HOW BIG IS THE BIG SCREEN?

UNDERSTANDING THE DEMAND FOR EXPERIENCE GOODS: THE CASE OF THE SWEDISH CINEMA MARKET

HENRIK EKWALL

MOLLY GUGGENHEIMER

How big is the big screen? Understanding the demand for experience goods: the case of the Swedish cinema market

Abstract:

In this study, we analyze the factors that affect demand for theatrical films in Sweden, how they do so, and how these factors change with regards to a film's regional origin. An ordinary least squares model with cinema admissions as the dependent variable is developed on a sample of 1293 films released on Swedish cinemas in between 2012 and 2016. The findings in this study show that ten independent variables - source material, whether a film is a sequel, runtime, reviews, genre, aggregate demand seasonality, number of opening screens, type of distributor, age limit and director - significantly explain demand, out of which source material is tested for the first time in this context. The findings also show that the effects of these independent variables significantly differ depending on whether or not a film is Swedish, from Anglo Saxon countries or from non-Swedish and non-Anglo Saxon countries. This study is therefore the first in this field of research to demonstrate a moderating effect of a film's regional origin on the film audience's perception of the film.

Keywords:

Cinema; Film; Demand for film; Film audience; Experience goods; Swedish film industry

Authors:

Henrik Ekwall (23285)
Molly Guggenheimer (23936)

Tutors:

Magnus Johannesson, Professor, Department of Economics
Patric Andersson, Associate Professor, Department of Marketing and Strategy

Examiner:

Gustav Almqvist, PhD Student, Department of Marketing and Strategy

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1.   Introduction

The film industry[1] is a risky business. The global box office - the aggregated revenue from sold cinema tickets worldwide - reached an all-time high of $40.6 billion in 2017 (Box Office Mojo, 2019). The highest grossing film of that year, *Star Wars: The Last Jedi,* accrued a staggering $1.3 billion alone (Box Office Mojo, 2019); there is certainly money to be made in film. Betting on the right film, however, is a different question. As the CEO of the Motion Picture Association of America, Jack Valenti, once said (Litman, 1983):

 "No one can tell you how a movie is going to do in the marketplace, not until the film opens in darkened theatre and sparks fly up between the screen and the audience".

The film audience is hard to predict. The attempts, however, from industry analysts and scholars to understand the nature of her demand is essential for producers, distributors and investors who rush to cut their slice of this growing pie.

This study, too, aims to make the film industry less risky. Focusing on the pre-purchase decision making process of the film audience, this study investigates the film and film distribution-related factors that might increase or decrease demand for specific films at the cinema. This study aims to empirically contribute to earlier research with data from the much-overlooked Swedish market for films and furthermore test factors that have not yet been researched in this context. This study is also the first in this field of research to particularly focus on how the film audience's preference in regard to these factors might change depending on a films regional origin.

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[1] "Film" refer hereafter to theatrical films, i.e. films that are screened at cinemas. Likewise, "Film audience" and "Film industry" or "Film market" refer to the audience of and the market for such theatrical films.

2. Background

2.1. The uncertain demand for cinema

The film industry is characterized by an uncertain nature of demand. In one of the earliest studies on the demand for cinema, Barry R. Litman proclaimed that "Hollywood is the land of hunch and the wild guess", in reference to the difficulty associated with predicting demand for films (Litman, 1983). This point has since been supported by a multitude of scholars, each motivating their respective attempts to develop new tools and frameworks for understanding the demand for film against the backdrop of an enigmatic and ambiguous film audience.

Many attribute this unpredictability to the inherent nature of film as a consumption good. Film is an experience good, of which the quality in the eyes of the audience cannot be fully assessed until after the good is consumed (Nelson, 1970; Chang & Ki, 2005; Wallentin, 2016). This quality posits distinct problems when it comes to forecasting the demand for and success of certain films. Echoing the above quote from the Jack Valenti, there is no way to estimate how a film will be received with absolute certainty until it opens in theatres and is experienced by the audience, at which point producers, distributors and investors all have invested their fair share in the hopes of launching the next big success.

This makes the film industry a risky business. Returns on films at the cinema are characterized by a high degree of volatility as the story of the film industry is one of blockbusters and flops (De Vany & Walls, 1999). Coping with this uncertainty of demand is relevant to several actors in the industry. The funding of the average film typically involves producers, distributors, private investors, screening rights holders and various types of public funding agencies (Boston Consulting Group, 2015). All of which rely on guesses, estimates and hunches as they invest time and money in the hope of getting their money's worth. As said, investing in and producing the *right* film could be a question of winning or losing hundreds of millions of dollars; actors in the industry are ever more reliant on a better and deeper understanding of what affects the demand for specific titles.

2.2. The Swedish film market

Sweden has been almost entirely overlooked in research on demand for and success of films. This is despite the fact that as a focal point for the research on the nature of the demand for film, Sweden is interesting for a number of reasons.

2.2.1. The aggregate demand for films in Sweden

Despite the growing popularity of close substitutes such as streaming services (The Swedish Film Institute, 2017), the demand for cinema in Sweden at an aggregate level has remained fairly constant over the past couple of years. In between 2000 and 2016, yearly cinema admissions per capita in Sweden have ranged from 1.5 to 1.9 (see attachment 1 in appendix). As of 2017, cinema admissions per capita in Sweden were above the average for European countries (Statista, 2018). This proves that despite a rapidly changing media landscape, the market for theatrical films in Sweden remains an important part of the overall film industry.

2.2.2. The digital cinema landscape

The past couple of years have marked a transformative phase in the Swedish film industry, as most of the cinemas in Sweden have been subject to a technological shift from analogue to digital film screening (Ekwall, 2017). The digitization of cinemas, despite not having been discussed in earlier research, has incurred changes in how films are screened and distributed that are significant enough to merit a brief outline.

In a digital cinema landscape, films can be released wider (i.e. to more cinemas) and faster. Facing increased competition for space at the cinemas, distributors therefore try to reach as many moviegoers and earn breakeven returns as fast as possible. As a result, the average theatrical run of a film has decreased and the share of admissions during a film's opening weekend has increased (Ekwall, 2017).

These changes posit a challenge for distributors as they schedule their film portfolios and evaluate the performance of their films. Opening weekend performance has earlier been a main indicator of how well a film will continue to do and to a large extent decides the length of the remainder of a film theatrical run (Elliott & Simmons, 2008). However, as an ever-increasing portion of the total admissions to a film is concentrated to a film opening weekend, waiting until after a film's opening weekend to evaluate its performance is becoming increasingly risky. This emphasizes an ever more important need for a good understanding of what will make or break a film in Sweden, *a priori*.

2.2.3. Domestic and foreign films in Sweden

A recent study from the Swedish Film Institute stated that the film audience's perception of a film can differ extensively between foreign and domestic films. Audience members in Sweden stated that their perception of a range of characteristics of a film differs considerably depending on whether the film was Swedish or American (Stål, 2016). This effect, however, has not been discussed in previous research. A reason for this is that the better part of the research in this field have been conducted with data from the U.S. film industry. A distinguishing feature of the U.S. film industry is that it almost exclusively screens domestic films (Statista, 2018). In the Swedish film market, however, domestic

films only account for 19 percent of the market share of films (The Swedish Film Institute, 2017). A study of the potential difference in audience perception between foreign and domestic films is therefore both warranted and made possible when looking at the Swedish film market.

2.3. Purpose

The overall purpose of this study is to reduce the apparent uncertainty of what constitutes a successful or unsuccessful film at the cinema, by developing an understanding of what factors affect demand for certain film titles, and how they do so.

The present authors set out to empirically contribute to the prevalent body of knowledge of how such factors affect demand for films with data from the much-overlooked Swedish film industry, in which early demand estimates are ever more important due to the recent digitization of Swedish cinemas. In other words, this study aims to test whether established knowledge regarding what affects demand applies to the Swedish film audience.

Furthermore, the present authors aim to investigate factors that might affect demand for films that have not yet been tested in this field of research.

Lastly, this study sets out to shed light on how the effects of the factors that influence demand for films might differ between foreign and domestic films. The present authors argue that an effort to develop a general understanding of the demand for films has to factor in the moderating effect that the film's origin seems to have, according to the above-mentioned study from the Swedish Film Institute (Stål, 2016). As such, results and models derived from the U.S. film market may lack a sufficient degree of generalizability to other countries. This study therefore aims to contribute with results and models that are adapted to non-U.S. markets with a large share of both foreign and domestic films.

This paper is part of a project in collaboration with the Swedish Film Institute.

2.4. Literature review

2.4.1. Research on the demand for films: Markets and methodologies

The questions now towering before the present authors have puzzled researchers in economics and media studies for close to a century; research on film performance and its explanatory factors has been carried out since the 1930's (Hadida, 2009). However, the first major contribution to the field came from Barry R. Litman in 1983. In his oft cited work "Predicting Success of Theatrical Movies: An Empirical Study" he was the first to empirically study the factors that affect the performance of specific film titles at the

cinema. He tested variables such as age limit, genre, awards and production budget against box office results in a multivariate regression with data from the U.S. film market (Litman, 1983).

This paper came to influence the later and current research in the field in two major ways. Firstly, the U.S. film market has become the by far most researched in the field. Much has happened in the field in the past couple of years, especially with regards to the growing number of studies on markets in Asia and particularly China. However, the predominant body of knowledge is derived from data from the U.S. market (Litman, 1983; Litman & Kohl, 1989; Shawney & Eliashberg, 1996; De Vany & Walls, 1996; Chang & Ki, 2005). Only one study has been conducted with data from the Swedish film market. In "Demand for cinema and diverging tastes of critics and audiences", Erik Wallentin studies the differences between what factors affect cinema attendance and expert reviews, however, does not particularly discuss the demand for film (Wallentin, 2016).

Secondly, Litman (1983) outlined what has been the preferred method for estimating the factors affecting film performance, namely the method of least squares. Many studies have since followed suite and have employed econometric methods in keeping with Litman's approach of linear modelling, however expanding the scope by including new potential explanatory variables of film performance (Elliott & Simmons, 2008; Chang & Ki, 2005; Sochay, 1994; Litman & Kohl, 1989; Litman, 1998; Terry et al., 2005).

Many researchers in this field attempt to quantify the effect on film performance of a set of variables that allow for estimates of the success of a film before it goes into production. In such cases the explanatory variables are pre-production factors. The reasoning is that the most helpful tools for film producers and distributors give reliable estimates how a film will perform before the wheels of production start churning and all the money is spent. The pot of gold at the end of the rainbow seems to be a universal guide from which filmmakers can model the films that they know will sit the best with the audience, and allocate resources to the most promising projects, *ex-ante.* In such research, however, the present authors note two common traits that, for the sake of clarity, merit a quick digression.

Firstly, the present authors note the interchangeable use of the terms "predict success of films" or "forecast performance of films" (Litman, 1983; Chang & Ki, 2005) with "study the demand for films" or "studying the determinants of success" (Elliott & Simmons, 2008; Wallentin, 2016) to describe endeavors that in essence are the same, namely to study how a set of variables affect the performance of specific film titles with ordinary least squares models. The difference between the above approaches is merely a question of framing or, if you will, semantics. The results and approaches in these studies are thus

for all intents and purposes comparable and have been treated as such by the present authors.

Secondly, the present authors note that the definition and use of pre-production factors is not entirely uniform across the literature. In many instances, it includes variables that "happen" after the production of a film is finished and that furthermore are in essence out of the control of the makers of the film themselves, such as age limits, reviews and awards (Elliott & Simmons, 2008). It should also be mentioned that awards, and in some instances reviews, more often than not come to the attention of the makers as well as the audience of a film after its theatrical release.

This is not to say that these factors are uninteresting or irrelevant when studying the factors underlying film performance, however the present authors argue that the selection of a set of variables warrants a discussion on where and when they occur in the life cycle of a film and how actionable the information in such a framework is, relating to the different actors involved in the making and release of a film. Not to mention the extent to which one can discuss "predictions" when the predicting variables relate to instances in the films life cycle that occur post-production, or post-theatrical release.

2.4.2. Research on specific variables

Table 1 below provides a summary of commonly examined variables in this field of research. Findings regarding the most researched variables are developed in brief.

Domestic box office results is the most commonly used measurement of film performance (Litman, 1983; Litman & Kohl, 1989; Shawney & Eliashberg, 1996; Chang & Ki, 2005). Another, more unusual, approach is measuring success with cinema admissions (Austin, 1981; Litman & Kohl, 1989; Wallentin, 2016). As the correlation between cinema admissions and box office results is close to one, however, the choice between these two measurements make no substantial difference (Wallentin, 2016).

Table 1. Research on specific explanatory variables

Independent variables	Significant effects	No significant effect
Genre	Austin, 1983; Litman, 1983; De Vany & Walls, 1996; Litman & Kohl, 1989; Sochay, 1994; Sawhney & Eliashberg, 1996; Terry et al., 2005, Chang & Ki, 2005; Larcenaux 2007; Wallentin, 2016.	
Presence of established actors	Litman & Kohl, 1989; Sochay, 1994; Reddy et. al, 1998; Holbrook, 1999; Elberse & Eliashberg, 2007; Basuroy et al., 2003; Chang & Ki, 2005; Larcenaux, 2007 (positive effect).	Litman, 1983; De Vany & Walls 1996.
Directed by established director	De Vany & Walls, 1999 (positive effect).	Litman, 1983; Litman & Kohl 1989; Sochay,1994; Litman, 1998.
Movie being a sequel	Litman & Kohl, 1989; De Vany & Walls, 1999; Chang & Ki, 2005; Terry et al., 2005; Basuroy et al., 2004; Elliott & Simmons, 2008 (positive effect).	Sochay, 1994.
Age limit	Litman, 1998; Litman & Kohl, 1989; Sochay, 1994; Sawhney & Eliashberg, 1996; De Vany & Walls, 2002; Chang & Ki, 2005. (negative effect from high age limits)	
Type of distributor	Hsu, 2006; Wallentin, 2016. (positive effect for major distributors, negative effect for independent distributors and minor distributors)	Chang & Ki, 2005.
High/low attendance seasons	Litman, 1983; Litman & Kohl, 1989; Sochay, 1994; Basuroy et al., 2004; Elberse & Eliashberg, 2003; Wallentin, 2016. (positive effect for high attendance periods, compared to low attendance periods)	
Number of opening screens	Sochay, 1994; De Vany & Walls, 1996; Walls, 2005; Chang & Ki 2005; Basuroy et al 2006., (positive effect).	
Reviews	Litman, 1983; Litman & Kohl, 1989; Sawhney & Eliashberg, 1996; Eliashberg & Shugan, 1997; Holbrook, 1999; Elberse & Eliashberg, 2003; Reinstein & Snyder, 2005; Chang & Ki, 2005; Basuroy et al., 2004; Wallentin 2016. (positive effect from high reviews)	Reinstein & Snyder,2005; Basuroy et al., 2003.
High/low competitive seasons	Basuroy et al., 2004; Sochay, 1994; Elberse & Eliashberg, 2003. (negative effect from high competition compared to low competition)	

A film's nationality or regional origin	Elberse & Eliashberg, 2003; Larceneux, 2007; Wallentin, 2016.
Runtime	Holbrook, 1999; Wallentin, 2016. (positive effect)
Production budget	Litman, 1983; Litman, 1998; Litman & Kohl, 1989; De Vany & Walls, 1999; Elberse & Eliashberg, 2003; Basuroy et al., 2004; Chang & Ki, 2005. (positive effect)
Awards and nominations	Litman, 1983; Smith & Smith, 1986; Sochay, 1994; Ravid, 1999.
Word of mouth	Austin, 1983; De Vany & Lee, 2001; Basuroy et al., 2004.

Note: Comments in parenthesis that refer to the independent variables' positive or negative effects on cinema admissions or box office results, when applicable.

Genre is one of the most researched variables, however most genre categories that have been tested have not significantly affected demand. The exceptions have been science fiction, action, fantasy, comedy and horror, which have been empirically supported to increase demand, relative to drama as a baseline category, or tested separately as binary dummy variables (Litman, 1983; Litman & Kohl, 1989, Shawney & Eliashberg, 1996; Terry et al., 2005). Drama has been proven to negatively affect film performance (Shawney & Eliashberg, 1996; Litman & Kohl, 1989).

Reviews from critics have also often been tested against film performance. Good reviews have been empirically supported to increase demand. The effect of the discussions surrounding a film (above referenced as word of mouth) has also been of interest in several earlier studies. However, since the methods that measure word of mouth vary to a large degree, the results in past research has been ambiguous (Austin, 1983; De Vany & Lee, 2001; Basuroy et al., 2004).

Type of distributor has been included in studies to measure the distribution-related aspects of a film, such as market power of the distributor and marketing expenses. It has been shown that large distributors effect demand positively, while small or independent distributors effect demand negatively (Chang & Ki, 2005; Wallentin, 2016).

High age limits have been shown to negatively affect demand whereas low age limits have yielded a positive effect on demand. (Litman, 1998; Litman & Kohl, 1989; Sochay, 1994; Sawhney & Eliashberg, 1996; De Vany & Walls, 2003; Basuroy et al., 2004).

It has been shown that demand increases if a film is released during high attendance periods (Litman, 1998; Sochay, 1991). In particular, summer releases have been shown to positively affect demand. Summer season in the U.S. (commonly referred to as "blockbuster season") is the period during which Americans attend films the most.

In a similar approach, release dates with regards to competition have been tested in past research, defining highly competitive periods as the times when most films are released. These periods have been shown to negatively affect demand (Elberse & Eliashberg, 2003).

2.4.3. Research on preferential differences between domestic and foreign films

The effect of a film's nationality on the film audience's demand and preferences has only been touched upon in a couple of earlier studies. Wallentin (2016) discussed the preferential difference amongst the film audience with regards to domestic and foreign films. He emphasized the potential of "home country bias" in non-U.S. markets, meaning the preference of domestic films over foreign films and controlled for this by including Swedish films and American films as dummy variables in his model (Wallentin, 2016).

The same methodology was used by Fabrice Larcenaux on the French film market (Larcenaux, 2007). Similarly, Francis Lee proved that cultural differences between the importing and exporting countries of a film had an affect how on imported films are received at the box office (Lee, 2008). Simple and intuitive as the above methods may be, they only test how a film's nationality affects the dependent variable alone. They do not capture the moderating effect, or interaction effect, that a film's nationality might have on other factors that explain demand for films.

In short summation of the above outlined body of research, the studies on the demand for films has paid little attention to the Swedish market. Furthermore, little research has been dedicated to investigating how the factors affecting demand for a film might differ with respect to where a film is from. Whilst underscoring that preferences for films in general are affected by a films origin, none of the studies investigate the overall difference in audience preferences across *a series* of factors that a film's origin might affect.

2.5. Research questions

This paper adds to the current literature by empirically contributing to established knowledge with data from a much-overlooked film market. It investigates factors that affect demand for film that have not yet been researched. Furthermore, it tests how the effects of the factors that influence demand for films might differ with regards to a films origin. The research questions are as stated:

- What factors affect the demand for theatrical films in Sweden, and how?

- How do the effects of these factors change with regards to what region a film is from?

It bears mentioning that the aim of this study is not to develop forecasting tools for film performance. Even though the results in this study could be discussed as predictors or forecasting tools, the present authors do not set out to do so. The aim is merely to outline the effect a set of variables have on the demand for certain films.

3.   Theory

The present authors recognize films as experience goods, meaning consumption goods which quality cannot be fully evaluated until after the good is consumed. The film audience therefore does not know what the film is worth in terms of utility before the film is shown and the good is consumed. Thus, potential audience members will seek additional information to avoid the risk of attending a film that is not to their liking (Nelson, 1970; Chang & Ki, 2005; Wallentin, 2016).

The information search and evaluation process of an experience good before consuming it was developed into a theoretical model by Karempudi Reddy et al. (1998) who categorized the types of sources from which audience members retrieve information before deciding which Broadway show to see. The authors stated that Broadway visitors are guided by two types of observable traits: information sources, such as third-party evaluations of a show, and objective characteristics, such as price and runtime (Reddy et al., 1998).

This model was later developed by Byeng-Hee Chang and Eyun-Jung Ki (2005) with respect to films. They added two new categories to the model; brand-related factors and distribution-related factors. Brand-related factors capture the traits of a film that are subjective, such as the talent of actors, and are therefore separated from a film's objective features, such as price or genre. Distribution-related factors was added as a fourth category to capture factors that measure the strategies and market power of distributors (Chang & Ki, 2005). The model including the variables used by Chang and Ki is summarized below in Figure 1.

Figure 1. Conceptual model by Chang and Ki
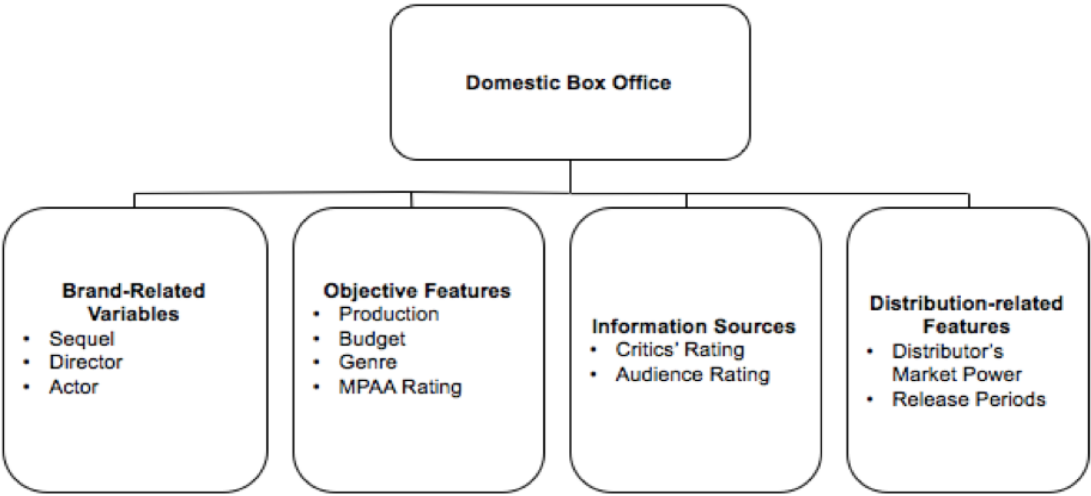
4. Method

What factors affect the demand for films in Sweden, and how?
In keeping with tradition, the present authors set out to investigate the factors that affect demand for films in Sweden using ordinary least squares models. This method is chosen due to its simplicity and easily interpreted results when the aim is to evaluate the effects of a set of independent variables against a dependent variable.

The main approach with regards to this method is to evaluate the independent variables' significance and effect on demand in the resulting multiple regression model[2]. However, since most of the independent variables assessed in this study are categorical, F-tests are done to assess if the variable categories are jointly significant in explaining demand. Unlike previous efforts in the empirical literature, the categorical variables will only be treated as significant if the variable categories are jointly significant. Since earlier studies have found signs of heteroscedasticity[3], the model is developed with robust standard errors.

This model that is developed on the entire data sample is referred to as the global model.

How do these factors change with regards to what region a film is from?
The present authors test if the effects of the explanatory variables vary depending on a film's regional origin, or that there in other words exists an interaction effect between a film's regional origin and other factors that explain demand. To test this, three multiple regressions are developed with regards to three samples of the entire sample of films: Swedish films, Anglo Saxon films and films from other countries (non-Swedish and non-Anglo Saxon). These three models provide an intuitive framework for comparing the differences between what factors affect demand for Swedish and foreign films as it allows for a discussion on how the significance and effects of the independent variables differ between the models.

The models that are developed on these three samples are referred to as regional models.

In order to test whether the differences between the regional models are statistically significant, F-tests are done to test the difference between the model developed on the entire sample, which controls for region with a categorical variable, and a model in which said variable is interacted with all other independent variables. If the coefficients of the independent variables differ significantly between the regional models, the model with interaction coefficients between the region variable and all the other independent

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[2] The significance level is set at 5 percent.
[3] Non-constant variance: $Variance\ (u_i;\ x_i \dots x_k) \neq \sigma^2$

variables will be significantly different from the model without these interaction coefficients in the F-test (Wooldridge, 2009).

Furthermore, to test whether there are significant differences between specific variables in the regional models, F-tests are done assessing the difference between the model with region interacting with all the independent variables and models in which one of the interactions between region and an independent variable are removed. If, for example, the effect of genre differs significantly depending on what region a film is from, then the model without region interacting with genre should differ significantly from the model that includes that interaction effect, as well as the interaction effect with all the other explanatory variables.

The rationale behind dividing the sample of foreign films (i.e. non-Swedish films) into two different categories, Anglo Saxon films and films from other countries, is that Anglo Saxon films are interesting to assess and contrast with Swedish films separately. The Swedish Film Institute use this regional categorization as a basis for some of their film funding decisions, since the strong position that Anglo Saxon films in general hold in the Swedish film market make them less warranted funding in relation to films from other, one might say less popular, countries. In short, since the overall aim of this study is to understand the demand for film, it is deemed to be of interest to separately assess the demand for Anglo Saxon films since they appear to have a particular grasp of the Swedish film audience.

These three regional models were not developed with robust standard errors since the number of observations in some of the variable categories in these models were too few to make this possible.

4.1. Data

This study is conducted on all the feature length films (i.e. not short films) that have been screened at Swedish cinemas from 2012 through 2016.[4] As a whole, this data set contains 1 293 films. The sample of Swedish films contains 231 titles. The sample of Anglo Saxon films contains 671 titles, and includes films from the United States, the United Kingdom, Australia and New Zealand. The sample of films from other countries contains 391 titles, and includes films from all other countries that are not in the Swedish and Anglo-Saxon samples, a total of 53 countries (see attachment 2 in appendix).

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[4] The Swedish Film Institute defines feature films as films with a runtime longer than 60 minutes.

The data has been provided with generous support from the Swedish Film Institute. The Swedish Film Institute was until 2017 nationally responsible for the collection and administration of all cinema admission statistics from Swedish cinemas. The Swedish Film Institute is also editorially responsible for the Swedish Film Database which provides production and title related information utilized for the independent variables in this study. All in all, The Swedish Film Institute serves as a uniform and reliable source of data. In only a few instances that will be discussed below have the present authors complemented with data from other sources.

4.2. Variables

Figure 2. Conceptual model in this study
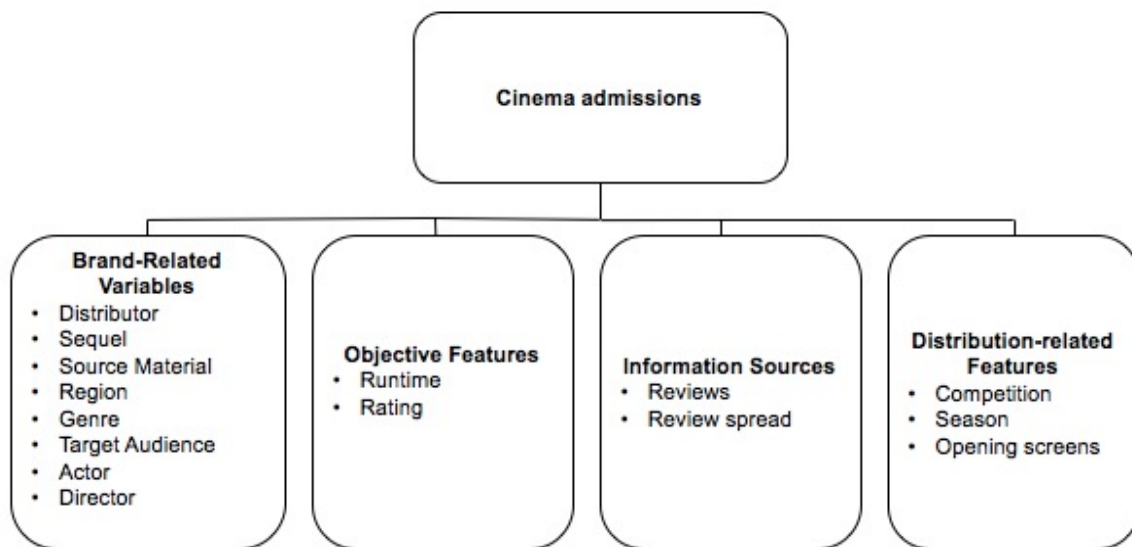
Working with the definition of films as experience goods, this study adopts the framework suggested by Chang and Ki (2005) for categorizing independent variables with regards to the film audience's assumed perception of these variables in their pre-purchase decision making process. The independent variables are categorized into brand-related variables, objective features, information sources and distribution-related factors. See Figure 2 above. This study however slightly revises the framework by suggesting that some variables should not be categorized according to Chang and Ki's framework, which will be developed below. Furthermore, this study adds to the framework explanatory variables that were not tested by Chang and Ki.

This study concerns explanatory variables that can come to the film audience's attention before or on the day of a film's premiere. It is in other word not limited to production or pre-production-related variables but also includes variables that concern its distribution. The effects of the variables that concern (and can be altered before) a film's production,

such as genre, actor and director, are therefore assumed to be of interest to producers, whereas variables that concern its distribution, such as release dates and openings screens, are of relevance to distributors.

4.2.1. Dependent variable

The dependent variable in this study is intended to measure demand for film. In earlier research, this has mostly been measured with aggregated ticket sales, commonly referred to as "box office" for short. The dependent variable in this study, however, is total cinema admissions. The established industry metric of how well a film does in the Swedish film industry is cinema admissions, rather than box office numbers. It should be noted that the only practical implication of using cinema admissions instead of box office numbers is that it spares the present authors the effort of adjusting for inflation over time, as aforementioned, the correlation between the cinema admissions and inflation adjust ticket sales is close to one (Wallentin, 2016).

Total cinema admissions refer to all the admissions to a particular film during its entire theatrical run. As such, admissions to films that premiered in the later part of 2016 have been adjusted as to include admissions in 2017.

An important feature of cinema admissions is its skewed distribution which is evident in the difference between the mean and the median (see attachment 3 in appendix). In plain terms, the Swedish film industry is characterized by a small amount of very successful films while the average film receives relatively few admissions. This feature has been commented upon in earlier studies which state that box office revenue is not normally distributed. As such, forecasting methods based on OLS assumptions are expected to lack precision. Some earlier studies have therefore opted to use the logarithm of cinema admission or box office revenue as the dependent variable (De Vany & Walls, 1999; Wallentin, 2016; Elliott & Simmons, 2008). As such, the present authors have determined *a priori* to use the logarithm of cinema admissions as the dependent variable to satisfy OLS assumptions (see attachment 4 in appendix).

4.2.2. Independent variables

Fifteen independent variables have been selected for this study, twelve of which have been tested in earlier studies whereas three have not. The inclusion and categorization of all the independent variables in this study have been decided *a priori,* as to avoid p-hacking.

Brand-related variables
This variable category includes factors that relate to the film's brand as perceived by the film audience.

Distributor

As detailed earlier, distributors have been included in earlier studies as an indicator of marketing budget and market strategy: The overall capacity to distribute a film in a competitive landscape. These factors are important, but are however in this study measured with other variables that will be detailed further on. What is less oft discussed regarding distributors is the role they can have in the extended brand of a film.

Whilst acknowledging that distributors do not promote and release perfectly homogenous goods, they are in this study assumed to indicate to the audience what type of film they release. As an example, Litman (1983) argued that big and established distributors typically release bigger, accessible films. Similarly, Wallentin (2016) reasoned that large distributors of independent films in Sweden, such as Folkets Bio, work with a relatively homogenous set of films. A film audience's familiarity with a distributor (or lack thereof) is thus expected to affect the perceptions and expectations of the film they release.

To measure this effect, distributors are included as a categorical variable with three categories: Major distributors, major independent distributors and minor distributors. This categorization is made in line with the categorization of film distributors made by the Swedish Film Institute (see attachment 5 in appendix).

The baseline category of this variable is minor distributors. The effect of major and major independent distributors on the demand for films is thus assessed in relative terms to small distributors that most audience members are not expected to be very familiar with.

Sequel

With sequel films, this study refers to films that are a continuation of the narrative in one or several preceding films. Previous studies have also treated films that are based on some form of source material, for example a book or TV-show, as sequels. However, the present authors argue that there are some important distinctions between these two types of films.

Sequel films are, as mentioned, part of a longer narrative that stretches over several films, and usually employs the same actors and directors as their preceding films, whereas films and their respective source materials may not share these aspects. The preceding film of a sequel film is thus expected to constitute an important part of the sequel film's brand and is assumed to serve as a particularly rich and influential reference point in the audience's decision-making process.

This variable is treated as a dummy variable in the models, and the classification has in part been done based on the source material categories from the Swedish Film Institute. The distinction of whether or not a film is a narrative continuation of preceding films has

however in some cases not been entirely clear-cut. In such cases the present authors have consulted the expertise of analysts at the Swedish Film Institute.

Source material

The source material is assumed to be a part of a film audience's familiarity with a film or of a film's brand. This study is the first to evaluate the effect source material has on demand. It is deemed to be of interest not only to evaluate whether source material in general has an effect on the demand for a film, but also what type of source material. Is a film based on a book more popular than a film based on a TV-series?

Thanks to the rigorous categorization of different types of source materials done by the Swedish Film Institute, the present authors are able to employ this variable as a categorical variable with eight mutually exclusive categories: Original script, fictional characters, past films of which the film is a remake, famous person or event, literary source material, plays, comic books and TV-series (see attachment 6 in appendix). Original script, i.e. films that are not based on any form of source material, is used as the baseline category.

Genre

In the conceptual model by Chang and Ki (2005), genre is considered an objective feature of a film. The present authors, however, argue that it should rather be considered a brand-related variable. Genre classifications often differ between different sources, and sometimes filmmakers do not explicitly state which genre a film belongs to. Therefore, the present authors do not consider this to be an objective feature of a film, but rather a part of a film's brand.

This study employs genre as a categorical variable with fourteen variable categories, in accordance with the mutually exclusive genre classifications from the Swedish Film Institute: Drama, documentary, action, biographical, fantasy, historic, comedy, crime, romance, science fiction, horror, thriller, adventure and other (see attachment 7 in appendix). The latter category combines films that are classified by the Swedish Film Institute as sport, musical, music/dance and nature. Since these genre categories were not attributed to a large enough amount of films on the sample, the present authors opted to combine them into a separate category. Drama is treated as the baseline category in this variable.

Target Audience

A film's target audience has not been included as a variable in previous literature. The present authors however argue that this variable is an interesting inclusion as it serves as a complement to, for example, genre, as films of a specific genre could be intended for various audiences.

Information regarding target audience is obtained from the Swedish Film Institute who categorize films with respect to different target audiences based on the content of the film itself as well as the film's marketing material (see attachment 8 in appendix). The variable is treated as a categorical variable with four categories: Adults, teenagers, children and families, whereas adults is treated as the baseline category for this variable.

Actor

The presence of well-known actors in a film is an often-emphasized part of a films brand. Chang and Ki (2005) refer to the presence of actors as ingredient branding, as actors can be considered components that add to the brand equity of the film. The present authors side with this notion and expect the level of fame of an actor in a film will have a positive effect on demand.

Most studies use dummy variables for the presence of famous actors in the cast of a film (Litman & Kohl, 1989; Sochay, 1994; Holbrook 1999). This study, however, suggests a more accurate measure. The level of fame of an actor is measured by the amount of films in which the actor has received an acting credit up to and including year during which the film is released. The amount of productions in which an actor has previously received an acting credit is thus assumed to have a cumulative effect on the fame of said actor. This variable is treated as a continuous variable with an expected positive effect on demand.

Director

The presence and level of fame of directors is for all intents and purposes theorized and treated in the same manner as with actors in this study. The level of fame of directors is thus measured by the amount of films which the directors has directed up to and including the year during which the film of interest is released. The variable is treated as a continuous variable with an expected positive effect on demand.

Region

Region is included as an independent variable in the global model to assess the direct effect a film's regional origin has on the demand for film. In other words, this variable is employed as a categorical variable in the model estimated on all of the films in the sample, with the categories Swedish films, Anglo Saxon films and films from other countries (see attachment 2 in appendix). The latter category is treated as the baseline variable.

The region of origin is expected to influence the audience's perception of the film in the same manner as the type of distributor or source material and is therefore considered to be a brand related variable.

Objective features
This variable category refers to the objective features of a film. In other words, these are the codified characteristics of a film that do not leave much room for interpretation for the film audience.

Runtime
Runtime refers to the length of a film, which in this study is treated as a continuous variable measured in the length of a film in minutes.

Age limit
A film's age limit is included as a categorical variable that is categorized in accordance with the ratings done by the Swedish Media Council, the Swedish government agency tasked with classifying films for public screenings. The variable categories are all ages, up to 7 years, up to 11 years, up to 15 years, and not rated. The variable category not rated is treated as the baseline category in this variable.

The attentive reader may think that a film's age limit may correspond to its target audience. The present authors would however like to emphasize that age limits narrow or widen the potential audience, whereas target audience rather captures what age group a film might appeal to.

Distribution related-factors
This variable category contains variables that capture the strategies and market power of distributors, in the sense that their strategies and marketing apparatuses affect demand in a competitive landscape.

Competition
Many previous studies have studied the effect of rivalry and competition on demand for films, however with differing approaches and measurements. This study suggests a fairly straight-forward approach. The films in the sample have been divided into three categories, "high competition", "medium competition" and "low competition", depending on their month of release. Films in the category "high competition" are released in one of the four months that have had the highest number of film releases from 2000 through 2011, films in the category "low competition" are released in one of the four months that have had the lowest number of film releases over the same period. Films in the category "medium competition" are released in one of the remaining four months (see attachment 9 in appendix). The variable category "medium competition" is treated as the baseline category for this variable.

Seasons

Aggregate demand seasonality has been of interest in many earlier studies. The categorization of different seasons is usually done with respect to national holidays and summer. This study, however, suggest another categorization method, for a number of reasons. The trend of an increased amount of cinema admissions during summer time does not apply to Sweden (Swedish Film Institute, 2016). Furthermore, some school vacations in Sweden occur during different weeks depending on the region which complicates the release date categorizations for screenings that occur around the entire country.

Therefore, this study suggests a categorization along the lines of the one used for competition. The films in the sample have been divided into three categories, "high season", "medium season" and "low season", depending on their month of release. Films in the category "high season" are released in one of the four months that have had the highest aggregate number of cinema admissions from 2000 through 2011. Films in the category "low season" are released in one of the four months that have had the lowest number of aggregate number of cinema admissions in the same period. Lastly, films in the category "medium season" are released in one of the remaining four months (see attachment 10 in appendix). The variable category "medium season" is treated as the baseline category for this variable.

Number of screens on opening day

An important and often studied measure of the market power of a distributor and launch strategy of a film is marketing expenses. Information regarding the marketing expenses relating to specific titles has, however, not been obtainable for all the films in this study's sample. However, a suggested approximate for marketing expenses is the number of opening screens, meaning the number of salons in which a film is screened on the day of its premiere. The number of opening screens has been proven to positively correlate with marketing expenses since it captures a distributor's financial effort in the launch of a film (Larcenaux, 2007). As such, the present authors include number of screens on opening day as a continuous variable in the models.

Information sources

This variable category includes factors that relate to the film audience's information gathering from third party sources in their pre-purchase evaluation of a film.

Reviews

The present authors resort to what is considered in the Swedish film industry as the standard measure of a film's critical reception, namely the review index compiled by the Swedish Film Institute. The Swedish Film Institute collects and averages the reviews

from ten Swedish sources: Dagens Nyheter, Svenska Dagbladet, Göteborgs-Posten, Sydsvenskan, Aftonbladet, Expressen, SVT Kulturnyheterna, Nyhetsmorgon, SR Kulturnytt, Filmtopp, Moviezine, SR P4 Björns Filmguide, Västerbottens-Kuriren and Nöjesguiden. This is done for all theatrically released films in Sweden. Films that receive reviews from five or more of the above sources are included in the index and receive an average review score with zero as the lowest score and five as the highest score. All the review sources above post their reviews before or on the day of a film's theatrical release.

This review index is included as a categorical variable with six variable categories: "very low", "low", "medium", "high", "very high", for films that receive an average score of 0-1, 1-2, 2-3, 3-4, 4-5, respectively. Films that are not included in the index are categorized as "not reviewed". This latter variable category is treated as the baseline category for this variable.

Difference between highest and lowest review

Thanks to the rigorous collection of specific reviews done by the Swedish Film Institute, this study also includes a review-related variable previously overlooked in research, namely the difference between the highest and lowest review. This variable is an interesting measure of the degree of unity in the critics' reviews of a film.

The present authors make no *a priori* assumption as to whether a higher unity amongst the critics negatively or positively affects demand. It could be theorized that a higher degree of unity amongst reviewers positively affects demand since it sends a clear signal to the film audience regarding the apparent quality of a film. However, this signal could be both positive and negative, since reviewers can be unison both in their appraisal as well as harsh critique. It could rather be assumed that a large disparity amongst critics could contribute to a larger general discussion of a film, which could evoke interest amongst audience members.

This latter point is the reason that the unity or disparity amongst critics is measured with the difference between the highest and lowest review, as opposed to the standard deviation of the reviews. The present authors recognize the fact that a single deviating review may receive quite a lot of traction in the discussion of a film's quality even though it may not affect the standard deviation to a large extent.

This variable is included as a categorical variable with six variable categories: "very low, "low", "medium", "high" and "unison" for films of which the highest and lowest reviews differ with 1, 2, 3, 4 index points respectively, or not at all. Films that are not included in the index are categorized as "not reviewed". This latter variable category is treated as the baseline category for this variable.

Omitted variables

There are some variables that have received quite a lot of attention in previous studies that have not been included for reasons that will be detailed below.

Production budget

Reliable information regarding production budget from the Swedish Film Institute has only been obtainable for Swedish films. As for foreign films, many earlier studies have collected information regarding production budget IMDb.com[5]. However, the quality of said information has been discussed by earlier researchers since it comes from various different third-party sources and to a large extent is based on estimates from industry analysts (Chang and Ki, 2005). Due to these restrictions, this variable is not included in this study.

It should be noted that many of the variables that are included in the study, particularly the presence of famous actors and directors and the number of opening screens, are likely to partially capture the effect of this variable, since a high production budget usually translates into a wide release and the casting of famous actors (Prag & Casavant, 1994).

Awards and nominations

The effect of film awards as well as nominations to film awards has received a lot of attention in previous literature. However, the present authors would like to note that domestic films in almost every case receive awards long after they have premiered. In other words, the effect an award has on cinema admissions is, at least when discussing domestic films, only possible for *ex-post* evaluations of what affects the demand for a film which is beyond the scope of this study.

Word of mouth effects

Despite the aforementioned interest in how the discussion revolving a film affects demand it remains rather unclear as to what is deemed a suitable methodology to measure word of mouth effects. Some earlier studies have resorted to collecting data from peer to peer review sites (Austin, 1983; De Vany & Lee, 2001; Basuroy et al., 2004). This, however, mainly concerns word of mouth after a films initial release. For this reason, this effect is not measured in this study, however the present authors recognize its importance.

4.3. Limitations

The present authors would like to raise a couple of issues about the above outlined methodology and variables with regards to validity and reliability as to provide the

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[5] The Internet Movie Database, website.

interested reader with sufficient information for their interpretation, and potential replication, of this study.

4.3.1. Validity

A couple of assumptions regarding the expected effect of some of the variables ought to be discussed. When it comes to distributors, the present authors support the assumption that they signal to the film audience what type of film they distribute, and as such function as a part of a films overall brand. However, readers should note that this variable may also capture the effect distributors have on demand in terms of marketing effort and launch strategies.

As for the variables measuring the effect of competition and demand seasonality, the attentive reader may suspect the corresponding categories in the two variables to be the same. Or in other words that competitive seasons are likely to correlate with a general spike in demand. However, as detailed in attachment 9 and 10 in appendix, there is a surprisingly low degree of overlap between months featuring, for example, high demand and high competitiveness. Therefore, the present authors do not suspect a high degree of correlation between these two variables.

As for the number of opening screens, this variable could be assumed to reflect a distributor's own assessment and predictions of how well a film will do. A film would not be released wide if not backed up by the belief that a wide, expensive release would be worthwhile. It is likely that distributors factor in genre, the presence of famous actors or directors, and other explanatory variables tested in this study, in this assessment. The present authors therefore suspect that the number of opening screens might capture the effect of other explanatory variables in the models.

4.3.2. Reliability

An overall note of precaution on the statistical significance of the independent variables should be made with regards to the large number of variables tested in this study. The high number of variables increases the risk for false positive errors, meaning the risk of finding a variable statistically significant even if it does not hold an explanatory value. For this reason, the present authors have set stricter demands on the significance level of this study in comparison to the previous body of research. The significance level is for this reason set at 5 percent and with a requirement of joint significance in the categorical variables.

An issue that concerns most of the categorical variables in this study is that they are categorized by the Swedish Film Institute, a source of information not used by other researchers in this field. The present authors have included material that provides the reader with information regarding how said categorization is done. It is at same time

important to stress that the results with regards to specific variable categories, such as genres, may not be entirely comparable with results from other studies. This particularly goes for the cases in which the present authors have consulted the expertise of analysts at the Swedish Film Institute in the variable categorizations. This certainly makes replications of this study more complicated, and the present authors recognize this fault.

For the same reason, it bears mentioning that rating systems for age limits vary across countries. Since most studies in this field are done with data from the American market for film, ratings are traditionally categorized in accordance with the ratings from the Motion Picture Association of America. As such, the results relating to the age limit variable in this study may not be entirely comparable with results in other studies.

Lastly, it should be noted that the average number of opening screens have in general increased due to the digitalization of Swedish cinemas. Over the past seven-year period, the average number of opening screens has increased by 30 percent (Ekwall, 2017). This poses a problem as the average number of opening screens has, ceteris paribus, increased over time rather than remaining constant. This might cause a potential heteroscedasticity error in this parameter which the reader should keep in mind when looking at the results from regional models that are not tested with robust standard errors.

4.4.   Model specifications

The four models tested in this study are specified below. Attachment 11 in appendix includes descriptive statistics for each variable and variable category in all the models.

Global model

$Log(Cinema\_Admissions)_i = \beta_0 + \beta_1 \text{Source\_Material}_i + \beta_2 \text{Sequel}_i + \beta_3 \text{Runtime}_i + \beta_4 \text{Reviews}_i + \beta_5 \text{Review\_Spread}_i + \beta_6 \text{Genre}_i + \beta_7 \text{Target\_Audience}_i + \beta_8 \text{Seasons}_i + \beta_9 \text{Competition}_i + \beta_{10} \text{Opening\_Screens}_i + \beta_{11} \text{Distributor}_i + \beta_{12} \text{Age\_Limit} + \beta_{13} \text{Actor}_i + \beta_{14} \text{Director}_i + \beta_{15} \text{Region} + u_i$

Swedish model

$Log(Cinema\_Admissions\_Sweden)_i = \beta_0 + \beta_1 \text{Source\_Material}_i + \beta_2 \text{Sequel}_i + \beta_3 \text{Runtime}_i + \beta_4 \text{Reviews}_i + \beta_5 \text{Review\_Spread}_i + \beta_6 \text{Genre}_i + \beta_7 \text{Target\_Audience}_i + \beta_8 \text{Seasons}_i + \beta_9 \text{Competition}_i + \beta_{10} \text{Opening\_Screens}_i + \beta_{11} \text{Distributor}_i + \beta_{12} \text{Age\_Limit} + \beta_{13} \text{Actor}_i + \beta_{14} \text{Director}_i + u_i$

Anglo Saxon model

$Log(Cinema\_Admissions\_Anglosaxon)_i = \beta_0 + \beta_1 \text{Source\_Material}_i + \beta_2 \text{Sequel}_i + \beta_3 \text{Runtime}_i + \beta_4 \text{Reviews}_i + \beta_5 \text{Review\_Spread}_i + \beta_6 \text{Genre}_i + \beta_7 \text{Target\_Audience}_i + \beta_8$

Seasons$_i$ + β_9 Competition$_i$ + β_{10} Opening_Screens$_i$ + β_{11} Distributor$_i$ + β_{12} Age_Limit +β_{13} Actor$_i$ + β_{14} Director$_i$ + u_i

Model for other countries

Log(Cinema_Admissions_Other)$_i$ = β_0 + β_1 Source_Material$_i$ + β_2 Sequel$_i$ + β_3 Runtime$_i$ + β_4Reviews$_i$ + β_5 Review_Spread$_i$ + β_6 Genre$_i$ + β_7 Target_Audience$_i$ + β_8 Seasons$_i$ + β_9 Competition$_i$ + β_{10} Opening_Screens$_i$ + β_{11} Distributor$_i$ + β_{12} Age_Limit +β_{13} Actor$_i$ + β_{14} Director$_i$ + u_i

5.   Empirical Results

5.1.   What factors affect demand for films in Sweden, and how?

Table 2. Determinants of cinema admissions (2012-2016)

Explanatory variables	Global		Anglo-Saxon		Swedish		Other	
	Coeff.	P	Coeff.	P	Coeff.	P	Coeff.	P
Intercept	4.68	.000***	4.64	.000***	3.90	.000***	4.95	.000***
f(Source Material)		0.008**		0.089		0.316		0.881
Source Material: Fictional characters	0.20	0.296	0.09	0.670	0.15	0.801	0.21	.700
Source Material: Remake	0.01	0.979	-0.19	0.430	1.13	0.355	0.30	0.576
Source Material: Famous person/event	0.59	0.007**	0.52	0.029*	1.01	0.010*	0.39	0.364
Source Material: Literary	0.28	0.003**	0.28	0.028*	0.15	0.592	0.22	0.220
Source Material: Play	0.19	0.417	0.63	0.108	-0.31	0.661	-0.17	0.592
Source Material: Comic books	-0.08	0.682	-0.18	0.510	-0.21	0.864	0.07	0.877
Source Material: TV-series	0.29	0.091	0.18	0.549	0.26	0.686	0.68	0.480
Sequel	0.29	0.018*	0.20	0.173	0.11	0.795	1.06	0.014*
Runtime	0.01	0.003**	0.01	0.014*	0.01	0.070	0.01	0.030*
f(Reviews)		.000***		.000***		.000***		.000***
Reviews: Very High	3.40	.000***	3.00	.000***	3.90	.000***	2.88	.000***
Reviews: High	2.10	.000***	1.87	.000***	2.31	.000***	1.86	.000***
Reviews: Medium	1.83	.000***	1.69	.000***	1.99	.000***	1.40	.000***
Reviews: Low	1.97	.000***	1.86.	000***	2.05	.000***	1.39	0.002**
Reviews: Very Low	1.72	0.021*	1.71	0.012*	1.98	0.116	0.05	0.972
f(Review Spread)		0.105		0.083		0.784		0.303
Review Spread: Unison	-0.24	0.487	0.15	0.748	0.47	0.445	-0.67	0.195
Review Spread: High	-0.37	0.267	0.13	0.825	0.06	0.950	-0.59	0.305
Review Spread: Medium	0.16	0.493	0.71	0.132	-0.41	0.185	-0.03	0.957
Review Spread: Low	0.13	0.548	0.64	0.169	-0.23	0.605	0.02	0.961
Review Spread: Very Low	-0.03	0.899	0.37	0.418	-0.19	0.605	-0.07	0.879
f(Genre)		.000***		.000***		0.594		0.104
Genre: Action	0.29	0.134	0.23	0.255	0.50	0.423	-0.05	0.886
Genre: Adventure	0.16	0.512	0.21	0.434	0.19	0.793	0.15	0.742
Genre: Biographical	-0.22	0.333	-0.12	0.715	-0.07	0.957	-0.41	0.314
Genre: Documentary	-0.32	0.018*	-0.63	0.014*	0.07	0.778	-0.32	0.180
Genre: Fantasy	-0.22	0.395	-0.26	0.394	-0.37	0.767	0.30	0.566
Genre: Historic	0.46	0.046*	-0.09	0.805	N/A	N/A	0.83	0.004**
Genre: Comedy	0.23	0.072	0.22	0.181	0.31	0.349	0.29	0.197
Genre: Crime	0.19	0.321	0.60	0.106	0.20	0.707	-0.33	0.462
Genre: Romance	0.48	0.068	0.49	0.302	1.49	0.214	0.41	0.321
Genre: Science Fiction	0.09	0.068	0.19	0.465	0.62	0.606	-1.13	0.046*
Genre: Horror	1.00	.000***	1.24	.000***	-1.31	0.035*	0.07	0.925
Genre: Thriller	0.36	0.050*	0.49	0.045*	-0.38	0.426	0.93	0.104
Genre: Other	0.15	0.566	0.30	0.371	-0.13	0.932	-0.00	0.995
f(Target Audience)		0.205		0.138		0.586		0.330
Target Audience: Children	0.23	0.217	0.52	0.021*	0.36	0.389	-0.51	0.152
Target Audience: Family	-0.04	0.868	0.07	0.854	-0.95	0.268	0.07	0.865
Target Audience: Teen	-0.20	0.152	-0.12	0.452	-0.25	0.401	-0.41	0.202

	Coef	p	Coef	p	Coef	p	Coef	p
f(Season)		0.001***		0.004**		0.155		0.630
Season: High	-0.27	0.007**	-0.30	0.030*	-0.43	0.072	-0.24	0.201
Season: Low	-0.11	0.188	-0.03	0.787	-0.50	0.031*	-0.09	0.581
f(Competition)		0.097		0.125		0.672		0.343
Competition: High	-0.13	0.173	-0.06	0.674	-0.34	0.127	-0.20	0.275
Competition: Low	-0.14	0.220	0.02	0.882	-0.08	0.775	-0.53	0.017*
Opening Screens	0.02	.000***	0.02	.000***	0.01	.000***	0.04	.000***
f(Distributor)		0.011*		0.981		.000***		0.599
Distributor: Major	0.53	0.002**	-0.00	0.990	1.71	.000***	0.23	0.382
Distributor: Major independent	0.32	0.031*	0.03	0.909	0.81	0.002**	0.08	0.655
f(Age Limit)		.000***		0.047*		0.027*		0.022*
Age Limit: No limit	0.61	.000***	0.51	0.007**	0.67	0.008**	0.720	.005**
Age Limit: Age of 7	0.48	.001***	0.31	0.010	0.80	0.005**	0.44	0.104
Age Limit: Age of 11	0.38	0.001***	0.41	0.007**	0.47	0.099**	0.33	0.120
Age Limit: Age of 15	0.32	0.010*	0.37	0.037*	0.65	0.085	-0.28	0.447
Director	0.02	0.011*	0.01	0.097	0.00	0.849	0.05	0.008**
Actor	0.00	0.119	0.00	0.891	0.02	0.417	0.01	0.373
f(Region)		0.821		N/A		N/A		N/A
Region: Anglo-Saxon	0.04	0.658	N/A	N/A	N/A	N/A	N/A	N/A
Region: Sweden	-0.01	0.924	N/A	N/A	N/A	N/A	N/A	N/A
R2	0.74		0.72		0.87		0.61	
Adjusted R2	0.73		0.71		0.84		0.56	
F	69(50;1242)		34.34(48;622)		26.98(47;183)		11.34(48;342)	
P>F	.000		.000		.000		.000	

Note: Robust standard errors in global model. Variables indicated by a f operator are the sum of the variable over all categories, tested as an F statistic for joint significance.

Significance codes: $p<0.001$ ***; $p<0.01$ **; $p<0.05$*

The results from the global regression, i.e. the factors that affect demand for film in general, are presented in Table 2. Given the model's low p-value, it is safe to say that the global regression significantly explains cinema admissions. The model has a high explanatory value with an R2-value of 74 percent, which concludes that the variables explain a large part of the variance in cinema admissions in Sweden. Three of the five continuous variables are significant and six out of the ten categorical variables are jointly significant.

The effect of source material on cinema admissions is tested for the first time and is found to significantly affect cinema admissions in Sweden. Films based on famous persons or events and literary source material increase cinema admissions with 59 and 28 percent respectively, relative to films based on original scripts. This study's other two new additions to this field of research, the effect of target audience and difference between the highest and lowest review, did however not yield any significant effect on demand.

In line with previous research, sequels, the length of a film and the number of opening screens have a significant and positive effect on demand. The significant results regarding reviews, age limit and distributors are also in line with established knowledge; films in Sweden with high reviews, low age limits that are released by big distributors are slated

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to receive more admissions than their contraries. Opening screens, reviews and age limit hold remarkably high significance levels and thus prove to most reliably effect demand.

Genre also has a significant effect on cinema admissions. In relation to the genre drama, horror films, historic films and thrillers increase cinema admissions with 100 percent, 46 percent and 36 percent respectively. Documentaries, however, decreases cinema admissions with 32 percent. Horror has been shown to increase demand in earlier studies. Comparing results are however difficult since the use of baseline variables vary to some extent in earlier studies. It should be noted that the fact that most variables are positive relative to drama is in line with earlier research which has found drama negatively affecting film performance.

Releasing a film during seasons of high aggregated demand proves to significantly affect demand negatively, contrary to results in earlier studies and the hypothesis of the present authors. Furthermore, the level of fame of directors positively affects demand for film in Sweden.

5.2.   How do these factors change with regards to what region a film is from?

When looking at the differences between the models estimated on regional samples a first noteworthy difference is between the R^2-values which range between 87 percent and 61 percent. This suggest that the overall differences between how the models explain cinema admissions are substantial. The high R^2-value in the model developed on Swedish films is particularly noteworthy. All models significantly explain cinema admissions. It should be noted that the differences in sample sizes between the models play an important role in affecting their respective statistical power (see attachment 11 in appendix for descriptive statistics).

The Anglo Saxon model holds six jointly significant variables, whereas the Swedish model and the model developed on other films hold four and six jointly significant variables respectively. The sequel and director variables are only significant in the model developed on other films. Genre and season are only significant in the model developed on Anglo Saxon films. Type of distributor is only significant in the Swedish model. The length of a film significantly explains cinema admissions in the Anglo Saxon model and the model developed on other films, however not in the Swedish model. Reviews, number of openings screens and age limit are significant in all the regional models, which is consistent with the high significance level of these variables in the global model.

The results above certainly demonstrate that models explain demand with varying precision and variables. However, do the factors that explain cinema admissions themselves significantly differ? Table 3 below outlines the results from the F-tests testing

whether the interaction effect between region and all the other determinants of demand is statistically significant.

Table 3. F-test between variables interacted with region and variables not interacted with region

Explanatory variables	F-Statistic	Significance
All interactions	1.64(96;1146)	***
Source Material	0.55(14;1146)	
Sequel	2.31(2;1146)	
Runtime	0.52(2;1146)	
Reviews	0.62(10;1146)	
Review spread	0.98(10;1146)	
Genre	1.57(26;1146)	*
Target Audience	1.12(6;1146)	
Season	1.55(4;1146)	
Competition	0.64(4;1146)	
Opening screens	15.97(2;1146)	***
Distributor	3.74(4;1146)	**
Age Limit	0.71(8;1146)	
Director	2.06(2;1146)	
Actor	0.77(2;1146)	
R2 in interacted model	0.76	
Adjusted R2 in interacted model	0.75	

Note: Significance codes: $p<0.001$ ***; $p<0.01$ **; $p<0.05$*

The results show that there is a significant difference between all the determinants in the models in general. This is consistent with the varying R2-values between the models; they certainly do a different job in explaining demand for films. As for specific variables, the results above show that the effect of genre, opening screens and type of distributor significantly differs between the models, which will be discussed further below.

5.3.　Other observations

With respect to the significant results regarding the number of opening screens, the present authors have opted to further investigate the effect of said variable, *ex-post*. Attachment 13 in appendix shows that 61 percent of the variation in the number of opening screens is explained by this study's other explanatory variables. The present authors were therefore correct to assume that opening screens capture the effect of some of the other explanatory variables in this study. However, since the correlation does not exceed the conventional limit for unacceptable multicollinearity of 80 percent, the coefficients in the model can still be considered reliable.

Since this variable captures the effect of other variables in this study, it is likely that it alone explains much of the variance in cinema admissions. Attachment 14 in appendix shows that the number of opening screens accounts for 59 percent of the variance in cinema admissions. All in all, this shows that the number of opening screens is alone an important and reliable predictor of demand for film.

6.   Discussion

What do these results tell us about how the demand for films is affected by a films brand, objective features, information sources and distribution?

The results show that genre, type of distributor, the film's director and prerequisite knowledge of a film in terms of preceding films as well as source material all affect demand as part of a film's brand. Genres should intuitively send actionable signals to the film audience regarding a films character and content since it is such a well-known way of categorizing films. One could guess that most audience members have a somewhat good idea of what genres they prefer. The findings show that the film audience seem to prefer spectacle - horror, thriller and historic films - over realism, i.e. documentaries, which strengthens the notion of films as a means of escapism. Another interesting aspect of the genres found to significantly explain cinema admissions in this study is that they are all relatively homogenous in character relative to, as an example, adventure, action and biographical films, which are not found significant. The by far most significant genre category, horror, could certainly be considered homogenous. It is therefore assumable that more distinct genres more effectively signal to audience members regarding what film they are evaluating, and are thus a stronger part of a film's brand.

The findings show that the film audience's attitude towards genres differ significantly depending on where a film is from. Horror is a particularly interesting example. If a horror film is Anglo Saxon, demand for said film increases with 124 percent. However, if the horror film is Swedish, demand decreases with 131 percent; Swedish horror lessens the appeal of a film's brand, while Anglo Saxon horror increases it. Since the preferential differences between genres differ to such an extent depending on the film's regional origin, genre proves to be too broad a categorization alone. It is evidently better to discuss Anglo Saxon horror films and Swedish horror films separately, if one sets out to accurately understand the film audience's demand with regards to a film's genre.

The effect of distributors also proves to be worth considering with regards to a film's regional origin. In general, audience members prefer films from well-known distributors, i.e. major and major independent distributors. It is however evident that audience members to a much larger extent reacts positively to films released from big distributors when it comes to Swedish films. If released by a major distributor, cinema admission increases with 171 percent when it comes to Swedish films, relative to being released by a small distributor. Admissions only increase with 23 percent for other films and remain unchanged when it comes to Anglo Saxon films, if released by a major distributor. The reason for this is likely the fact that Swedish films to a larger extent are distributed by a greater variety of distributors, including less established ones (see attachment 11 in appendix). When it comes to Swedish films, there are simply a lot more films from small

distributors that established distributors effectively steer the audience members away from.

Audience members seem to veer themselves towards well-known material to avoid the uncertainty of watching something unknown. Prerequisite knowledge of a film, in the form of a preceding film or some form of source material, improves a film's brand and increases demand. Films based on famous persons or events increase demand the most, which suggests that the more well known the source material is, the more comfortable the film audience is with purchasing a ticket to that film. Films based on famous persons or events increase cinema admissions with 59 percent relative to films that are not based on any source material, whereas sequels only raise cinema admission with 29 percent. This proves that this study's separation between films based on source material and sequel films has been useful in separating these two effects.

The positive effect on demand from the level of fame of a film's directors could be argued to alleviated uncertainty in the same way. The past work of a famous director serves as an uncertainty reducing reference point in the film audience's pre-purchase evaluation of a film.

As for the objective features of a film, this study supports two main findings. The longer the film is, the higher the demand for it is. It is assumable that audience members might associate longer runtimes with spectacle and high productions budget, and therefore prefer long films. This study also finds that age limits have a negative effect on demand; the higher the age limit, the lesser people see the film, which supports the quite intuitive hypothesis that higher age limits narrows the potential audience of a film.

Information and evaluations of a film by third party sources is an important influence on the film audience's pre-purchase evaluation process. All in all, good reviews increase demand substantially. A noteworthy finding is that the effects of getting reviewed in general are very strong relative to not getting reviewed at all. This shows that reviews, the critics' positive or negative sentiment notwithstanding, are a much sought out and influential information source for the audience. Another interesting finding is that audience members seem to prefer films with low critics' scores over medium critics' scores. Films that cause strong reactions - both positive and negative - seems to evoke more interest than films than leave the critics unaffected.

Distribution related factors also influence demand. In contrast to expectations and previous research, high seasons yield a negative effect on cinema admissions. Counterintuitively, this means that films on average receive less admissions when the general demand for films is higher. A possible explanation for this is that a few films capture most of the benefit from the aggregated spikes in demand, at the expense of most

other films, which in other words suggests that high seasons resemble winner takes it all-markets.

One significant effect that merits a longer discussion is that of the number of opening screens. As an assumed approximate measure of a film's marketing budget, it proves that the overall marketing expenditure on a film efficiently attracts audience members and reliably predicts demand. The effect of opening screens differs significantly with regards to what region a film is from. If a film is shown on one additional movie screen on its opening day, cinema admissions increases by two percent for Swedish and Anglo Saxon films, whereas cinema admissions for other films increases with as much as four percent with each additional screen. One could assume that the marginal utility of one additional screen on opening day is higher amongst films from other countries, since they in general are less popular amongst the film audience (see average cinema admissions per region in descriptive statistics). In other words, for films that typically are not released to very broad audiences, a wide release sends a particularly strong signal that a film is worth watching.

However, the present authors would like to refrain from drawing conclusion regarding the precise effect opening screens have on demand since this variable has been proven to capture various other effects. It is however evident that opening screens certainly increase cinema admissions reliably.

It has also been proven that the number of opening screens alone account for large parts of the variation in cinema admissions. However, it does not account for as much as the models developed in this study. Opening screens alone only account for about 59 percent of the variance in cinema admissions, whereas the global model in this study explains 74 percent. If opening screens captures a distributor's own predictions of demand for a certain film, this study proves that there are factors that distributors fail to account for and that they could benefit from including a more systemic model with more explanatory variables, as suggested in this study.

On a concluding note, however, the present authors would like to emphasize that including more explanatory variables is not the only key to better understanding the film audience's preferences. These results show that there is a statistically supported point in dividing these explanatory models with regards to what region a film is from. This study shows preferences do in fact statistically differ between depending on a film's nationality. Furthermore, the high R2-value in the model developed on Swedish films show that models that take this interaction effect into account are more accurate. In countries were both foreign and domestic films are screened, global explanatory models paint too wide a picture.

7.　Conclusion

With regards to the first research question in this study - "What factors affect the demand for theatrical films in Sweden, and how?" - the present authors conclude that ten independent variables - source material, whether a film is a sequel, runtime, reviews, genre, demand seasonality, number of opening screens, type of distributor, age limit and director - significantly explain demand, out of which source material has been proven to significantly explain demand for the first time.

With regards to the second research question in this study - "How do the effects of these factors change with regards to what region a film is from?" - the present authors acknowledge that the film audience's preferences with regards to these factors significantly differ depending on if a film is from Sweden, Anglo Saxon countries or other countries, which for the first time in this field of research proves the moderating effect a film's regional origin has on the film audience's perception of a film.

This study hopes to reduce the uncertainty in the film industry. The results demonstrated above will hopefully serve as useful marketing tools for film producers, distributors and industry analysts as they attempt to grasp the ambiguous and unpredictable film audience. However, the results, and perhaps even more so the introduced methodology, in this study could certainly be useful in other attempts to understand audience demand in many neighboring fields that revolve around experience goods, such as the market for theatre, musicals or the restaurant business. This particularly goes for goods for which nationality, or other potential moderating factors for that matter, might have an effect on demand.

The present authors now nevertheless stand somewhat humbled by this task with regards to the yet unsolved questions of what makes a successful film. As suggested by this study, a sequel horror film based on a famous person or event, with a long runtime, very high reviews, released for all ages on hundreds of opening screens by a major distributor in between high and low season that features a famous director may very well be successful, but there is probably more to it than that. The questions discussed in this paper have puzzled scholars and industry analysts for decades, and will most likely continue to do so.

However, this study is hopefully a good long step along the way towards a greater knowledge. At the very best it might even help future filmmakers and distributors from investing millions of dollars in the next big flop. What could be more worthwhile?

8.   Appendix

Attachment 1. Cinema admissions per capita in Sweden 2006 – 2016
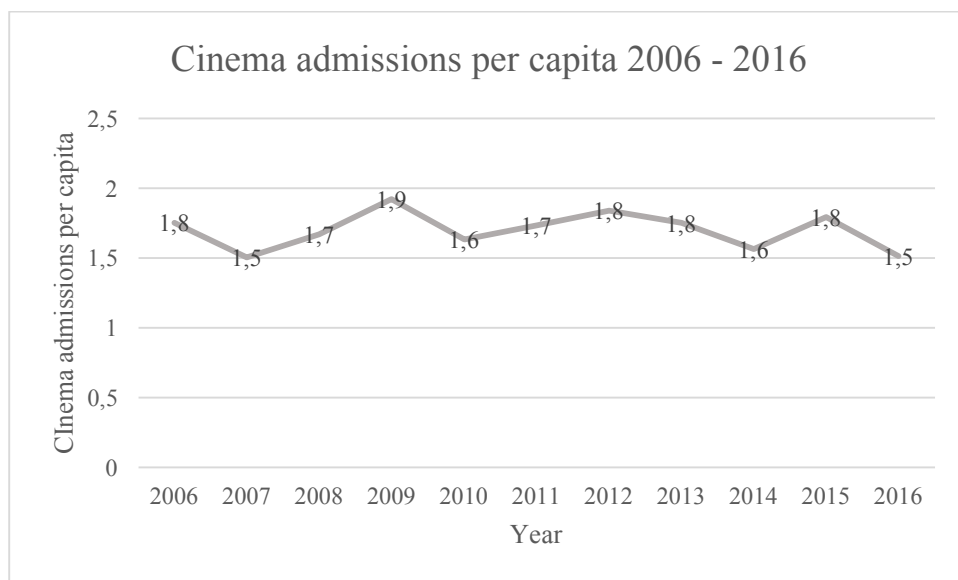
(The Swedish Film Institute, 2017)
(SCB, 2019)

Attachment 2. Summary of countries in the regional samples

Country	Sample	Number of films released 2012-2016
Afghanistan	Other countries	1
Argentina	Other countries	6
Belgium	Other countries	14
Brazil	Other countries	4
Bulgaria	Other countries	2
Chile	Other countries	5
Denmark	Other countries	18
Egypt	Other countries	2
Estonia	Other countries	2
Finland	Other countries	11
France	Other countries	132
United Arab Emirates	Other countries	2
Greece	Other countries	3
Hong Kong	Other countries	1
India	Other countries	5
Iran	Other countries	3
Ireland	Other countries	8
Iceland	Other countries	6
Israel	Other countries	5
Italy	Other countries	15
Japan	Other countries	9

Yemen	Other countries	1
Jordan	Other countries	1
Canada	Other countries	12
Kenya	Other countries	1
China	Other countries	4
Croatia	Other countries	1
Lebanon	Other countries	1
Lithuania	Other countries	1
Morocco	Other countries	1
Mexico	Other countries	5
Netherlands	Other countries	4
Norway	Other countries	19
Palestine	Other countries	5
Poland	Other countries	4
South Korea	Other countries	1
Romania	Other countries	1
Russia	Other countries	4
Saudi Arabia	Other countries	1
Switzerland	Other countries	3
Serbia	Other countries	2
Singapore	Other countries	1
Spain	Other countries	13
South Africa	Other countries	1
Taiwan	Other countries	1
Tanzania	Other countries	1
Chad	Other countries	1
Turkey	Other countries	3
Germany	Other countries	31
Ukraine	Other countries	1
Hungary	Other countries	4
Venezuela	Other countries	1
Austria	Other countries	7
Australia	Anglo Saxon	13
New Zealand	Anglo Saxon	2
Great Britain	Anglo Saxon	118
USA	Anglo Saxon	538
Sweden	Swedish	231

Attachment 3. Distribution of cinema admissions 2012 - 2016

Cinema Admissions

Mean = 64793,84
Std. Dev. = 143486,201
N = 1 293
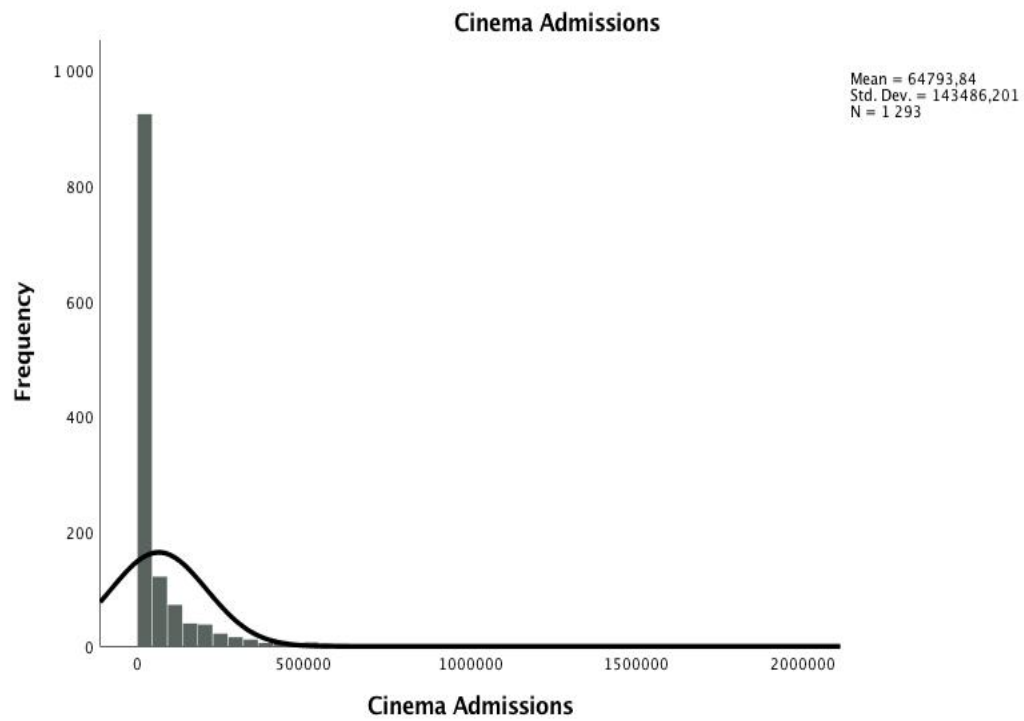
Attachment 4. Distribution of log of cinema admissions 2012 - 2016

Log of Cinema Admissions

Mean = 3,98
Std. Dev. = 1,014
N = 1 293
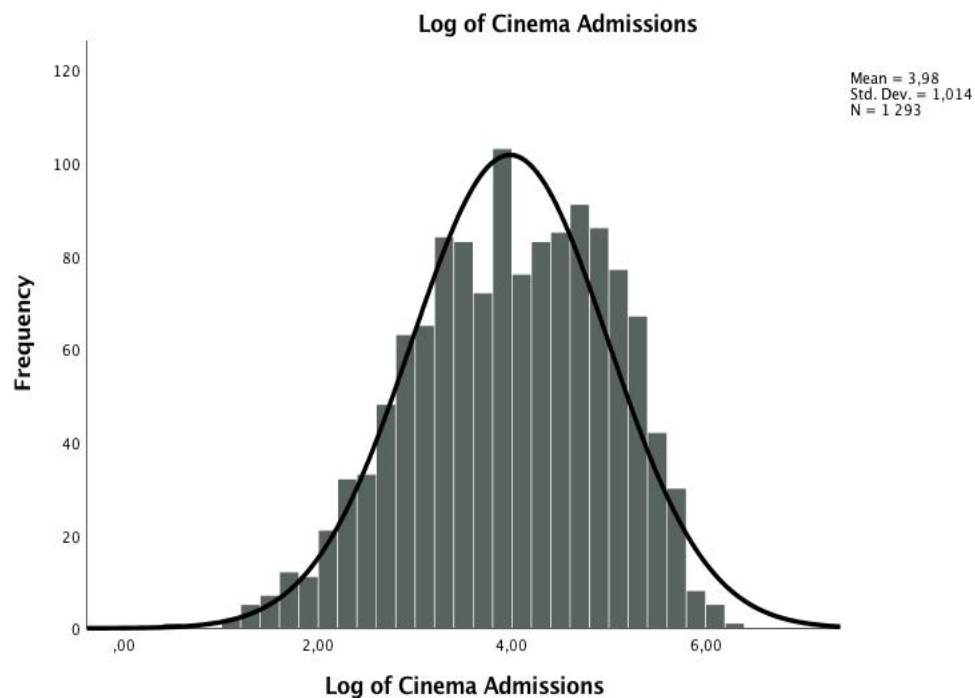
Attachment 5. Categorization of distributors

Distributor	Category	Released films	Cinema admissions
20th Century Fox	Major	80	10586663
Nordisk Film	Major	84	12229449
Paramount (UIP)	Major	38	3760684
SF Studios	Major	140	13167485
Sony (Walt Disney)	Major	81	4829398
Universal (UIP)	Major	73	8581330
Walt Disney	Major	68	14506026
Warner (Fox)	Major	54	6543882
Atlantic Film	Major independent	13	119078
Folkets Bio	Major independent	123	747829
Njutafilms	Major independent	76	154996
Noble Entertainment	Major independent	58	1877286
Nonstop Entertainment	Major independent	94	982341
Scanbox Entertainment	Major independent	81	3527879
TriArt Film AB	Major independent	85	1516430
Edge Entertainment	Major independent	18	46367
Lucky Dogs AB	Major independent	22	219532
Studio Scoop	Major independent	26	304455
Affekt Film AB	Minor	1	6242
Arab Cinema In Sweden AB	Minor	4	2951
Auto Images	Minor	1	1477
Berg Images	Minor	2	77
Biografcentralen	Minor	5	1835

Bob Film	Minor	1	156
Diagonalfilm	Minor	1	130
Ellung Media AB	Minor	1	704
Film and Tell AB	Minor	2	431
Firma Tobias Rydin, Ykky	Minor	1	27
Folkets Hus och Parker	Minor	5	3675
Garagefilm International AB	Minor	1	163
Glimmer Film	Minor	1	6423
Green Jacket Productions	Minor	1	74
Gunilla Nadler	Minor	1	266
HB Filmfilm	Minor	1	598
Hellsgård Filmproduktion	Minor	1	20
Klubb Super 8	Minor	1	104
Krapsan Produktoin	Minor	1	210
Lasse Z Produktion	Minor	1	7613
Levande Bilder i Kullavik AB	Minor	1	896
Lisbet Gabrielsson Film	Minor	1	29
Lykke Trädgård	Minor	1	164
Malin Andersson Film AB	Minor	1	474
MANTARAY FILM AB	Minor	2	914
Manus AV-produktion AB	Minor	1	626
Momento Film AB	Minor	1	289
Movieboosters AB	Minor	4	7005
Naive AB	Minor	1	62
Novemberfilm	Minor	4	3279
Nämen Produktion, Tova Kurkila Medbo	Minor	1	63
Picture Wings	Minor	1	490
Reality Film	Minor	1	38
Regina Film	Minor	2	173
Regina FilmSF Bio	Minor	1	5519
Roxa Filmproduktion	Minor	1	315
Röde Orm Film AB	Minor	1	1869
SF Bio	Minor	2	2257
Shake Film AB	Minor	1	456
Slowlife	Minor	1	50
Solid Entertainment	Minor	1	180
Starlet Media	Minor	4	2039
Story AB	Minor	2	289
Svenska Grammofonstudion	Minor	1	5164
TS Produktion AB	Minor	1	320
Turkisk Film Fastighet & Organisation AB	Minor	1	235
Universal Music AB	Minor	1	6425
Universal Pictures Nordic AB	Minor	1	607
Vogue Film and Entertainment Ldt.	Minor	1	27
Way Creative Films AB	Minor	1	388
WG Film AB	Minor	2	3100
Ögat AB	Minor	1	408

Attachment 6. Categorization of source material by the Swedish Film Institute

Fictional characters

This type of source material refers to well-known characters that are not associated with a particular piece of work, but are rather part of common knowledge.

Earlier films

Earlier films refer to films which a new film is based on, but that are not a prequel to the new film. Films based on this type of source material are usually remakes of earlier films.

Famous person or event

This refers to well know persons or events that, like fictional characters, are expected to be a part of common knowledge.

Literary

This category includes films that are based on various types of literature, i.e. novels, short stories, and the likes, however not comic books.

Play

This concerns films that are based on plays.

Comic book

This concerns films based on comic books.

TV-series

This refers to films that are based on TV-series.

Original script

This concerns films that are original ideas and not based on any form of source material.

Attachment 7. Categorization of genre made by the Swedish Film Institute

Action
Movies in which the course of events is characterized by a high tempo and typically includes events such as car chases, fights, escapes and explosions, to mention a few.

Biographic
Movies that depict the life of a historical person and in which the plot is concentrated around this person.

Documentary
Objective or subjective presentation of real events and places, with a purpose of informing, documenting or debating and propagating. This genre also includes movies which style resembles a documentary, but where the content is fictive, so called mockumentaries.

Drama
Normally dialog driven presentations of characters, environments and situations, portrayed in a realistic or trustworthy way.

Experiment
Movies that deliberately violate the traditional movie setting, by its shape and/or its plot.

Fantasy
Movies that are partly or fully set in a fantasy- or a parallel world, inhabited by fairy tale characters, creatures, wizards, mythological figures or similar.

Comedy
Movies in which the main aim is to entertain and trigger laughter; by satire, jokes, comedic situations, etc.

War
Movies that depict war, military life or education in modern times. This genre can also include movies set during war times.

Criminal
Movies in which the plot involves crime, centered around the committer of a crime or the police that investigates this crime.

Musical
Movies that contain recurring dance- and musical acts as a part of the story. These acts can drive the story forward by, for example, expressing a character's feelings, or as unrealistic disruptions.

Music/Dance
Movies in which the storyline is set around musicians or dancers and in which music- or dance acts make up a significant part of the movie.

Nature
Movies about nature, plants, insects, animals or ecosystems.

Romanic
Movies in which the themes revolve around infatuation, love and/or romantic relationships.

Science Fiction
Movies with quasi-scientific themes that is often set in a technologically advanced future, or movies that feature visitors from unknown worlds.
Horror
Movies that include monsters, ghosts, serial killers or similar, and in which the main aim is to frighten or trigger discomfort.
Sports
Movies that depict an athlete or an athletic team training and/or participating in a game. Usually with a focus on a specific sport, such as football or boxing.
Thriller
Movies defined by their ability of creating accelerating tension, due to the uncertainty of the story's outcome. Usual themes include conspiracies, crimes or espionage.
Western
Movies in which the motif is derived from the North American history and myths. Typical characters are usually (stereotypes of) cowboys, native Americans, cavalry, settlers and outlaws.
Adventure
Movies that often include a trip or an expedition to an exotic place that often revolving around treasure hunts or scientific achievements. The expeditions usually feature obstacles, such as the forces of nature, wild animals or bad-sinned people.

Attachment 8. Categorization of target audience the Swedish Film Institute

Children
Children's films are films that portray children and childhood and/or have an appeal that is clearly addressed to children between six and twelve years old.
Teen
Teen films are films that portrays teenagers and/or have an appeal that is clearly addressed to teenagers between thirteen and nineteen years old.
Family
Family films are films that are either about adults with a child-friendly approach, or films about children or young people, but with a broader appeal. Regarding movies that are exclusively about animals or fantasy creatures, the categorization is determined by the film's appeal exclusively. In order for these films to be categorized as family films, they must have an appeal that is clearly aimed at both adults and children, that is, for adults to watch without children and vice versa.
Adult
Adult movies are movies that portrays and/or have an adult appeal.

Attachment 9. Categorization of competitive seasons

Month	Level of competition	Number of films released 2000-2011

Month	Season	
October	High	343
April	High	297
March	High	296
September	High	291
February	Medium	277
December	Medium	250
November	Medium	246
January	Medium	216
May	Low	212
August	Low	211
July	Low	174
June	Low	165

Attachment 10. Categorization of seasons with regards to aggregate demand

Month	Season	Aggregated cinema admission 2000-2011
December	High	29.255.026
February	High	20.849.019
November	High	19.245.360
September	High	19.134.476
July	Medium	18.653.305
October	Medium	17.686.919
August	Medium	15.862.357
January	Medium	13.148.374
March	Low	12.479.045
May	Low	12.214.650
June	Low	9.846.513
April	Low	7.263.723

Attachment 11. Descriptive statistics

Variables	Global					Anglo Saxon					Swedish					Other				
	μ	σ	min	max	n	μ	σ	min	max	n	μ	σ	min	max	n	μ	σ	min	max	n
Log Cinema Admissions	4.81	5.16	0.48	6.23	1292	4.95	5.19	1.15	6.12	671	4.89	5.29	0.48	6.23	231	4.15	4.55	1.3	5.69	391
Cinema Admissions[6]	65'	143'	3	1715'	1292	90'	154'	14	1315'	671	77'	194'	3	1715'	231	14'	36'	20	491	391
Source Material: Original	0.60	0.49	0	1	1292	0.51	0.50	0	1	671	0.70	0.46	0	1	231	0.71	0.46	0	1	391
Source Material: Literary	0.20	0.40	0	1	1292	0.23	0.42	0	1	671	0.16	0.37	0	1	231	0.17	0.37	0	1	391
Source Material: TV-series	0.02	0.13	0	1	1292	0.03	0.16	0	1	671	0.02	0.13	0	1	231	0.01	0.07	0	1	391
Source Material: Comic books	0.03	0.16	0	1	1292	0.04	0.19	0	1	671	0.00	0.07	0	1	231	0.02	0.14	0	1	391
Source Material: Play	0.02	0.15	0	1	1292	0.01	0.12	0	1	671	0.01	0.11	0	1	231	0.04	0.20	0	1	391
Source Material: Fictive	0.05	0.22	0	1	1292	0.07	0.26	0	1	671	0.05	0.21	0	1	231	0.02	0.13	0	1	391
Source Material: Event/person	0.05	0.22	0	1	1292	0.06	0.24	0	1	671	0.06	0.23	0	1	231	0.03	0.16	0	1	391
Source Material: Remake	0.03	0.16	0	1	1292	0.04	0.20	0	1	671	0.00	0.07	0	1	231	0.02	0.12	0	1	391
Sequel	0.10	0.30	0	1	1292	0.16	0.37	0	1	671	0.06	0.23	0	1	231	0.03	0.17	0	1	391
Runtime	105	19	60	241	1292	110	18	75	180	671	90	15	60	144	231	105	20	66	241	391
Reviews: No review	0.09	0.29	0	1	1292	0.06	0.23	0	1	671	0.21	0.41	0	1	231	0.08	0.27	0	1	391
Reviews: Very Low	0.00	0.07	0	1	1292	0.01	0.08	0	1	671	1	0.00	0	1	231	0.00	0.05	0	1	391
Reviews: Low	0.10	0.31	0	1	1292	0.13	0.34	0	1	671	0.09	0.28	0	1	231	0.07	0.25	0	1	391
Reviews: Medium	0.36	0.48	0	1	1292	0.42	0.49	0	1	671	0.30	0.46	0	1	231	0.28	0.45	0	1	391
Reviews: High	0.41	0.49	0	1	1292	0.36	0.48	0	1	671	0.35	0.48	0	1	231	0.53	0.50	0	1	391
Reviews: Very High	0.04	0.19	0	1	1292	0.03	0.17	0	1	671	0.04	0.20	0	1	231	0.04	0.20	0	1	391
Review spread: Unison	0.02	0.16	0	1	1292	0.02	0.15	0	1	671	0.02	0.13	0	1	231	0.03	0.17	0	1	391
Review spread: Very Low	0.17	0.38	0	1	1292	0.19	0.39	0	1	671	0.10	0.30	0	1	231	0.19	0.39	0	1	391
Review spread: Low	0.49	0.50	0	1	1292	0.51	0.50	0	1	671	0.41	0.49	0	1	231	0.50	0.21	0	1	391
Review spread: Medium	0.22	0.41	0	1	1292	0.23	0.42	0	1	671	0.21	0.41	0	1	231	0.21	0.41	0	1	391
Review spread: High	0.02	0.15	0	1	1292	0.02	0.14	0	1	671	0.01	0.11	0	1	231	0.03	0.17	0	1	391
Genre: Drama	0.34	0.47	0	1	1292	0.22	0.42	0	1	671	0.35	0.48	0	1	231	0.54	0.50	0	1	391
Genre: Action	0.09	0.28	0	1	1292	0.13	0.34	0	1	671	0.02	0.15	0	1	231	0.05	0.21	0	1	391
Genre: Biographical	0.02	0.15	0	1	1292	0.03	0.16	0	1	671	0.00	0.07	0	1	231	0.03	0.17	0	1	391

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[6] Cinema admissions for mean, standard deviation and maximum is rounded to thousands of admissions

Variable	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N
Genre: Documentary	0.12	0.33	0	1	1292	0.06	0.24	0	1	671	0.37	0.48	0	1	231	0.08	0.28	0	1	391
Genre: Fantasy	0.03	0.16	0	1	1292	0.04	0.19	0	1	671	0.00	0.07	0	1	231	0.02	0.13	0	1	391
Genre: Historic	0.02	0.16	0	1	1292	0.02	0.14	0	1	671	0	0	0	0	231	0.05	0.22	0	1	391
Genre: Comedy	0.17	0.38	0	1	1292	0.22	0.42	0	1	671	0.14	0.35	0	1	231	0.11	0.31	0	1	391
Genre: Crime	0.02	0.14	0	1	1292	0.02	0.13	0	1	671	0.03	0.18	0	1	231	0.02	0.13	0	1	391
Genre: Romance	0.01	0.11	0	1	1292	0.01	0.10	0	1	671	0.00	0.07	0	1	231	0.02	0.15	0	1	391
Genre: Science Fiction	0.03	0.17	0	1	1292	0.05	0.22	0	1	671	0.00	0.07	0	1	231	0.01	0.11	0	1	391
Genre: Horror	0.04	0.19	0	1	1292	0.06	0.22	0	1	671	0.02	0.13	0	1	231	0.01	0.09	0	1	391
Genre: Thriller	0.04	0.19	0	1	1292	0.05	0.22	0	1	671	0.03	0.18	0	1	231	0.01	0.11	0	1	391
Genre: Adventure	0.05	0.21	0	1	1292	0.06	0.23	0	1	671	0.02	0.13	0	1	231	0.04	0.20	0	1	391
Genre: Other	0.02	0.13	0	1	1292	0.02	0.15	0	1	671	0.00	0.07	0	1	231	0.01	0.10	0	1	391
Target Audience: Adult	0.79	0.41	0	1	1292	0.77	0.42	0	1	671	0.77	0.42	0	1	231	0.83	0.38	0	1	391
Target Audience: Children	0.10	0.30	0	1	1292	0.10	0.30	0	1	671	0.10	0.29	0	1	231	0.10	0.30	0	1	391
Target Audience: Family	0.02	0.14	0	1	1292	0.02	0.14	0	1	671	0.01	0.09	0	1	231	0.03	0.16	0	1	391
Target Audience: Teen	0.09	0.29	0	1	1292	0.11	0.31	0	1	671	0.12	0.33	0	1	231	0.05	0.02	0	1	391
Season: Low	0.32	0.47	0	1	1292	0.31	0.46	0	1	671	0.29	0.45	0	1	231	0.03	0.48	0	1	391
Season: Medium	0.33	0.47	0	1	1292	0.35	0.48	0	1	671	0.29	0.46	0	1	231	0.30	0.46	0	1	391
Season: High	0.35	0.48	0	1	1292	0.34	0.47	0	1	671	0.42	0.49	0	1	231	0.35	0.48	0	1	391
Competition: Low	0.28	0.45	0	1	1292	0.31	0.46	0	1	671	0.18	0.38	0	1	231	0.37	0.45	0	1	391
Competition: Medium	0.33	0.47	0	1	1292	0.34	0.47	0	1	671	0.35	0.48	0	1	231	0.30	0.46	0	1	391
Competition: High	0.39	0.49	0	1	1292	0.35	0.48	0	1	671	0.47	0.50	0	1	231	0.43	0.50	0	1	391
Opening Screens	56	67	1	478	1292	76	72	1	478	671	58	77	1	374	231	19	23	1	185	391
Region: Sweden	0.18	0.38	0	1	1292	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Region: Anglo Saxon	0.52	0.50	0	1	1292	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Region: Other	0.30	0.46	0	1	1292	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distributor: Major	0.48	0.50	0	1	1292	0.72	0.45	0	1	671	0.35	0.48	0	1	231	0.69	0.46	0	1	391
Distributor: Major independent	0.41	0.49	0	1	1292	0.25	0.43	0	1	671	0.40	0.49	0	1	231	0.69	0.46	0	1	391
Distributor: Minor	0.11	0.32	0	1	1292	0.03	0.18	0	1	671	0.19	0.43	0	1	231	0.17	0.38	0	1	391
Rating: All ages	0.12	0.32	0	1	1292	0.10	0.30	0	1	671	0.19	0.39	0	1	231	0.11	0.31	0	1	391
Rating: No rating	0.49	0.50	0	1	1292	0.35	0.48	0	1	671	0.49	0.50	0	1	231	0.65	0.48	0	1	391
Rating: Age of 7	0.12	0.33	0	1	1292	0.14	0.35	0	1	671	0.13	0.34	0	1	231	0.09	0.29	0	1	391
Rating: Age of 11	0.20	0.40	0	1	1292	0.28	0.45	0	1	671	0.14	0.35	0	1	231	0.11	0.31	0	1	391

Rating: Age of 15	0.09	0.28	0	1	1292	0.12	0.33	0	1	671	0.06	0.23	0	1	231	0.04	0.19	0	1	391
Director	4.18	5.24	1	43	1292	4.89	6.16	1	43	671	4.01	4.17	1	24	231	3.07	3.65	0	1	391
Actor	7.59	11.33	1	86	1292	10.48	12.28	1	77	671	2.18	2.98	1	19	231	5.82	11.22	0	1	391

Attachment 12. Imported and domestic film per distributor category

Distributor	Imported Films	Domestic Films
Minor distributor	8%	24%
Major independent distributor	41%	35%
Major distributor	50%	40%

Attachment 13. Opening screens as dependent variable

Explanatory variables	Global model	
	Coeff.	P
Intercept	-104.57	.000***
Source Material: Fictional characters	29.23	.000***
Source Material: Remake	14.71	0.056
Source Material: Famous person/event	10.55	0.095
Source Material: Literary	7.50	0.029*
Source Material: Play	2.47	0.767
Source Material: Comic books	26.41	0.001**
Source Material: TV-series	14.84	0.115
Sequel	44.62	.000***
Runtime	0.70	.000**
Reviews: Very High	23.80	0.009**
Reviews: High	26.35	.000***
Reviews: Medium	20.16	0.003**
Reviews: Low	10.17	0.180
Reviews: Very Low	-33.85	0.072
Review Spread: Unison	-7.22	0.436
Review Spread: High	4.95	0.643
Review Spread: Medium	0.90	0.904
Review Spread: Low	1.70	0.813
Review Spread: Very Low	0.31	0.966
Genre: Action	43.53	.000***
Genre: Adventure	41.70	.000***
Genre: Biographical	-5.65	0.521
Genre: Documentary	-0.51	0.914
Genre: Fantasy	49.25	.000***
Genre: Historic	-3.48	0.665
Genre: Comedy	29.50	.000***
Genre: Crime	17.31	0.052
Genre: Romance	19.07	0.078
Genre: Science Fiction	45.64	.000***
Genre: Horror	15.94	.028***
Genre: Thriller	14.25	0.043*
Genre: Other	13.38	0.187
Target Audience: Children	21.23	.000***
Target Audience: Family	-5.31	0.557
Target Audience: Teen	-4.98	0.275
Season: High	29.17	.000***
Season: Low	4.57	0.289
Competition: High	6.49	0.116
Competition: Low	3.46	0.554

Independent variable	Coefficient	P-value
Region: Anglo-Saxon	11.72	.000***
Region: Sweden	42.49	000***
Distributor: Major	26.39	.000***
Distributor: Major independent	-4.20	0.365*
Age Limit: All ages	7.81	.081
Age Limit: Age of 7	12.12	.010**
Age Limit: Age of 11	20.04	.000***
Age Limit: Age of 15	9.74	0.049*
Director	0.70	0.004**
Actor	-0.04	0.702
R2	0.605	
Adjusted R2	0.589	
F	38.85(49;1243)	
P>F	.000	

Note: Significance codes: p<0.001 ***; p<0.01 **; p<0.05*

Attachment 14. Opening screens as the only independent variable

Independent variable	Coefficient	P-value
Intercept	7.68	.000***
Opening screens	0.03	.000***
R2	0.59	
Adjusted R2	0.59	
F-statistic	1861(1;1291)	
P-value	.000***	

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