

**Bricks, Clicks, Blockbusters, and Long Tails:
How Video Rental Patterns Change as Consumers Move Online?**

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ABSTRACT

Internet markets increase available product selection versus brick-and-mortar markets, but how will this change consumption patterns? Answering this question is complicated by the obvious selection effect: if Internet consumers purchase more niche products than brick-and-mortar consumers do, is this because of the characteristics of the channel, or the characteristics of consumers who choose the channel?

We address this question using customer-level rental data obtained from a national video chain as it was closing many of its local stores. This allows us to observe how behavior changes when consumers are forced to move from brick-and-mortar to online consumption.

The data suggest that when consumers move from brick-and-mortar to online channels they are significantly more likely to rent “niche” titles relative to “blockbusters.” This suggests that a significant amount of niche product consumption online is due to the nature of the channel, not just the nature of the consumers choosing the channel.

Keywords: *Long Tail, movie rentals, natural experiment, empirical estimation.*

1. Introduction

Some observers believe that the emergence of the information economy, by transforming production and distribution costs as well as affecting consumers' preferences, has the potential to greatly change the answer to fundamental economic questions such as the decisions of how and what to produce. Although the new economy's impacts on performance, productivity, and organizations have been examined in some detail for various markets (see for example Brynjolfsson and Hitt 1996, Acemoglu *et al.* 2007, Aral, Brynjolfsson, and Van Alstyne 2011, and Miller and Tucker 2011,), its impact on what goods are produced or sold has received limited academic attention.

In this paper we focus on how one aspect of the new economy—online commerce—might affect what goods are produced and sold. The shift from offline to online commerce can affect the overall distribution of product sales by changing both the producer's cost structure and consumers' choices. The small amount of research on this topic has been inconclusive as to how “long tail” product markets might change the types of products that are demanded by customers and produced by firms (see for example Elberse 2008, Fleder and Hosanagar 2009, Brynjolfsson, Hu, and Smith 2010, Oestreicher-Singer and Sundararajan 2011).

Moreover, these changes from long tail markets could derive from either supply-side or demand-side effects (Brynjolfsson, Hu, and Smith 2006). On the supply side, the selection of products available from the Internet channel is much wider than the selection available at physical stores. Online marketplaces can offer a larger selection of products than traditional physical stores can because the online channel has lower storage and

inventory costs and there are no shelf space limitations. As a consequence, the expectation is that the concentration of overall sales across products would decrease as transactions shift from offline to online channels.

On the demand-side, online commerce can change consumers' product choices, even when the sets of products offered online and offline are identical. In part, this might happen because the ways consumers search for products online and offline are fundamentally different. At a physical store, finding a popular product may be easier than finding a niche product, even when both are available. Popular products occupy prominent shelf space in physical stores as opposed to older products that are relegated to less visible positions. In online marketplaces, some search tools may tend to promote the discovery of niche titles. However, personalization and recommendation engines and other search tools may also decrease the concentration of product sales. For example, top 10 seller lists may tend to reinforce the popularity of already popular products. Similarly, recommendation systems may increase the concentration of product sales because they base their recommendations on actual sales and there is limited data for products that have low historical sales (see Fleder and Hosanagar 2009 and Oestreicher-Singer and Sundararajan 2011).

In short, online markets may (or may not) transform markets that have traditionally exhibited "superstar" effects, where a few top-selling products take the lion's share of all revenues (Rosen 1981). In studying this question, it is important to note that while early research has shown that a large proportion of online purchases occur for products that would not normally be stocked in brick-and-mortar markets (e.g., Brynjolfsson, Hu, and Smith 2003), it is not clear whether this change in sales concentration is due to the nature

of the channel or the nature of the customers who choose the channel. What is really needed is customer-level data on purchases before and after an exogenous change in the relative cost of purchasing online.

In this paper we attempt to analyze this question using just such a dataset for DVD rentals. In the market for DVD rentals, new releases have traditionally accounted for a substantial share of all DVD rental transactions. Our objective is to empirically examine how the introduction of online commerce has changed the share of transactions taken by blockbuster DVDs.

We base our empirical analysis on household-level panel data from a large video rental chain. Our approach is to examine how household-level purchase patterns for popular and niche titles change when consumers move from offline to online channels — using the exit of physical stores as an instrumental variable for the online versus offline channel choice. This instrument exploits transportation cost changes experienced by individuals located near the exiting store (Forman, Ghose, and Goldfarb 2009 and Brynjolfsson, Hu, and Rahman 2009). We find that superstar DVD titles take a smaller share of the market as consumers shift from offline to online marketplaces.

We believe that this finding is particularly important for the movie industry, an industry that is actively wrestling with whether it should alter its business strategy as consumers move to online marketplaces. In this light, our finding suggesting that consumers are more likely to rent products from the long tail of the distribution when they move from brick and mortar to online channels is important for movie studios investment choices,

video rental companies stocking choices, and for the revenue sharing contractual agreements between studios and video rental companies.

2. Literature

Our results contribute most directly to a small empirical literature studying the effect of information technology on sales concentration patterns. Elberse and Oberholzer-Gee (2007) study how online commerce affected the distribution of sales in the United States home video industry from 2000 to 2005. Using weekly data on video sales by title, and examining how the distribution of overall video sales changed over time, they find that as a proportion of overall product offerings, superstar products comprise by the end of their study period a larger proportion of sales than ever before.

Brynjolfsson, Hu, and Simester (2011) examine the concentration of product sales for a retailer selling women's clothing via both the Internet and catalog channels. Using cross sectional data on sales aggregated by item and channel, they find that the concentration of product sales is lower for the Internet channel than the catalog channel. Importantly, they conclude that the differences in the product sales distributions are due to the search costs on the Internet versus catalog channels, since the Internet and catalog channels' product selections for this retailer are identical.

In contrast to the prior literature, in our analysis we use individual-level panel data including information on consumers' transactions from the online versus brick-and-mortar channels. We analyze how individuals change their consumption patterns when they are induced to move from in-store to online consumption.

Our results also contribute to a growing literature on the impact of popularity and recommendation information on sales of niche and popular titles. In this literature Tucker and Zhang (2011) study the impact of popularity information on sales, arguing that titles with niche appeal may benefit from being listed in popular product lists more than general appeal products do. Likewise, Fleder and Hosanagar 2009 and Oestreicher-Singer and Sundararajan 2011 analyze how peer-based automated recommendation lists influence preferences for long tail and blockbuster titles, with the former authors finding that recommendation lists can either increase or decrease sales of “long tail” products, and the latter authors finding that product categories that are more sensitive to recommendation network are also more likely to have higher sales in long tail titles.

3. Data and Setting

Our data come from a large video rental company that operates both brick and mortar stores and online DVD rental channels. For a monthly flat rate subscription, customers can rent DVDs online and receive them in the mail, and then exchange these DVDs either through mail or at a physical store.

The selection of DVD titles available for rental at physical stores is a subset of the selection of titles available for rental online. While a typical store has a rotating selection of approximately 2,000 titles, the online channel has over 100,000 titles. The Internet channel has a much larger DVD selection than the selection available at physical stores because the online channel has lower storage costs. Storage costs are even lower for video streaming services, although video streaming was in its infant stages of development during our study period. Our focal company did not offer its subscribers a

video streaming service during our period of analysis. Due to the storage capacity limitations, the physical stores stocks more copies of new releases than of older titles. Inventory costs are also lower online than in physical stores because the company we study ships DVDs to its customers from a small number of national locations, compared with a much larger number of physical stores. Thus, as these shipping locations reach a much larger number of consumers than a physical store would, the law of large numbers indicates that the company can reduce inventory cost by more accurately predicting demand from the online channel.

Our data cover the DVD rental activity for all subscribing customers of both the online and in-store channels, and includes 49 million rental transactions for the period from October 2009 through April 2010. Although consumers without a monthly subscription can rent movies from physical stores, our data only includes the information from consumers with a monthly subscription. The data include the subscriber, DVD title, transaction date, and whether the DVD was delivered by mail or exchanged at a physical store. In addition, we have the zip code for each subscriber, the address for each physical location operated by this firm, and the closing date for locations that were closed during our study period.

Table 1 presents the summary statistics for our data. The DVD rental market has experienced important changes during the last decade. Industry trends show that traditional physical stores have been displaced by online DVD rental services, and more recently by video streaming services and kiosks. Our data come from a company that closed 16.1% of its physical stores during our period of analysis (see the last column of Table 1). This substantial change in the number of physical rental stores will play a

central role in our identification strategy, since we will use the exit of a store from a zip code as an instrumental variable for online versus offline channel selection by consumers.

Table 1: Summary Statistics

Month	Number of Transactions	Number of Stores
Oct-09	6,667,302	3,535
Nov-09	7,616,518	3,482
Dec-09	7,575,591	3,187
Jan-10	7,387,813	3,161
Feb-10	6,572,908	3,146
Mar-10	7,565,999	3,145
Apr-10	6,003,824	2,966

DVD exchanges at physical stores represent approximately 31% of all rentals. Subscribers rented an average of 6.1 DVDs per month: 1.9 DVDs from the store and 4.2 DVDs by mail.

Importantly, a monthly subscription fee allows the rental of a certain number of DVDs at a time, but subscribers do not pay a price each time they rent a DVD from either the online or offline channel. Thus, for subscribers, the DVD rental price is neither a driver of the online versus offline channel selection, nor of the specific DVD title choice.

3.1. Popular and Niche Product Definitions

A stream of prior research, while focusing on examining the potential of information technologies to transform the distribution of sales across products and channels, has classified products as either niche or popular. Products are typically classified as niche when they are less likely to be stocked in physical stores, or are only available after incurring a high search cost. In spite of this definition, because of data restrictions, prior studies classified products as niche or popular based primarily on product sales from the online channel and not on product sales from the offline channel. Our data have the

advantage that they allow us to define the popularity of DVD titles during a month using information from both online and offline rental channels.

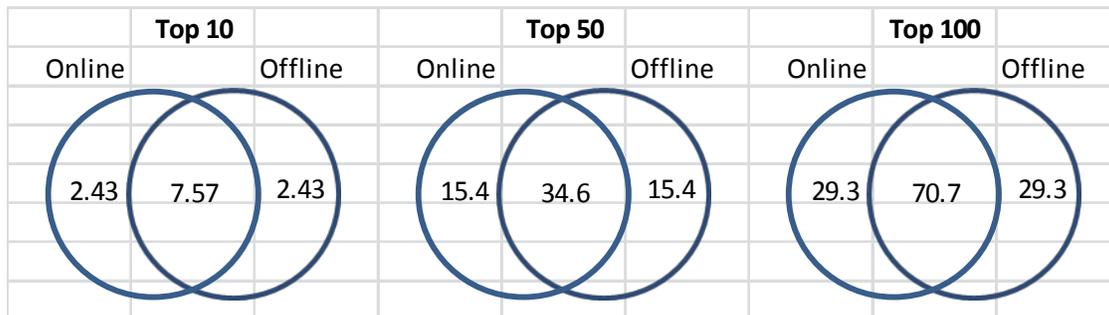
Classifying goods as niche or popular based on online sales may be problematic if the distribution of sales across products online and offline are different. We know that firms choose which products to stock online and offline, and furthermore that product availability by channel may influence consumers' channel choices. As an example of the possible problems that can occur when classifying products based solely on online sales, suppose that consumers buy a product online only when this product is not available at the physical store. If this situation is common for a product then this product would be classified as popular using online sales, but many consumers are buying it online precisely because it is not available in physical stores and therefore is a niche product. Additionally, some online retailers, because they face low competition from physical stores, may specialize on selling only niche products that are less likely to be available at physical stores. For these retailers classifying top-selling products as popular and the remaining products as niche would also be incorrect.

Using our data, we can only provide comparisons of transactions online and offline for a single product category (DVD rentals) and within a single firm. However, within this major firm, we can compare the extent to which the selection of DVDs rented online is different than the selection of DVDs rented offline. We do this by using online and offline data aggregated at the national level, and computing the total number of rentals for each DVD title and each channel during each month. We then rank DVDs by popularity, computing two separate monthly ranks of DVDs using either the online and offline rental information.

Our definition allows for the popularity of a DVD to vary from month to month; a DVD that is popular at the beginning of the study period can become niche by the end the study period, since DVDs have short-lived popularity cycles. For example, 53 (170, 271) different DVD titles are among the top 10 (top 50, top 100) DVD titles for at least one month during our seven-month study period.

Figure 1 shows that the rankings of DVD rentals computed using online rentals are somewhat different than the rankings of DVD rentals computed using offline rentals. For example, comparing the top 10 DVD titles based on either online and offline rental information shows that a monthly average of 7.57 DVD titles are included in both rankings, but 2.43 DVD titles are included in only one ranking. Similarly, for the top 50 and top 100 DVDs approximately 70% of the titles are included in both rankings and the remaining 30% of the DVD titles are included in only one ranking.

Figure 1: Commonality Between Online and Offline Popular Titles



It is difficult to disentangle the degree to which differences in the online and offline rankings of DVD titles occur due to cross-channel differences on the demand-side or on the supply-side. On the demand-side, differences between online and offline rankings could be driven by differences in preferences between consumers who choose the online versus the offline channel; while on the supply-side, these differences could be driven by

differences in the selection of DVDs available online versus offline or the search costs to find those DVDs in either channel.

3.2. Superstars: Online versus Offline DVD Rental Distributions

Because our objective is to examine how the shift from offline to online rental channels affects the aggregate selection of DVD rentals, in this study we define the popularity of DVD titles during a month using our information from both online and offline rentals. And using this definition, in Table 2 we see that superstar DVD titles take a substantially larger share of total rentals offline than they do online. For example, the top 100 DVD titles in our sample represent 83.7% of in-store rentals, but only represent 33.6% of online rentals.

However, we must be cautious when interpreting Table 2. From these statistics alone we cannot conclude that online commerce decreases the superstar nature of the DVD rental market. The differences in Table 2 could be explained by heterogeneous tastes of the consumers who rent primarily online versus consumers who rent primarily offline. These differences may also be explained by a limited number of copies of popular DVDs available for rental online. If there are queues to rent popular DVDs online, then consumers who typically rent from both channels may rent from the physical store more often than from online when they desire to watch popular versus non-popular DVDs.

Table 2: Cumulative Share of Monthly Top Ranked DVD Rentals by Channel

	Rented Online and Delivered by Mail	Rented from the Physical Store
Top 10	9.2%	40.9%
Top 50	24.7%	75.7%
Top 100	33.6%	83.7%

To better identify the source of these observed differences, we turn to our empirical approach examining the causal effect of the advent of IT on the concentration of total rentals.

4. Econometric Model

Our objective is to study whether changes in which rental channel a consumer uses affect the selection of DVD rentals, and establishing whether online markets affect the consumption of superstar DVDs. We showed in Table 2 that the distributions of DVD rentals online and offline are quite different. Superstar DVDs in particular take a substantially larger share of all rentals made in physical stores than they do online. However, as discussed above, these differences do not necessarily imply that the rental channel changes a household's selection of DVD rental titles. For example, the different rental distributions online and offline in Table 2 could be explained by sample selection—i.e., heterogeneous tastes of the consumers who rent primarily online versus primarily offline. Cross-section regressions would suffer from a similar problem, because these regressions obtain identification from comparing DVD rental selections across heterogeneous consumers.

Our approach then is to control for unobserved heterogeneity using panel data, exploiting changes in DVD rental activity across time and across rental channel for each household. For each household i on each month t we define the following variables: $Share\ Popular_{it}$ is the share of the number of superstar DVD title rentals (monthly top 10, top 50, and top 100) over the total number of rentals, and $Share\ Offline_{it}$ is the share of the number of rentals made offline over the total number of rentals both online and offline.

We then use these variables to estimate the following fixed effect model:

$$(1) \text{ Share Popular}_{it} = \alpha + \beta \text{ Share Offline}_{it} + \gamma \text{ Total Rentals}_{it} + \phi_i + \psi_t + u_{it}$$

The variable $\text{Total Rentals}_{it}$ in Model (1) represents the total number of DVD rentals made by household i in month t . The coefficient β in Model (1) measures how changes in the share of DVDs rented from the physical store relate to changes in the share of popular DVD rentals, conditional on the total number of DVD rentals. The model includes fixed effects for each household ϕ_i and each month ψ_t .

By using a longitudinal model we can “difference out” the time invariant unobserved characteristics of each household; for example the household fixed effects capture income levels or household sizes that are unlikely to change substantially during a seven month period. The month fixed effects capture aggregate changes over time, such as changes in DVD rental consumption that can be caused by school breaks or seasons. Because Model (1) includes both household and month fixed effects, identification arises from changes in the DVD rental selection and rental channel within households from month to month.

While our panel data approach allows us to control for the time invariant tastes of each household, ordinary least squares estimates of Model (1) still provide a misleading measurement of how the rental channel affects the selection of DVD rentals when a household’s desire for popular versus non-popular DVDs changes over time. For example, if there is a longer queue for renting popular DVDs online than offline, an individual may rent from the physical store more often than from online if they wish to watch popular DVDs instead of non-popular DVDs. The rental channel is a choice; and

individuals' changes in their desires to watch popular DVDs may influence the channel selection, creating an endogeneity problem. In order to identify how changes in the rental channel affect the overall selection of DVD rental titles we would need to observe changes in individuals' shares of offline rentals that are not caused by changes in the desire to watch popular versus non-popular DVDs.

To break this endogeneity problem, we use the exit of physical stores at the zip code level as an instrumental variable. The rationale for using the exit of physical stores as an instrument is that the exit of a store from a zip code, by changing the transportation cost of travelling to the store for the individuals that reside in that zip code, increases the relative cost of renting DVDs from the physical store. In turn, the increase in the relative cost of renting DVDs from the physical store induces consumers to shift their rentals from the offline to the online channel. We believe that the exit of stores is unlikely to be affected by individuals' high frequency changes in their desire to rent popular versus non-popular DVDs, in which case our instrument is orthogonal to the error.

5. Results

Table 3 presents the OLS estimation results for Model (1). The standard errors are clustered at the level of the household in order to allow for the possibility of serial correlation over time. The regressions include fixed effects for each month and over a million and a half fixed effects at the household level. The results show that households increase the fraction of rentals of popular DVDs when they rent more DVDs from the physical store. The coefficient estimates on the fraction of offline rentals are both statistically and economically significant. The size of the coefficient estimates on the

fraction of offline rentals indicates that a household that increases the fraction of DVDs rented from the physical store from zero to one would increase the fraction of top 10 (top 50, top 100) DVD rentals by 32.1 (50.3, 48.7) percentage points.

Table 3: Share of Popular Rentals - OLS Estimates

	Top 10	Top 50	Top 100
Share of Offline Rentals	0.3216*** (0.0007)	0.5034*** (0.0008)	0.4878*** (0.0008)
Total DVD Rentals	-0.0046*** (0.00002)	-0.0047*** (0.00003)	-0.0042*** (0.00003)
Constant	0.1147*** (0.0003)	0.2428*** (0.0004)	0.3322*** (0.0004)
Observations	7,696,706	7,696,706	7,696,706
R-squared	0.4600	0.5875	0.6048

Includes fixed effects for months and individuals (1,591,823). Standard errors in parentheses are clustered by household. * significant at 10%; ** significant at 5%; *** significant at 1%

The sign of the coefficient estimates on total DVD rentals per month is negative and economically small. The negative sign is unsurprising because individuals tend to rent top DVDs first, and rent DVDs that are further down the popularity distribution during months when they increase the number of DVD rentals. Renting an additional DVD in a month reduces the fraction of top 10, top 50, or top 100 DVD rentals by less than half of a percentage point.

Table 4 presents our IV estimation results. The first column shows the results from the first stage. This regression indicates that individuals reduce the fraction of DVDs rented from physical stores when a store exits their zip code. This is expected because, by increasing the transportation cost, the exit of a store from a zip code increases the relative cost of renting from the physical store for the households that reside in that zip code. This result is consistent with the prior literature showing that the likelihood of purchasing

products online decreases as consumers are located closer to physical stores (Forman, Ghose, and Goldfarb 2009 and Brynjolfsson, Hu, and Rahman 2009).

Table 4: Share of Popular Rentals - IV Estimates

	First Stage	Second Stage		
		Top 10	Top 50	Top 100
Number of Stores in the Zip Code	0.0229*** (0.0007)	n/a n/a	n/a n/a	n/a n/a
Share of Offline Rentals	n/a n/a	0.1421*** (0.0307)	0.1559*** (0.0400)	0.1059** (0.0424)
Total DVD Rentals	0.0066*** (0.00003)	0.0034*** (0.0002)	0.0024*** (0.0003)	-0.0016*** (0.0003)
Constant	0.2094*** (0.0005)	0.1546*** (0.0068)	0.3202*** (0.0089)	0.4172*** (0.0094)
Observations	7,696,706	7,696,706	7,696,706	7,696,706
R-squared	0.6224	0.3983	0.5139	0.5449

Includes fixed effects for months and individuals (1,591,823). Standard errors in parentheses are clustered by household. * significant at 10%; ** significant at 5%; *** significant at 1%

The results from the second stage in Table 4 still show that individuals increase the fraction of popular DVD rentals when they rent more DVDs from the physical store, but the size of the coefficient estimates are substantially smaller than in the OLS regressions from Table 3. The size of the coefficient estimates on the fraction of offline rentals indicate that when household increases the fraction of DVDs rented from the store from zero to one, the fraction of top 10 (top 50, top 100) DVD rentals increases by 14.2 (15.5, 10.5) percentage points. We note that the size of the coefficient estimate measuring the effect of the fraction of DVDs rented from physical stores on the fraction of popular DVD rentals on Table 4 is smaller for top 100 DVD rental titles than for top 10 and top 50 DVD titles, and the statistical significance of the coefficient for top 100 DVD titles is also lower.

As in Table 3, the coefficient estimates on total DVD rentals per month in Table 4 are negative and economically small.

5.1. Sensitivity Of Results To Attrition

Our focal company lost a substantial number of subscribers during our study period. Additionally, the customer base exhibits a high churn rate that may be fueled by free of charge trial period offers. Our panel of data is therefore unbalanced. An unbalanced panel does not generate biased estimates when the reason for having missing observations is not correlated with the regression error term. For example, subscribers that rent DVDs in only one month during our study period do not bias the estimates since time demeaning for such observations yields all zeros. But in order to examine whether or not our previous empirical results are driven by the changes in the customer base we ran the regressions using a balanced panel of subscribers.

Table 5 present OLS results analogous to those in Table 3, but only including the information from subscribers who rented at least one DVD in both the initial and final months of our study period. There are slightly over 800,000 such subscribers; approximately half of the total number of subscribers compared with Table 3. The coefficient estimates on both the fraction of offline rentals and the total DVD rentals per month variables are similar in Table 5 to those in Table 3.

The similarity of the results in Tables 3 and 5 indicates that the effects of the online versus offline channel choice on superstar DVD rentals are not significantly different for transient subscribers versus subscribers who maintained subscriptions during the entire length of our study period.

Table 5: Share of Popular Rentals - OLS Estimates (Balanced Panel)

	Top 10	Top 50	Top 100
Share of Offline Rentals	0.3269*** (0.0008)	0.5053*** (0.0009)	0.4849*** (0.0009)
Total DVD Rentals	-0.0051*** (0.00003)	-0.0050*** (0.00003)	-0.0044*** (0.00004)
Constant	0.1235*** (0.0003)	0.2503*** (0.0004)	0.3391*** (0.0004)
Observations	5,390,963	5,390,963	5,390,963
R-squared	0.4197	0.5568	0.5719

Includes fixed effects for months and individuals (1,591,823). Standard errors in parentheses are clustered by household. * significant at 10%; ** significant at 5%; *** significant at 1%

However, the value of a subscription may be greater as the distance to an offline store decreases, since having a physical store within reach provides the additional value of exchanging DVDs at the store. Since attrition in our data is likely correlated with the exit of physical stores, attrition can bias our instrumental variable results. Table 6 examines this possibility empirically by showing the instrumental variable results using the balanced sub-sample of our data.

Table 6: Share of Popular Rentals - IV Estimates (Balanced Panel)

	First Stage	Second Stage		
		Top 10	Top 50	Top 100
Number of Stores in the Zip Code	0.0222*** (0.0007)	n/a n/a	n/a n/a	n/a n/a
Share of Offline Rentals	n/a n/a	0.1329*** (0.0333)	0.1317*** (0.0429)	0.0710 (0.0454)
Total DVD Rentals	0.0062*** (0.00003)	-0.0039*** (0.0002)	-0.0027*** (0.0003)	-0.0018*** (0.0003)
Constant	0.2370*** (0.0005)	0.1720*** (0.0083)	0.3438*** (0.0107)	0.4427*** (0.0114)
Observations	5,390,963	5,390,963	5,390,963	5,390,963
R-squared	0.6168	0.3559	0.4800	0.5098

Includes fixed effects for months and individuals (1,591,823). Standard errors in parentheses are clustered by household. * significant at 10%; ** significant at 5%; *** significant at 1%

The results in Table 6 using the balanced sub-sample are similar than those in Table 4 using the entire sample. The coefficient estimates on the fraction of offline rentals variable are only slightly smaller in Table 6 than in Table 4; for the top 100 DVDs the coefficient in Table 4 is neither statistically different from zero nor statistically different from the coefficient in Table 6. The similarity of the estimates in Tables 4 and 6 suggests that our results in Table 4 using the entire sample are not driven by changes in the profile of customers over time.

6. Discussion

As the proportion of commerce conducted online increases, will producers and retailers need to re-evaluate their investment and inventory choices? Answering this question is complicated by endogeneity surrounding the types of consumers who purchase online and the observed purchase decisions between online and offline channels. While early research has observed a large proportion of sales online in niche products — products that would not normally be stocked in brick-and-mortar stores — it is unclear whether this change is due to the nature of the Internet channel (selection, search tools), or the nature of consumers who select the channel.

Breaking this endogeneity requires an exogenous shift in the cost of purchasing online, and the ability to observe customer-level purchase decisions before and after the shift. Our data provide us with just such an opportunity. Our data document customer-level rental decisions for consumers before and after their local video rental store closed. Our empirical analysis suggests that when consumers move online they are much less likely to rent blockbuster titles than they were previously. This finding has implications for the

types of projects companies should be investing in and for retailers' stock choices as more of their business moves to online channels.

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