

Converting Pirates without Cannibalizing Purchasers:
The Impact of Digital Distribution on Physical Sales and Internet Piracy

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This Version: April 2009

Available from <http://ssrn.com/abstract=1381827>

ABSTRACT

The availability of digital distribution channels for media has raised several important questions for marketers. Notable among these are whether digital distribution channels will cannibalize physical sales and whether legitimate digital distribution will dissuade consumers from using digital piracy channels. We address these questions using the removal of NBC television content from Apple's iTunes store in December 2007, and its restoration in September 2008, as natural shocks to the supply of legitimate digital content and analyzing its impact on DVD and piracy channels.

We find that NBC's decision to remove its content from iTunes in December 2007 is causally associated with an 11.5% increase in the demand for pirated content. This is roughly equivalent to an increase of 53,000 downloads a day for NBC's content which is approximately twice as large as NBC's total legal purchases on iTunes for the same content prior to the removal. We also see no change in demand for NBC's DVD content associated with the removal of the iTunes channel. Finally, we find evidence of a smaller, and statistically insignificant, decrease in piracy for the same content when it was restored to the iTunes store in September 2008.

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“We can’t compete with free. That’s an economic paradigm that doesn’t work.”
James Gianopulos, Co-Chairman, Twentieth Century Fox, (quoted in Thompson 2003)

“You’ll never stop [piracy]. What you have to do is compete with it.”
Steve Jobs, CEO Apple Inc., (quoted in Goodell 2003)

Results: NBC Removes Television Content from iTunes December 1, 2007

**Table 2: OLS Regressions of Log of Daily Downloads
November 18 – December 15, 2007**

	<i>Episode-Level</i>	<i>Season-Level</i>	<i>Series-Level</i>	<i>Network-Level</i>
After 12/1	0.043** (0.005)	0.042* (0.021)	0.076* (0.038)	-0.023 (0.092)
After 12/1 * NBC	0.138** (0.008)	0.138** (0.033)	0.115* (0.058)	0.159 (0.129)
Constant	7.157** (0.003)	10.017** (0.011)	10.969** (0.020)	14.707** (0.046)
Observations	9,776	476	150	12
Number of Groups	4,888	238	75	6
R ²	0.16	0.19	0.25	0.36

The dependent variable is ln(total pirated downloads before/after December 1). T-statistics are listed in parenthesis; ** and * denote significance at 0.01 and 0.05, respectively. Data are aggregated at the episode, season, series, and network levels in columns 1, 2, 3, and 4 respectively. In each case the regressions include fixed effects at the appropriate level of aggregation.

**Table 3: OLS Regressions of Log of Daily Downloads by Genre
November 18 – December 15, 2007**

	<i>Drama</i>	<i>Action</i> ¹	<i>Comedy</i>
After 12/1	0.087 [†] (0.049)	0.037 (0.079)	0.056 (0.059)
After 12/1 * NBC	0.076 (0.091)	0.116 (0.102)	0.246* (0.109)
Constant	11.579** (.029)	10.708** (.036)	11.150** (.032)
Observations	42	64	42
# Groups (Series)	21	32	22
R ²	0.29	0.16	0.48

The dependent variable is ln(total pirated downloads before/after December 1). T-statistics are listed in parenthesis; **, *, and [†] denote significance at 0.01, 0.05, and 0.10 respectively. Data are aggregated at the series level and each regression includes series fixed effects.

¹ We include science fiction and crime in the “action” category.

**Table 4: DVD Sales Rank at Amazon.com (Comparison of Means)
November 11 – December 15, 2007**

	<i>NBC Networks</i>	<i>Non-NBC Networks</i>
Amazon.com sales rank prior to Dec. 1	24,553	35,384
Amazon.com sales rank after Dec. 1	26,056	38,785
<i>Change</i>	<i>1,503</i>	<i>3,401</i>
	<i>6%</i>	<i>10%</i>

**Table 5: OLS Regressions of Ln Sales Rank of Season DVD Box Sets
November 18 – December 15, 2007**

	<i>DVD Box Sets</i>
Ln(Amazon Price)	1.725 (0.028)
After 12/1	-0.025 (0.008)
After 12/1 * NBC	0.003 (0.014)
Constant	2.907 (0.095)
Observations	9813
# Groups (Series)	408
R ²	0.29

The dependent variable is ln(Amazon sales rank before/after December 1). T-statistics are listed in parenthesis; ** and * denote significance at 0.01 and 0.05 respectively. Regressions include DVD-level fixed effects.

Results: NBC Restores Television Content to iTunes September 9, 2008

**Table 7: OLS Regressions of Log of Daily Downloads
August 26 – September 22, 2008**

	<i>Episode-Level</i>	<i>Season-Level</i>	<i>Series-Level</i>	<i>Network-Level</i>
After 12/1	0.049** (0.005)	0.051* (0.022)	0.056 (0.038)	0.104 (0.058)
After 12/1 * NBC	-0.092** (0.008)	-0.125** (0.035)	-0.062 (0.058)	-0.057 (0.082)
Constant	6.906** (0.003)	9.385** (0.012)	10.212** (0.020)	14.271** (0.029)
Observations	9,678	512	150	12
Number of Groups	4,839	256	75	6
R ²	0.03	0.05	0.03	0.49

The dependent variable is ln(total pirated downloads before/after September 9). T-statistics are listed in parenthesis; **, *, and † denote significance at 0.01, 0.05, and 0.10 respectively. Data are aggregated at the episode, season, series, and network levels in columns 1, 2, 3, and 4 respectively. In each case the regressions include fixed effects at the appropriate level of aggregation.