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Substitution or Promotion? The Impact of Price Discounts on Cross-Channel Sales of Digital Movies

Jing Gong, Michael D. Smith *, Rahul Telang

School of Information Systems and Management, Heinz College, Carnegie Mellon University, Pittsburgh, PA 15213, United States

Abstract

Technology is transforming the marketing function in many ways, and this transformation is particularly apparent for information goods such as movies where digital technologies provide marketers with new distribution channels, which in turn create new opportunities for cross-channel effects. However, these digital channels also provide researchers with new opportunities to measure micro-level customer behavior to understand the impact of cross-channel effects in real-world settings.

In this paper, we study cross-channel effects between movies sold in digital purchase (commonly known as Electronic Sell Through or EST) and digital rental (commonly known as Video-On-Demand or VOD) markets. We do this using a unique sales dataset from a major digital movie retailer provided by a major movie studio. Our analysis takes advantage of a 14-week field experiment that allows us to measure the impact of price discounts on own- and cross-channel sales. We use this experiment to estimate own and cross price elasticities, whether price discounts cannibalize future sales, and most importantly whether price discounts in one channel affect sales for the same product in a presumably competing channel.

Our analysis indicates that digital movie consumers are highly sensitive to price promotions. However, we also find that, contrary to expectations, price promotions in a digital sales channel for a movie do not seem to cannibalize digital rentals. Indeed, our results suggest that, if anything, price promotions for digital movie sales can increase digital rentals. We explore a variety of explanations for this counterintuitive result, including the possibility that the ease of information transmission online through third-party websites, blogs, and online discussion areas may create information spillovers such that price discounts in one channel may increase product awareness in other competing sales channels. From a managerial perspective, our results suggest that cross-channel cannibalization can be reduced or even reversed in the presence of information spillovers, and that there are many new opportunities for marketers to directly measure these cross-channel effects using experimental data from online platforms.

Keywords: Digital channel; Movie; Price; Digital products; Cross-channel sales

Introduction

Technological advances are transforming the marketing of movies in several ways. First, new distribution channels allow studios to deliver movies with better access, a wider selection, and more frequent updates of new content than was previously possible. Second, online platforms provide studios with new promotional methods, including promotional placement, free trailers, and promotional posts on social media sites. Third, digital channels frequently enable studios to directly set retail prices on their products. Finally, advances in digital rights management technologies enable firms to offer rental versions of digital content.

With the rapid adoption of Internet-enabled devices, digital channels have become increasingly popular among consumers. According to the Digital Entertainment Group (2014), U.S. home entertainment spending in digital channels increased from an estimated $5.2 billion in 2012 to $6.5 billion in 2013, accounting for 35.5% of U.S. home entertainment consumer spending.

One key challenge of managing many distribution channels is that there is an implicit belief that they cannibalize one another. In turn, these beliefs frequently lead to tension among downstream suppliers who want to protect its profits and, wherever possible, to ensure exclusivity. For example, HBO believes that digital sales channels such as iTunes and Amazon Instant Video are substitutes for its service, and uses exclusivity clauses in licensing contracts to force studios to remove their content

* Corresponding author.
E-mail addresses: jingg@andrew.cmu.edu (J. Gong), mds@cmu.edu (M.D. Smith), rtelang@andrew.cmu.edu (R. Telang).

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from digital sales channels during the HBO broadcast window (Kumar, Smith, and Telang 2014). Likewise, managers at the studio we worked with expressed concern that price promotion in one digital sales channel could cannibalize sales in the digital rental channel on the same retailer, limiting any value they could obtain from digital price promotions.

In spite of these beliefs in the industry, there is relatively little empirical analysis of cannibalization effects across digital channels. Our goal in this paper is to analyze the degree to which price promotions in a digital sales channel cannibalize sales in a presumably competing digital rental channel.

However, estimating channel interactions comes with significant empirical challenges. Most of the channel choices and pricing strategies across channels are endogenous, making unbiased identification difficult. In this paper, we address this empirical challenge by using a unique quasi-random experiment to estimate own price elasticities for movie purchases and cross price elasticities between purchases and rentals.

Specifically, our study focuses on cross-channel effects between the digital purchase (commonly known as Electronic Sell Through or EST) and digital rental (commonly known as Video-On-Demand or VOD) markets. EST and VOD channels for a movie are essentially two differentiated products under the same umbrella brand, and since most consumers only purchase once for the same title, one would expect that the EST and VOD channels are substitutes at a movie level. Therefore, if the EST price of a movie drops, EST may become more attractive than VOD, causing the movie's VOD sales to decrease.

However, there may be other confounding effects that could reduce, or even reverse, the substitution effects across these two channels. For example, in digital markets there also may be information spillover effects between EST promotion and VOD sales for the same movie title. In online markets, the availability of various searching and browsing tools and deal-collection websites makes it easy for consumers to find discount information, and some of these visits may convert to purchases (Li and Kannan 2014). This sort of information spillover, triggered by price discounts but not directly initiated by studios or retailers, may increase the overall awareness of the discounted movies, leading to increased sales in other channels. For example, suppose a consumer browsing a deal website finds that an EST version of the 1939 movie *Gone with the Wind* is on sale from $9.99 to $4.99 on iTunes. She may become interested in the movie, go to iTunes, and find that the VOD price ($1.99) is still cheaper than the discounted EST price, and she may ultimately decide to consume the VOD version of *Gone with the Wind*, even though VOD was not part of the original price promotion. Therefore, a price discount in one channel can inform consumers of the umbrella brand – the promoted movie – and this information spillover effect may increase the sales of both EST and VOD channels. As a result, the net cross-channel effect between EST and VOD is not clear.

To examine cross-channel effects between movie purchases and rentals, we use a unique dataset provided by a major movie studio documenting their sales and rental data through a major digital movie retailer. In our analysis, we take advantage of a 14-week field experiment conducted between November 14, 2011 and February 19, 2012 to explore several important managerial and academic questions. In particular, we use this data to estimate own and cross price elasticities for digital movie sales on this platform, whether (and how much) price discounts cannibalize future sales, and notably whether a price discount in one channel affects sales in other channels.

Our analysis indicates that consumers in EST channels are highly sensitive to price changes. However, we also find that, contrary to expectations, a price decrease in the EST channel does not necessarily reduce sales in the presumably competing VOD channel. In fact, if anything, we observe a potential information spillover between the two channels such that a reduction in EST prices in our sample may increase VOD sales for the same movie. We observe this in spite of the fact that there were no other studio-initiated promotional campaigns for these movies during our time period. We argue that one potential explanation for this counterintuitive finding is that in digital markets, price discounts of one type can create information spillovers (possibly through third party websites, blogs, or online discussions) that may increase the overall awareness of promoted products, leading to increased overall sales across channels (Li and Kannan 2014).

Our research makes several contributions to the literature. First, prior research has found spillover effects of a movie's television broadcast on DVD sales (e.g., Kumar, Smith, and Telang 2014; Smith and Telang 2009), of marketing-mix within umbrella brands (e.g., Erdem and Sun 2002), of patient feedback among competing drug brands (Janakiraman, Sismeiro, and Dutta 2009), and of advertising among competing retailing brands (Anderson and Simester 2013). Our study adds to these results by examining the potential for positive spillovers of price promotions on sales in presumably competing channels.

Further, while previous research has studied cross-channel relationships between online and offline channels (e.g., Brynjolfsson, Hu, and Smith 2003; Zentner, Smith, and Kaya 2013), cross-channel relationships between digital and physical products (e.g., Danaher et al. 2010; Deleersnyder, Inge, and Katrijn 2002; Hu and Smith 2013; Kannan, Pope, and Jain 2009), and the impact of multichannel marketing campaigns on within- and cross-channel sales (e.g., Dinner, Van Heerde, and Neslin 2014; Montaguti, Neslin, and Valentini 2014), little is know about the potential effects among different digital channels. Our study extends this stream of research by studying the impact of price discounts for a movie on sales in other digital channels, potentially closer substitutes than the settings studied previously given the co-location of purchase (EST) and rental (VOD) channels in a single online retailer. Our empirical findings also offer new insights for studios and online platforms to better understand cross-channel effects between purchase and rental markets, and to optimize pricing strategies across channels for higher overall profits.

While more tentative because of differences in estimation techniques, we believe our second contribution is in a finding that consumers in our digital channel are extremely price sensitive relative to measured price sensitivity in traditional markets (see Bijmolt, van Heerde, and Pieters 2005 and Tellis 1988 for surveys of studies of price sensitivity in traditional industry) or

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