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ABSTRACT

We develop a basic framework to understand the organization of highly creative activities. Management faces a fundamental tradeoff in organizing such activities. On the one hand, since creativity cannot be achieved by command and control or by monetary incentives, internal/contractual production of creative products is plagued by hazards arising from their fundamental characteristics: extremely high input, output and market uncertainty, and the inherent informational advantages of creative talent. Procuring highly creative products in the market place, though, exposes the distributor to a fundamental risk: independently produced creative goods are generic distribution-wise. Thus, in procuring creative products in the marketplace, distributors face the unavoidable winner's curse risk. Since this risk is, to a large extent, independent of the creative nature of the product, the higher the creative content, the higher the relative hazards associated with internal or contractual production. Thus, internal/contractual production of creative goods will tend to be less prevalent the higher the creative content associated with its production. We apply this insight to the evolution of the U.S. film industry in the mid-XXth century. We exploit two simultaneous natural experiments -- the diffusion of TV and the Paramount antitrust decision forcing the separation of exhibitors from distributors and prohibiting the use of block-booking. Both events increased the demand for creative content in movies. We develop empirical implications which we test by analyzing in detail the decision by distributors to produce films internally or to procure then in the market place, in the face of an increase in the demand for creative content.

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Creativity: *the ability to make or otherwise bring into existence something new, whether a new solution to a problem, a new method or device, or a new artistic object or form.*[1]

All productive activities have a creative component. Some activities, however, have a higher need for creative input. Consider, in particular, a productive activity whose output requires the creation of a final product whose nature must be intrinsically different than all previously produced products. Artistic products are a classic example. For a new theatre production to attract large audiences, it has to be substantially different from any other theater piece previously produced. The same also applies to other artistic media such as radio shows, TV series, and movies. Highly creative activities also abound outside of the arts. Consider, for example, the myriad of new products, technologies, business models and ideas that originated during the dot com era and in today's Web 2.0 to realize that extreme creativity flourishes in business.

Creativity, however, has serious organizational drawbacks. For one, high level creativity, in contrast to humdrum work, cannot be forced or coerced. The standard writers' block syndrome, where a writer is unable to fill up a blank page, can be applied to software engineers, product designers, theater directors, movie producers, academics, consultants, or indeed any worker who is faced with an impending highly creative task. The fundamental organizational problem with "the block" is that it cannot be solved by command and control (i.e., instructing the worker what to do) or by monetary incentives – the two foundational principles of organizational economics. High level creativity, in short, can only be fostered, it cannot be commanded.

[1] "Creativity". Encyclopedia Britannica. 2007. Encyclopedia Britannica on line. 25 April 2007.

Creativity also generates particular informational asymmetries between creative talent and management arising from the three fundamental characteristics of creative work initially identified by Caves (2000). First, *infinite variety,* meaning that the possible solutions to a particular need or demand (whether a book, film, software design, etc.) are impossible to define *ex-ante* (i.e., in advance) and to count *ex-post.* In other words, a given general task has infinite potential solutions. Second, *nobody knows,* meaning that creative output is shroud in extreme uncertainty about its marketability. Third, *art for art's sake,* which underscores the fact that creative talent enjoy the creative process itself. The interactions among these three features make highly creative work extremely difficult to manage.

Consider a manager attempting to determine whether a particular creative product or design is the most appropriate to the problem at hand. Given the "*infinite variety*" characteristic of creative work, management may have to undertake the creative process all over again, with its time and cost implications, to determine the appropriateness of the original outcome.

Although creative talent may have strong opinions about the appropriateness of its proposed solution, and management may have serious difficulties in second guessing talent, in fact most movies do not get screened, most books do not sell and most new products fail (the "nobody knows" feature). The "*infinite variety*" and "*nobody knows"* features of creative products make the finished product's success a highly unpredictable.

Informational asymmetries are further aggravated by the fact that creative talent may enjoy the creative process. In fact, "Art for Art's Sake,"[2] the quintessential feature of creative talent, may explain why, for example, so many highly creative outcomes end

[2] See Caves (2000).

up failing, and why the return to artistic endeavors is below average.[3] Thus, on the job enjoyment, coupled with strong differences in the appraisal of the quality of creative output between creative talent and management, generate particular and specific managerial problems, making the cost of creative activities very difficult to control.

The Hazards of Internal Creative Production

Internal creative production is subject to particular types of hazards, which bear both similarities and differences to the production of humdrum goods.

Creative Talent Hold-Up

Creative outputs are inherently uncertain. When a manager requests the development of a particular creative output such as a book, movie, or a video game, the manager cannot, by definition, define the output that she is actually seeking. If the output could be defined to a high degree of specificity, then the manager would have already undertaken the creative activity itself. Thus, the product is typically defined in very general terms,[4] and although management may provide some restrictions on inputs, creative talent is in a much better position to know what inputs are in fact required to achieve the general task.

Given the nature of sequential production, where development costs are sunk early on, and subsequent improvements are needed to achieve a satisfactory outcome, Caves' (2000) Ten Ton Turkey syndrome, where costs easily escape managerial control, appears naturally. Since a certain amount of investment is already sunk, informational asymmetries place management in the position of either having to contribute new funds to a project or discontinue it. Given that creative output is shroud in uncertainty about its

[3] See, Pew Internet Report (2004), showing that while artists are more educated than the average population have nevertheless an annual income below average. See, also, Dekom (2004) reporting that the average internal rate of return in the motion picture industry is negative (at around -5%).

[4] This is not too different from defense procurement of new weapon systems. See Oudot (2006).

marketability (Caves (2000)' "*nobody knows*" property of creative activities) as long as management's expectations of the project's marketability are unaffected by its development cost, management may often find it optimal to follow creative talent's recommendations and commit additional investment to the project.

In sum, internal production is subject to a serious hold-up hazard based upon the inherent informational asymmetry between talent and management, and management's inability to force the creation of high quality work that will have a certain commercial success. The consequence is a systematic inability to keep cost tied to initially predicted production budgets through internal production.

Dynamic Hazards

Creativity transactions are also plagued with dynamic hazards, hazards that arise with the implementation of creative work over time. Two fundamental features of creative work are at play here: infinite variety and nobody knows. First, the creative process is, by definition, particular and unique (*infinite variety*). Although a creative output – say a new video game – may be completed and released, *infinite variety* implies that creative talent may have also found a better or more interesting game concept which did not disclose to management, and from which she may be able to profit in later employment. Management, then, may be subsidizing future career opportunities of its creative talent.[5]

Second, although *ex-ante* the "*nobody knows"* feature of creative production applies, *ex-post* an actor may become identified with his or her character, and future attempts to exploit that character may encounter hold-up by the creative talent. Similarly,

[5] This is the problem of "tacit" knowledge, with its intellectual property implications.

a successful product – say a great game or movie – does not assure that a sequel will be equally successful. The "*nobody knows"* feature applies at all times.[6]

In sum, creative production is subject to transaction hazards quite different from the standard transaction cost framework. The hazards we emphasize here are those associated with the fundamental features of creativity: extremely high input, output and market uncertainty, and the inherent informational advantages of creative talent. Producing and distributing creative products require organizational adaptation to those hazards.

A Basic Organizational Response: Talent Internalization of Creative Production

Transaction costs call for internalization[7] of production when the hazards associated with a transaction are hard to manage via contract (Williamson, 1979). The transaction hazards discussed earlier are all associated with the production of highly creative products in circumstances where talent is not the residual claimant of its work – in other words, they are associated with the hiring of creative talent. Depending on the level of creativity required, these hazards may become extreme, and may lead to serious hold-up problems and conflicts between creative workers and management.

Talent internalization, that is, making talent the residual claimant, may not be feasible in team production when the creative components are relatively distributed among talent. For example, talent internalization in game software development with multiple components, where each component has to be developed by separate talent, may not be feasible, as the contribution of each creative individual becomes inextricably

[6] See De Vany and Walls (1999) on the effect of movie stars on box office.
[7] By internalization of production we mean both in-house production and contracting a specific project to another party. This is in contrast to buying a finished creative output from a completely independent production process.

interlinked with the others. On the other hand, in activities where the creative component may be more highly concentrated, talent internalization may solve much of the hazards of creative internal production. For example, books are written by independent writers who internalize to a large extent the risks of creative writing. Musicians tend also to perform at risk. Although record labels may provide long term contracts that mitigate creative risk, in most cases music performers bear most if not all the risk. In contrast, orchestra musicians work as hired labor. Their creativity, however, is eliminated to cater to the necessary output, so despite their highly skilled role, their labor is more attuned to humdrum rather than to creative work.

Talent internalization in teams, although incomplete, may still be hazard reducing if a major component of talent takes over the residual rights. In this case, informational asymmetries between other talent providers and talent/manager are reduced, leading to better cost control and more on-time delivery. Talent internalization, though, exposes talent to the risks associated with the *infinite variety* and *nobody knows* features of creative work.

Hazards of Procuring Independently Produced Creative Products

A distributor of creative products may find it appealing to procure its product from independent talent producers. It saves the hazards of managing "*Art for Art's Sake*" talent and pushes upstream Caves' "*Ten Ton Turkey*" problem. On the other hand, independently produced creative goods, while very particular and hopefully unique, are generic distribution-wise. In fact, any distributor can distribute them. Consider, for example, a new cookbook by a major chef. There are multiple publishers that could enhance their portfolio of cookbooks with such a book. In fact, unless there are some

prescient features associated with particular editors, no publisher has better information concerning the potential market for this book. The "*nobody knows*" rule applies here as well. If a publisher, however, attempts to obtain the distribution rights to that book, it will have to out-compete all other publishers. The publisher who out-competes all others is, though, assuming same printing and distribution costs throughout the industry, the publisher who thinks it can sell more. In other words, it is the most optimistic of all. In fact, with many publishers competing for the book, the winning publisher is likely to regret obtaining it. This is, essentially, the winner's curse associated with a common values auction.[8]

Although the winner's curse is a common occurrence in auctions for goods such as paintings, used cars, and wines, as long as the buyer is a final user, it is of no significant consequence. The auction winner takes home a nice painting after paying a bit too much, but still paid below her reservation price. Buying products for resale in common value auctions, however, has a different implication. The winning buyer will have paid more than its competitors were willing to pay for that product. Since each bidder may be thought of as being a random draw on a common information set, on average winning bidders in common value auctions may be unable to resell the product at a profit.[9]

Distributors may develop strategies to buy creative products without falling into the winner's curse. They may refuse to participate in auctions, and may require creative producers to negotiate with them on a one-to-one rather than a one-to-many basis.[10]

[8] See Kagel and Levin (1986).
[9] This may explain why art merchants do not normally buy at auctions.
[10] An example of this process is visible in the Sundance Film Festival where often a private screening is arranged to a previously selected distributor, who is given the right to make a preemptive purchase offer.

Distributors may also enter into a long term arrangement with independent producers of creative products, which limits the producers' ability to negotiate with other distributors.[11] These arrangements, however, highlight the significance of the hazards of producing creative products internally.

The Fundamental Managerial Trade-off in Creative Goods Production

Management faces a fundamental trade-off in the acquisition of creative goods. It can attempt to enter into internal or contractual arrangements for the production of those goods, but such arrangements will be subject to extreme talent informational asymmetries and potential hold-ups. On the other hand, buying finished creative products for commercial purposes is subject to different degrees of the winner's curse. Since the winner's curse is to a large extent independent of the creative nature of the product, the higher the creative content, the higher the risks associated with internal or contractual production. Thus, our main organizational insight is that

> *internal/contractual production of creative goods should be less prevalent than their outright purchase the higher the creative content associated with its production.*

For the remainder of this article, we apply this insight to the evolution of the U.S. film industry in the middle of the XXth century.

The US Movie Industry in the 1940s and 1950s

Movie production is the quintessential creative process. Movies have to provide audiences with a uniquely different experience each time, and their making is associated with so much creativity that virtually the only predictor of commercial success is their first week box office performance. Budget size, the quality of all individual inputs, and

[11] This is the case, for example, of the relation between the Weinstein Co. and Metro-Goldwyn-Mayer.

the film's cast do not guarantee the market appeal of the final product.[12] In fact, the sum of the parts may be lesser, equal to or greater than the whole. Also, the sum of the same parts may yield very different outcomes if released at different points in time. Given the extreme uncertainty of demand (the "nobody knows" principle), the "infinite variety" prevalent in the industry, and the fact that artists in this industry are likely to be among the most extreme representatives of the "*art for art's sake*" principle, it is surprising – and encouraging for the future of the industry – that we find rationality in the way the movie industry manages to exercise control over the production process.

This article focuses specifically on the organizational decisions of movie production and distribution companies on an individual project level. Production companies must decide for each film whether to execute distribution in-house or outsource to another distributor. Similarly, distribution companies must decide whether to produce in-house, co-produce (including funding), or purchase films on the open market.

As discussed earlier, the higher the desired creative content of the good, the lower the hazards of open market acquisitions relative to internal or contractual production. It is also in this sense that the movie industry serves as an interesting case study of the organizational implications of an increase in the required high-level creative content of its product.

Until the late 1940s, the U.S. motion picture industry was dominated by the "Big Five" studios that integrated production, distribution, and exhibition.[13] These firms

[12] See De Vany (2004).
[13] These were Paramount, Warner Bros., Loew's (MGM), Twentieth Century-Fox and RKO. To these, we need to add the "Little Three" (Universal, Columbia, and United Artists) to complement the set of relevant players (Balio, 1990).

directly controlled theaters accounting for 50 percent of total domestic film rentals, and all the theaters were required to abide by the practice of "block booking," where films could only be purchased in prepackaged groups. These "blocks" included a mixture of both high and low quality films, leaving theaters with little choice but to agree to purchase since the Big Five produced and distributed roughly three quarters of the top grossing "A" films (Balio 1990). The quality of the worst of these films purchased was occasionally so poor that theaters simply shelved them instead of showing them to the public (Strick 1978). It is widely believed that block booking helped theaters save on search costs and assure a constant flow of films onto their screens.[14] Similarly, distributors saved on bargaining costs and were able to market a range of movies that varied widely in quality and genre since the size of the block was also important to theaters. With demand from theaters guaranteed through direct control and block booking, motion picture production was organized under the "studio system," resembling a large-scale manufacturing operation with routinized production processes (Storper and Christopherson 1987).

After years of strong box office attendance, the motion picture industry began a rapid and dramatic decline in the post-World War II period. Average weekly movie attendance declined 50% from $90 million in 1946 to $45 million in 1956 (Stuart 1982). This had a traumatic impact on the profits of the motion picture studios, with the combined profits of the ten largest production operations falling 74% from $121 million to $32 million during the same period (Balio 1985). The weekly habitual moviegoers that the motion picture industry relied upon were disappearing, and audiences grew more discriminating about the films they chose to see (Wasko 1982).

[14] See Kenney and Klein (1983).

There were two major external shocks that led to the downturn in the motion picture industry during this period. The first was the Supreme Court ruling on *U.S. vs. Paramount Pictures, Inc. et al* in 1948 which forced the separation of exhibition from the production and distribution businesses owned by the Big Five. With exhibitors now able to freely purchase films, independent producers began to take rental market share from the Big Five producer-distributors (Stuart 1982). The ruling also banned restrictive trade practices such as block booking, and the added insurance such mechanisms provided to producers and distributors vanished with them. Every movie produced and distributed would now have to be sold individually, and not at all if the quality was too poor.[15]

The second major shock was the spread of television. Americans owned only 14,000 television sets in 1947, but by 1954 ownership reached 32 million. By the end of the 1950s, almost 90 percent of American homes owned a television set. The marginal cost of viewing television was insignificant relative to a movie ticket once a set was purchased, and the variety and convenience provided by the new visual medium made it a competitive substitute for motion pictures (Balio 1985). Confronted with the combination of both shocks, major producers and distributors began to face an increasingly competitive environment for films.

Increased competition drove distributors in the industry to increase their demand for higher quality movies. This increased the demand for creativity for both in-house as well as independent productions. Producers responded by increasing the amount of resources and creative inputs invested into the production process of hopefully higher

[15] See Balio (1990) and Wasko (1982).

quality movies.[16] Production was refocused away from lower budget "B" films and concentrated instead on producing a smaller number of big budget "A" films, with significant investments in a variety of new technologies including color, 3-D, and stereophonic sound.[17]

In the following sections we specify the empirical organizational implications of the increased demand for creative content, describe the data used here, and conduct empirical tests of our hypotheses.

Empirical Implications for Make-or-Buy Decisions in the US Movie Industry in the 1940s and 1950s

The testable implications follow the fundamental managerial trade-off in the production of creative goods stated above and rewritten here:

> "*Internal/contractual production of creative goods should be less prevalent than their outright purchase the higher the creative content associated with its production."*

We define five testable implications within the context of the movie industry in the middle of the XXth century and the special circumstances that we have described in the previous section.

The first empirical implication is that the increase in demand for creativity should lead to a greater decrease in the amount of internal production for the "Paramount" distributors (the Big Five plus Universal, Columbia and United Artists) than for the "non-Paramount" distributors. Even though all distributors should have decreased internal

[16] This does not mean a change in the taste of American movie-goers over this time. The two shocks presented here basically mean that the demand for creativity by distribution and production companies increased because now they had to compete against television and each movie had to compete with all other movies, as they were not sold in blocks any longer.
[17] See Balio (1990), Stuart (1982) and Kindem (2000).

production activity, because of the increased competition from television, the distributors involved in the Paramount antitrust case were further affected, as their use of block booking as contractual practice was not allowed from 1948 on.[18] Thus, their demand for creativity after 1948 must have increased by more than that of other "non-Paramount" integrated distributors.

A second empirical implication arises from the fact that the demand for creativity was also affected by theater ownership. By owning theaters, distributors were able to assure release of their less appealing movies even if no independent theaters demanded them. Therefore theater divorcement by the five integrated "Paramount" distributors (the Big Five) must also have decreased the proportion of internal/contractual production in these firms in relation to other non-forwardly integrated firms. This must hold across years within the group of "Paramount" distributors and when compared to other distributors.

A third empirical implication arises from the volatility over time in the make-or-buy decision. When demand for creativity is relatively low, changes in movie portfolios can be adjusted mostly by internal production/contracting. With increased demand for creativity, unexpected changes in the required movie portfolio must be satisfied opportunistically by internally producing/contracting or acquiring a movie as needed. Thus, with the increase in the demand for creativity, we should observe an increase in the volatility of make-or-buy decisions. Thus, our third empirically testable implication is that increases in demand for creativity among "Paramount" distributors resulting from the

[18] United Artists was included in the trial but never sold movies in blocks. This created controversy about the real goal of the case.

block booking ban and theater divorcement must bring an increase in the volatility of their make/or buy decisions.

A fourth empirical implication arises from the need to use other firms' assets to produce more creative films. During the 1940s and 1950s studios utilized long-term contracts with their actors and actresses[19] who specialized in different genres. The increased demand for creative content increased the demand for assets and agents that were held under long-term relationships with other studios, and originated the collaboration of different studios in the production of a movie. Thus, our fourth empirical implication is that we should observe an increase in the number of co-productions (movies produced by more than one studio) when the demand for creativity increases and studios are not able to adjust their production technologies fast enough (which we argue is the case).[20]

Finally, we would expect that all these changes in the production process would have an effect on the overall quality of movies in the industry due to the reorganization of production and the use of more creative inputs in each individual movie. The fifth testable empirical implication is then that the increase in demand for creativity should, in fact, bring about higher quality movies. In particular, this shift should have increased the quality of movies produced in-house relative to the quality of movies produced by independent firms and distributed by integrated distributors.

In the following section we present the data used to test these implications and describe the organization of the industry during the two decades under study.

[19] See Storper and Christopherson (1987).
[20] See Spiller and Zelner (1997) for a similar analysis of joint ventures in telecommunications.

Data Description

In this study we combine information from two data sets. The first data set comes from the American Film Institute catalog.[21] From this data set, we obtain information on movie length in minutes, production companies and distributors. A movie is defined as a co-production if more than one studio takes part in the production process.

The second information source is the IMDBPro data set.[22] From this data set we use information on movie characteristics such as genre, IMDB ratings, award nominations, and production budgets for a limited number of movies.

In total we have information for 8126 movies that convert to 8848 movie-studio pairs (due to co-productions). All films in our study were released between 1940 and 1960. These movies were distributed by approximately 300 distributors and produced by roughly 1250 production companies.

As shown in Figure I, II and III below, the structure of the industry did not remain constant across these two decades. Figure I shows that the number of movies released decreased from 500 in the early 1940s to roughly 200 by the end of the 1950s. The figure also segments the number of movies by type of organizational form governing the distribution of a movie. The number of movies produced by independent studios (regardless of the distribution channel) was roughly constant (see blue and red lines), whereas the number of movies produced internally by integrated distributors decreased substantially and is responsible to a large extent for the wide decrease in the industry.

[21] See http://www.afi.com/members/catalog/.
[22] See www.imdb.com.

Figure I

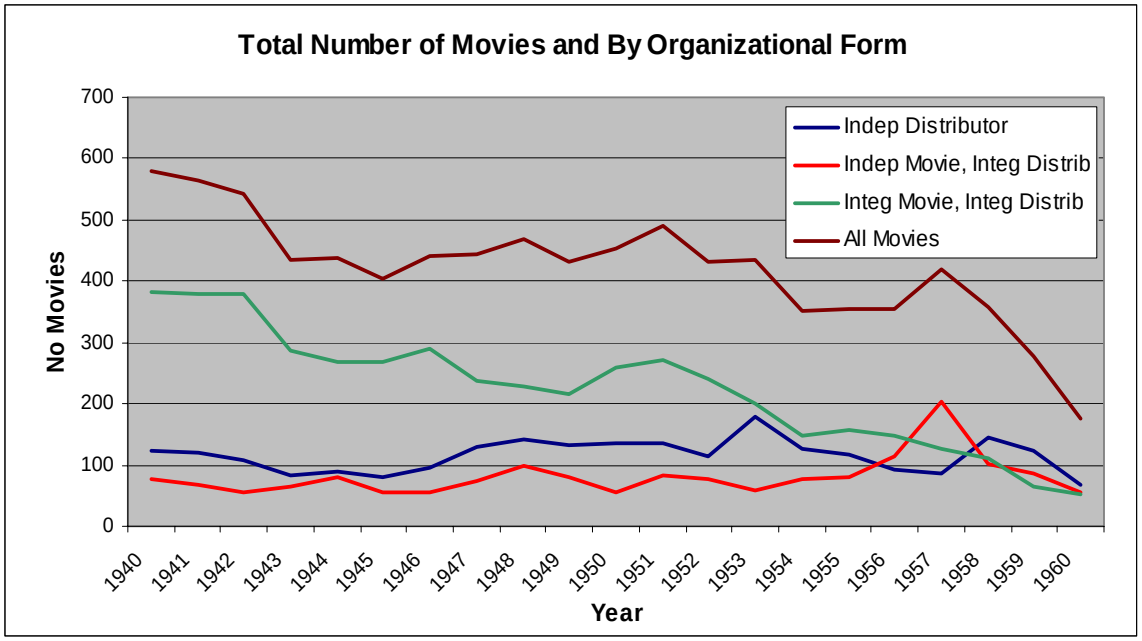


Figure I already provides evidence concerning the first empirical implication, as the number of movies produced internally by integrated distributors decreased substantially with the increase in creativity demand.

Figure II provides the evidence on the number of producers by organizational form. Figure II shows that the number of independent producers increased significantly after 1946 and peaked again after 1956. The number of integrated producers did not change over the two decades under study.[23] When combining the evidence from Figure I and Figure II, we can see that the decrease in the number of movies produced by integrated producers did not follow from a decline in the number of integrated producing companies. As Figure I shows, the overall decrease in number of movies released in the

[23] In Figure II we define "Integrated Producers Outsourcing" as those production companies that had their own distributing branch and did use other companies to distribute some of their movies. Similarly, we define "Integrated Producers Not Outsourcing" as those producers that distribute all their movies through their own distributing branch.

industry almost perfectly matches the decrease in the number of movies produced internally by the integrated distributors.

Figure II

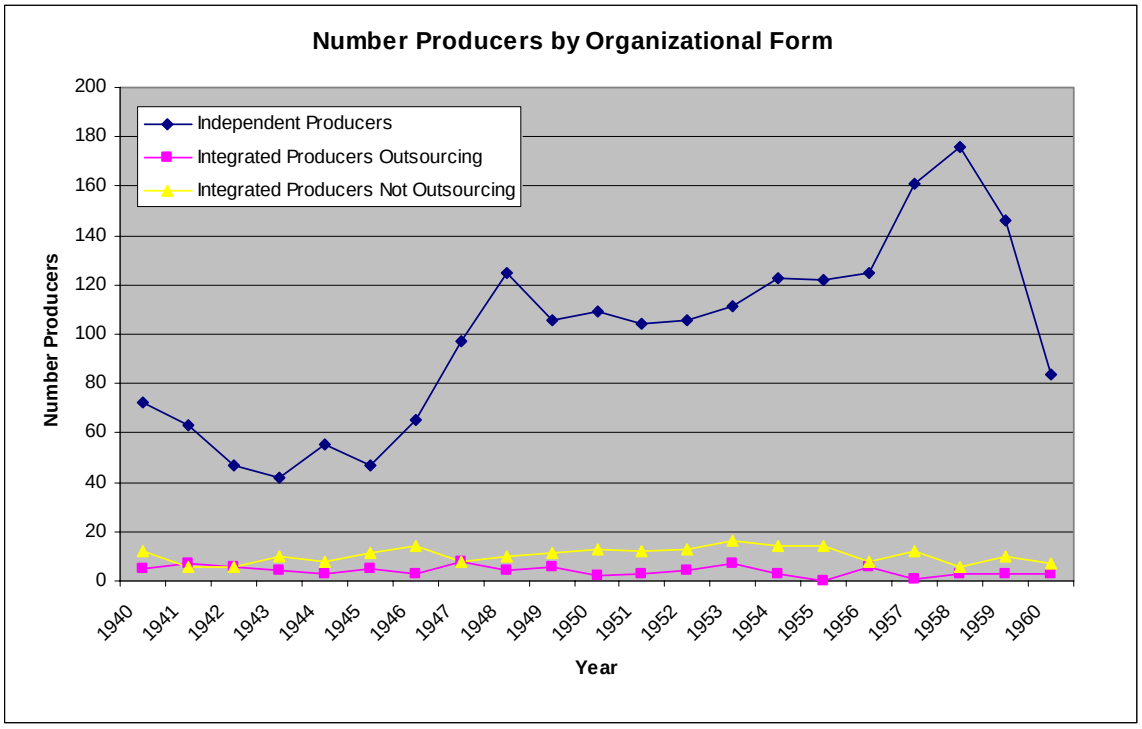
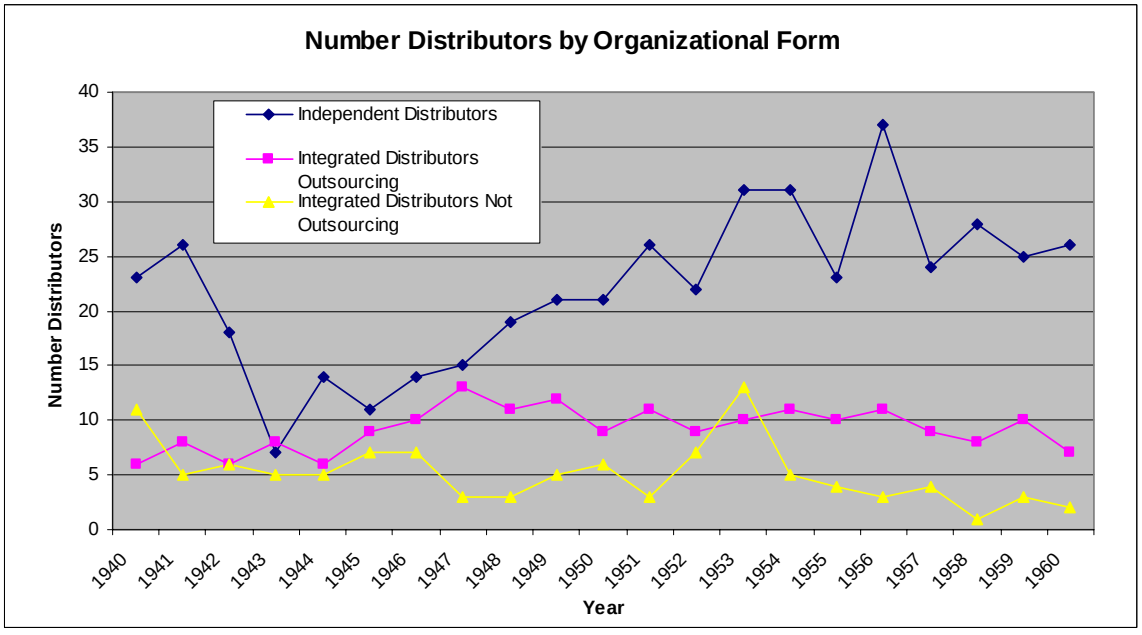


Figure III



Finally, Figure III presents the number of distributors by organizational form. Figure III shows that the distribution market did not shrink either. Even though the number of distributors defined as "Integrated Distributors Not Outsourcing" decreased significantly from 10 to 2 between 1940 and 1960,[24] the number of independent distributors more than compensated for this decrease by increasing from 7 to 25 during the same period. The number of "Integrated Distributors Outsourcing" remained roughly constant around 10 since 1946.

The decrease in the number of movies released and the increase in the number of production and distribution companies are jointly explained by the disintegration of dominant firms in the 1940s followed by a massive entry of independent producers through co-productions. The data also suggest that the increase in demand for creativity decreased the number of movies distributed by existing distribution companies by more than the decrease in the market size for movies, and thus allowed other (new independent) distributors to enter the market.

Empirical Implementation

In this section we describe the methodology we use to test for the implications outlined earlier. We combine regression and graphical analysis to bring evidence on the validity of our testable implications.

Make-or-Buy Decisions

The first and second testable implications state that the increase in demand for creativity will lower the amount of internal production, and that block booking banning and theater divorcement will magnify this effect. To test these implications we use a difference-on-

[24] In Figure III, we define an "Integrated Distributors Outsourcing" as a distributor that distributes movies of its own and movies produced by others, and "Integrated Distributors Not Outsourcing" as distributors who do not distribute movies produced by others.

differences approach where we not only compare make-or-buy decisions before and after the increase in demand for creativity due to the introduction of television, but also compare make-or-buy decisions across different types of distributors ("Paramount" and "non-Paramount" distributors) to test for the second implication. We estimate OLS regressions of the the share of internally produced movies over all movies distributed by distributor j in year t (VI_{jt}) using specification (1):

$$VI_{jt} = \alpha_0 + \alpha_1 * Paramount_j + \alpha_2 * Post\_1948_t + \alpha_3 * Paramount_j * Post\_1948_t + \\ + \alpha_4 * Theaters?_{jt} + \delta_j + \delta_t + u_{jt}, \qquad (1)$$

where the explanatory variables are a dummy variable "$Paramount_j$" that takes value 1 if distributor j is one of the eight distributors in the Paramount antitrust case and 0 if otherwise; a dummy variable "$Post\_1948_t$" that takes value 1 if year t is after 1948, and 0 otherwise; the interaction of the previous two; and a dummy variable "$Theaters?_{jt}$" that takes value 1 if distributor j owned theaters in year t, and 0 otherwise. We also add to the analysis distributor and year fixed effects to control for differences in unobservable characteristics across firms and years.

Directly related to the first testable implication is the question of how distributors adjust to changes in genre popularity. They may adjust to these changes by either producing movies of new genres internally or by buying from independent producers, and these rates of adjustment may be determined by previous decisions of genre specialization. For this reason, we study vertical integration decisions by genre and distributor by estimating specification (2) such that

$$VI_{jkt} = \alpha_0 + \alpha_1 * \#Movies_{kt} + \alpha_2 * \#Movies_{jt} + \qquad (2) \\ + \alpha_3 * \#Movies_{kt} * \delta_t + \alpha_4 * \#Movies_{jt} * \delta_t + \delta_{jk} + \delta_t + u_{jkt},$$

where now the dependent variable VI_{jkt} is the share of movies of genre k distributed by distributor j in year t that is internally produced. The two main explanatory variables are the total number of movies in genre k in the industry in year t $\#Movies_{kt}$ and the total number of movies distributed by distributor j in year t $\#Movies_{jt}$. We also include in the regression analysis genre-distributor and year fixed effects, as well as the interactions of the two main explanatory variables with year fixed effects. The total number of movies distributed by each distributor j in a given year t proxies for scale effects at the firm level and the total number of movies of genre k in year t in the industry captures changes in demand (popularity) across genres in different years.

The third empirically testable implication states that an increase in demand for creativity will increase the volatility of make-or-buy decisions because internal production is no longer a low cost alternative to high cost outside movies. To study the evolution of the volatility of production and distribution decisions by producers and distributors, we compute a measure of volatility of the number of movies produced or distributed that can be compared across firm types and years and investigate its evolution from 1940 to 1960. Take, for example, the volatility of the number of movies produced by a production company. To compute such a measure of volatility, we first estimate OLS regressions using specification (3):

$$\text{Number of Movies}_{jt} = \alpha_0 + \delta_j + \delta_t + u_{jt}, \qquad (3)$$

where the dependent variable is the number of movies produced by producer j in year t (but in other instances will be the number of movies distributed by distributor j in year t), and the right-hand side of the regression equation only contains a constant and firm and year fixed effects. From specification (3), we obtain the residuals and the predicted

values of the dependent variable and create a third variable that is the result of dividing the estimated residual by the predicted value. We call this third variable the standardized residual. The standardized residual becomes an approximation of the percentage variation from the mean of the dependent variable that is comparable across firms and years. We then calculate the standard deviation per year, group of firms and decision that we are comparing. The standard deviation of the standardized residual is our measure of volatility. We repeat this same exercise for all make-or-buy decisions for integrated producers and integrated distributors.

To examine the third testable implication, we create a series of volatility for number of movies produced by integrated and independent producers, and number of movies distributed by independent and integrated distributors. For integrated distributors only, we create a series reflecting the volatility of number of movies bought and made and we break these series into volatility of those distributors with theaters and those without. We plot these series and observe their different behavior across time.

Co-Productions

Our fourth testable implication is that the increased demand for creativity will increase the number of co-produced movies. To explore this implication we calculate the share of co-produced movies per organizational form (independent distributor, independent movie-integrated distributor, and integrated movie-integrated distributor) and plot it against time.

Supply of Creativity

The fifth testable implication states that the changes in the organization of production that followed the increase in demand for creativity had an effect on the use of creative inputs

and the supply of creative output. To test this last implication, we study the evolution of a few variables such as production budgets, the number of genres a movie qualifies for, IMDB ratings and nominations for Oscars, Golden Globes and international film festivals.

More creative inputs under a period of higher demand for creativity will become more expensive and therefore we study the evolution of production budgets under different organizational forms to test whether integrated distributors reacted more to the increase in demand for creativity than independent distributors did. For this purpose, we undertake two types of analysis. We first graph the evolution of the average movie production budget by organizational form across time and then estimate OLS regressions of the product budget in US$ of movie i ($Budget_i$) in specification (4):

$$Budget_i = \alpha_0 + \alpha_1 * Post\_1950?_i + \alpha_2 * [Indep\ Movie, Integ\ Distrib]_i +$$
$$+ \alpha_3 * [Integ\ Movie, Integ\ Distrib]_I + \alpha_4 * [Indep\ Movie, Integ\ Distrib]_i * Post\_1950?_i +$$
$$+ \alpha_5 * [Integ\ Movie, Integ\ Distrib]_i * Post\_1950?_i + u_i, \qquad (4)$$

where the unit of observation is a movie and the explanatory variables are a dummy variable "Post 1950?" that takes value 1 if movie i was released after 1950 and 0 otherwise, a dummy variable [Indep Movie, Integ Distrib] that takes value 1 if movie i was distributed by an integrated distributor but produced by a different firm and 0 otherwise, and a dummy variable [Integ Movie, Integ Distrib] that takes value 1 if movie i was produced and distributed by the same firm and 0 if otherwise. We also include interactions between the organizational form dummies and "Post 1950?" This specification takes as a control group movies produced by independent producers and distributed by non-integrated distributors in the 1940s.

We also examine graphically the time series of the average number of genres per movie, IMDB ratings, nominations to the Oscars' four main categories, nominations to best picture at the Golden Globes, and awards from the Berlin, Cannes and Venice international film festivals. These are movie characteristics that are proportional to movie complexity and movie quality. The number of genres per movie is a direct measure of movie complexity given the genre studio specialization commented above. IMDB ratings are direct measure of the audience opinion on a given movie quality. Finally, the nominations to different award, in the US and abroad, are a different measure of movie quality.

Empirical Results

In this section we show the results of applying the methodology described in the previous section. We divide the results into different subsections that illustrate the consequences of the increase in demand for creativity on make-or-buy decisions on levels of internal production, volatility, incidence of co-productions and the supply of creativity respectively.

Make-or-Buy Decisions

We start by testing the first and second empirical implications that posit an increase in creativity demand will decrease the incidence of vertical integration. The first empirical implication indicates that the increase in demand for creativity should decrease internal production more in "Paramount" distributors than in "non-Paramount" distributors. We test this by running OLS regressions on specification (1) below. We show the results in Table I below.

TABLE I - DEP. VARIABLE: % INTERNAL PRODUCTION OF TOTAL DISTRIBUTION

Independent Variable:	(1)	(2)	(3)	(4)	(5)	(6)
Post 1948?	-0.09	-0.05	-	-0.12	-0.19	-0.03
	(0.03)***	(0.04)	-	(0.08)	(0.09)**	(0.10)
Paramount Case Studio?	0.03	-	0.03	-	-	-
	(0.07)	-	(0.07)	-	-	-
Post 1948?*Paramount Case Studio?	0.20	0.03	0.20	0.03	-	-
	(0.07)***	(0.04)	(0.07)***	(0.05)	-	-
Owned Theaters?	0.52	0.26	0.49	0.21	0.22	-
	(0.05)***	(0.04)***	(0.06)***	(0.04)***	(0.03)***	-
Constant	0.29	0.31	0.23	0.29	0.53	0.19
	(0.03)***	(0.02)***	(0.02)***	(0.04)***	(0.03)***	(0.06)***
Distributor FE	No	Yes	No	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	No	No
Sample	Full	Full	Full	Full	Paramount	No Paramount
Observations	764	764	764	764	165	599
R-squared	0.19	0.86	0.22	0.87	0.94	0.84

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Results from column (1) show that all firms as a group decreased their percentage of in-house production after 1948 by 9 percentage points. This result is a combination of the effect on "Paramount" and "non-Paramount" firms as can be seen in columns (5) and (6). The former decreased vertical integration by 19 percentage points after 1948 while the latter did not change their behavior much.[25] This result is consistent with the first testable implication.

The second testable implication is that forward integrated theaters will decrease internal production after separating from their theaters. We test this by adding to the OLS regressions in Table I a dummy variable that equals 1 if the distributor owns theaters and 0 otherwise. This variable varies across distributors and within distributors across time. Results in Table I show that forward integrated distributors distributed 20 to 50 percentage points more of in-house production when they owned a theater branch (see

[25] Most of the Non-Paramount firms are not integrated. Thus, the relevant results are those in column (5).

columns (1) to (5)) relative to when they did not own a theater branch. These results are consistent with the prediction of our second testable implication.

TABLE II - DEP. VARIABLE: % INTERNAL PRODUCTION OF TOTAL DISTRIBUTION BY GENRE

Independent Variable:	(1)	(2)	(3)	(4)
No. Movies Distributed Firm/Year	0.004	0.003	0.005	0.005
	(0.001)***	(0.001)***	(0.001)***	(0.001)***
No. Movies Genre/Year	0.001	-0.001	-0.001	-0.001
	(0.0003)***	(0.0003)**	(0.0003)*	(0.0003)
Constant	0.302	0.497	0.394	0.393
	(0.019)***	(0.033)***	(0.043)***	(0.044)***
Genre/Firm FE	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes
No. Movies Genre*Year FE	No	No	No	Yes
No. Movies Distributed*Year FE	No	No	Yes	Yes
Observations	3526	3526	3526	3526
R-squared	0.73	0.76	0.76	0.77

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

In Table II we show the results of estimating specification (2). This table sheds light on how distributors adjust make-or-buy decisions to changes in movie genre popularity within their chosen movie portfolio. The results indicate that bigger distributors are more likely to integrate more production across all genres. The results also show, controlling for year fixed effects, that sudden positive changes in genre popularity are negatively correlated with the share of in-house production (see columns 2-4). This is consistent with the notion that distributors adjust to unexpected demand changes for certain genres in demand by licensing movies produced elsewhere.

The third testable implication is that an increase in creativity demand will increase volatility in make-or-buy decisions. Therefore, we study if this is the case for decisions in the number of movies produced and distributed for producers and distributors respectively, and the number of movies made and bought for integrated distributors only with and without theaters. We use as a measure of volatility the standard deviation of the

percentage deviation over the predicted value of the number of movies produced or distributed (depending on the case).

Figure IV

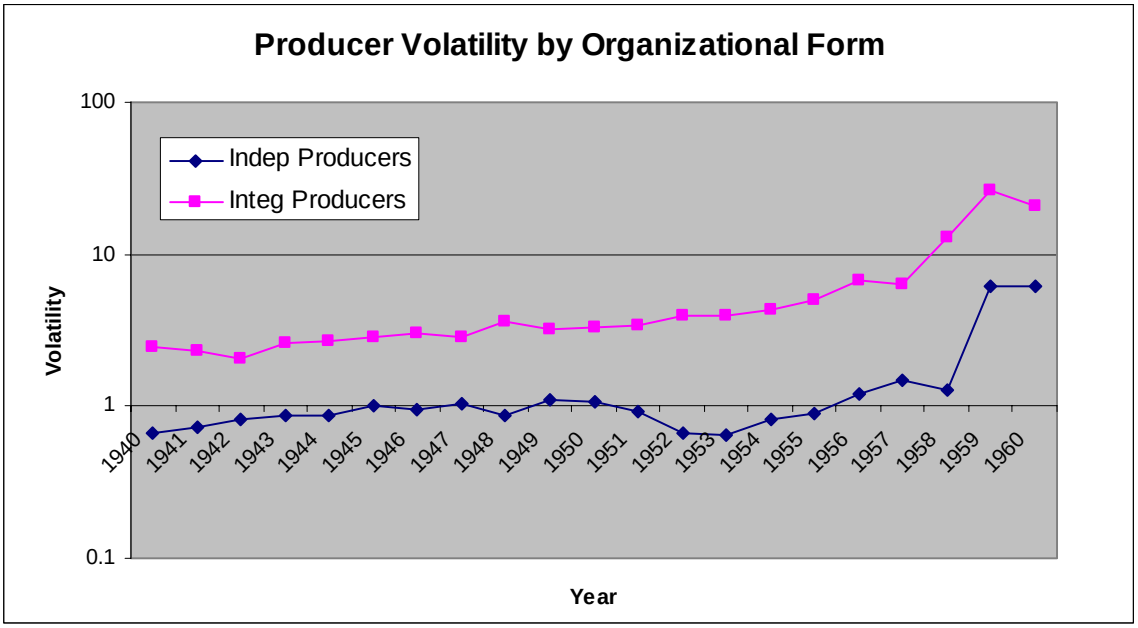
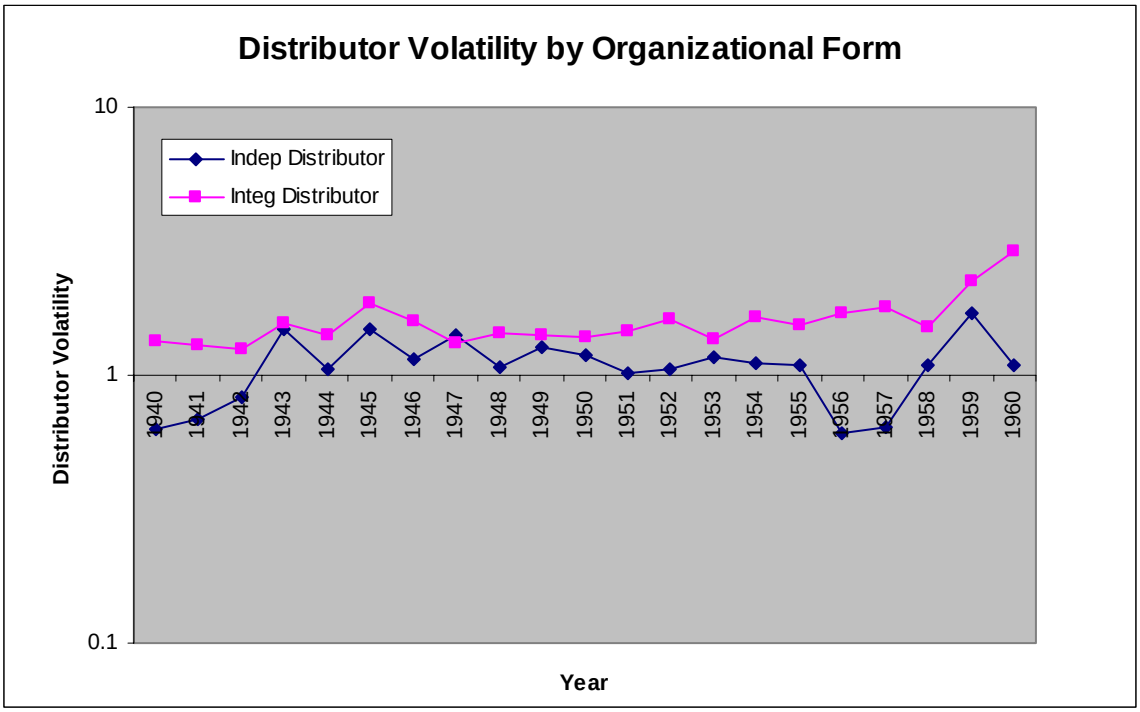


Figure IV above shows the evolution of the volatility of the number of movies produced between 1940 and 1960 for integrated (with a distribution branch) and independent producers (without a distribution branch). The graph shows that decisions of integrated producers are more volatile than decisions of independent producers during the whole period. This higher volatility is the result of integrated producers' ability to use internal production as an adjustment margin to available external production. We also observe that the volatility of decisions of both types increased substantially in the late 1950s as we predicted.

Figure V below compares the volatility in the number of movies distributed by independent and integrated distributors.

Figure V

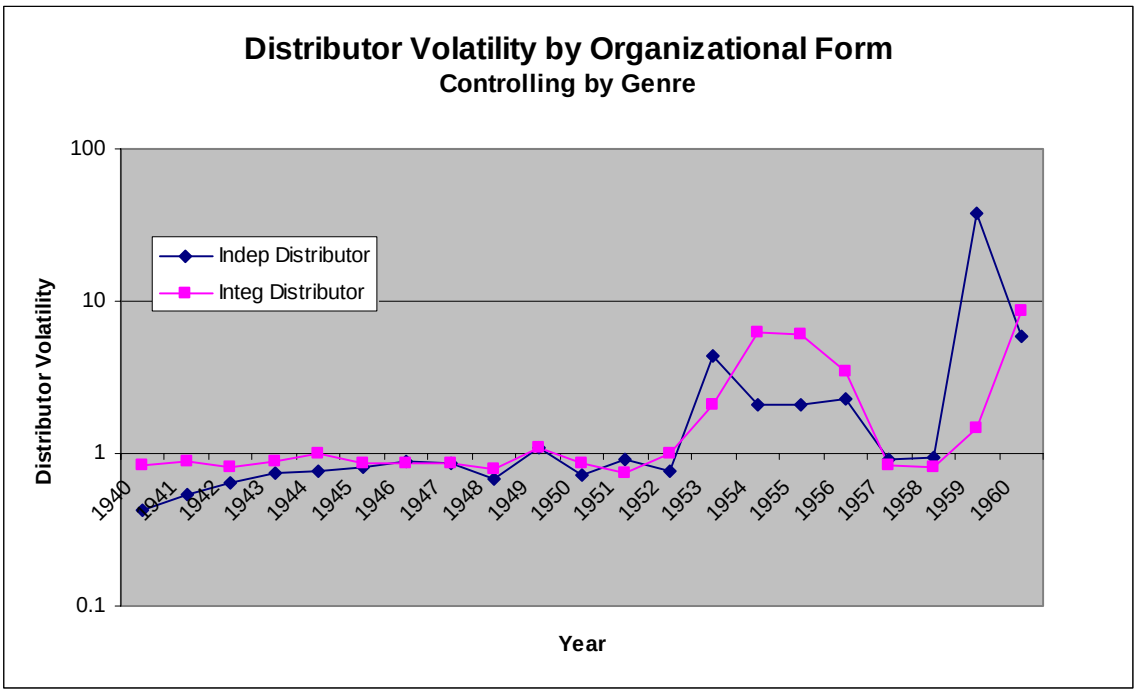


This figure shows that the volatility of integrated distributors is consistently higher than that of independent distributors, and that the gap between the two increased from 1955 to 1960. There is also an increase in the volatility of integrated distributors that may be due to the increase in demand for creativity and its organizational implications as described above.

Since Table II suggests that firms adjust their internal production to changes in genre popularity, we hypothesize that the observed increases in volatility could come from unexpected changes in genre popularity. For this reason, we repeat the exercise in specification (3) adding a genre fixed effect. Thus, the left-hand side variable represents a measure of volatility that controls for genre composition. Figure VI plots this volatility series. Figure VI shows that the volatility of the number of movies distributed by independent and integrated distributors is low and equal across distributor types until the

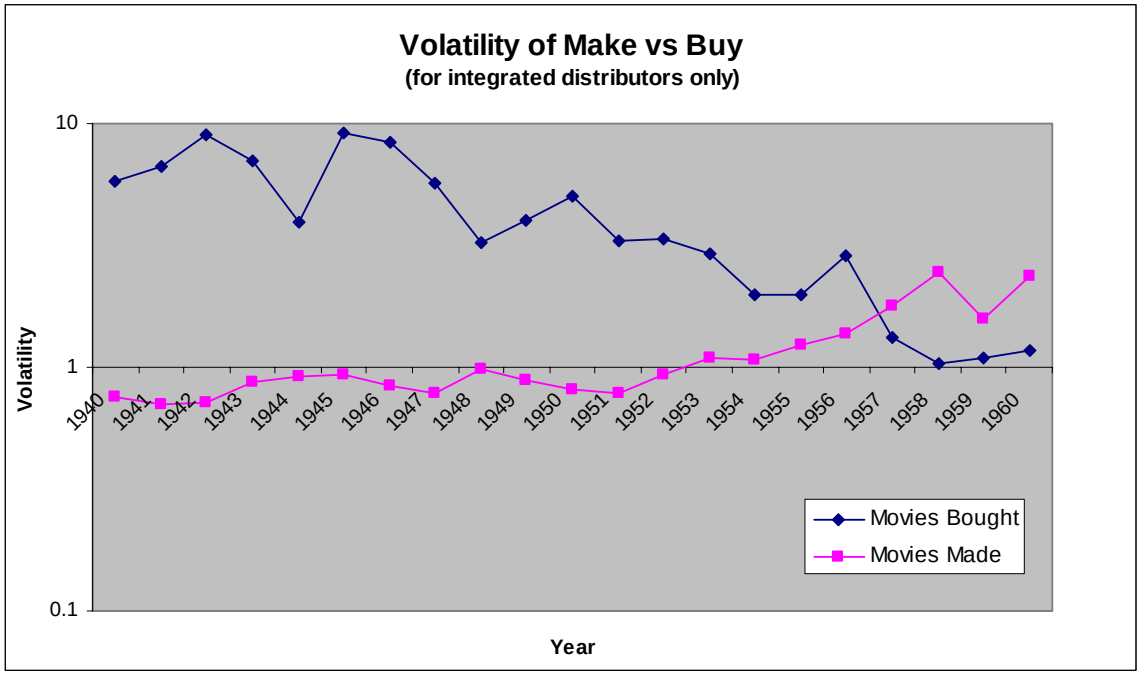
early 1950s. The volatility of both increased equally in the 1950s. The contrasting evidence in Figure V and Figure VI indicates that independent and integrated distributors adjust equally within genres, but integrated distributors have an easier time adjusting across genres, explaining why the volatility of the number of movies distributed overall by integrated distributors is higher than that of independent distributors.

Figure VI



We can also analyze, for integrated distributors, the volatility of the number of movies made versus the volatility of the number of movies bought. Figure VII below shows that during the 1940s the volatility of movies distributed was due primarily to the number of movies bought. As the demand for creativity increased, the volatility of movies bought decreased drastically, while the volatility of movies made increased, suggesting that the margin of adjustment shifted from outsourcing to in-house production.

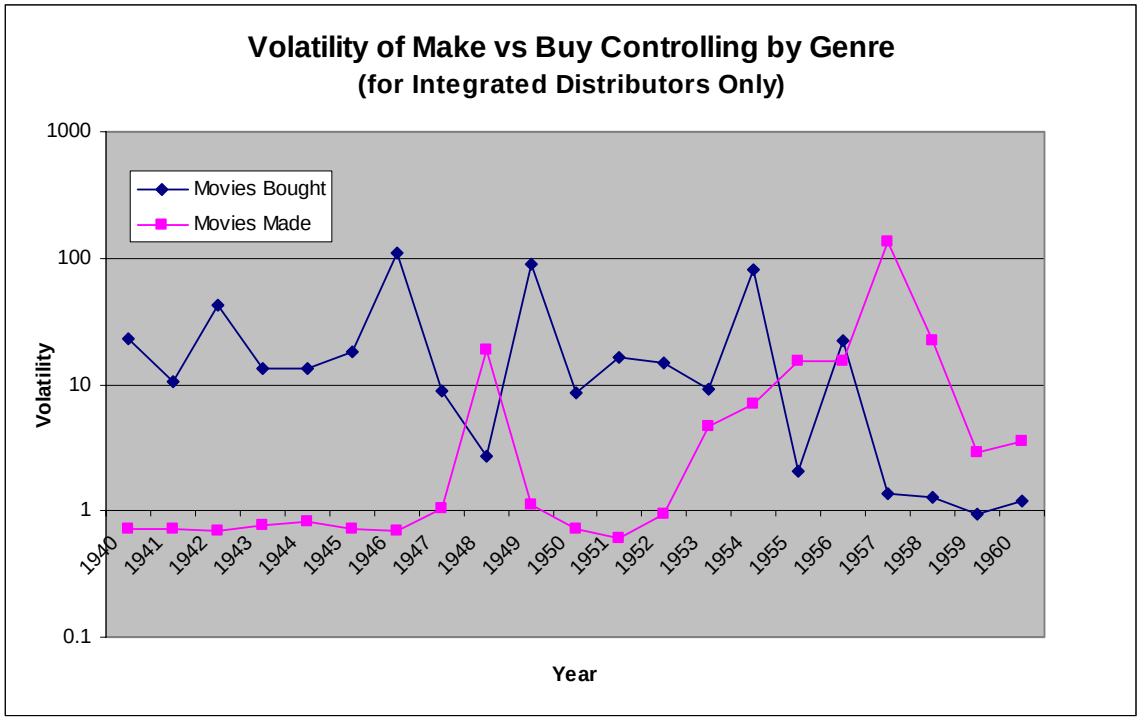
Figure VII



As in the previous case, we compute the volatility of movies made and movies bought controlling for genre (Figure VIII below) and observe that, controlling for genre, the volatility of movies made increased from 1953 on.[26] Figure VIII, when compared to Figure VII, suggests that integrated distributors not only adjust their movie portfolio across make-or-buy decisions but also across decisions on what genres to market.

[26] There was a volatility spike in 1948, but the sustained increased took place in the 1950s.

Figure VIII



Next we examine differences in volatility in make-or-buy decisions between integrated distributors that were forward integrated into exhibition in the early 1940s and integrated distributors that were never integrated into exhibition in our sample. We do this because owning theaters allowed these distributors to assure release of many of their movies that may not have found an alternative outlet. We show volatility series of both distributor types in Figure IX.

Figure IX

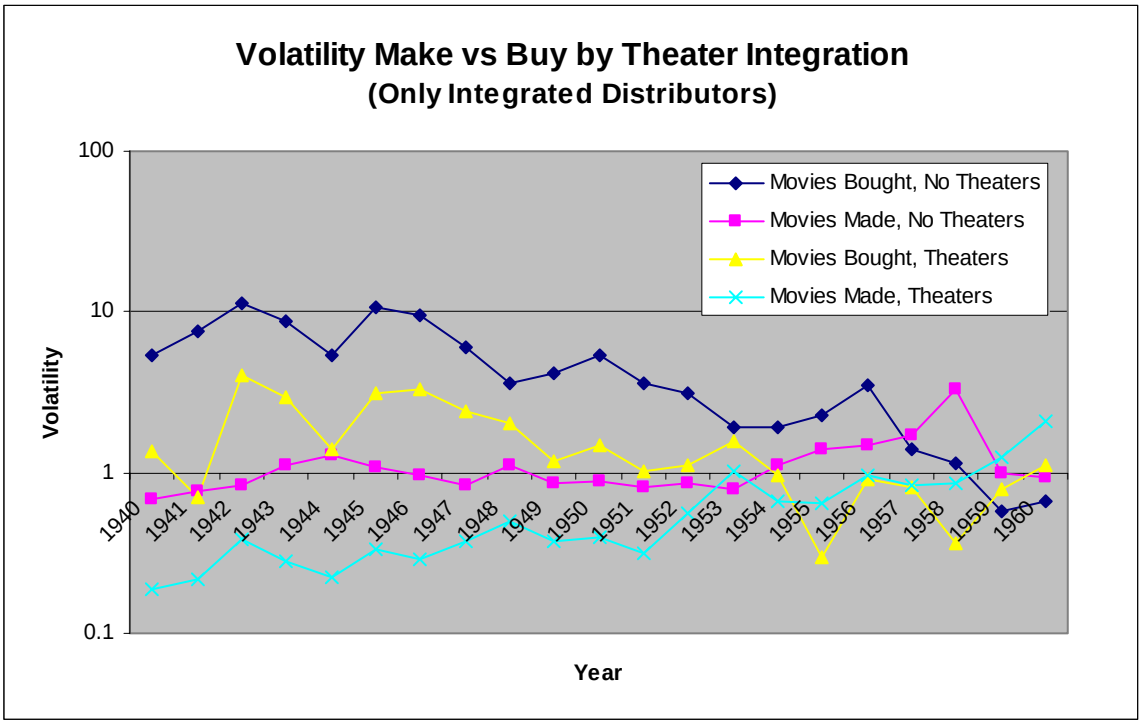
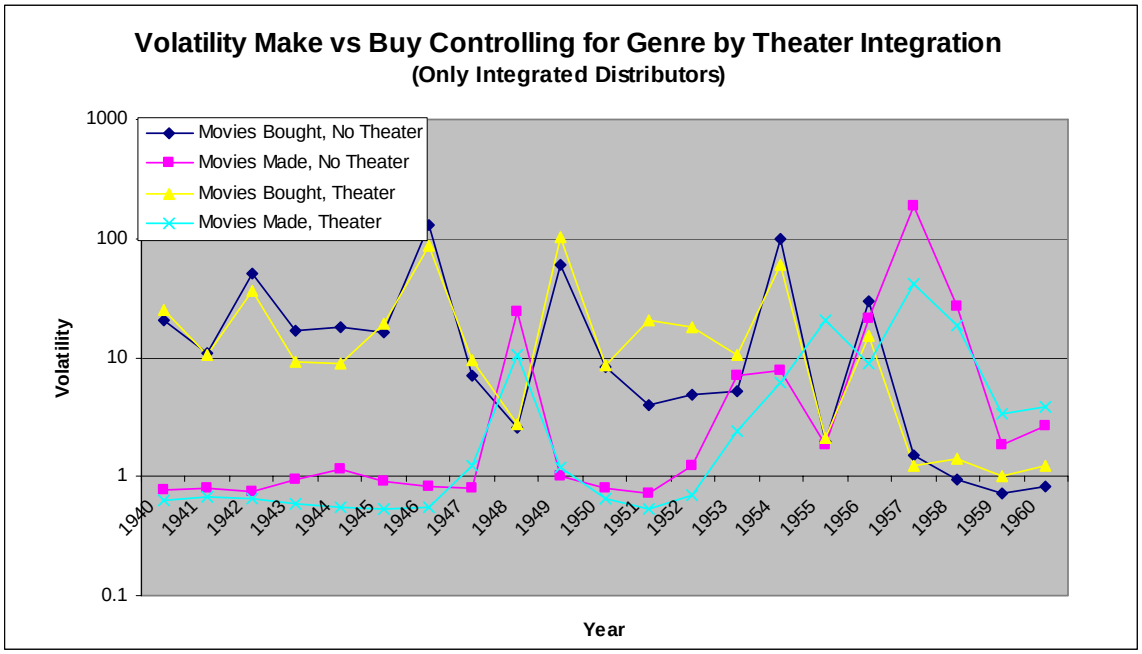


Figure IX above suggests that the volatility of movies made and bought for distributors with theaters was lower than for those that owned no theaters. It is also notable that these four series converge to the same levels since the owners of theaters were forced to separate from their exhibition branches as part of the 1948 Supreme Court resolution in the Paramount antitrust case.

Figure X



Finally, we analyze the volatility of movies made and bought for integrated distributors with and without theaters controlling by genre. We show the volatility series in Figure X above. We observe that the volatility of movies made and movies bought across distributors with and without theaters is the same. This evidence combined with the evidence in the previous figure (without controlling for genre) suggests that distributors with theaters adjust better across genres than distributors without theaters.

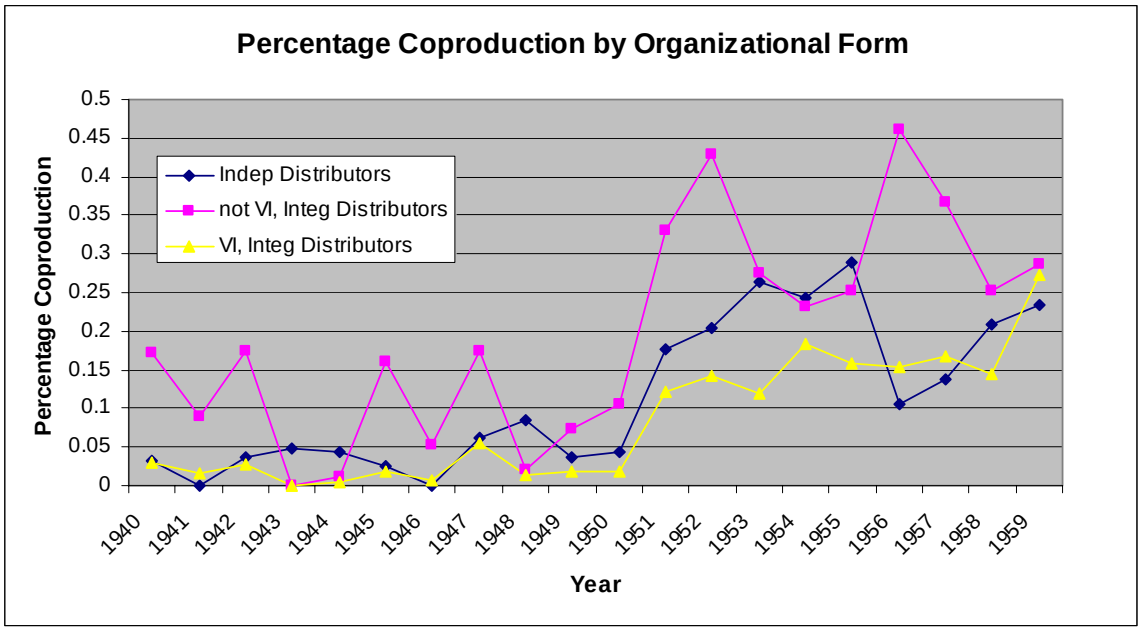
Co-Productions

The fourth testable implication states that an increase in demand for creativity will lead to an increase in the incidence of co-productions. Co-productions allow firms not only to share production costs but also share ideas and skills that eventually turn into more creative movies. The increase in co-productions at the end of the 1940s and throughout the 1950s was the first step towards the production process that takes place currently, where separate inputs are added together for the making of a movie and disintegrated

afterwards. During the 1940s, assets (actors, studios, script writers, etc) still belonged to studios, so co-production was the most flexible way to combine different assets for different movies.

Figure XI below depicts two regularities. The first regularity is that the percentage of co-productions increased substantially after 1950 and increased under all organizational forms. The second regularity is that even though the series of co-production of independent movies distributed by integrated distributors is more volatile than the other two series before and after 1950, all three series appear to have become more volatile after 1950.

Figure XI



Both regularities are consistent with the fourth testable implication that an increase in the demand for creativity (roughly after 1950) led to an increase in the number of co-productions. Integrated distributors co-produced more movies and distributed more co-produced independent movies. The general increase in demand for

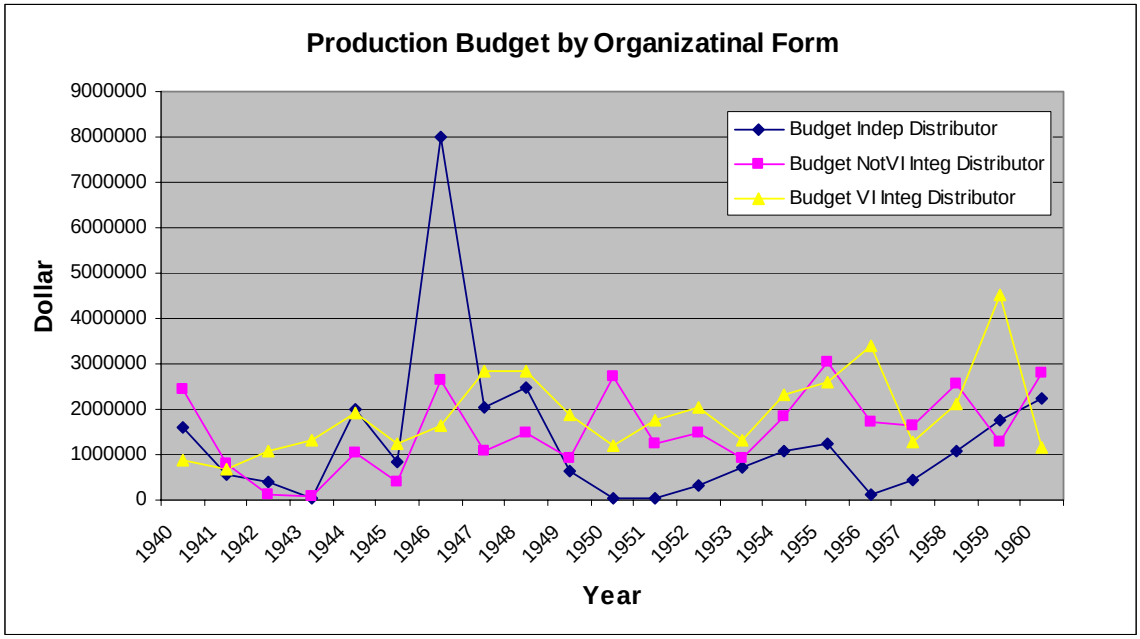
creativity also increased the number of movies co-produced by independent producers and distributed by independent distributors.

Supply of Creativity

The fifth empirical implication states that the reorganization of production due to the increase in the demand for creativity will have an effect on the use of creative inputs and the supply of creative output. In particular, we expect to observe changes in production costs (more creative inputs are more rare and therefore more expensive), the number of genres per movie as a way to measure movie complexity and creativity, and award nomination and IMDB ratings as a way to measure for movie quality.

We start the analysis by examining time series of production budgets in Figure XII. We have production budget information for a selected sample of 518 movies from IMDB. Figure XII shows the evolution of average movie production costs in our sample. We observe that costs across organizational forms are very similar during the whole sample period. Also, costs of independently distributed movies were consistently lower than costs of movies distributed by integrated distributors during the 1950s.

Figure XII



Next, we show in Table III the results of estimating specification (4). Column (1) shows, not surprisingly, that movies in our sample were on average more expensive to produce during the 1950s than in the 1940s. This increase is probably caused by both the increase in demand for creativity and the inflation during those years. Column (2) also shows that movies produced by an integrated distributor are generally more expensive than movies produced by independent producers. Finally, column (3) that movies distributed by integrated distributors (produced in-house or outsourced) were the primary driver of production budget growth during these two decades, reflecting the tendency towards higher quality required from those distributors.[27]

These findings are consistent with our fifth testable implication. Because of the increase in demand for creativity, studios demanded more creative inputs that were more

[27] Our results also show that independently produced movies distributed by integrated distributors cost less to produce than movies distributed by independent distributors and less that those movies produced and distributed by integrated studios. These results are at odds with Robins (1993). In his paper, Robins finds that in the case of Warner Brothers films produced by independent producers actually cost more than those produced in-house.

expensive, and therefore spent more per movie production during the 1950s. The budgets in in-house productions increased and independently produced movies distributed by integrated studios cost more.

TABLE III - DEP. VARIABLE: PRODUCTION BUDGET PER MOVIE

Independent Variable:	(1)	(2)	(3)
After 1950?	335885	421831	-499184
	(155987)**	(163643)**	(362892)
Indep Movie, Integ Distrib		385458	-653877
		(243611)	(325976)**
Integ Movie, Integ Distrib		547535	-202202
		(223259)**	(313996)
After 1950?*[Indep Movie, Integ Distrib]			1429270
			(449029)***
After 1950?*[Integ Movie, Integ Distrib]			1066280
			(431328)**
Constant	1425680	1009150	1685960
	(94611.9)***	(209695)***	(291322)***
Observations	518	518	518
R-squared	0.01	0.02	0.04

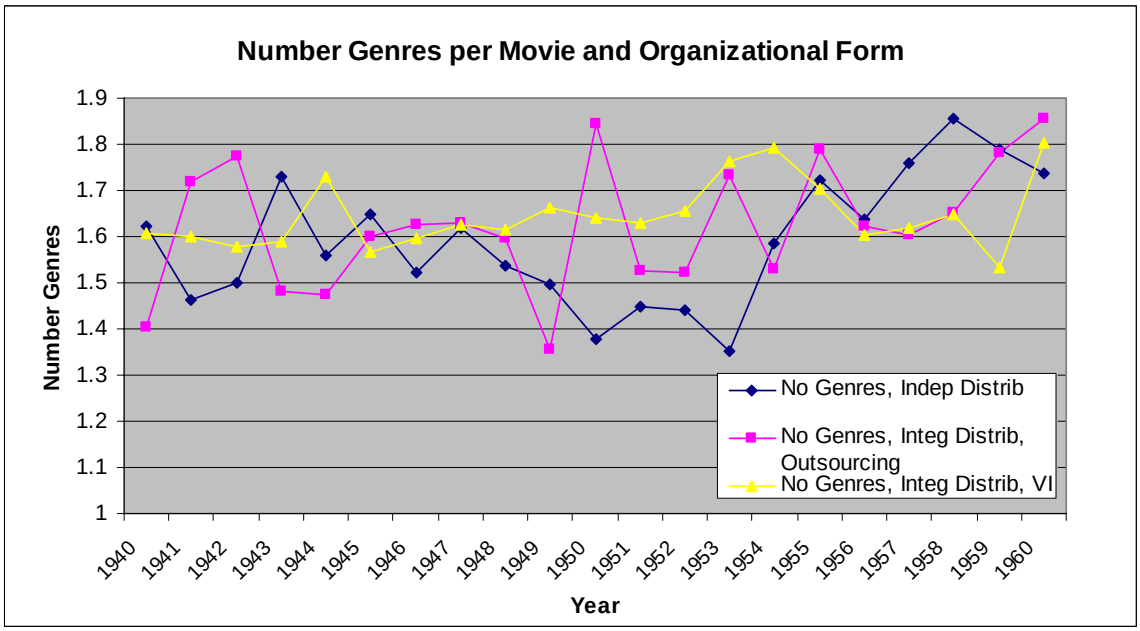
Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

We can also examine other creative dimensions of movies such as the number of genres per movie, and nominations for Oscars and other awards.[28] The number of genres that a movie is categorized into is a good measure of movie creativity since studios specialized in the production of specific genres in the 1940s (see Chisholm (1993)), and therefore producing a movie that qualified for other genres involved the use of new and existing assets and expertise in novel ways.

[28] The IMDB movie ratings can be seen as another measure of creativity. These ratings range between 0 and 10, and are self-reported. However, because they are self-reported, they engender two major weaknesses. First, there is no rating for a considerable number of movies, possibly because these movies are of poor quality or because they are older and current raters are not aware of them. Also, older movies from independent distributors may be less commercialized than those of integrated distributors that have survived over the years, which may affect ratings in a way completely unrelated to movie quality. For these reasons we decided not to report these results here. Results are available upon request.

We have genre data for our full sample of over 8000 movies. Thus, in Figure XIII we use the full sample of movies. Figure XIII shows that the average number of genres per movie increased from the 1940s to the 1950s.[29]

Figure XIII



Finally, we analyze the differential extent of award nominations by organizational form. We present results in two separate figures.

[29] Figure XIII does not show a difference of number of genres per movie across governance structures during the time period under study.

Figure XIV

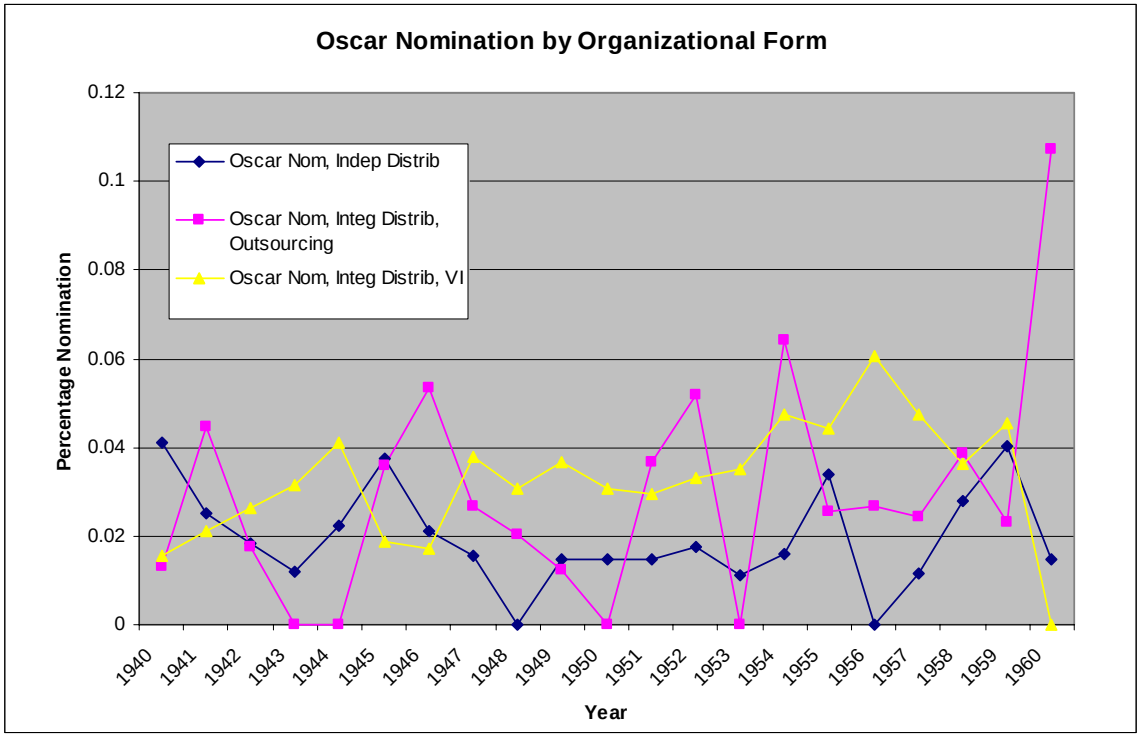
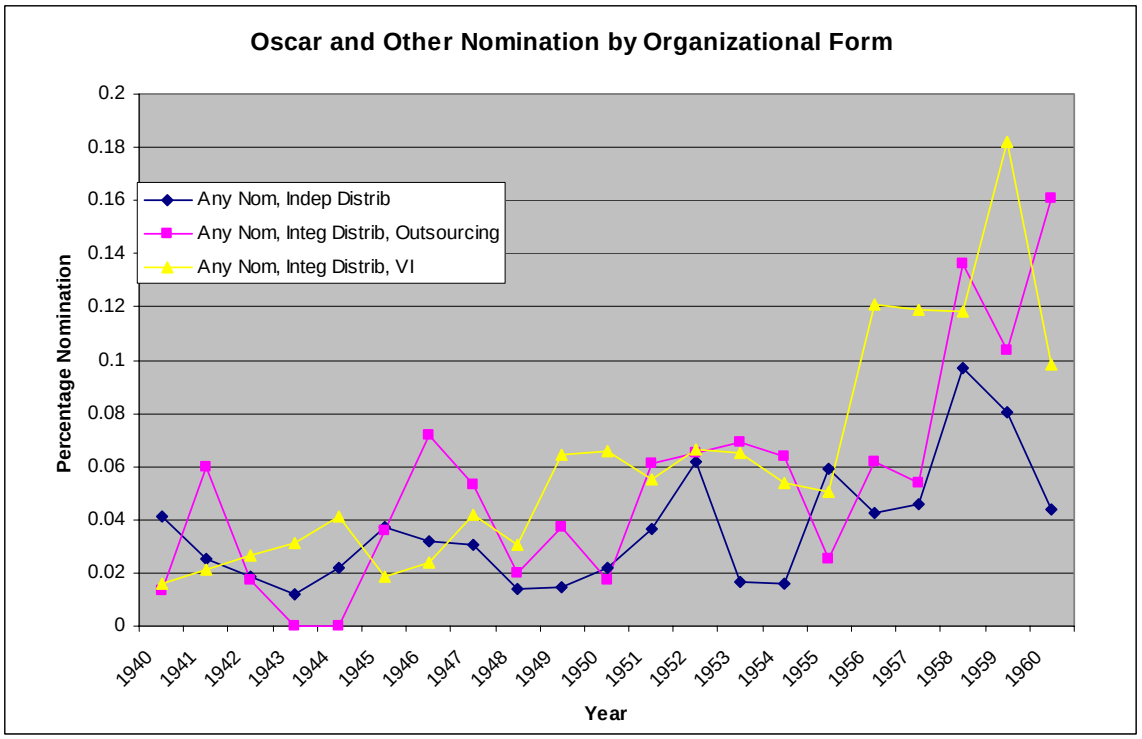


Figure XIV shows the percentage of movies with an Oscar nomination by organizational form (the Oscar nominations considered here are Best Picture, Best Director, Best Actor and Best Actress). Note that independent movies and movies produced and distributed by integrated distributors exchanged relative positions in consecutive years up to 1947. After 1947, "integrated" movies did consistently better than independently distributed movies with the exception of 1960. The "success" rate of independent movies distributed by integrated firms is the most volatile of the three series and goes from 0 nominations to the top number of nominations in consecutive years.

In Figure XV we add to the Oscar nominations the number of nominations for best movie in a series of other award ceremonies and international film festivals (Golden Globe,

Berlin, Cannes and Venice).[30] These other awards were created during the period of time under study, which explains the series' increase in the late 1950s for all three organizational forms. Despite this limitation, we are still able to observe how movies under different organizational forms perform relative to each other.

Figure XV



As in Figure XIV, even after the introduction of new award nominations and international film festivals which may have included other criteria and maintained greater independence from the power circles in Hollywood, the success rates of "integrated" movies are higher than that of independent movies during the 1950s. In this figure, even the success rate of independent movies distributed by integrated distributors is

[30] It is important to show how nominations on other award ceremonies evolved because Oscar nominations may have been driven by circles of power in Hollywood. Foreign film festivals are independent of this and are more likely to nominate films only for their artistic value and not connections.

consistently higher than that of independent movies distributed by independent distributors.

Conclusions

In this paper we investigate the organizational implications of creativity. Among all the issues that organizations need to deal with when managing creative inputs, we concentrate on make-or-buy decisions. The perils of outsourcing for distributors arise from the unavoidability of the *winner's curse* in an environment in which distributors are undifferentiated and the *nobody knows* principle operates equally across the board. We compared this to the hazards of internal production where control over production processes and costs may be drastically hindered when managing increasingly more creativity-intense goods. Thus, when the demand for creativity is low internal production becomes relatively more attractive, while when the demand for creative content is high, the gap between both options narrows.

Since we seldom find scenarios where an increase in demand for creative content is visible and measurable, this is a difficult empirical prediction to test. In this paper, we use data from the US motion picture industry during the 1940s and 1950s where, due to two simultaneous shocks (the introduction of television and judicially imposed changes in the contractual structure of the industry), the demand for creative content increased. We find that the number and percentage of movies produced in-house declined significantly during this period. Also consistent with the organizational implications that we derive, we show that the volatility of make-or-buy decisions increased during the 1950s relative to the 1940s. We show that part of the difference in volatility between

independent and integrated distributors is explained by the ability of integrated distributors to adjust within and across genres due to changes in genre popularity, as well as changes in overall demand for creativity. We are also able to document an increase in the number of co-productions that took place from 1950 onward and argue this was another method to increase the use of creative inputs into the production process. Finally, we look at outcomes of creative outputs and show that these changes in the organization of production had consequences on production budgets, the number of genres per movie, award nominations, and IMDB ratings.

Although we show patterns in the data that demonstrate that increases in demand for creativity had major consequences on the way the industry organized production, we cannot easily identify which of the two major shocks drove which changes. Future work should address and differentiate the effect of the introduction of television from the effect of changes in contractual practices on organizational decisions. Similarly, we focused primarily on make-or-buy decisions and co-productions, but organizations have many other dimensions that creativity is likely to have organizational implications for. Examples include pay for creativity or authority and decision delegation in the presence of creativity within an organization. These are all topics for future creative research.

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