

The Competitive Dynamics of Vertical Integration: Evidence from U.S. Motion Picture Producers, 1912-1970

Giacomo Negro
Università L. Bocconi, Milano
giacomo.negro@unibocconi.it

Olav Sorenson
London Business School, London
osorenson@london.edu

August 28, 2005

Abstract

We investigate the competitive consequence of vertical integration on organizational performance using a comprehensive dataset of U.S. motion picture production companies, which includes information on their vertical scope and competitive overlaps. Vertical integration appears to change the dynamics of competition in two ways: (i) it buffers the vertically integrated firms from environmental dependence, and (ii) it intensifies competition among non-integrated organizations. In contrast to the existing literature, our results suggest that vertical integration has implications well beyond both the level of the individual transaction and even the internal efficiency of the integrated firm.¹

1 Introduction

Organizational ecology's contributions to strategy have been at least threefold. First and foremost, organizational ecologists, sometimes also known as corporate demographers, have drawn attention to the positive and negative interactions among populations of firms drawing on the same resources (e.g., raw materials, types of employees, and customers), investigating not just how these forces influence organizations but also how they change over an industry's life cycle. Second, this perspective has emphasized the importance of demographic rates, primarily the births and deaths of firms, as measures of industry vitality. And finally, organizational ecologists have brought a truly enormous amount of data into the picture to answer these questions, avoiding many of the methodological problems

¹We would like to thank the volume editors, Jerker Denrell, Carolin Haeussler and Michael Hannan for valuable comments on previous versions of the paper and helpful discussions in the development of this research. Negro received additional financial support through a grant from SDA Bocconi's Claudio Demattè Research Center.

inherent in cross-sectional studies or in small samples of unrepresentative firms (e.g., the Fortune 500).

Although a large number of questions have fallen under the purview of ecologists (as one can see in this volume), much open territory remains. Consider the issue of vertical integration - that is, the degree to which a firm encompasses two or more activities where output from one serves as input for another. By and large, the analysis of vertical integration in the strategy literature has relied on the (efficiency) logic of transaction cost economics (Williamson, 1975; for exceptions, see Pfeffer and Salancik, 1978, and Sorenson, 2003). This perspective argues that firms should (and do) integrate vertically when the need for specialized investments coupled with the tendency for independent actors to behave opportunistically renders prohibitively expensive the writing of a contract. Though this logic yields many useful insights, it also leaves us with a relatively limited understanding of the consequences of vertical integration because it focuses almost exclusively on factors internal to the firm, or, even more narrowly, the transaction.

Here, we apply an ecologist's lens to the question. This perspective leads us to ask not how vertical integration influences the efficiency of the transaction itself, but rather, how does it alter the interactions between organizations in an industry? Our primary claim is that vertical integration offers organizations privileged access to resources, buffering them from the negative effects of competition while simultaneously intensifying the competition among non-integrated rivals. We argue that integration guarantees organizations access to a larger share of the resources required for operation. In essence, when facing constraints in the scale of a production activity, integrated firms first supply the internal demand for these goods and services before they offer it to other potential buyers. As a result, integrated firms face a lower risk of either an interruption in production or slowed growth as a result of an inability to obtain internally produced resources. The intensity of competition among non-integrated firms also rises because they must compete over the portion of resources not locked up in integrated producers. These processes may also influence the relative positioning of integrated and non-integrated firms. In particular, we suspect that the protection from competition afforded by vertical integration might allow and encourage integrated firms to exploit broader niches.

To corroborate these speculations, we analyzed an original dataset of motion picture production companies in the United States from 1912 to 1970. Our analysis of the exit rates of these firms revealed several interesting results: i) integrated production companies exit the population at a lower rate than non-integrated firms, even after accounting for differences in scale; ii) integrated production companies exhibit less susceptibility to diffuse competition both from other integrated firms and from non-integrated firms; and

iii) integrated production companies also appear unaffected by localized competition with non-integrated firms. Additional examination of determinants of exit rates reveals a general positive impact of producing in broader set of market segments defined by genres, however this effect turns negative for integrated firms. Also, organizational niche breadth seems to be larger for integrated producers than for non-integrated ones. Finally, market segment variety appears to be maximum with growing density of integrated producers. Together, the results suggest that a portion of the benefits of vertical integration stem from its ability to insulate firms from competition and that such ability may depend on increasing product variety and competitive differentiation.

2 The Consequences of Vertical Integration

One of the most important questions in both the management and study of organizations has been: What is the appropriate scope of the firm (i.e. where should the firm draw its boundaries)? The critical factor in answering this question is an understanding of how changes in firm boundaries (scope) alter the behavior and performance of organizations.

Scope varies along multiple dimensions - geographic, horizontal and vertical - all of which have important consequences for firm performance and industry dynamics. We nonetheless focus here on a single dimension: vertical scope. Researchers typically refer to expansions in vertical scope as vertical integration. In particular, vertical integration refers to situations where an organization encompasses two or more stages of a production process. In other words, cases in which a firm produces an output that becomes an input to another segment of the firm's operations. Examples of vertical integration would include automobile manufacturers that either produce the engines used in their cars or sell cars to consumers through their own dealerships, and soda manufacturers that also bottle and distribute their soft drinks. In our context, vertical integration refers to those motion picture production companies that also distribute their own films.

Researchers have devoted substantial attention to understanding numerous features of the processes related to vertical scope extension. One might cluster this research into two streams: (i) the reasons why firms decide to integrate vertically, and (ii) the consequences of being integrated (for recent reviews of theory and empirical studies, see Joskow, 2005, and Klein, 2005). When separated along these dimensions, the former question has received a great deal more attention than the latter. Such a characterization, however, strikes us as misleading. To the extent that an efficiency logic has dominated the analysis of the antecedents of vertical integration, the two issues have been conflated: These perspectives contend that firms integrate vertically when doing so would improve their

economic performance. Hence, the two issues become one and the same.

2.1 Efficiency logics

Perhaps the most prominent approach to understanding the function of vertical integration is transaction cost economics (TCE). TCE maintains that engaging in transactions exposes actors to a series of potential costs, contractual and organizational hazards, that depend on the nature of the transactions themselves (Williamson, 1971, 1975). Examples include the cost of writing complete contracts covering all contingencies, monitoring performance following the contract, and bargaining over unexpected events. These *ex ante* and *ex post* costs vary as a function of several factors including the uncertainty, frequency, and complexity of the transactions, but asset specificity plays the central role. Asset specificity refers to the degree to which sunk investments have alternative uses outside of the existing buyer-seller relationship. Specific investments have few alternative uses. This inflexibility provides an incentive for the party not making these investments to behave opportunistically, attempting to renegotiate terms to their advantage once the investments have been made. As a result, parties that face such risks tend to under-invest in specific investments in the first place. In these circumstances, vertical integration therefore often represents a superior solution for organizing transactions.

Whereas TCE underscores the relevance of *ex post* costs and their connection to *ex ante* investment incentives in contractual arrangements, property rights theory (PRT) highlights the inefficiencies that can arise when split ownership produces a misalignment of incentives (Grossman and Hart, 1986; Hart and Moore, 1990). Again, the argument turns on the value of specific assets; non-integrated firms tend to underinvest in specific assets when the costs of developing them would fall unduly on one party. Joint ownership avoids underinvestment in these specific assets by aligning the incentives of the two parties. Though pointing to a different mechanism, like TCE, property rights theory focuses on the efficiency of the transaction as the consequence (and also the antecedent) of vertical integration.

The empirical support for these efficiency logics remains somewhat thin. The bulk of research to date corroborating the TCE perspective has involved cross-sectional correlations between asset specificity and vertical integration. Although these studies overwhelmingly find positive correlations, their cross-sectional nature does not allow one to discern whether firms integrated because of the perceived value of developing specific assets or because integration in an earlier period shifted the incentives for future specific investments. Moreover, these studies do not really consider whether integration improved performance. Rumelt (1974), in fact, finds that vertically integrated firms underperform

non-integrated firms, a result that seems difficult to reconcile with the notion that these decisions have been made to promote economic efficiency. The most convincing evidence for an efficiency logic comes from a study of the for-hire trucking industry (Silverman, Nickerson and Freeman, 1997; Nickerson and Silverman, 2003). It found that companies employing an “inappropriate” governance of certain labor and capital market transactions experienced higher failure rates, though these effects appeared weak relative to the importance of age, size and density dependence on failure rates.

2.2 Adaptation

Although the idea that governance arrangements influence the efficiency of transactions has received substantial attention, the effects of vertical integration on other organizational features and outcomes has been less extensively explored. For instance, the focus on specific investments does not account for the fact that while vertical integrated structures may reduce opportunism, they also impose structural costs and constraints. Williamson (1975), for example, asserted that vertical integration represents an inferior strategy for obtaining, processing and employing various types of information, such as price/cost structures and technical evaluations. These disadvantages, however, would accrue to the firm as a whole rather than to the focal transaction.

A more dynamic perspective on the effects of vertical integration has been developed by Sorenson (1997, 2003). He argues that vertical integration engenders interdependence among a firm’s activities and that this interdependence has countervailing short- and long-term effects. In the short term, integrated firms can often benefit from interdependence through synergy by producing goods of higher quality or with novel features. They can also eliminate the search costs associated with locating external exchange partners because they rely on internal resources to manage their transactions. Indeed, Sorenson’s empirical analysis of the exit rates of computer workstation manufacturers from 1980 to 1996 found that firms integrated into the production of components enjoyed an approximately 33 percent lower hazard of exit than non-integrated producers.

In the longer term though, vertical integration can become a disadvantage because interdependence limits the rate of organizational learning. Organizational knowledge resides in routines, and increasing levels of interdependence, such as those found in integrated firms, tend to obscure specific cause-effect relationships. Integration therefore stymies the identification of effective routines. Moreover, even when firms do discover more effective procedures, interdependence also increases the costs and difficulties associated with implementing them because the interactions between operations typically produce a cascading series of unintended consequences within the firm in response to any change. As a result,

integrated firms benefit less from learning through cumulative experience. Consistent with this logic, Sorenson (1997, 2003) finds that a history of vertical integration increases the exit rates of workstation producers.

Unlike efficiency perspectives, this approach does not assume that firms integrate to maximize performance. Indeed, defining optimal performance in any dynamic setting is difficult because it depends crucially on the discount rate. Firms (or managers) that discount the future heavily prefer to integrate for short-term gains, but those with more distant horizons remain unintegrated to maximize the future benefits of learning. On the other hand, this perspective, like the efficiency-based accounts, focuses on the effects of vertical integration on the *internal* operations of the firm.

2.3 Competitive interaction

Although a great deal of research has considered the effect of integration on internal processes, relatively less attention has been given to how vertical integration might influence processes external to the organization. A clear exception (discussed below), however, appears in the theories expounded both in antitrust case law and in an accompanying (largely game theoretic) literature in economics. To address the question of how integration affects processes external to the organization, we adopt an ecological perspective. Organizational ecologists have highlighted the importance of two processes - legitimation and competition - in industry evolution. Our principle insight with respect to this perspective is that integrated firms differ from non-integrated firms because integration alters the nature of competition for scarce resources.

The density dependence model relates the processes of legitimation and competition to changes in the population vital rates. By definition, all firms within a population could draw on the same set of resources to sustain their survival. Legitimation increases the viability of firms by easing access to these resources, while competition for limited resources reduces firm viability. By assuming that these processes both relate to the number of organizations in a population (i.e. its density) - legitimation increasing linearly (or less than linearly) with density while competition increases as a function of its square - organizational ecologists produce an expectation of a non-monotonic relationship between population density and vital rates. Specifically, entry into the population should follow an inverse U-shaped curve, first increasing and then decreasing with greater population density, and exit from the population should follow a U-shaped function. Dozens of studies have found empirical support for these expectations (Carroll and Hannan, 2000).

How then does vertical integration modify competition and competitive interaction?

Increased vertical scope reduces an organization's dependence on the external environment (Thompson, 1967; Pfeffer and Salancik, 1978). Consider a case of forward integration, where a firm engaged in manufacturing activities extends its scope into distribution. As a producer, the firm in question can better control schedules and smooth deliveries by integrating into distribution. As a distributor, the firm foregoes the costs of coordinating operations, monitoring the market and responding to unstable supply. This forward integration has two effects: On the one hand, internally it stabilizes inputs for the distribution side of the business and secures demand for the manufacturing side, thereby mitigating some of the uncertainty typically associated with these activities. On the other hand, externally it reduces the supply of goods available to non-integrated distributors and the availability of distribution outlets to non-integrated manufacturers.

Even when integrated firms do seek to access resources from outside the firm, they likely enjoy an advantage relative to non-integrated rivals. To the extent that vertical integration reduces the uncertainty inherent in the coordination of production processes across firms, external parties perceive less risk in dealing with integrated firms and hence prefer them in negotiations. For example, an actor knows that an integrated production company will almost certainly distribute any film it produces to theaters, while an independent producer on the other hand may fail to negotiate a distribution agreement. To the extent that the actor's compensation depends on the revenue it produces, he would then have a higher expected value for the film being produced by the integrated company. And even if his compensation did not depend on box office performance, he would likely prefer the film with guaranteed distribution as its greater likely visibility increases his odds of being considered for roles in future projects. Because of this privileged access to external resources, vertical integration might reduce the volume of resources available to non-integrated firms by an even greater amount than the sum of resources internalized by integrated firms.

We see these processes potentially influencing density dependence in a variety of ways. At the most basic level, integrated firms should exhibit less sensitivity to diffuse competition. Because integrated firms have internalized a portion of the resources they require, they should compete less intensely both against non-integrated firms and vis-a-vis other integrated firms. This process should be reflected in enhanced survival chances for integrated firms, particularly as the competition for resources associated with increasing density becomes more intense.

Hypothesis 1: Vertical integration reduces the positive effect of density on exit rates.

A more nuanced picture, however, arises from considering the potential differential effects of density both within and across sub-populations. Here, we expect that vertical integration would engender asymmetric competition. First consider the effects of the density of integrated firms. Integrated firms should exert more competitive pressure on non-integrated firms than on other integrated firms. This effect reflects the advantageous position of integrated firms relative to non-integrated firms with respect to accessing external resources. On the other hand, non-integrated firms should compete less intensely with integrated firms than with their non-integrated peers. Two factors underlie this effect. First, the internalization of inputs among integrated firms reduces the number of fronts on which they must compete with non-integrated firms for critical resources. Second, even when the two sub-populations do vie for resources, integrated firms enjoy an advantageous position compared to non-integrated firms.

Although vertical integration may introduce asymmetry into the strength of competitive pressures across sub-populations, it is less clear whether these groups should differ in terms of density dependence within their sub-populations. Legitimation likely operates within each sub-population to some degree. On the one hand, both integrated and non-integrated firms may mutually benefit from the joint legitimation of the enterprise. The prevalence of each sub-form may nonetheless help to establish the legitimacy of a particular vertical scope of operations. With respect to competition, however, one might suspect that vertically integrated firms would compete less intensely with other integrated firms than non-integrated firms do with others of similar vertical scope because non-integrated firms compete on a day-to-day basis over a much larger range of the resources they require to sustain their operations.

Hypothesis 2a: Integrated producer density increases the exit rates of non-integrated producers more than non-integrated producer density.

Hypothesis 2b: Non-integrated producer density increases the exit rates of integrated producers less than integrated producer density.

Additional evidence for the effect of vertical integration on competitive dynamics can also be garnered from a more fine-grained consideration of competitive intensity. Although the density dependence model assumes that all firms interact with one another, in practice firms typically respond more directly to interactions occurring within specific subsets of the resource space (Hannan and Freeman, 1977; McPherson, 1983; Baum and Singh, 1994). One observes this general insight across a variety of dimensions: Organizations of similar size compete more intensely with each other than with firms of either larger or smaller scale (Baum and Mezias, 1992). Firms overlapping to a greater extent in the

nature of the services they provide experience higher failure rates (Baum and Singh, 1994; Dobrev, Kim and Hannan, 2001). Organizations that recruit from the same population of potential employees exhibit greater interdependence in their vital rates (Sørensen, 1999, 2004). And geographic proximity, which increases the degree of overlap both in terms of inputs and in terms of potential buyers, dramatically intensifies competition (Sorenson and Audia, 2000; Stuart and Sorenson, 2003).

Just as we expect vertical integration to modify the nature of density dependence across and within integrated and non-integrated firms, we also anticipate that it should alter the effects of direct overlap in organizational niches. We argued above that integrated firms should exhibit less sensitivity to diffuse competition over inputs or outputs compared to non-integrated firms due to benefits from internalization and asymmetric positions. Here we expect that increasing overlap hurts all firms, but that overlap between integrated firms and non-integrated firms should primarily disadvantage the non-integrated firms. Two mechanisms produce this expectation. First, integrated firms depend less on the resources they share with non-integrated firms even when their niches overlap substantially. Second, they also have an advantage in accessing these resources when they compete for them against non-integrated firms.

Hypothesis 3a: Competitive overlaps with integrated producers increase the exit rates of non-integrated producers more than competitive overlaps with non-integrated producers.

Hypothesis 3b: Competitive overlaps with non-integrated producers increase the exit rates of integrated producers less than competitive overlaps with integrated producers.

These insights parallel closely those garnered from game theoretic models of vertical integration (cf. Krattenmaker and Salop, 1986; Ordoover, Salinger, 1988; Saloner and Salop, 1990). In general, this literature demonstrates that firms can often increase their profitability by integrating vertically. These benefits in turn typically come at the expense of rivals that remained non-integrated. Non-integrated firms find themselves paying more for critical expenses, thereby reducing their profitability. To the extent that exit rates mirror profits then this stream of research would appear to suggest that vertical integration would reduce the exit rate of firms that integrate and raise the exit rate of non-integrate firms.

We nonetheless have built our theory independent of this literature because several factors raise questions regarding the applicability of these analytical models to our setting.

First, these models have been limited to markets with very small (and fixed) numbers of firms (often only two in any one stage). By contrast the motion picture industry has hundreds of active firms through most of our window of study. Though the intuitions of these game theoretic models may extend to populations with large numbers of firms, this robustness has not yet been demonstrated. Moreover, since these models always assume a fixed population of producers, it has been silent with regard to the competitive effects of population density. Second, integrated firms benefit in these models through their ability to manipulate prices. But in the film industry, the contracts between production and distribution companies are designed to share the risks associated with the film. As a result, the transfer price is determined *ex post*. Similarly, theaters charge consumers uniform prices across films. The price mechanism therefore does not appear to offer a meaningful mechanism for gaining a competitive advantage in this setting.

3 The Motion Picture Industry in the United States

We analyze whether vertical integration influences the relationship between competitive interaction and organizational performance by studying the population of feature film production companies in the United States from 1912 to 1970. The film industry offers a particularly appropriate context for studying the effects of vertical integration on competitive interaction for four main reasons. First, a clear sequential interdependence of activities links the production and distribution of films: production companies assemble creative and technical inputs to make a film and then license the negative print to a distributor, which proceeds to market the right to use positive prints of a film to exhibitors. Second, this sequential interdependence nevertheless does not require either party to sink a specific investment into the transaction. To the contrary, production companies can consider distributors fungible because they do not offer differentiated services (Conant, 1960). As a result, we can separate the competitive effects of integration from the competitive consequences of differentiation that might arise from specific investments. A third feature making the motion picture industry amenable to the study of vertical integration is that we can trace every exchange between production and distribution companies, thereby allowing us to develop a far more nuanced picture than the typical study of vertical integration. Fourth, the geographic concentration of the film industry in Hollywood allows us to isolate vertical integration from other relevant scope dimensions such as localization.

The feature film industry in the United States began in 1912, following the appearance on screen of longer films imported from Europe. Feature-length films (usually defined as longer than four reels, where each reel runs 1,000 feet or about 10 minutes) altered the nature of production because they involved multiple reels, thereby requiring more artic-

ulate production processes and higher levels of capital investment than the ‘shorts’ that preceded them (Bordwell, Staiger and Thompson, 1985). Distribution and exhibition also became more complex businesses as the industry transformed into one of differentiated products. Production companies had sold shorts by the foot, implicitly considering a minute of film a commodity, but bids across films began to diverge with the advent of these longer motion pictures. In fact, historians have even interpreted the emergence of the star system as a means of signaling audiences to alert them to the differences between offerings (Kerr, 1990).

Feature films enjoyed quick success. In 1914, roughly 14,000 exhibition outlets in the United States played feature films more or less exclusively (Lewis, 1933). Our data indicate that in the same year, 121 production companies released 327 films. Consumption continued to grow in the following years: in 1921, theaters sold roughly 40 million tickets each week, and the number continued to grow throughout the decade (Lewis, 1933). The fact that feature films could build on the established demand for short film entertainment almost certainly contributed to its rapid adoption. Despite this moderate substitutability on the demand side, the dramatic differences in the organization and process of production meant that new populations of firms arose to meet this demand; very few producers of shorts successfully transitioned to producing feature length films (Mezias and Boyle, 2005).

During this same period, the number of production companies and films, on the other hand, declined: 244 production companies released close to 650 films in 1921 down from a peak of 926 in 1917. Figure 1 shows the historical density of production companies over our observation period (1912-1970). In the drive to differentiate their films, production companies created longer and more expensive films that spent increasingly long periods in the theaters. These rising costs erected barriers to entry for those interested in making movies, which may account in part for the diverging patterns of demand and density.

Throughout the industry’s history, production companies have varied in their choice of whether or not to integrate into distribution (see Figure 2). When theaters first began exhibiting shorts to audiences, they would contract directly with production companies to purchase the films that they played. Hence, in this early stage, all companies essentially engaged in both production and distribution. Independent distribution companies emerged out of the recognition of inefficiencies in this system. Films typically had a limited life in any given theater; audiences demanded novelty. As a result, rental companies, the precursors of distributors, arose to rent shorts to theaters so that they could share content acquisition costs. As the feature film industry evolved toward more differentiated products, these companies expanded the scope of their activities to include not just the purchase and rental of film reels, but also the marketing of motion pictures and eventually

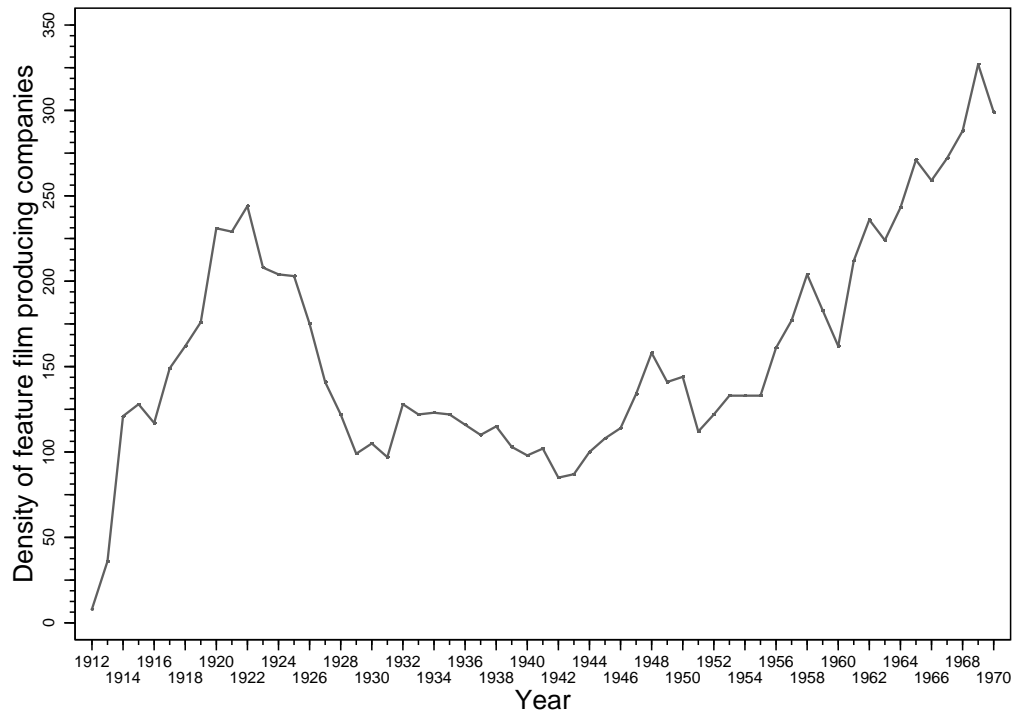


Figure 1: *Density of feature film production companies*

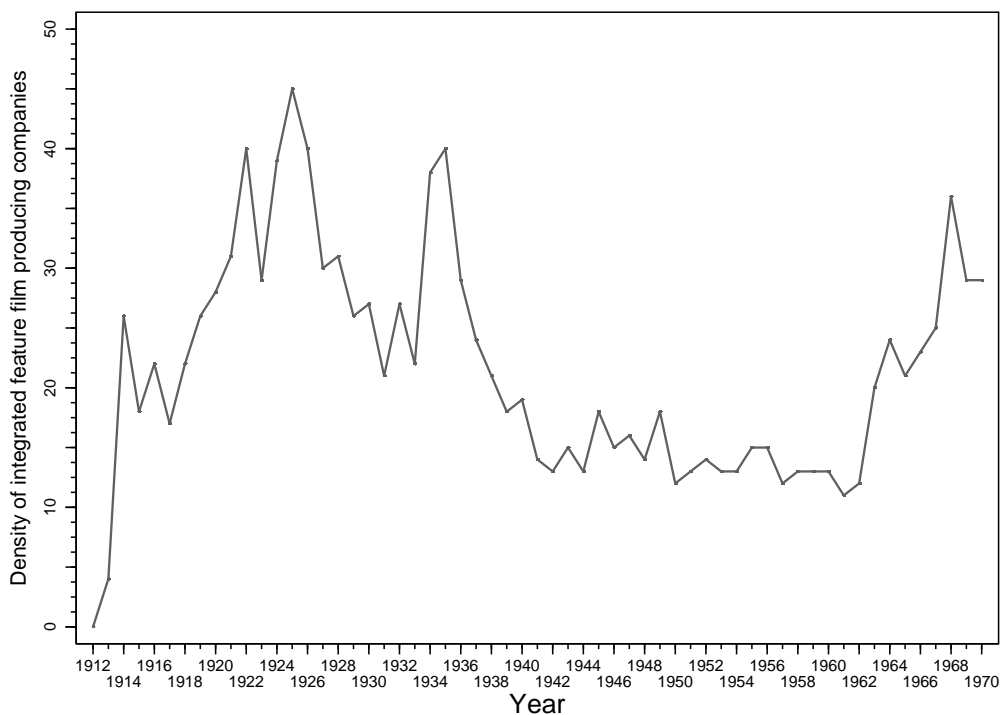


Figure 2: *Density of vertically integrated feature film production companies*

the copying of the negative.

In some cases, integration also extended into exhibition. During the second half of the 1920s a group of integrated firms, called the ‘Majors’ and composed of Paramount, Loew’s-MGM, Fox, Warner Bros, and RKO emerged and became dominant players in the industry (Balio, 1993). When the Great Depression struck, theater attendance declined by more than 30 percent, forcing more than 4,000 theaters to close in the space of three years, dramatically increasing the concentration of ownership. The production and distribution of films also became increasingly concentrated. During the 1930s, the Majors produced and distributed more than half of all domestic features. A niche nonetheless remained for independent production companies because none of the Majors had sufficient production capacity to meet the demand of its own theater circuit. Integrated firms therefore depended on a residual external supply of feature films from other majors and independent producers. This organization remained in place well into the 1940s.

In 1948, a decision by the Supreme Court in the *United States v. Paramount Pictures* antitrust case found the eight largest organizations guilty of restricting competition in the market for exhibition, and forced them to discontinue several practices that the Court considered illegal. In addition, the decision forced the separation of the five Majors into production/distribution businesses on the one side, and exhibition on the other side. Following this decision, the Majors reduced their production of films by more than 50 percent and concentrated increasingly on distribution and film financing (Christopherson and Storper, 1989). In their wake, the industry experienced a proliferation of independent production and distribution companies.

From 1946 to 1970, the demand for motion pictures declined. Attendance fell rapidly from 98 million tickets per week to 65 million in 1950 and to 44 million in 1955. Radio and more significantly television began to compete with motion pictures for consumers' leisure time, gradually eroding film attendance. After 1955, the number of tickets sold continued to decline gradually until the early 1970s.

4 Analysis of Producer Exit Rates

4.1 Data

We analyze an original database that includes all motion picture production companies in the United States. We began the observation period in 1912, the year of release of the first American-produced feature film, and ended it in 1970, the last year covered by the primary data source. We reconstructed the life histories of production companies through the release dates of the films they made. Production companies enter the population with the release of their first film, and exit it the first day following the release date of their last film (Mezias and Mezias, 2000, adopt a similar strategy). As with other corporate demography studies that use product level information to time entry, these data do not account for the duration of pre-production processes. The short period of time necessary to produce a film, however, should limit the importance of these pre-production periods in industry dynamics. On average, production companies can complete a film in six to eighteen months.

The *American Film Institute Catalog of Motion Pictures* (AFI) serves as the primary data source. This directory comprises reviews of all motion pictures distributed in the U.S. between 1893 and 1970 and provides detailed information on each film - including the production company, distributor, release date, length and genre. In addition to this primary source, we also collected industry-level statistics and supplemental information from *The Motion Picture Year Book*, the *Motion Picture Almanac*, and *Moving Picture*

World, a trade journal. Although experts generally consider the AFI Catalog the most complete and comprehensive source on the film industry (Mezias and Mezias, 2000), it has one shortcoming: It lists feature films released in the periods 1911-1950 and 1960-1970, but has not yet documented the period from 1951 to 1960. To fill this missing window, we consulted several additional sources: i) A.G. Fetrow’s filmography covering film production in the U.S. in the 1950s, which reviews 3,069 movies; ii) the *Motion Picture Catalog of the Library of Congress*, which provides a list of all films that received copyright protection from 1950 to 1959 along with their respective production and distribution companies; and iii) *The Motion Picture Guide 1927-1982*, a 12-volume reference set edited by J.R. Nash and S.R. Ross that provides comparable information.

We restricted the population of production companies in several ways. Films produced and released for non-commercial purposes, such as those commissioned by government agencies do not enter the data. We also excluded imported films as these come from non-U.S. based production companies. In cases of international coproduction, we included only those films in which an American producer was the majority stakeholder. Finally, we excluded films from the late 1960s that provided no information on genre. An examination of the titles and casts suggests that the majority of these films contained pornographic content or represented unauthorized rereleases of earlier material. The final dataset consists of life histories for 4,089 production companies.

4.2 Measures

Our dependent variable is exit from the motion picture industry. Exit offers an attractive means of estimating performance for at least two reasons. First, it is less susceptible to manipulation than accounting based measures and therefore provides a more reliable measure of performance. Second, production companies in most cases are not required to, and do not, report financial information. When available, moreover, firms typically aggregate the financial information of production activities together with non-production activities, making it impossible to isolate the profitability of the business of interest.

Firms can exit industries in many different ways, including disbanding, bankruptcy, merger, acquisition, etc. For this study we could trace many instances of mergers, but only in cases where the merged entity produced a film following the merger. Moreover, we could not distinguish between other modes of exit so we do not attempt to analyze transition rates for these different types of events separately. Of the 4,089 producing organizations we identified in the period, we observed 4,022 exits.

Our key explanatory variables are density, overlap density and vertical integration. We

update all of our covariates annually using 12-month moving averages. Knowledge that production in the motion picture industry requires an average of 12 months of pre-entry activity governed our choice of lag (Squire, 1992). Following other recent studies (Ruef, 2004; Lomi, Larsen and Freeman, 2005), we use moving averages as a means of adjusting for inertia in the rate at which firms respond to changes in population density and environmental characteristics. The use of moving averages accounts for the fact that organizational vital rates do not reflect exclusively events that occurred precisely 12 months earlier, and also reduces the effect of measurement error in our recording of the timing of events.

We measured population *density* by counting the number of production companies operating each year. In addition to total density, we calculated counts of *integrated producer density* and *non-integrated producer density* to investigate asymmetry in the density-dependent effects produced by these two sub-populations.

We measured *vertical integration* using a dichotomous variable set to one, if the producing organization also self-distributed at least one of its films in a given year, or set to zero otherwise. In separate (unreported) analyses, we calculated a continuous ratio measure of integration by dividing the number of self-distributed films by the total number of films produced in a year. Analyses using that continuous measure produced qualitatively equivalent results to those we report here. We nonetheless prefer the dichotomous measure because it more clearly distinguishes scope from size, and also eases the interpretation of the interaction terms.

We measured localized competition through niche *overlap density*, the sum of niche overlaps (in terms of genre space) between the focal organization and all other firms releasing films in a particular year (Baum and Singh, 1994). The overlap density for an organization in niche i at time t is given by:

$$N_{it} + \sum_{j \neq i} w_{ij} N_{jt}, \quad (1)$$

where N_{it} is the number of production companies in niche i at time t , N_{jt} is the number of production companies in niche j at time t , and w_{ij} is the niche overlap weight for production companies in niche i with those in niche j . Our operationalization of organizational niche comes from the classification of films into genres. AFI classifies films into 72 different genres, but the classification we used includes only 53 categories because we grouped together genres which appear nearly synonymous (e.g. baseball, boxing and football group into a singles “sports” genre). Genres represent socially constructed categorizations of conventions regarding content and form (DiMaggio, 1987). As social constructions, the

rules for inclusion and exclusion remain somewhat fluid over time and a continuous logic of membership probably better represents the truth than a discrete one. These categories nonetheless provide meaningful if rough information on niche positions for two reasons: First, audiences respond to genre characteristics when they select films to view (Austin, 1989). Second, barriers do appear to constrain the easy movement from one genre to another to some extent. For instance, producing a Western requires different resources and strategies from a musical (lighting, sound equipment, props, choreography, etc.). As a result, production companies likely compete more intensely with other organizations operating in the same genres. Since we do not have a clear means of assigning distances between genres, our formulation of niche overlap, assumes that $w_{ij} = 0$ and that overlap density is equal to:

$$\sum_i N_{it}, \tag{2}$$

in other words, to the sum of production companies operating in all niches where producer i competes (less one).

In addition to these variables of interest, our analyses include several controls. To control for age dependence, we estimate a piecewise exponential specification of time dependence that we describe in greater detail below. By including time-varying information on *size*, we can isolate the effects of age from scale. Research on time-varying size and life chances has conceptualized organizational size in two ways: capacity and scale of operations. Our measure here, the (log of) annual volume of film production (i.e. a count of films released in the previous 12 months) focuses on the absolute scale of operations. Companies engaged in more projects may survive longer thanks to their ability to diversify away some of the project specific uncertainty plaguing each individual film (De Vany, 2004). In addition to absolute size, we also control for *relative size* effects, calculated as the ratio of an organization’s absolute size to the largest size observed in the population for a given year. Scale-based processes can affect survival in complex ways, and the largest organizations may enjoy positional gains by way of scale advantages in politics, production costs, etc. (Dobrev and Carroll, 2003).

We also included several industry level variables to control for changes in carrying capacity and industry structure. First, we included *weekly attendance* in terms of millions of admissions per year. Over the observed period motion pictures went from being the primary form of visual entertainment (1912-1946) to being an alternative to television (1947-1970). Second, we introduced a measure of market *concentration* to control for potential barriers to entry and the alternative explanation of resource partitioning (Carroll, 1985; Mezias and Mezias, 2000). We calculated a Hirschman-Herfindahl index, obtained by squaring and then summing the market share of each producer based on the number

of films produced (multiplied by 100).² Third, we included two dichotomous variables to capture period effects. One variable controls for the potential effects associated with the establishment of the Hollywood *studio system* (RKO, the youngest of the Majors, began producing films in 1928); our measure takes a value of one between 1928 and 1947, and zero otherwise. Historical analyses of the industry suggest that total integration might have reduced the viability of specialized producers because the Majors controlled access to a significant proportion of first-run theaters (Conant, 1960; Balio, 1985). A second variable, *Post-Paramount*, captures the potential impact of antitrust actions on the structure of the industry. In 1948 a government suit against the eight largest firms (*United States v. Paramount Pictures*, 334 U.S. 131) culminated in a Supreme Court decision that imposed divestiture of the exhibition chains owned by the Majors. The variable takes the value of one from 1948 to 1970 and zero otherwise.³ Table 1 reports descriptive statistics for the variables used in the regressions.

Table 1: *Descriptive statistics*

Variable	Mean	Std dev	Min	Max
Tenure	3.94	7.15	1	56
Weekly attendance (/1,000,000)	45.23	22.60	17.90	87.25
Studio system period	0.25	0.43	0	1
Post-Paramount period	0.48	0.50	0	1
Market concentration (/1,000)	3.76	2.75	0.51	58.50
Absolute Size	0.50	1.92	0	4.44
Relative Size	0.08	0.15	0	1
Density	177.75	64.06	2	310
Density ² (/100)	357	243.05	0	961
Vertical integration	0.13	0.34	0	1
Density integrated	22	8.54	0	42
Density ² integrated (/100)	5.73	4.17	0	18
Density non-integrated	155.42	61.11	2	269
Density ² non-integrated (/100)	278.89	203.87	1	723
Overlap density	34.97	46.21	0	326
Overlap density integrated producers	11.39	19.25	0	174
Overlap density non-integrated producers	23.58	32.33	0	152
Niche width	2	2.63	0	24

²In unreported analyses, we also estimated models including interaction terms between size and concentration to capture the potential effects of consolidation of industry structure (Dobrev, Kim and Carroll, 2002). This interaction term, however, had no significant effect on producer exit rates.

³Several studies have argued that the nature of competition varies over an industry's lifecycle (Baum, 1995; Hannan, 1997; Sorenson, 2000). Though we tested these alternative specifications, none of them substantively modified the reported results.

4.3 Estimation

We estimate the effects of vertical integration and competitive interaction on organizational performance using survival (event history) analysis. More specifically, we estimate the hazard of exit from the market, defined as:

$$\mu(t) = \lim_{\Delta t \rightarrow 0} \frac{Pr(t \leq T \leq t + \Delta t | T > t)}{\Delta t}, \quad (3)$$

where T is a random variable representing the time of exit, t denotes the amount of time that producer i has been in operation, and $Pr(\cdot)$ represents the probability of exit over the interval $(t, t + \Delta t)$ given that the production company still had ongoing operations at the beginning of the interval. Age dependence is a crucial feature of these models. We adopt the piecewise exponential specification, which allows the base rate of exit to vary flexibly with organizational age. In particular, this approach splits time into pieces according to the tenure of the organization. The base failure rate remains constant within each time piece, but these base rates can vary across pieces. As a result, the piecewise model does not require any strong assumption about the exact form of duration dependence (for more information on this approach, see Barron, West and Hannan, 1994).

We define the P pieces according to break points:

$$0 \leq \tau_1 \leq \tau_2 \leq \dots \leq \tau_P. \quad (4)$$

and with $\tau_{P+1} = \infty$. Our exploratory research on the population found the best fit using five break points at 1, 2, 4, 10 and 20 years (intervals open on the right). The first segment then includes events occurring within the first year of tenure in the industry and cases that enter and exit within the same year. The second segment includes events that occur within the first and second years of tenure, and so forth.

We specify producer exit rates $r(u, t)$ as a function of firm tenure in the industry, u , a set of time-varying covariates, X , and a set of time-invariant covariates, Z :

$$\ln r_i(u) = m_p + \sum \alpha_x x_{it} + \sum \beta_z z_i \quad (5)$$

where m_p denotes tenure-specific effects, and α and β respectively scale the effects of time-varying and time-invariant effects. To estimate rate models with time-varying covariates, we constructed split-spell data breaking observation periods with durations of more than one year to allow for the updating of annual covariates.

4.4 Results

Tables 2 and 3 report the results of our analysis. Model 1 reports a baseline density dependence model. The baseline shows that film production follows the expected form of density-dependent evolution, with exit rates having the predicted U-shaped relationship to density. The results also suggest that film production companies suffer from a liability of newness and experience decreasing exit rates over time. The extremely high exit rate associated with the first year of tenure may actually stem from a specific feature of the movie industry, where individuals frequently organize to produce a single motion picture and then intentionally disband. Or, this liability may reflect the risky nature of movie-making, where 8 out of 10 products fail at the box office (De Vany, 2004). The benefits associated with very long tenures may stem either from the development or selection of effective production routines and/or from having established relations with distributors or other critical resource holders (Sorenson and Waguespack, 2004).

With respect to scale, increasing size appears to provide an effective means of reducing market risks. All models reveal negative size-dependence. Since analyses of the industry typically do not find substantial cost savings associated with the simultaneous production of multiple films, these effects likely stem more from risk diversification than from economies of scale. The non-significant effect of relative size also supports such an interpretation. Consistent with this idea, market concentration does not significantly influence exit rates in any of the models (hence cost advantages do not appear to push smaller production companies out of the market).

Among the period effects, only the post-Paramount indicator variable ever shows a significant coefficient. Production companies experienced an increased hazard of exit following the divestiture of the Majors out of exhibition. Given that the justification for this decision revolved to some degree around the idea that the studio system had locked independent production companies and distributors out of the market, this result seems somewhat surprising. It might nonetheless stem from two factors. On the one hand, by reducing the barriers to entry, the Paramount agreement may have increased the number of firms with limited resources entering the industry, thereby increasing the exit rate. Or, it may reflect a riskier environment. Around the same time as the Paramount decision, production companies faced the arrival of television, which both increased the competition for leisure time and for many of the types of personnel required for motion picture production.

Model 2 introduces the main effect of vertical integration. Being integrated reduces the instantaneous hazard of exit from the population. The magnitude of the effect, moreover, is large: integrated producers have a 57 percent lower rate of exit than specialized producers ($\exp^{-0.842} \simeq 0.43$). This result is consistent with Sorenson's (2003) analysis of vertical

integration in the computer workstation industry; he found that integrated manufacturers enjoyed a survival advantage of roughly 33 percent compared to non-integrated organizations. Model 3 then tests to what extent this effect stems from integration's ability to buffer firms from the competitive effects of density dependence. We find some support for this hypothesis. Models 4 and 5 decompose density into two sub-counts, one for integrated production companies and another for non-integrated firms. Non-integrated firms continue to exhibit the expected relationship between density and exit rates, first falling and then rising with increasing density. Integrated firms, however, exhibit the opposite pattern; the competitive effect reaches its peak near the maximum of the observed integrated density range ($n=30$) and becomes negative largely outside the range ($n=149$). One possibility is that integrated firms contribute little to the legitimacy of the form either because the form had largely been legitimated before production companies began integrating into distribution in large numbers or because external resource holders failed to see scope as an important feature of film production companies. Models 5 to 7 introduce interactions between integration and these subgroup densities separately and then conjointly. Integrated firms seem to place greater competitive pressure on non-integrated firms than on other integrated rivals. More importantly, vertically integrated firms appear less susceptible to competition from non-integrated organizations. In the full model the first interaction term becomes non-significant but this specification fails to improve over the previous two (respectively, LR $\chi^2(1) = 4.76$ with Prob $> \chi^2 = 0.0291$ and LR $\chi^2(1) = 2.96$ with Prob $> \chi^2 = 0.0852$). In sum, we find full support for hypotheses 1, 2, and 3b, while hypothesis 3a does not receive full support.

Table 3 reports our analysis of the effects of niche overlap. Models 6 to 8 address the effects of overlap. Models 6 and 7 test the main effect of overlap density and its interaction with vertical integration. As expected, increasing overlap with production companies operating in the same film genres reduces organizational survival. Integrated production companies, on the other hand, do not appear to suffer from this overlap. Model 8 decomposes niche overlap according to vertical scope, showing that genre overlaps with integrated and non-integrated production companies show roughly equivalent effects, and includes the interactions between these overlap densities and vertical integration. The interaction between integration and integrated firm overlap is not significant, suggesting that integrated firms impose roughly equivalent competitive pressure on both integrated and non-integrated firms (hence failing to support hypothesis 3a). The interaction between integration and non-integrated firm overlap, on the other hand, is negative, significant and roughly equal in magnitude to the main effect of the overlap. Integrated firms therefore do not appear to suffer from competition with non-integrated firms (consistent with hypothesis 3b).

Table 2: Piecewise exponential regressions: Competitive effects of vertical integration and density dependence on producer exit rates

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Tenure $0 < u \leq 1$	2.644** (0.181)	2.858** (0.186)	2.820** (0.187)	2.493** (0.197)	2.453** (0.198)	2.459** (0.197)	2.509** (0.199)
Tenure $1 < u \leq 2$	1.062** (0.191)	1.297** (0.197)	1.260** (0.197)	0.935** (0.201)	0.895** (0.207)	0.900** (0.207)	0.950** (0.209)
Tenure $2 < u \leq 4$	-0.989** (0.192)	1.227** (0.197)	1.189** (0.198)	0.860** (0.201)	0.820** (0.207)	0.825** (0.207)	0.875** (0.208)
Tenure $4 < u \leq 10$	0.777** (0.193)	0.951** (0.199)	0.971** (0.199)	0.580* (0.227)	0.538* (0.228)	0.542* (0.227)	0.591* (0.229)
Tenure $10 < u \leq 20$	0.716* (0.213)	0.910** (0.218)	0.910** (0.218)	0.536* (0.209)	0.496* (0.210)	0.501* (0.209)	0.550* (0.210)
Tenure $u \geq 20$	-0.054 (0.295)	0.495† (0.299)	0.482 (0.299)	0.148** (0.301)	0.131 (0.307)	0.146 (0.307)	0.211 (0.309)
Weekly attendance	0.002 (0.002)	0.001 (0.002)	0.002 (0.002)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)
Studio system period	-0.093 (0.086)	-0.030 (0.087)	-0.035 (0.087)	-0.248* (0.103)	-0.250* (0.102)	-0.253* (0.103)	-0.258* (0.102)
Post-Paramount period	0.101* (0.047)	0.030 (0.048)	0.035 (0.048)	0.083 (0.063)	0.084 (0.063)	0.083 (0.063)	0.081 (0.063)
Market concentration	-0.019 (0.014)	-0.016 (0.015)	-0.015 (0.015)	-0.017 (0.013)	-0.016 (0.013)	-0.016 (0.013)	-0.017 (0.013)
Absolute Size	-1.465** (0.053)	-1.429** (0.053)	-1.430** (0.053)	-1.471** (0.055)	-1.471** (0.055)	-1.471** (0.055)	-1.473** (0.055)
Relative Size	-0.188 (0.442)	-0.159 (0.452)	-0.156 (0.451)	0.316 (0.470)	0.302 (0.469)	0.304 (0.469)	0.326 (0.470)
Density	-0.016** (0.002)	-0.016** (0.002)	-0.016** (0.001)				
Density ²	0.005** (0.000)	0.005** (0.000)	0.005** (0.000)				
Vertical integration		-0.842** (0.063)	-0.652** (0.111)	-0.864** (0.063)	-0.571** (0.173)	-0.673** (0.104)	-1.304** (0.391)
Density ² x integration			-0.001* (0.000)				
Density integrated				0.041** (0.013)	0.041** (0.014)	0.041** (0.014)	0.041** (0.014)
Density ² integrated				-0.069** (0.026)	-0.068** (0.026)	-0.068** (0.026)	-0.071** (0.026)
Density non-integrated				-0.020** (0.002)	-0.020** (0.002)	-0.020** (0.002)	-0.020** (0.002)
Density ² non-integrated					0.006** (0.000)	0.006** (0.000)	0.006** (0.000)
Density integrated x integration						-0.002† (0.001)	0.006 (0.004)
Density ² non-integrated x integration							-0.001* (0.001)
Log-likelihood		-16712.182	-16685.89	-16595.79	-16586.72	-16585.12	-16584.22
Number of producers		4,089	4,089	4,089	4,089	4,089	4,089
No. of producer-year spells		11,446	11,446	11,446	11,446	11,446	11,446
Chi-square vs. null rate			228.75	232.79	250.93	254.12	255.91

† $p < .10$, * $p < .05$, ** $p < .01$. Standard errors in parentheses.

Table 3: *Piecewise exponential regressions: Competitive effects of vertical integration and niche overlap on producer exit rates*

Variable	Model 8	Model 9	Model 10
Tenure $0 < u \leq 1$	2.815** (0.187)	2.477** (0.194)	2.876** (0.193)
Tenure $1 < u \leq 2$	1.250** (0.197)	0.922** (0.204)	1.313** (0.203)
Tenure $2 < u \leq 4$	1.182** (0.197)	0.853** (0.204)	1.244** (0.203)
Tenure $4 < u \leq 10$	0.915** (0.218)	0.559** (0.225)	0.964** (0.223)
Tenure $10 < u \leq 20$	0.865** (0.199)	0.536* (0.207)	0.929** (0.205)
Tenure $u \geq 20$	0.457 (0.300)	0.504 (0.307)	0.507 (0.305)
Weekly attendance	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)
Studio system period	0.014 (0.088)	0.017 (0.086)	0.025 (0.089)
Post-Paramount period	0.078 (0.050)	0.072 (0.057)	0.074 (0.050)
Market concentration		-0.019 (0.015)	-0.019 (0.014)
Absolute Size		-1.516** (0.593)	-1.414** (0.053)
Relative Size		0.034 (0.452)	0.204 (0.447)
Density		-0.016** (0.002)	-0.016** (0.002)
Density ²		0.005** (0.000)	0.004** (0.000)
Vertical integration		-0.840** (0.063)	-0.850** (0.063)
Overlap density		0.002** (0.000)	0.002** (0.001)
Overlap density x integration			-0.004** (0.001)
Overlap of integrated producers			0.005** (0.002)
Overlap of non-integrated producers			0.004** (0.001)
Overlap of integrated x integration			0.001 (0.001)
Overlap of non-integrated x integration			-0.003** (0.001)
Log-likelihood	-16592.09	-16580.43	-16650.895
Number of producers	4,089	4,089	4,089
No. of producer-year spells	11,146	11,146	11,146
Chi-square vs. null rate	240.19	249.43	290.52

† $p < .10$, * $p < .05$, ** $p < .01$. Standard errors in parentheses.

5 Integration and Niche Width

The results of the preceding section imply that vertical integration buffers integrated firms from competitive pressures, particularly from those generated by non-integrated firms. Clearly, this buffering influences survival rates, but might it also affect other aspects of organizational behavior? Here, we investigate how vertical integration may interact with niche width in determining firm viability.

Film historians have analyzed production trends among the Hollywood Majors and their accounts suggest that each integrated producer developed similarly wide, but unique product strategies: MGM became prominent in the production of sophisticated dramas called “prestige films”, Paramount invested in comedies starring actors recruited from vaudeville, radio and stage, RKO introduced musicals, and distributed successful animated films created by Walt Disney (Bordwell, Stainger and Thompson, 1985; Balio, 1993).

The main reason that we suspect a link between these two dimensions is that buffering from competition may provide an incentive for vertically integrated firms to expand their horizontal scope. Broader scope offers the organization a greater ability to weather shifts in the environment, for example, as a result of changing consumer preferences. Previous studies have shown that firms with wide niches benefit from risk spreading and economies of scale (Baum and Singh, 1994; Dobrev, Kim and Hannan, 2001). This reduction in risk nevertheless comes at a price because as organizations expand their scope they come into competitive contact with a larger number of rivals. To the extent that vertically integrated firms can avoid this competition, scope offers a relatively greater advantage to these firms.

On the other hand, one might anticipate a positive relation between vertical and horizontal scope even in the absence of these incentives. Expansion in both directions might simply reflect the routines that reside at the core of the organization (Sorenson et al., 2005). Firms that expand their boundaries in one direction reveal operating procedures for and values favoring the expansion of firm scope. The very act of engaging these routines moreover may strengthen them as they become embedded within the firms operations and routinized among employees.

The key difference between these two accounts concerns the benefits of expanded scope for integrated firms relative to non-integrated firms. The first argument implies that vertically integrated firms benefit more from broad scope than non-integrated firms, while the second argument does not. We therefore began our investigation by estimating the effects of niche width on organizational exit. We measured horizontal scope with *niche width*, calculated as the number of film genres in which the producing organization is engaged. Table 4 presents the regression results of a model estimating the effect of niche

width, measured as the number of genres in which a producer operates, and integration on exit rates. As we expected, exit rates rise with niche width, but only for non-integrated organizations. Integrated firms should therefore prefer wider niches.

Table 4: *Piecewise exponential regressions: Competitive effects of vertical integration and niche width on producer exit rates*

Variable	Model 9
Tenure $0 < u \leq 1$	3.142** (0.196)
Tenure $1 < u \leq 2$	1.578** (0.206)
Tenure $2 < u \leq 4$	1.510** (0.206)
Tenure $4 < u \leq 10$	1.224** (0.227)
Tenure $10 < u \leq 20$	1.191** (0.208)
Tenure $u \geq 20$	0.681* (0.309)
Weekly attendance	0.001 (0.002)
Studio system period	-0.002 (0.087)
Post-Paramount period	0.046 (0.048)
Market concentration	-0.023 (0.015)
Absolute Size	-1.233** (0.074)
Relative Size	-0.513 (0.457)
Density	-0.016** (0.002)
Density ²	0.005** (0.000)
Vertical integration	-1.324** (0.099)
Niche width	0.371** (0.057)
Niche width x integration	-0.244** (0.058)
Log-likelihood	-16561.33
Number of producers	4,089
No. of producer-year spells	11,446
Chi-square vs. null rate	266.94

† $p < .10$, * $p < .05$, ** $p < .01$. Standard errors in parentheses.

Consistent with this finding and with the historical accounts, vertically integrated firms appear to maintain a broader scope than non-integrated firms for most of the industry's history. Figure 3 illustrates scope relative to size - the ratio of the number of genres rep-

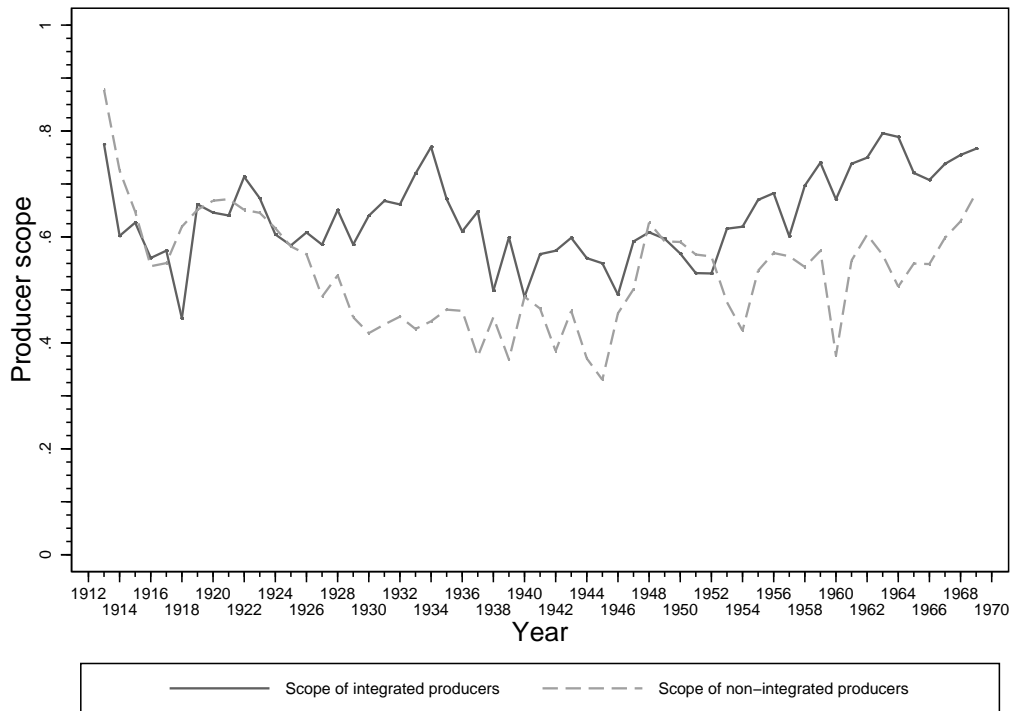


Figure 3: *Integrated, non-integrated producers and their scope*

resented to the number of films made - for both sub-populations (we exclude companies with only a single film in a year from these calculations because they trivially have a ratio of one).

6 Discussion and Conclusion

Our results strongly suggest that vertical integration influences not just the internal operations of organizations, but also the competitive interactions between firms. We see both specific and broader implications of our study. At a more specific level, whereas previous research primarily emphasized the role of integration as an organizational arrangement to gain efficiency in transactions, we offer and support an ecological perspective on the vertical integration question. Vertical integration buffers firms from environmental uncertainty and competitive pressures through the internalization of input and output activities. Hence we find that integrated firms exhibit less sensitivity to diffuse competition, particularly

that produced by non-integrated firms. This buffering also appears to allow integrated firms to pursue broader product niches, which connotes its own advantages to these firms.

In addition to buffering integrated firms from the environment, vertical integration may also increase the intensity of competition experienced by non-integrated firms. Integrated firms enjoy privileged access to the resources they control directly. And because of the greater stability they offer to resource providers, they may also enjoy preferential access to external resources. Because these ecological benefits result from the relative competitive strength of integrated firms vis-a-vis non-integrated firms, they likely offer the greatest benefits when the number of integrated firms is few relative to the number of non-integrated firms; when competing against other integrated rivals, integrated firms find themselves on level ground.

The combined analysis of integration and niche width moreover offers a more nuanced view of competitive processes, and the resulting evidence allows us to address other possible explanations for the observed patterns. First, one might argue that, contrary to our prediction, vertically integrated firms would compete more intensely with each other because their structural overlap increases. Not only does the general findings of less intense density- and overlap-based competition run counter to this account, but also the fact that integrated producers enjoy lower exit rates when they increase their niche seems inconsistent with the expectations of this thesis. Second, we also believe that we can rule out the advantages of head-to-head competition as an alternative explanation for our findings (Klempner, 1992). In cases with high search costs for alternative suppliers, competing head to head can benefit firms and we would consequently expect higher exit rates for integrated producers. Again, however, we find the opposite effect. Finally, one might attribute our cross competition effects to differences in the relative efficiency of integrated and non-integrated firms (and hence a consequence of differing internal processes rather than external ones). Though we cannot bring direct evidence to bear on this possibility, Corts (2001) recent analysis of the release decisions of integrated and non-integrated firms finds evidence inconsistent with this hypothesis. Despite the advantage of coordinating release dates to avoid product cannibalization, non-integrated producers and distributors actually exhibited less clustered releases than integrated producers. From where such internal efficiency would arise therefore remains unclear in this setting.

Despite the support for the hypotheses we have developed, this study suffers from four main limitations. First, we have modeled and analyzed the impact of integration on film producers alone. To improve the validity of our results, we should observe similar patterns in the performance of film distributors. Second, and partly related to this, film producers do not develop specific investments with distributors but distributors may

develop specific commitments with exhibitors, making the final outcome of integration more complex. Moreover, other types of sunk costs play a role here, raising the exit barriers that integrated firms face. For instance, advertising expenses crucially influence distributor performance and excluding them from the picture might lead to inappropriate inferences about the role of integration. Third, we lack information on various forms of quasi-integration (e.g., strategic alliances) and hence cannot speak to whether or not these structures create dynamics similar to those of vertical integration. Finally, the focus on film genres as a measure for organizational niche means that we have analyzed realized rather than fundamental niches. The problem with the use of realized niche measures is that we cannot separate organizations' abilities to procure and exploit resources from the outcomes of their competitive interactions. Alternative niche measures therefore might provide a sounder basis for future empirical research on vertical integration and niche width dynamics.

Though this study helps to clarify how horizontal competition affects and is affected by the vertical organization of industries, our results seem relevant to several other issues and literatures as well. For example, the analysis of horizontal and vertical scope can connect to niche width theory (Freeman and Hannan, 1983). In its original formulation, this theory considered the relationship between the width of an organization's fundamental niche and its capacity for resource utilization, holding that specialist strategies prevail over generalist strategies in fine-grained environments (i.e. environments where resource distributions shift rapidly in time and/or space. If we believe the film industry occupies a fine-grained environment, with frequent fluctuations in demand, we expect to find a relative advantage to specialism. One might then expect that advantage to lead to the extinction of the other sub-form (Gause, 1934). Our results indicate, however, that integration can help to reduce the inferiority in the fitness of generalists, and concomitantly to explain the coexistence of generalists and specialists in industries.

Our results may also have relevance to research in multimarket competition (MMC). MMC occurs when firms encounter the same rivals in multiple markets. In these circumstances, competitive behavior may differ from that of single-point rivals because a firm that meets a rival in multiple markets can respond to an attack not only in the attacked market, but also in other markets in which both firms compete. MMC can therefore foster tacit cooperation, and reduce the competitive intensity among rivals (Baum and Korn, 1996; Gimeno and Woo, 1999). Our analysis of the film industry suggests that if producers "meet" rivals in the same genres integration allows distinct strategies to reduce the effects of niche overlap. This effect could interfere with the incentive structure that allows tacit collusion to emerge in MMC, and therefore could mediate its effect on competitive intensity. We therefore see reason to incorporate information and theory on vertical integration

in future studies of multimarket competition.

Finally, our study provides evidence consistent with industrial organization perspectives on integration. The basic industrial organization argument is that vertical integration can increase profitability by internalizing the downstream or upstream profit margin and augmenting the integrated firm's market power through market foreclosure. Our study corroborates the intuition that vertical integration benefits the integrated firms and hurts the nonintegrated ones. Most models that address the vertical foreclosure effect of integration nonetheless focus on the competitive exclusion of downstream firms rather than upstream competitors (Rey and Tirole, 2003). This becomes particularly important when economic theory maintains that vertical integration reduces consumer surplus and total welfare. By focusing on downstream market outcomes, these studies overlook the potential positive effects - that we find here - related to increased differentiation in the upstream market (see also Chipty, 2001).

We also see potential policy implications in our study. The antitrust decision that forced the Majors to divest of their theaters turned on the notion that vertical integration allowed these firms to gain undue access to the market, to the detriment of both rival production and distribution companies and consumers. Some scholars have nonetheless maintained that the hierarchical structure of the Major studios and the long-term contracts they used to book films into theaters actually represented a more efficient solutions to the problems associated with identifying demand, controlling principal-agent problems, and maintaining the flexibility necessary to adapt to new technologies (De Vany, 2004). Our results seem more consistent with the first view, but we see a novel twist. In particular, we find substantial evidence that forced divestiture might not have served public interest. First, in all of our models, the external reorganization required by the antitrust decision *increased* the exit rates of film production companies. One possible reason for this effect is that vertical integration may have helped to stabilize the industry as a whole, even if the majority of the advantages accrued to the integrated firms. Another possibility, of course, is that the combination of competition with, and the potential for ancillary markets in, television disrupted established routines around the time of the Paramount agreement, so more research is required. Our findings nonetheless raise questions regarding the standard antitrust wisdom.

Second, our investigation of product scope suggests that variety increases with vertical integration. At least two factors might account for this fact. On the one hand, vertical integration buffers firms from competition, thereby reducing the costs associated with broader scope. On the other hand, guaranteed outlets also decrease the risks associated with producing novel genres. Before these new types of films gain legitimacy, distributors

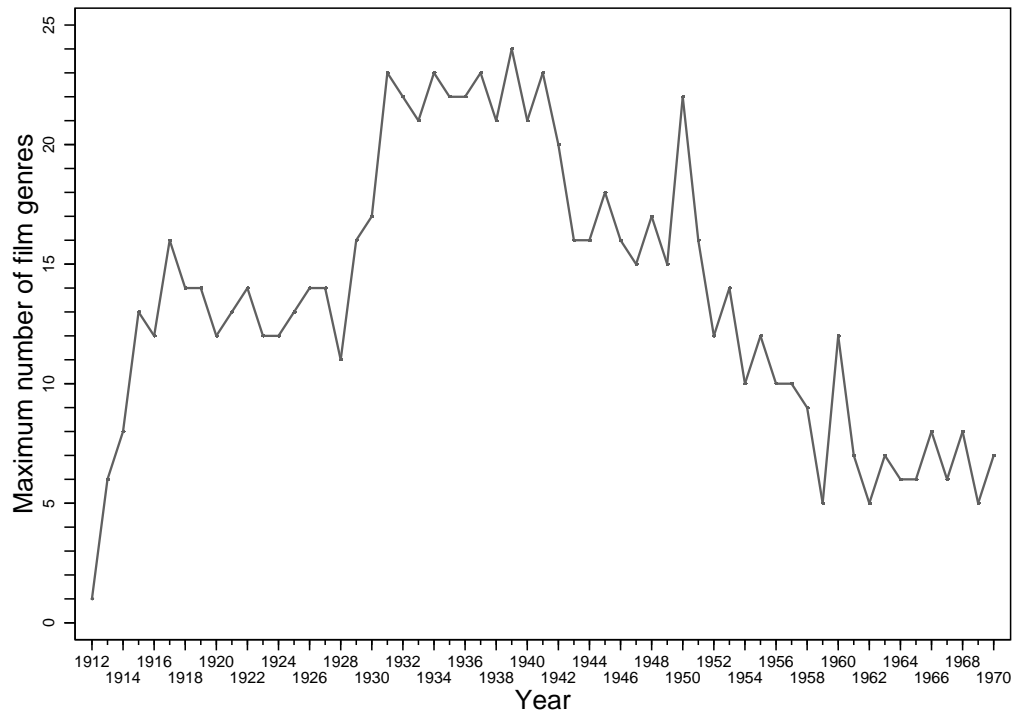


Figure 4: *The maximum number of film genres in which producing organizations operated*

and exhibitors likely have a reluctance to commit to these untested products. Figure 4 depicts the evolution of the maximum number of film genres in which producers operated. Consistent with our speculation, maximum diversity coincided with the period with the highest density of integrated production companies; following the Paramount case, it declined. One proposition deriving from this argument is that reduced competition among vertically integrated firms has greater positive welfare consequences relative to competition among specialized producers because of the additional product variety supported by integration.

Finally, at a more general level, we view these results as a call for greater ecological research. In the late 1970s, with the emergence of organizational ecology, institutional theory, and resource dependence, organizational scholars witnessed an explosion of interest in incorporating the environment more seriously into our understanding of the operations of organizations. Despite substantial progress in these research programs, the dominant mode of analysis with respect to many organizational questions remains a focus on the internal efficiency of the firm. Vertical integration is but one example. Extant empirical research has primarily focused on whether ownership offers a more efficient solution to contracting in a market (Williamson, 1975). Even “dynamic” analyses of this phenomenon have been framed in terms of whether firms appear to move toward this “equilibrium.” We claim that in addition to these internal effects, the consequences of many structural features of the organization, such as vertical integration, reverberate throughout the dynamics of a population. The effects ripple through the population because these structural features of the organization influence firms’ resource requirements and concomitantly their interactions with other firms either in the same or in overlapping niches.

References

- American Film Institute (AFI). (1989-1999). *The American Film Institute Catalog of motion pictures produced In the United States: Feature films, 1911-1920, 1921-1930, 1931-1940, 1941-1950, 1961-1970*. Berkeley, CA: University of California Press and New York: R.R. Bowker.
- Austin, B.A. (1989). *Immediate seating: A look at movie audiences*. Belmont, CA: Wadsworth.
- Balio, T. (1985). *The American film industry*. Madison, WI: University of Wisconsin Press.
- Balio, T. (1993). *Grand design: Hollywood as a modern business enterprise 1930-1939*. Berkeley, CA: University of California Press.
- Barron, D.N., West, E. and Hannan, M.T. (1994). A time to grow and a time to die: Growth and mortality of credit unions in New York, 1914-1990. *American Journal of Sociology*, 100: 381-421.
- Baum, J.A.C. (1995). The changing basis of competition in organizational populations: The Manhattan hotel industry, 1887-1990. *Social Forces*, 74:177-205
- Baum, J.A.C. and Korn, H.J. (1996). Competitive dynamics of interfirm rivalry. *Academy of Management Journal*, 39:255-291.
- Baum, J.A.C. and Mezias, S.J. (1992). Localized competition and organizational mortality in the Manhattan hotel industry, 1898-1990. *Administrative Science Quarterly*, 37: 580-604.
- Baum, J.A.C. and Singh, J.V. (1994). Organizational niches and the dynamics of organizational mortality. *American Journal of Sociology*, 100, 346-380.
- Bordwell, D., Staiger, J. and Thompson, K. (1985). *The classical Hollywood cinema. Film style and mode of production to 1960*. London: Routledge.
- Carroll, G.R. and Hannan, M.T. (2000). *The demography of corporations and industries*. Princeton: Princeton University Press.
- Carroll, G.R. (1985). Concentration and specialization: Dynamics of niche width in populations of organizations. *American Journal of Sociology*, 90: 1262-1283.
- Chipty, T. (2001). Vertical integration, market foreclosure, and consumer welfare in the cable television industry. *American Economic Review*, 91: 428-453.
- Christopherson, S. and Storper, M. (1989). The effects of flexible specialization on industrial politics and the labor market: the motion picture industry. *Industrial and Labor Relations Review*, 42: 333-347.
- Conant, M. 1960. *Antitrust in the motion picture industry. Economic and legal analysis*. Berkeley, CA: University of California Press.
- Copyright Office. (1951-1971). *Catalog of copyright entries: Motion pictures 1912-1939, 1940-1949, 1950-1959, 1960-1969*. Washington: Library of Congress.
- Corts, K.S. (2001). The strategic effects of vertical market structure: Common agency

- and divisionalization in the U.S. motion picture industry, *Journal of Economics and Management Strategy*, 10: 509-552.
- De Vany, A. (2004). *Hollywood economics*. New York: Routledge.
- DiMaggio, P.J. (1987). Classification in art. *American Sociological Review*, 52: 440-455.
- Dobrev, S.D., and Carroll, G.R. (2003). Size (and competition) among organizations: Modeling scale-based selection among automobile producers in four major countries, 1885-1981. *Strategic Management Journal*, 24: 541-558.
- Dobrev, S.D., Kim, T-Y. and Carroll, G.R. (2002). The evolution of organizational niches: U.S. automobile manufacturers, 1885-1981. *Administrative Science Quarterly*, 47: 233-264.
- Dobrev, S.D., Kim, T-Y. and Hannan, M.T. (2001). Dynamics of niche width and resource partitioning. *American Journal of Sociology*, 106: 1299-1337.
- Fetrow, A.G. (1999). *Feature films 1950-1959: A United States filmography*. Jefferson, NC: McFarland and Company, Inc.
- Freeman, J.H., and Hannan, M.T. (1983). Niche width and the dynamics of organizational populations. *American Journal of Sociology*, 88: 1116-1145.
- Gimeno, J. and Woo, C.Y. (1999). Multimarket contact, economies of scope, and firm performance. *Academy of Management Journal*, 43: 239-259.
- Grossman, S. and Hart, O. (1986). The costs and benefits of ownership: A theory of vertical and lateral integration. *Journal of Political Economy* 94: 691-719.
- Hannan, M.T. (1997). Inertia, density and the structure of organizational populations: Entries in European automobile industries. *Organization Studies*, 18: 193-228.
- Hannan, M.T. and Freeman, J.H. (1977). The population ecology of organizations. *American Journal of Sociology*, 82: 929-964.
- Hart, O. and Moore, J. (1990). Property rights and the nature of the firm. *Journal of Political Economy*, 98: 1119-1158.
- Izod, J. (1988). *Hollywood and the box office, 1895-1986*. New York: Columbia University Press.
- Joskow, P. (2005). Vertical integration. In: Menard, P. and Shirley, M.M. (Eds.), *Handbook of new institutional economics*. New York: Springer.
- Kerr, C. (1990). Incorporating the star: The intersection of business and aesthetic strategies in early American film. *Business History Review*, 64: 383-410.
- Klein, P. (2005). The make or buy decisions: Lessons from empirical studies. In: Menard, P. and Shirley, M.M. (Eds.), *Handbook of new institutional economics*. New York: Springer.
- Koszarski, R. (1990). *An evening's entertainment. The age of the silent feature picture, 1915-1928*. Berkeley, CA: University of California Press.
- Krattenmaker, T.G., and Salop, S.C. (1986). Anticompetitive exclusion: Raising rivals' costs to achieve power over price. *Yale Law Journal*, 96: 209-293.

- Lewis, H.T. (1933). *The motion picture industry*. New York: D. Van Nostrand Company.
- Lomi A., Larsen, E.R., and Freeman, J.H. (2005). Things change: Dynamic resource constraints and system-dependent selection in the evolution of populations of organizations. *Management Science*, forthcoming.
- McPherson, J.M. (1983). An ecology of affiliation. *American Sociological Review*, 48: 519-535.
- Mezias, J.M. and Mezias, S.J. (2000). Resource partitioning, the founding of specialist firms, and innovation: The American film industry, 1912-1929. *Organization Science*, 11: 306-322.
- Mezias, S.J., and Boyle, E. (2005) Blind trust: Market control, legal environments, and the dynamics of competitive intensity in the early American film industry, 1893-1920. *Administrative Science Quarterly*, forthcoming.
- Nash, J.R. and Ross, S.R. (1983). *The motion picture guide 1927-1982*. New York: Cinebooks.
- Nickerson, J.A. and Silverman, B.S. (2003). Why firms want to organize efficiently and what keeps them from doing so: Inappropriate governance, performance, and adaptation in a deregulated industry. *Administrative Science Quarterly*, 48: 433-465.
- Ordoover, J.A., Saloner, G., and Salop, S.C. (1990). Equilibrium vertical foreclosure. *American Economic Review*, 80: 127-142.
- Pfeffer, J. and Salancik, G.R. (1978). *The external control of organizations*. New York: Harper and Row.
- Rey, P. and Tirole, J. (2003). A primer on foreclosure. In Armstrong, M. and Porter, R. (Eds.), *Handbook of industrial organization Vol.3*. New York: North-Holland.
- Ruef, M. (2004). For whom the bell tolls: Ecological perspectives on industrial decline and resurgence. *Industrial and Corporate Change*, 13: 61-89.
- Rumelt, R.P. (1974). *Strategy, structure and economic performance*. Boston: Division of Research, Graduate School of Business Administration, Harvard University.
- Salinger, M.A. (1988). Vertical mergers and market foreclosure. *Quarterly Journal of Economics*, 77: 345-356.
- Silverman, B.S., Nickerson, J.A. and Freeman, J.H. (1997). Profitability, transactional alignment, and organizational mortality in the U.S. trucking industry. *Strategic Management Journal*, 18(Special Issue): 31-52.
- Sørensen, J.B. (1999). Executive migration and interorganizational competition. *Social Science Research*, 28: 289-315.
- Sørensen, J.B. (2004). Recruitment-based competition between industries: A community ecology. *Industrial and Corporate Change*, 13: 149-170.
- Sorenson, O. (1997). The complexity catastrophe in the computer industry: Interdependence and adaptability in organizational evolution. Stanford University. *Unpublished PhD dissertation*.
- Sorenson, O. (2000). The effect of population-level learning on market entry: The

- American automobile industry. *Social Science Research*, 29: 307-326.
- Sorenson, O. (2003). Interdependence and adaptability: Organizational learning and the long-term effect of integration. *Management Science*, 49: 446-463.
- Sorenson, O. and Audia, P.G. (2000). The social structure of entrepreneurial activity: Geographic concentration of footwear production in the U.S., 1940- 1989. *American Journal of Sociology*, 106: 424-62.
- Sorenson, O., McEvily, S., Roy, R. and Ren, C. (2005). Niche width revisited: Organizational scope, behavior and performance. *Working paper*. UCLA Anderson Graduate School of Management.
- Sorenson, O. and Waguespack, D. (2004). Social networks and exchange: Self-confirming dynamics in Hollywood. *Working paper*. UCLA Anderson Graduate School of Management.
- Squire, J.E. (1992). *The Movie Business Book*. New York: Fireside.
- Stuart, T.E. and Sorenson, O. (2003). The geography of opportunity: Spatial heterogeneity in founding rates and the performance of biotechnology firms. *Research Policy*, 32: 229-252.
- Thompson, J.D. (1967). *Organizations in action. Social science bases of administrative theory*. New York: McGraw-Hill Co.
- Williamson, O.E. (1971). The vertical integration of production: market failure considerations. *American Economic Review*, 61: 112-123.
- Williamson, O.E. (1975). *Markets and hierarchies: Analysis and antitrust implications. A study in the economics of internal organization*. New York: Free Press.