Written Testimony of Dr. Michael D. Smith
J. Erik Jonsson Professor Of Information Technology And Marketing,
Heinz College of Information Systems and Public Policy
Carnegie Mellon University

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Subcommittee on Intellectual Property

Copyright Law in Foreign Jurisdictions:
How Are Other Countries Handling Digital Piracy?

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Introduction

Chairman Tillis, Ranking Member Coons, Distinguished Members of the Subcommittee, thank you for giving me this opportunity to testify on "Copyright Law in Foreign Jurisdictions: How Are Other Countries Handling Digital Piracy?"

My name is Michael Smith and I am the J. Erik Jonsson Professor of Information Technology and Marketing at Carnegie Mellon University's Heinz College of Information Systems and Public Policy.

My testimony today is informed by over 20 years of empirical research into the impact of technological change on economic markets for entertainment goods. My written testimony draws heavily, and in some cases directly, from a Piracy Landscape Study my colleagues Brett Danaher and Rahul Telang, and I recently completed for the U.S. Patent and Trademark Office. However, the views expressed here are my own, and do not necessarily reflect official positions of the U.S. Patent and Trademark Office.

In our Piracy Landscape Study, my co-authors and I reviewed over 20 years of empirical academic research into the impact of digital piracy on legal markets for entertainment goods, focusing on studies published in peer-reviewed academic journals. Our report drew three broad conclusions from the academic literature:

First, the peer-reviewed academic literature shows that digital piracy harms creators by reducing their ability to make money from their creative efforts.

Second, the peer-reviewed academic literature shows that that digital piracy harms society by reducing the economic incentives for investment in creative output.

Third, the peer-reviewed academic literature shows that legislative interventions implemented worldwide have been effective in reversing these harms.

I expand on each of these conclusions in the remainder of my written testimony.

1. The Impact of Digital Piracy on Legal Markets

Article 1, Section 8, Clause 8 of the U.S. Constitution grants Congress the power "to promote the progress of science and useful arts, by securing for limited time to authors and inventors the exclusive right to their respective writings and discoveries." The ability to protect intellectual property rights in this way has always been a central tool for providing artists and rightsholders with the necessary economic incentives to invest in creating content, but it is particularly important today. Because digitized works like films, books, music, television shows, and software can be reproduced and distributed at near zero cost, a straightforward application of economic theory predicts that digital piracy will significantly diminish the profitability of legal markets for these products.

The empirical evidence in the academic literature is consistent with this prediction.

Specifically, my colleagues and I found 33 papers published in peer-reviewed academic journals that have analyzed the impact of digital piracy on sales. These papers span domestic and worldwide markets for music, television, books, and films; and have considered the sale of physical CDs, DVDs, and Blu-Ray Discs; legal digital downloads, paid video streaming services; and the theatrical box office. Notably, 29 of these 33 papers find that piracy causes significant harms to sales in legal channels. Tables 1 and 2 at the end of this document summarize the 4 papers finding no evidence of harm from pirated content and the 29 papers finding evidence of statistically and economically significant harm from pirated content.

In short, there is near unanimity in the academic literature that digital piracy does exactly what one would expect: It makes it harder for artists and rightsholders to profit from their investments in content creation.

This raises a second question: Should society care about the economic harm to artists and rightsholders resulting from digital piracy?

2. The Impact of Digital Piracy on Creative Output

Given that creators invest substantial resources, in terms of time, money, talent, energy, and risk, to create products,[1] when rightsholders have limited opportunities to recover their initial investment, economic theory predicts that they will in turn have limited incentives to create future products. These reduced creative incentives could cause significant problems—both for creators and for the broader society that benefits from their talents.

Again, the available empirical evidence is consistent with this prediction.

To analyze the causal impact of piracy on the incentives for artists to create content one needs to isolate the effect of piracy on the supply of creative works from the other effects of digitization. We are aware of two published academic studies that specifically attempt to separate these effects.

Telang and Waldfogel (2018), in a paper published in the peer-reviewed journal *Information Economics and Policy*, examine production in the Indian "Bollywood" film industry. Their study focuses on the time period immediately before and after the invention of the VCR led to widespread VHS tape piracy throughout Indian urban areas. They find that movie industry revenues were increasing in the time leading up to the introduction of the VCR, and accordingly so were the number of Bollywood films being brought to the market.

However, after the VCR made physical movie piracy commonplace in India, Bollywood revenues began to fall sharply. Moreover, as revenue fell in India the number of Bollywood films produced began to fall—and so did the quality of the remaining films being created (as measured by the

[1] For example, music labels may invest millions of dollars to "break" a new artist, Hollywood films regularly have production budgets of several hundred million dollars, and authors can spend years working on a single book.

generally lower ratings of these films on IMDb.com). Because the introduction of piracy here was unaccompanied by any digitization-related cost reductions for producers, Telang and Waldfogel's results show that VCR-based piracy caused a sharp decrease in both the number and quality of movies produced in India. The authors conclude that their results support "a central tenant of copyright law, that stronger effective copyright protection effects more creation."

Danaher and Smith (2017), in a paper published in the *George Mason Law Review*, take a different approach to analyze whether piracy impacts the supply of creative content. Professor Danaher and I note that while all countries experienced a surge in video piracy after the development of BitTorrent in 2003, BitTorrent piracy was more prevalent in some countries than others. Recognizing that it is difficult to produce a foreign film unless it will perform well in its local market, we asked whether domestic output of Academy Award winning (or nominated) films decreased in high-piracy countries after the introduction of BitTorrent, as compared to the change in Academy Award quality output in lower-piracy countries.

The data showed that this was indeed the case. Countries whose domestic markets were most harmed by piracy suffered precipitous drops in the number of award-winning films produced for those domestic markets, relative to much smaller or no changes in countries whose domestic markets experienced less harm from piracy.

Thus, there is overwhelming evidence in the peer-reviewed academic literature that Internet piracy has decreased the revenues available to creators of entertainment products, and that this reduction in revenue has caused a reduction in both the quantity and quality of creative output.

These findings, in turn, raise a third question: Are there proven strategies lawmakers can use to reverse these harms?

3. The Effectiveness of Anti-Piracy Regulations

Our review of the literature identified 8 peer-reviewed articles which, consistent with the subject of this hearing, analyzed the impact of government-led anti-piracy enforcement efforts initiated worldwide. These articles are summarized in Table 3.

Following Danaher et al. (2020), these anti-piracy interventions can be broadly classified into either "demand-side" actions or "supply-side" actions. Demand-side anti-piracy enforcement refers to actions or policies that target consumers of pirated content, usually with potential penalties or education efforts meant to dissuade them from illegal consumption. Supply-side anti-piracy enforcement refers to actions or policies that target the websites that facilitate piracy.

Starting with demand-side enforcement efforts, my colleagues and I identified three studies published in peer-reviewed journals analyzing the effectiveness of these strategies worldwide. First, in Danaher et al. (2014), my co-authors and I studied the HADOPI law in France, a law that empowered rightsholders to monitor Internet traffic from French citizens for instances of copyright infringement, and to issue legal warnings and penalties in response. We found that this law caused French digital music sales to rise by 22-25 percent relative to a control group of countries, and that the resulting increase in sales was larger for more heavily pirated genres.

Second, Adermon and Liang (2014) studied the IPRED law in Sweden, a law that made it easier for rightsholders to pursue cases against pirates. They found this law caused music sales to increase by 36 percent in the six months after the law was passed; however, music sales returned to the pre-IPRED levels after citizens observed lax enforcement of the law.

Finally, Mckenzie (2017) studied a number of graduated response antipiracy laws across six different countries, finding no increase in box office sales across those countries after the law was passed. In light of the other studies in the literature, cited above, one interpretation of this result is that piracy's effect on box office revenue in these countries was smaller than its effect on digital sales channels and formats, leaving little room for antipiracy laws to boost box office revenues.

Among supply-side enforcement efforts, my colleagues and I identified five studies published in peer-reviewed journals analyzing the effectiveness of these strategies as they have been implemented worldwide.

First, Danaher and Smith (2014) study the effect of the 2012 shutdown of Megaupload.com, the largest piracy cyberlocker in the world, and ask whether it increased legal consumption of digital movies. Professor Danaher and I use variation in Megaupload's adoption rates across countries as quasi-experimental evidence and show that the shutdown of Megaupload led to a 6.5-8.5 percent

increase in digital movie revenues for major Hollywood studios. Similarly, Peukert et al. (2017) study the effect of the Megaupload shutdown on film box office revenues. Their most conservative estimate of the effect found that shutting down Megaupload caused an overall increase in theatrical revenue by 4.3%, with most of these gains coming from top-decile wide-release movies.

In the context of efforts to block access to sites providing pirate content, Poort et al. (2014) found that when The Pirate Bay—the largest torrent piracy website in the world—was blocked by ISPs in the Netherlands, it caused no lasting change in total Dutch piracy. Similarly, Aguiar et al. (2018) found that the shutdown of Kino.tv, a major German piracy linking site, caused no increase in visits to legal consumption sites. These two studies suggest that blocking access to pirated content through a single dominant channel does not cause consumers to decrease piracy or increase legal consumption.

This raises the question of whether blocking more than a one site might increase the effectiveness of site blocking efforts. My colleagues and I address this question in Danaher et al. (2020), which was recently accepted for publication in the top peer reviewed journal *Information Systems Research*. Our paper studied three separate—and increasingly broad—instances of website blocks in the UK.

In the first instance, which occurred in May 2012, ISPs were only required to block access to a single website: The Pirate Bay. Our data confirmed the findings described above: blocking access to just The Pirate Bay did not cause legal consumption to increase; pirates simply shifted to other, readily available, piracy sites.

However, our results changed in November 2013 when the courts ordered ISPs to simultaneously block access to 19 different major video piracy sites and in November 2014 when the courts ordered ISPs to block 53 additional piracy sites. Specifically, we found that when 19 sites were blocked in November 2013, prior users of these sites increased their visits to paid legal streaming sites (like Netflix) by 8 percent. Likewise, following the November 2014 blocking, prior users of the 53 blocked sites increased their visits to paid legal streaming sites by an additional 7-12 percent.

In short, our study found that consumer behavior changed only after a sufficiently large number of pirate sites were blocked, making it inconvenient for erstwhile pirates to find new sources for illicit content.

To summarize, the peer-reviewed literature makes it clear that piracy harms creators by reducing the revenue available in legal channels, and thereby harms society by reducing the economic incentives artists have to invest in their craft. Likewise, the peer-reviewed academic literature is clear that both demand-side and supply-side anti-piracy efforts implemented worldwide have been effective at reversing these harms by increasing the search and transactions costs necessary to locate and consume pirated content online.

Again, thank you for your leadership in addressing this important topic, and for the opportunity to share my observations from the academic literature.

Table 1: Peer-Reviewed Journal Articles Finding No Statistical Impact of Piracy

Citation	Media Type	Primary Data	Result
Oberholzer and Strumpf (2007, *Journal of Political Economy*)	Music—Physical and Online Album Purchases	2002 OpenNap music downloads, 2002 U.S. sales of popular albums	"[F]ile sharing has had no statistically significant effect on purchases of the average album in our sample."
Smith and Telang (2009, *MIS Quarterly*)	Movies—Physical (DVD)	2005-2006 Amazon DVD sales ranks and BitTorrent movie file downloads	"[T]he availability of pirated content at [television broadcast] has no effect on post-broadcast DVD sales gains."
Andersen and Frenz (2010, *J. of Evolutionary Economics*)	Music—Physical (CD)	2006 survey of Canadian customers' file sharing and CD purchasing behavior	There is "no (statistical) association between the number of P2P files downloaded and CD album sales."
Aguiar and Martens (2016, *Information Economics and Policy*)	Music—Digital	Clickstream data on a panel of European Internet users in 2011	Find "no evidence of digital music sales displacement by unlicensed downloading" and find a "small but positive" effect "for some countries."

Table 2: Peer-Reviewed Journal Articles Finding That Piracy Harms Sales

Citation	Media Type	Primary Data	Result
Hui and Png (2003, *Contrib. to Economic Analysis & Policy*)	Music—Physical (CD)	1994-98 IFPI worldwide CD sales data and physical piracy rates	"[D]emand for music CDs decreased with piracy, […] actual losses amounted to about 6.6 percent of sales or 42 percent of industry estimates."
Peitz and Waelbroeck (2004, *Rev. of Econ. Res. on Copyright*)	Music—Physical (Singles, LPs, Cassettes, CDs)	1998-2002 worldwide CD sales, IPSOS survey data for piracy downloads	Internet piracy may have been responsible for a 20 percent decrease in music sales between 1998-2002.
Stevans and Sessions (2005, *Journal of Consumer Policy*)	Music—Physical (Tapes, LPs, CDs)	1990-2004 consumer spending on cassette tapes, LPs, and CDs	"[T]he proliferation of peer-to-peer file sharing networks since 2000 has led to a *significant* decline in music format sales. […] Due to the increased availability of the substitute good, downloaded MP3 files, a 1 percent increase in the price of recorded music after 2000 was associated with a more than proportionate 1.4 percent decline in the quantity purchased—decreasing consumption and sales.
Zentner (2005, *Topics in Economic Analysis and Policy*)	Music	1997-2002 country-level data on music sales and broadband usage	"Countries with higher internet and broadband penetration have suffered higher drops in music sales"

Citation	Media Type	Primary Data	Result
Bounie et al. (2006, *Rev. of Econ. Res. on Copyright*)	Movies—Theatrical & Video (DVD or VHS) Purchase and Rental	2005 survey of movie piracy and purchases from French universities	"[Piracy] has a strong [negative] impact on video [VHS and DVD] purchases and rentals" but statistically no impact on box office revenue.
Michel (2006, *Topics in Economic Analysis and Policy*)	Music—Physical (CD)	1995-2003 U.S. BLS Consumer Expenditure Survey data	"The relationship between computer ownership and music purchases weakened" due to piracy, potentially reducing CD sales by 13 percent.
Rob and Waldfogel (2006, *J. Law and Econ.*)	Music—Physical (CD)	2003 survey U.S. college student music piracy, sales	"[E]ach album download reduces purchases by 0.2 in our sample, although possibly by much more."
Zentner (2006, *Journal of Law and Economics)*	Music—Physical & Digital	2001 survey of European music purchases, piracy	"[Piracy] may explain a 30 percent reduction in the probability of buying music."
Bhattacharjee et al. (2007, *Management Science*)	Music—Weeks on Billboard Top 100	1995-2002 Billboard 100 chart rankings, WinMX file sharing post 2000.	P2P file sharing technologies have resulted in "significantly reduced chart survival except for those albums that debut high on the charts."
DeVany and Walls (2007, *Review of Industrial Organization)*	Movie—Box Office	Box office revenue and the supply of pirated content for an unnamed movie	"[Piracy] of a major studio movie accelerated its box-office decline and caused the picture to lose about $40 million in revenue."
Hennig-Thurau, Henning, Sattler (2007, *Marketing Science*)	Movies—Box Office, Rental (DVD), and Purchases (DVD)	2006 survey of German movie purchases and piracy intentions	Piracy causes "substantial cannibalization of theater visits, DVD rentals [and] purchases responsible for annual revenue losses of $300 million in Germany."
Rob and Waldfogel (2007, *J. of Ind. Econ.*)	Movies—Legal Consumption (Theater, Television, Rental, or Purchase)	2005 U.S. college student survey movie piracy, sales	"[U]npaid first [piracy] consumption reduces paid consumption by about 1 unit." "[Unpaid consumption] reduced paid consumption in [the] sample by 2.3 percent."
Liebowitz (2008, *Management Science*)	Music—Album Sales	1998-2003 Census data, Internet use, music sales	"[F]ile sharing appears to have caused the entire decline in record sales [observed from 1998-2003]."
Bender and Wang (2009, *International Social Science Review*)	Music—Digital (after 2005) and Physical	1999-2007 Country-level annual recorded music sales	"For a one percent increase in piracy rate, music sales declined about 0.6 percent."
Danaher et al. (2010, *Marketing Science*)	Television Content – Pirated Digital (Bit Torrent) and Legal Physical (DVD)	2007-2008 BitTorrent downloads of TV shows	"[T]he removal of NBC content from iTunes resulted in an 11.4 percent increase in piracy for its content"
Waldfogel (2010, *Info. Econ and Policy*)	Music (Songs)—Physical and Digital	2009-10 survey of student music piracy, sales	"[A]n additional song stolen reduces paid consumption…between a third and a sixth of a song."

Citation	Media Type	Primary Data	Result
Bai and Waldfogel (2012, *Information Economics and Policy*)	Movies—Consumption (Theatrical, Digital, and/or Physical)	2008-2009 survey of Chinese university students' movie behavior	"[T]hree quarters of [Chinese students'] movie consumption is unpaid and … each instance of [piracy] displaces 0.14 paid consumption instances."
Hong (2013, *Journal of Applied Econometrics*)	Music—Recorded Music Expenditure (CDs, Tapes, and LPs)	1996-2002 survey data from U.S. BLS Consumer Expenditure Survey data	"[F]ile sharing is likely to explain about 20 percent of the total sales decline during the Napster period, mostly driven by ... households with children aged 6-17."
Danaher et al. (2014, *Journal of Industrial Economics*)	Music—Digital (iTunes)	2008-2011 iTunes music sales in France and other European countries	The HADOPI anti-piracy law "caused iTunes music sales to increase by 22-25 percent [in France] relative to changes in the control group [countries]."
Danaher and Smith (2014, *Intl. Journal of Industrial Org.)*	Movies—Digital (Sales and Rentals)	2011-2013 Movie sales and rentals, 12 European countries, 3 major studios	"The shutdown of Megaupload and its associated sites caused digital revenues for three major motion picture studios to increase by 6.5–8.5 percent."
Ma et al. (2014, *Info. Sys. Research*)	Movies—Box Office	All movies in wide release, Feb. 2006 to Dec. 2008.	"Pre-release piracy causes a 19.1 percent decline in revenue compared to [post-release] piracy."
Adermon and Liang (2014, *J. of Econ. Behavior & Org.*)	Music—Digital and Physical	Digital and physical music sales in Sweden, Norway, and Finland, 2004-2009.	IPRED copyright reform measure in Sweden "increased music sales by 36 percent in during the first six months [after it was implemented]."
Leung (2015, *Information Economics and Policy*)	Music Demand—Physical (CD), Digital (iTunes songs), and pirated—and listening options (iPod, Computer, and Radio)	Survey data from ~900 college students in 2007-2008.	"Music piracy decreases music sales by 24-42 percent" but it also "contributes 12 percent to iPod sales."
McKenzie and Walls (2016, *B.E. J. of Econ. Analysis and Policy*)	Movies—Box Office	Australian theatrical sales, torrent downloads, Jan. 2010 through Aug. 2011.	Piracy causes "a sales displacement effect on box office revenues" via "release delay between the U.S. and Australian markets". However, "although statistically significant, the economic significance of this displacement appears relatively small." "[F]or every 100 downloads [of a median film from the sample data] somewhere between 2.4 and 3.4 cinema admissions are displaced."

Citation	Media Type	Primary Data	Result
Reimers (2016, *Journal of Law and Economics*)	Books—Physical, Audio, and Digital	Print and e-book sales of 653 book titles from 2010 to 2014.	Studies implementation of private copyright enforcement against piracy of some book titles and finds "a protection-related increase of e-book sales […] of more than 14 percent" but "sales of non e-book formats are not affected."
Papies and ven Heerde (2017, *Journal of Marketing*)	Music—Concert and Recorded Format Revenues	German recorded music and live concert revenues for ~400 popular artists from 2003-2010.	Piracy and unbundling "weaken the effect of concert demand on record demand", meaning that live performances have a smaller stimulating effect on record sales as a result of piracy.
Peukert, Claussen, and Kretschmer (2017, *International Journal of Industrial Organization*)[2]	Movies—Box Office	Weekly box office revenue of 308 movies across 14 countries from 2011-2012.	The shutdown of Megaupload caused "an increase of 47 percent" in box office revenues for the top decile of wide release films, but also caused "an average weekly decrease of 4 percent for narrow release films".
Koh, Hann, and Raghunathan (2019, *MIS Quarterly*)	Music—Physical and Digital	U.S. physical and digital album and single sales from 1982-2012.	Piracy displaces legal sales, but "the introduction of licensed digital downloads has weakened the piracy effect" by about "15 percent every year".
Danaher, Hersh, Smith, and Telang (2020, *MIS Quarterly*)	Movies—Digital	Clickstream data to legal and illegal video sites among a sample of UK Internet users, 2012-2014.	Blocking access to a single dominant piracy site does not reduce piracy or increase legal consumption, but simultaneously blocking access to a number of piracy sites increased legal consumption by 7-12 percent and also caused some users to buy a legal streaming site subscription.

[2] This paper finds that shutting down a major piracy website helped box office ticket sales of large blockbuster films, but hurt ticket sales of smaller niche films and had no statistically significant effect on mid-sized films. We include this in the "piracy harms sales" category because in film, sales of the top products drive the vast majority of overall revenues.

Table 3: Summary of Empirical Literature on Government Antipiracy Enforcement

Authors	Topic	Demand or Supply-side?	Source Content Removed?	Result
Danaher et al. (2014)	HADOPI "three strikes law" in France	Demand	-	Approximately 25 percent increase in digital music sales in France.
Adermon and Liang (2014)	IPRED law in Sweden	Demand	-	36 percent increase in music sales for six months, then return to normal levels after lax enforcement of law
Mckenzie (2017)	Graduated response antipiracy laws in 6 countries	Demand	-	No increase in box office revenues of films
Poort et al. (2014)	Dutch ISP domain blocking of The Pirate Bay	Supply	No	No lasting decrease in total Dutch piracy
Danaher and Smith (2014)	Shutdown of Megaupload.com	Supply	Yes	6.5-8.5 percent increase in digital revenues from Hollywood films
Peukert et al. (2017)	Shutdown of Megaupload.com	Supply	Yes	47 percent increase in theatrical revenue for top decile, wide-release films; 4 percent decrease in theatrical revenue for smaller, independent films
Aguiar et al. (2018)	Shutdown of Kino.to (popular German piracy streaming/linking site)	Supply	No	No increase in legal consumption, increase in piracy at other sites, emergence of new piracy link sites to replace Kino.to
Danaher et al. (2020)	Court ordered ISP blocking of piracy websites, 3 separate waves	Supply	No	Blocking one major site had no effect on total piracy or legal consumption, blocking multiple sites increased legal consumption by 7-12 percent

References:

Adermon, A., C-Y. Liang. 2014. Piracy and music sales: The effects of an anti-piracy law. *Journal of Economic Behavior and Organization*, **105** 90-106. (https://doi.org/10.1016/j.jebo.2014.04.026)

Aguiar, Luis, Bertin Martens. 2016. Digital music consumption on the Internet: Evidence from clickstream data. Information Economics and Policy. 34(C) 27-43. (https://doi.org/10.1016/j.infoecopol.2016.01.003)

Aguiar L, Peukert C., and Claussen J. 2018. Catch Me If You Can: Effectiveness and Consequences of Online Copyright Enforcement. Information Systems Research, 29(3) 656-678. (https://doi.org/10.1287/isre.2018.0778)

Andersen, B., M. Frenz. 2010. Don't blame the P2P file-sharers: the impact of free music downloads on the purchase of music CDs in Canada. Journal of Evolutionary Economics, 20:715-740. (https://doi.org/10.1007/s00191-010-0173-5)

Bai, J., J. Waldfogel. 2012. Movie Piracy and Sales Displacement in Two Samples of Chinese Consumers. Information Economics and Policy, 24(3) 187-196. (https://doi.org/10.1016/j.infoecopol.2012.08.002)

Bender, M. T., Y. Wang. 2009. The Impact of Digital Piracy on Music Sales: A Cross-Country Analysis. International Social Science Review 84(3-4) 157-170.

Bhattacharjee, S., R. Gopal, K. Lertwachara, J. Marsden, R. Telang. 2007. The Effect of Digital Sharing Technologies on Music Markets: A Survival Analysis of Albums on Ranking Charts. Management Science 53(9) 1359-1374. (https://doi.org/10.1287/mnsc.1070.0699)

Bounie, D., M. Bourreau, P. Waelbroeck. 2006. Piracy and the Demand for Films: Analysis of Piracy Behavior in French Universities. Review of Economic Research on Copyright Issues, 3(2) 15-27. (https://doi.org/10.2139/ssrn.936049)

Danaher, B., S. Dhanasobhon, M.D. Smith, R. Telang. 2010. Converting Pirates without Cannibalizing Purchasers: The Impact of Digital Distribution on Physical Sales and Internet Piracy. Marketing Science, 29(6) 1138-1151. (https://doi.org/10.1287/mksc.1100.0600)

Danaher, Brett, Michael D. Smith, Rahul Telang, Siwen Chen. 2014. The Effect of Graduated Response Anti-Piracy Laws on Music Sales: Evidence from an Event Study in France. Journal of Industrial Economics. 62(3) 541-553. (https://doi.org/10.1111/joie.12056)

Danaher, Brett, Michael D. Smith. 2014. Gone in 60 Seconds: The Impact of the Megaupload Shutdown on Movie Sales. International Journal of Industrial Organization. 33 1-8. (https://doi.org/10.1016/j.ijindorg.2013.12.001)

Danaher, Brett, Michael D. Smith, Rahul Telang. 2017. Copyright Enforcement in the Digital Age: Empirical Evidence and Conclusions. Communications of the Association of Computing Machinery. 60(2) 68-75. (https://doi.org/10.1145/2979673)

Danaher, Brett, Jonathan Hersh, Michael D. Smith, Rahul Telang. 2020. The Effect of Piracy Website Blocking on Consumer Behavior. Management Information Systems Quarterly, Forthcoming.

De Vany, A.S., W.D. Walls. 2007. Estimating the Effects of Movie Piracy on Box-office Revenue. Review of Industrial Organization. 30 291-301. (https://doi.org/10.1007/s11151-007-9141-0)

Hennig-Thurau, T., V. Henning, H. Sattler. 2007. Consumer File Sharing of Motion Pictures. Journal of Marketing. 71(October) 1-18. (https://doi.org/10.1509/jmkg.71.4.1)

Hong, S.-H. 2013. Measuring the Effect of Napster on Recorded Music Sales: Difference-in-Difference Estimates Under Compositional Changes. Journal of Applied Econometrics. 28 297-324. (https://doi.org/10.1002/jae.1269)

Hui, K., I. Png. 2003. Piracy and the Legitimate Demand for Recorded Music. Contributions to Economic Analysis & Policy, 2(1) Article 11. (https://doi.org/10.2202/1538-0645.1160)

Koh, Byungwan, Il-Horn Hann, Srinivasan Raghunathan. 2019. Digitization of Music: Consumer Adoption Amidst Piracy, Unbundling, and Rebundling. MIS Quarterly, 43(1) 25-45. (https://doi.org/10.25300/MISQ/2019/14812)

Leung, Tin Cheuk. 2015. Music piracy: Bad for record sales but good for the iPod? Information Economics and Policy, 31(C), 1-12. (https://doi.org/10.1016/j.infoecopol.2015.04.001)

Liebowitz, S. 2008. Testing File-Sharing's Impact by Examining Record Sales in Cities. Management Science, 54(4) 852-859. (https://doi.org/10.1287/mnsc.1070.0833)

Ma, Liye, Alan Montgomery, Param Singh, Michael D. Smith. 2014. The Effect of Pre-Release Movie Piracy on Box Office Revenue. Information Systems Research. 25(3) 590-603. (https://doi.org/10.1287/isre.2014.0530)

McKenzie, Jordi, W. David Walls. 2016. File Sharing and Film Revenues: Estimates of Sales Displacement at the Box Office. B.E. Journal of Economic Analysis and Policy. 16(1) 25-57. (https://doi.org/10.1515/bejeap-2015-0004)

McKenzie, Jordi. 2017. Graduated response policies to digital piracy: Do they increase box office revenues of movies. Information Economics and Policy. 38(C) 1-11. (https://doi.org/10.1016/j.infoecopol.2016.12.004)

Michel, N. 2006. The impact of digital file sharing on the music industry: an empirical analysis. Berkeley Electronic Press: Topics in Economic Analysis & Policy, 6, Article 18. (https://doi.org/10.2202/1538-0653.1549)

Oberholzer, F., K. Strumpf. 2007. The Effect of File Sharing on Record Sales. An Empirical Analysis. Journal of Political Economy, 115(1) 1-42. (https://doi.org/10.1086/511995)

Papies, Dominik, Harald van Heerde. 2017. The Dynamic Interplay Between Recorded Music and Live Concerts: The Role of Piracy, Unbundling, and Artist Characteristics. Journal of Marketing, 81(4), March, 67-87. (https://doi.org/10.1509/jm.14.0473)

Peitz, M., P. Waelbroeck. 2004. The Effect of Internet Piracy on CD Sales: Cross-Section Evidence. Review of Economic Research on Copyright Issues, 1(2) 71-79.

Peukert, Christian, Jorg Claussen, Tobias Kretschmer. 2017. Piracy and Box Office Movie Revenue: Evidence from Megaupload. International Journal of Industrial Organization, 52(May) 188-215. (https://doi.org/10.1016/j.ijindorg.2016.12.006)

Poort, J., Leenheer, J, Ham, JVD, and Dumitru, C. 2014. Baywatch: Two Approaches to Measure the Effects of Blocking Access to The Pirate Bay. Telecommunications Policy. 38(1) 383-392. (https://doi.org/10.1016/j.telpol.2013.12.008)

Reimers, I. 2016. "Can Private Copyright Protection Be Effective? Evidence from Book Publishing." Journal of Law and Economics. 59, 411-440. (https://doi.org/10.1086/687521)

Rob, R., J. Waldfogel. 2006. Piracy on the High C's: Music Downloading, Sales Displacement, and Social Welfare in a Sample of College Students. Journal of Law and Economics, 49(1) 29-62. (https://doi.org/10.1086/430809)

Rob, R., J. Waldfogel. 2007. Piracy on the Silver Screen. Journal of Industrial Economics, 55(3) 379-393. (https://doi.org/10.1111/j.1467-6451.2007.00316.x)

Smith, M.D., R. Telang. 2009. Competing with Free: The Impact of Movie Broadcasts on DVD Sales and Internet Piracy. Management Information Systems Quarterly, 33(2) 312-338. (https://doi.org/10.2307/20650294)

Stevans, L.K., D.N. Sessions. 2005. An Empirical Investigation Into the Effect of Music Downloading on the Consumer Expenditure of Recorded Music: A Time Series Approach. Journal of Consumer Policy, 28(3) 311-324. (https://doi.org/10.1007/s10603-005-8645-y)

Waldfogel, J. 2010. Music File Sharing and Sales Displacement in the iTunes Era. Information Economics and Policy, 22(4) 306-314. (https://doi.org/10.1016/j.infoecopol.2010.02.002)

Zentner, A. 2005. File Sharing and International Sales of Copyrighted Music: An Empirical Analysis with a Panel of Countries. Berkeley Electronic Press: Topics in Economic Analysis and Policy, 5(1), Article 21. (https://doi.org/10.2202/1538-0653.1452)

Zentner, A. 2006. Measuring the Effect of File Sharing on Music Purchases. The Journal of Law and Economics, 49 63–90. (https://doi.org/10.1086/501082)