

Piracy or Promotion?

The Impact of Broadband Internet Penetration on DVD Sales

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EXTENDED ABSTRACT

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 industry, whose business model is driven by its ability to extract revenue from what are essentially information goods.

On one hand, digital networks can create new and lower cost channels for studios to promote, sell, and distribute their content to paying customers. Having high speed access to the Internet might allow consumers to collect and exchange more information about movies they are interested in, might allow access to products that would not have been available in brick-and-mortar channels (Brynjolfsson, Hu, and Smith 2003), and might allow producers a more targeted channel to promote movies of interest to consumers.

On the other hand, digital networks could harm movie studios economically. For example, broadband Internet access could create new entertainment outlets for consumers, crowding out the time they would have spent watching movies. For example Williams and Shapiro (1985) found that in-home entertainment resulted in decreased theater attendance. In addition to “crowding out” effects, broadband Internet access creates new opportunities for unscrupulous users to illegally obtain free copies of movies through file sharing. And particularly in the case of movies, whose file size can range from hundreds of megabytes to gigabytes, such file sharing is predicated on broadband Internet access (Pruitt 2004).

The goal of this research is to measure the economic impact of broadband Internet access in this particularly important sector of the economy. This research has both managerial and policy importance. From a managerial perspective, our results shed light on the degree to which broadband Internet access has supported or harmed the industry. At present, the movie industry has focused disproportionately on the potential harm from broadband Internet availability — arguing that the dominant impact of broadband Internet access will be a significant increase in Internet piracy and a resulting drop in DVD sales.

From a policy perspective, our results may shed light on the degree to which governments should regulate new Internet technologies to protect established industries. 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).

Thus, our research contributes to the literature by addressing the following question: what has been the net impact of increased broadband Internet penetration on economic activity in the movie industry. While the impact of piracy has been much discussed in the literature, there have been no rigorous studies showing a causal relationship between increased access to broadband digital networks and changes in DVD sales. This is because analyses at the individual DVD level are problematic due to causality concerns: popular movies both sell more DVDs and are shared more in file sharing networks. Since controlling for popularity is generally quite difficult, any direct estimate capturing the effect of sharing on individual DVD sales is bound to be spurious, without the presence of appropriate instruments, which are hard to find.

Therefore in our research, instead of focusing on individual DVD sales, our unit of analysis is the aggregate sales of DVDs at a local level. We have obtained DVD sales data from Nielsen Videoscan for 99 Designated Market Areas (DMAs) for the years 2000, 2001 and 2003. We have matched this data with broadband Internet penetration data for these same regions. Because of the bandwidth required to download ripped DVDs (typically around 3-6 GB uncompressed, and 700-900 MB compressed), broadband penetration serves as a useful proxy for (unavailable) data on file-sharing levels across regions. Our broadband penetration data comes from a U.S. Government current population survey (CPS) of more than 60,000 U.S. Households conducted in 2000, 2001, and 2003. The CPS one of the most reliable and detailed data source used by government policy makers and academics.

The use of panel data is critical to our study. A purely cross-sectional analysis of broadband penetration and DVD sales would again be subject to spurious correlation. With a longitudinal dataset across a large number of local areas, we can estimate a first difference model to overcome these limitations. The intuition is that by running a regression of changes in DVD sales on changes in broadband penetration over time (after controlling for local area characteristics), we can obtain an unbiased estimate of the impact of broadband penetration on DVD sales.

Using this data we find that, contrary to concerns expressed by the movie industry, increased broadband Internet penetration leads to a large and statistically significant increase in DVD sales. This increase is robust to a variety of different specifications. Using the most conservative results, we find that 9.3% of the \$14.1 billion increase in DVD sales during our study period can be directly attributed to increased broadband Internet penetration. This corresponds to a \$1.3 billion increase in DVD revenue to the movie industry, and a \$630 million increase in profits to Hollywood studios.

Our research is ongoing. We are currently in the process of obtaining data that would allow us to estimate the degree to which these increases in DVD sales resulted from increased access to a wider variety of movies online (the “long tail effect”) or are due to sampling from piracy. We anticipate being able to present these results at a potential workshop presentation in March.

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