

ORGANIZATION AS STRATEGY: RESTRUCTURING PRODUCTION IN THE FILM INDUSTRY

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Few changes in the structure of firms have attracted as much attention during the last decade as the movement away from integrated production and toward cooperative relations among independent organizations. Despite recent emphasis on these strategies of 'disaggregation' and 'network' organization, little quantitative research exists on the impact of this type of reorganization on economic performance—at least in part due to the difficulty of obtaining appropriate data. The economic impact of disaggregation is examined in this paper using data on film production in the period after World War II.

There is mounting evidence that an important transformation has been taking place in the structure of firms in a number of industries. A shift away from integrated production and toward cooperative relationships among independent organizations has attracted increasing attention during the last decade. This trend toward 'disaggregation' (Miles and Snow, 1986) and 'network' organization (Thorelli, 1986; Jarillo, 1988) has been heralded as a corporate restructuring comparable to earlier movements toward functional and multidivisional forms of organization (Powell, 1990; Sabel, 1984). Although debate about the ultimate extent and significance of this restructuring continues (e.g., Chandler, 1990), there can be little doubt that the movement away from vertical integration has emerged as a key concern of both managers and researchers. General Electric's Jack Welch has described the corporation of the future as 'boundaryless' (Dumaine, 1992), while Tom Peters (1990) has gone even further and predicted the virtual disappearance of vertically integrated enterprise.

Key words: Corporate reorganization, strategic organization, film industry, corporate restructuring, vertical integration

A recent cover story in *Fortune* magazine summarized many of these expectations in this way (Dumaine, 1992: 36):

...the corporation of the future will still retain some vestiges of the old hierarchy and maybe a few traditional departments to take care of the boringly rote. But spinning around the straight lines [of the organization chart] will be a vertiginous pattern of constantly changing teams, task forces, partnerships, and other informal structures.

These changes already have begun to create new challenges for strategic management. Managers increasingly confront decisions about outsourcing and out-selling for virtually all aspects of economic activity (Quinn and Paquette, 1990; Peters, 1990). The emergence of these organizational decisions as a key element of strategy underscores the importance—and current limitations—of knowledge of the relationship between organization and economic performance.

Concern with the economic implications of organization is not new. The relationship between complex organizations and their economic environments has been a focus of organizational and strategic research for more than a half

century (e.g., Ansoff, 1965; Schendel and Hofer, 1979; Meyer, 1978). Despite the extensive work that has been done on these topics, there has been little quantitative research on the impact of project-level organization on economic performance. Research on economic performance typically has been carried out at the level of the firm or industry, while project-level studies rarely have been able to incorporate measures of economic performance. In consequence, little research exists that directly examines one of the central questions associated with strategic change in organizational boundaries: how does the form of organization of economic activities affect their performance?

The weakness of empirical work on this issue reflects the difficulty of carrying out project-level quantitative research more than any lack of interest in the topic (Teece, 1985). Data on project performance rarely are reported publicly, and the use of data collected for internal monitoring and control can be deeply problematic. Interfirm comparisons based on managerial accounting information may be subject to serious biases due to idiosyncrasies in reporting and control systems. Analysis of the impact of disaggregation on performance requires a form of information that is exceptionally difficult to obtain—comparable data on multiple projects carried out under different forms of organization.

This paper looks at evidence from an empirical setting that offers an unusual opportunity to examine information of this type—the American film industry in the period following World War II. The film industry underwent a transformation in the 1950s and 1960s that is virtually a prototype for the current changes in firm structure that are attracting the attention of researchers and managers. Demographic and technological developments sharply altered the market for feature films during this period, and the major studios responded by disaggregating production. A closer examination of the ways this reorganization helped the studios adapt to a new economic environment can provide interesting insights into the use of similar organizational strategies in contemporary industries.

These changes in the film industry offer something close to a natural experiment for examination of the relationship between the organization of production and economic performance. After the second World War, the major

studios progressively disintegrated production of feature films while retaining their roles as financiers and distributors (Balio, 1976).¹ During the 1950s and 1960s, independent and studio productions were financed and distributed by the same firms, created with the same production technologies, and sometimes filmed in the same facilities. The principal distinction between the two types of projects lay in the organization and management of production. Studio films were made by employees of large organizations working under long-term contracts, while independent productions came from small, entrepreneurial firms that sometimes were created in order to carry out individual projects (Balio, 1976; Wasko, 1982).

The material that follows is organized in two major sections. The first section provides a very brief summary of some of the interpretations of the relationship between organization and performance that have emerged from prior research. These ideas serve as the basis for a few simple hypotheses about possible differences between the performance of independent and internal production. The second part of the paper presents descriptive analysis of data on films released by Warner Brothers between 1946 and 1965. This analysis provides a means of evaluating the hypotheses outlined in the first section of the paper and offers a general response to the question of whether project-level organizational choices appeared to have had an important impact on economic performance in the post-war film industry. The paper concludes with discussion of the relevance of these findings to the problem of understanding restructuring in contemporary industries that have been moving away from vertically integrated forms of organization.

ORGANIZATION AND ECONOMIC PERFORMANCE

Research on the relationship between disaggregation of organization and economic performance

¹ The misapprehension that disaggregation of production was mandated by the courts is unfortunately widespread. The Paramount Consent Decree required divestment of exhibition facilities; disaggregation of production by the studios was undertaken at their own initiative.

has concentrated on two general issues: economic efficiency and innovation. In one case, disaggregation has been viewed as a means of improving economic efficiency in production and exchange. In the other case, spinning off activities to independent producers has been interpreted as a means of increasing the likelihood of product or process innovation. These two views of disaggregation are not necessarily mutually exclusive (e.g., Quinn and Pacquette, 1990), but they rely on different underlying theories to link organization structure to economic performance, and they lead to somewhat different expectations for disaggregated production.

Explanations based on economic efficiency

Efficiency explanations characteristically have looked at the organization of economic activity in terms of sourcing and selling relationships in systems for production of well-defined outputs. In this view, the integration or disintegration of economic activities is driven primarily by cost-efficiency (Williamson, 1985; Porter, 1980). If the costs or hazards associated with external supply are high, integration of production may provide an efficient solution for the organization of economic activity (Harrigan, 1983). In situations where independent production and market exchange are less costly than integrated production and internal transfer, outsourcing can be expected to replace internal supply.

Although much of the discussion of strategies of disaggregation has assumed cost-efficiencies of this type (e.g., Harrigan, 1983; Peters, 1990; Quinn and Pacquette, 1990), systematic theories linking organizational structure and economic efficiency have appeared primarily in work on organizational economics. Transaction cost and agency theories have developed rigorous frameworks for examining the economic implications of organizational form (e.g., Eisenhardt, 1989; Williamson, 1985). Transaction cost economics has been particularly significant in work on the integration of production (Monteverde and Teece, 1982; Teece, 1985; Williamson, 1971), sourcing decisions (Walker and Weber, 1984), and network relations among firms (Thorelli, 1986; Powell, 1990).

Transaction cost theory has helped to give precision to the idea of efficient organization in two ways: by recasting the definition of

organizational boundaries in terms of choices among alternative forms of economic exchange, and by providing an explicit argument linking organizational structure to cost competition (Teece, 1984; Williamson and Ouchi, 1981). Transaction cost theory treats the organization as a set of exchange relationships or 'nexus of contracts' for the purposes of economic analysis (Macneil, 1981; Williamson, 1979). Different forms of contract offer different levels of economic efficiency under specifiable environmental conditions (Williamson and Ouchi, 1981).

This approach shifts the focus of analysis from the firm to the *form of organization* of economic activity. Integration and disintegration become choices among forms of contracting for relations between stages of production (Williamson, 1971). Transaction cost theory argues that market processes create pressures for the adoption of cost-efficient forms of organization for these relationships. In the same way that capitalist competition forces firms to be price takers in factor markets, competition also moves entire systems of production toward the organizational arrangements that offer greatest cost efficiency in providing goods and services to consumers (Williamson, 1985).

When disaggregation of film production is interpreted in this fashion, it becomes a reorganization of two types of economic exchange: upstream contracting between producers and financiers and downstream contracting between producers and distributors. However, both financing and distribution of feature films were controlled by the major studios in the post-war period, and the only contractual relationship in the system for creating and delivering movies altered by disaggregation was the contract between studio and production personnel. If the shift from hierarchical control of production to a market-mediated (and market-disciplined) relationship with production personnel served to increase economic efficiency, then the use of independent production should have been less costly for the studios than internal production:

Hypothesis 1: Independent production was less costly than internal production of films.

Production cost was a particularly important issue for the studios in the post-war period because they bore costs of production for both

internal and independent films. The studios functioned as financial intermediaries for independent producers, borrowing money from banks and investing in specific projects (Wasko, 1982). A studio typically financed the costs of making an independent film from development of a script through delivery of a final print, while holding a chattel mortgage on physical properties associated with the production (Baumgarten and Farber, 1973). Direct third party participation in the financing of independent films was rare, and the studios enjoyed monopolistic control of distribution (Gordon, 1976). The complex financial arrangements that became commonplace in the 1980s (Vogel, 1986) were virtually unknown in the post-war period, and any strategy that reduced the cost of producing films directly benefitted the studios in their roles as financiers and distributors.

The idea that disaggregation may have served as a strategy to decrease costs gains plausibility from the economic conditions in the post-war film industry. Improved transportation, the baby boom, and the advent of television combined to reduce demand for films and increase audience selectivity in the years following World War II (Conant, 1964; Stuart, 1982; Williams, 1968). As indicated in Figure 1, box office receipts fell sharply in the 1950s and 1960s. The studios slipped in and out of insolvency, and they faced great pressure to cut costs in response to shrinking revenues (Balio, 1976; Perry, 1966).

Explanations based on innovation

Explanations based on the innovative capacity of firms, on the other hand, have looked at ways that the organization of production may affect the nature of outputs. Studies of this type characteristically have been driven by the idea that small autonomous producers may be better equipped than larger organizations to create new types of goods and services (e.g., McKenna, 1985; Miles and Snow, 1986). This idea has played an important part in two different types of research: studies of market structure and innovation carried out by industrial-organization economists, and work on internal structure and control by students of organizational behavior.

The industrial-organization research has largely been concerned with documenting associations

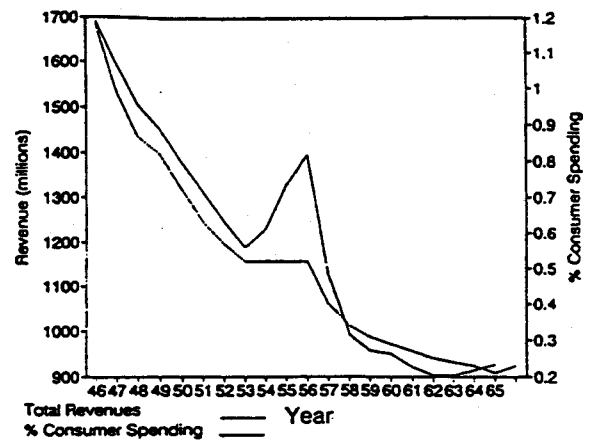


Figure 1. Box office revenues
Total revenues ———
% Consumer spending - - -

between firm size or market structure and innovation. A number of different types of studies have argued that smaller firms account for a disproportionate fraction of innovations (Kamien and Schwartz, 1982). For the most part, however, this research has not offered detailed theories of the underlying relationship between organization and innovation. Industrial-organization studies characteristically have relied upon broad speculation about issues such as diseconomies of scale in the management of research and development to explain associations between firm size and innovation (Cooper, 1964; Kamien and Schwartz, 1982).

The work on organizational behavior, on the other hand, has presented detailed analysis of a wide variety of complex relationships among size, structure, control and innovation. A number of different streams of research have contributed to this body of work, including studies of bureaucracy (e.g., Blau and Schoenherr, 1971; Crozier, 1964; Weber, 1957), work on environmental contingency (e.g., Burns and Stalker, 1961; Lawrence and Lorsch, 1967; Thompson, 1967), research on matrix and project management (e.g., Ansoff and Brandenburg, 1971; Thompson, 1965), and recent studies of organizations in industries such as microelectronics (e.g., Bahrami and Evans, 1987). One of the key ideas that emerges from these diverse works is that the complex division of labor associated with large organizations may be better suited to routine tasks than innovation.

In this view, large complex organizations are most effective for activities that can be decomposed into routine tasks coordinated by standard procedures (Blau and Schoenherr, 1971; Weber, 1957). This division of labor involves structures and controls that work well when the characteristics of inputs and outputs are clearly defined and not subject to unplanned change (Eisenhardt, 1985; Ouchi, 1979). Where environments are less stable, bureaucratic structures and controls may reduce the capacity of organizations to make needed changes in products or processes (Hlavacek and Thompson, 1973; Thompson, 1965; Woodward, 1965).

Researchers have described a variety of alternative forms of organization that may allow firms to innovate more effectively, ranging from the 'organic structures' (Burns and Stalker, 1961) and 'open systems' (Thompson, 1967) discussed in the 1960s to the 'stratocracies' (Bahrami and Evans, 1987) and 'hollow organizations' (Peters, 1990) of the last decade. Two features of these different forms of organization have received particular attention: autonomy from bureaucratic controls, and reward systems that favor uncertain, hit-or-miss projects (Bahrami and Evans, 1987; Mintzberg, 1983; Peters, 1990). Small, independent firms and autonomous subunits within firms have been seen as better able to create new products and processes demanded by rapidly changing environments.

An interpretation of disaggregation as a response to environmental conditions that require new types of products also fits the post-war movie business. As indicated above, changing social and technological conditions in the 1950s and 1960s created a radical shift in demand for films. Prior to the second World War, virtually any completed project recouped most of its costs (Yousling, 1948). In the post-war period, demand for commodity-like 'B' films collapsed, and hits became the primary source of revenue for the studios (Balio, 1976). This shift from a commodity-type market to a 'market for hits' can be seen vividly in the increasing concentration of revenues earned by films during this period (Figure 2).

The studios initially responded to these market conditions by looking for ways to use technology to differentiate films from television. Firms such as Warner searched intensively for means of simulating three-dimensional images, and color

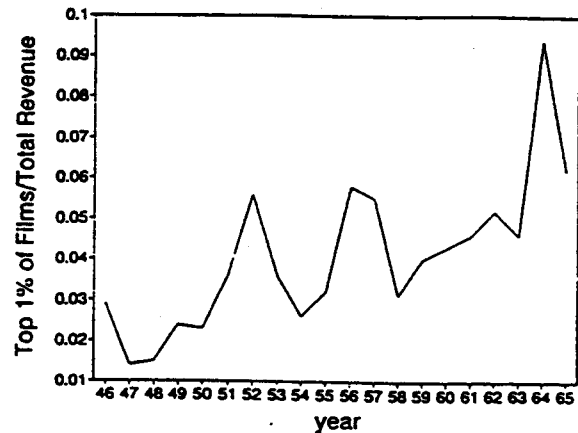


Figure 2. Concentration of revenues

photography was widely adopted in the 1950s.² However, technological innovations created only a transient increase in demand, and decline continued through the 1950s and 1960s (Figure 1).

If disaggregation altered the type of films available to the studios and increased the likelihood of hits, it may have provided an organizational strategy for dealing with these market conditions. This interpretation of disaggregation has direct implications for the market performance of independent and studio productions. If independent and studio films were fundamentally different types of products, their market performance should have differed as well.

Hypothesis 2: The market performance of independent productions was significantly different from the performance of studio productions.

At least two dimensions of market performance are of interest in this context. Gross revenues are the most fundamental indicator of the audience appeal of a film; audiences are not directly aware of production costs, and little variability exists in the pricing of first run films. However, evidence exists that box office performance is influenced by a number of

² During the 1950s, Jack Warner had agents traveling throughout western Europe calling on virtually any inventor—including a few outright crackpots—who claimed to have a process for creating 3-D images on the movie screen (Warner archives, 1955).

characteristics of films that are linked to production budgets, most notably the use of star performers (Kinden, 1982; Simonet, 1980). Analysis of the margin of gross revenues over production costs introduces some control for these expenditures and makes it possible to examine market responses to characteristics of films that are less readily priced and purchased. Characteristics of this type are particularly interesting from a strategic standpoint because their contributions to profit are not absorbed by competition in factor markets (Barney, 1986).

Market response to product characteristics that cannot be readily programed (Eisenhardt, 1985) and priced is an especially important issue in the film industry because a great deal of uncertainty exists about the attributes of projects that create hits. Apart from the effect of inputs that tend to capitalize their own value—such as stars, sets, special effects, and locations—the factors that influence performance generally have defied codification. However, certain individuals appear to have a craft-like ability to create hits, and that ability may help to explain the existence of independent producers (Balio, 1976).

Changes in controls and reward systems that accompanied the shift from internal to independent production lend support to this view. Independent producers not only were relieved of most of the bureaucratic controls that affected studio employees, they also were provided with the means and incentives to employ their abilities to seek out innovative projects. The independent producer operated as an archetypal entrepreneur—finding promising scripts, assembling commitments from teams of actors and production personnel, and convincing studios to fund the resulting projects.

Although independent films were made with studio money in the post-war period, the standard production-distribution agreement of the era gave the independent producer a residual claim against revenues that created very distinctive incentives (Baumgarten and Farber, 1973). The residual revenues or 'net profits' that the independent producer split with the distributor were the portion left after production costs, interest charges, distribution costs, and other distribution fees had been subtracted by the distributor (Leedy, 1980). The charges levied by the distributor frequently absorbed all revenues, and only 'hit' films generated substantial net profits

(Baumgarten and Farber, 1973; Wasko, 1982). Independent producers faced incentives that favored hit-or-miss projects; pay-offs came from exceptional successes, and studios carried financial risks associated with failure.

If independent films were more innovative hit-or-miss projects than studio films, they would have evoked a more variable response from audiences. Once again, market performance provides a direct indicator of audience response.

Hypothesis 3: Variability in market performance was greater for independent than studio films.

This use of variability in revenues and margins as indicators of audience response to attributes of films should not be confused with analysis of risk. In this analysis, variance in market performance serves solely as a measure of variability in the audience appeal of films. Independent films may have been hit-or-miss projects without necessarily representing a greater risk to the owners or managers of studios. Specific assumptions about the utilities of studio owners or managers would be required in order to link variability in revenues to risk, and analysis of risk would be meaningful only in the context of the overall analysis of performance (Libby and Fishburn, 1977).

The issue of overall performance highlights a general assumption that lies behind both explanations based on efficiency and explanations based on innovation: economic performance was the driving force behind disaggregation. If that assumption is accurate, independent production would have had a greater pay-off for the studios than internal production. Because explanations of disaggregation based on efficiency and innovation are not mutually exclusive, superior performance for independent films could have been a result of higher revenues, lower costs, or both.

Hypothesis 4: Economic performance of independent production was superior to performance of internal production

Although these hypotheses are relatively modest, they touch on some of the most basic empirical issues associated with disaggregation of production. They directly address the effect of the organization of production on the nature

of outputs, and they can offer insight into the key strategic question of whether project-level organizational choices offer a tool for influencing economic performance.

EMPIRICAL ANALYSIS OF PROJECT PERFORMANCE

Data and methods

The general hypotheses outlined above were examined using data on films released by Warner Brothers in the period from 1946 to 1965. These data were collected from business archives of Warner Brothers held in the libraries of Princeton University and the University of Southern California. The collection at Princeton included records from Warner Brothers film distribution through the year 1968, and the archives at the University of Southern California contained information on production activities in the same period. Princeton archives supplied financial data originally assembled for performance audit, including information on the cost, financing, domestic and foreign revenues of films. The University of Southern California archives provided information on the organization of production of films and financial records accumulated in the course of production, such as monthly cost summaries and ledgers detailing weekly expenditures on projects.

The Warner archives are an unusual source of information for two reasons: they offer the very rare opportunity to collect secondary data on project-level economic performance, and they are a unique source of data on the financial performance of films. Estimates of box office gross revenues have been the sole measure of the financial performance of films used in published research to date (e.g., Faulkner and Anderson, 1987; Simonet, 1980), and systematic information on production cost is not available for releases of firms other than Warner. The Warner data provide an exceptional opportunity for empirical research on the economic impact of the organization of production.

The data on production costs were verified by comparing information from audit reports at Princeton to detailed expense ledgers and reports at the University of Southern California. Expenditures on each project in a 100 film subsample were tracked from the initial acquisition of rights

through shipment of a final print. Differences greater than 5 percent appeared for only four films in the subsample, and no film showed a discrepancy as great as 10 percent.

Data were collected on all new films distributed by Warner Brothers during the years 1946 through 1965. Of a total of 393 films, 162 were studio productions and 231 were independent films. Twenty-four independent films were eliminated from the study because they had been 'pick-ups' and Warner had not participated in production financing.

Study design

The use of data drawn from the output of a single firm offers some extremely important advantages for this type of research. It solves one of the key problems of project-level analysis by providing quasi-experimental control for idiosyncrasies in reporting that might bias data collected across firms. Data on projects carried out by different firms are potentially subject to serious problems of incomparability due to anomalies in managerial accounting.

Although a study design of this type inevitably results in some uncertainty about the degree to which findings can be applied to firms other than Warner, it is important to bear in mind the fact that the research does not deal with firm-level variables. Key comparisons between independent and studio production involve differences between *forms of organization* that go below the level of the firm. However, some of the same caution used in interpreting case studies of firms or industries also is appropriate in drawing generalizations from this research—although there is little external evidence that the restructuring of production at Warner Brothers differed in important ways from the disaggregation of the other major studios (Balio, 1976; Perry, 1966). Warner was neither the first nor the last firm to disaggregate production, and the differences that did exist between Warner and its competitors were not sufficient to alter the overall pattern of economic and organizational change.

Measures

Seven variables were examined in the analysis: production cost (COST), distributor's gross revenues (GROSS), the difference between gross

and cost (MARGIN), the ratio of margin to cost (RATIO), the organizational status of the production (ORG), year of production (YEAR), and an estimate of the cash flow to the distributor from each film (CASHFLOW). As indicated above, distributor's gross revenues were a primary measure of performance because they represent a direct indicator of public response to films (and they are the indicator typically tracked in the film industry). Margin of gross over production cost is less sensitive to production expenditures, and the ratio of margin to production cost provides adjustment for the scale of projects. Estimates of cash flow to the studio were relatively crude measures, but they took account of differences in the structure of pay-offs associated with independent and internal production and provided some indication of the profitability of films. The Appendix provides a brief summary of procedures used to estimate cashflows to distributors from independent and studio films. Dollar figures were adjusted to 1967 equivalents using a CPI inflator.

Table 1 provides breakdowns of the variables COST, GROSS, MARGIN, RATIO, and CASHFLOW by organizational form (ORG) and intercorrelations of variables. Means and standard deviations of subgroups are reported, with student's *t*-statistics for differences between subgroup means (two-tailed, based on separate variance estimates).

Analysis

Comparisons between studio and independent films were carried out using relatively simple descriptive analysis. The principal methodological difficulty associated with the analysis was the cross-sectional use of data drawn from a 20-year period. This was potentially problematic because the shift from studio to independent production during the 1950s and 1960s meant that independent films were disproportionately from the later years of that period. This raised the possibility that apparent differences between studio and independent films actually could reflect biases due to the time at which films were produced.

These temporal effects were analyzed by estimating a series of covariance problems for production cost, gross revenues, margin, ratio of margin to cost, and cashflow in which organizational form and year of production

were factor and covariate. These models were estimated using dummy variable regressions, with hierarchical tests of significance (*F*-statistics) for entire models, interaction terms, and main effects of form of organization and year of production. The tests are summarized in Table 2, together with the regression equations for significant variables.

Interactions between year of production and form of organization were significant for production cost and gross revenue, while only the main effect of organizational form had explanatory power for the other variables. In consequence, values of production cost and gross revenues adjusted for the effect of year of production were included in the descriptive data analysis. Adjusted values were created by subtracting least squares estimates (derived from dummy variable regressions in Table 2) of COST and GROSS from observed values. Separate models were used for independent and studio films because the covariance analysis indicated nonhomogeneous slopes for the two forms of organization.³

Production costs and revenues both fell significantly over time for studio films, while both rose significantly for independent production (Table 2). However, temporal trends in costs and revenues tended to offset each other, and year

³ The models used to estimate values of COST and GROSS based on year of production were derived from the covariance analysis reported in Table 2. ORG was a dummy variable in the regressions, with studio production serving as the reference category (i.e., ORG = 0 for studio films). The least squares estimates of production cost as a function of year for studio and independent films therefore were:

$$\begin{aligned} \text{COST}(\text{studio}) &= 5278 - 67.8 \text{ YEAR} \\ \text{COST}(\text{independent}) &= (5278 - 6006) + (118 - 67.8) \text{ YEAR} \\ &= -728 + 50.2 \text{ YEAR} \end{aligned}$$

Similarly, the estimated functions for GROSS were:

$$\begin{aligned} \text{GROSS}(\text{studio}) &= 9135 - 118.8 \text{ YEAR} \\ \text{GROSS}(\text{independent}) &= (9135 - 7139) + (154.1 - 118.8) \text{ YEAR} \\ &= 1996 + 35.3 \text{ YEAR} \end{aligned}$$

In the case of COST and GROSS, adjustment for YEAR had essentially the same effect on *F*-tests as a partitioning of variance. The difference between the variance of adjusted and unadjusted scores is the variance explained by the linear effect of YEAR. The *F*-ratios computed for adjusted variables test heterogeneity (across categories of ORG) in the variance left unexplained by YEAR. Estimation of an additional parameter also resulted in the loss of one degree of freedom from both the numerator and denominator of the *F*-ratios computed for the adjusted variables.

Table 1. Breakdown of descriptive statistics for studio and independent productions

Variable	N	Mean	S.D.	t	Prob.(t)
COST					
Ind.	207	2116	1998	2.65	(0.008)
Studio	162	1680	1120		
GROSS					
Ind.	207	3999	5089	3.01	(0.006)
Studio	162	2833	2030		
MARGIN					
Ind.	207	1883	3734	2.57	(0.010)
Studio	162	1152	1482		
RATIO					
Ind.	207	1.55	2.60	3.81	(0.001)
Studio	162	0.819	0.864		
CASH-FLOW					
Ind.	207	651.9	1944.1	3.43	(0.001)
Studio	162	122.2	948.8		

Intercorrelations

	Year	Cost	Gross	Margin	Ratio	Cash
YEAR	1.00					
COST	0.019	1.00				
GROSS	-0.001	0.770	1.00			
MARGIN	-0.013	0.489	0.933	1.00		
RATIO	0.068	-0.234	0.107	0.278	1.00	
CASH	0.008	0.302	0.827	0.961	0.348	1.00

of production was not significant in explaining margin of revenue over cost, ratio of margin to cost, or cashflow, and only unadjusted values of those variables were included in the descriptive data analysis.

Distributions of production cost, gross revenues, margin of revenues over cost, ratio of margin to cost, and cashflow were analyzed using parametric tests of differences between means and variances and nonparametric tests of goodness of fit of entire distributions. Table 1 reports *t*-statistics for differences of means, and Table 3 presents *F*-ratios for homogeneity of variance and Kolmogorov-Smirnoff probabilities for goodness of fit of cumulative distributions for independent and studio films.

Finally, the impact of production cost on the performance of independent and studio films was examined. A substantial correlation ($r = 0.77$,

Table 1) between production cost and gross suggests that audience response to films was affected by expenditure on production. The analyses of margin of revenue over cost and ratio of margin to cost provide indications of performance differences net of production cost; however, they do not indicate whether the impact of production cost on revenues differed significantly between independent and studio films. An additional covariance model was estimated to evaluate effects of production cost and form of organization on revenues (Table 4).

Although the Warner data represent a census of releases of the firm, inferential statistics are appropriate for hypotheses that refer to underlying distributions of potential film projects. For the purposes of comparing integrated and independent forms of production, the films that actually were financed by Warner were treated

Table 2. Effect of year of production and form of organization

Dependent variable	Source of Explained Variance				Model
	Main effect of YEAR	Main effect of ORG	Interaction YEAR-ORG		
COST	(a)	(a)	0.033 ($F = 12.68$)*		0.050 ($F = 6.40$)*
GROSS	(a)	(a)	0.01 ($F = 3.77$)*		0.033 ($F = 4.15$)*
MARGIN	0.004 ($F = 1.46$)	0.015 ($F = 5.58$)*	0.001 ($F = 0.365$)		0.019 ($F = 2.36$)*
RATIO	0.003 ($F = 1.10$)	0.031 ($F = 11.92$)*	0.002 ($F = 0.730$)		0.034 ($F = 4.27$)*
CASHFLOW	0.001 ($F = 0.366$)	0.029 ($F = 10.67$)*	0.0004 ($F = 0.147$)		0.030 ($F = 3.75$)*

(a) Not applicable, interaction term significant

* $p < 0.01$

Dep. Var.	Regression Coefficients (Dummy Variable Regressions)				
	Ind. Var.	B	B*	t	Prob.
COST	Constant	5278		4.20	0.000
	YEAR	-67.8	-0.222	-2.88	0.004
	ORG	-6006	-1.77	-3.29	0.001
	YEAR-ORG	118	1.99	3.56	0.000
GROSS	Constant	9135		2.98	0.003
	YEAR	-118.8	-0.16	-2.06	0.040
	ORG	-7139	-0.87	-1.60	0.111
	YEAR-ORG	154.1	1.08	1.90	0.058
MARGIN	Constant	1152		4.95	0.000
	ORG	730.7	0.122	2.35	0.019
RATIO	Constant	0.819		5.13	0.000
	ORG	0.735	0.177	3.45	0.001
CASHFLOW	Constant	122.2		0.980	0.328
	ORG	529.7	0.164	3.18	0.002

as unbiased samples from indefinitely large populations of potential projects. Statistical inferences refer to the characteristics of those underlying distributions.

The performance of independent and studio production

Significant differences appeared between studio and independent films in both individual parameters and entire distributions of variables. Independent films exhibited greater mean performance than studio films, greater variance in performance than studio films, and appeared to have been drawn from different underlying distributions of potential projects than studio films. Kolmogorov-Smirnoff tests of differences between cumulative distributions resulted in rejection of the hypothesis that independent

and studio films were drawn from a common underlying distribution with a probability of less than 0.02 for every variable except unadjusted production cost ($\alpha = 0.097$). t -statistics for means and F -tests of heterogeneity of variance were significant for production cost, and the Kolmogorov-Smirnoff test was significant at $\alpha = 0.016$ when COST was adjusted for the effect of YEAR.

The relative cost of independent and studio production (Hypothesis 1)

As indicated in Tables 1 and 2, the cost of independent productions proved to be greater than the cost of studio films. Contrary to Hypothesis 1, the shift to independent production did not provide a means for Warner to reduce production budgets. This finding is particularly

Table 3. Distributions of studio and independent productions

Variable	Mean	S.D.	Var	F	KS Prob.
COST:	1925	1683	2831626	3.18*	0.097
Indep.	2116	1998	3993529		
Studio	1680	1120	1255305		
ADJ.COST	-0.017	1640	2689457	3.53*	0.016
Indep.	-0.024	1983	3932678		
Studio	-0.009	1056	1115457		
GROSS:	3487	4079	16637500	6.28*	0.017
Indep.	3999	5089	25899300		
Studio	2833	2030	4122236		
ADJ.GROSS	-0.015	4012	16096800	7.01*	0.000
Indep.	-0.027	5086	25869100		
Studio	0.001	1922	3693057		
MARGIN	1562	2982	8894915	6.35*	0.006
Indep.	1883	3733	13935289		
Studio	1152	1482	2196324		
RATIO	1.23	2.06	4.24	9.05*	0.012
Indep.	1.55	2.6	6.76		
Studio	0.819	0.864	0.747		
CASHFLOW	419.3	1606	2578779	4.20*	0.000
Indep.	651.9	1944	3779136		
Studio	122.2	948.8	900221		

* $p < 0.01$.

Table 4. Effects of cost and type of production on gross

Dependent variable	Source of explained variance			Model
	Effect of COST	Effect of ORG	Interaction COST-ORG	
GROSS	(a)	(a)	0.014 ($F = 4.01$)*	0.609 ($F = 189.79$)**

* $p < 0.01$. ** $p < 0.001$

Regression coefficients for effects of cost and form of organization:

Dep. Var.	Ind. Var	B	B*	t	Prob.
GROSS	Constant	703.23		1.94	0.054
	COST	1.27	0.523	7.04	0.000
	ORG	-931.59	-0.113	-2.09	0.038
	COST-ORG	0.730	0.327	3.64	0.000

interesting in light of speculation in the trade press of the period that disintegration was a cost-saving measure.

Differences in project type (Hypothesis 2)

Differences in distributions support the hypothesis that independent films were a fundamentally different type of project than studio films. If films are viewed as a selection from some underlying set of potential projects, independent productions appear to have been drawn from a different set than studio films (Table 3). Independent films evoked a different audience response and offered different performance to the distributor.

Variability in performance (Hypothesis 3)

These results supported the expectation that independent films would exhibit higher variance in performance than studio productions (Hypothesis 3). Form of organization was significant in the covariance problems, and the variance of independent films was greater for revenue, margin of revenue over cost, and ratio of margin to cost. *F*-ratios were significant at $\alpha = 0.001$ in all cases.

Overall performance (Hypothesis 4)

Independent films also outperformed studio films on average. Revenue, margin of revenue over cost, ratio of margin to cost and cashflow were significantly higher for independent productions (Table 1). The superior performance of independent films reflected higher gross revenues and higher revenues net of production cost. Although independents were more costly on average, their performance was superior even when the scale of projects was taken into account. Estimated cash flow to the distributor also was greater from independent than studio films, and the coefficient of variation of cash flows actually was lower for independent films than studio production ($CV = 2.98$ for independent films as opposed to $CV = 7.76$ for studio films, calculated from Table 1). Distributors not only could expect greater cash flows from independent production, but it is possible that independent production was preferable to studio production in terms of risk as well as expected return (Weston and Brigham, 1979).

The impact of production cost on gross revenues differed significantly between studio and independent films. The interaction term was significant in covariance analysis, indicating nonhomogeneous slopes for the two categories of ORG (Table 4). Comparison of slope coefficients suggests that expenditures on independent production had a greater impact on revenue than expenditures on studio production.

DISCUSSION

Analysis of the Warner data suggests that organizational form had an important effect on performance and that restructuring of the studios may have played a fundamental part in economic strategy in the post-war film industry. Independent films appear to have been significantly different types of projects than studio releases, and they earned higher revenues and margins, even when margins were corrected for project scale. Variance in gross revenues also was greater for independent films, suggesting that they were more nearly 'hit or miss' projects than studio films. Higher variability in margins provides an indication that these differences were not merely a result of the size of projects.

Variability in box office performance is a very interesting issue because it touches on some of the key uncertainties associated with film making. As remarked above, audiences are not directly aware of the cost of films, and their responses to movies are based on attributes that may elude identification until after the fact. The impact of production cost on revenues suggests that Warner could increase box office performance through expenditures on production. However, differences between independent and studio films went beyond items that could be identified *a priori* and purchased. Decisions about the organization of production apparently provided a means of managing some of the economic uncertainty associated with film production (Table 4).

Differences in production cost indicate that independent releases were significantly more expensive to produce than studio films. This contradicts the conventional wisdom of the post-war period and argues against the idea that disaggregation provided a means of escaping from the effects of a costly internal administrative apparatus. Warner Brothers appear to have

been effective in controlling costs of internal production; their principal problem lay in producing films that could draw audiences.

The overall picture that emerges from this analysis lends support to the view that disaggregation of film production was a means for the studio to secure new types of products. Contracting production to independents resulted in films that had different marketable characteristics than internally produced films. Independent films were more volatile projects, and they offered better prospects for box office success in the environment of the post-war period.

CONCLUSION

The experience of the film industry offers some interesting insights into the disaggregation of production. The most important observation from the Warner data probably is the simple fact that internal and independent productions apparently were fundamentally different types of projects. Form of organization had a direct economic impact, and organizational choices served as a basic tool of strategy.

The Warner data also suggest that disaggregation may serve as a means of altering the marketable characteristics of products. Independent production was not a cost-cutting measure for Warner; it helped the studio to adapt its output to meet changing patterns of market demand. Faced by a market for hits, the firm found that a fundamental change in structure from fully integrated production and distribution to a more complex system of contracting with independent producers provided an effective strategy for creating new, more distinctive products. The use of this organizational strategy is particularly noteworthy in light of the failure of purely technological means of differentiating films. It suggests that restructuring production systems may provide a strategy for dealing with environmental change when strategies based on technological development fail.

The 'market for hits' faced by the film studios in the post-war period has interesting parallels in some of the industries that currently are experiencing restructuring toward complex forms of contracting among autonomous or semiautonomous producers. The economic importance of 'hits' has grown in a wide variety of businesses

ranging from book publishing, software development, or popular arts and entertainment to many areas of consumer product and industrial design, and interorganizational relationships have emerged in these industries that bear a resemblance to the structure of the film industry in the post-war period. In many of these industries, competition focuses on qualitative distinctions among products, and finding the specific type of good or service that captures demand may be more important to competitive advantage than the management of costs. Firms are responding to this form of competition by using external contractors who work under incentives and controls not unlike those of independent film producers in the post-war period (e.g., Bahrami and Evans, 1987; Dumaine, 1992; Miles and Snow, 1986). Our understanding of markets for hits—and of the organizational strategies that may be pursued by firms in markets of that type—still is in its infancy. The experience of Warner Brothers provides valuable evidence about the possible effects of these organizational strategies, and it offers interesting insight into some of the forces that may be helping to create the 'boundaryless' firm of the future.

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APPENDIX: ESTIMATION OF CASHFLOWS FROM FILMS

Cashflows from films were estimated from data on the distributor's gross revenues and production cost of films. Distributor's gross revenues were the portion of box office receipts remitted to the distributor. Distribution fees charged to independent productions typically averaged about 30 percent of gross for domestic distribution and about 40 percent of gross for international distribution (Vogel, 1986). Distribution costs have been estimated at about 26-31 percent in the late 1970s (Vogel, 1986) and about 30 percent in the 1960s (Baumgarten and Farber, 1973). The higher 30 percent estimate was used for the films in this post-war sample.

Net profits from an independent film were the residual sum after distribution expenses, distribution fees, production cost, and interest charges levied on production costs had been subtracted from the distributor's gross (Leedy, 1980). Net profits typically were split between the distributor and independent producer. Documents in the University of Southern California archives indicated that the elapsed time between expenditure of production costs and receipt of revenues was about 1 year in the case of most films in the Warner sample, and the 1-year time

horizon was used for financial calculations except in cases where specific evidence indicated that a longer time period was appropriate.

Cashflow from studio films was simply the distributor's domestic and foreign gross less distribution costs and production costs (discounted for the time between expenditure of costs and realization of revenues):

$$CF_s = \frac{G_{fs} + G_{ds} - 0.3(G_{fs} + G_{ds})}{(1 + k)^t} - C_s$$

$$= \frac{0.7G_s}{(1 + k)^t} - C_s$$

Where:

- CF_s = Cashflow from studio film 's'
- G_{fs} = Foreign gross from film 's'
- G_{ds} = Domestic gross from film 's'
- C_s = Production cost of film 's'
- k = Opportunity cost of capital
- t = Number of years between expenditure and realization of revenue

Estimation of cash flow to the studio from independent productions was slightly more complex. Where the distributor's fee was estimated at 30 percent of gross for domestic revenues and 40 percent of gross for revenues, distribution expenses at another 30 percent, and the indepen-

dent production was charged interest on production costs at a rate 'k', net profits were:

$$G_{fi} - G_{di} - 0.3(G_{fi} + G_{di}) - (0.3G_{di} - 0.4G_{fi}) - C_i(1 + k)^t$$

Where

- G_{fi} = Foreign gross from film 'i'
- G_{di} = Domestic gross from film 'i'
- C_i = Production cost of film 'i'
- k = Opportunity cost of capital
- t = Number of years between expenditure and realization of revenue

Cashflow to the distributor therefore was gross minus distribution costs, independent producer's (50 percent) share of 'net profits', and production costs. Appropriately discounted this would be:

$$\begin{aligned} & \frac{G_{di} + G_{fi} - 0.3(G_{di} + G_{fi}) - 0.5[0.7G_{di} + 0.6G_{fi} - C_i(1 + k)^t]}{(1 + k)^t} - C_i \\ &= \frac{0.35G_{di} + 0.4G_{fi} - 0.5C_i}{(1 + k)^t} \end{aligned}$$

However, if a film did not generate net profits—that is, costs and charges by the distributor absorbed all revenues—then cashflow to the distributor was estimated as the (discounted) portion of gross left over after production costs and distribution expenses had been subtracted, i.e.,

$$\begin{aligned} & \frac{G_{fi} + G_{di} - 0.3(G_{fi} + G_{di})}{(1 + k)^t} - C_i \\ &= \frac{0.7G_{fi} + 0.7G_{di} - C_i}{(1 + k)^t} \end{aligned}$$