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SOME ECONOMICS OF THE MOVIE INDUSTRY*

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A progress report is provided on a long-term research project, joint with Gabriel Natividad, on the economics and strategy of the movie industry. Specifically, a series of empirical papers dealing with demand estimation, pricing and movie-release strategies is surveyed.
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1. Introduction

For many decades, the movie industry has been the object of extensive economics research, probably more than the economic significance of the industry would justify. There are at least three reasons for this disproportionate interest. First, the movie industry provides a useful testing ground for many industrial organisation models, theories and predictions: for instance, market segmentation (e.g. the "windows" system of content release); vertical relations (e.g. the contractual relations between distributors and movie theaters); and firm strategy (e.g. the "release-date game" played by distributors). Second, there is a considerable amount of data regarding various aspects of the industry, some proprietary but much of it in the public domain. Last but not least, most people enjoy movies and possess some degree of knowledge about the industry's production process (e.g. studios, writers, directors amd actors), as well as demand patterns.

In this paper, I survey a series of papers dealing with various aspects of the economics of movies and home video. Specifically, I focus on four different papers co-authored with Gabriel Natividad. I should state from the start that the present paper does not pertain to survey the literature. Moreover, there is no claim that the papers summarised here are the most important or even representative of the literature (which by now is fairly vast). Rather, my purpose is to offer a "progress report" on a research project initiated several years ago and still in progress.

The paper is structured as follows. In Section 2, I deal with the issue of demand spillovers, specifically the situation when a successful theatrical release boosts the demand for DVDs featuring the same actors as the box-office hit. Sections 3 and 4 deal with the practice of bundling, both at the wholesale and at the retail level. As we will see, the motivation for and nature of bundling is different at the different stages of the value chain: retailers bundle titles that share a number of characteristics (e.g. the top cast); wholesalers, by contrast, use bundling to "push" low-demand titles along with high-demand ones.

Section 5 deals with one of the most important decisions by distributors: theatrical release. It first documents evidence that being ranked number 1 during a movie's release weekend has a significant effect on subsequent demand, and argues that this effect takes place primarily through the awareness channel (i.e. #1 movies receive a disproportionate amount of attention, even with respect to very similar movies that happened to be #2

*While the present paper has a single author, it reports on joint work with Gabriel Natividad of the University of Piura.

during opening weekends). The section then focuses on the decision of when to release a movie. Two theoretical points are made regarding optimal strategy.

First, among blockbuster movies, the greater a movie's appeal, the more likely the movie is released during a high-demand period. Second, and somewhat surprisingly, among "niche" movies, the greater a movie's appeal, the more likely the movie is released during a low-demand period.

Finally, Section 6 concludes the paper.

2. Backward demand spillovers

Broadly understood, Hollywood has evolved from an industry primarily focused on theatrical releases to one where a given piece of original content generates multiple revenue streams: in addition to theaters, we now have television, DVDs (before that, video-cassette tapes) and streaming; as well as merchandising and a series of other derived products and services (e.g., video games).

This multiplication of revenue streams implies a series of challenges to demand analysts. For example, the demand for the DVD version of a given movie depends on how well that movie did in theaters. These cross-section and inter-temporal demand effects call for complex firm strategies. For example, the benefit of advertising a soon-to-be-released movie should take into account not only additional ticket sales but also the increased discounted value of the movie as a media asset.

Based on data from a related entertainment industry, the music industry, Hendricks and Sorensen (2007) show that "releasing a new album causes a substantial and permanent increase in sales of the artist's old albums — especially if the new release is a hit" (p. 324). For example, when in 1995 Alanis Morissette released, with great success, her album *Jagged Little Pill*, sales of *Alanis* (1992), also by Alanis Morissette, increased as well. In other words, Hendricks and Sorensen (2007) document important consumer sales spillovers due to demand interactions.[1]

Could something like that also take place in the movie industry? One important difference of movies with respect to music is that, whereas in the latter case there is a clear one-to-one correspondence between product and producer (the singer or band), in the case of movies each product is created by an "organisation" of its own: a combination of director, actors, etc. This implies that one must identify the channel for demand spillovers across movies, if any.

One possible strategy is followed by Cabral and Natividad (2016b), who examine movie-DVD demand interdependency through the lens of "star power". Specifically, they ask the question: does success at the box office by a movie starring actor X lead to greater sales of DVDs also featuring actor X? Anecdotal evidence suggests that the answer is yes. For example, when *The Vow*, starring Rachel McAdams, was released in theaters in 2012 with great success, DVD sales of *Wedding Crashers* (2005), also starring Rachel McAdams, showed an increase in sales.

In order to get a more systematic estimate of the backward spillover effect, Cabral and Natividad (2016b) construct a variable Bos_{it}, which measures studio i's DVD library's box-office success at time t. This is not just the box-office success of studio i's

[1] The theoretical background for these articles includes the literature on umbrella branding. See, for example, Wernerfelt (1988), Choi (1998) and Cabral (2000).

movies; it's a little more complicated than that. Let us return to the example considered above: Sony Pictures' *The Vow* (2012), starring Rachel McAdams, was released in theaters on 12 February 2012. If studio i owns a DVD starring Rachel McAdams as one of the top-3 actors, then Bos_{it} includes all of the period t revenues of films starring Rachel McAdams as a top-3 actor. If studio i owns n titles starring McAdams as a top actor then the above value is added n times. In other words, Bos_{it} captures the potential spillovers of McAdams' current success on distributors who have ever had a stake in McAdams: what the studio's DVD library has at stake with respect to the movies currently shown in theaters.

Note that studio i need not be Sony, the distributor of *The Vow*. Warner Bros. owns *Wedding Crashers*, released as a DVD in 2006, and so Bos_{it} includes the current revenues of *The Vow* if i is equal to Warner Bros. Intuitively, the backward demand spillovers work across studios: film viewers care about stars, not the studios that hire them. The success of Sony's *The Vow* is good news for Sony and for Warner Bros. as well.

In this context, backward demand spillovers correspond to the effect of Bos_{it} on studio i DVD sales at time t. Measuring both dependent and independent variables in logarithms, we estimate a regression coefficient which can then be understood as an elasticity. Depending on the set of controls included, we obtain point estimates from 0.166 to 0.198, always with a high level of statistical precision (p values lower than 1%).

In sum, we conclude that the observation by Hendricks and Sorensen (2007) regarding music sales does extend, to some extent, to movie sales as well, provided that we make the appropriate adaptations to take into account the specificities of the movie production and sales process.

The results from the movie industry provide a novel illustration of a more general phenomenon: the pervasiveness of demand-side externalities across different but related revenue streams. This phenomenon is particularly intense in media industries. For example, the success of soccer leagues provides a demand boost for the FIFA videogame; a successful rock band tour increases demand for its recordings; and, continuing with the movie industry, a hit at the box office opens the possibility of a hit on Broadway or a new videogame.[2]

3. Wholesale bundling

Many industries are characterised by bundling or related practices, and the movie industry is no exception: for example, movie studios sell movies to rental stores based on full-line forcing contracts (Ho *et al*., 2012); that is, contracts that "force" buyers (retailers, in this case) to purchase a certain number of units of good i if they want to buy good j as well. The precise details of the relevant contractual relationship are not always easy to obtain. Moreover, anecdotal evidence suggests that various aspects of the contractual relationship between wholesalers and retailers are not spelled out explicitly. In this context, one may ask whether and to what extent bundling actually takes place, and what its downstream effects are.

[2] Naturally, this type of externality is also present in non-media industries whenever there is a patter of complementarity across products: a shock to the demand for peanut butter is likely to imply an increase in the demand for jelly as well.

Cabral and Natividad (2016b) estimate the degree of wholesale bundling in the home video sales industry, where a product is given by a video title of a particular movie. Although the industry's value chain can be complex, in essence there are three levels to consider: retailers such as KMart purchase DVDs from distributors such as Warner Bros. and sell them to individual consumers. In this context, wholesale bundling refers to the practice of bundling in the relationship between distributors (e.g. Warner Bros.) and retailers (e.g. KMart).

Unlike Ho *et al*. (2012), who examine wholesale contracts in detail, the approach in Cabral and Natividad (2016b) allows for the estimation of the degree of upstream bundling without knowledge of the precise nature of the contracts between wholesalers and retailers — and including possible unwritten elements of the "contractual" relationships.

Conceptually, the estimation strategy is based on the idea that upstream bundling gets "passed through" to downstream sales in the form of studio-level cross selling effects. That is, if a distributor bundles good x with good y, effectively "forcing" the retailer to acquire good y if the retailer also wants good x, then we should observe that an increase in retail sales of good x is accompanied by an increase in retail sales of good y. This is the sense in which upstream bundling gets "passed through" at the downstream level.

Specifically, suppose that there is no bundling at the downstream level.[3] If wholesalers bundle titles when selling to retailers, then a positive shock to the consumer demand of title x should lead to an increase in consumer sales of title y *even if there is no relation between x and y in the eyes of the consumer* (that is, even if the two titles are neither related in terms of consumer utility nor in the way they are sold to the final consumer).

Specifically, Cabral and Natividad (2016b) model theoretically and estimate empirically the phenomenon of "bundling pass through:" A positive shock to the consumer demand for x leads to an increase in retailer derived demand for x. To the extent that the retailer's purchases of title x are linked to purchases of title y (wholesale bundling), a consumer demand shock to x leads to an increase in the retailer's stock of y, since there is no positive shock to the consumer demand for y. This excess inventory leads the retailer to market y more aggressively, which in turn results in higher sales of y. In sum, an estimate of the degree of upstream bundling between x and y is the degree of correlation in downstream sales between x and y.

Wholesale bundling implies an additional testable prediction: retailers have different instruments to increase the demand for y. In the home video sales market segment, these include the number and location of copies displayed, the used of "corrugated boards," and other promotion devices. In particular, one would expect retailers to use price as a means to "push" excess inventory. Therefore, an additional testable prediction of the "bundling pass through" narrative is that a positive shock to the demand for x is correlated with a decrease in the price of y.

The empirical evidence is consistent with final consumer cross-selling effects that are both statistically significant and economically important. If x represents demand for library titles and y sales of new releases, a one-standard deviation demand shock to x is associated with an increase in sales of y by two thirds of a standard deviation; and a decrease in the price of y by four thirds of a standard deviation.

[3] In reality, there is some bundling at the downstream level, as we will see in the next section. However, for the sake of illustration I assume no downstream bundling in what follows.

Overall, Cabral and Natividad (2016b) suggest that the degree of upstream bundling is considerable and gets "passed through" in the form of downstream cross-selling effects; and these effects are economically large and statistically significant.

The paper contributes a novel empirical strategy for estimating (indirectly) the degree of bundling in wholesales. This is particularly important in situations when the degree of actual bundling goes beyond what can be identified from explicit contracts.

4. Retail bundling

Many retail stores, such as Walmart or Kmart, sell DVDs of previously released movies. In some cases, DVD titles are sold in bundles, typically a bundle of two different titles. In addition to the bundle, buyers can choose to purchase the individual titles separately (in other words, it is a case of mixed bundling).

At least since Stigler (1963), the practice of bundling movies has been considered a form of second-degree price discrimination that takes advantage of the negative correlation in buyer valuations. In Stigler's words, "the simplest plausible explanation [for the practice of bundling] is that some buyers would prize one film much more relative to the other" (p. 153). Crawford and Yurukoglu's (2012) evidence from the US cable industry seems largely consistent with this view; that is, that a "multiproduct monopolist generally achieves higher profit from mixed bundling than from separate selling if consumer values for two of its products are negatively dependent, are independent, or have sufficiently limited positive dependence" (Chen and Riordan, 2013).

By contrast, the practice of DVD bundling seems largely inconsistent with this narrative. Typically, bundled DVD titles have one or more elements in common (e.g. the same lead actor/actress, the same director or the same genre). (They are also owned by the same distributor.) For example, Universal Pictures' *The Scorpion King*, starring Dwayne Johnson, was released in 2002. In 2003, Universal released another DVD, *The Rundown*, starring the same lead actor. Soon after, retail stores started selling a bundle comprising *The Scorpion King* and *The Rundown*. To the extent that similarity of characteristics is associated with correlation of valuations, this presents a puzzle: if negative correlation of valuations (or "sufficiently limited positive dependence") is the basis of a successful bundling strategy, then why do distributors choose bundles the way they do?

Cabral and Natividad (2018) propose a solution to this puzzle. DVDs, just as many other media products, have several distinct characteristics: they are durable goods, they are released sequentially, and there is a great number of different titles available. Two DVDs that share several characteristics are likely to be similarly valued by viewers. However, at the time the second title is released, it is likely that high-valuation buyers will have bought the first one. For this reason, even though *ex-ante* valuations are positively correlated, *ex-post* (i.e. at the time the second title is released), valuations are negatively correlated: buyers who have a high valuation for the second title are likely to have a low valuation for the first one, because they have already purchased it before.

Cabral and Natividad (2018) present reduced-form empirical evidence consistent with this prediction: a simple difference-in-differences analysis suggests that the introduction of mixed bundling leads, on average, to an increase in revenues between 30 and 40%, and that the gain from mixed bundling is greater the greater the similarity between bundled titles.

Cabral and Natividad (2018) also develop a continuous-type model and calibrate it to reproduce the main moments in the data. Preliminary results from this calibrated model confirm the prediction that the gains from mixed bundling are positive and increasing in the degree of correlation in valuations. The estimated values of gains are lower than in the reduced-form regressions: from 17% if valuations are independent to 28% if they are perfectly correlated.

Finally, based on a preliminary analysis of the calibrated model, Cabral and Natividad (2018) estimate that the optimal bundling discount, keeping the prices for singles at the sample mode, is approximately $10. This is considerably more than the median bundling discount in the sample, approximately $5. However, anecdotal evidence suggests that many bundles (especially those of sequels) include substantial value added (e.g. special editions) with respect to the individual components, so that the actual bundling discount is greater than the difference in prices between singles and bundles.

Despite the differences in values between the reduced-form model and the calibrated analytical model, overall the evidence corroborates the idea of mixed bundling of sequentially released durable goods as a form of second-degree price discrimination.

In some ways, the rationale for bundling in the durable-goods case is similar to the classic Stigler interpretation: negative correlation in valuations. The twist introduced by durability is that, even if ex-ante valuations are positively correlated, once some consumers purchase one element of the bundle, valuations become negatively correlated. This idea is relatively general and should apply beyond DVD sales. In fact, as Derdenger and Kumar (2013) show, a similar phenomenon takes place in the video-game industry (where games are bundled with game consoles).

5. Theatrical release

How easy is it to predict movie demand? In reference to this question, screenwriter William Goldman once famously quipped that "nobody knows anything" (Goldman, 1983). One thing industry participants do know, however, is that winning the first competitive battle at the box office (the very first weekend of a film's theatrical life) can be a strong predictor of a movie's eventual success.

Cabral and Natividad (2016a) propose a theoretical framework to understand the relation between opening weekend rankings (in particular, being #1 at the box office) and the film's subsequent economic success. The paper considers two possible channels. A first one is that being anointed as a box office winner implies a positive shock to the consumer utility for watching that movie: for example, being #1 might work as a coordination device for moviegoers with a strong social consumption motivation (i.e. moviegoers who want to watch the movies that others watch). A second effect is that some moviegoers are ''inattentive", so that and their consideration set places a disproportionate weight on #1 movies. In other words, being #1 increases awareness of a movie's existence.

These two channels parallel the classical persuasion-information dichotomy of the effects of advertising on demand. In fact, if we substitute advertising for opening weekend success, then we have the two possible effects of advertising: informing uninformed consumers about a product's existence; and "persuading" informed consumers about the product's "value". Both of these effects have one feature in common, however: both predict that opening weekend success causes subsequent performance success.

From a statistical point of view, identifying such a causality relation is quite a challenge. For example, there may be underlying movie characteristics (e.g. intrinsic quality) that cause both opening weekend success and subsequent success, so that the correlation between performance at different moments in time is just that: a correlation. Moreover, the date of a movie's release is likely to be endogenous.[4] Lacking any natural experiment to work with, Cabral and Natividad (2016a) propose two different approaches: one is to include as many controls as possible in the regression analysis (e.g. consumer reviews, movie characteristics and time-specific effects). The second one is to follow a regression-discontinuity approach. Intuitively, if the two top movies in a given weekend are very close in sales, then a large subsequent difference in favor of the leader can more safely be interpreted as caused by the first weekend's ranking.

Cabral and Natividad (2016a) derive theoretical results that allow the identification of these effects. One test checks that being #1 increases the slope of the regression of box office revenue on movie quality. A second one is that increased consumer exposure to media promotion of films (by their actors and directors) negatively impacts the joint effect of being #1 and movie quality on total box office revenue (in other words, media exposure is a substitute for the awareness effect of being #1).

These predictions are tested on US box office data. Controlling for all variables that they are able to control for (including in particular movie quality, the competitive strength of contemporary rivals, and a variety of fixed effects), the results suggest that being #1 has an economically and statistically significant effect on a movie's eventual performance. On average, being #1 is associated with an increase of $68 to 75 million in a movie's total box office sales. Considering that the mean total sales of the sample's 1,380 #1 movies is $93 million, this is a very large number indeed.

Moreover, the results are consistent with the effect of being #1 appearing in interaction with the movie's quality; that is, being #1 is more beneficial for movies of higher quality.

This result is consistent with the theoretical prediction that being #1 affects box office revenues by creating greater awareness of a movie's existence. Further evidence of this information effect is given by the finding that, for movies that were widely featured in the media prior to release, the effect of being #1 is smaller.

Cabral and Natividad (2016a) contributes to a variety of economics and marketing research debates. One such debate refers to the informative vs persuasive nature of advertising expenditures. The results in Cabral and Natividad (2016a) suggest that information plays an important role: in an industry with a very large number of products, consumer awareness is crucial. Being ranked #1 helps place a movie in the consumer's consideration set.

Another literature to which the paper contributes is the literature on rankings: while most of economics deals with cardinal measures, there is a recent literature dealing with ordinal rankings (Sorenson, 2007). Cabral and Natividad (2016a) provide an interpretation for the importance of ordinal rankings.

Cabral and Natividad (2016a) suggest that a movie's performance during opening weekend is an important determinant of its eventual overall success. More generally, the choice of a release date is one of the most important strategic decisions by a distributor (advertising being another one). There are several trade-offs to take into account when it comes to picking an opening weekend. On the one hand, choosing a high-demand weekend allows a distributor to tap into a larger potential demand. On the other hand, it

[4] The next section deals with the choice of a movie's release date.

is more likely than not that several other distributors open during a high-demand weekend, which implies fiercer competition. Industry players recognise the importance of this strategic dimension and how it can turn into a "highly destructive game".

Cabral and Natividad (2019) characterise the demand–competition trade-off in the choice of a release date. They develop a game-theoretic framework which contemplates two possible extreme cases: If the competing movies are sufficiently large (blockbusters), so that a particular movie's release decision has a measurable impact on rival movies' demand, then, in equilibrium, the greater a movie's appeal, the more likely the movie is relesed during a high-demand week. In the limit, if a blockbuster is the single super-mega-blockbuster of the year, then it takes over whatever weekend it opens; and it thus optimally opens during the highest-demand weekend. This is not entirely surprising and is in line with prior theoretical and empirical evidence (Einav, 2007; Krider and Weinberg, 1998).

Perhaps more surprisingly, Cabral and Natividad (2019) also show that, if the competing movies are sufficiently small (niche movies), so that a particular movie's release decision has no measurable impact on rival movies' demand, then, in equilibrium, the greater a movie's appeal, the more likely the movie is released during a low-demand week. To understand the intuition for this result, note that, in this measure-zero-movie extreme world, a movie's decision is one of individual optimisation against the field. Because in equilibrium many more movies flock to the high-demand period, the marginal return to movie-specific appeal, which is related to the ratio between a movie's appeal and the aggregate appeal of rival releases during a given period, is *smaller* during the high-demand period. This in turn implies that the trade-off between period-specific demand and period-specific competition leads higher-appeal movies to prefer lower-demand periods.

Theoretical results are based on specific assumptions regarding movie demand and on extreme cases regarding movie appeal (blockbuster or niche). To test the theory's robustness, Cabral and Natividad (2019) consider a series of simulations with more general distributions of movie appeal and different demand functional forms. These simulations confirm the change in sign of a movie's release strategy as we move from niche to blockbuster movies.

Finally, Cabral and Natividad (2019) test the theory's predictions on actual data from international movie releases (10,585 distinct feature films from 84 production countries and distributed in 59 destination). This data has two advantages. First, a 84×59 matrix of country or origin and country of release implies a large number of observations of demand and release dates for each of the 10,585 movies. Second, by measuring exogenous shocks to the proximity of two countries, one is able to measure variations in a movie's appeal, thus avoiding the common problem of unobserved characteristics in supply and demand estimation.

Specifically, following Voeten *et al*. (2017), Signorino and Ritter (1999) and Cabral and Natividad (2019), we use United Nations voting behaviour as a measure of political affinity between each country pair. Their identification strategy is based on the assumption that variations in political affinity between countries i and j have an effect on the appeal of movies produced in country i when shown in country j. Naturally, there are many different factors which influence movie demand aside from political affinity. All that the estimation strategy requires is that an increase in political affinity leads to greater appeal. 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. The point is that, were Venezuela to change its political regime to one that is closer to that of Chile, one would say the two countries become even closer; this increase in political affinity would be measured (with noise) by the two countries' United Nations voting behaviour; and ultimately one would expect an increase in demand for Venezuelan movies in Chile and for Chilean movies in Venezuela (everything else constant).

Preliminary empirical estimates confirm the theoretical model's predictions. Cabral and Natividad (2019) consider various measures of movie appeal, including budget, star cast and number of release screens. For each of these measures, they split the sample into the top quintile and the bottom four quintiles. As expected, the data shows a positive relation between movie appeal and propensity to release during high-demand weeks for blockbusters (top quintile) and a negative one for niche movies (bottom quintiles). The results are robust in a variety of ways, including different ways of splitting the sample.

6. Conclusion

As mentioned in the Introduction, the movie industry is a rich field for testing industrial organisation models and theories. The works surveyed in this paper only scratch the surface of a deep throve of data and issues. For example, the existence of backward demand spillovers (see Section 2) suggests that there may be important externalities across studios: the theatrical release of a movie by studio i may benefit DVD sales of titles owned by studio j. What implications does this have for a studio's choice of cast? In future research efforts, we plan to attack some of these questions.

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REFERENCES

Cabral, L. (2000) "Stretching Firm and Brand Reputation", *Rand Journal of Economics*, Vol. 31, pp. 658–673.
——— and G. Natividad (2016a) "Box-Office Demand: The Importance of Being #1", *Journal of Industrial Economics*, Vol. 64, pp. 277–294.
——— and ——— (2016b) "Cross-Selling in the US Home Video Industry", *Rand Journal of Economics*, Vol. 47, pp. 29–47.
——— and ——— (2018) "Mixed Bundling in Retail DVD Sales: Facts and Theories", Working Paper, New York University.
——— and ——— (2019) "Movie Release Strategy: Theory and Evidence from International Distribution", Working Paper, New York University.
Chen, Y. and M. H. Riordan (2013) "Profitability of Product Bundling", *International Eco- nomic Review*, Vol. 54, pp. 35–57.
Choi, J. P. (1998) "Brand Extension as Informational Leverage", *Review of Economic Studies*, Vol. 65, pp. 655–669.
Crawford, G. S. and A. Yurukoglu (2012) "The Welfare Effects of Bundling in Multichannel Television Markets". *American Economic Review*, Vol. 102, pp. 643–685.
Derdenger, T. and V. Kumar (2013) "The Dynamic Effects of Bundling as a Product Strategy", *Marketing Science*, Vol. 32, pp. 827–859.
Einav, L. (2007) "Seasonality in the U.S. Motion Picture Industry", *Rand Journal of Economics*, Vol. 38, pp. 127–145.
Goldman, W. (1983) *Adventures in the Screen Trade*, New York: Warner Books.
Hendricks, K. and A. Sorensen (2009) Information and the Skewness of Music Sales", *Journal of Political Economy*, Vol. 117, pp. 324–369.

Ho, K., J. Ho and J. H. Mortimer (2012) "The Use of Full-line Forcing Contracts in the Video Rental Industry", *American Economic Review* Vol. 102, pp. 686–719.
Krider, R. E. and C. B. Weinberg (1998) "Competitive Dynamics and the Introduction of New Products: TheMotion Picture Timing Game", *Journal of Marketing Research*, p#. 1–15.
Signorino, C. S. and J. Ritter (1999) "Tau-b or Not Tau-b: Measuring Alliance Portfolio Similarity", *International Studies Quarterly*, Vol. 43, pp. 115–44.
Sorensen, A. T. (2007) "Bestseller Lists and Product Variety", *Journal of Industrial Economics*, Vol. 55, pp. 715–738.
Stigler, G. J. (1963) "United States v. Loew's, Inc.: A Note on Block Booking", *Supreme Court Review*, Vol. 152.
Voeten, E., A. Strezhnev and M. Bailey (2017) "United Nations General Assembly Voting Data".
Wernerfelt, B. (1988) "Umbrella Branding as a Signal of New Product Quality: An Example of Signalling by Posting a Bond", *The Rand Journal of Economics*, pp. 458–466.