801.9</td>
<td>594.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>743.0</strong></td>
<td><strong>252.6</strong></td>
<td><strong>1022.3</strong></td>
</tr>
</tbody>
</table>

### iTunes track unit sales (thousands)

<table>
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<th>Country</th>
<th>Mean</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>9.8</td>
<td>9.7</td>
<td>2.2</td>
</tr>
<tr>
<td>Germany</td>
<td>87.4</td>
<td>85.0</td>
<td>22.9</td>
</tr>
<tr>
<td>Spain</td>
<td>10.1</td>
<td>9.8</td>
<td>2.3</td>
</tr>
<tr>
<td>France</td>
<td>49.7</td>
<td>53.4</td>
<td>14.7</td>
</tr>
<tr>
<td>Italy</td>
<td>18.7</td>
<td>18.6</td>
<td>4.6</td>
</tr>
<tr>
<td>UK</td>
<td>270.7</td>
<td>275.2</td>
<td>82.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>74.4</strong></td>
<td><strong>25.9</strong></td>
<td><strong>98.6</strong></td>
</tr>
</tbody>
</table>

### iTunes album unit sales (thousands)
French iTunes Track Sales* vs. Non-Hadopi Control Group

*Total iTunes track sales units for the four majors
French iTunes Track Sales* vs. Non-Hadopi Control Group

*Total iTunes track sales units for the four majors
French iTunes Album Sales* vs. Non-Hadopi Control Group

*Total iTunes album sales units for the four majors
Robustness Check: The Four Majors

• Cannot display data for each individual music label for competitive reasons

• However… each label’s time graph looks quite similar to the aggregate one, so this is an industry-wide phenomenon

  • Not caused by one label’s marketing or campaign efforts

  • Labels cannot legally collude, so each label might be looked at as partially independent from the others
### Estimations

<table>
<thead>
<tr>
<th></th>
<th>(i)</th>
<th>(ii)</th>
</tr>
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<tbody>
<tr>
<td>All Tracks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After Hadopi</td>
<td>0.228*</td>
<td>0.351*</td>
</tr>
<tr>
<td></td>
<td>(0.037)</td>
<td>(0.033)</td>
</tr>
<tr>
<td>After Hadopi * France</td>
<td>0.203**</td>
<td>0.223**</td>
</tr>
<tr>
<td></td>
<td>(0.037)</td>
<td>(0.033)</td>
</tr>
<tr>
<td></td>
<td>[0.031]</td>
<td>[0.040]</td>
</tr>
<tr>
<td>Constant</td>
<td>12.520*</td>
<td>10.168*</td>
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<tr>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Observations</td>
<td>918</td>
<td>918</td>
</tr>
<tr>
<td># of Countries</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.361</td>
<td>0.417</td>
</tr>
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Robust standard errors clustered at country level appear in parentheses
Two-tailed P-values derived from permutation test appear in square brackets
+ significant at 10%; ** significant at 5%; * significant at 1%
March 30, 2009 is counted as the beginning of Hadopi
Columns (i) and (ii) include data from all four majors, while columns (iii) through (v) reflect data from only two.
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| Observations   | 918            | 918             | 912                                           | 912             |
| # of Countries | 6              | 6               | 6                                             | 6               |
| R-squared      | 0.361          | 0.417           | 0.082                                         | 0.103           |

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|                  | 918            | 918             | 912                                       | 912            | 912              |
| Observations     |                |                 |                                           |                |                  |
| # of Countries   | 6              | 6               | 6                                         | 6              | 6                |
| R-squared        | 0.361          | 0.417           | 0.082                                     | 0.103          | 0.42             |

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Discussion

- Effect of Hadopi was to increase French iTunes song sales units by 22.5% on average after Hadopi
  - Album sales units increased by 25%

- Effect of Hadopi begins upon national awareness of law and not simply passing or enforcement

- Effect is larger for highly pirated genres and smaller for less pirated genres

- Effect is not label-specific
Discussion

- This study suggests that Hadopi increased iTunes revenues to the four majors by €9.63 million per year on average for the two years following its passing (13.75 million if we include iTunes’ cut)

- Implication is that policies less Draconian than SOPA/PIPA can be effective (didn’t even need to enforce the penalty to see an effect)

- Implications for other countries considering similar or even stricter measures
  - U.S. voluntary graduated response, Germany
Challenges

- Hadopi Bill actually involves a “carrot” and a “stick”
  - The warnings + sanctions are the stick and receive the most attention
  - However, there is also a “carrot”
    - Education campaign about piracy and legal alternatives
    - Billboards and ad campaign to build awareness
    - Price discount to youths under 18 (but this only started in 2011)

- Can’t disentangle these effects

- We measure the benefits, but can’t measure the costs or perform a social welfare analysis
Next – Supply Side Intervention

- Government shutdown of Megaupload
- Largest piracy cyberlocker
- Did pirates switch to legal consumption channels or simply migrate to other filesharing services?
- Use cross-country variation in pre-shutdown Megaupload adoption to measure “intensity of treatment” of shutdown
Post Shut-down Change in Digital Movie Sales vs. Pre-Shutdown Megaupload Penetration

![Graph showing the relationship between % Change in avg. weekly sales and Megaupload penetration ratio for various countries.](image)

Countries included: Austria, Germany, Great Britain, New Zealand, U.S., Canada, Ireland, Mexico, Spain, France, Great Britain, New Zealand.