# Exporting Movies:
# Country Proximity, Release Strategy, and Performance

Luís Cabral
*New York University*

Gabriel Natividad
*Universidad de Piura*

June 2018

**Abstract.** We examine the release strategy and performance of movies produced in country $i$ and exhibited in country $j$. Our theoretical model implies that country proximity and demand potential are substitute factors in the movie-release decision: the closer countries $i$ and $j$ are the more likely $i$'s movies are released in $j$ during a period of low demand. Moreover, everything else constant, country proximity leads to better performance.

We test our predictions with a data set comprising 10,585 feature films produced in 84 different countries and distributed in 59 different countries. As a country distance variable, we use a well-known measure of political affinity which is subject to yearly exogenous shocks.

The empirical results confirm the theory with regression coefficients that are both statistically and economically significant: a unit change in the country proximity variable (e.g., from uncorrelated to perfectly aligned political preferences) leads to a 31.7% increase in box-office revenues (or $5.6 million per movie) and a 7.9% decrease in the probability of releasing the film on a high-grossing weekend.

Cabral: Stern School of Business, New York University; luis.cabral@nyu.edu. Natividad: Universidad de Piura; gabriel.natividad@udep.pe. Thanks to audiences at Pontificia Universidad Catolica de Chile, Universidad de Piura, the 2017 Mallen conference on the economics of filmed entertainment, the 2018 Munich Summer Institute, to Justin Tumlinson (discussant) for comments, and to Walter Noel and Leandro Pezán for valuable research assistance.

# 1. Introduction

It is common wisdom that the level of economic exchange between two countries is correlated with their "proximity." In the international trade economics literature, this is encapsulated in the so-called *gravity equation*, which posits a level of bilateral trade proportional to measures of country size and inversely proportional to distance measures. For example, Eaton and Kortum (2002) consider measures of proximity such as a common border, a common language or a common trade area, and confirm the gravity equation with data on bilateral trade in manufactures among 19 OECD countries in 1990.

Most of the trade literature focuses on commodities and manufactures. A tantalizing possibility is that a similar logic applies to cultural goods as well.[1] The idea is that, whereas for physical goods measures of physical distance are relatively more important, in the case of cultural goods other intangible, more culture-related measures of distance, become relatively more important. For example, Craig et al. (2005) show that American "films perform better in countries that are culturally closer to the U.S. and those that have a higher degree of Americanization."

In this paper, we study — theoretically and empirically — the export of a movie from country $i$ into country $j$. We are interested in understanding how export performance and export strategy — in particular movie-release strategy — depend on how close countries $i$ and $j$ are. Throughout the paper, the proximity of two countries refers to a composite of cultural, historical, political and economic factors which influence the demand for the foreign country's movie exports.

We develop a theoretical model of movie supply and demand. On the demand side, we consider two important features. First, every else constant, the closer two countries are, the greater the demand of a movie export across the two countries. Second, in a given period movies compete for a fixed number of moviegoers, so that the greater number of competing movies, the lower a given movie's demand. On the supply side, we assume that each movie must choose a release date taking into account the movie's demand in the particular market as well as beliefs regarding the other movies' release strategies.

We show that, in equilibrium, a foreign movie from a "closer" country is likely to perform better in the foreign country. This is not surprising and we use as a "sanity check" of both the theoretical model and the empirical regressions. More important, we also show that distance has implications for release strategy: the closer two countries are, the more likely a movie is released during a low-demand weekend. Intuitively, a period of greater demand attracts more movie openings, which implies that the *relative* value of a movie with greater specific demand is lower during a high-demand period. As a result, *in equilibrium* (that is, taking into account the distribution of release-date choices) higher-demand movies prefer to release during low-demand periods.

The empirical portion of the paper tests these theoretical predictions and obtains additional results. We consider a particular cultural good, feature movies, and a specific measure of variations in proximity between countries, namely variations in political affinity. Specifically, we measure each country pair's voting behavior at the United Nations over time. The empirical results largely confirm the theoretical predictions.

Except for the prediction that closer proximity is associated with greater demand —

1. Eurostat defines cultural goods as "products of artistic creativity that convey artistic, symbolic and aesthetic values; examples are antiques, works of art, books, newspapers, photos, films and music."

which is neither surprising nor novel — our analysis includes at least two features which are surprising or somewhat controversial or both; a few notes are thus in order.

First, anecdotal evidence and common sense suggest that blockbusters should be released (and *are* released) during high-demand periods. Einav (2007) estimates that higher sales during holiday weekends are due both to demand and to supply effects, which corroborates the view that supply shocks and demand shocks are complements. By contrast, our theoretical prediction suggests that country proximity makes it optimal for higher-demand movies to be released abroad during low-demand periods.

To reconcile the two views, we present two extreme versions of the movie-release game: one with a continuum of players and one with two (asymmetric) players. The two-player game implies that, with sufficient asymmetry, the unique equilibrium has the blockbuster released during the high-demand period. The continuum player game, by contrast, implies the opposite prediction.

Our result for the continuum-player case is novel and somewhat surprising but not, we argue, contrived. In equilibrium, the continuum of movies spreads out across periods in a pattern that trades-off higher demand against higher competition. In equilibrium, the high-demand period attracts a greater measure of movies. This implies that the *marginal* gain from movie "quality" is lower during high-demand periods than during low-demand periods. As a result, movies sort out in a pattern whereby movie demand and period demand are substitute, not complementary, factors.

Reality is somewhere in between the above two extreme views of the world (two asymmetric players and a continuum of players). We submit that, except for a limited number of movies, international releases are closer to the continuum-player game than to the two-player game. Accordingly, we stand by our prediction that, on average, better titles avoid periods of high demand in the destination country, and we provide strong support for this view.

The second controversial feature of our analysis is measuring correlation in United Nations's voting patters as a measure of country proximity. We will readily admit that political preferences — in particular the way we measure them — correspond to a very small fraction of a given country's makeup. Moreover, the proximity between two countries involves many dimensions — economic, cultural, etc. — that go beyond political affinity. For the purpose of our empirical exercise, the important identifying assumption is that political affinity contributes to proximity more broadly defined. For example, Chile and Venezuela can be said to be culturally close on a variety of dimensions, including language. In the current state of affairs, the two countries cannot be said to be politically close. Our point is that, were Venezuela to change its political regime to one that is closer to Chile, we would say the two countries become even closer; and such increase in political affinity would be measured (with noise) by the two countries' United Nations voting behavior.

Following this identification strategy, we find that a film's box office performance abroad is higher when the country of origin and the country of destination become politically closer. We estimate (with reasonably high statistical precision) that a unit change in the affinity variable (e.g., from uncorrelated to perfectly aligned) leads to a 31.7% increase in box-office revenues (or $5.6 million per movie). We also estimate that a one-unit increase in political affinity implies a 7.9% *decrease* in the probability of releasing the film during a high-grossing weekend.

■ **Related literature.** At a very broad level, our paper is related to the international trade literature on the gravity equation; see Anderson (2011) for a survey. That stream of research has focused primarily on commodities and manufactured goods; and the measure of distance is typically related to physical distance or other variables which impact transportation costs. By contrast, we consider a specific cultural good — feature movies — and a distance measure that seems more related to demand than to cost conditions.

The literature on strategy and international business has given significant attention to the liability of foreignness (Zaheer, 1995, Cuervo-Cazurra et al., 2007). Our paper proposes a framework to better understand the market-specific competitive scenarios faced by firms operating abroad (Gimeno et al., 2005, Ghemawat and Thomas, 2008). Empirically, our use of political changes gives substance to Ghemawat's (2007) assertion that significant political differences hinder the flattening of international barriers around the world. Our key finding that foreign-market demand shocks and bilateral political affinity changes are substitute factors in strategic release decisions offers new insight into the complex relation between strategy and globalization.

We are not the first to use U.N. voting data as a measure of proximity. Stone (2004) shows that African countries which are close (in the U.N.-voting sense) to developed-country patrons are subject to less rigorous enforcement of IMF contracts. Simmons (2005) estimates a gravity model of bilateral trade, claiming that "foreign policy comity should be associated with more extensive bilateral economic relations." She uses the same U.N.-voting index, claiming that "while hardly a perfect measure, ... it captures the underlying degree of 'affinity' between country pairs." Finally, Bertrand et al. (2016) argue — and confirm empirically — that lower political affinity increases the likelihood that a host government intervene against foreign acquirers, which in turn leads the latter to increase their initial acquisition premium.

There is an economics, strategy and marketing strategy literature dealing with the international performance of motion pictures — see Neelamegham and Chintagunta (1999), Elberse and Eliashberg (2003), Craig et al. (2005). Kim and Jensen (2014) is particularly germane to our paper. They consider a large sample of films produced and distributed domestically and internationally in Europe between 2004 and 2009 and find that domestic commercial performance and film festival participation increase international film success, but also that their effects depend on the cultural distance between countries and the use of major or independent distribution in the domestic and foreign markets.

Regarding the measurement of cultural distance, our paper differs in that we use an annual measure that allows us to measure yearly shocks (which, we argue, correspond to exogenous changes). Moreover, our analysis goes beyond measuring sales impact and includes the effect of country proximity on the distributors' overseas strategy, namely in terms of release time. In this respect, our paper is related to an economics, marketing and strategy literature dealing with the release-date game; see Krider and Weinberg (1998) and Einav (2010). To the best of our knowledge, ours is one of the first papers to study the issue of release timing in an international context.

■ **Roadmap.** The rest of the paper is organized as follows. In Section 2 we propose a simple model of movie demand and supply which provides fairly sharp predictions regarding the relation between cultural proximity and the performance of a domestic movie in a foreign market, as well as the movie-release strategy followed in the foreign market. Section 3

describes the data we use in our empirical tests, whereas Section 4 presents the results of a series of tests. Finally, Section 5 concludes the paper.

## 2. Theory

Consider the market for movie exhibition in a given country and in a given year. For now, we assume the number of movies is sufficiently large that we may treat it as a continuous variable. This is not an innocuous assumption, as we will see later. The idea is that, with the exception of a few countries of origin, foreign movies are typically a "niche" product with relatively low demand (relative to total market demand).

Specifically, there is a measure $n$ of movies, which we will also refer to as number of movies. Movies originate from $m$ countries competing for theater demand. We assume price and advertising expenditures are fixed, so that the sole strategy by distributors is to decide when to release the movie. As shown by Einav (2007), there are a few select weekends throughout the year when demand is particularly high. To capture this variation, we assume that there are two possible release dates: $t = 1, 2$; we assume that $t = 2$ corresponds to a high-demand period.

Specifically, demand for movie $i$ when released in period $t$ is given by

$$d_{it} = \left(\alpha + q_i/Q_t\right)\ \beta_t \tag{1}$$

where $q_i$ is a demand index of movie $i$ and $Q_t$ the total supply of movies in period $t$:

$$Q_t = \int_{k \in S_t} q_k\ dk \tag{2}$$

where $S_t$ is the set of all movies released in period $t$.

The idea underlying the above demand system is that, in a given period, a movie's demand consists of a fixed component and a variable component. The fixed component corresponds to moviegoers who will watch the movie regardless of what its competition is. The variable component, by contrast, corresponds to moviegoers with a fixed "budget" (in terms of time or money or both). This implies that, the more movies are released in a given period, the lower the demand faced by a given movie. Finally, demand variations across periods are parameterized by a multiplier $\beta_t$, where, consistently with our assumption that $t = 2$ is a "hot" period, we make the following assumption:

**Assumption 1.** $\beta_2 > \beta_1$

An equilibrium consists of a set of release strategies $T(q_i)$, where $T(q_i) \in \{t_1, t_2\}$, such that for every film $i$ demand from releasing at $T(q_i)$ is greater than demand from release during the alternative release date.

■ **Affinity and demand.** Our first result relates country proximity to overseas movie performance.

**Proposition 1.** *An increase in proximity between country $i$ and country $j$ implies an increase in country $i$ movie sales in country $j$*

**Proof:** A movie's payoff is given by

$$\max_t \left\{ \left(\alpha + q_i/Q_t\right) \beta_t \right\}$$

Both elements of the max function ($t = 1, 2$) are increasing in $q_i$. It follows that payoff is increasing in $q_i$. ■

Proposition 1 corresponds to the well-known result from the movie industry — and more generally from the trade literature — that country proximity translates into greater trade flows (Neelamegham and Chintagunta, 1999; Elberse and Eliashberg, 2003; Craig et al., 2005). We do not consider it as a central result in our paper but rather as a test that a sensible trade model should pass.

■ **Proximity and release strategy.** Differently from Proposition 1, our next theoretical results provide sharp predictions regarding the relation between country proximity and movie release strategy.

**Proposition 2.** *An increase in proximity between country $i$ and country $j$ implies that country $i$ movies are more likely to be released in country $j$ at time $t = 1$.*

**Proof:** Let $q'$ be the demand index of a movie distributor which is indifferent between $t = 1$ and $t = 2$:

$$\left(\alpha + q'/Q_1\right) \beta_1 = \left(\alpha + q'/Q_2\right) \beta_2$$

Since $\alpha\,\beta_2 > \alpha\,\beta_1$, it follows that $\beta_1/Q_1 > \beta_2/Q_2$. Therefore,

$$\frac{\partial d_1}{\partial q'} = \beta_1/Q_1 > \beta_2/Q_2 = \frac{\partial d_2}{\partial q'}$$

This implies that all movies with $q > q'$ (resp. $q < q'$) strictly prefer to release at $t = 1$ (resp. $t = 2$). ■

Intuitively, a period of greater demand attracts more movie openings (Einav, 2007). This means that the relative value of a movie with greater specific demand is lower during a high-demand period: it has to compete against more movies. To put it differently, "autonomous" demand $\alpha\,\beta_t$ is greater at $t = 2$. Since this demand component is independent of movie-specific demand $q$, the high-demand period attracts relatively lower $q$ movies. In relative terms, the autonomous component of demand is worth more for these movies.

Proposition 2 formally establishes that high demand during a given period and high movie-specific demand are substitute factors: the greater the level of general demand in a given period, the lower the marginal effect of an increase in movie-specific demand.

To rephrase the result with an example, suppose that Iran and France are closer than an average pair of countries. An Iranian movie will feature well in France regardless of when it is released. That being the case, the Iranian distributor prefers to release the movie during a period of low general demand: such release strategy diminishes competition without sacrificing much in terms of sales.

■ **Blockbusters.** Lest Proposition 2 seem trivial and obvious, we note that, in a similar but different setup, Krider and Weinberg (1998) provide the opposite prediction. Their

**Figure 1**
Blockbuster release-date game

| | | Movie $b$: $t_1$ | Movie $b$: $t_2$ |
|---|---|---|---|
| Movie $a$ | $t_1$ | $\left(\alpha + \frac{q_b}{q_a+q_b}\right)\beta_1$ <br> $\left(\alpha + \frac{q_a}{q_a+q_b}\right)\beta_1$ | $(\alpha+1)\,\beta_2$ <br> $(\alpha+1)\,\beta_1$ |
| | $t_2$ | $(\alpha+1)\,\beta_1$ <br> $(\alpha+1)\,\beta_2$ | $\left(\alpha + \frac{q_b}{q_a+q_b}\right)\beta_2$ <br> $\left(\alpha + \frac{q_a}{q_a+q_b}\right)\beta_2$ |

movie-release game considers the simultaneous choice by two movies with different levels of attraction. Although there may exist multiple equilibria to their game, their results suggest that, when the two players and the two periods are sufficiently asymmetric, the more appealing movie tends to open during the high-season, whereas the weak movie prefers to avoid head-to-head competition.

To see this, we consider a simplified version of the game they consider which can be cast in terms similar to our release-date game. As before, suppose there are two periods, $t = 1, 2$. Differently from before, suppose that there are only two movies, $a$ and $b$. The movie demand function is as before, with the difference that we now do not treat movies as a continuum but rather a finite number.

Specifically, similarly to the continuum case, demand for movie $i$ when released in period $t$ is given by (1). As to $Q_t$, the total supply of movies in period $t$, instead of (2), we now have $Q_t = q_i$ if only movie $i$ is released and $Q_t = q_a + q_b$ if both movies are released. We maintain Assumption 1 and add a second assumption:

**Assumption 2.** $\beta_2 < \frac{1+\alpha}{\alpha}\,\beta_1$

Note that Assumptions 1 and 2 define a non-empty set of parameter values. Basically, we require that $\beta_2$ be greater than $\beta_1$ (Assumption 1) but not much greater (Assumption 2).

Since we have two players and two strategies, the simultaneous-move game may be represented in matrix form, which we do in Figure 1. Normally, entry-type games such as this one admit multiple equilibria (two asymmetric pure-strategy equilibria and a mixed-strategy equilibrium). However, if players are sufficiently asymmetric, then a unique equilibrium ensues, as the next result establishes.

**Proposition 3.** *There exists a $\epsilon > 0$ such that, if $q_a/(q_a + q_b) < \epsilon$, then the release-date game admits a unique equilibrium: $a$ at $t = 1$, $b$ at $t = 2$.*

**Proof:** The conditions that $t = 2$ is a dominant strategy for $b$ and $t = 1$ is $a$'s best response to $t = 2$ by $b$ are, respectively,

$$\left(\alpha + \frac{q_b}{q_a + q_b}\right)\beta_2 > (\alpha+1)\,\beta_1$$
$$\left(\alpha + \frac{q_a}{q_a + q_b}\right)\beta_2 < (\alpha+1)\,\beta_1$$

If $q_a/(q_a + q_b) = 0$, then this reduces to

$$(\alpha + 1)\,\beta_2 > (\alpha + 1)\,\beta_1$$
$$\alpha\,\beta_2 < (\alpha + 1)\,\beta_1$$

which follow from Assumptions 1 and 2, respectively. Finally, the result follows by continuity. ■

Propositions 2 and 3 imply opposite predictions. Proposition 2 states that higher-demand movies are released during low-demand periods, whereas Proposition 3 states that higher-demand movies are released during high-demand periods. The crucial difference between the two results is that the first result is based on a continuum-player game, whereas the second result is based on a two-player game with very asymmetric players.

Consider first the two-player game with asymmetric players. In the limit, a blockbuster takes over whatever market it enters; that is, movie $b$'s market share is 100% regardless of the other movie's choice. Consequently, it is optimal (a dominant strategy) for the blockbuster to enter during the high-demand period. This result corresponds to the model developed by Krider and Weinberg's (1998) as well as the empirical evidence from U.S. releases (Einav, 2007).

At the opposite end, in the continuum case a movie's choice of $t = 1$ or $t = 2$ does not affect the total supply during that period. The equilibrium is thus one of individual optimization against the field. Since many more movies flock to the high-demand period, the marginal return to quality, $q/Q$, is small during the high-demand period, which in turn explains why high-demand movies prefer the low-demand release period.

Propositions 2 and Proposition 3 correspond to extreme assumptions regarding movie size. Reality is somewhere between these two extremes. Whether higher movie demand increases or decreases propensity for release during low-demand periods is largely an empirical question. Except for a limited number of movies, the vast majority of country $i$ releases in country $j$ corresponds to relatively "niche" players. Given this, our theoretical prediction is that the continuum model provides a better descriptor of the reality of international releases. In fact, in the next section we provide strong evidence in favor of Proposition 2. That said, we believe Proposition 3 has empirical content too, again as the next section will show.

## 3. Data

We assembled our database on global box office revenues and movie production from two main sources, both of which are publicly available online. First, Box Office Mojo records weekend box office revenues on feature films shown in 62 countries from 2001 to 2015; we sum over all weeks of each film for our yearly analysis, though in some tests we also exploit the weekly dynamics of performance in this setting.

Second, the Internet Movie Database (IMDb) details the nationality of production companies behind feature films. For clarity, we exclude from our sample any cross-border-production films, that is, those made by production companies based in different countries. Our resulting data set includes 10,585 distinct feature films from 84 production countries and distributed in 59 destination countries in the sample period of interest.

To supplement the evidence on the impact of cultural affinity shocks on movie performance, we also employ proprietary data (purchased from Nielsen) on DVD sales in the U.S. based on content produced in 103 countries and released between 2000 and 2009. These DVDs are not restricted to feature films — they include TV and cable content — yet no international sales data on DVDs are available.

The United Nations voting data we use to construct a measure of political affinity are drawn from the Voeten et al. (2017) repository publicly available online. This data set contains the roll call votes of all countries in the U.N. General Assembly over the sample period for the global film sales data set described above. The similarity variable $S$ that proxies for the affinity between countries (Signorino and Ritter, 1999) is a statistic that describes the similarity between the voting patterns of two countries in the U.N. General Assembly. For each country $i$ voting on resolution $r$, define $P_r^i = 1$ if the country votes "Yes", $P_r^i = 0$ if it votes "Abstain" and $P_r^i = -1$ if it votes "No". Thus, considering two countries $i$ and $j$ in year $t$, their bilateral affinity measure is defined as:

$$S_{ijt} = 1 - \frac{2 \sum_{r=1}^{R} |P_r^i - P_r^j|}{2\,R}, \tag{3}$$

where $R$ is the total number of resolutions in year $t$. The measure $S$ takes values between $-1$ and $+1$, with higher values of $S$ reflecting more similar voting patterns between the two countries. By construction, $S_{iit}$=1, that is, the affinity between a country and itself, is always 1.

How well does this measure capture the affinity between two countries? The vast literature following Signorino and Ritter (1999) is arguably a testament to its usefulness, but one might ask whether this variable correlates well with other measures of bilateral affinity for our period of interest. Unfortunately, the only alternative time-varying proxy for bilateral trust employed in the literature was available in the Eurobarometer survey and ended in 1997, a few years before our start date. That variable recorded answers to a survey of citizens from various developed countries.[2] When comparing this survey's 1997 answers with the values of the $S$ variable also for 1997 we find, reassuringly, a correlation coefficient of 0.14, with a $p$-value of 0.027. We thus see $S$ as a reasonable proxy for bilateral affinity in light of other measurement approaches.

## 4. Results

Propositions 1 and 2 imply specific predictions regarding the effects of country proximity on box-office success as well as on movie-release strategy. Our first goal in this section is to test these implications directly. We then offer additional empirical results which help better understand the nature of the effects of greater proximity between two countries.

■ **Performance.** A chief difficulty in studying country proximity is that potentially many country-level (or country-pair) factors are unobservable, so it is important to fix as many dimensions as possible in the analysis of cultural shifters. Our design is thus centered on

2. The phrasing of the question is: "I would like to ask you a question about how much trust you have in people from various countries. For each, please tell me whether you tend to trust them or tend not to trust them."

*political affinity shocks*: for any given pair of countries in the data, we define this shock as the change in the political affinity variable $S$ from year $t-2$ to year $t-1$:

$$D_{ij(t-1)} \equiv S_{ij(t-1)} - S_{ij(t-2)}$$

where $i$ denotes the producing country, $j$ the country of exhibition, and $t$ the time period.[3] Specifically, we consider the following demand equation:

$$B_{jft} = \alpha + \beta\, D_{ij(t-1)} + \theta_{ij} + \lambda_{jt} + \xi_f + \epsilon_{jft}, \tag{4}$$

where $B$ is box office revenue of movie title $f$ when shown in country $j$ in year $t$. As explanatory variables, we include

- $D_{ij(t-1)}$: the political-affinity shock, as described above
- $\theta_{ij}$: country-pair fixed effect
- $\lambda_{jt}$: country-year fixed effect
- $\xi_f$: movie title specific effect

We also include a constant $\alpha$ and an error term $\epsilon_{jft}$ (country-, movie- and year-specific). The coefficient $\beta$ thus captures the impact of political affinity shocks on box office outcomes, after holding various key dimensions fixed.

Table 2 show the results of tests following different variations of specification (4). The analysis is conducted at the country-film-year level. In a given market, defined as a combination of destination country $j$ and year $t$, outcomes may not be assumed to be independent from one another, so we cluster standard errors at the market level. The full sample size of 41,436 observations is reduced whenever fixed effects are not calculated due to singleton cases.

The first model (first column) takes the log of box-office revenues as a dependent variable (box-office revenues are measured in millions of dollars). We are particularly interested in the estimate of $\beta$, the coefficient on the political affinity shock. An estimate of 0.317 indicates that a one-unit change in the independent variable (e.g., from neutrality to perfect alignment) leads approximately to a 31.7% increase in movie $i$'s revenues in market $j$. The second model measures the dependent variable in levels. The coefficient estimate of 5.565 now indicates that the one-unit increase in political affinity leads to a $5.6 million increase in revenues (in market $j$ alone). In both cases the coefficient on political affinity is statistically significant at the 5% level.

Gross revenues is not the only — nor necessarily the most appropriate — performance measure. It is well known that box-office revenues are largely determined by the number of screens in which a movie is shown. For this reason, our third model takes box-office revenue *per screen* as a performance dependent variable. A one-unit increase in political affinity leads to an increase in per-screen revenues of about half a million dollars. (Sample size is reduced by about 40%, given the lack of complete data on the number of screens.) In other words, the third regression suggests that movies do better in "close" markets for reasons that go beyond the number of screens in which they open.

3. Garmaise and Natividad (2013) provide evidence on how these political affinity shocks can be traced to various national events that drive the affinity distance between countries farther or closer.

Finally, the fourth regression addresses the possibility of "U.S. exceptionalism" when it comes to movie exhibition. The visibility and tradition of the American film industry raises the question of whether the impact of international affinity is significantly different in the U.S. territory (that is, when country $j$ is the U.S.) or for American movies (that is, when country $i$ is the U.S.). In order to address this possibility, we reestimate model (1) by adding an interaction term corresponding to political affinity shocks in the U.S. (that is, a dummy variable that equals 1 when the destination market is the U.S.). The corresponding coefficient is not significantly different from zero. We also considered models (not tabulated for brevity) with a dummy corresponding to the U.S. as a production country (country $i$) and models with both dummies corresponding to production and exhibition. In all cases, the corresponding coefficients were not different from zero. This suggests that the results are quite general.

■ **Release strategies.** As mentioned earlier, we are interested in the effect of proximity not only on performance but also on release strategies. The choice of a movie's release date is one of the most important components of a distributor's strategy. Previous research has focused on the domestic market's release strategy (Krider and Weinberg, 1998; Einav, 2010). By contrast, we focus on a movie's international release strategy. As shown in previous work (Einav, 2007), demand for movies is highly seasonal, with a select number of "hot" weekends throughout the year (in the U.S., mostly around the summer and the November/December holiday season).

In order to address this issue, we define, for each country and year, the top five weekends as those that had the highest gross revenues in the previous year.[4] We also define as high-demand weekend the weekend chronologically posterior to those top five weekends.[5] We then ask the following question regarding international release strategy: how likely is a movie to open overseas during a high-demand weekend depending on country proximity?

The first column of Table 3 provides an answer. As before, we are particularly interested in the independent variable "political affinity shock." The results suggest that the closer two countries are the less likely a movie from country $i$ opens during a top weekend in country $j$. Specifically, a one-unit change in the independent variable (e.g., from neutrality to perfect alignment) leads to a 7.9% decrease in the probability a movie opens during a top weekend. In order to better evaluate this change in percentage, note that the average fraction of movies opening during a top weekend is 14.9%.

This result is consistent with our theoretical prediction. As mentioned in Section 2, proximity between country $i$ and country $j$ (which we measure by political affinity) is a *substitute* for demand, so that a movie from a farther away country is more likely to be shown during a high-demand weekend (everything else constant).

A different decision faced by distributors is how quickly to release a movie in country $j$ with respect to its world premiere. This lag, measured in weeks, is the dependent variable in the second column of Table 3. Political affinity shocks have a negative and significant effect on release lag, equivalent to about a two-week more proximate release date when a affinity switches from 0 to 1.

4. Einav (2007) shows, with U.S. data, that high supply meets high demand, that is, the weekends of highest demand are also the weekends when the biggest blockbusters are released. This suggests that, in equilibrium, the highest-grossing weekends are the ones with highest demand (that is, the supply effect reinforces the demand effect).

5. Our coding convention is robust to alternative definitions of top weekend.

We do not have a sharp theoretical prediction regarding the exhibition lag strategy. That said, suppose that each movie is released in the home country ($i$) at the beginning of each year (or at the end of the previous year). Then the release decision in country $j \neq i$ may be rephrased as a trade-off between early release ($t = 1$) or late release ($t = 2$). Proposition 2 then implies that, if we consider two identical countries except for their proximity to country $i$, a distributor optimally releases the movie earlier in the country that is farther from the home country, as suggested by the results in the second column in Table 3.

As mentioned in the previous section, the prediction that movies from a country "farther away" from $j$ are more likely to be shown in high-demand weekends is surprising — and apparently counter to the conventional wisdom from prior literature on release-date strategy. Intuitively, the idea is that, overall demand and movie-specific demand are substitute factors in determining the release date.

■ **Blockbusters.** The conventional wisdom regarding release-date strategy is that higher-demand movies are delivered during higher-demand periods (Einav, 2007). As mentioned in the previous section, this result depends on how we model movie size relative to total demand. At one extreme, we consider the case when each movie is too small to affect total supply in a given period. In this context, we show theoretically and test empirically that higher-demand movies are more likely to be distributed during low-demand periods, everything else constant.

At the opposite extreme, if there exists a blockbuster that dominates total supply regardless of the periods in which it is released, then we expect such blockbuster to be released during a high-demand period. This is the thrust of Proposition 3, which we now proceed to test.

Equation (4) includes movie-specific effects, $\xi_f$. We now take our estimates of movie-specific demand effects as a measure of $q$ and estimate a regression where the dependent variable is release during the high-demand period. The estimated coefficient (see first column in Table 4) is positive and relatively precise.

Alternatively, we create a dummy variable "U.S. blockbuster" and interact political affinity with such dummy variable (second column in Table 4). We define a U.S. blockbusters as a movie in the top 20% of U.S. box office revenues (of U.S.-produced films).[6]

The coefficient on "political affinity shock" as an isolated independent variable is negative (consistent with Proposition 1). However, the interacted coefficient with the U.S. blockbuster dummy is positive and greater in absolute value than the previous coefficient. This is consistent with Proposition 3. When we focus on blockbuster movies, the conventional wisdom holds: release takes place during the high-demand period.

■ **Time-varying effects.** Up to now, we have been fairly agnostic about the source of demand advantage enjoyed by movies from proximate countries. One possible explanation is consumer awareness, that is, the closer countries $i$ and $j$ are, the more likely viewers in $j$ are aware of the existence of a movie from $i$. If this is the case, we would also expect the relative advantage of country proximity to be lower the longer a given movie has been released. The idea is that, once a movie is released, worth of mouth and other related effects (e.g., press reviews) provide a primary source of information for potential moviegoers (as opposed to the ex-ante additional awareness provided by country proximity). In other

6. To avoid circularity, U.S.-produced blockbusters are dropped from the sample.

words, actual theatrical exhibition acts as an "equalizer:" once two separate movies open in a given weekend, differences in political affinity of their countries of origin become relatively less important. In a different context, Cabral and Natividad (2016) provide evidence for this substitutability between alternative channels of consumer awareness.

Table 5 provides evidence regarding this interpretation. We estimate a series of equations where the dependent variable is box-office revenues by screen in the first, second, third and fourth week of exhibition in country $j$ of a firm originating in country $i$. As before, the explanatory variable of interest is the political affinity shock between country $i$ and country $j$. Consistent with an awareness-based theory of the effect of political affinity, we notice a declining trend in the value of the estimated coefficient.

■ **Evidence from DVD sales.** Our last set of results pertains to a different but related market: DVD sales. A significant fraction of DVD sales correspond to feature movies. Consequently, we expect the pattern that applies to movies also to apply to DVDs, namely with respect to the the effect of political affinity on the performance of a title from country $i$ when sold in country $j$.

Our results are based on a data set on DVD sales in the U.S. during the period 2000–2009. The analysis is done at the DVD title-year level for all DVD titles released in the sample period, totaling 842,810 observations.

The results are shown in Table 6. The first model follows (4), with adaptations required by the U.S.-centric nature of the DVD markets analyzed. The performance measure (the dependent variable) is now the logarithm of DVD unit sales in the U.S., and markets are defined as genre-year combinations (for fixed effects and the clustering of standard errors). The coefficient of interest (political affinity shocks) is statistically significant and positive in sign, as one would expect. It suggests that a one-unit change in the independent variable (e.g., from neutrality to perfect alignment) leads to a 112.9% increase in movie $i$'s revenues in market $j$.

The second column shows the results of a test using the weighted average of the price of DVD titles sold as the dependent variable (using a smaller sample than for quantities given the sparser availability of price information in our data source). The results show no significant impact of the political affinity shock on DVD prices. Our theoretical model includes no implication regarding pricing patterns. In fact, movies (and other cultural goods) are known for the remarkably low price variation with respect to quality variation (Einav and Orbach, 2007). The results in listed in the second column of Table 6 confirm the stylized fact that almost all the variation in sales is due to variation in quantities, not prices.

The third column in Table 6 provides an extension of our analysis of feature movies. About one quarter of all DVD sales correspond to feature movies; the remaining observations correspond to documentaries and other cultural goods. An interesting question is whether the evidence we find for movies is extensible to other cultural goods. The third column in Table 6 restricts the first regression to observations not corresponding to movies. The point estimate appears to be at least as large as for the general case of content pooled across any release sources, and the restricted sample is a significantly large fraction (77%) of the complete sample, suggesting an important role of political affinity shocks in the performance of these related yet different cultural goods.

## 5. Conclusion

Following the widely-cited work by Hofstede (1984), an extensive literature has derived and tested a number of implications of cultural distance for international business (see Kirkman et al., 2006 for a survey). These include foreign investment expansion, entry mode choice, and the performance of foreign invested affiliates, among others. Generally speaking, the thrust of this literature is that the closer two countries are, the more "aggressive" an entry strategy should be.

Our paper relates to this literature in that we look at the "release strategy" of a domestic movie entering a foreign market. In contrast with previous research, our theoretical and empirical results suggest that the closer two countries are, the less inclined a distributor is to release its movie during a period of high demand. In other words, foreign-market demand shocks and proximity are substitute factors in the movie release decision.

**Table 1**
Summary statistics

| variable | N | mean | sd | p1 | p99 |
|---|---|---|---|---|---|
| Log box office | 44,988 | -2.18 | 2.50 | -8.37 | 3.49 |
| Box office revenue (US$M) | 44,988 | 1.82 | 9.89 | 0.00 | 32.71 |
| Box office / N. screen (millions per thousand) | 27,616 | 2.08 | 2.71 | 0.06 | 10.46 |
| Political affinity shock | 41,436 | -0.00 | 0.09 | -0.20 | 0.31 |

**Table 2**
Country proximity and box office performance

| Dependent variable: | Log Box Office | Box Office | Box Office / N. screens | Log Box Office |
|---|---|---|---|---|
| Political Affinity Shock | 0.317** | 5.565** | 0.495*** | 0.300** |
| | (0.13) | (2.43) | (0.17) | (0.14) |
| ...× destination is U.S. | | | | 0.215 |
| | | | | (0.74) |
| Country pair fixed effects | Yes | Yes | Yes | Yes |
| Destination country-year fixed effects | Yes | Yes | Yes | Yes |
| Film dummies | Yes | Yes | Yes | Yes |
| Adjusted R2 | 0.69 | 0.17 | 0.52 | 0.69 |
| N. obs | 35374 | 35374 | 20860 | 35374 |
| N. clusters | 617 | 617 | 436 | 617 |

**Table 3**
Country proximity and release strategies

| Dependent variable: | Release on Top Box Office Wkd. (0/1) | Weeks of Lag from World Premiere |
|---|---|---|
| Political Affinity Shock | -0.079** | -2.356** |
| | (0.03) | (1.01) |
| Country pair fixed effects | Yes | Yes |
| Destination country-year fixed effects | Yes | Yes |
| Film dummies | Yes | Yes |
| Adjusted $R^2$ | 0.08 | 0.99 |
| N. obs | 35374 | 35374 |
| N. clusters | 617 | 617 |

**Table 4**
Country proximity and release strategies: High quality films and U.S. blockbusters

| Dependent variable: | Release on Top Box Office Wkd. (0/1) | |
|---|---|---|
| Movie fixed effect coefficient (from eq. (4)) | 0.003** | |
| | (0.00) | |
| Political Affinity Shock × U.S. blockbuster | | 0.128* |
| | | (0.08) |
| Political Affinity Shock | | -0.103*** |
| | | (0.04) |
| Adjusted $R^2$ | 0.00 | 0.08 |
| N. obs | 35374 | 35173 |
| N. clusters | 617 | 617 |

**Table 5**
Country proximity and box office per screen over time

| Dependent variable: | Box Office 1st Wkd. / Screens 1st Wkd. | Box Office 2nd Wkd. / Screens 2nd Wkd. | Box Office 3rd Wkd. Screens 3rd Wkd. | Box Office 4th Wkd. Screens 4th Wkd. |
|---|---|---|---|---|
| Political Affinity Shock | 1.270*** | 0.940*** | 0.417* | 0.395** |
| | (0.49) | (0.31) | (0.23) | (0.19) |
| Country pair fixed effects | Yes | Yes | Yes | Yes |
| Destination country-year fixed effects | Yes | Yes | Yes | Yes |
| Film dummies | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.44 | 0.43 | 0.36 | 0.45 |
| N. obs | 20684 | 18099 | 15418 | 12718 |
| N. clusters | 423 | 418 | 417 | 414 |

**Table 6**
Country proximity and DVD sales in the U.S.

| Dependent variable: | Log DVD Unit Sales | Weighted DVD Prices | Log DVD Unit Sales on content not feature films |
|---|---|---|---|
| Political Affinity Shock | 1.129** | 1.089 | 1.355** |
| | (0.56) | (0.99) | (0.67) |
| Genre-year fixed effects | Yes | Yes | Yes |
| DVD title dummies | Yes | Yes | Yes |
| Adjusted R2 | 0.51 | 0.87 | 0.42 |
| N. obs | 842810 | 120130 | 648536 |
| N. clusters | 153 | 153 | 153 |

## References


Anderson, J.E. "The Gravity Model." *Annual Review of Economics*, Vol. 3 (2011), pp. 133–160.

Bertrand, O., Betschinger, M.A., and Settles, A. "The Relevance of Political Affinity for the Initial Acquisition Premium in Cross-border Acquisitions." *Strategic Management Journal*, Vol. 37 (2016), pp. 2071–2091.

Cabral, L. and Natividad, G. "Box-Office Demand: The Importance of Being #1." *Journal of Industrial Economics*, Vol. 64 (2016), pp. 277–294.

Craig, C.S., Greene, W.H., and Douglas, S.P. "Culture Matters: Consumer Acceptance of U.S. Films in Foreign Markets." *Journal of International Marketing*, Vol. 13 (2005), pp. 80–103.

Cuervo-Cazurra, A., Maloney, M., and Manrakhan, S. "Causes of the difficulties in internationalization." *Journal of International Business Studies*, Vol. 38 (2007), pp. 709–725.

Eaton, J. and Kortum, S. "Technology, Geography, and Trade." *Econometrica*, Vol. 70 (2002), pp. 1741–1779.

Einav, L. "Seasonality in the U.S. Motion Picture Industry." *RAND Journal of Economics*, Vol. 38 (2007), pp. 127–145.

—. "Not All Rivals Look Alike: Estimating an Equilibrium Model of the Release Date Timing Game." *Economic Inquiry*, Vol. 48 (2010), pp. 369–390.

Einav, L. and Orbach, B. "Uniform Prices for Differentiated Goods: The Case of the Movie-Theater Industry." *International Review of Law and Economics*, Vol. 27 (2007), pp. 129–153.

Elberse, A. and Eliashberg, J. "Demand and Supply Dynamics for Sequentially Released Products in International Markets: The Case of Motion Pictures." *Marketing Science*, Vol. 22 (2003), pp. 329–354.

Garmaise, M.J. and Natividad, G. "Cheap Credit, Lending Operations, and International Politics: The Case of Global Microfinance." *Journal of Finance*, Vol. 68 (2013), pp. 1551–1576.

Ghemawat, P. "Why the world isn't flat." *Foreign Policy*, (2007), pp. 54–60.

Ghemawat, P. and Thomas, C. "Strategic Interaction Across Countries and Multinational Agglomeration: An Application to the Cement Industry." *Management Science*, Vol. 54 (2008), pp. 1980–1996.

Gimeno, J., Hoskisson, R., Beal, B., and Wan, W. "Explaining the Clustering of International Expansion Moves: A Critical Test in the US Telecommunications Industry." *Academy of Management Journal*, Vol. 48 (2005), pp. 297–319.

Hofstede, G. *Culture's consequences: International Differences in Work-Related Values*, Vol. 5. Sage, 1984.

Kim, H. and Jensen, M. "Audience Heterogeneity and the Effectiveness of Market Signals: How to Overcome Liabilities of Foreignness in Film Exports?" *Academy of Management Journal*, Vol. 57 (2014), pp. 1360–1384.

Kirkman, B.L., Lowe, K.B., and Gibson, C.B. "A Quarter Century of Culture's Consequences: a Review of Empirical Research Incorporating Hofstede's Cultural Values Framework." *Journal of International Business Studies*, Vol. 37 (2006), pp. 285–320.

Krider, R.E. and Weinberg, C.B. "Competitive Dynamics and the Introduction of New Products: The Motion Picture Timing Game." *Journal of Marketing Research*, Vol. 35 (1998), pp. 1–15.

Neelamegham, R. and Chintagunta, P. "A Bayesian Model to Forecast New Product Performance in Domestic and International Markets." *Marketing Science*, Vol. 18 (1999), pp. 115–136.

Signorino, C.S. and Ritter, J. "Tau-b or not tau-b: Measuring Alliance Portfolio Similarity." *International Studies Quarterly*, Vol. 43 (1999), pp. 115–44.

Simmons, B.A. "Rules over Real Estate." *Journal of Conflict Resolution*, Vol. 49 (2005), pp. 823–848.

Stone, R.W. "The Political Economy of IMF Lending in Africa." *American Political Science Review*, Vol. 98 (2004).

Voeten, E., Strezhnev, A., and Bailey, M. "United Nations General Assembly Voting Data." (2017).

Zaheer, S. "Overcoming the Liability of Foreignness." *Academy of Management Journal*, Vol. 38 (1995), pp. 341–363.