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Piracy or promotion? The impact of broadband Internet penetration on DVD sales

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ABSTRACT

The Internet provides copyright holders with new sales and promotional channels for their content, while also providing consumers with new opportunities to illegally obtain free copies of this content. Unfortunately, disentangling these two effects is extremely difficult.

In this paper we attempt to disentangle these two effects by applying fixed effects and first difference models to a new dataset quantifying changes in broadband Internet penetration and DVD sales at a local level from 2000 to 2003. We then compare our results to those reported in Liebowitz (2008), who uses similar models in a similar time period on a similar product category: music CDs.

Unlike Liebowitz, who finds a strong negative impact of broadband penetration on music sales, our results show that increased broadband penetration leads to a significant *increase* in DVD sales. Using the most conservative results, 9.3% of the $14.1 billion increase in DVD sales during our study period can be attributed to increased broadband penetration. One interpretation of these results is that the difference arises from differences in the ability to pirate these two types of content: while Internet music piracy was easy and rampant from 2000 to 2003, Internet movie piracy was difficult and of generally low quality in this time period. If this interpretation is true it would suggest that, in the absence of piracy, the Internet has an overall strong positive impact on media sales.

1. Introduction

> "There are days where I really wish Al Gore hadn't invented the Internet."
> *Stephen Soderbergh, 60 Minutes Interview with Leslie Stahl, November 1, 2009.* (CBS, 2009)
> "The moat that has slowed a wide-spread assault on movies in digital form is the languor with which American computer-homes have valued broadband access... But that moat will gradually be drained as broadband grows, both in its speed-power and in the deployment of broadband to homes. Once that happens...all barriers to high-speed takedowns of movies will collapse... It is the certainty of that scenario which concerns every moviemaker and distributor in the land."
> *Jack Valenti, testimony before the Senate Committee on Foreign Relations, February 12, 2002.* (Valenti, 2002)

Digital computer networks represent a disruptive technology, with the potential to create or destroy economic value in established industries. These opportunities and challenges are particularly apparent in the movie and music industries, whose business models are driven by the ability to extract revenue from what are essentially information goods.

On one hand, digital networks can create new and lower cost channels for media companies to promote, sell, and distribute their content to paying customers. Having high

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speed access to the Internet might allow consumers to collect and exchange more information about content they are interested in, might allow access to products that would not have been available in brick-and-mortar channels (Brynjolfsson et al., 2003), and might allow companies a more targeted channel to promote content of interest to consumers.

On the other hand, digital networks could harm media companies economically. For example, broadband Internet access could create new entertainment outlets for consumers, crowding out the time they would have spent watching movies or listening to music. For example Williams and Shapiro (1985) found that in-home entertainment resulted in decreased theater attendance. More importantly, broadband Internet access creates new opportunities for unscrupulous users to illegally obtain free copies of media files through pirate websites and peer-to-peer file sharing.

However, while the dual possibilities of broadband access driving Internet promotion and Internet piracy have been well known, it is difficult to disentangle these two effects because of the inherent simultaneity in their application. The goal of this research is to attempt to disentangle these two effects by comparing the impact of broadband Internet access on sales of DVDs to the results in Liebowitz (2008) documenting the impact of broadband Internet access on music CDs. These two papers use similar models in similar timeframes and on similar products. One notable difference, however, is that while Internet piracy for music CDs was easy and rampant from 2000 through 2003, movie piracy, owing to its relatively larger size, was much harder during this same timeframe. Moreover, the pirated movie content that was available was of a much lower quality relative to the competing DVD goods than were comparable pirated music files to the competing CD content. While our identification strategy derives from the comparison between these two results, as opposed to a direct comparison within the data, we believe it provides suggestive evidence of the potential benefits and potential harm from broadband Internet access.

As such, this research has both managerial and policy importance. From a managerial perspective, our results shed light on the degree to which broadband Internet access supports the media industries when separated from the cannibalizing effect of digital piracy. For the movie industry, a loss in DVD sales due to piracy is a significant concern because DVD and other media sales comprised 46% ($14.9 billion) of total revenue in 2002 (Epstein, 2005, p. 20; see also PBS, 2005). Moreover, studios' concerns about piracy are not without empirical and anecdotal support. A recent study found that in 2005 Hollywood studios lost $1.3 billion in the United States due to piracy (McBride and Fowler, 2006). Of this, $447 million was attributed to Internet piracy (with the remaining amounts coming from physical copies of movies sold by professional bootleggers ($335 million) and illegal copies made by individual consumers ($529 million)).

However, while piracy is a significant concern for media companies, focusing solely on the potential for increased piracy may serve to obscure the potential positive benefits broadband Internet access brings to the movie industry. For example, broadband Internet access may provide consumers with new ways to access movie information through sites such as IMDB.com and Yahoo movies. Further Internet retailers can provide a substantially larger variety of movies for sale on their websites than brick-and-mortar retailers can. Finally, the impact of piracy may be smaller than initially expected if the individuals illegally downloading movies would not otherwise have purchased a legitimate copy of that movie.

From a policy perspective, our results may shed light on the degree to which governments should regulate new Internet technologies to protect established industries, relative to more focused efforts to reduce piracy on these networks. For example, representatives of the recording industry in the United Kingdom have argued that the government should impose a 4 Euro per month tax on broadband Internet access to reimburse rights holders in the movie and music industry for anticipated losses due to piracy (Orlowski, 2006). One could argue that while this approach may provide a short-term revenue boost, if it forestalls the use of broadband Internet connections it could also harm sales down the road.

Thus, our research contributes to the literature by addressing this question: what has been the net impact of increased broadband Internet penetration on DVD sales during a period where it was difficult to pirate movies, relative to the net impact of broadband Internet penetration on CD sales reported in Liebowitz (2008) for the same time period — a period where music piracy was easy and widespread.

While the dual impacts broadband Internet access on promotion and piracy of media content has been much discussed in the literature, there have been no studies attempting to disentangle these two effects. It seems likely that this is because of two estimation challenges. First, studies of the impact of piracy on sales are complicated by obvious endogeneity issues: unobserved popularity impacts both the left-hand side sales variable and the right-hand side piracy variable. Second, disentangling the impact of broadband Internet access on promotion and piracy of media content is complicated by simultaneity issues: Internet access typically impacts both factors at the same time.

To address the first problem, instead of focusing on individual DVD sales, we use the aggregate sales of DVDs at a local level as our unit of analysis.[1] We have obtained DVD sales data from Nielsen Videoscan for 99 Designated

[1] We do not measure the DVD rental market because DVD rentals do not represent a source of additional revenue to the movie industry. Under the first sale doctrine, once a rental company purchases a DVD, they can rent that physical copy of the media out to its consumers without further reimbursement to the rights holder. While studios have recently entered into agreements with rental companies, such as Netflix, to provide them with priority access to some new titles in high demand, in exchange for licensing fees, these agreements were not in place during our study time period.