

The Use of Full-line Forcing Contracts in the Video Rental Industry

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WEB APPENDIX

I. Additional Summary Statistics

In this appendix, we discuss preliminary evidence and patterns from the data. Tables A and B provide additional information to supplement that in Table 2 of the paper. The number of titles released by distributors, and taken by stores, under different contract types are broken out by Box Office Group.

Table C provides information on the size distribution of stores choosing different types of contracts. We begin by calculating the percent of each store's titles that are taken under each contract type. We then break down this distribution into quintiles and report, in the first panel of Table C, the average store size (tier) for each quintile. The results demonstrate that stores that accept very few titles on LP contracts (the lowest quintile) are the small stores - these stores take a relatively high proportion of their titles on RS contracts. The stores that accept a high proportion of their titles on LP contracts are on average larger stores. This is consistent with the adverse selection effect noted above: large stores tend to be located in high-demand markets and therefore expect high demand for their titles. LP contracts are most profitable for these stores. The pattern for FLF contracts is similar to that for LP: larger stores are more likely to accept a high proportion of their titles on FLF contracts.

The second panel of Table C looks at these patterns in more detail. For each quintile and contract type, we examine the percent of stores in that quintile/contract type that are store tiers 1-3 or store tiers 7-10. We normalize these percentages by the overall percent of stores that are in those tier groups across all quintiles and contract types. Thus, the result of 1.59 for tier 1-3 under LP and Quintile 1 indicates that store tiers 1-3 (small stores) are relatively over-represented in the first quintile of LP contracts (a value greater than 1 indicates over-

representation, and a value less than 1 indicates under-representation). Overall, small stores are over-represented in the first, second, and third quintiles of LP contracts, the first and second quintile of FLF contracts and the third, fourth and fifth quintiles of RS contracts. The reverse pattern holds for large stores: these are over-represented in the fourth and fifth quintiles of LP and FLF contracts and in the first and second quintiles of RS contracts. However, similar to small stores, large stores are also over-represented in the first quintile of FLF contracts.

Demand Elasticities

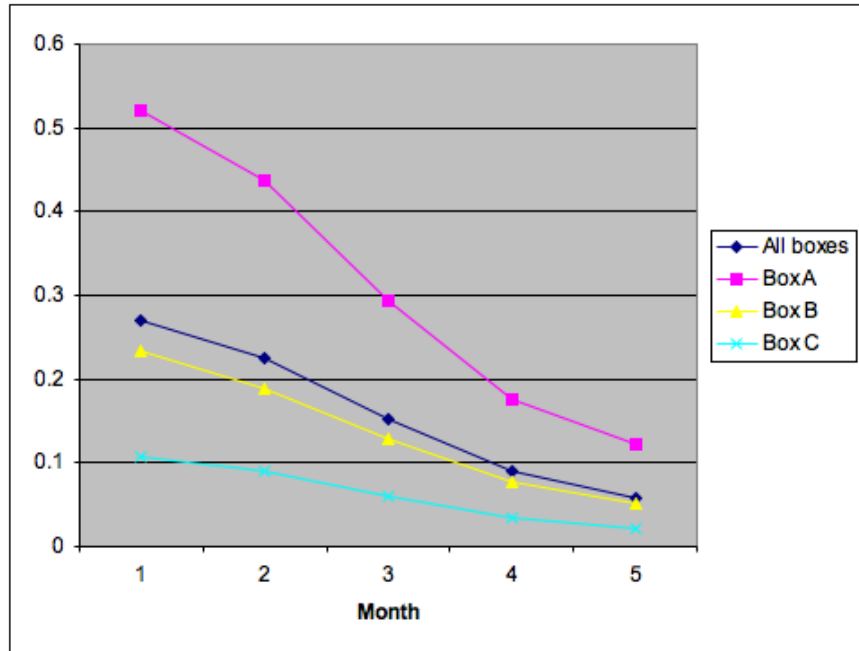
The variation for inventory elasticities, as discussed in the paper, is displayed in Figure 1.

Second-Stage Demand Regression

Table D reports the results of a regression of the store-title quality levels estimated in the nested logit on store and title characteristics. Our dependent variable is the estimated value of $\left[\hat{\delta}_j + \hat{\gamma}_j z_m + \hat{\eta}_m + \hat{\theta}_t + \hat{\beta}_t x_j + \hat{\lambda}_t c_{jm} \right]$. Results for the first region are reported here; those for other regions are similar. The independent variables are title characteristics (quarter of release to video, box office category, genre, rating and interactions of these variables), store characteristics (demographics of the market, the number of households in the market and an indicator for markets where Blockbuster Video is active), interactions between title and store characteristics and the same month dummies and interaction terms that are included in the nested logit. The results are intuitive. Box office category A titles have higher estimated quality than those in categories B and (particularly) C. Action/adventure movies (the omitted genre category) and comedies have higher demand than other genres; children’s movies, romances and science fiction movies have particularly low rental demand. PG13 movies have higher demand than those with other ratings. Markets with a high percent female consumers have high demand for video rentals; those with a high proportion of family heads who are single mothers have particularly high demand and those with a high

proportion of family heads who are single without children have particularly low demand. The Blockbuster dummy is positive and significant, probably indicating that Blockbuster chooses to enter high-demand markets.¹

Figure 1: Inventory Elasticities Implied by Demand Estimates



Notes: Elasticities implied by the demand estimates. Corresponding data are given in Table 4. Elasticities with respect to inventory are calculated for every store-title-month observation and then averages are taken within each zipcode region - month and then across regions.

¹The coefficient on the number of households is negative and significant, implying that large markets where Blockbuster is not located have low demand. The coefficient on median income is negative and significant: wealthier markets have fewer movie rentals, perhaps because wealthy families choose more expensive leisure activities.

Table A: SUMMARY STATISTICS (CONT.)

Contract	Linear Pricing	Revenue Sharing	Full-Line Forcing	Sell-Through Pricing
Total No. of Titles Released by Distributors				
Year 1:	219	115	0	27
A Titles:	30	12	0	15
B Titles:	36	17	0	6
C Titles:	153	86	0	6
Year 2:	204	125	10	24
A Titles:	32	23	1	14
B Titles:	42	29	2	6
C Titles:	130	73	7	4
Year 3:	231	132	18	21
A Titles:	43	29	4	15
B Titles:	44	29	3	1
C Titles:	144	74	11	5
Year 4:	209	113	38	26
A Titles:	36	20	9	16
B Titles:	50	19	5	3
C Titles:	123	74	24	7

Notes: Total number of titles released by distributors and offered under each contract type. Titles may be counted in more than one column. All Revenue-Sharing and Full-Line Forcing titles are also offered under Linear-Pricing contracts, although many titles are offered under LP terms only. No Sell-Through Pricing titles are offered under alternate contracts.

Table B: SUMMARY STATISTICS (CONT.)

Contract	Linear Pricing	Revenue Sharing	Full-Line Forcing	Sell-Through Pricing
Number of Stores	6,358	6,150	5,111	6,171
Avg No. of Titles Taken by Stores				
Year 1:	99.72 (44.18)	23.74 (24.83)	- -	20.41 (6.78)
A Titles:	19.99 (7.41)	4.98 (3.54)	- -	12.07 (4.04)
B Titles:	23.85 (9.54)	5.23 (5.38)	- -	4.29 (1.62)
C Titles:	55.89 (30.06)	13.52 (17.01)	- -	4.05 (1.65)
Year 2:	69.64 (45.03)	20.31 (21.69)	4.15 (3.15)	15.24 (7.89)
A Titles:	14.53 (8.89)	7.11 (6.12)	0.63 (0.48)	8.96 (4.38)
B Titles:	20.03 (11.90)	6.88 (7.67)	1.23 (0.85)	3.93 (2.39)
C Titles:	35.08 (26.31)	6.32 (9.20)	2.29 (2.18)	2.35 (1.58)
Year 3:	98.98 (56.36)	18.61 (23.28)	6.29 (3.90)	14.70 (6.77)
A Titles:	23.83 (12.29)	7.36 (7.28)	1.58 (0.98)	11.42 (5.16)
B Titles:	26.18 (13.66)	5.23 (7.46)	0.92 (0.66)	0.78 (0.42)
C Titles:	48.97 (32.74)	6.02 (9.85)	3.79 (2.71)	2.50 (1.47)
Year 4:	88.77 (40.12)	14.26 (17.57)	10.36 (7.26)	18.14 (7.16)
A Titles:	20.35 (8.81)	5.69 (5.35)	3.37 (2.08)	12.49 (4.94)
B Titles:	33.30 (13.08)	3.69 (5.36)	1.06 (0.97)	2.39 (1.08)
C Titles:	35.12 (20.77)	4.88 (7.73)	5.92 (4.61)	3.26 (1.50)

Notes: Average number of titles of each contract type taken by all active stores in each year. Standard deviations in parentheses.

Table C: SUMMARY STATISTICS (CONT.)

Contract		Linear Pricing	Revenue Sharing	Full-Line Forcing	Sell-Through Pricing
Ave store tier					
Quintile 1		2.70	4.99	3.79	5.54
Quintile 2		2.93	5.16	2.76	4.70
Quintile 3		3.55	3.51	4.28	4.00
Quintile 4		4.74	3.01	4.29	2.93
Quintile 5		5.47	2.71	4.28	2.21
Quintile	% of quintile				
1	Tier 1-3	1.58	0.43	1.12	0.50
	Tier 7-10	0.53	1.60	1.42	3.07
2	Tier 1-3	1.42	0.40	1.48	0.55
	Tier 7-10	0.31	1.60	0.28	1.25
3	Tier 1-3	1.14	1.21	0.71	0.81
	Tier 7-10	0.74	0.84	0.81	0.45
4	Tier 1-3	0.48	1.39	0.83	1.40
	Tier 7-10	1.06	0.43	1.24	0.14
5	Tier 1-3	0.37	1.57	0.86	1.75
	Tier 7-10	2.36	0.54	1.26	0.08

Notes: Panel 1 breaks the percent of each store’s titles adopted under a particular type of contract into quintiles and reports the average store tier in each quintile. Tiers are ranked from 1 to 10 where 10 is largest. Panel 2 reports the percent of stores in each quintile that are in store tiers 1-3 and 7-10 respectively. These percentages are normalized by the percent of all stores that are in the relevant set of tiers. Numbers over 1 indicate that the store type is over-represented in the relevant quintile.

Table D: DEMAND RESULTS: SECOND STAGE REGRESSIONS

		OLS Coef (S.E.)	IV 1 Coef (S.E.)	IV 2 Coef (S.E.)
Release date:				
	Quarter 2	-0.008 (0.004)	-0.012 (0.004)	-0.015 (0.004)
	Quarter 3	-0.119 (0.004)	-0.120 (0.004)	-0.124 (0.004)
	Quarter 4	-0.029 (0.004)	-0.040 (0.004)	-0.042 (0.004)
Box Office:				
	B	-0.755 (0.042)	-0.685 (0.043)	-0.724 (0.045)
	C	-1.363 (0.039)	-1.278 (0.041)	-1.317 (0.042)
Genre:				
	Child/Family	-0.787 (0.051)	-0.600 (0.052)	-0.638 (0.051)
	Comedy	0.172 (0.046)	0.265 (0.047)	0.250 (0.046)
	Drama	-0.135 (0.023)	-0.069 (0.023)	-0.096 (0.023)
	Horror/Suspense	-0.021 (0.031)	-0.021 (0.033)	-0.036 (0.034)
	Romance	-0.821 (0.045)	-0.661 (0.046)	-0.688 (0.046)
	Science Fiction	-0.721 (0.053)	-0.549 (0.056)	-0.530 (0.056)
Rating:				
	PG	-0.021 (0.032)	0.027 (0.032)	0.044 (0.032)
	PG13	0.052 (0.053)	0.171 (0.054)	0.198 (0.053)
	R, NC17, NR	-0.006 (0.059)	0.115 (0.060)	0.124 (0.060)
Market characteristics:				
	Median age	0.0073 (0.0006)	0.0084 (0.0006)	0.0067 (0.0006)
	Median income	-0.0113 (0.0002)	-0.0114 (0.0002)	-0.0118 (0.0002)
	Number of households	-0.0001 (3.4E-7)	-0.0001 (3.5E-7)	-0.0001 (3.6E-7)
	Percent white	-0.0295 (0.0004)	-0.0289 (0.0004)	-0.0306 (0.0005)
	Percent black	-0.0240 (0.0004)	-0.0233 (0.0004)	-0.0249 (0.0004)
	Percent female	0.0163 (0.0020)	0.0128 (0.0020)	0.0209 (0.0021)
	Percent single mother with kids	0.0063 (0.0013)	0.0064 (0.0013)	0.0079 (0.0014)
	Percent single father with kids	-0.2546 (0.0037)	-0.2509 (0.0039)	-0.2526 (0.0040)
	Percent single male	-0.3782 (0.0076)	-0.3797 (0.0078)	-0.3753 (0.0080)
	Percent single female	-0.0382 (0.0043)	-0.0410 (0.0044)	-0.0390 (0.0045)
	Percent married with kids	0.0196 (0.0005)	0.0194 (0.0006)	0.0227 (0.0006)
	Percent with Bachelor's	-0.0115 (0.0003)	-0.0116 (0.0003)	-0.0110 (0.0003)
	Blockbuster in market	0.6703 (0.0035)	0.6707 (0.0036)	0.6743 (0.0037)
	Percent rural	0.0006 (0.0002)	0.0004 (0.0002)	0.0008 (0.0002)
	Percent suburban	-0.0008 (0.0001)	-0.0009 (0.0001)	-0.0008 (0.0001)
N		407,006	407,006	407,006
R^2		0.43	0.40	0.40

Notes: Regression of estimated quality (including title fixed effect-store characteristic interactions, store fixed effects and all decay rate interactions) from nested logit on title and store characteristics. IV1 instruments for the within-group share only. IV2 instruments for both within-group share and inventory. Omitted category for Box is A; for Genre is Action/Adventure; for Rating is G. All specifications include interactions between title and store characteristics and between month fixed effects and title characteristics.