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Piracy and Movie Revenues: Evidence from Megaupload A Tale of the Long Tail?

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Extended Abstract

1 Background

In this paper we make use of a natural experiment in the market for illegal downloading to study movie box office revenues. Exogenous variation comes from the unexpected shutdown of the popular file hosting platform Megaupload.com on January 19, 2012.

Megaupload has been one of the most popular file hosting services worldwide (self-reportedly) accounting for 4% of the entire internet traffic. Files uploaded to the platform could be accessed via links, either as direct downloads or streams. While free downloading was limited in size and bandwidth, users could buy unlimited premium memberships. Most of the users did not enter the website directly but were often linked to it via other portals. Just like Peer-to-Peer networks, such as Napster or BitTorrent, Megaupload has caused controversial discussion concerning copyright infringement of the content its users shared. The peak has been reached in January 2012 when the managing team was arrested and the internet domains were seized.

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2 Existing literature

The theoretical literature on piracy has looked at the phenomenon from a variety of perspectives (Peitz and Waelbroeck, 2006a). Some work finds that firm revenues decrease due to copying. A typical long run effect are lower incentives to invest in quality (Bae and Choi, 2006). Other authors suggest that piracy may actually benefit firms. Takeyama (1994) puts forward the idea that unpaid copying may help firms to reach critical mass in network markets more quickly. Others have looked at how illegal reproduction may help consumers to make informed purchase decisions by allowing to find a better match to their tastes. This is what has been called ‘sampling’ (Peitz and Waelbroeck, 2006b). On a related note Zhang (2002), Gopal et al. (2006) and Alcalá and González-Maestre (2010) offer a more distinguished perspective. In such models, unpaid copying lowers the information costs of consumers which in turn increases the market share of niche products relative to superstars.

According to a recent survey by Smith and Telang (2012), also the results of the empirical literature are mixed, however the majority of papers find that piracy negatively impacts sales of media products. For example, Danaher and Waldfogel (2012) look at the theatrical release lag of the top ten movies in several countries relative to the US. They find that longer release lags lead to lower revenues. The effect is stronger in years were BitTorrent was available. It should be noted that only a few papers directly look at heterogeneity in terms of popularity. The work of Oberholzer-Gee and Strumpf (2007) for example suggests that there is no significant difference between the effect of piracy on music sales of popular and less popular artists. A recent paper by Zentner et al. (2012) yet highlights the importance of the long tail phenomenon in entertainment markets. They show that consumers are more likely to rent niche movie titles relative to blockbusters once they switch to (legal) online channels.

3 Data and Methods

We use weekly data from 1344 movies in 49 countries spanning from 2007w31 to 2012w35. The data is obtained from Boxofficemojo.com, a commercial provider of industry statistics. Our sample begins with the launch of Megaupload’s video streaming service, which made it considerably more convenient to watch pirated movies online. The estimation strategy is based on a quasi difference-in-differences approach. We compare box office revenues before and after the shutdown to a matched control group of movies unaffected by the shutdown. The control group is based on matching movie characteristics to the treatment group. We use country, calendar week, stage of the life-cycle and genre. Identification comes from cross-country and temporal variation.

4 Results

We specify a conservative set of fixed-effects including years, calendar week, country and genre. Column (1) in table A.1 shows the results for a baseline model. In Column (2) we add movie fixed effects, in column (3) we control for composition of the focal movies' control group, column (4) combines both. In all specifications we find that the shutdown had a negative effect on box office revenues across all movies in our sample. When we control for movie fixed effects the coefficient is not significant.

Adding an interaction of the shutdown dummy and number of screens suggests a heterogenous effect depending on movie popularity (see table A.2). Box office revenues of movies shown on the average number of screens and below were affected negatively, but the total effect is not statistically significant. For blockbusters (shown on more than 500 screens) the sign is positive (and significant, depending on the specification).

The results are robust to various different sample designs (e.g. budget size as a matching criteria), expanding and contracting the sample period, adjusting for inflation of ticket prices, interactions with country-level characteristics (GDP, Internet penetration, Megaupload popularity) and counterfactual specifications where the shutdown date is chosen arbitrarily.

5 Conclusions

Our counterintuitive finding may suggest support for the theoretical perspective of (social) network effects where file-sharing acts as a mechanism to spread information about a good from consumers with zero or low willingness to pay to users with high willingness to pay. The information-spreading effect of illegal downloads seems to be especially important for movies with smaller audiences. 'Traditional' theories that predict substitution may be more applicable to blockbusters.

We aim to contribute to the emerging empirical literature on the effects of piracy. We believe that the setting we study offers a unique opportunity for causal identification. Our results have implications for theory and firm strategy in practice, but may also contribute to the recent global debate on copyright in the digital society.

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Appendix

Table A.1: Fixed-effect model specification

	(1)		(2)		(3)		(4)	
	No Movie Effects		Movie Effects		Control Group Effects		Movie and Control Group Effects	
Affected	0.231	(0.301)	0.438	(0.316)	0.370	(0.233)	0.409	(0.293)
Shutdown	-0.398**	(0.191)	-0.058	(0.152)	-0.474***	(0.148)	-0.111	(0.101)
In Weeks active	-0.878***	(0.083)	-1.147***	(0.061)	-0.485	(1.002)	-0.192	(0.514)
Year effects	Yes		Yes		Yes		Yes	
Calendar week effects	Yes		Yes		Yes		Yes	
Country effects	Yes		Yes		Yes		Yes	
Genre effects	Yes		No		No		No	
Observations	28660		28660		28660		28660	
$\overline{R^2}$	0.431		0.812		0.607		0.912	

Dependent variable: ln Gross weekend revenues

Note: Standard errors (clustered on movies) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.2: Fixed-effect model specification, interaction

	(1)		(2)		(3)		(4)	
	No Movie Effects		Movie Effects		Control Group Effects		Movie and Control Group Effects	
Affected	0.290**	(0.125)	0.265	(0.215)	0.323***	(0.102)	0.210	(0.200)
Shutdown	-0.331***	(0.128)	-0.199	(0.128)	-0.126	(0.140)	0.062	(0.108)
In Weeks active	-0.868***	(0.032)	-1.088***	(0.036)	-0.924***	(0.316)	-1.051***	(0.301)
In Screens	1.158***	(0.022)	0.882***	(0.022)	1.215***	(0.023)	0.935***	(0.021)
Shutdown*Screens	0.082***	(0.030)	0.102***	(0.028)	-0.001	(0.035)	0.007	(0.028)
Year effects	Yes		Yes		Yes		Yes	
Calendar week effects	Yes		Yes		Yes		Yes	
Country effects	Yes		Yes		Yes		Yes	
Genre effects	Yes		No		No		No	
Observations	28660		28660		28660		28660	
$\overline{R^2}$	0.821		0.899		0.886		0.952	

Dependent variable: ln Gross weekend revenues

Note: Standard errors (clustered on movies) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$