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"Winner-Takes-All": Influencing Factors of the Post-Theatrical Supply and Demand in Motion Picture Exhibition

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ABSTRACT

The post-theatrical exhibition has become essential for motion pictures to break even. Nevertheless, besides the first attempts to study TV broadcasters and streaming providers as release windows, academic research in marketing has concentrated primarily on the initial theat-rical release. This article examines factors influencing supply and demand during the sequential release process of the motion picture industry. The authors build a modelling framework to ana-lyze the drivers resulting in comprehensive supply and strong demand in major exhibition win-dows (i.e., during the home video, video-on-demand, and free-to-air TV exhibition). They esti-mate the conceptual model of regressions using market data from Germany, including all 5 200 theater-released motion pictures between 2005 and 2014. The authors expand the existing suc-cess-breeds-success theory and use a winner-takes-all theory to explain market supply and de-mand in sequential distribution. The results reveal a limited set of influencing factors (e.g., word-of-mouth communication or certain genres) that increase the probability of comprehensive exhibition and strong demand. Other influencing factors depend on the exhibition window (e.g., age ratings). The results add to existing theories of sequential distribution and can help research-ers and managers improve movie-specific exhibition strategies.

ACKNOWLEDGEMENT

This manuscript is based on the working paper (Kumb & Kunz, 2017) and was published in the monograph of the first author (Kumb, 2018). The initial publication's literature review was extended and updated.

1. INTRODUCTION

The motion picture business relies on a system of sequential exhibition to maximize profits (Ahmed & Sinha, 2016; Elberse & Eliashberg, 2003; Mukherjee & Kadiyali, 2011). Box-office revenues are usually insufficient for movies to achieve profitability (Bruce, Foutz & Kolsarici, 2012). While theater growth rates in the U.S. are modest (MPAA, 2016), home entertainment revenues are decreasing and video-on-demand (VOD) revenues are increasing (Hennig-Thurau & Houston 2019; Hiller 2017; Wallenstein, 2016). Accordingly, the limited life cycles of motion pictures have raised the question of optimal sequential distribution (Chiou, 2008; Hennig-Thurau, Houston, & Walsh, 2006; Hennig-Thurau et al., 2007a). Previous studies on factors influencing supply and demand have focused on theatrical revenues to investigate potential spillover effects on ancillary windows. Considerably fewer studies have examined home video, VOD, or television exhibition (e.g., Kübler, Seifert, & Kandziora, 2021; Lang, Switzer & Swartz, 2011; McKenzie, 2010; McKenzie, Crosby, Cox, & Collins, 2019; Schauerte, Feiereisen, & Malter, 2021). Research results often refer to the success-breeds-success theory (Elberse & Eliashberg, 2003), which is common knowledge in the industry. Further, scholars have interpreted profit-maximizing distribution as dynamic timing games between exhibition windows (e.g., Chiou, 2008; Hennig-Thurau, Henning, Sattler, Eggers, & Houston, 2007a; Krider & Weinberg, 1998; Radas & Shugan, 1998).

Although (fixed) production costs are high and (variable) release costs are comparatively low, not all movies are available in every window. Some movies are released in all market segments while others' release is limited to specific windows. By means of our own analyses, we have found that between 2005 and 2014, in Germany, 79% of theater-exhibited motion pictures were released on DVD or Blu-ray Disc, 60% were available on VOD platforms, and 50% were broadcast on free-to-air TV.

Therefore, presupposing a given supply side does not correspond to empirical market data. Although the success-breeds-success theory may partially explain the success of a small number of high-budget U.S. movies (blockbusters), success in previous demand markets cannot explain market supply in subsequent exhibition windows. Compared to non-sequential markets, the supply of sequentially released motion pictures result from window-specific negotiations between distributors and potential exhibitors. Each exhibitor, for example, a VOD platform, has individual objectives, success strategies, and content options. Window-specific consumer preferences, consumption behaviour, and non-movie competitors (e.g., original series on VOD) sets out the demand for a movie.

Our aim is to examine factors that influence post-theatrical supply and demand of motion pictures. Using original least squares (OLS) and maximum likelihood

estimation (MLE) methods, we test whether universal influencing factors foster availability and success of movies. Results of our modeling approach show that a set of a few influencing factors increases the probability of comprehensive release and high demand; other influencing factors have a window-dependent effective power.

First, we develop a conceptual framework of supply and demand in the motion picture industry for post-theatrical exhibition. We introduce relevant indicators for home video, VOD, and TV exhibition. Results add a winner-takes-all theory regarding universal factors influencing supply and demand of post-theatrical movie exhibition. Second, this article empirically tests the developed modeling approach in the German exhibition markets. We integrate sequential decision making in our model and expand the timing game and knowledge of efficient distribution strategies. The model indicates variances of influencing factors between supply and demand and between exhibition windows. The findings support the design of profit-maximizing exhibition strategies, especially for non-major companies.

The remainder of this article is structured as follows: section 2 provides a review of the literature of influencing factors and sequential distribution of motion pictures; section 3 describes variables, datasets, and measurements; section 4 presents the theoretical basis and develops the research model; section 5 presents and discusses the empirical findings; finally, Section 6 abstracts and generalizes our findings, points out the limitations of the model, and suggests avenues for future research.

2. LITERATURE REVIEW

The high risk of sunk costs (Clement et al., 2014; Ding & Eliashberg, 2002) and the distinct disequilibrium between the most and least successful motion pictures in theaters (Bi & Giles, 2009; Walls, 2005) are the impetus for extensive research to identify influencing factors of theatrical success (see Kumb, Kunz & Siegert, 2016 for a comprehensive review). Table 1 presents a brief overview of major research results on influencing factors of movie success.

Table 1· Literature Review on Influencing Factors

Influencing Factor	Positive impact on movie success	No impact on movie success
Admissions	Walls, 2010; Lang, Switzer, & Swartz, 2011	
Age Rating	**1· Revenues opening weekend:** Leenders & Eliashberg (2011). **2· Box office revenues:** Ravid (1999); De Vany & Walls, 2002; Boatwright, Basuroy, & Kamakura, 2007.	**Market supply:** Clement, Wu, & Fisher, 2014
Awards	Sochay, 1994; Deuchert, Adjamah, & Pauly, 2005; Hennig-Thurau, Houston, & Walsh, 2006	
Budget	Basuroy, Chatterjee, & Ravid, 2003; Ravid & Basuroy, 2004; Chang & Ki, 2005; Boatwright, Basuroy, & Kamakura, 2007; King, 2007; Brewer, Kelley, & Jozefowicz, 2009; Hadida, 2010	**1· Irrelevance for demand side:** Clement, Wu, & Fische, 20. **2· Profitability:** Basuroy, Chatterjee, & Ravid, 2003; Chang and Ki, 2005; Boatwright *et al.*, 2007; King, 2007; Brewer *et al.*, 2009; Hadida 2010.
Cast	**1· Number of screens:** Chang & Ki, 2005. **2· Revenue expectations:** Elberse, 2007. **3· Revenues opening weekend:** Leenders & Eliashberg, 2011; Joshi & Mao, 2012. **4· Box office revenues:** Elberse & Eliashberg, 2003; Walls, 2009; Hadida, 2010; Gong, van der Stede, & Young, 2011; Nelson & Glotfelty, 2012; Hennig-Thurau, Marchand, & Hiller, 2012; Clement, Wu, & Fischer, 2014.	Ravid (1999), DeVany & Walls (1999), Ravid & Basuroy (2004), Ravid & Basuroy (2006), Brewer *et al.* 2009, Hennig-Thurau *et al.*, 2006, 2009; Liu, 2006; Gemser *et al.*, 2007, 2012; McKenzie, 2009; and McKenzie and Walls, 2013.
Genre	**National differences:** Sochay, 1994; Neelamegham and Chitagunta, 1999; and Leenders and Eliashberg, 2011.	Clement, Wu, & Fischer, 2014.
Major	Chang & Ki, 2005; Clement, Wu, & Fischer, 2014; Prieto-Rodriguez, 2015.	
Price	**Pricing online platforms:** Hitt & Chen. 2005; Daripa & Kapur (2001), Prasada, Mahajanb, & Bronnenberg (2003), and Xing (2010).	**Inelastic demand:** Lang, Switzer, & Swartz, 2011.
Reviews	**1· Short term revenues:** Hennig-Thurau, Houston, & Walsh, 2006. **2· Box office revenues:** Jansen 2005; Boatwright, Basuroy, and Kamakura 2007; Brewer, Kelley, and Jozefowicz 2009; Hennig-Thurau, Marchand, and Hiller 2012.	**1· Long term revenues:** Hennig-Thurau, Houston, & Walsh, 2006. **2· Predictor:** Eliashberg and Shugan, 1997.
Sequel	Ravid (1999); Chang & Ki, 2005; Hennig-Thurau, Houston, & Heitjans, 2009; Moon, Bergey, & Dawn, 2010; Gong, van der Stede, & Young, 2011; Hennig-Thurau, Marchand, & Hiller, 2012; Clement, Wu, & Fischer, 2014.	
WOM	Ginsburgh, 2003; Chang & Ki, 2005; Liu 2006; Gopinath, Chintagunta, & Venkataraman, 2013, Clement, Wu, & Fischer 2014.	

Content-Related Influencing Factors: While many researchers have found a positive impact of the CAST on box-office revenues, other studies have not found such an impact. For comprehensive reviews and a meta-analysis, see Hennig-Thurau, Völckner, Clement, & Hofmann (2013) and Hofmann, Clement, Völckner, & Hennig-Thurau (2016). Studies analyzing GENRE have revealed differences between countries of a genre's general popularity. Nevertheless, genre may have an impact on total revenue of respective movies, but not necessarily on the demand of an individual movie (e.g., Clement et al., 2014).

BUDGET is one of the most significant determinants of revenues and success (Ahmed & Sinha, 2016; Clement et al. 2014; Hadida 2010; Hennig-Thurau & Houston, 2019). However, Clement et al. (2014) argued that only exhibitors are interested in production budget as an indication of a movie's quality. Furthermore, large budgets do not affect the profitability of films. (e.g., Basuroy, Chatterjee & Ravid, 2003). The positive influence of SEQUELS is confirmed by most academic research for both the supply and demand sides (e.g., Hennig-Thurau, Houston, & Heitjans, 2009; Hennig-Thurau, Houston, & Walsh, 2006). Only popular sequels seem likely to have an advantage on home video, leaving the isolated sequel and other branding variables without major effects (Hennig-Thurau, Marchand, & Hiller, 2012). Although their conclusions differ, some authors (e.g., Boatwright, Basuroy & Kamakura, 2007; De Vany & Walls, 2002) have found a correlation between certain AGE RATINGS and box-office revenues but not market supply (e.g., Clement et al., 2014).

Response-Related Influencing Factors: The influence of REVIEWS on film revenues is a comprehensive and controversial discussion in the literature (Hennig-Thurau et al., 2012; Lui, 2006; Marchand, Hennig-Thurau, & Wiertz, 2017).1 Critics can be considered influencers or predictors. Further, several articles have revealed a link between AWARDS and the economic success of movies. However, national differences and indicators – apart from the Academy Awards – remain unconsidered. Several studies have indicated that word-of-mouth (WOM) communication affects film revenues during the theatrical-exhibition period (e.g., Clement et al., 2014, for the German industry). Koschat (2012) assumed that recommendations on online platforms, such as Amazon or Netflix, increase demand. Basuroy, Ravid, Gretz, & Allen (2020) conclude that professional critics are more important to moviegoers than the volume and valence of amateur ratings. WOM effects have also been tested empirically for the DVD and VOD markets (Luan & Sudhir, 2010) or across sequential channels (Hennig-Thurau et al., 2006).

Distribution-Related Influencing Factors: Successful distributors with market power, called MAJORS, have competitive advantages (Ahmed & Sinha, 2016). Because there is uniform pricing during theatrical or DVD rental exhibition,

PRICES are irrelevant. However, price may play a more important role in post-theatrical retail markets (e.g., Hitt & Chen, 2005). Lang, Switzer & Swartz's (2011) findings suggest the level of ADMISSIONS during the theatrical-exhibition period may determine supply and demand in subsequent release windows, such as DVD sales (success-breeds-success theory).

In summary, the evaluated literature provides extensive insights into relevant influencing factors that explain and predict supply and demand of motion pictures during theatrical exhibition. However, some studies offer equivocal results, and there are regional differences. Additional findings concern post-theatrical exhibition demand, although there are few contributions in this area to date. Recently, a special issue on "The Economics of Filmed Entertainment in the Digital Era" edited by Hennig-Thurau, Ravid, & Sorenson (2021) was published in the Journal of Cultural Studies, in which several influencing factors of theatrical release and subsequent release windows are addressed (Behrens, Zhang Foutz, Franklin, Funk, Gutierrez-Navratil, Hofmann, Leibfried, 2021; Haida, Lampel, Walls, & Joshi, 2021; Hennig-Thurau et al., 2021; Kübler et al., 2021; Schauerte et al. 2021). However, Hennig-Thurau et al.'s editorial also underlines the still existing research gap in motion picture rental and retail distribution and exhibition (supply) as well as consumption (demand).

3. DATA SELECTION FOR MOTION PICTURES RELEASED IN GERMANY

We conduct our study with a focus on the German market because Germany ranks among the Top10 international film markets in terms of revenues (MPA 2021). Relevant previous studies of motion picture research have also relied on German market data (Clement et al. 2014; Hennig-Thurau et al. 2007b). Our sample consists of all 5 200 motion pictures released in German cinemas between 2005 and 2014. To avoid selection effects, we omit any restrictions except for the minimum length of 40 minutes.[2] German companies produced 39% of the motion pictures, 34% were U.S. imports, and 27% were imports from other countries. A total of 4 105 movies (78.9 %) were available in at least one of the four home video segments, and 3 128 movies (60.2 %) were available in at least one VOD library. In the period under review, free-to-air TV stations broadcast 2 608 movies (50.2%). Table 2 summarizes the major variables.

Table 2· Variables, Descriptions, Measurement and Sources

Variable	Description	Measurement	Source
		Content-related Factors	
BUDGET	Production budget	Production budget in Euro, inflation-adjusted	Mediabiz / BF TheNumbers.com BoxOfficeMojo IMDb JPBox-Office (France) Allocine.fr Turkcealtyazi.org (Turkey) Calculations on DFFF subsidiaries Expert consultations Multiple Imputation
CAST	Star power of actors	accumulated Filmstarts.de users' ranking of participating actors, reverse coded[1]	Filmstarts.de
COUNTRY	Country of origin of production company and main distributor	Germany, the USA, the UK, France, Italy, Spain, Turkey, Korea, Austria, the EU (excluding Germany), other countries are examined	Mediabiz / BF
DIRECTOR	Star power of director	accumulated Filmstarts.de users' rank of director, reverse coded[2]	Filmstarts.de
FSK	German age rating, comparable to MPAA rating	1 = FSK0 2 = FSK6 3 = FSK12 4 = FSK16 5 = FSK18	Mediabiz / BF
SEQUEL	sequel movie	1 = sequel 0 = no sequel	Mediabiz / BF IMDb The-Numbers.com BoxOfficeMojo
ACTION	Genre action / adventure	1 = action / adventure 0 = other genre	Mediabiz / BF
CHILDREN	Genre children / animation	1 = children / animation 0 = other genre	Mediabiz / BF
COMEDY	Genre comedy	1 = comedy 0 = other genre	Mediabiz / BF
CRIME	Genre crime / thriller	1 = crime / thriller 0 = other genre	Mediabiz / BF
DRAMA	Genre drama	1 = drama 0 = other genre	Mediabiz / BF
DOC	Genre documentary	1 = documentary 0 = other genre	Mediabiz / BF
FANTASY	Genre fantasy / science fiction	1 = fantasy / science fiction 0 = other genre	Mediabiz / BF
HORROR	Genre horror	1 = horror 0 = other genre	Mediabiz / BF

1 The annual Top50 most popular actors from Germany and the U.S.A. are considered.
2 The annual Top10 most popular directors from Germany and the U.S.A. are considered

Variable	Description	Measurement	Source
OTHER	Other genre (*e.g.* western, musical)	1 = other genre 0 = action, children, comedy, crime, drama, doc, fantasy, horror	Mediabiz / BF
		Distribution-related Factors	
MAJOR	International or national major distributor with market power	1 = major distributor (Constantin, Disney, Fox, Paramount, Sony, Studio Canal, Universal, Warner) 0 = other distributor	Mediabiz / BF
MAJOR_PS	Partnership of distributor with international or national major distributor	1 = partnership with major distributor (Constantin, Disney, Fox, Paramount, Sony, Studio Canal, Universal, Warner) 0 = no partnership	Mediabiz / BF
SCREENS	Number of screens	Maximum number of screens reached in Germany during exhibition	Mediabiz / BF
ADMISSIONS_GER	Box-office admissions in Germany	Total amount of sold admission tickets measured by AC Nielsen EDI and FFA, inflation-adjusted	Mediabiz / BF BoxOfficeMojo
AVAIL_DVD-R	Rental DVD availability	1 = Rental DVD available 0 = not available	Mediabiz / Videomarkt
AVAIL_DVD-S	Sell-through DVD availability	1 = Sell-through DVD available 0 = not available	Mediabiz / Videomarkt
AVAIL_BR-R	Rental Blu-ray availability	1 = Rental Blu-ray available 0 = not available	Mediabiz / Videomarkt
AVAIL_BR-S	Sell-through Blu-ray availability	1 = Sell-through Blu-ray available 0 = not available	Mediabiz / Videomarkt
TOP_DVD-R	Successful rental DVD	1 = on annual Top100 ranking 0 = not on ranking	GfK Entertainment
TOP_DVD-S	Successful sell-through DVD	1 = on annual Top50 ranking 0 = not on ranking	GfK Entertainment
TOP_DVD-S_AZ	Successful sell-through DVD sold by Amazon	1 = on annual bestseller list of amazon.de 0 = not on list	Amazon Germany
TOP_BR-R	Successful rental Blu-ray	1 = on annual Top100 ranking 0 = not on ranking	GfK Entertainment
TOP_BR-S	Successful sell-through Blu-ray	1 = on annual Top50 ranking 0 = not on ranking	GfK Entertainment
AVAIL_VOD	VoD availability on 15 major platforms	1 = movie available 0 = not available	Werstreamt.es
VOD_PLATFORMS	Cumulative VoD availability	Number of platforms a film is available on	Werstreamt.es
TOP_INST	Successful on Amazon Instant Video	1 = on Top100 ranking 0 = not on ranking	Amazon Germany

Variable	Description	Measurement	Source
TOP_PRIME	Successful on Prime Instant Video	1 = on Top100 ranking 0 = not on ranking	Amazon Germany
TOP_GOOLE	Successful in Google Play Store	1 = on Top100 ranking 0 = not on ranking	Google Germany
TOP_ITUNES	Successful in Apple iTunes Store	1 = on Top100 ranking 0 = not on ranking	Apple Germany
TOP_VLOAD	Successful on Videoload	1 = on Top100 ranking 0 = not on ranking	Deutsche Telekom
AVAIL_TV	Free-to-air availability	1 = TV available 0 = not available	GfK TV Research
RATING_ALL-3+	Viewers of a movies' free TV premiere (aged 3 or older)	Total audience in millions	GfK TV Research
RATING_14_49	Viewers of a movies' free TV premiere aged between 14 and 49	Total audience in millions	GfK TV Research
		Response-related variables	
NOMINATIONS	Total number of nominations in major categories	Total amount of nominations at Academy Awards, Golden Globes, European Film Awards, German Film Awards, Golden Bears	AMPAS HFPA EFA DFA Berlin Int. Film Festival
AWARDS	Total number of awards in major categories	Total amount of awards at Academy Awards, Golden Globes, European Film Awards, German Film Awards, Golden Bears	AMPAS HFPA EFA DFA Berlin Int. Film Festival
REVIEW_FS	Critical opinion of Film-starts.de	Filmstarts.de rating, from 0 (worst) to 5 (best)	Filmstarts.de
REVIEW_PI	Critical opinion of the press	Filmstarts.de press index, from 0 (worst) to 5 (best)	Filmstarts.de
WOM	Word-of-mouth communica-tion between consumers	Filmstarts.de community rating, from 0 (worst) to 5 (best)	Filmstarts.de

We use the local popularity of cast and director in Germany in the movie's year of production as a time-dependent indicator of star power. The annual community ranking of Filmstarts, a leading online film magazine in Germany with 2.83 million unique users, provides an adequate framework for our analysis. In contrast to previous research, our framework considers that star power can significantly change between countries and during a career. This is on contrast to services such as IMDb, with mostly English-speaking raters.

We measure the impact of industry awards on supply and demand by the number of nominations and awards received in major film-related categories of the Academy Awards ("Oscars"), Golden Globes, European Film Awards ("Felix"), and German Film Awards ("Lola"). Further, we include awards and nominations of the Berlin International Film Festival ("Bears"), which is among the world's leading festivals.

To measure critics' opinions, we use two ratings from Filmstarts, one from the editorial staff (REVIEW_FS) and a press index (REVIEW_PI), both based on a scale of 0 to 5. Additionally, we use the magazine's user-generated rating on a 0 to 5 scale to measure effects of WOM communication.

German database Werstreamt.es provides information on the library of 15 large VOD services that were available in Germany during the studied period (Amazon [two services], Maxdome [two services], iTunes, Netflix, Watchever, Videobuster, Videoload, Sky [two services], Videociety, X-box, Google, and Netzkino). Videoload, iTunes, Google Play, and Amazon (Instant Video, Prime Instant Video, and DVD sell-through) provide bestseller lists.

Budget information is not publicly available for every film. Other empirical studies on motion pictures have avoided this constraint through sample selection (e.g., Elberse & Eliashberg, 2003) or list-wise deletion (e.g., Clement et al., 2014). To complete missing data, particularly the budget variable, we used a four-stage process. First, we gathered additional information from other industry information services, namely Filmstarts (Germany), Allocine (France), JP-Boxoffice (France), Turkcealtyazi (Turkey), The-Numbers (USA), IMDb (USA), and BoxOfficeMojo (USA). Second, we supplemented missing budget data on medium- and high-budget German films by considering the budget-related subsidization level of the German Federal Film Fund (DFFF). Third, we complemented and verified the budget data with the help of industry experts. Fourth, we adjusted all financial figures for inflation due to the long period under consideration.

We found that the missing values for 692 films (13% of all films) were not completely random (Little's, 1988, MCAR-Test results: Chi-square = 274.538, d.f. = 18, sig. p = .000). The t-test of variance shows that cinema demand for films with missing budget data and those excluded in other studies was below average. Further, these films received nominations or awards less frequently and rarely employed a highly popular cast or director. Therefore, we compensated for the lack of budget data on the remaining 692 films through multiple imputation, following the recommendation of Graham, Olchowski, & Gilreath (2007). Therefore, we used a high number of 20 imputations to minimize integrity losses and provide complete empirical data on the yearly movie output in order to draw generalizable conclusions.

4. SEQUENTIAL MOTION PICTURE EXHIBITION

Motion pictures are individually manufactured investment projects with a limited product life cycle. The exhibition of motion pictures in different windows of time is a complex, sequential process to maximize profits and is influenced by various actors such as distributors, exhibitors, and customers. Assuming the

intent of maximizing profit, all actors attempt to minimize their risk of sunk costs. Distributors exploit all release windows where the potential for profit, including a risk discount, exceeds the distribution costs. Exhibitors such as cinema operators, VOD services, and broadcasters acquire exhibition rights from distributors according to their individual cost-benefit considerations. Customers see movies in the theater, buy home video products and VOD services, and watch television according to their entertainment preferences.

Sunk costs would result if distributors funded low-selling movies, exhibitors bought exhibition rights of less competitive movies, or customers spent time and money for movies that did not match their preferences. To reduce costs, actors rely on signaling factors. The amount of available information signaling success increases during the exhibition period and thus exhibitors prefer to make decisions later in this period and in the window prior to their own exhibition period to minimize the risk of sunk costs. Broadcasters, for example, receive information about admission figures or awards a movie receives and decide accordingly. However, fierce market competition may require presales or early decision making.

Consequently, films with signaling factors on which distributors, exhibitors, and customers rely (influencing factors) have a higher probability to be comprehensively distributed in all exhibition windows and have higher sales expectations. To examine relevant influencing factors of supply and demand, we derive a conceptual model of regressions based on signaling theory and previous research on success factors in the motion picture industry.

4.1 WINNER-TAKES-ALL THEORY

Available movie-related signaling factors can be categorized into *content-related factors*, *distribution-related factors*, and *response-related factors*. Before distribution, *content-related factors,* namely CAST, DIRECTOR, BUDGET, SEQUEL, GENRE, and AGE RATING, may influence decision making. In addition to these factors, Clement et al. (2014) indicated that the country of origin (e.g., U.S.A. and Germany) may influence supply and demand. Therefore, we include COUNTRY OF ORIGIN to control differences regarding the major film-producing countries present in the German market.

Likewise, *distribution-related factors*, particularly the involvement of a MAJOR company, may influence the decision process. In the German motion picture industry, several local distributors have a contractual partnership with the national subsidiary of major U.S. distributors (e.g., X-Verleih and Warner Bros.). Therefore, we need to determine whether independent distributors' partnerships with majors (MAJOR_PS) have the same effect on exhibition as a major distributor. The time between release windows is also of major importance: Clement et al. (2014), for

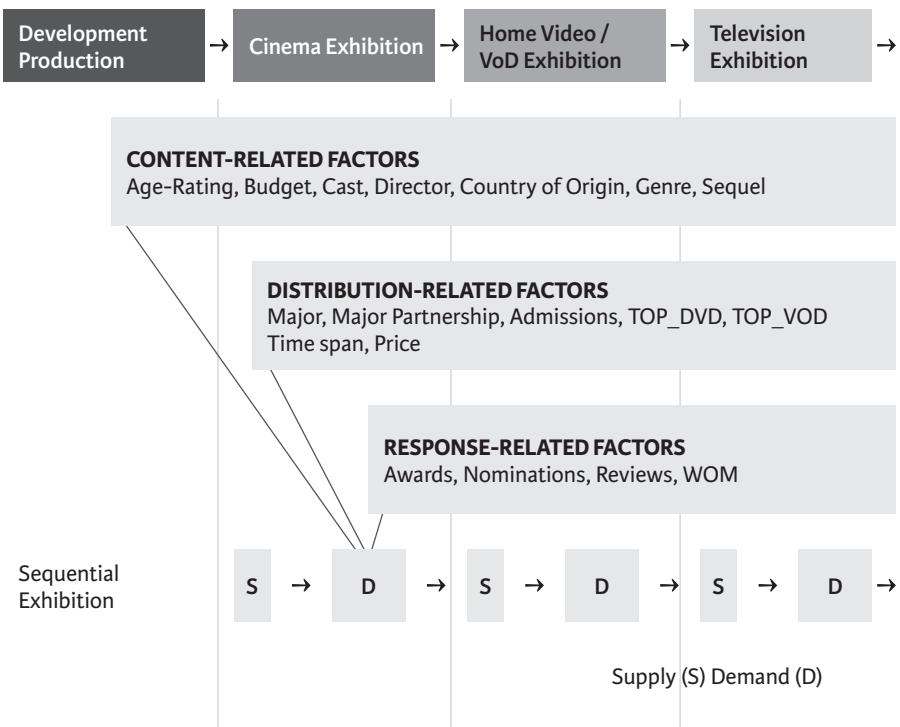
example, detected a negative relationship of the time span between U.S. and foreign cinema release and box-office revenues. Therefore, we implement a variable to control the TIME LAG between exhibition windows.

At the first window, theatrical exhibition faces the highest risk; during exhibition, additional *distribution-related factors* reduce uncertainty. Every completed exhibition window increases knowledge of demand (e.g., cinema ADMISSIONS or sold DVD items). As a result, the decision process involving distributors and exhibitors may lead to either the termination or continuation of a movie's exhibition and thus influences availability in post-theatrical markets.

Furthermore, we include a PRICE factor for the physical retail market; in all other markets, uniform pricing prevails (e.g., DVD rental, VOD) or prices are irrelevant (free-to-air TV).

At the beginning of exhibition, *response-related factors* such as REVIEWS, AWARDS, and WOM are important. While winning an award may be subject to random effects or jury composition, NOMINATIONS face a lower bias risk due to the larger reference group and the usually extended group of people qualified to suggest possible nominations. Therefore, we include nominations as an additional variable.

Figure 1· Influencing Factors during Sequential Movie Exhibition



We hypothesize that the different interests of distributors, exhibitors, and customers lead to different preferred factors. Consequently, all actors may agree on only a small set of signaling factors that result in extensive supply and strong demand: these are *winner-takes-all* influencing factors. Distributors and exhibitors that consider these factors will maximize revenues and minimize sunk costs.

Market circumstances of sequential release and empirical availability of data do not allow the use of well-established static or dynamic models to determine these influencing factors. Thus, we use OLS for metric endogenous variables to test multiple linear regressions and MLE for categorical endogenous variables to create a set of partial logit models (Hosmer Jr., Lemeshow & Sturdivant, 2013). The combination of both methods is advantageous as this exploits all available information and creates robust results and considers the influence of incremental demand.

4.2 MODELLING MOVIE SUPPLY

The home video market faces low variable costs of reproduction, heterogeneous retail structures, and a lack of capacity barriers in online trading. Therefore, the importance of the amount of provided items at the retail level is negligible. Thus, we measure market supply by the availability of a motion picture in the video rental and sell-through markets and consider rental DVD, sell-through DVD, rental Blu-ray, and sell-through Blu-ray. For digital video products, we analyze the libraries of the VOD services. We measure market supply in the free-to-air TV market by the availability of a motion picture in the linear schedules of German broadcasters. The endogenous variable in the supply function is dichotomous (1 – available / 0 – not available). Therefore, a logit model with the MLE method is used.

$$p\,(y = 1 - available) = 1 + \frac{1}{1+e^{-z}}$$

$$z = \alpha_0 + \alpha_1 C_i + \alpha_2 D_i + \alpha_3 R_i [+\alpha_4 A_i] + \varepsilon_{si}$$

The α and β terms respectively are regression coefficients. The vector *Ci* denotes the cumulative content-related influencing variables of CAST, DIRECTOR, BUDGET, SEQUEL, GENRE, AGE RATING, and COUNTRY OF ORIGIN. *Di* includes the distribution-related variables MAJOR and MAJOR_PS. The vector *Ri* denotes the response-related variables REVIEWS, NOMINATIONS, AWARDS, and WOM. *Ai* for home video and VOD supply includes only the ADMISSIONS variable of cinema exhibition due to parallelism of home video and VOD exhibition. For television supply, we extend the

sequential hierarchical logit model and include the variables TOP_DVD (home video bestsellers) and TOP_VOD (VOD bestsellers) in *Ai*. *εsi* is the error term.

As with all models concerning post-theatrical exhibition, the market supply estimations of home video, VOD, and television exhibition involve a risk of multicollinearity. The reason for this is the presumable dependence of exogenous influencing factors (such as cast or sequel) and cinema admission figures. The latter serves as the endogenous variable in the cinema demand equation. Therefore, we create a sequential hierarchical logit model, introducing the vector *Ai* in a second step to control multicollinearity.

4.3 MODELLING MOVIE DEMAND

Sold or rented items are the primary performance indicators in home video and VOD markets. However, this information is often unavailable due to incomplete market tracking in most countries. Alternatively, we introduce reference lists of the most successful home video and VOD products to draw conclusions about consumers' behavior in terms of demand. We consider bestsellers among home video products as well as products on Amazon's bestseller lists of sell-through DVDs, since the company is a major reseller in Germany. Additionally, the bestselling motion pictures of five of the most popular VOD services are included. The endogenous variable in the demand function is dichotomous (1 – bestseller / 0 – not bestseller). Therefore, we use a logit model with the MLE method. Following the argument of Clement et al. (2014), we exclude BUDGET, MAJOR, and MAJOR_PS due to the low value of this information for potential consumers.

$$p\,(y = 1 - bestseller) = 1 + \frac{1}{1+e^{-z}}$$

$$z = \alpha_0 + \alpha_1 C_i + \alpha_2 D_i + \alpha_3 R_i [+\alpha_4 A_i] + \varepsilon_{si}$$

Moreover, we measure demand in the television market using the number of viewers. Total audience aged three or older and aged between 14 and 49 are the most relevant audience groups in the German market. The endogenous variable in the demand function is metric, measured in millions of people. It is assumed that more than one exogenous variable is necessary to explain demand. Therefore, we use the OLS method to test multiple linear regression. We use a log-log formulation to simplify comparisons of elasticities with the logit models.

$$RATING_i = e^{\beta_0} * C_i^{\beta_1} * D_i^{\beta_2} * R_i{}^{\beta_3} [* A_i^{\beta_4}] * e^{\varepsilon_{Ri}}$$

5. EMPIRICAL FINDINGS

5.1. RESULTS OF DATA ANALYSIS

The dataset includes 63 categorical variables. Budget data and admission figures show high variance. F-tests prove high levels of significance ($p < .001$) of OLS regressions. Further, the Omnibus tests of all logit models show high levels of significance ($p < .01$). The adjusted R^2 values (coefficients of determination) are between .57 and .77, indicating a high quality of estimation. Furthermore, 12 of 20 logit models meet the requirements of Cox & Snell's pseudo R^2 and Nagelkerke's R^2. Values > .20 are considered acceptable; nevertheless, nine logits of VOD supply and demand show weakness in variance explanation. The percentages of correct classification are consistently high.

Table 3· Model Summary

Exhibition Windows	Model		Regression	R^2	Adj. R^2
Cinema	Supply	Screens	multilinear	.679	.677
Cinema	Demand	Admissions	multilinear	.568	.566
Home Video	Supply	DVD-R	bin logit	—	—
		DVD-S	bin logit	—	—
		BR-R	bin logit	—	—
		BR-S	bin logit	—	—
Home Video	Demand	DVD-R	bin logit	—	—
		DVD-S	bin logit	—	—
		DVD-S Amazon	bin logit	—	—
		BR-R	bin logit	—	—
		BR-S	bin logit	—	—
Video on Demand	Supply	Amazon Instant	bin logit	—	—
		Prime Instant	bin logit	—	—
		iTunes	bin logit	—	—
		Maxdome (T)	bin logit	—	—
		Maxdome (S)	bin logit	—	—
		Netflix	bin logit	—	—
		Watchever	bin logit	—	—
		Videobuster	bin logit	—	—
		Videoload	bin logit	—	—
		Sky Snap	bin logit	—	—
		Sky Go	bin logit	—	—
		Videociety	bin logit	—	—
		Xbox	bin logit	—	—
		Google Play	bin logit	—	—
		Netzkino	bin logit	—	—

The null hypothesis (p = .000) of the Hosmer-Lemeshow tests is rejected for all logits, except for three regressions. Weaknesses and insignificant results may be attributable to the nature and range of movie offerings (e.g., Videobuster, which has a limited product range).

Durbin-Watson tests produce satisfactory results between 2.00 and 2.02, which militate against autocorrelation. The variance inflation factors (VIF) lie within the acceptable range of 1 to 5 (Hair et al. 2010) and indicate an acceptable degree of multicollinearity. We avoid common method bias through different data sources for dependent and independent variables (Podsakoff et al., 2003). Besides this, we rule out heteroscedasticity by graphic means. Table 3 summarizes the results of all estimations.

	Cox & Snell R^2	Nagelkerke R^2	Sig.	Classification	Hosmer-Lemeshow	Durbin-Watson	VIF Min	VIF Max	VIF Mean	Tol. Mean
	—	—	.000 [1]	—	—	2.009	1.032	3.273	1.562	.695
	—	—	.000 [1]	—	—	2.003	1.032	3.241	1.603	.707
	.500	.675	.000 [2]	84.2	.461	—	—	—	—	—
	.310	.464	.000 [2]	82.4	.605	—	—	—	—	—
	.479	.681	.000 [2]	88.4	.409	—	—	—	—	—
	.504	.682	.000 [2]	84.9	.753	—	—	—	—	—
	.464	.686	.000 [2]	88.9	.000	—	—	—	—	—
	.282	.706	.000 [2]	96.5	.242	—	—	—	—	—
	.289	.681	.000 [2]	95.6	.247	—	—	—	—	—
	.122	.506	.000 [2]	97.1	.999	—	—	—	—	—
	.202	.610	.000 [2]	96.8	.541	—	—	—	—	—
	.340	.461	.000 [2]	78.1	.070	—	—	—	—	—
	.081	.161	.000 [2]	89.0	.577	—	—	—	—	—
	.335	.447	.000 [2]	76.8	.001	—	—	—	—	—
	.248	.338	.000 [2]	75.1	.067	—	—	—	—	—
	.063	.109	.000 [2]	84.5	.336	—	—	—	—	—
	.066	.152	.000 [2]	91.5	.150	—	—	—	—	—
	.036	.093	.000 [2]	93.4	.317	—	—	—	—	—
	.071	.130	.000 [2]	86.6	.275	—	—	—	—	—
	.291	.395	.000 [2]	75.8	.000	—	—	—	—	—
	.054	.167	.000 [2]	95.2	.757	—	—	—	—	—
	.049	.184	.000 [2]	96.4	.702	—	—	—	—	—
	.081	.145	.000 [2]	86.0	.057	—	—	—	—	—
	.367	.549	.000 [2]	85.5	.039	—	—	—	—	—
	.323	.445	.000 [2]	78.7	.001	—	—	—	—	—
	.010	.292	.000 [2]	99.8	.969	—	—	—	—	—

Exhibition Windows	Model		Regression	R^2	Adj. R^2
Video on Demand	Demand	Amazon Instant	bin logit	—	—
		Prime Instant	bin logit	—	—
		iTunes	bin logit	—	—
		Google Play	bin logit	—	—
		Videoload	bin logit	—	—
Television	Supply	Linear	bin logit	—	—
	Demand	3+	multlinear	.659	.653
		14-49	multlinear	.765	.760

1 F-test
2 Omnibus

In summary, the fundamental interrelations are describable although we must pay attention to explanatory weaknesses concerning VOD markets.

5.2 VALIDITY TEST

While the results for theatrical exhibition are not the focus of this study, comparison derived factors that significantly influence supply with previous findings of the literature, in particular with Clement et al. (2014), serves as an external validity test of results for subsequent windows (for a comprehensive description of triangulation as a research concept, see Denzin & Lincoln, 2011; Flick, 2011).

Table 4· Comparison of Results regarding Theatrical Exhibition

Influencing factor	Clement *et al.* (2014)	Results of this study
Cast	+	+
Director		+
Budget	+	+
Sequel	+	+
Genre	+[a]	+
Age Rating	-	-
Country of Origin	+	+
Major	+	+
Reviews		+

Results of Clement et al. (2014) refer to the first week of exhibition, N=1,360, released 2002–2010.
[a]results for documentaries are not significant.

	Cox & Snell R^2	Nagelkerke R^2	Sig.	Classification	Hosmer-Lemeshow	Durbin-Watson	VIF Min	VIF Max	VIF Mean	Tol. Mean
	.068	.289	.000 [2]	97.1	.905	—	—	—	—	—
	.029	.140	.000 [2]	97.5	.964	—	—	—	—	—
	.050	.218	.000 [2]	97.2	.714	—	—	—	—	—
	.067	.294	.000 [2]	97.2	.446	—	—	—	—	—
	.124	.501	.000 [2]	97.0	.908	—	—	—	—	—
	.187	.249	.000 [2]	67.1	.180	—	—	—	—	—
	—	—	.000 [1]	—	—	2.001	1.018	3.767	1.830	0.777
	—	—	.000 [1]	—	—	2.023	1.018	3.767	1.830	0.777

Table 4 presents a comparison of results from the present study and that of Clement et al. (2014). Influencing factors, marked with +, represent a positive correlation with movie availability while factors marked with – symbolize a negative correlation. Empty cells indicate insignificant findings. This study provides results comparable to those of Clement et al. (2014) for theatrical release which demonstrate high explanatory power.

5.3 DISCUSSION OF RESULTS

The results show that movies in the genres *Action/Adventure, Comedy*, and *Fantasy/Sci-Fi* that are SEQUELS, that employ STARS – especially as cast members –, and that have a low AGE RESTRICTION (*FSK12*) are more successful in post-theatrical exhibition. These movies come more frequently from the U.S. than from other countries such as Germany. These *content-related variables* differentiate successful movies with comprehensive exhibition from unsuccessful movies with only limited exhibition. They are universal influencing factors of comprehensive supply and high demand. If producers and distributors consider these factors, they will gain competitive advantages regarding supply range and revenues.

In contrast, different market niches (GENRE; COUNTRY OF ORIGIN), for instance, *Horror*, *Crime*, and *Comedy*, are popular genres for rental DVDs. Films in these genres have a higher probability of becoming bestsellers sell-through DVDs, whereas *Comedy* movies are seldom bestselling. Additionally, niche markets exist for *French* and *Korean* movies, which have a higher probability of being released as rental Blu-rays. In addition, FSK16 has a significant positive effect on the probability of home video supply. An oversupply of *Drama* is visible in television exhibition, caused by public service broadcasting.

The results for the *distribution-related variables* show a positive influence on movie supply. If a major company distributes a movie, a positive effect on availability during exhibition can be observed. Furthermore, the partnership of a national distributor with a major (MAJOR_PS) also increases the probability of availability on TV. This demonstrates that major distributors have a competitive advantage in exhibition. Other distributors should establish a partnership with a major distributor. Production companies, third-party investors, and other stakeholders should distribute local movies through majors or distributors with a partnership with a major. However, the probability for the availability on subscription-based VOD services (S-VOD), such as Netflix, is significantly negative. This illustrates that distributors may favor a restrictive S-VOD policy for new movies in the German market.

The Price of physical home video products has a slightly negative correlation with the probability of movies becoming bestsellers, except for rental DVDs, for which there is a small, positive correlation. This contrary effect may be due to strong demand for new releases, which may tend to have higher prices during the exclusive exhibition period after cinema release and before retail DVD exhibition.

A long Time span between cinema release and home video, VOD, or television release has a small, positive effect on television demand and the probability that movies become home video and VOD bestsellers. Distributors may enforce a restrictive and longer windowing strategy for successful movies. Consequently, a longer time span and successful movie exhibition are correlated, within a tolerance limit.

Results for the *response-related variables* show a positive influence on movie supply and demand. Overall, movies with positive responses from the industry community, critics, and WOM have a higher probability of being available in a larger number of exhibition windows, with high demand in certain windows. The effect of WOM on supply and demand is strong. NOMINATIONS positively influence availability; NOMINATIONS and AWARDS affect demand for movies broadcast on television. The positive influence of critics' REVIEWS on post-theatrical availability and success is confirmed although they may be predictors (see Eliashberg & Shugan, 1997). Exceptions are negative effects on the probability that movies enter on home video or VOD bestseller lists. We thus conclude that distributors should employ strategies to increase responses from the industry, critics, and consumers. Positive attention creates awareness of potential exhibitors and customers, which increases exhibition revenues.

The stepwise integration of demand variables, particularly cinema ADMISSIONS and home video (TOP_DVD) and VOD bestseller figures (TOP_VOD), do not explain market supply and demand with the exception of a

significantly positive effect on television demand.

In summary, supply decisions of exhibitors depend on content-related, response-related, and distribution-related variables. Low demand is not responsible for shorter and less comprehensive exhibition. Little success in one window may have an influence in the subsequent windows via the price mechanism. Prices for DVD and Blu-ray may decrease, and VOD exhibitors and TV stations may pay lower licensing fees.

6. CONCLUSION

In this article, we use an insightful sample to analyze the influencing factors of sequential release in post-theatrical exhibition. The research model uses OLS and MLE regressions to examine market supply with a movie's availability as the categorical endogenous variable and market demand based on market success data. The approach avoids the selection bias of previous research.

6.1 CONTRIBUTIONS

Overall, our research makes three key contributions. First, the research makes theoretical contributions. We show that relying on a given market supply ignores important factors such as scarcity, bargaining power of suppliers, and exhibition costs. We introduce additional variables with explanatory power for supply and demand in movie exhibition. For example, nominations are more significant than winning an award.

Second, this study is among the first to extend previous research to market supply and demand in post-theatrical exhibition. Our research provides basic findings regarding influencing factors to explain the availability and success of motion pictures in the home video, VOD, and TV markets. Thus, the empirical results explain movie supply and demand in markets with sequential distribution and limited product life cycles. The article expands the success-breeds-success theory by considering a winner-takes-all theory regarding a set of few influencing factors generating a high probability of comprehensive exhibition and high demand. Other influencing factors differ between exhibition windows or show insignificant effects on the scope and success of a movie's exhibition. However, high demand figures (ADMISSIONS and DVD/Blu-ray and VOD bestseller) do not increase availability in subsequent windows.

Third, this study expands the previous blockbuster-oriented view to a global industry perspective by considering local content and small budget movies. We increase understanding of the requirements for a comprehensive exhibition, which is the basis of high revenues. We show empirical results for the German motion picture industry. To make a meaningful assessment, it is necessary to consider regional market differences. We show this by implementing

a variable to consider partnerships of national distributors with majors, which are common in the German market.

6.2 LIMITATIONS AND FURTHER RESEARCH

We acknowledge some limitations of our study that require additional research. Our results are based on specific market conditions and may not be applicable to other markets. Further, although this article is based on a comprehensive literature review and examines major influencing factors from the literature, we are not able to account for all influencing factors. External factors such as public film funding, macroeconomic effects, or lockdowns as a consequence of a global pandemic remain unconsidered. In addition, advertisement levels during exhibition are also excluded due to multiple adverting institutions (distributors and exhibitors) and unobservable results. Furthermore, inter-market effects on supply and demand, for example, the influence of previous U.S. theatrical releases on exhibition in Germany, are excluded for reasons of comparability with local movies.

Another limitation of our study and other research papers is the approximation of a movie's content and quality. Content-related factors are only considered through factors such as genre, sequel, and age ratings. Substantial content analyses would be required to test whether the influence of these factors is supportable. The fact that individual movies with a negative supply probability are comprehensively exhibited argues for further research in this area.

Moreover, there is a need to investigate existing exhibition strategies. The predominant movie exhibition timing game may be complemented by a modelling approach to determine the scope and order of exhibition windows. The first attempt of Hennig-Thurau et al. (2007) in this area is extendable with our findings. We suggest that additional research will reveal differences among certain groups of movies.

Although our findings are consistent with the existing theory on influencing factors and sequential distribution, they raise new questions. The findings reveal interesting avenues for further research, for example, to reduce the risk of sunk costs and to maximize a movie's profits, especially for non-major companies.

Additionally, there are some unexplainable effects. For example, the market dominance of major distributors, which have a higher probability of achieving an exhibition in all windows, is not observable in the segment of S-VOD services. This gives rise to the question of to what extent this is explainable by the strategy of distributors or exhibitors. Further analyses of these and other disparities are required to substantiate our results, particularly regarding

video-on-demand exhibition.

Various models can predict success, for example, BOXMOD-I (Sawheny & Eliashberg, 1996), virtual stock market models (e.g., Spann & Skiera, 2003), and the study of Chang & Ki (2005) on theatrical success. We find that it is possible to expand these models to market supply and post-theatrical success. Dynamic models could be applied to make additional contributions. A simultaneous analysis of both dynamics within an exhibition window and between exhibition windows is one potential area of future research.

ENDNOTES

1 For a discussion about the ambiguity concerning whether high demand is influenced by positive film reviews or identical opinions of critics and consumers, see Eliashberg & Shugan (1997).

2 Rule 2 – 2A of the 87th Academy Awards 2015, Academy of Motion Picture Arts and Sciences.

3 The variable serves as a control variable to investigate whether competitive disadvantages exist in the German market or other European markets that are not existing in all European countries; the variable is not fully independent, but the highest correlation is .616 (EU – France) and all quality criteria are acceptable.

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APPENDIX

Estimated Supply Coefficients

SUPPLY (1)	CINEMA	HOME VIDEO				
	Screens	DVD-S	DVD-R	BR-R	BR-S	Amazon Instant
Action / Adventure	.280 ***		.233 ***		.366 **	.336 ***
Admissions			1.000 **			1.000 ***
Austria	-.078 ***					1.495 *
Budget	.708 ***		1.000 **	1.000 ***		
Cast	.346 ***		1.007 **	1.009 ***	1.009 ***	1.005 **
Children/Animation	.276 ***		.436 *			.493 *
Comedy	.118 ***		.369 **			.415 **
Crime	.044 ***		.394 **			.358 ***
Director	.093 ***	1.141 *				
Documentary	-.278 ***		4.219 ***	4.547 ***	2.313 *	
Drama	-.257 ***					
EU (ex. Ger)	-.172 ***			.721 *		
Fantasy/Sci-Fi	.251 ***			.352 *	.347 *	
France	-.102 ***		.777 *	.678 **	.558 ***	
FSK0	-.041 ***	.272 ***	.696 *			.545 ***
FSK12	.040 ***	.250 ***	.476 ***			.603 ***
FSK16		.190 ***	.271 ***	.550 **		.546 ***
FSK18	-.052 ***					*
FSK6	.020 *	.182 ***	.374 ***	.593 *		.492
Germany	-.196 ***		1.335 ***	1.529 ***	1.659 ***	1.358 ***
Horror	.030 **		.353 *			.290
Italy	-.062 ***					1.469 **
Korea	-.033 ***			.380 *		***
Major	.617 ***			.000 ***		.395 ***
Major Joint Venture	.056 ***					***
Nº of Awards						.603
Nº of Nominations		1.838 ***	1.749 ***	1.319 **	1.495 ***	1.447 ***
Online WOM	.292 ***	1.335 ***	1.416 ***	1.743 ***	1.841 ***	1.463 ***
Other Country	-.180 ***		1.207 *			1.359
Other Genre						
Review Filmstart.de	.241 ***	1.107 ***	1.084 **	1.144 ***	1.127 ***	1.105
Review Pressindex	.362 ***			1.084 **	1.106 ***	1.108
Sequel	.403 ***			.582 **		
Spain	-.047 ***	.634 *				
TOP Amazon Inst						
TOP Apple iTunes						
TOP Blu-ray R						

VIDEO ON DEMAND												
	Prime Instant		Apple iTunes		Maxdome (T)		Maxdome (S)		Netflix		Watchever	
			.114	***	.320	***	.259	**				
			1.000	**	1.000	***						
	6.387	***	.677	**	1.617	**	1.777	**				
									1.000	*		
			1.004	*			.996	*				
			.196	***	.323	***	.299	*				
			.162	***	.292	***	.318	*				
			.164	***	.309	***	.235	**				
	1.086	**			1.071	*	1.087	**			.867	*
			.493	*								
			.276	***	.373	***	.316	*				
	.652	**										
			.134	***	.277	***	.308	*				
							1.472	**				
			.454	***								
	.598	*	.612	***								
	.499	***	.543	***	.542	***	.626	**				
			.476	***								
	1.586	***			1.176	*	1.345	***	1.452	**	1.441	**
			.132	***	.380	**	.232	**				
	1.751	*	1.455	*					.451	***	.520	**
											.305	**
	.760	**	.292	***	.248	***	3.192	***	1.635	***	.672	***
	1.235	**	1.455	***	1.258	**	1.365	***	1.321	**	1.251	*
	1.155	*	1.560	***	1.230	***	1.264	***	1.527	***	1.356	***
	1.520	***	1.150	*								
	1.098	*	1.115	***	1.051	***			1.122	**		
			1.131	***			.878	***				

SUPPLY (1)	CINEMA	HOME VIDEO					
	Screens	DVD-S	DVD-R	BR-R	BR-S	Amazon Instant	
TOP Blu-ray S							
TOP DVD R							
TOP DVD S							
TOP DVD S AMAZ							
TOP Google Play							
TOP Prime Instant							
TOP Videoload							
Turkey	-.126 ***	16.444 ***	21.136 ***	13.895 ***	12.723 ***	9.620 ***	
UK	.020 *	.617 **	.577 ***		.579 ***		
USA	.449 ***	.679 ***	.664 ***			.585 ***	

* p < .1
** p < .05
*** P < .01
in black: unconsidered variables

SUPPLY (2)	HOME VIDEO				
	Videobuster	Videoload	Skynap	Sky Go	Videocity
Action / Adventure		.195 ***			.370 **
Admissions	1.000 **	1.000 **			1.000 **
Austria					
Budget	1.000 ***		1.000 *		1.000 **
Cast	1.008 ***	1.006 ***	1.008 **	1.010 ***	1.006 ***
Children/Animation		.441 **			
Comedy		.387 ***			
Crime		.495 *			
Director					
Documentary					
Drama					
EU (ex. Ger)	.674 **				
Fantasy/Sci-Fi		.298 ***			.281 **
France			.524 **		
FSK0		.479 ***			
FSK12	.593 **	.618 **			
FSK16		.499 ***			
FSK18					
FSK6		.465 ***			
Germany		.834 *	1.782 **		.772 **
Horror		.340 ***			
Italy					
Korea	.266 ***				
Major	.407 ***	.413 ***	1.391 **	2.236 ***	.664 ***

	VIDEO ON DEMAND					
	Prime Instant	Apple iTunes	Maxdome (T)	Maxdome (S)	Netflix	Watchever
	5.580 ***	2.709 ***	3.780 ***	3.425 ***	6.033 **	
					.598 **	
	.576 ***	.616 ***	.736 ***	.635 ***	.665 **	

					TELEVISION
	Xbox	Google Play	Netzkino	Free-to-air	
		.363 **		.509	*
	1.000 **	1.000 ***		1.000	***
				.643	**
	1.000 ***			1.000	***
		1.005 **			
	.437 *				
	.377 **	.505 *		.523	**
				.449	**
				.488	**
			.224 *	1.591	***
	.426 *	.399 **			
		.705 **		.736	**
	.495 **	.454 ***		.652	**
	.540 **	.536 ***		.570	***
	.449 ***	.506 ***			
	.415 ***	.434 ***		.672	**
				.538	***
		.398 **		.304	***
	1.979 *				
	.074 ***	.319 ***		.736	***

SUPPLY (2)	HOME VIDEO					
	Videobuster	Videoload	Skynap	Sky Go	Videocity	
Major Joint Venture						
Nº of Awards	1.441 *					
Nº of Nominations		1.485 ***				
Online WOM	1.323 ***	1.402 ***		1.687 ***	1.547 ***	
Other Country						
Other Genre						
Review Filmstart.de	1.139 ***	1.091 ***				
Review Pressindex		1.122 ***		1.198 **	1.122 ***	
Sequel				.590 *		
Spain			.377 ***			
TOP Amazon Inst						
TOP Apple iTunes						
TOP Blu-ray R						
TOP Blu-ray S						
TOP DVD R						
TOP DVD S						
TOP DVD S AMAZ						
TOP Google Play						
TOP Prime Instant						
TOP Videoload						
Turkey		11.963 ***				
UK			.552 **			
USA		.574 ***	.543 ***	.352 ***		

* p < .1
** p < .05
*** P < .01
in black: unconsidered variables

									TELEVISION
	Xbox		Google Play		Netzkino		Free-to-air		
							.683	***	
			1.253	**			1.512	***	
	1.307	***	1.366	***			1.124	***	
			1.306	**			1.247	**	
			1.102	***			1.063	**	
	1.154	***	1.151	***			.924	***	
							1.501	**	
	.542	*							
							8.428	***	
							5.148	***	
							. 351	**	
							.335	***	
							. 618	*	
							2.011	**	
							28.528	***	
	5.523	**	2.397	***			12.874	***	
							. 784	*	
			.608	***					

APPENDIX

Estimated Demand Coefficients

SUPPLY (1)	CINEMA	HOME VIDEO				
	Admissions	DVD-R	DVD-S	DVD-S Amazon	BR-R	BR-S
Action / Adventure	.155 ***	.049 ***				.033 *
Admissions		1.000 ***	1.000 ***	1.000 ***	1.000 ***	1.000 ***
Austria	.052 ***					
Cast	.264 ***	1.014 ***	1.007 *			1.012 **
Children/Animation	.170 ***					
Comedy	.064 ***	.208 *	5.446 *			
Crime		.102 **				
Comp_Share 14–49						
Comp_Share 3+						
Director	.084 ***				1.175 *	
Documentary	-.155 ***					
Drama	-.162 ***					
EU (ex. Ger)	-.109 ***	2.753 **		.415 *		
Fantasy/Sci-Fi	.230 ***	.046 ***		.203 *		.027 *
France	-.066 ***	.476 *		2.695 *		
FSK0		8.404 ***				
FSK12	.061 ***	2.610 ***	2.785 **			
FSK16	-.041 ***					
FSK18	-.048 ***					
FSK6		6.003 ***	3.288 **			
Germany	-.116 ***					
High Season (AU)						
Horror		.127 **				
Italy	-.036 ***					
Korea	-.022 *					
Nº of Awards						
Nº of Nominations						
Nº of Screens	.733 ***					
Online WOM	.208 ***		2.622 ***	9.414 ***	7.369 ***	2.603 **
Other Country	-.123 ***					
Other Genre						
Price		1.026 **	.936 *	.944 *		.911 **
Review Filmstart.de	.169 ***		.692 **			
Review Pressindex	.252 ***	1.313 ***		.782 **		
Sequel	.386 ***	3.269 ***				.263 ***
Spain	-.034 ***					
Cast	.264 ***	1.014 ***	1.007 *			1.012 **
Time_Lag		.998 ***			.987 *	.998 ***
TOP Amazon Inst						

	VIDEO ON DEMAND					TELEVISION	
	Amazon Instant	Prime Instant	Apple iTunes	Google Play	Videoload	TV 3+	TV 14–49
						.271 ***	.306 ***
	1.000 **				1.000 ***	.670 ***	.677 ***
						-.086 ***	-.101 ***
				1.009 **		.300 ***	.304 ***
						.100 ***	.093 ***
						.144 ***	.151 ***
						.103 ***	.078 ***
							.711 ***
						.441 ***	
						.081 ***	.077 ***
						-.267 ***	-.255 ***
						-.261 ***	-.304 ***
					18.933 *	-.177 ***	-.208 ***
						.255 ***	.294 ***
					.053 **	-.123 ***	-.141 ***
						-.064 ***	-.079 ***
						.057 ***	.057 ***
						-.039 **	
						-.273 ***	-.329 ***
						.071 ***	.080 ***
						-.060 ***	-.075 ***
						-.042 **	-.037 **
						.065 ***	.049 ***
						.103 ***	.059 ***
	11.270 ***	3.028 ***	6.528 ***	8.287 ***	10.783 ***	.232 ***	.206 ***
	7.011 *		8.337 *			-.185 ***	-.184 ***
						.142 ***	.120 ***
	.735 **			.752 **	.559 ***	.359 ***	.386 ***
						.282 ***	.323 ***
						-.053 ***	-.067 ***
				1.009 **		.300 ***	.304 ***
					.998 *	.118 ***	.130 ***
						.177 ***	.188 ***

SUPPLY (1)	CINEMA	HOME VIDEO					
	Admissions	DVD-R	DVD-S	DVD-S Amazon	BR-R	BR-S	
TOP Apple iTunes							
TOP Blu-ray R							
TOP Blu-ray S							
TOP DVD R							
TOP DVD S AMAZ							
TOP DVD S							
TOP Google Play							
TOP Prime Instant							
TOP Videoload							
Turkey	-.058 ***						
UK		.363 **					
USA	.266 ***	.161 ***	.236 ***	.271 ***		.218 *	

* p < .1
** p < .05
*** P < .01
in black: unconsidered variables

	VIDEO ON DEMAND					TELEVISION	
	Amazon Instant	Prime Instant	Apple iTunes	Google Play	Videoload	TV 3+	TV 14–49
						.109 ***	.086 ***
						.174 ***	.175 ***
						.305 ***	.328 ***
						.634 ***	.683 ***
						.540 ***	.548 ***
						.539 ***	.560 ***
						.113 ***	.124 ***
						.108 ***	.102 ***
						.247 ***	.242 ***
						-.042 **	-.037 **
						.040 **	
				.188 ***	.081 ***	.450 ***	.515 ***

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