Content Distribution in the Netflix Era: Contingency-based Revenue Maximization Across Channels for Filmed Home Entertainment

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CONTENT DISTRIBUTION IN THE NETFLIX ERA: CONTINGENCY-BASED REVENUE MAXIMIZATION ACROSS CHANNELS IN FILMED HOME ENTERTAINMENT

Abstract

The rise of online subscription services (OSS) like Netflix disrupts decades-long business models of film studios and brings uncertainty regarding its impact on established transactional channels when integrated in a film's distribution strategy. To understand this effect and maximize total HE revenues for rights owners, the authors develop an informed contingency model (ICM) for film distribution across transactional and subscription channels, accounting for time-, channel-, product-, and customer-specific contingencies, and estimate the model applying fixed-effects panel regression for weekly DVD/Blu-ray revenues for all 1,859 theatrically released films between 2011 and 2018 in Germany. Results show substantial cannibalization when a film is available on OSS and reveal strong contingency effects across all four categories. Simulations indicate that despite the strong cannibalization, OSS can become an important complementary revenue stream for the majority of films.

Keywords: online subscription services, filmed entertainment, sequential distribution

Track: Marketing Strategy & Theory

1. Introduction

The last decade witnessed the rise of online subscription services (OSS) such as Netflix, Amazon Prime Video, Spotify, or Xbox Game Pass, which offer consumers a bundle of content such as films, series, music, or games for a flat fee, instead of providing access to content on a per-title transactional basis. The success of these service providers challenges decades-long business models of media and entertainment producers and distributors. In 2019, 64% of U.S. consumers' spending for filmed home entertainment (HE) went to subscription-based offerings (Motion Picture Association 2020), and subscription streaming of music claimed a share of 61% of all music revenues in the United States (Friedlander 2020). Similar trends have occurred in other parts of the media and entertainment industry, such as video games (e.g., Xbox Game Pass, Apple Arcade), books (e.g., Kindle Unlimited), and magazines (e.g., Readly).

With OSS taking a major share of the revenues, distribution planning by media producers and distributors requires fundamental changes. While these companies may benefit from making their content available via OSS because of low marginal costs of distribution and potentially attractive compensation schemes offered by OSS (Castillo 2017), content availability via OSS may cannibalize revenues from established distribution channels. Were less DVDs and Blu-rays of Disney's blockbuster film *The Avengers* sold when the film was made available on Netflix? And did it improve or harm total revenues when taking all HE channels into account? The answers to these questions remain largely speculative, having mostly been assessed by managerial gut feeling (Siegel & Kit 2018). Prominent decision heuristics include selling the complete portfolio as well as full OSS avoidance.

Assuming that making content available on OSS affects revenues in transactional channels, managers must carefully integrate OSS releases into their distribution strategy to maximize revenues in the new marketplace which consists of both transactional channels and OSSs. Specifically, they need to decide *whether* and if so, *when and how long to offer their content* to a *specific* OSS, given the potential for cannibalization and compensation. At the core of such decisions is the necessity of a deep understanding of the effect a content's availability via OSS has on revenues in transactional channels, which can be assumed to be contingent upon time, channel, product, and customer characteristics, based on extant media distribution research (see, e.g., Ahmed & Sinha 2016; Hennig-Thurau, Henning, Sattler, Eggers, and Houston 2007).

We address this need by developing an informed contingency model (ICM) for integrating OSS into existing distribution strategies of filmed entertainment, which we derive by substantiating and nuancing theoretical insights from media distribution research with qualitative expert interviews with industry executives. We then quantify the cannibalization effect of Netflix and Amazon Prime Video, the two major OSSs in the German market, on physical transactional HE via a fixed-effects panel regression of weekly German DVD and Blu-ray revenues for all 1,859 films released theatrically in Germany between January 2011 and June 2018 in at least 25 theaters. In the next step, we combine the estimated regression coefficients with an approximation of the industry's compensation schemes for licensing content to OSS providers and digital transactions, which we approximate with information and data from our interviewees, to simulate the impact that releasing films on OSS in line with our ICM has on total HE revenues, compared to other approaches.

Our results show that an OSS release on Netflix reduces a film's weekly DVD and Blu-ray revenues by 77% and on Amazon Prime Video by 43% on average. More importantly, our results stress the critical role of contingencies, as we find that the degree of such cannibalizing effects differs substantially with several context factors, including time, channel, product, and customer characteristics. Our simulations, however, point to the important role OSS can have for rights owners as a complementary revenue stream: According to our calculations, making a film from our simulation data set available on OSS in an optimal fashion guided by our ICM increased total HE revenues by almost two thirds on average compared to an exclusive transactional HE release. Nevertheless, our simulations show that rights owners still have to be careful when integrating OSS into their distribution strategy, as for almost one third of the films in our simulation data set an OSS release would have resulted in *lower* total HE revenues. We further find that applying our contingency-based model to the films that actually had been released on OSS would have resulted in 55.8% higher total HE revenues on average, whereas the actual OSS release only added around one third in total revenues compared to having no OSS release.

Our contingency-based approach enhances extant research on the distribution of media and entertainment offerings for a rich understanding of the changes that the new concept of OSS demands from rights owners, extending current theoretical frameworks which solely consider revenues from transactional channels (see, e.g., Burmester, Eggers, Clement, and Prostka 2016; Hennig-Thurau et al. 2007) and shedding light on contextual factors which affect the magnitude of inter-channel effects. This is the first paper to quantify and contextualize the cannibalization effect resulting from OSS availability, while enabling media

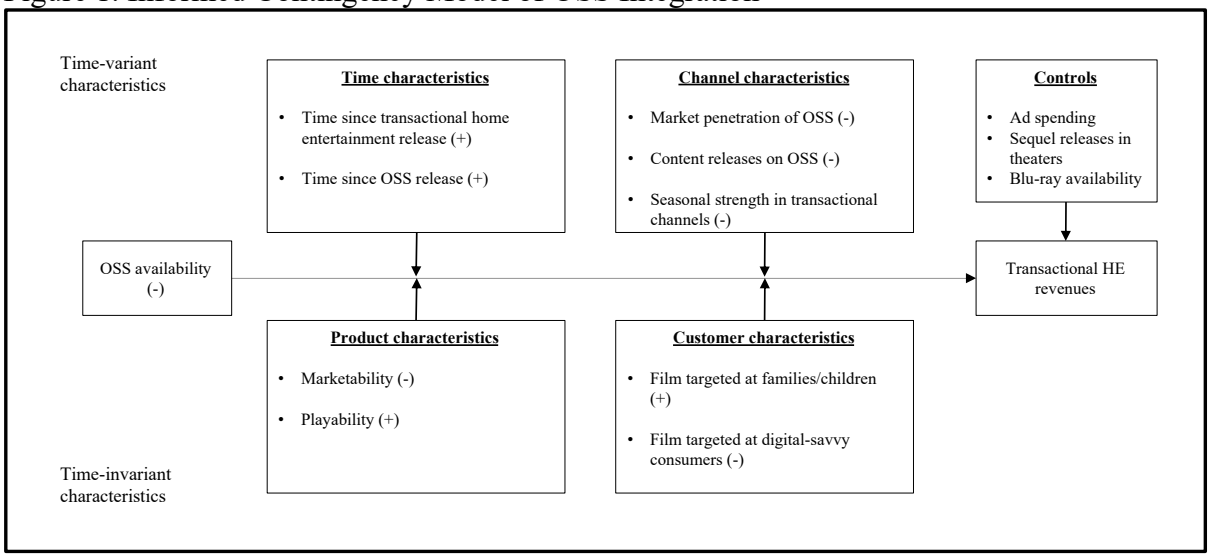
managers to fine-tune their distribution by accounting for time-, channel-, product-, and customer-specific contingencies when releasing a new product in a way that maximizes their total revenues.

2. Developing and testing an informed contingency model of the link between OSS and transactional channels for filmed entertainment

Given the scarce nature of research on OSSs in general and on the contingencies that moderate their impact on other channels in particular, we substantiate and nuance the knowledge extant media distribution literature provides us with (see, e.g., Ahmed & Sinha 2016; Datta, Knox, and Bronnenberg 2018; Hennig-Thurau et al. 2007; Yu, Chen, Peng, and Chau 2020) with industry expertise. Specifically, we conducted six 90–120 minutes long semi-structured interviews with managers of filmed entertainment. Our interviewees are international film industry experts; they represent both rights owners and OSS providers. This led us to ten assumptions, which we will only present in an abbreviated form in order to focus on our results in the given space.

Our ICM consists of four contigency categories, including specific contingency factors, which we argue moderate the impact of the availability of a film on an OSS on the revenues it generates in transactional HE channels as shown in Figure 1: (1) time contingencies, (2) channel contingencies, (3) product contingencies, and (4) customer contingencies.

Figure 1. Informed Contingency Model of OSS Integration



Notes: Main effect: OSS availability of a product/film on transactional HE revenues; contingecy characteristics constitute moderators for the main effect.

We expect a film's availaibility on OSS to cannibalize revenues in physical transactional channels. We propose the timing-related factors *Time since transactional HE release* and *Time since OSS release* both to dampen the effect of a film's OSS availability on its physical transactional HE revenues. Regarding channel characteristics, we argue that *market*

penetration of an OSS, the volume of *content releases on an OSS*, and the *seasonal strength in transactional channels* (i.e., in transactional HE and film theaters) increase the cannibalizing effect of OSS on transactional HE revenues. For product characteristics, we focus on the two industry key indicators for product success (Hennig-Thurau & Houston 2019), and expect stronger cannibalization the higher a film's *marketability* (i.e., strong ex-ante quality signals attracting mass audiences, e.g., a strong brand, stars, a high budget) and lower cannbibalization the higher its *playability* (i.e., high consumer-perceived experience quality triggering powerful WOM cascades). Finally, with regards to customer characteristics, we argue that cannibalization is lower for *films targeted at families and children* and higher for *films targeted at digital-savvy consumers*.

2.1. Model Testing

We empirically estimate our ICM with data from the German filmed HE market. We rely on an unique extensive data set that incorporates the weekly OSS availability, DVD and Blu-ray revenues, advertising spending, and a broad array of film-specific variables for 1,859 films released in Germany on DVD, of which 1,592 films were also released on Blu-ray. The films constitute all fictional and non-fictional films released in at least 25 German theaters between January 2011 and June 2018 and then subsequently on DVD and Blu-ray. The weekly nature of our data enables us to employ econometric panel models, which can leverage the time-varying structure of our data set. We use a fixed-effects specification, controlling for any time-constant heterogeneity at the film-level without the need to explicitly observe it in our data; this specification is widely used in marketing (e.g., Germann, Ebbes, and Grewal 2015) and filmed entertainment research (see, e.g., Einav 2007, Gelper, Peres, and Eliashberg 2018); it is particularly suitable for large-scale data sets with many independent variables as is the case here (Wooldridge 2018).[1]

We estimate our model on the OSS provider level, determining separate parameters for a film's availability on Netflix and Amazon Prime Video which have been the dominant OSSs in Germany since their introduction, together accounting for more than 80% of the OSS market shares for filmed entertainment in 2020 (Lindlahr 2021). Doing so allows us to investigate differences between the two services. In all cases, we follow extant entertainment research and log-transform our dependent variable to remedy skewness and to ease model

[1] Note that we observe more time periods for films with an earlier transactional HE market entrance than for films that entered at a later point in time, which makes our panel unbalanced. We do not consider this a problem in our fixed effects setting, as the reason for these observations being missing is simply that they lie in the future and have not occurred yet, which is not systematically related to unobserved factors captured in our error term ε_{it} (Wooldridge 2018, pp. 468–69).

interpretation, which allows us to treat coefficients as approximate percentage changes in our dependent variable. We also centered all relevant terms (we centered variables on sensible values, mostly on their respective means, see Table 1 for details) before interacting them with OSS availability to ease the interpretation of the direct effect of OSS availability (Hayes 2018).

2.2. Estimation Results

We report the results of our estimates for HE revenues in Table 1. The model fit is satisfactory with an adjusted R-square of .72. The results show a strong negative impact of OSS availability on transactional HE revenues, in line with our arguments. We find that cannibalization is substantially stronger for a film's availability on Netflix (76.9%) than for its availability on Amazon Prime Video (43.0%), which is consistent with news reports stating Netflix to have a higher number of active users in Germany than Amazon Prime Video (Bartl 2019). With regards to contingency effects, we find strong empirical support for the relevance of our four contingency categories: time, channel, product, and customer characteristics all moderate the cannibalization effect substentially. For both OSS, most contingency effects are consistent. Whereas some of the contingency factors affect transactional revenues only when a film is available on Netflix (i.e., *Seasonal strength of transactional HE* and *Family/children*), others are exclusive for Amazon Prime Video (i.e., *Seasonal strength of box office* and *Digital savviness*).

3. Revenue maximization across transactional and subscription HE channels

To identify strategies that maximize total HE revenues, we counterbalance potential cannibalization with compensation from OSS providers with extensive simulations on the film-level, varying the contingency factors rights owners can determine (i.e., OSS entry, choice of OSS provider, and duration of OSS availability). We enrich our ICM with approximations of OSS compensation (i.e., OSS licensing fees) and digital transactional HE (i.e., EST and TVOD) revenues based on confidential information and data provided in the expert interviews with industry executives. To ensure that our simulations reflect current industry practices, we selected films (1) that had their HE release after OSS players entered the German market and had at least 1.5 years of consecutive data available from their release (few OSS deals run longer than this), and (2) for which our data covered both their OSS entry and exit in case a film has been available on either Netflix or Amazon Prime Video. 402 films meet both conditions and serve as our simulation data set.

Table 1. Results from Fixed-Effects Panel Regression of Transactional HE Revenues on OSS Availability

Variables	Measurement (Source)	Netflix		Amazon	
		B	SE	B	SE
Variables of OSS Availability					
OSS availability	Two separate dummy variables for availability on either Netflix or Amazon in (WSE, JuWa)	-.76880***	.12363	-.43001***	.08820
Time Characteristics					
Weeks since HE release	Cumulative weeks since first release in physical transactional HE; centered on first week (GfK)	-.03145***	.00041	-.03145***	.00041
Weeks since HE release²	Squared values of cumulative weeks since first release in physical transactional HE	.00005***	.00001	.00005***	.00001
OSS availability × Weeks since HE release		.01021***	.00122	.00780***	.00091
OSS availability × Weeks since HE release²		-.00002***	.00001	-.00002***	.00001
OSS cumulative availability	Cumulative weeks since release of current OSS availability; centered on first week (WSE, JuWa)	-.00453***	.00159	-.00724***	.00126
OSS cumulative availability²	Squared values of cumulative weeks since release of current OSS availability	.00005***	.00002	.00005***	.00002
Channel Characteristics					
OSS market penetration	Current year of observation; centered on the year 2015	.06112***	.01083	.06112***	.01083
OSS availability × OSS market penetration		-.09901***	.02304	-.10434***	.01953
OSS content releases	Sum of content releases on Netflix or Amazon Prime Video in week of observation; mean-centered (WSE, JuWa)	-.00206***	.00048	.00553***	.00058
OSS availability × OSS content releases		.00084	.00094	-.00204*	.00116
Seasonal strength of box office	Av. BO gross (in mio €) for calendar week of observation based on period 2011–2018; mean-centered (GfK)	.00681***	.00048	.00681***	.00048
Seasonal strength of transactional HE	Av. DVD+Blu-ray revenues (in mio €) for calendar week of observation based on period 2011–2018; mean-centered (GfK)	.01368***	.00026	.01368***	.00026
OSS availability × Seasonal strength of box office		-.00054	.00148	-.00345***	.00122
OSS availability × Seasonal strength of trans. HE		-.00190***	.00072	-.00074	.00060
Product Characteristics					
OSS availability × Production budget	Marketability: Production budget (in mio US$); mean-centered (IMDb, TheNumbers, boxoffice-mojo)	-.00023	.00054	-.00075	.00053
OSS availability × Film theater attendants	Marketability: Total theatrical visitors (in 10k); mean-centered (Comscore)	-.00082***	.00030	-.00075**	.00037
OSS availability × Hollywood film	Marketability: Dummy indicating English as main language in film (Comscore)	.01317	.06938	.03595	.04246
OSS availability × Major distributor (major)	Marketability: Categorical variable indicating major studio, midsized distributor, or niche distributor (Comscore)	.05915	.07709	.05258	.04935
OSS availability × Major distributor (midsized)		.01597	.08199	-.03138	.05063
OSS availability × Consumer rating	Playability: Av. IMDb audience rating on 10-point scale (1=worst rating, 10=best rating); mean-centered (IMDb)	.09326***	.03578	.05992**	.02861
OSS availability × Critics rating	Playability: Av. Metacritics critics rating on 10-point scale (1 = bad review, 10=good review); mean-centered (Metacritics)	.01203	.02048	-.01638	.01563
OSS availability × Oscar score	Playability: Academy Award score according to Hennig-Thurau et al. (2006)	-.00214	.00182	.00053	.00139
Customer Characteristics					
OSS availability × Family/children	Dummy indicating genre being categorized as film targeted at families or children (Comscore)	.19443***	.07316	.05406	.07211
OSS availability × Digital savviness	Percentage of IMDb rating votes given by male IMDb users between age 18 and 29 years; mean-centered (IMDb)	-.00845	.00521	-.00738**	.00344
Control Variables					
Ad spending	Weekly advertising spending in € (Ebiquity/Nielsen)	.00001**	.00001	.00001**	.00001
Sequel releases in theaters (–4 wks)	Dummies for the week of the theatrical release of a film's sequel or prequel as well as for the four weeks before and	-.01915	.04596	-.01915	.04596
Sequel releases in theaters (–3 wks)	the four weeks after the release (IMDb, boxoffice-mojo)	.01780	.04926	.01780	.04926
Sequel releases in theaters (–2 wks)		.21200***	.05550	.21200***	.05550
Sequel releases in theaters (–1 wks)		.43251***	.05641	.43251***	.05641
Sequel releases in theaters		.69547***	.06679	.69547***	.06679
Sequel releases in theaters (+1 wks)		.71210***	.07178	.71210***	.07178
Sequel releases in theaters (+2 wks)		.62176***	.06615	.62176***	.06615
Sequel releases in theaters (+3 wks)		.52563***	.06634	.52563***	.06634
Sequel releases in theaters (+4 wks)		.51196***	.05887	.51196***	.05887
Blu-ray availability	Dummy indicating a film is available on Blu-ray in addition to DVD in a given week (GfK)	.51056***	.13995	.51056***	.13995

*Notes: GfK = Gesellschaft für Konsumforschung; WSE = werstreamt.es; JuWa = JustWatch; IMDb = Internet Movie Database. We use cluster-robust standard errors, rely on Arellano's (1987) correction method, as suggested by Croissant & Millo (2019, pp. 110 ff.). Notes: Adj. R2 = .72. Asterisks indicate the significance level of an estimate, with *** ≤.01; ** ≤.05; * ≤.10.*

To identify the OSS release strategy with the highest total HE revenue potential (i.e., physical and digital transactional HE revenues plus the corresponding fee paid by OSS providers), we simulate all potential release strategies (start month: 1-12; duration: 3, 6, 9, and 12 months; OSS: Amazon and Netflix) for all 402 films and compare the results using our ICM against not releasing films via OSS and also with current industry practice.

ICM vs no OSS. Our simulations show that the current licensing fees from OSSs offer the potential for substantial value increases for rights owners, despite the strong cannibalizing effect releasing a film on OSS has on transactional HE revenues, as shown in the first step of this research. When applying our ICM, a film gains an average 63.1% (median: 17.7%; max: 3,175.2%) in total HE revenues in comparison to only releasing it in transactional HE.

However, we find strong heterogeneity of the OSS effect on total HE revenues, highlighting the crucial role of our contingencies. While the HE revenue-maximizing approach includes an OSS release for about two thirds of our films (68.7%), an exclusive transactional release (without any OSS availability) generates more revenues for the remaining one third of films (31.3%). Also, the potential for revenue increases differs dramatically between the two-thirds of films where OSS can boost total HE revenues; additional revenues from OSS span from .01% to more than 3,000%.

ICM vs industry practice. How does the ICM perform compared to industry practice? When considering all 402 films in the simulation set (regardless of whether their rights owners had decided to release them on OSS or not), we find that total HE revenues are on average 5.7% higher (median: 0.0%; max: 454.1%) for the release strategies actually applied by the respective rights owners compared to not releasing the films on OSS at all. In contrast, when we compare not releasing those 402 films on OSS at all with a scenario that employs their optimal release strategies as suggested by our ICM, we find that revenues are 63.1% higher in the latter case.

Moreover, when focusing on the 71 films whose rights owners decided to actually release them on OSS, we see that industry practice for those films led to an increase in total HE revenues of 32.2% on average (median: 9.0%; max: 454.1%), compared to not releasing the films on OSS. Interestingly, we find that in 25.4% of the films, releasing a film on OSS lowered total HE revenues compared to a transactional HE release only. In comparison, our ICM would have increased total HE revenues for those films by 55.8% (median: 15.2%; max: 653.7%), a multiplier of 1.73.

In sum, our simulations show that leveraging our ICM approach helps rights owners to increase total HE revenues of individual films beyond current industry practices by both

avoiding losses due to suboptimal strategies and maximizing additional revenues by selecting the optimal time to enter OSS, the optimal duration of OSS availability, as well as the optimal OSS provider.

4. Conclusion

The main contribution of this research lies in the thorough understanding of how making content available on OSS affects revenues in established transactional channels and a corresponding revenue maximization approach taking into account relevant contingencies. This adds to the important literature streams of windowing and sequential distribution and also provides actionable guidance for media managers who seek to maximize revenues in a fast-paced business environment.

We find that making content available on OSS has a strong average cannibalizing effect (Netflix: 77%; Amazon Prime Video: 43%) on established transactional channels, which is in line with previous findings (Datta et al. 2018; Yu et al. 2020). However, to the best of our knowledge, our study is the first to identify, systematize, and empirically test an exhaustive set of contingencies encompassing time, channel, product, and customer characteristics that exert a large influence on this average effect and hint at strong heterogeneity between media products.

Building on these empirical findings, we conduct extensive simulations counterbalancing cannibalization with current industry-typical OSS content licensing compensation schemes to identify a film's optimal OSS release strategy, maximizing total HE revenues including OSS and established transactional channels. As the first study to implement this approach, we are able to show that despite high cannibalization, OSS can function as a complementary distribution channel that will increase total revenues if it is carefully integrated with respect to characteristics of the distributed media product.

Despite generous compensation, we found that for roughly a third of the films in our simulation data set, there is no OSS release option that does not hurt revenues. In a similar vein, when looking at current industry practices, we estimate that for a quarter of films, their OSS release was detrimental with respect to their total HE revenues. Yet we show that when carefully managed, OSS often offer substantial revenue potential. Applying our ICM increases total HE revenues across all films in our simulation data set by an average 63.1% – and for those films with an actual OSS release, we can increase the net revenue gain by roughly 73% from initial 32.2% with current industry practices to 55.8% taking contingency factors into account in our ICM approach.

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