International Launch Window and Performance: Analysis of Movies

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Abstract

With the growing globalization of business, international launch time window (the elapsed time between product launch in the home country and launch in the focal country) is becoming increasingly critical for the success of new products, in particular, short life cycle products, such as movies, books, music, and video games. We address important research questions related to this launch time window. What are the determinants of launch time window? What are the relative effects of prelaunch advertising and word of mouth on launch time window? What is the effect of launch time window on performance in foreign countries? We formulate an analytic model and develop predictions related to these questions. We empirically test these predictions and the influences of other variables using a unique dataset comprising 228 movies covering 62 countries during 2007-08. We develop and estimate a simultaneous system of equations, in which country revenues, launch time window, and prelaunch advertising are the dependent variables. Our results show that launch time window is positively associated with word of mouth but negatively related to prelaunch advertising spending and foreign demand potential. We also find that firms release new products faster into countries that are culturally closer to the home country. Our findings offer new insights into the tradeoff between leveraging the word of mouth effect and investing in prelaunch advertising for the international launch window decision.

Key words: International marketing strategy, new product marketing, market entry timing, econometrics, movies.
1. **Introduction**

With the growing globalization of business, international markets are becoming important for many products, in particular, short life cycle products, such as movies, books, music, and video games. For these products, in a given country or market, sales typically peak early and decline steeply, so it is critical to enter and grow in multiple international markets. In fact, a substantial chunk of revenues for these products come from outside the home country of launch. Consider the motion picture industry—the context for our empirical analysis. In 2011, foreign box office receipts reached $22.4 billion (Motion Picture Association of America [MPAA] 2011), while total U.S. box office revenues were $10.2 billion. In many cases, domestic launch is unprofitable and its loss is offset by international revenues. Elberse and Anand (2007) estimate that the average movie loses approximately $17 million from its domestic theatrical release. Not surprisingly, Weinberg (2005) asks whether the North American release of a movie should even be viewed as a ‘loss leader.’ Thus, international markets are important for many products, such as motion pictures.

An important decision relating to international market entry strategy is the timing of entry into international markets. Firms commonly practice one of two international entry timing strategies, a waterfall or sprinkler approach (Kalish, Mahajan, and Muller 1995). A waterfall or sequential release strategy is one in which the new product enters multiple countries sequentially. A sprinkler or simultaneous strategy, in contrast, involves an almost simultaneous entry into multiple countries. In the motion picture industry, movie studios\(^1\) appear to be adopting both simultaneous and sequential release strategies. For example, Sony-Columbia’s *Spider-Man 3* was simultaneously released into 71 countries in 2007, making the launch time window—the elapsed

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\(^1\) The major studios both produce and distribute movies, so we use the terms, studios and distributors, interchangeably.
time between product launch in the home country and launch in the focal country— for each country almost zero. In contrast, DreamWorks’ *Terminal* was released in 55 countries sequentially with the time window between the release dates in the U.S. and in the foreign country ranging from 70 to 203 days.

To determine the launch time window in a foreign country, firms need a better understanding of the relative influence of domestic prelaunch advertising and word of mouth on foreign market performance and on time window because advertising and word of mouth have spillover effects across countries. For short life cycle products, such as movies, achieving good opening revenues is critical to its success. Indeed, Friedman, the former Vice Chairman of Paramount Pictures, says, “If the opening grosses are not strong, the picture will not survive for an extended run. If a picture is not performing as expected, it is virtually impossible to rescue it” (Friedman 2004).

Firms spend huge sums of money on a prelaunch advertising campaign to inform potential customers of the product’s upcoming launch and to create an opening buzz about the product. According to MPAA (2007), the average marketing cost for movies released by major studios in 2007 reached $35.9 million, out of which, advertising expenditures amounted to $32.2 million. On average, a Hollywood movie spends about 80% of its advertising expenditures before the release date (Elberse and Anand 2007; Vogel 2007).

An advantage of a large prelaunch domestic advertising campaign is a big advertising spillover effect across countries. Advertising spillover refers to the positive effect of domestic advertising on sales in foreign markets. Why or how does domestic advertising affect foreign sales? First, domestic advertising directly exposes potential customers in foreign countries to the product. For example, in the motion picture industry, foreign audience can easily watch a trailer
for a movie through various websites. Second, local media will likely cover those products with heavy prelaunch advertising support in their home country, increasing the awareness and attractiveness of these products among potential consumers in foreign markets. Third, local channels/distributors are more likely to promote sales in the target country for those products that receive high advertising support in the home country (Tellis, Stremersch, and Yin 2003). Therefore, managers’ decisions on the foreign launch time window will be guided by the strength and the duration of the domestic prelaunch advertising’s spillover effect on its foreign market performance. Specifically, if the prelaunch advertising effect is high, then managers will want to enter foreign markets quickly before the advertising spillover effect wears out.

Word of mouth also plays a significant role in the time window decision. Word of mouth refers to information transmission among consumers. For example, in the movie industry, consumers who watched a movie in one country often post their reviews on websites that can be accessed by consumers in another country even before the movie is released in that country. In other words, online word of mouth can and does travel across countries.

How does word of mouth affect the international launch window of new products? Potential negative word of mouth for a new product may tilt a firm toward a simultaneous international launch. In the domestic context of the motion picture industry, Moul and Shugan (2005) argue that the current strategy of wide release, which has replaced the limited release in the 1970s, is at least in part, an attempt to limit the adverse effects of negative word of mouth that might be exacerbated by a sequential entry strategy. In the international setting, their argument suggests that firms will follow a simultaneous launch strategy to minimize the effect from negative word of mouth. By launching simultaneously into multiple countries, firms can better prepare themselves for the downside that their products may not perform well initially in
the home country. However, if a firm is confident about the performance of its product and wants to capitalize on the positive word of mouth effect across countries, then it is better if it uses a sequential release strategy that would allow reasonable time for word of mouth to travel across countries. In this case, products can benefit from the positive word of mouth effect from one country to another with a sequential launch (Elberse and Eliashberg 2003).

Therefore, international launch time window will be based on the tradeoff between the effects of prelaunch advertising and word of mouth. Firms will use a simultaneous release strategy in foreign markets if the product is supported with a large prelaunch advertising campaign, but will follow a sequential release strategy to maximize the effect of positive word of mouth. Indeed, advertising (word of mouth) is more effective in the earlier (later) stage of a movie’s life (Bruce, Foutz, and Kolsarici 2012). Understanding this tradeoff has important implications on resource allocation because firms can benefit from a higher return on advertising investment by effectively utilizing the tradeoff between these two effects.

Despite the importance of international launch time window and the effects of prelaunch advertising and word of mouth on the time window, important questions relating to these variables remain underexplored. What are the determinants of international launch time window? In particular, what are the relative effects of prelaunch advertising and word of mouth on the launch time window? What are the effects of launch time window on international market performance? We address these important research questions using the motion picture industry as the context. The movie industry provides an ideal setting to explore these issues because both prelaunch advertising and word of mouth are important. Our contribution is to model this tradeoff both analytically and empirically and to offer important insights that address these critical questions.
2. Related Literature and Contribution

Prior research has examined simultaneous and sequential market entry strategies. For example, Kalish, Mahajan, and Muller (1995) use a competitive game theory framework to examine simultaneous and sequential strategies and show that a sequential entry strategy is appropriate if (1) the product has a long life cycle, (2) the foreign market is small, not innovative, and characterized by a slow growth rate, and (3) competitors in the foreign market are weak.

However, empirical evidence for the success of each of these strategies is mixed. For example, Van Everdingen, Fok, and Stremersch (2009) and Tellis, Stremersch, and Yin (2003) find that if a new product category takes off in one country, it increases the probability of taking off in other countries, suggesting a sequential release strategy is preferable to a simultaneous release strategy. This spillover phenomenon is referred to as a cross-country lead-lag or learning effect in the international innovation diffusion literature (e.g., Dekimpe, Parker, and Sarvary 2000; Ganesh and Kumar 1996; Kumar and Krishnan 2002; Putsis et al. 1997; Takada and Jain 1991; Talukdar, Sudhir, and Ainslie 2002). The lead market refers to the country where the product is first launched. The lag market is the country where the product is launched later. Prior research suggests that new product diffusion is generally faster in the lag market than in the lead market. Thus, firms can take advantage of the lead-lag effect when they use a sequential release strategy.

Another study by Fischer, Shankar, and Clement (2005) examines international market entry strategies as defined by the market scope and the speed of rollout. They find that late mover brands that sequentially enter many large international markets can challenge the market pioneer in a country more effectively than other late mover brands, suggesting that a sequential strategy may be more appropriate when there are multiple brands. In contrast, Elberse and
Eliashberg (2003), who analyze 164 movies released from 1999 to 2000 in the U.S. and four European countries, find that the longer the time lag is between releases, the weaker the relationship between domestic and foreign market performances. This finding suggests that a simultaneous release strategy is advantageous.

Our study differs from this first set of studies. Unlike prior studies that find support for either a simultaneous or a sequential release strategy, we identify the conditions under which a simultaneous or a sequential release strategy is beneficial. We do this by examining the tradeoff between the effects of prelaunch advertising and word of mouth on the international launch window.

Three additional studies examine the issue of entry timing into international markets. Mitra and Golder (2002) examine the impact of dynamic near-market knowledge (a firm’s own operations in similar markets) and other economic and cultural variables on foreign market entry timing. Using a hazard model on 722 foreign market entries of 19 multinational firms, they find significant effects for near-market cultural and economic knowledge. Gielens and Dekimpe (2007) also estimate a hazard model on the top 75 European grocery retailers’ decisions to enter the Eastern European market and find that firms take their competitors’ prior decisions into account when deciding on their own entry timing. Verniers, Stremersch, and Croux (2011) investigate the relationship between the launch window and the price of new ethical drugs and conclude that the window is small when the price is moderately high.

Our research also differs from this set of studies. The first two analyses pertain to a firm-level entry decision rather than the entry strategy of new products or brands into foreign countries, and the third study focuses on pricing decisions for long life products. Furthermore, modeling entry timing using dynamic updates is not appropriate for short life cycle products,
such as movies, for which once media plans are scheduled, it is hard to change them for short
time periods. Studios typically buy the vast majority of their TV advertising (as much as 90%-95%) in the ‘up-front’ advertising period that occurs at least several months prior to movies’
releases. Based on interviews with studio executives, Elberse and Anand (2007) report that once
advertising expenditures are allocated across media outlets, studio executives have limited
flexibility in adjusting a movie’s advertising campaign in the weeks leading up to the release
even if they receive updated information about the movie’s potential or about changes in the
competitive environment. Our research uses a different modeling approach to address this issue
for short life cycle products.

To summarize, although these studies provide valuable insight into the factors that may
affect the entry timing and performance of new products in foreign markets, they do not identify
conditions under which a simultaneous or sequential release strategy achieves a better
performance. Specifically, our research is the first to analyze the effects of prelaunch advertising
and word of mouth on the international market entry timing of new products across a large
number of countries in a comprehensive framework. We extend prior research in important ways.
First, we formulate an analytic model of optimal international entry time window and prelaunch
advertising. Second, we empirically test our predictions from the analytic model using a
simultaneous system of equations in which launch time window, prelaunch advertising spending,
and country revenues are the dependent variables.

3. Analytic Model

In this section, we formulate an analytic model. The purpose of this model is to develop
predictions relating to the launch time window and prelaunch advertising by deriving the optimal
launch time window and the prelaunch advertising spending level. Our analytic model captures
only the tradeoff between these two variables. For the empirical estimation, we augment these predictions with expectations about the effects of additional variables (e.g., cultural distance, seasonality, and star power) that can potentially influence the time window decision.

If a product is launched in the home country at time \( t = 0 \) and is launched in a foreign country at \( t = t_F \), that is, if \( t_F \) is the international time window, then the domestic \((D_D)\) and foreign \((D_F)\) demands for the product are given by:

\[
D_D(t) = \alpha_D e^{-\beta_D t}
\]

\[
D_F(t) = \alpha_F e^{-\beta_F (t-t_F)} \quad [t \geq t_F]
\]

where \( \alpha_D (\geq 0) \) and \( \alpha_F (\geq 0) \) represent the opening demand and \( \beta_D (\geq 0) \) and \( \beta_F (\geq 0) \) represent the decay rates of opening demand in the home country and in the foreign market, respectively.

Domestic demand at \( t = 0 \) is \( \alpha_D \) and foreign demand at \( t = t_F \) is \( \alpha_F \). The parameter \( \alpha \) can be viewed as external influence because the firm’s prelaunch effort (e.g., advertising and promotion) is expected to influence the level of opening demand. Similarly, \( \beta \) can be viewed as internal influence because the decay rate is likely to depend on word of mouth. The exponential decay model is consistent with prior research (e.g., Krider and Weinberg 1998; Lehmann and Weinberg 2000; Basuroy, Desai, and Talukdar 2006). The model captures the aspect of demand that peaks at opening and then gradually declines, which is typical of short life cycle products.

The opening demands in the home country and in the focal foreign country are given by:

\[
\alpha_D = \alpha_1 A
\]

\[
\alpha_F(t_F) = \alpha_0 + \kappa W t_F + \delta A e^{-\beta_F t_F}
\]

where \( W \) is word of mouth effect from consumers in the home country, \( A \) is prelaunch advertising spending before product launch in the home country, and \( \alpha_j \) is the marginal effect of
prelaunch advertising (A) on domestic demand. The key part of our model is \( \alpha_F \). We model foreign opening demand as a function of: (1) the intrinsic foreign demand potential, (2) the word of mouth effect, and (3) the effect of domestic prelaunch advertising. \( \kappa_w (\geq 0) \) and \( \delta_a (\geq 0) \) are demand responsiveness to word of mouth and to prelaunch advertising, respectively. The effect of prelaunch advertising declines at the rate of \( \beta_a \).

The assumption that domestic prelaunch advertising expenditures affect opening demand in the foreign country is based on the idea that firms can utilize the advertising spillover effect by launching the product in multiple countries within a short period of time as explained earlier. If firms want to make the most of the prelaunch advertising spillover effect before it wears out, then it is better for them to use a simultaneous release strategy. However, as discussed earlier, it is better to use a sequential release strategy if firms want to rely on the word of mouth effect to allow for word of mouth to build up. Our model captures these tradeoffs between sequential and simultaneous release strategies. We do not include prelaunch advertising spending for the foreign release in our model because: (1) we focus on the domestic advertising spillover effect, (2) prelaunch advertising spending for the domestic release is a reasonable proxy for the firms’ local advertising, and (3) typically, total domestic prelaunch advertising spending dwarfs advertising expenditures in any one foreign country.

Substituting \( \alpha_D \) and \( \alpha_F \) into the demand function and subtracting the prelaunch advertising cost, we obtain the following profit function.

\[
\max_{t_f, A} \pi = \frac{-A^2}{A} + m_D \int_0^\infty \alpha_i A e^{-\beta_{D,i}} e^{-rt} dt + m_F \int_{t_f}^\infty [\alpha_0 + \kappa_w W t_f + \delta_a A e^{-\beta_{F,i}} e^{-\beta_f(t-t_f)} e^{-rt}] e^{-\beta_f(t-t_f)} e^{-rt} dt
\]

where \( m_D \) and \( m_F \) are the domestic and foreign margin ratios, respectively. The profit function is the sum of the domestic and foreign demand multiplied by the respective margin ratio. The profit
function is assumed to be concave in \( A \), that is,

\[
(6) \quad \frac{\partial \pi}{\partial A} > 0 \text{ and } \frac{\partial^2 \pi}{\partial A^2} < 0
\]

Revenues are discounted by a continuous discount rate, \( r \).

The firm selects the optimal time window \((t_F)\) and prelaunch advertising \((A)\) to maximize its profit. The first order conditions for the time window and prelaunch advertising are given by:

\[
(7) \quad \frac{\partial \pi}{\partial t_F} = \frac{m_F e^{-rt_F} (\kappa W - A \delta \beta e^{-\beta t_F} - r \alpha_0 - r \kappa W t_F - r A \delta e^{-\beta t_F})}{\beta + r}
\]

\[
(8) \quad \frac{\partial \pi}{\partial A} = \frac{m_F \alpha_1}{\beta + r} + \frac{m_F \delta A e^{-\beta t_F} e^{-rt_F}}{\beta + r} - 2A
\]

There are no closed form solutions for the time window and prelaunch advertising from these first order conditions. Using the implicit function theorem, we derive the following comparative statics for the launch time window and prelaunch advertising spending. Result 1 through Result 3 are predictions about launch time window.

**Result 1.** International launch time window is negatively related to the foreign opening demand potential \((\alpha_0)\), all else equal.

\[
(9) \quad \frac{\partial t_F^*}{\partial \alpha_0} = -\frac{2m_F e^{-rt_F}}{\beta + r} \leq 0
\]

The result shows that firms will launch a movie faster into countries with a greater baseline opening demand potential. By entering earlier into countries with a higher revenue potential, firms can recover their costs faster. In addition, achieving higher revenues will help build positive word of mouth and reduce the risk of trial by potential customers in subsequent countries.

**Result 2.** International launch time window is positively associated with foreign demand word of
mouth responsiveness ($\kappa_w$), all else equal.²

$$\frac{\partial t_F^*}{\partial \kappa_w} = \frac{2m_F W e^{-rt_F} (rt_F - 1)}{\beta_F + r} \geq 0$$

This result states that firms will release new products at a slower rate into international markets if they expect them to generate good word of mouth in those markets. This is consistent with the idea that firms can benefit from a positive word of mouth effect from one country to another with a sequential launch.

**Result 3.** International launch time window is negatively associated with foreign demand responsiveness to prelaunch advertising ($\delta_0$), all else equal.

$$\frac{\partial t_F^*}{\partial \delta_0} = \frac{m_F e^{-rt_F} e^{-\beta r t_F} (\beta_0 + r)(2A\beta_F + 2Ar + m_F \delta_0 e^{-rt_F} e^{-\beta r t_F})}{(\beta_F + r)^2} \leq 0$$

This result suggests that firms will launch their new products at a faster rate into international markets if they are supported with higher prelaunch advertising. This result reflects the idea that firms can utilize the cross-country advertising spillover effect by launching the products quickly into foreign countries.

For prelaunch advertising spending, we obtain the following two results.

**Result 4.** Domestic prelaunch advertising is positively associated with foreign opening demand potential ($\alpha_0$), all else equal.

$$\frac{\partial A^*}{\partial \alpha_0} = \frac{r m_F \delta_0 e^{-2rt_F} e^{-\beta r t_F} (\beta_0 + r)}{(\beta_F + r)^2} \geq 0$$

The result says that firms will spend more on prelaunch advertising if they expect a good level of foreign opening demand. This result indicates that firms want to leverage the advertising

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² We assume that the optimal launch time window is less than $1/r$. This is because $\frac{\partial \pi}{\partial t_F} < 0$ at $t_F = 1/r$, assuming that the profit function is concave in time window.
spillover effect across countries by supporting their new products with a large amount of prelaunch advertising if they expect a good level of foreign demand.

**Result 5.** Domestic prelaunch advertising spending is negatively related to word of mouth responsiveness ($\kappa_w$), all else equal.

\[
\frac{\partial A^*}{\partial \kappa_w} = \frac{m_F^2 Wd_r e^{-2rt_F} e^{-\beta \delta_F} (\beta_w + r)(rt_F - 1)}{(\beta_F + r)^2} \leq 0
\]

This result suggests that firms will spend less on prelaunch advertising if they expect to generate a good level of word of mouth. It also implies that firms will complement lower expected levels of word of mouth with higher levels of prelaunch advertising support.

### 4. Data, Variables, and Measures

#### 4.1. Data

Our analytic model captures the key aspects of the tradeoff between the effects of prelaunch advertising and word of mouth on the international launch time window. We test the analytic results and explore related issues using data from the motion picture industry by augmenting those predictions with additional variables that may influence the time window decision. We collected data on 300 Hollywood movies during the years 2007 and 2008. These movies represent over 95% of worldwide gross revenues each year. We selected movies that were released in at least 10 countries. Sixty two countries are represented in our dataset. We had to drop a few movies due to unavailability of key data (e.g., production budget, limited or platform releases), consistent with Einav (2007) and Elberse (2007). The final dataset consists of 228 movies and contains the weekly box-office revenues for each country.

Table 1 summarizes the variables, measures, and data sources. The variables related to the movie characteristics include U.S. and international theatrical release dates.
production budget (Mojo), total box office revenues for each country (Mojo), number of screens (Mojo), average user rating (Internet Movie Database, hereafter “IMDB”), MPAA rating (G, PG, PG13, and R, Mojo), producer (Mojo), genre (IMDB), whether a movie cast includes a star actor/actress (Mojo), whether a movie is a sequel (Mojo), critical reviews (www.metacritic.com, hereafter “Metacritic”), and advertising spending for the U.S. release (TNS Media Intelligence, hereafter “TNS”). The country-specific variables include cultural distance (Hofstede.com), degree of globalization (KOF Institute), piracy rate (Business Software Alliance, “BSA” hereafter), real GDP per capita (World Development Indicators by the World Bank, “WDI” hereafter), and seasonality (Mojo).

A few comments are in order about the dataset. In a few cases, Mojo reports only combined data for some countries. For example, it aggregates data from Belgium and Luxembourg. In these cases, we also combine or average relevant country variables such as cultural distance and degree of globalization. If one country dominates the other countries in GDP per capita or box office revenues, we simply use the data for the dominant country. Examples include France (France, Algeria, Monaco, Morocco, and Tunisia) and the United Kingdom (the United Kingdom, Ireland, and Malta). Mojo sometimes divides the release dates for Switzerland into three regions: the German-, French-, and Italian-speaking regions. If two or three of these dates are available, we use the earliest release date. We collected data for Taiwan from the International Monetary Fund (IMF) because WDI does not separately report data for Taiwan.4

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3 This approach is consistent with several studies that use data from Boxofficemojo (e.g., Chintagunta, Gopinath, and Venkataraman 2010, Dellarocas, Zhang, and Awad 2007, Duan, Gu, and Whinston 2008, Wiles and Danielova 2009).

4 World Bank does not add the numbers for Taiwan to the data cited for China.
Table 2 presents the descriptive statistics of the data. The final dataset includes 7,687 movie-country pairs. There are a few independent film studios in our dataset, such as Lionsgate, Newmarket Films, and the Weinstein Company (Dimension Films). However, six major studios, Paramount Pictures, Sony Pictures Entertainment, Twentieth Century Fox Film, Universal Studios, Walt Disney Studios, and Warner Bros., who are also members of MPAA, dominate the industry. In addition to their mainstream release division, some of the large studios also have subsidiaries that focus on smaller ‘art-type’ movies. Although consumers rarely consider the studio when they decide whether to watch a movie, studio-specific factors can affect the international release time window. Previous research shows that large studios have very different parameters for their mainstream and art labels (Ainslie, Dreze, and Zufryden 2005). Therefore, in the empirical model we subsequently discuss, we create a dummy variable for each studio instead of one 'major' studio dummy to control for these studio-specific effects.

< Table 2 about here >

4.2. Focal Variables

Market potential. As discussed in Result 1 and Result 4, the demand potential for a movie in the focal foreign country will likely affect the launch time window and prelaunch advertising spending for the U.S. release. We construct the expected foreign country box office revenues for the demand potential in that country using the double exponential smoothing technique (Elberse and Eliashberg 2003; Basuroy, Desai, and Talukdar 2006).

Word of mouth. As Result 2 and Result 5 suggest, we expect word of mouth to influence launch time window and prelaunch advertising. Consistent with Elberse and Eliashberg (2003), we capture word of mouth for a movie through the average revenues per screen collected in the previous week. We also estimate the expected word of mouth using double exponential
smoothing. For the revenue equation, we include the actual word of mouth represented by the sum of domestic and foreign revenues per screen in the previous week.

**Prelaunch advertising.** From Result 3, we expect prelaunch advertising expenditures to be positively related to the launch time window. We obtained weekly advertising expenditures for the U.S. release from TNS. We calculated total prelaunch advertising spending based on the U.S. opening day. The ratio of average prelaunch advertising to total advertising in the data is 81.1%.

### 4.3. Control Variables

**Production budget.** Production cost represents the biggest chunk of a movie’s cost. Big production budgets are associated with high-profile stars or expensive special effects. Previous research shows that big budgets enhance box office revenue (e.g., Basuroy, Chatterjee, and Ravid 2003; Ravid 1999). To control for this effect, we include production budget.

**Star power.** Following prior research on the role of star power in a movie’s success (e.g., Moul 2007; Renhoff and Wilbur 2008), we construct star power using the average box office revenues of the movies in which the actors were cast members five years prior to the release of the movie.

**Sequel.** Prior research shows that if a movie is a sequel, then it is associated with significantly higher box office revenues than when it is not (e.g., Basuroy, Desai, and Talukdar 2006; Dhar, Sun, and Weinberg 2012; Hennig-Thurau, Houston, and Heitjens 2009; Ravid 1999; Ravid and Basuroy 2004). To control for the effect of a sequel on performance and entry time window, we collect data on the ‘sequel’ variable. We operationalize the sequel variable as a dummy variable, which takes the value 1 if the movie is a sequel.

**Number of screens.** The number of screens is a potential determinant of the time window, prelaunch advertising, and country revenues (Neelamegham and Chintagunta 1999; Elberse and Eliashberg 2003). We include the average number of screens over the theatrical run of a movie in
the revenue equation because the number of screens varies week by week. For the window
equation, we include only the number of opening screens because the number of screens in
subsequent weeks cannot be decided at the time of release. For similar reasons, we include the
number of opening screens for the U.S. release in the prelaunch advertising equation.

*Cultural distance.* We also expect a country’s culture to be related to launch window in foreign
markets. A country’s culture affects the diffusion of a new product or service (e.g., Gatignon,
Eliashberg, and Robertson 1989; Leenders and Eliashberg 2011; Takada and Jain 1991; Tellis,
Stremersch, and Yin 2003). For example, in an analysis of 299 movies released in the U.S. and in
eight foreign countries, Craig, Greene, and Douglas (2005) find that U.S. films are substantially
more successful in culturally similar countries than in culturally distant countries. Therefore,
firms may want to launch their products faster into countries that are culturally closer to the
home country. To control for the influence of cultural proximity on the entry time window and
performance of a movie, we use a four-dimensional measure of the Hofstede index (e.g., Craig,
Greene, and Douglas 2005; Gielens and Dekimpe 2007; Mitra and Golder 2002). The four
dimensions are power distance, individualism, masculinity, and uncertainty avoidance. These
dimensions represent the ‘collective programming of the mind’ that distinguishes one national
culture from another (Hofstede 2001, p.1). We construct a composite index of cultural distance
from the U.S. for each country using these four dimensions, following Kogut and Singh (1988).
For a few countries, for which the Hofstede index is unavailable, we use the average regional
score as a proxy for the index.

*Economic wealth.* Consumers in wealthy countries adopt a new product more quickly than
consumers in poor countries. Following previous research that shows that economic wealth
affects the diffusion of an innovation in a country (e.g., Chandrasekaran and Tellis 2008;
Stremersch and Tellis 2004; Talukdar, Sudhir, and Ainslie 2002), we use GDP per capita.

Degree of globalization. The speed of information transmission from the home country to foreign countries affects advertising spillover and word of mouth. This transmission depends on the degree of globalization in that country. We use the KOF index of globalization to capture a country’s degree of globalization. Unlike other measures that incorporate only economic dimensions such as trade openness and foreign direct investment (FDI), the KOF Index measures the economic, social, and political dimensions of globalization on the basis of a comprehensive set of 24 variables. The resulting index ranges from 0-100, with higher scores indicating a higher degree of globalization. We replace missing values for a few countries with their regional averages.

Seasonality. Seasonality greatly affects performance of a movie and is an important consideration when studios set their domestic and the international release dates. Studios typically release movies with higher anticipated box office revenues during high seasonal demand weeks. To control for seasonality when a U.S. movie is released, previous studies use weekly dummy variables (e.g., Einav 2007), use major movie release seasonal dummy variables (e.g., Jedidi, Krider, and Weinberg 1998; Joshi and Hanssens 2009; Moul 2007), or construct a weekly index based on past weekly box office revenue (e.g., Ainslie, Dreze, and Zufryden 2005; Basuroy, Desai, and Talukdar 2006; Elberse and Eliashberg 2003). In our case, creating weekly dummy variables for each of 78 countries would not make much sense. Therefore, we opt for a weekly index variable for each country. We collect weekly revenue data from 2002 to 2008 and calculate the average weekly revenue share for the top 10 movies each week for each country.

Competitor strength: Studios make a tradeoff between the effects of seasonality and competition in their launch timing decisions. While they prefer releasing a movie during periods of high

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5 Revenue data are adjusted for inflation.
seasonal demand, they also want to avoid engaging in head-to-head competition with other movies. Therefore, they will likely release movies into countries when their competitors’ movies are not as strong. Competitor movies are likely to have a negative effect on a movie’s revenues in a country (Basuroy, Desai, and Talukdar 2006; Elberse and Eliashberg 2003). Consistent with Luan and Sudhir (2006), we measure competitor strength using the total production budgets of all competitor movies that were released in a two-week period prior to the focal movie’s launch in the focal country.

**Piracy.** For products with intellectual content, such as movies, music albums, and books, piracy concerns may affect the launch time window decision. Studios use a simultaneous launch strategy to combat piracy. For example, when *Spider-Man 3* was released in 16 overseas markets on May 1, 2007, three days prior to the U.S. release, the move was viewed as a means of securing a strong opening at these countries’ box offices before pirated copies had a chance to flood those markets (*The Hollywood Reporter* 2007). Piracy rates can also affect the financial performance of movies. To control for the effect of piracy on the time window and a country’s revenue, we use the software piracy rate of each country from the BSA. In a few cases, where the piracy data have missing values, we use the following year’s figures, because piracy rates show little variation year to year. We average the regional data for a few countries when the piracy rate data is missing.

**Number of countries of previous launch.** A movie’s lead-lag experience is another potential determinant of its launch time window and performance (Takada and Jain 1991). To control for the lead-lag effect, we include the number of countries in which the product was previously launched.6

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6 One could argue that whether a movie is dubbed into the local language or not may affect the launch time window decision. Dubbing depends on a country’s practice. For example, movies are generally dubbed in Germany and
5. Empirical Model

Figure 1 shows the conceptual model for our empirical analysis. The model presents the determinants of time window, prelaunch advertising expenditures, and box office revenues in foreign countries. Three main sets of factors -- studio characteristics, movie characteristics, and country characteristics -- affect entry time window. Movie characteristics influence the prelaunch advertising spending level for a U.S. movie’s release. Finally, three sets of factors -- studio characteristics, movie characteristics, and country characteristics -- impact the box office performance of a movie.

To test the predictions from our analytic model using this conceptual model, we develop a system of three equations.

\[
\begin{align*}
\ln WIN_{mc} &= \alpha_0 + \alpha_1 \ln REV_{mc}^* + \alpha_2 \ln PAD_m + \alpha_3 \ln WOM_m^* + \alpha_4 \ln X_{1m} + \alpha_5 \ln Y_{1c} \\
&\quad + \alpha_6 D_{1m} + \alpha_7 D_{1c} + \alpha_8 \ln Z_{1mc} + \epsilon_{mc} \\
\ln REV_{mc} &= \beta_0 + \beta_1 \ln WIN_{mc} + \beta_2 \ln PAD_m + \beta_3 \ln WOM_m + \beta_4 \ln X_{2m} + \beta_5 \ln Y_{2c} \\
&\quad + \beta_6 D_{2m} + \beta_7 D_{2c} + \beta_8 \ln Z_{2mc} + \eta_{mc} \\
\ln PAD_m &= \gamma_0 + \gamma_1 \ln WIN_{mc} + \gamma_2 \ln REV_{mc}^* + \gamma_3 \ln WOM_m^* + \gamma_4 \ln X_{3m} + \gamma_5 D_{3m} + \nu_m
\end{align*}
\]

\(WIN\) is the time window (in days) between the launch dates in the U.S. and the focal country \(c\), \(REV\) is the total box office revenues, \(PAD\) is the prelaunch advertising spending, \(WOM\) is word of mouth, \(X\) is a vector of non-dummy movie-specific characteristics, \(Y\) is a vector of country-specific characteristics, \(Z\) is a vector of movie- and country-specific characteristics, \(D\) is a vector of movie- and country-related dummy variables, including release year dummies, \(m\) is movie, \(\epsilon\), \(\eta\), and \(\nu\) are error terms, and \(\alpha, \beta, \text{ and } \gamma\) are parameter vectors associated with different variables in the equations. There are three endogenous variables and each equation has at least four

France, but subtitled in Greece and Croatia. However, many movies are simultaneously introduced into 50-70 countries, suggesting that dubbing is not a defining factor that affects entry timing. Whether dubbing affects the launch time window depends on the studio’s capability and resources. We control for this studio specific factor through a studio dummy variable.
excluded exogenous variables, so the system is identified.

The launch time window and prelaunch advertising decisions depend on the expected values of box office revenue ($REV^*$) and word of mouth ($WOM^*$) in our model. Since the time window is fixed over time, we need to use cross-sectional data instead of panel data. Therefore, we use the average expected revenues over a movie’s theatrical run derived based on double exponential smoothing procedure applied to the weekly data. Similarly, we use the average expected value of word of mouth based on double exponential smoothing.\(^7\)

We also account for negative time windows. About 6.6% of the observations have negative time windows that range from -14 to -1. There are at least two reasons why studios release movies in foreign countries before they release them in a domestic market. First, the typical opening day of the week in some countries is before Friday, the traditional opening day in the U.S. Second, a movie season in some countries could fall before the planned U.S. release date.\(^8\) For example, *Constantine* (2005) was released in South Korea, 10 days before the U.S. release, to take advantage of one of the biggest national holidays in the country, Lunar New Year’s Day. We control for such negative windows by setting the window to zero and considering it as a simultaneous release, consistent with previous research in marketing and economics. For example, Elberse and Eliashberg (2003), who use A.C. Nielsen EDI data, report the range of international time windows as 0 to 514 days. Engen and Gale (2000) apply the natural logarithmic transformation towards a median regression after setting negative values to

\(^7\) In a few exceptional cases, we use the actual values for some observations for which the double exponential smoothing technique does not work well. We can also use the control function approach for endogeneity (Luan and Sudhir 2010).

\(^8\) A negative window could be also due to the studio’s earlier release in a country to combat piracy. However, this is not the case in our data. The correlation between time window and piracy rate is very low in the entire sample (0.035) as well as in the sample containing only negative windows (0.126). Nevertheless, we estimated several regression models of time window with different specifications of piracy on the sample with negative windows. In all the models, the coefficient of piracy is insignificant ($p > 0.10$). This is consistent with movie studios’ practice of simultaneous release in countries where piracy rates are expected to be high.
one by using a technique outlined in Johnson, Kitamura, and Neal (2000). To enable log-transformation, we set negative and zero windows to one.

We finally estimate a log-linear model. An advantage of this specification is that the estimated coefficients represent the elasticity of the dependent variables with respect to changes in the independent variables. A similar specification is used by Basuroy, Desai, and Talukdar (2006) for domestic market and Elberse and Eliashberg (2003) for international markets. We estimate this system of three equations using three-stage least squares (3SLS). The OLS estimator is inconsistent due to endogeneity of time window, country revenue, and prelaunch advertising in the equations. In addition, the errors in the three equations may be correlated. For example, a new release of a blockbuster movie in one country can affect revenues of the movie in the country and the time window decision for the country. In this case, a three-stage least square (3SLS) procedure is more efficient than a two-stage least squares (2SLS) procedure (Zellner and Theil 1962).

We do not include piracy rate and real GDP per capita in our final model due to their high correlations with globalization index (-0.724 and 0.699, respectively). Instead, we use these variables to check the robustness of our results.

6. Results and Robustness Checks

6.1. Results

The results from the time window, prelaunch advertising, and country revenues equations appear in Table 3. In the window equation, we expected foreign demand potential to be negatively related to launch time window (Result 1). The negative and significant ($p < 0.01$) coefficient of expected country revenues suggests that distributors launch movies with higher

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9 In median regression, if the conditional median is greater than zero, this recoding does not affect the coefficient, but affects the standard errors in some cases, because it changes the distribution of the residuals (Pence 2001).
expected revenues at a faster rate into foreign markets, which helps them realize worldwide revenues sooner. The coefficient of expected word of mouth is positive and significant ($p < 0.01$), consistent with our expectation (Result 2). Distributors delay international releases of a movie with high expected word of mouth. A delayed entry strategy allows the word of mouth effect to build over time and have a stronger effect when the product is launched into the country. The coefficient of prelaunch advertising is negative and significant ($p < 0.01$) as predicted by Result 3. With a higher level of prelaunch advertising spending, distributors launch a movie faster into foreign markets to take advantage of advertising spillover across countries.

Because our model is double-log in the endogenous variables, the coefficients of expected country revenues and prelaunch advertising represent the elasticities of these variables and can be directly compared. All else equal, if a studio expects the revenues of its movie in Country A to exceed that in Country B by 10%, then it will launch it 3.7% faster in Country A. Similarly, if a studio’s prelaunch advertising spending in Country X to exceed that in Country Y by 10%, then it will release the movie, 14.24% faster in Country X. For an average movie in the database (with expected launch window of 56 days), a 10% increase in expected revenues (prelaunch advertising spending) will likely result in a launch window of 54 (48) days.

The effects of control variables in the window equation are generally in the expected directions. Consistent with our expectation, the coefficient of cultural distance is positive and significant ($p < 0.01$), suggesting that a studio launches a movie faster into culturally proximate countries. However, the coefficient of globalization index is positive and significant ($p < 0.01$), contrary to our expectation. One possible explanation is that because more globalized countries are better connected with the U.S., studios may wait longer to release their movies in those
countries so that they can apply the lessons learned in the U.S. market in those countries. The coefficient of the number of opening screens is negative and significant \((p < 0.01)\), suggesting that firms launch movies faster into those foreign countries where the movies can be seen on more screens. As expected, the coefficient of the number of previous launches is positive and significant \((p < 0.01)\). If a movie was previously released in more countries, then the firm can expect a larger cross-country lead-lag effect. The coefficient of sequel is negative and significant \((p < 0.01)\), suggesting that distributors tend to release sequels faster into international markets.

The up-front investment in making a sequel is typically much higher than that of a non-sequel, because actors and actresses have increased bargaining power in sequels. In the data, the average production budget of sequels (\$95.3 million) is also greater than that of non-sequels (\$72.2 million). Sequels serve as quality signals (Basuroy, Desai, and Talukdar 2006) and exhibit less uncertainty than do non-sequels.

The signs of the coefficients of production budget and star power, however, are positive and significant \((p < 0.01)\), contrary to our expectation. Perhaps, a large production budget constrains a studio’s resources to enter foreign markets quickly and a greater star power of the movie allows the studio to wait longer to enter a foreign market. The coefficient of seasonality is negative and significant \((p < 0.05)\) and competitor strength is insignificant \((p > 0.10)\). Firms launch movies with MPAA ratings, such as PG13 and R, and with genres, such as action, adventure, documentary, family, fantasy, musical, period, and science fiction, faster into foreign countries than those with an R rating. Studios release movies with drama or romance later than movies with an R rating or a thriller genre.

The results from the revenues equation offer important insights that are consistent with those from the window equation. The coefficient of launch time window is negative and
significant \( (p < 0.01) \), consistent with our expectation. This finding suggests that the shorter the window, the higher the revenues from international markets, after controlling for other factors. The sign of the coefficient of prelaunch advertising is positive as expected, but not significant \( (p > 0.10) \). The coefficient of word of mouth is positive and significant \( (p < 0.01) \) as expected. The elasticity of word of mouth \( (0.137) \) is also significantly \( (p < 0.01) \) greater than that of prelaunch advertising \( (0.03) \). Note that our measure of word of mouth includes both domestic and foreign components. Thus, this result partially confirms the existence of cross-country spillover effect.

The result on the number of countries with previous launches also supports this interpretation. It is positive and significant \( (p < 0.01) \), suggesting that the number of countries in which a movie was previously launched has a positive effect on its revenues in subsequent countries of launch.

The coefficients of average number of screens, production budget, globalization, and seasonality all have the expected signs (positive) and are significant \( (p < 0.01) \). The coefficient of cultural distance, however, is positive and significant \( (p < 0.01) \), contrary to our expectation. A possible explanation is that Hollywood movies have a mystique appeal among consumers in many countries that are culturally distant from the U.S (e.g., Japan, Korea). The coefficients of star power, sequel, and competitor strength are not significant \( (p > 0.10) \). PG13 and R ratings and genres such as adventure, animation, comedy, family, fantasy, horror, musical, period, and romance have higher \( (p < 0.10 \) or better) base revenues than thriller genre that has base revenues similar to crime, documentary, and drama genres.

For the prelaunch advertising equation, the coefficient of launch time window is negative and significant \( (p < 0.01) \), reinforcing the negative relationship between launch time window and prelaunch advertising uncovered in the window equation. We expected foreign demand potential to be positively related to prelaunch advertising (Result 4). The coefficient of expected country
revenues is indeed positive ($p < 0.10$). To leverage the cross-country spillover effect, studios spend more on prelaunch advertising when they expect larger foreign revenues. Consistent with our prediction (Result 5), the coefficient of expected word of mouth is negative, but it is not significant ($p > 0.10$).

The coefficients of the number of opening screens for the U.S. launch, production budget, and star power are all positive and significant ($p < 0.01$). Studios spend more on prelaunch advertising for movies which open on higher number of screens, production budgets, and stars. An interesting finding is that studios spend less on prelaunch advertising of sequels than non-sequels ($p < 0.01$). This is because sequels are already known, so studios may leverage their quality signal rather than depend on advertising spending (Basuroy, Desai, and Talukdar 2006).

6.2. Robustness Checks

We performed several robustness checks. First, we estimated an alternative model using the GDP per capita and piracy rate in lieu of globalization index. Although we could not add these variables to our model due to their collinearity with globalization index, we obtain the same results when we included these variables in lieu of globalization index. Second, because critical reviews affect firm value (Chen, Liu, and Zhang 2011), we estimated a model with user rating and critic’s review as a proxy for product quality to control for possible omitted variable bias. The results largely remain unchanged. Third, our results are robust to different measures of number of screens, such as opening number of screens and average number of screens in the window and revenue equations. Fourth, to see whether negative windows create any estimation bias, we estimated the same model after dropping the negative windows instead of setting them to zero. The substantive results were the same. Fifth, we estimated an alternative model in which we determined expected country revenues by regressing revenues on average ratio of past
country revenues to past U.S. box office revenues, movie budget and country per capita GDP, using data from a prior regime (2003-06). The results did not change substantively.

Finally, we performed additional analyses to rule out any systematic bias due to potential missing observations. Possible reasons why we do not observe all 78 countries for each movie include: (1) the movie was released in only a subset of countries and (2) data were missing for a few countries in which the movie was released. To investigate this issue further, we estimated alternative models using sub samples obtained by dropping movies that were launched into less than 10, 20, or 30 countries. The results remained substantively the same. We estimated several probit models in which we created dummy variables which take the value of one if a movie belongs in the top 10, 20, or 30 in the number of countries where it was released and zero otherwise. We estimated probit models in which the dependent variables are those dummy variables; the independent variables are genre dummies (Craig, Greene, and Douglas 2005). In all three probit models, the overall model was not significant ($\chi^2 = 1.68$, degrees of freedom [df] = 6; $\chi^2 = 3.39$, df = 8; $\chi^2 = 8.98$, df = 9). Thus, we do not find any evidence for a systematic bias due to missing data.

A summary of the key results with brief explanations and rationale appears in Table 4.

Among the determinants of launch time window, word of mouth (+), prelaunch advertising (-), foreign demand potential (-), and cultural distance (+) are the key variables and their relationships are in the expected directions. With regard to the determinants of revenues equation, launch time window (-), word of mouth (+), and the number of previous launches (+) have important effects in the right directions. For prelaunch advertising, time window (-) and foreign market potential (+) are the key variables, and their relationships are in line with our predictions.

< Table 4 about here >
7. Managerial Implications, Limitations, and Future Research

7.1. Managerial Implications

What should managers do as a result of the findings? First, managers should carefully balance the tradeoff between prelaunch advertising and word of mouth effects when deciding international entry time window. If the domestic prelaunch advertising spending budget is low, then they should delay releasing the product in the foreign country. However, if firms can support a new product with high prelaunch advertising, then they should not delay the international release because the advertising spillover effect can dissipate quickly. Managers should, however, delay international launch if they expect positive word of mouth so that they can better leverage the word of mouth effect.

Word of mouth typically depends on the quality of new products. Thus, the international entry timing decision is a tradeoff between leveraging product quality versus marketing effort. On the one hand, if managers believe that product quality is the stronger driver of performance, then they should delay foreign entry to take advantage of the positive word of mouth effect. On the other hand, if they anticipate marketing effort to more strongly drive revenues, then they should enter foreign markets as quickly as possible.

Second, managers also need to consider several country-specific factors when deciding foreign entry timing. Our results suggest that they should consider factors, such as cultural distance and seasonality. Managers should consider launching new products faster into countries that are culturally closer to their home country.

To summarize, our research has important implications on current practices in the motion picture industry and potentially on other industries with short life cycle products. For example, studios increasingly rely on a day-and-date launch practice worldwide, that is, a simultaneous
launch strategy. Our findings suggest that overemphasizing a day-and-date practice can be misleading. A major reason why studios are leaning toward a simultaneous launch decision is piracy concern (Variety 2003). However, the impact of piracy on revenues is still controversial (see Oberholzer-Gee and Strumpf 2007 for a discussion on music industry piracy) and can even be positive in some cases (Jain 2008).

To examine the effect of piracy, we included piracy rate instead of globalization index as an independent variable. Table 5 shows the results from this regression model. The coefficient of piracy is positive and significant \( p < 0.01 \) in the revenues equation. We used overall software piracy rate as a proxy for movie piracy because typically they are highly correlated.\(^{10}\) Therefore, our finding provides a caveat against overemphasizing piracy as a major concern. Firms can increase their return on investment by leveraging the word of mouth effect instead of overly relying on prelaunch advertising spending and a simultaneous release strategy.

\(< \text{Table 5 about here} >\)

7.2. Limitations and Future Research

International market entry strategy and international launch time window, in particular, are critical to the success of new products in several industries. We developed an analytic model of optimal international launch time window and prelaunch advertising expenditures and advanced some predictions. We tested these predictions and the effects of other determinants using a unique and large dataset from the motion picture industry. Our main findings are that launch time window is positively associated with word of mouth but negatively related to prelaunch advertising efforts and foreign demand potential. We also find that firms release new products faster into countries that are culturally closer to the home country. Our findings offer

\(^{10}\) The correlation between movie piracy and overall software piracy rate is 65.2% based on 10 sample countries reported in a study by MPAA (2006).
new insights into the tradeoff between leveraging the word of mouth effect and investing in a prelaunch advertising campaign for the international launch time window decision.

Our research has some limitations that offer opportunities for future research. First, we did not study the time window decisions for home video and downloadable format releases for domestic markets. Future research could model international time window by simultaneously considering these subsequent channel time windows. Second, we did not include local advertising spending in each country because data were not available and because it is typically small relative to US advertising. Future research can investigate issues related to how entry timing decision and advertising spillover are affected by local advertising campaigns. Third, our model could be extended to use purchase intentions as a measure of expected revenues, consistent with Chintagunta and Lee (2012). Fourth, it could be applied to movies involving studio alliances, extending Palia, Ravid, and Reisel (2008). Finally, our model could be applied to other products or industries if appropriate data are available. For example, books, music, and video games exhibit a sales pattern similar to movies. In addition to these short life cycle products, it would be interesting to see whether our results can be also applied to short-to-medium life cycle products and durable goods. Analysis of international entry timing in these additional product categories will be worthwhile.
References


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Johnson, W., Y. Kitamura, D. Neal. 2000. Evaluating a simple method for estimating black-


Variety. 2003. How great is day-and-date? Not all tentpole releases benefit from 'X2'-style worldwide blitz (May 12).


<table>
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<tr>
<th>Variables</th>
<th>Descriptions (Measures)</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIN</td>
<td>Time difference between U.S. and country launch date (days)</td>
<td>Mojo</td>
</tr>
<tr>
<td>REV</td>
<td>Gross box office revenues in the country ($)</td>
<td>Mojo</td>
</tr>
<tr>
<td>PAD</td>
<td>Advertising expenditures before U.S. release ($)</td>
<td>TNS</td>
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<tr>
<td>WOM</td>
<td>Sum of average revenues per screen in the previous week in domestic and foreign markets ($)</td>
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</tr>
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<td>OPENSCRN</td>
<td>Number of opening screens</td>
<td>Mojo</td>
</tr>
<tr>
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<td>Number of opening screens in the U.S.</td>
<td>Mojo</td>
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<td>Average number of screens</td>
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<tr>
<td>PROD</td>
<td>Production budget ($)</td>
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<td>Average box office revenues of the movies in which the actors were cast members five years prior to the release of the movie ($)</td>
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<td>Country piracy rate (%)</td>
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<td>GDP</td>
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<td>SEASON</td>
<td>A weekly index for seasonality based on total revenues (0 - 100 scale)</td>
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<td>STUDIO, SEQUEL, MPAA RATING, GENRE, COUNTRY</td>
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Table 2 Descriptive Statistics

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<td>FAMILY</td>
<td>0.04</td>
<td>0.19</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>FANTASY</td>
<td>0.07</td>
<td>0.26</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>HORROR</td>
<td>0.08</td>
<td>0.27</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>MUSICAL</td>
<td>0.02</td>
<td>0.16</td>
<td>0.00</td>
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<tr>
<td>PERIOD</td>
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<td>0.21</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>ROMANCE</td>
<td>0.07</td>
<td>0.26</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>SCIFI</td>
<td>0.06</td>
<td>0.23</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>THRILLER</td>
<td>0.07</td>
<td>0.26</td>
<td>0.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Table 3 Empirical Results of the Window, Revenue, and Prelaunch Advertising Equations

<table>
<thead>
<tr>
<th>Effect of</th>
<th>Time Window</th>
<th>Country Revenue</th>
<th>Prelaunch Advertising</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ln WIN</td>
<td>-0.370</td>
<td>-0.177</td>
<td>-0.009</td>
</tr>
<tr>
<td>Ln REV</td>
<td>-0.142</td>
<td>0.355</td>
<td>0.009</td>
</tr>
<tr>
<td>Ln PAD</td>
<td>0.089</td>
<td>0.090</td>
<td>0.741</td>
</tr>
<tr>
<td>WOM</td>
<td>0.126</td>
<td>0.0137</td>
<td>-0.005</td>
</tr>
<tr>
<td>SCRN</td>
<td>0.009</td>
<td>0.001</td>
<td>0.007</td>
</tr>
<tr>
<td>NPRELAUNCH</td>
<td>0.009</td>
<td>0.040</td>
<td>-0.218</td>
</tr>
<tr>
<td>CD</td>
<td>0.105</td>
<td>0.274</td>
<td>0.050</td>
</tr>
<tr>
<td>GLOBAL</td>
<td>5.768</td>
<td>1.092</td>
<td>0.107</td>
</tr>
<tr>
<td>SEASON</td>
<td>-0.099</td>
<td>0.525</td>
<td>0.042</td>
</tr>
<tr>
<td>COMP</td>
<td>0.001</td>
<td>-0.004</td>
<td>0.003</td>
</tr>
<tr>
<td>PG</td>
<td>0.265</td>
<td>-0.001</td>
<td>0.050</td>
</tr>
<tr>
<td>PG13</td>
<td>-0.210</td>
<td>0.241</td>
<td>0.054</td>
</tr>
<tr>
<td>R</td>
<td>-0.213</td>
<td>0.220</td>
<td>0.056</td>
</tr>
<tr>
<td>ACTION</td>
<td>-0.270</td>
<td>-0.181</td>
<td>0.039</td>
</tr>
<tr>
<td>ADVENTURE</td>
<td>-0.777</td>
<td>0.134</td>
<td>0.055</td>
</tr>
<tr>
<td>ANIMATION</td>
<td>-0.028</td>
<td>0.238</td>
<td>0.050</td>
</tr>
<tr>
<td>COMEDY</td>
<td>0.305</td>
<td>0.106</td>
<td>0.037</td>
</tr>
<tr>
<td>CRIME</td>
<td>0.034</td>
<td>0.069</td>
<td>0.051</td>
</tr>
<tr>
<td>DOCU</td>
<td>-0.525</td>
<td>0.164</td>
<td>0.203</td>
</tr>
<tr>
<td>DRAMA</td>
<td>0.140</td>
<td>-0.002</td>
<td>0.042</td>
</tr>
<tr>
<td>FAMILY</td>
<td>-0.285</td>
<td>0.232</td>
<td>0.059</td>
</tr>
<tr>
<td>FANTASY</td>
<td>-0.259</td>
<td>0.119</td>
<td>0.047</td>
</tr>
<tr>
<td>HORROR</td>
<td>-0.026</td>
<td>0.083</td>
<td>0.043</td>
</tr>
<tr>
<td>MUSICAL</td>
<td>-0.374</td>
<td>0.538</td>
<td>0.060</td>
</tr>
<tr>
<td>PERIOD</td>
<td>-0.292</td>
<td>0.105</td>
<td>0.050</td>
</tr>
<tr>
<td>ROMANCE</td>
<td>0.168</td>
<td>0.311</td>
<td>0.042</td>
</tr>
<tr>
<td>SCIFI</td>
<td>-0.378</td>
<td>-0.216</td>
<td>0.050</td>
</tr>
</tbody>
</table>

R² = 0.753 0.868 0.407

N = 7,687. Standard errors are in parentheses. The dependent and the independent variables except the dummy variables are in logarithm form. Revenues and word of mouth are expected values in the window and prelaunch advertising equations. SCR is the average number of screens in the revenue equation, the opening number of screens in the window equation, and the number of opening screens for the U.S. release in the prelaunch advertising equation. The window equation includes studio and country dummies and the revenues equation includes country dummies. The parameter estimates corresponding to these variables are not shown to save space. G.THRILLER, Studio 25 (Weinstein), and Country 62 (Venezuela) are the base cases.

* Significant at 10%; ** significant at 5%; *** significant at 1%.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Effect</th>
<th>Brief Interpretation and Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Launch Time Window</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word of mouth</td>
<td>+</td>
<td>Firms delay launch of new products in a foreign country if the word of mouth for those products is higher. By entering the foreign market later, firms can leverage the positive word of mouth built over time.</td>
</tr>
<tr>
<td>Prelaunch advertising</td>
<td>-</td>
<td>Firms enter a foreign country earlier if they spend more on prelaunch advertising in their home market. Entering early enables them to leverage the global buzz created by a large advertising campaign.</td>
</tr>
<tr>
<td>Country demand potential</td>
<td>-</td>
<td>Firms launch products into a foreign country more quickly if the market potential in that country is higher. Early entry in high-potential markets can earn greater revenues and profits faster before competitors can make inroads into the markets.</td>
</tr>
<tr>
<td>Cultural distance</td>
<td>+</td>
<td>Firms enter those countries that are more culturally distant from their home country later than when they enter culturally closer countries. Consumer acceptance of new products is faster and home country management practices are more effective in culturally closer countries.</td>
</tr>
<tr>
<td><strong>Country Revenue</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Launch time window</td>
<td>-</td>
<td>All else equal, the longer the launch time window in a country, the smaller the sales revenues in that country. Early entry in a country earns greater revenues and profits faster before competitors can make inroads into that country.</td>
</tr>
<tr>
<td>Word of mouth</td>
<td>+</td>
<td>Firms earn greater revenues in a foreign country when the positive word of mouth effect is larger. Positive word of mouth acts as an effective advocate for the product in that country.</td>
</tr>
<tr>
<td>Number of previous</td>
<td>+</td>
<td>Firms earn greater revenues for their product in a foreign country if the product was previously launched in more countries.</td>
</tr>
<tr>
<td>launches</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prelaunch Advertising</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country demand potential</td>
<td>+</td>
<td>Firms spend more on their advertising before launching in their home country if the market potential in foreign countries is higher. Greater prelaunch advertising in the home country helps them earn greater revenues.</td>
</tr>
<tr>
<td>Word of mouth</td>
<td>-</td>
<td>Firms spend less in prelaunch advertising for products with greater expected word of mouth. They take advantage of the complementary role of consumer word of mouth with prelaunch advertising by compensating for lower expected user ratings with high prelaunch advertising.</td>
</tr>
</tbody>
</table>
### Table 5 Empirical Results of the Window, Revenue, and Prelaunch Advertising Equations with Piracy Rate

<table>
<thead>
<tr>
<th>Effect of</th>
<th>Time Window</th>
<th>Country Revenue</th>
<th>Prelaunch Advertising</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ln WIN</td>
<td>-0.177 (0.034)***</td>
<td>-0.009 (0.003)***</td>
<td></td>
</tr>
<tr>
<td>Ln REV</td>
<td>-0.370 (0.018)***</td>
<td>0.005 (0.003)*</td>
<td></td>
</tr>
<tr>
<td>Ln PAD</td>
<td>-1.424 (0.059)***</td>
<td>0.003 (0.032)</td>
<td></td>
</tr>
<tr>
<td>WOM</td>
<td>0.355 (0.019)***</td>
<td>0.137 (0.012)***</td>
<td>-0.005 (0.003)</td>
</tr>
<tr>
<td>SCRN</td>
<td>0.089 (0.026)***</td>
<td>0.909 (0.016)***</td>
<td>0.741 (0.022)***</td>
</tr>
<tr>
<td>NPRELAUNCH</td>
<td>0.853 (0.007)***</td>
<td>0.155 (0.026)***</td>
<td></td>
</tr>
<tr>
<td>PROD</td>
<td>0.126 (0.025)***</td>
<td>0.193 (0.018)***</td>
<td>0.183 (0.007)***</td>
</tr>
<tr>
<td>STAR</td>
<td>0.009 (0.002)***</td>
<td>0.001 (0.001)</td>
<td>0.007 (0.001)***</td>
</tr>
<tr>
<td>SEQUEL</td>
<td>-0.475 (0.028)***</td>
<td>0.040 (0.025)</td>
<td>-0.218 (0.013)***</td>
</tr>
<tr>
<td>CD</td>
<td>-4.959 (0.140)***</td>
<td>-0.856 (0.102)***</td>
<td></td>
</tr>
<tr>
<td>PIRACY</td>
<td>7.491 (0.212)***</td>
<td>1.419 (0.139)***</td>
<td></td>
</tr>
<tr>
<td>SEASON</td>
<td>-0.099 (0.047)***</td>
<td>0.525 (0.042)***</td>
<td></td>
</tr>
<tr>
<td>COMP</td>
<td>0.001 (0.004)</td>
<td>-0.004 (0.003)</td>
<td></td>
</tr>
</tbody>
</table>

\[ R^2 = 0.753 \quad 0.868 \quad 0.407 \]

N = 7,687. Standard errors are in parentheses. Model specification is the same as in the previous model. Only globalization index is replaced by piracy rate. The estimates of the remaining variables are not shown to save space.

* Significant at 10%; ** significant at 5%; *** significant at 1%.
Figure 1 A Conceptual Model of the Determinants of Launch Window, Country Revenues, and Prelaunch Advertising

**Studio Characteristics**
- Studio brand

**Movie Characteristics**
- Word of mouth
- Production budget
- Opening screens
- Sequel
- Star power
- Genre
- MPAA rating

**Country Characteristics**
- Cultural distance
- Globalization index
- Seasonality
- Competition
- Number of previous launch countries

**Movie Characteristics**
- Word of mouth
- Production budget
- Sequel
- Star power
- U.S. opening screens

**Studio Characteristics**
- Studio brand

**Movie Characteristics**
- Word of mouth
- Production budget
- Sequel
- Star power
- Genre
- MPAA rating
- Average screens

**Country Characteristics**
- Cultural distance
- Globalization index
- Seasonality
- Competition
- Number of previous launch countries

**Launch Time Window**

**Country Revenues**

**Prelaunch Advertising**