The Organizational Efficiency of Internal Capital Markets*

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Abstract

I investigate the effect of multidivisional structure on investment efficiency using project-level data from the motion picture industry in the United States. I find that the multidivisional structure of the largest studios in Hollywood increases the production budget of a movie by $7M, a 90% increment at the mean, but does not improve its box office performance. I arrive at this finding in two different ways. First, I observe a decrease in the investment efficiency of independent distributors after being acquired by the largest movie studios. Second, I account for the potentially endogenous relation of multidivisional structure and larger budget using instruments based on the internal configuration of movie creative teams. The results suggest that the influence of a multidivisional structure on efficiency at the project level can be sizable in addition to other financial and organizational characteristics. Because this influence is negative, I conclude that internal capital markets in Hollywood do not improve investment efficiency.

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A growing body of research in corporate finance and strategy argues that the organization of activities within the horizontal boundaries of the firm can affect financial performance (Stein 2003, Collis and Montgomery 2005, Maksimovic and Phillips 2006). The discussion is characterized by a duality. Diversification creates value or destroys value. Conglomerates should be dismantled or maintained. Firms have weak divisions or strong divisions. Capital allocation is "socialistic" or efficient. Socialistic investment is optimal or suboptimal. And so on. Much of this research is based on constructs where the influence of organization on investment efficiency can only be observed in the aggregate. Capital expenditures may take years to pay off; divisions within a firm may face different industry environments that make inference difficult; and data structures may not be suitable to obtain reliable estimates. Because of these problems, the duality in the debate may inspire contradictory or even pessimistic views on what organizational policies should be implemented to create value. The CEO of the multi-business corporation has not received much help from the academic debate.

I study the influence of multidivisional structure on investment and performance at the *project* level. Firms have divisions, and divisions have projects in the same line of business. Observing the investment and performance of each project could help us understand whether the value differentials discovered in the aggregate are real. Multidivisional firms may just have a completely different way of evaluating investment prospects from that of focused firms. More importantly, the mechanisms for the efficiency of an internal capital market can be studied with more accuracy when multiple divisions of the same firm operate in the *same* line of business than when these divisions perform different activities even if they are closely related.

The motion picture industry in the United States between 1985 and 2005 is a prime candidate to investigate how organization affects investment efficiency. I leave aside the fact that the largest companies in the industry belong to diversified conglomerates, and I focus on their operation in the movie distribution business alone. Starting in 1991, the largest distributors in Hollywood, called the *majors*, made acquisitions and internal rearrangements that led them to adopt a multidivisional structure. That is, these firms started participating in the distribution market with two types of divisions: major and "specialty." By design, specialty divisions became part of an internal capital market, obtaining finance from the firms controlling the majors, retaining at the same time substantial autonomy in the marketplace.

I find that multidivisional structure reduces the investment efficiency of movie distributors because it increases investment but does not affect the revenue associated with it. Holding many project and organizational characteristics fixed, I find that movies distributed by a major's specialty division require an extra $7M real dollars of production budget when compared with a focused firm. This amount represents a 90% increase in investment measured at the mean, an economically sizable estimate. In contrast, movies do not show a statistically significant differential in box office revenue attributable to a multidivisional structure. I obtain a very similar point estimate when observing the within-organization decrease in the investment efficiency of independent studios acquired by the largest studios in Hollywood. After the acquisition event, I find a significant increase in production budget of $6.85M per movie, but no significant increase in box office revenue.

While the focus of the study is on the movie industry, the notion of multidivisional operation within an industry carries significant interest in a variety of settings. Lexus achieved enormous market success in the U.S. operating separately from Toyota. The new owners of the Hilton Hotels have to decide whether some hotel chains should be divested. Much of the research on the efficiency of multidivisional firms uses large samples of many industries attempting to draw general conclusions. Yet managers and investors make decisions at the micro level, hoping to succeed in an industry. Understanding the influence of organizational decisions on investment efficiency is thus fundamental.

The identification strategy of this paper follows two alternative paths converging to strikingly similar estimates of how internal capital markets affect investment efficiency. In a first set of tests, I observe changes in the investment efficiency of independent distributors after they are acquired by the firms owning the major distributors. Because I observe projects of the same organization before and after the acquisition, I identify the effect of internal capital markets using within-organization regressions controlling for investment opportunities and introducing fixed effects the micro level of the thematic genres and of the companies producing the movies carried by the distributor. After an independent distributor is acquired by a Hollywood conglomerate, the production budget of its movies shows a positive and significant increase but the box office revenue does not change. I show that this decrease in investment efficiency is not due to a reallocation of good and bad projects across the different divisions of the new organizational form. I do this by constructing the yearly movie portfolio of studios that will constitute a multidivisional organization through the acquisition (e.g., Miramax and Disney's Buena Vista), and measuring the investment and performance of the group before and after the event. The average movie budget of the group increases by $8M after the acquisition, while the average box office does not change significantly.

Under an alternative identification assumption, I consider the potentially endogenous involvement of *multidivisional* studios in movies requiring *larger* budget, and use team-level instruments to model the effect of organizational structure on investment efficiency. I exploit the fact that each movie project requires a match between a distribution company and a creative team. Descending to the level of the creative teams behind movies, I show that three team variables — the diversity of experiences with distribution companies in the recent past, the degree of familiarity with the major studios, and the ratio of creative participants debuting in the movie — significantly explain a match of the team with a multidivisional-studio type. These variables impact investment through the indirect channel of that organizational choice, and I argue there are no reasons to expect other influences on budget after controlling for the quality of the team. Therefore, I use those three variables as instruments for multidivisional structure in a two-stage least squares design. In the first stage, I predict the binary variable of multidivisional type using the instruments and many controls. In the second stage, I use the instrumented multidivisional structure variable as a regressor to explain budget and box office revenue. The coefficient on multidivisional structure is positive and significant when explaining movie budget, but it is insignificant when explaining box office revenue. Because my models are limited to box office revenue as the metric for performance, I also explore the possibility that the benefits of multidivisional structure are hidden in ancillary market revenues not covered in the data. I provide empirical evidence against this possibility, showing that multidivisional structure does not enhance broader measures of performance.

An explanation for the harmful effect of multidivisional structure on investment efficiency is complexity at the operational and managerial levels. First, when restricting the instrumental variable models to R-rated movies, I find that these projects receive more funding in a multidivisional studio than in a focused firm. Because these projects are especially difficult to handle commercially, the largest studios seem to be overinvesting in them despite the mismatch with their expertise. Second, I find that specialty divisions resulting from *acquisitions* are more lavish in their movie budgets than specialty divisions *developed internally* by the Hollywood majors. While this finding could be interpreted as evidence of agency behavior — independents overinvest after becoming divisions of rich conglomerates — there are reasons to believe that managerial complexity is the problem. For example, acquired divisions do not show higher performance than divisions developed internally despite increasing sharply the number of screens for their movies.

The negative effect of organizational structure is striking because the major studios acquired independent firms to learn their selection methods, or developed new divisions to expand their opportunity set into low-budget prospects. I show that this change in investment efficiency may not be due to the availability of just more finance, but *internal* finance. By observing distributors that switch from publicly to privately held, or viceversa, during the period studied, I find that they do not show an increase in investment but in *performance* during the publicly-traded regime. Despite the mounting evidence on inefficiency, however, I cannot rule out a genuine motivation to capture value through mergers and acquisitions. Using a variance components model for movie portfolio returns, I show that a substantial portion of the variability of a movie portfolio's performance is due to business-unit effects. This result suggests that large studios may have attempted to operate their new divisions separately so that they could keep the "magic." At the same time, the high cost of this organizational arrangement suggests that other mechanisms may be compensating the loss of efficiency.

This study contributes to a growing literature on investment in multidivisional firms.[1] The study is close in spirit to work by Hubbard and Palia (1999), who study the creation of an internal capital market after the acquisition of financially constrained firms, and to work by Çolak and Whited (2007), who analyze investment efficiency using data on spinoffs. The focus on the micro reality of the business unit bears resemblance to the work on plant efficiency by Maksimovic and Phillips (forthcoming). A unique feature of my data is the availability of investment information at the project level, allowing me to show that the effect of structure on efficiency can be sizable *in addition to* other micro financial and organizational characteristics. In terms of the direction of the results, the study is consistent with previous findings that internal capital markets do not enhance investment efficiency.

The results have direct implications for a new research strand addressing the mechanisms for the diversification discount. Rawley (2007) proposes costly organizational adjustment as the channel through which diversification hurts productivity. He finds that taxicab firms diversifying into the limousine business are less likely to adopt efficient technological systems or grant optimal ownership to their cabdrivers. Seru (2007) argues that agency problems between

[1] See theoretical developments by Stein (1997), Scharfstein and Stein (2000), Rajan, Servaes, and Zingales (2000), Almeida and Wolfenzon (2005), and Bernardo, Luo, and Wang (2006), and empirical contributions by Khanna and Tice (2001), Gertner, Powers, and Scharfstein (2002), and Ahn and Denis (2004).

divisional R&D teams and headquarters produce a suboptimal allocation of resources, making conglomerates less innovative than focused firms. Santaló and Becerra (forthcoming) argue that the high concentration of specialized firms in an industry reflects the bad fit of diversified firms in that economic environment, thereby leading to a diversification discount. I advance a different mechanism for the effect of multidivisional operation on economic value. First, I find that structure *per se* affects investment efficiency. By design, the study overcomes the separability problem between additional structure and new investment opportunities usually neglected in studies of related diversification. Different movie divisions of the same firm face largely the same industry environment, so that we can observe structure more precisely. Second, I find that multidivisional structure influences investment positively but does not influence performance, suggesting that excessive investment is the explanation for the loss of efficiency. The budget of movies of multidivisional studios is larger than that of focused studios, though the box office revenue is insignificantly different across the organizational structures. Third, I find that complexity at the managerial and operational level are the mechanism behind the harmful effect of multidivisional structure. Acquired specialty divisions and R-rated movies are at the core of the value-destruction results.

Recent empirical work on Hollywood has discovered several sources of inefficiency in the way studios operate. For example, Einav (2007) finds an exacerbated seasonality caused by the practice of releasing more and better movies during peak seasons. Corts (2001) shows that the multidivisional *vertical* structure of studios does not benefit efficiency in release dates. Sorenson and Waguespack (2006) find that movie distributors give excessive economic support to production principals with whom they have strong ties. My results add to previous evidence of inefficiency, finding that internal capital markets reduce *investment* efficiency. But I also provide evidence that multidivisional structure may be an equilibrium result. In the case of star-studded films, multidivisional structure is beneficial to performance, suggesting that the design of the largest Hollywood studios has some advantages. The conclusion that the availability of financial resources and the structure associated with it are harmful to efficiency is perfectly compatible with the persistence of this organizational practice because of the difficulty in estimating the organizational efficiency of internal capital markets.

1 Organization and Investment in Hollywood

The motion picture industry has a history of over a hundred years. Since the 1910s, production has been concentrated in Los Angeles, thus the industry is colloquially known as Hollywood. The configuration of the industry follows its output, the feature film. Some firms perform the creative tasks, while others are responsible for commercializing the final product. The technical and organizational complexity of movie production makes collaboration among production firms a common practice, while theatrical distribution is performed by only one firm. The industry structure in the period 1985–2005 is characterized by an imbalance of power along the value chain. The distributors are the most powerful firms, whereas production firms are atomized. The industry is competitive at all levels, and involves a considerable amount of risk. For instance, in 2004 the median production budget was $20M, and 504 films were released in the market. There exist a few dominant firms, called the *majors*, and hundreds of distribution and

production firms of different sizes, called *independents* by opposition to the majors.

Feature film financing is intertwined with distribution because a movie's financial performance hinges on good commercialization. There exist many ways in which movie investments are financed (e.g., Cones 1995, Goettler and Leslie 2005), but ultimately all business plans require a distribution deal. Typically, funds are committed at different stages of a project. Either directly or implicitly, distributors decide whether a particular movie is made, how much it will cost, and what level of marketing support it will receive to reach audiences.

Changes in consumer preferences and the rise of niche competitors unsettled the position of the majors. A generation of young creative directors gained recognition in the 1970s, and technological changes in filmmaking and home-video viewing created new supply and demand. Suddenly, creative filmmakers found profitable alternatives to traditional distribution,[2] and so the majors started facing stronger competition from *independent distributors*. Generally small and focused, these firms were able to identify projects with particular appeal, and bring them to the market in an untraditional way.

The majors reacted to these industry changes in different ways. Some acquired independent distribution companies, while others developed quasi-independent divisions parallel to their core. These acquisitions and internal rearrangements, started in 1991, are essentially different from previous corporate events in the industry because the majors changed their structure. That is, instead of merging the newly acquired independents into their core distribution division, or fully accommodating their starting niche divisions within the environment of the traditional distributor, the majors let these divisions have substantial autonomy in their operations. These organizations are staffed differently, have a different market focus, and are officially recognized by the Motion Picture Association of America as distinct players in the market under the name "specialty divisions." Table 1 lists the major firms in Hollywood and their specialty divisions.

By design, specialty divisions are different from independents because they have access to an internal capital market. These divisions obtain finance from the firms controlling the majors, or take advantage of synergies that improve their investment efficiency. While these divisions maintain some autonomy in market operations, their investment levels are approved by corporate executives. The headquarters sets limits to formerly independent distributors incorporated through acquisitions, and those limits are more relaxed than the capital constraints they had previously as independents. In the case of internally developed divisions, capital allocation might be more generous than what they would have had starting by themselves.

As seen in table 1, what began in 1991 with Sony Classics, and gained visibility in 1993 with Disney acquiring Miramax, has become a widespread organizational design. Industry observers believe that the arrival of the specialty divisions helped revive the Hollywood economy. This paper investigates whether the internal capital markets inherent to the new organizational form of the largest firms in Hollywood increased investment efficiency.

[2]Attempts to create a system alternate to the dominant distributors have always existed in the industry. Moreover, some of the majors started themselves as independents decades ago. But from the 1950s on, the distance between majors and independents had not been shortened by any organizational innovation until the rise of independent distributors mentioned here.

2 Empirical Design

2.1 Data

The data draw from the population of 7,491 feature films released in the U.S. between 1985 and the first quarter of 2005. The main industry data sources are *Variety*/ACNielsen EDI, Studio System, and the Internet Movie Database (IMDb). Corporate information is obtained from Compustat, Hoover's Online, the *Wall Street Journal* archives, Dun & Bradstreet's *Who Owns Whom*, and Wikipedia. The project-level information reported by *Variety*/ACNielsen EDI assigns each movie to a single distribution company or division of a company (e.g., movies from the Walt Disney Corporation are reported as either distributed by Buena Vista or Miramax). I use these data sources to identify the organizational design of studios. The data repository covers all firms in the distribution industry, both privately- and publicly-held. Corporate information available from all types of firms are combined with project-level variables.

The detail of project-level information is good to control for many dimensions. Each feature film has weekly information on box office revenue and the number of screens, as well as a genre classification (*Variety*/AC Nielsen EDI). Production budget information is available for about 40% of all movies (IMDb and Studio System), and this is the main filter to select the sample for the study.

The complete creative team — actors, directors, producers, and writers — is available for about 95% of the population of feature films, and for many other types of projects such as TV or cable films. I observe 1,449,475 project-person observations for 179,732 unique individuals involved in feature films in the period of interest, so that I construct personal track records to be analyzed at the team level.

2.2 Identification

The goal of this study is to measure the effect of internal capital markets on investment efficiency at the project level. To do this, the identification strategy follows two alternative paths.

The efficiency of internal capital markets can be assessed by studying an event that brings focused firms into a larger, diversified organization. A first set of tests uses event study designs comparing the investment and performance of movie studios before and after an ownership change that brings an independent into the boundaries of a Hollywood major already operating in the market. This design assumes that the influence of an internal capital market can be consistently estimated within each organization being acquired because the investment and performance of projects are observable.[3] Using within-organization estimates (i.e., business-unit fixed effects) in the comparison, and controling for investment opportunities would be sufficient under this assumption. It is also well known that the characteristics of some movie

[3]This argument is different from assuming that the acquisition event is exogenous. Unobserved drivers of changes in investment efficiency at the project level are assumed here as directly related to the acquirer, not the acquired organization, so that controlling for business unit fixed effects is sufficient to identify the effect of internal capital markets on investment efficiency.

genres (e.g., action) are very different from others (e.g., horror), and that certain trends affect all firms in a year. Therefore, identification is further strengthened by the inclusion of genre and year fixed effects.

The second identification strategy instruments for the existence of an internal capital market, defined as a multidivisional structure. Such structure includes the case of acquired and internally developed specialty divisions. In the case of movie firms, the conditions under which internal capital markets operate at the project level depend on a previous match, namely, that creative teams bring their projects to firms with a multidivisional structure rather than to a focused firm.[4] Therefore, structure can be instrumented at the level of each project. In order to account for the potentially endogenous relation between multidivisional structure and unobserved drivers of investment, it is necessary to find variables that are otherwise unrelated to the investment efficiency of the distribution company.

Three instruments for the existence of a multidivisional structure are expected to be unrelated to investment efficiency, except through their effect on the match with a multidivisional type of distributor. The first instrument is the average recent experience of a team in dealing with major studios, defined for team k as:

$$\text{Experience with majors}_{k,t} \quad = \quad \left(\sum_{i \in I^k} \frac{\sum_{i,t-3}^{i,t-1} \#MoviesM_{i,t}}{\sum_{i,t-3}^{i,t-1} \#Movies_{i,t}} \right) / n(I^k)$$

where I^k is the set of all principals in movie k (i.e., actors, directors, producers, and writers), i is a principal, $\#MoviesM_t$ is the number of movies made with major distributors in year t, and $\#Movies_t$ is the count of all movies. The measure is calculated over the individuals' records in the three calendar years prior to the current movie. Creative teams with more recent work experience with the majors may be more prone to work with these firms or their specialty divisions by the sheer familiarity with these types of organizations.

The second instrument is based on the creative talent's variety of interactions with distribution companies:

$$\text{Diversity of interactions}_{k,t} \quad = \quad \left(\sum_{i \in I^k} \#Distributors_{i,t-1} \right) / n(I^k)$$

where $\#Distributors_{i,t}$ is the number of distribution companies with which principal i made a movie in year t. It is expected that creative teams with more exposure to different distribution companies do not benefit as much from the larger size or variety offered by a multidivisional studio, thus being less likely to contract with it.

[4] I do not impose the assumption that the creative teams select their distributors, but that there is a match based on team characteristics, rather than on distributor characteristics. My design is reminiscent of brokerage in financial services (e.g., Garmaise and Moskowitz 2003) without assuming explicitly which party selects the other.

The third instrument is the ratio of principals debuting in movie k,

$$\text{Ratio of debutants in film}_{k,t} \quad = \quad \frac{\sum_{i \in I^k} 1(\text{Previous feature films}_i = 0)}{n(I^k)}$$

A prediction about the direction of this instrument is less straightforward than in the case of experience with the majors or diversity with distribution companies. On the one hand, debutants have no track record in feature films, and their contribution to the quality of film may be deemed too small by a multidivisional distributor, reducing the possibility of a match. On the other hand, debutants may be too risky for focused distributors, so that their match is more likely with multidivisional companies. What is clear is that the ratio of debutants in a feature film should have little to do with the efficiency of the investment in ways other than the indirect relation through a multidivisional structure, after controlling for the quality of the entire team, and so it may qualify as an instrument. Extensive evidence on the suitability of the instruments is provided in subsection 3.4.

2.3 Specification, dependent variables and controls

Models

The unit of observation is the feature film. The models follow two alternative identification strategies. First a set of models follows the form of event studies before and after the acquisition of independent movie studios, using a sample including only such companies. Second, the sample is expanded to include all firms and their projects after 1990, exploiting instruments in two-stage least squares (2SLS) specifications.

I supplement the main models with two other specifications to show the importance of organization for performance. First, I fit a variance components models analyzing movie genre portfolios and measuring the effect of business units (i.e., distribution organizations) on returns. Second, I examine movie studios that undergo different regimes of access to external capital markets — publicly- or privately-held — to provide a comparison with the event studies of access to internal capital markets. The specifications are detailed in section 3, with the formulae for the regressions accompanying each table of results.

Previous work on Hollywood has shown significant effects for distributor and genre at the movie level (Litman 1983, Prag and Casavant 1994). The large sample used in this paper spans over two decades, thereby allowing for time heterogeneity, as well. Therefore, most models use fixed effects at the distributor, genre, and year levels. In contrast to studies using production budget as an explanatory variable for box office performance, the question posed by this paper fits other studies (e.g., Sorenson and Waguespack 2006) analyzing box office and production budget separately, so that investment efficiency can be investigated in detail.

Dependent variables

Investment. A movie's production budget is a suitable measure of investment.[5] The

[5]In related work (Natividad 2007) I sum the budgets of movies on a quarterly slate to model a distributor's investment portfolio. Financial management in the movie industry is dual: both the portfolio and the individual

items typically included in a production budget are the cost of the script, the salary of the producer, director, leading actors and other cast members, and the sum of "below-the-line" expenses such as the salaries of the crew and staff, set building, and special effects. To account for inflation, the production budget is expressed in 1985 dollars using deflators from the Bureau of Labor Statistics.

Performance. A movie's box office revenue is the performance metric used in the study. Previous work on the economic performance of movies has used this variable as a proxy. Moreover, industry participants use box office revenue as an acid test for the financial results of a movie, and many subsequent commercial contracts for the movie are based on U.S. theatrical results. The measure is expressed in real 1985 dollars.

CONTROLS

- *Project-level variables.* *Talent financial score* is the average of personal scores obtained summing the box office revenue of movies made by each creative member in the movie —producers, directors, writers, and actors— during the three years prior to the current movie. This value proxies for the star power of the team, equivalent to the investment opportunities of the dyad distributor-production company involved in the project. *USA production* is equal to one if all production firms involved in the movie are U.S. based. *Film length* is measured in minutes and proxies for the type of film and its complexity. *Talent experience in films* is the average of the count of previous feature films done by the principals participating in the movie: directors, producers, actors, and writers. *Number of principals* controls for the size of the project and the span of control of the director and producers. *New director dummy* is equal to one when the director of the film has never directed a feature film before, and proxies for his or her relative inexperience managing talent. *Debuts in role* is a ratio of the count of principals appearing for the first time in a role (i.e., actor, director, producer, or writer) divided by the number of principals.

- *Corporate and divisional variables.* *Specialty division* is a dummy indicating whether the movie was distributed by the specialty division of a multidivisional firm.[6] *Publicly traded* is equal to one if the distributor is or belongs to a publicly-traded firm, capturing differences due to the access to capital markets. *Average box office per movie lagged* is the sum of the box office revenue of the distributor in the previous year divided by the total number of movies; this variable controls for the effect of liquidity on investment. *Movies distributed lagged* is the count of the distributor's movies in the previous year, and controls for the effects of scale.

movies require investment rules.

[6]MGM does not have a specialty distribution division. I obtained a list of movies considered by MGM as comparable to specialty movies in other major studios, and counted them as 'specialty.'

3 Results

3.1 The organizational component of movie portfolio performance

How much does organization matter for movies' financial performance? The variance components model estimated in table 2 is inspired by Rumelt's (1991) analysis of business unit effects in a large panel of diversified U.S. firms,[7] but descends to the internal reality of the business unit in the movie distribution industry alone. Variance components methods impose assumptions on the stochastic nature of the errors and yield an additive structure for the variance of the variable of interest.[8] The descriptive model proposed here for movie returns attributes them to the genre, the organization (business unit), the year in which the movie is released, and interactions between genre and year, as well as genre and business unit. The purpose of analyzing organizational effects on micro-level performance should be clear. If the uniqueness of an organization matters, movie conglomerates may rationally choose to acquire independent firms and keep them operating with their previous organization to appropriate the returns to their unique resources or human capital.

Table 2 shows that business unit effects are much more important than genre, year, and genre-year effects when explaining the variance of movie portfolios. The return of a movie genre portfolio is measured as the difference in the logarithm of box office revenue and production budget summed over each genre and each business unit per year. A change in genre classification from 14 to only 10 genres does not alter the finding that business unit effects explain almost 50% of the variance of returns. The influence of the organization does change with the period of measurement, as the pure influence of business unit effects increases significantly after 1992 but the genre-business unit effects decrease. This recomposition suggests that the inherent characteristics of organizations become more critical in the later period of the sample. Organizational effects are more important for private firms, with 46% of the variance of results explained by business unit effects compared with 29% in the case of publicly-held studios. Overall, the robustness of business unit effects measured in different sub-samples is indicative of an underlying mechanism linking organization to economic returns.[9]

3.2 Investment and performance after acquisitions

Panel I of table 3 presents estimates of movie budget increments after independent distributors are acquired by major distributors and remain operating with the same organization. The estimates of the indicator variable *After Acquisition* in columns 1 through 3 are obtained within

[7] Rumelt (1991) used variance components techniques to discover that the locus of performance differentials is not the firm but business unit.

[8] The variance components method employed in table 2 allows for nesting, thus being more flexible than regression models in which a variable nested in another variable may not be analyzed jointly because of collinearity. The estimation is based on linear algorithms described in the technical appendix of Rumelt (1991). As noted there, the technique does not prevent a variance component estimate to be negative.

[9] For robustness, in unreported tests I model three alternative specifications for portfolio returns other than the logarithm of the box office–budget ratio, finding largely the same results as those reported in table 2. I also break down the portfolios into internal and external movies, depending on whether the distribution company had residual claims on the proceeds, and find qualitatively the same result of a large business-unit component.

the same organization, that is, holding business units fixed. The budget of acquired studios goes up between \$6.8M and \$10.5M dollars for movies in the same genre depending on whether a control for the quality of the creative talent is introduced (columns 1 and 2). The estimated increment of budget after acquisition becomes \$4.9M after introducing year fixed effects, as shown in column 3, with statistical significance at the 15% level. The t-statistics are high but clustering standard errors at the distributor level reduces greatly the degrees of freedom, making the usual cutoff of 1.96 go up because of the small number of clusters.[10] A different way to see budget increments after the acquisition event is to calculate relative-year fixed effects without introducing the post-acquisition dummy. Columns 4 and 5 report similar models holding movie genre fixed, and find an increase in budget significantly larger with respect to years prior to the acquisition.

A strong test of whether the investment of an independent distributos increases after becoming part of a larger studio is to measure the increase at the level of the same *production* companies with whom they have worked before. Distributors carry movies of these production companies to the market. By observing the change in investment fixing distributor and production companies, the effect is identified at the relationship level. Column 5 of table 3 shows that the production budget of the same distribution and production companies goes up in \$7.65M after the distribution company is acquired by a large studio. This finding suggests that the increment found in previous tests is not due to a reshuffling of production companies.

In contrast to the increment in production budget, the box office revenue of movies distributed by acquired studios does not increase significantly after an acquisition event. Table 3 shows that *After Acquisition* is not significant for any specification explaining box office revenue, and the relative-year fixed effects show no distinguishable difference in *Year 0*. Unlike much of the evidence on underperformance of mergers and acquisitions, the models presented here exploit project-level data, and suggest that independent studios become less profitable after being acquired. The fact that the Hollywood majors acquired well-established independent distributors suggests that the insignificant increase in performance after the acquisition is not due to their being one-timers with no further investment opportunities.

The asymmetry in the investment and performance metrics after the acquisition of movie studios can also be seen graphically in figure 1. The panels depict the relative-year fixed effects estimates in budget and box office revenue with respect to a baseline year, and reveal the contrast between the upward pattern in movie budgets and the erratic trend in box office revenues for the organizations that became part of movie conglomerates.

Do *external* capital markets impact investment and performance in the same way as internal capital markets? No. Table 4 explores the potential changes in the behavior of movie studios that switched from privately to publicly held, or vice versa. The sample is modified accordingly, including only distributors that have these two regimes, public and private, along the period. No significant difference in budget is found across regimes. All the contrary, the box office revenue is significantly higher in publicly-held regimes. The estimates are calculated within each organization, that is, holding business units fixed. As before, genre and year fixed

[10]Throughout the paper, I report the number of clusters so that the appearance of under-rejection can be assessed more clearly.

effects are included to smooth out the unobserved heterogeneity due to these dimensions.[11] The results suggest that internal capital markets do not bring the same discipline to managers as external capital markets.

3.3 Movie portfolios after acquisitions

In table 5, I analyze how the investment and performance of *groups* of movie studios change after an acquisition. The specification groups studios that will form the multidivisional distributor "in the future" (e.g., Buena Vista and Miramax), and compares their yearly movie portfolios before and after the actual acquisition. The table shows estimates obtained within each group, that is, using group fixed effects. The results confirm that the budget increases but their market performance does not vary. When regressing budget on the *After Acquisition* dummy, the t-statistic is 5.56, whereas the equivalent t-statistic when explaining box office revenue is 1.55, with a low point estimate for the coefficient of interest.

The table also shows the effect of acquisitions on the groups' opening screens, box office revenue per screen, and break-even ratio. The number of opening screens is a proxy for marketing expenses and other short-term investments involved in commercializing movies. The estimate is positive and highly significant when no control for talent quality is included, and it remains significant at the 11% level when the control is introduced. The ratio of movies breaking even, measured as a dummy variable equal to one when box office revenue is greater than production budget, goes down in 0.16 after an acquisition. Taken together with the results in table 3, the yearly portfolio comparisons provide robustness to the idea that investment efficiency decays after an independent becomes part of a multidivisional studio. More importantly, the fact that we are observing the investment and performance of *acquiring* studios pooled together with acquired studios suggests that the investment efficiency fall is not due to an internal rearrangement of good and bad projects.

3.4 Instrumenting for the effect of multidivisional structure on investment and performance

We seek to understand the effect of organization on investment efficiency. So far we have observed a negative correlation between internal capital markets and performance, under the identification strategy of using within-organization estimates of performance for independent studios acquired by the Hollywood majors. But many project characteristics may be changing along with the working of an internal capital market, so that the event studies centered on acquired studios may hide substantial heterogeneity. An instrumental variable design will help address these concerns.

The sample for the new set of models draws from all feature films released between 1990 and the first quarter of 2005 by all distributors in the market. The starting point is one year before the first multidivisional movie distributor, Sony, participated as such in the marketplace.

[11] The models in table 4 use absolute, not relative, year fixed effects because most of the regime changes are to go private rather than to go public. Relative year fixed effects would lack a straightforward interpretation.

This time horizon is appropriate to model each distribution contract as a match between creative teams and distributors because before 1990 creative teams did not have the alternative to choose between focused an multidivisional distributors. In the new set of tests, multidivisional studios are those participating with more than one division in the marketplace, regardless of whether these exist due to acquisitions or internal development. Thus, for the first time in the analysis, specialty divisions developed internally by distributors (e.g., Fox Searchlight) are considered part of multidivisional structures, in parallel to their core divisions (e.g., Twentieth Century-Fox). The sample includes majors, specialty divisions, and independents, totaling 85 distribution companies.

Before describing the methods and results, it is instructive to plot some summary statistics. Figure 2 shows the average production budget and box office revenue for the four most popular movie genres, breaking down the estimates by type of organization: focused or multidivisional. There is great heterogeneity in the influence of structure across genres. Sometimes multidivisional structure is associated with higher box office revenue for the average movie (e.g., comedy). But in all four cases, multidivisional structure reflects higher production budget. We start to observe an asymmetric pattern in the influence of internal capital markets on investment and performance in the cross section of firms in the industry.

Table 6 provides summary statistics on the 2,152 movies for which budget information is available, distributed by focused or multidivisional distributors in the period 1990-2005. The median movie costs \$14.7M but collects only \$9.8M in box office revenue, suggesting that investment efficiency is a key concern to survive in the industry. Over 65% of movies in the sample were distributed by multidivisional firms, suggesting that the organizational structure analyzed is prevalent in this period.[12]

A. Instruments

We are looking for a causal explanation of whether internal capital markets lead to lower investment efficiency. A unique feature of the movie industry is that creative teams need a match with a distribution company. Therefore, each movie project involves a choice of a particular type of distributor, so that we can observe the marginal influence of a multidivisional structure on investment after controlling for many project and firm characteristics.

To test how multidivisional structure affects investment efficiency, a regression should relate a movie's budget to proxies of the existence of such organizational design. The key empirical concern is that investment is likely to be correlated with unobserved project-level heterogeneity. The characteristics requiring a larger budget may cause the match with a multidivisional distributor, and not the converse. That is, the participation of a multidivisional distributor in large-budget projects may be endogenous. I account for this possibility using instruments for the match of a multidivisional distributor and a movie team.[13]

[12]Movies of multidivisional studios are oversampled because they report budget information more frequently than focused studios, a requirement to be included in the analysis. In the population, , only 38% of movies are carried by multidivisional firms, still a large share of the market. Resampling robustness checks will be addressed in subsection 4.3.

[13]The event studies in previous tables use the indicator dummy *After Acquisition* directly. In the sample discussed here, a direct regression of budget on whether the distributor had multidivisional configuration also yields a positive and significant coefficient, though the instrumental variable design is methodologically better suited.

The three instruments introduced in this study exploit information on the creative team making a movie. Creative teams have some average level of prior interaction with the major Hollywood firms, some experience with different distributors, and a number of debutants. The definitions of these variables were provided in subsection 2.2. In contrast to most instrumental variable studies using exogenous drivers that may not overlap with the sample of interest, I exploit team characteristics that are present in all projects. This strategy gives confidence that I am measuring population treatment effects, and not local effects (Imbens and Angrist 1994). Figure 3 gives evidence on this feature of the design, showing that the kernel density of each instrument is very similar to the Gaussian distribution.

B. Mechanisms through which the Instruments affect Structure

The instruments affect the choice of a distributor type because of the complexity of a project, without influencing the production budget of a movie or its box office revenue through channels other than this choice. To see this more clearly, I construct three measures of movie complexity and analyze how they relate to the instruments and to the choice of multidivisional distributors.

Good candidates to measure complexity in movie production are the length of the production period and the complexity of the story.[14] Table 7 reports two-stage least squares (2SLS) estimates of how shooting time, post-production wait time, and the number of writers influence the choice of a multidivisional distributor. In the first stage, the instruments introduced in the study are shown to be related to complexity in sensible ways. In the second stage, complexity is shown to influence insignificantly (e.g., production time) or significantly (e.g., number of writers) the match with a multidivisional studio. These findings suggest that the mechanism through which the instruments work is the complexity of a movie project.

Because instruments are not testable, their suitability has to be argued on the basis of economic terms. The first two columns of table 8 indeed give strong evidence on the suitability of the instruments. The instruments are highly significant when explaining the endogenous regressor *and* the dependent variable. Moreover, the direction of the influence (i.e., signs) is internally consistent. The binary Logit model in the first column regresses the multidivisional dummy on a set of project characteristics including the three instruments of interest. The results show that creative teams are more likely to make movies with multidivisional distributors when they have more experience working with the majors, and when they have a higher proportion of talent debuting in feature films. Movie teams are less likely to match with multidivisional distributors when they have had more diverse interactions with distribution firms in the past. All estimates are obtained after controlling for many controls, as well as genre and year fixed effects, thereby doing away with linear unobserved characteristics in these dimensions. Business unit fixed effects, however, are not to be used, to keep consistency in the matching argument that creative teams decide cross-sectionally on what studio should carry their movies, and not intertemporally (e.g., choosing Miramax in 1991 vs. Miramax in 1995), controlling for year fixed effects.

The second column of table 8 provides a strong confirmation that distributors' investment behavior changes after they become part of an internal capital market. The model is an OLS

[14] Production length information is only available for 452 movies.

regression of movie budget on the instruments and other project characteristics. Teams with more experience with major distributors, less diversity of interactions with distributors in the recent past, and a higher ratio of principals debuting in the film all require significantly larger budgets, after controlling for all other factors and including genre and year fixed effects. The t-statistics for these coefficients are highly significant, with the ratio of debutants slightly above the 10% significance level (t=1.53). These findings are strong evidence in favor of a causal interpretation of multidivisional structure affecting investment. It is hard to find reasons why team-level variables such as individuals' diversity of interactions with distributors or inexperience in the trade would lead to higher budgets after controlling for the team's quality, outside of indirect effects through the matching with multidivisional distributors.

C. Main Results

Table 8 shows that the influence of multidivisional structure on investment is sizable. Multidivisional distributors invest significantly more than focused distributors on projects otherwise equal. The 2SLS estimates in columns 4 and 5 reveal that the participation of a multidivisional distributor in a movie adds between $20.7M and $24M to a movie if it is carried by the main division of the distributor, or $7M if it is carried by its specialty division, as the coefficient for the specialty dummy is -$13.6M. The last column presents GMM estimates using a two-step estimation of the variance-covariance matrix, yielding a budget differential of about $10M for specialty divisions. These point estimates are strikingly similar to the those of the acquisition event studies reported in table 3.

The unreported first-stage regressions for these models are OLS, as suggested by Angrist (2001). The estimates vary little when using only movie-level regressors (column 4) or all divisional and corporate controls (column 5). The fit of the regressions in the first and second stages is very good. Because three instruments are used, Hansen's tests of overidentifying restrictions are reported, with p-values over 0.38, suggesting no reason to reject the validity of the instruments. The clustered standard errors impose a conservative on autocorrelation, and the t-statistics for the multidivisional structure coefficient demonstrate that the effect is highly significant.

It is worth noting that the controls account for many factors other than multidivisional structure. Project-level characteristics such as the length of the film, the number of creative people involved, and the relative inexperience of a distributor impact a movie's budget in a significant way. The 2SLS estimates from column 4 are little changed after introducing distributor-level controls in column 5. Holding fixed the concentration of genres on the slate, access to external capital markets, the scale effect reflected by average box office revenue, and the count of movies distributed in the previous year, the project-level variables maintain their significance while the distributor-level variables are largely insignificant. The instrumented regressor has a t-statistic of 1.71. Because this regressor reflects organizational structure, it is interesting that other divisional factors do not matter to the extent that structure does.

Table 9 is the mirror image of the previous analysis, but focuses on how multidivisional structure influences *performance*. The 2SLS regressions of box office revenue on multidivisional structure and many characteristics demonstrate that multidivisional operation does not impact box office performance positively. Column 1 uses the regressor directly along with its proxies,

finding a negative effect. Column 2 uses the instrumented variable and the full set of controls, and still finds a negative coefficient though with a t-statistic of -1.17. The final columns use variants of the dependent variable to consider measures of great importance to industry practitioners, especially the majors, and they are all based on box office results. The results show that multidivisional structure does not impact the first three weeks of box office revenue (column 3), the box office revenue of movies released in top-grossing holidays (column 4), or the revenue per screen of the movie (column 5). The last column follows a 2-step GMM specification for the whole sample of movies, showing insignificant coefficient on structure. All these results are strong evidence that the multidivisional structure does not help achieve superior performance in the marketplace.

D. What is Driving the Negative Influence of Multidivisional Structure?

The causal interpretation that multidivisional operation affects investment while leaving performance unchanged is now further explored. Movie distributors can integrate vertically into movie production, or simply carry movies produced externally without becoming residual claimants. I exploit information on this contractual difference to shed light on whether multidivisional structure affects investment behavior in one type of movies more than in the other. The results for external movies are particularly interesting. Panel I of table 10 shows that multidivisional structure entails a higher production budget for external movies, but does not affect their market performance. In contrast, the unreported results for vertically-integrated movies show a less significant effect of structure on investment. This finding supports the logic of the instruments gauging the match between creative teams and a distributor's organizational type, a process more intuitively understood in the case of movies produced externally. Moreover, the finding that structure is affecting negatively the overall performance of external movies suggests that distributors can still be optimizing in equilibrium with their organizational design because they are not residual claimants of external movies that do poorly. Yet it is unlikely that only this rent-capturing explanation drives the results of tables 8 and 9. The total incremental budget in the case of external movies is about \$3.3M (\$16.9 minus \$13.5M), less than half of the total effect found for the whole sample.

It is well known in Hollywood that R-rated movies are especially risky to handle commercially (De Vany and Walls 2002). Panel II of table 10 shows the effect of multidivisional investment on the budget and box office revenue of R-rated films.[15] The asymmetry and coefficient estimates are strikingly similar as those found in the main results. In an unreported table, the results for movies with lower rating than R (e.g., G) show no significant influence of structure on investment efficiency. Thus R-rated movies are projects that demand more budget but yield no incremental benefit when distributed by multidivisional studios. The mechanism for this result could be the commercial complexity of these projects, and the more lavish financial resources in the internal capital market for investment prospects that would receive less funds in a focused organization.

One type of movie that seems to do well in multidivisional studios is the one with many stars. The last panel of table 10 reports models using an alternative measure of talent financial

[15]The database includes the NC-17 and X-rated films released in theaters and covered by *Variety*, but no movies of these types have budget information available. Thus R is the highest rating included in the sample.

score based only on top-20 billing actors. Movies in which this score is greater than 50 are considered star-studded and used as the new sample for the same tests. The results show that multidivisional structure benefits investment efficiency in this type of movies.

We can step back and probe "multidivisional" structure further. Two types of organizations are included in this classification: Hollywood studios that acquired independent distributors and kept them operating semi-autonomously in parallel to the core division, and studios that developed specialty divisions internally. Hence it is worthwhile to compare the differences across these two groups. Table 11 summarizes regression results restricting the sample only to specialty divisions' movies. The purpose is to assess differences across different types of multidivisional studios.

The results in table 11 demonstrate that specialty divisions resulting from acquisitions are associated with a larger budget than divisions developed internally by the major studios. In regressions explaining budget, the coefficient on the dummy for acquired divisions has a value between \$4M and \$6.3M depending on the specification, with t-statistics higher than 2.5. In contrast, these acquired divisions do not show box office revenue or revenue per screen significantly different from those of internally developed divisions. The case of MGM is noteworthy because some of its movies are considered "specialty" without belonging to a specialty division.[16] When excluding MGM's specialty movies from the analysis, the result that internally developed divisions are more frugal than acquired divisions is unchanged.

E. Exploring the "Ancillary Revenue" Hypothesis

Movies may have more 'legs' in a larger firm. I explore the possibility that studios become more complacent in their investment analysis because, even after controlling for many project and divisional characteristics, the nature of a multidivisional distributor might be automatically associated with a longer revenue stream.[17] The empirical tests of this ancillary revenue hypothesis are limited by the fact that my data do not cover revenues beyond the box office. External empirical evidence from marketing studies suggests that box office revenues are highly correlated with subsequent income sources, making the results obtained thus far suggestive of the negative effect of multidivisional operation. Yet I go beyond the analysis of hard data to validate the result that multidivisional structure does not enhance revenue.

The first route is the prediction of ancillary revenue based on observable characteristics. I consider two external studies on ancillary revenue for movies. First, Luherman and Teichner (1992) provide detailed estimates of "ultimate" movie revenue for more than 90 movies released in 1989 considering sources beyond theatrical exhibition.[18] Based on the revenues of these movies, I fit regression models on project-level characteristics, and make out-of-sample predictions for movies distributed in the next few years and by the same distributors as those in that study. With the predicted revenues, I fit 2SLS models on the influence of multidivisional investment. Panel I of table 12 confirms that the effect of multidivisional

[16] Including MGM's specialty movies without attributing a multidivisional structure to MGM gives a nice orthogonality property to the specialty division dummy in the main 2SLS specifications.

[17] I explore additional revenue while remaining silent about additional *costs*. The advertising expenses of the Hollywood majors escalated during the period studied. Broadening performance measures without broadening cost will bias the results in favor of a beneficial effect of multidivisional structure.

[18] The HBS Arundel case is fictional, but the data in the case are real.

structure is asymmetric. There is a positive and significant influence of structure on budget, and an insignificant influence on total revenue generated by the movie.

The second set of models presented in table 12 uses predicted DVD sales based on coefficient estimates found by Luan and Sudhir (2005). I impute the coefficients on the characteristics that most significantly predict DVD sales, and make out-of-sample predictions to simulate total revenue. When comparing the influence of multidivisional structure on budget and revenue, I find again strong evidence of inefficiency. Movies distributed by multidivisional studios perform more poorly than those by focused distributors.

Another way to investigate the ancillary revenue hypothesis is based on box office revenue alone. I restrict the sample to only large movie distributors. If the hypothesis were true, we would find that restricting the sample to only large Hollywood firms would find no difference in the influence of multidivisional structure on budget and performance. Yet the results of 2SLS models using this sub-sample, reported in panel III of table 12, show very different coefficients and t-statistics for the variable of interest. There exist important differences between large distributors operating with one division, and large distributors operating with several. Multidivisional structure increases budget but leaves box office revenue unchanged.

The industry structure in ancillary markets gives further confirmation to the empirical findings. Media companies other than the Hollywood majors were greatly benefited by the renaissance of independent film in the period studied. It became relatively simple for focused distributors to offer attractive deals to TV stations, cable networks, and other content-buyers. The large number of firms competing in these industries is at odds with the vision that only the majors could offer ancillary markets to creative teams.

4 Further empirical considerations

This paper brings the debate on the efficiency of internal capital markets to the micro level of individual projects in a competitive industry, arguing that firms with a multidivisional structure invest less efficiently than focused firms. To better interpret the results, it is pertinent to discuss whether the investment regressions are well defined, and whether the coefficients of the main empirical tests make economic sense besides their statistical significance. For a balanced evaluation of the results, a discussion of their robustness is also appropriate.

4.1 The elements of investment regressions

An innovation of this study is that all the investment models introduce a *project-level measure of investment opportunities*, the quality of creative talent measured in a dollar score.[19] Most cross-industry models of investment control for investment opportunities using Tobin's Q, or a proxy for the shadow price of capital. There exist also precedents using industry-specific measures modeled at the corporate or divisional level. Khanna and Tice (2001) use productivity in the

[19] In a study of investment-cash flow sensitivities in the movie industry (Natividad 2007), I use Wall Street analysts' forecasts to control for investment opportunities at the *divisional* level.

supermarket sector to gauge investment opportunities. I exploit the fact that the main item of a production budget is the salaries of actors, and that Hollywood cares greatly about the track record of talent. In unreported regressions using a small sample of 776 star salaries, I find that they are highly correlated with the metric of talent financial score, and that person-fixed effects regressions of salaries on talent financial score have a good fit, with the score having a high explanatory power.[20] Previous work on Hollywood has found similar correlations (e.g., Prag and Casavant 1994, Sorenson and Waguespack 2006). Based on previous box office results of the talent, the production and distribution companies decide how much to invest in stars and all the other budget items. I introduce a new way to measure their investment opportunities.

As seen in all specifications, the financial score of talent is a powerful regressor for movie budget, the dependent variable gauging investment. Moreover, it allows for an interpretation of the main factor of interest, multidivisional structure, beyond the effects of quality differentials. After controlling for the star power of talent, a multidivisional structure significantly increases the budget of a film.

Another methodological innovation is the treatment of potentially endogenous relations between the proxies of internal capital markets and investment. As explained in sub-section 2.2, this is achieved by saturating the regressions with many controls, including within-estimates at the genre and year levels, and instrumenting for the participation of a multidivisional firm in 2SLS designs. There are many differences in the investment characteristics of movies, but there are far fewer differences within a genre (e.g., romantic comedy) and within a year, so the analysis does away with fixed sources of unobserved heterogeneity.

The empirical design is also in line with a vast literature in finance arguing that investment regressions should account for scale and liquidity (Natividad 2007). The main models include proxies for previous-year cash flow and size of the distributor. The Herfindahl index of genres helps control for the focus of the studio not captured by a simple count of movies distributed, and the publicly-traded dummy accounts for differences due to access to external capital markets. Because these regressors are common to several observations, the use of clustered standard errors at the distributor level is appropriate.

4.2 The economic significance of the results

The results of the two identification routes are internally consistent. The event study design in table 3 finds that independent studios increase the budget of their movies by $6.8M on average after an acquisition. The unreported unconditional mean of the budget of these studios is $5.3M and $14.7M before and after being acquired, respectively. Thus the estimated increase is accounting for 72% of the unconditional increase. While it may seem surprising that the budget doubles after an acquisition, the estimate is in line with the stratified nature of the industry, where independents and majors are abysmally different in the size of their investment.

The way to compare the 6.808 coefficient discussed above with the 20.72 coefficient (t-stat=1.71) in the second 2SLS model of table 8 is straightforward. In the 2SLS specification the

[20] It is also worth noting that investment opportunities are created when assembling the team, so that my observation of the teams *ex post* may underestimate investment opportunities.

correct coefficient for the increment of budget due to multidivisional structure is the sum of the instrumented multidivisional coefficient \$20.7M and the specialty movie coefficient, -\$13.6M (t-stat=-2.59), resulting in \$7.1M. This is a reasonable value for the cross-sectional difference between specialty and independent distributors in Hollywood, and is very close to the within-organization increase of \$6.8 from table 3. Despite being based on different samples, control variables, and assumptions, the cross-sectional and longitudinal estimates of how structure affects investment behavior of independent firms are very similar.

The finding that organizational structure affects the budget but does not affect the box office revenue of a movie has important economic significance. The unconditional mean of budgets of independent distributor movies from 1990 onwards is \$7.5M. Thus the \$7M coefficient discussed earlier represents a 93% increase in an independent film budget if the project is brought about through a specialty division. No statistically significant boost in market performance, however, is revealed by the 2SLS coefficients in table 9. Therefore, the average creative team making a movie with a specialty division can be almost certain that the investment in the movie will be 93% larger, but not at all certain that the movie will do better at the box office to match that increment.

4.3 Robustness tests

To provide further confirmation of the results, I perform a large number of robustness checks, some of which are highlighted in table 13. The tests introduce changes in the sample and the specification of the benchmark 2SLS models. The results obtained using different sample periods suggest that the negative effect of multidivisional structure is more pronounced at the early stage of this organizational innovation, as the coefficient is much larger when restricting the analysis to the period prior to 1999. This finding suggests that Hollywood studios are learning to make their internal capital markets work to their benefit. In unreported tests, I exclude one by one the twenty largest distributors from the sample, finding that the results are not affected. These tests guarantee that no single firm is driving the finding of inefficient multidivisional structure.

Other tests probe the suitability of the instruments. When excluding more than a hundred movies for which the value of the instruments is very high, that is, the outliers in the right tails of the kernel densities shown in figure 3, the results remain largely unaffected. The concern about the availability of budget information for 41% of the population of movies is addressed in several ways. In unreported Wilcoxon unmatched-sample rank-sum tests I find that the distribution of some variables such as box office revenue is different for the sub-samples with or without budget information, and the distribution of two instruments is also significantly different across these groups. Tests of differences in means and medians, however, suggest that the sample used in the study has a larger share of high-revenue movies than the population. Thus the potential direction of the bias is against the results of the study, which demonstrate no impact of multidivisional structure on revenue. The fact that the instruments have well-behaved distributions relieves concerns about how their loading may bias the results.

Similarly, table 13 shows that changes in specification do not affect the main findings.

The key control for the quality of a creative team, the talent financial score, is modeled with different years entering the moving average. As reported in the specification using two years for the team-level moving average in the first row of panel B, the one with the weakest relation with star power, the coefficient explaining budget is similar to the benchmark case and also highly significant. Other tests reported in table 13 regarding fixed effects or clustered standard errors leave the asymmetry between larger budget and flat revenue unchanged.

There exists a theoretical tradeoff between instrument quality and sample size (Bekker 1994). Besides providing evidence on the economic characteristics of the instruments in section 3.4, I perform multiple statistical tests and find that the instruments are of good quality, that is, well correlated with the variables of interest. The first-stage regressions are highly explanatory, so that weak identification is not an concern (Stock, Wright, and Yogo 2002). Moreover, it has been argued that the number of instruments affects the small-sample properties of estimators (Donald and Newey 2001). I find that using the quadratic version of the instruments in addition to the values in levels does not affect the coefficient estimates. Nevertheless, the fit of the first-stage regressions obtain in such a way is not as good as using only instruments in levels.

Are clustered standard errors good enough? It has been argued that some types of bootstrapping may yield better accuracy than clustered standard errors in non-experimental designs (Bertrand, Duflo, and Mullainathan 2004). I address this issue in three ways. First, I run bootstrap repetitions resampling at the movie level and choosing the optimal number of repetitions that guarantees significance levels consistent with the study (Andrews and Buchinsky 2000). The results of these tests are reported in the last row of table 13, showing a slight increment to 13.6 from the benchmark standard error. Second, I bootstrap distributors rather than individual movies, an equivalent way of showing clustered standard errors but exploiting the nice properties of the bootstrap to improve the first-order expansions of a linear design. Third, I draw on theoretical considerations for the more general case of GMM designs (Hall and Horowitz 1996) and implement the block bootstrap, resampling blocks of observations so that the time series structure of the data is maintained. The unreported results are qualitatively the same as the benchmark estimates.

5 Discussion

5.1 Implications for research

This paper provides rare micro evidence on the efficiency of multidivisional operation, a topic of major interest in financial economics and corporate strategy. While it would be surprising not to see any change in investment or performance after the change in ownership from independent to division of a conglomerate, it is striking that the change is asymmetric. The clean observation of this phenomenon is facilitated by the rich detail of the data. Much of the research in the mergers and acquisitions literature cannot untangle investment efficiency because it is difficult to observe the pre- and post-acquisition operation of organizations. Moreover, the cross-industry evidence of previous work on internal capital markets only indirectly relates to the micro nature of theories of divisional investment. While it is methodologically appealing to

draw inferences on large samples of many different economic activities, the working of internal capital markets raises micro questions that can only be approximated in those settings making somewhat restrictive assumptions.[21]

This study investigates the investment efficiency of firms participating with multiple divisions *in the same industry*, defining industry in a very precise way.[22] A precedent to using intraindustry categories to study performance differentials is work by Siggelkow (2003), though he does not attempt to study investment efficiency.[23] My observation of different divisions in the same industry enhances the power of the empirical tests to capture the organizational component of investment efficiency, which I call the *organizational efficiency* of internal capital markets. I gauge the existence of an internal capital market by observing the number of divisions doing the same economic activity. Billett and Mauer (2003) propose a linear definition for the value of an internal capital market based on inferred capital flows to and from divisions of diversified firms. My approach is new. The advantage with respect to studies of "related diversification" should be obvious. With a newly acquired or newly developed division, new costs and investment opportunities arise by the sheer fact that this division is in a different line of business, adding a new source of potential endogeneity to the study of organization and investment. My study of movie distributors circumvents these problems.

The results have several important implications for the current literature on diversification and internal capital markets. The negative impact of a multidivisional design on efficiency goes against results highlighting the benefits of internal capital markets (Khanna and Tice 2001, Guedj and Scharfstein 2004). The single-industry focus provides more detailed evidence than previous cross-industry studies also discovering negative effects (Ozbas and Scharfstein 2007). Because both types of divisions in movie distribution perform essentially the same activities, the design circumvents the separability problem between new investment opportunities and additional structure faced by research on related diversification (e.g., Rawley 2007). Multidivisional firms in this industry have a much higher market share than specialists and yet have lower investment efficiency, a result against the argument by Santaló and Becerra (forthcoming). Because investment and performance are observable for each project in the sample, the paper provides a new way to assess investment efficiency (Çolak and Whited 2007). In particular, each investment is linked with its own revenue, so that the lag between the drivers of inefficiency and value differentials can be traced better than in cases such as R&D (Seru 2007). By drawing from reliable industry sources, the paper overcomes some of the typical concerns about measurement error due to data structures (Whited 2001, Chevalier 2004, Villalonga 2004).

The findings should also be of interest to the strategy literature studying the locus of performance differentials: the industry, the corporation, the business unit, or time (e.g., Rumelt 1991, McGahan and Porter 1999). First, I illustrate how the techniques of this literature

[21] The very construct "investment efficiency" in the literature often refers to investment above a rough average or median, or to some performance metric, without tracking down the returns to investment. An exception is work by Çolak and Whited (2007) including a variety of efficiency measures in the study of spinoffs.

[22] The definition of "movie distribution industry" in this paper is based on reliable industry sources, and is widely accepted by industry participants and external observers.

[23] Recent work has used data on mutual funds to address organizational questions (e.g., Siggelkow 2003, Chen, Hong, Huang, and Kubik 2004). A limitation of that setting is that mutual funds constitute a peculiar economic activity in which value creation is largely driven by security portfolio management and transaction fees.

can be applied to the internal reality of the *business unit*. The movie industry seems to have the right data structure for this exercise (e.g., thematic genres), but other industries with data on plants or geographies seem promising. Second, I argue that these techniques can be introduced to the analysis of mergers and acquisitions. This line of research could lead to solve an old puzzle in strategy research: the apparent paradox between corporate (Rumelt 1974) and business unit effects (Rumelt 1991). Corporations know that business units matter. Therefore, a corporation may want to acquire another corporation, and leave it functioning as a semi-autonomous division. The largest movie studios may have rationally chosen to acquire independents to learn their "magic." Third, I show robust evidence that there exist returns to managerial competence at the level of the business unit, even when considering variation inside the business unit. To the best of my knowledge, this is one of the first confirmations that Rumelt's (1991) result holds also from *below*.

From a methodological perspective, this study expands the use of proven techniques in the investigation of the internal constructs of the firm. New research is encouraging. Garmaise (forthcoming) uses personal information on the owners of small businesses to instrument for corporate financial constraints. Lederman and Forbes (2007) use weather in airport terminals to identify the effect of vertical integration on airlines' operating performance. Novak and Stern (forthcoming) discover that outsourcing is associated with high performance in car manufacturing in the short term, but vertical integration is superior later in the product lifecycle. My design brings the attention to creative teams in their match with corporations, providing extensive evidence on the mechanisms behind the instruments for structure. This approach could be exploited in other economic studies of organizations.

Naturally, in a research stream with little empirical evidence, there is still much to be done. On the one hand, financial economics is paying more attention to the effects of organization on performance (e.g., Chen, Hong, Huang, and Kubik 2004). On the other hand, corporate strategy has long been studying the spectrum of diversification and structure possibilities (e.g., Rumelt 1974, Villalonga and McGahan 2005). What is needed is a better understanding of the micro-mechanisms for outcomes such as diversification. So there is an opportunity to overcome the impasse of contradictory results in an "unlikely topic for research" such as the diversification discount (Maksimovic and Phillips 2006, p. 22), and investigate why internal capital markets exist, how they affect the organization, and how they can be improved (Liebeskind 2000). There are many avenues for future work. For example, research at the plant level finds strong evidence that industry life cycles matter for organizational effects on performance (Maksimovic and Phillips forthcoming). Many well known constructs can be rediscovered to examine the internal reality of the firm.

5.2 Implications for practice

The Hollywood major studios are constantly experimenting for new ways to enhance *their* investment efficiency. This paper shows that *overall* investment efficiency is hurt by a multidivisional structure. The results emerge from studying the acquisition of independents when they are followed by organizational autonomy, and from the cross-sectional differences after they operate with a multidivisional structure. Because movies usually involve different

investors, it is possible that the major studios are still profitable after these organizational arrangements, even if the overall investment efficiency decreases. Armed with complex financial contracts and great bargaining power, movie studios may be squeezing other parties, forcing them to finance most projects independently, consistent with calculations by Goettler and Leslie (2005). Another possibility is that the lower performance at the box office makes studios put more pressure on divisions responsible for ancillary markets (e.g., DVD, pay TV). In either case, investment inefficiency has long-term negative implications that can be alleviated with new project-selection methods, or new organizational practices, and not just with short-term financial contracts that may seem to save the day for the studios.

The rent of Miramax and those studios acquired by conglomerates might have been the ability to pick winners at low price. When their financial constraints are relaxed, they take on more risk but do not achieve higher performance. In related work (Natividad 2007), I find that specialty divisions mostly finance their investments with the internal funds they generate, while the major divisions depend less on their internal finance. Therefore it is possible that these divisions are financed well, but that other organizational factors are making them less efficient. Spinning these divisions off while retaining ownership would be a better alternative than simply merging them fully into the majors, which would undo what has been gained in terms of market expansion and experience handling independent talent.

Creativity is the driver of value creation in the movie industry. Yet the access to more financial resources may not help creativity. Nimble organizations may become more complacent. Ideas may be run and re-run to create franchises. Projects that do not fit with the firm's culture may still be pursued with the desire to profit from more revenue outlets. The new wave of private-equity investors trying to outsmart established studios with complex portfolio deals should be very clear about how they can help create value.

When compared to many traditional industries, movies seem more complex. But precisely this complexity may force firms to design new organizational arrangements that guarantee their survival and prevalence. Hollywood is successful and remains the most American of industries (Leamer 2007). Many creative industries face similar challenges but do not show the same resilience as Hollywood. The results of this paper can motivate further managerial action to experiment, correct, and experiment again, being mindful about the financial consequences of organizational decisions.

Because multidivisional operation within an industry is a widespread practice, the study transcends the focused setting of movie distribution. Hollywood alone presents other examples of this design. Pixar, the renowned animation studio acquired for $5M by Steve Jobs in 1986 and sold for $5B to Disney in 2006, is currently run separately from the traditional Disney animation division. Sony and a pool of private equity firms acquired MGM in 2005, but have left the firm operate with substantial autonomy from Sony Pictures. In other industries we also see many cases. Lexus is kept separate from Toyota, and several chains of the Hilton Hotels participate in largely the same line of business with different organizations and market focus. Managers and investors make decisions hoping to find organizational arrangements that allow their firms to succeed in an industry. Further investigation of the interplay between internal flows of capital and organizational structure would have important practical applications.

6 Conclusion

In this paper, I provide specific evidence that the multidivisional structure of the largest movie studios in Hollywood increases investment, measured in real dollars per movie, but does not affect performance. I arrive at this finding by observing within-organization changes after the acquisition of independent distributors, and by accounting for the potentially endogenous relation between multidivisional operation and investment. This negative effect of organizational structure is puzzling because the major studios acquired successful independent distributors to learn their project selection methods, or developed new divisions to expand their presence into lower-investment prospects. My results highlight that the effect of a multidivisional structure on efficiency can be sizable at the project level in addition to many financial and organizational characteristics. Because this effect is negative, I conclude that internal capital markets in Hollywood do not improve investment efficiency.

This paper contributes to the current debate on the efficiency of internal capital markets by focusing on a competitive industry where the boundaries of firms and divisions can be observed with precision. Most empirical work in this research stream is conducted using large panels of many industries. Yet managerial competence, contractability, unobserved heterogeneity, and many other concepts used in theory require a detailed analysis that may be better performed at the intraindustry level. This endeavor becomes more rewarding when the industry and companies of interest are highly visible and have great influence on society.

The study of firm structure and internal capital markets is particularly relevant in an economy where most large firms are diversified, and where more companies are becoming reluctant to pay the cost of external capital markets. New evidence on why internal markets for financial and human capital exist, what they do, and how they can be improved will have substantial welfare implications.

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Figure 1: Budget, Box Office Revenue, and the Acquisition of Movie Studios

This figure depicts changes in movie budgets and revenues for distribution firms before and after they are acquired by the Hollywood major distributors. The variables of interest are the incremental budget (panel A) and the incremental box office revenue (panel B) calculated for movies of the same organization (business unit) and in the same genre (e.g., comedies) before and after the corporate event. The dashed line depicts heteroskedasticity-robust standard errors of the mean estimates clustered by distributor. In terms of the regression models in table 3, the graphic panel A is equivalent to the full description of relative year fixed effects in column 4, and graphic panel B is equivalent to column 9. The baseline coefficient is Year -11. Budget and box office revenue are in millions of 1985 dollars.

Figure 2: Structure, Investment, and Performance in Most Popular Genres

This figure shows the average production budget and box office revenue of movies in the four most popular genres: action, comedy, drama, and suspense. The data are from 1990-2005, the period when Hollywood distributors participated with a multidivisional structure. Budget and box office revenue are in 1985 millions of dollars.

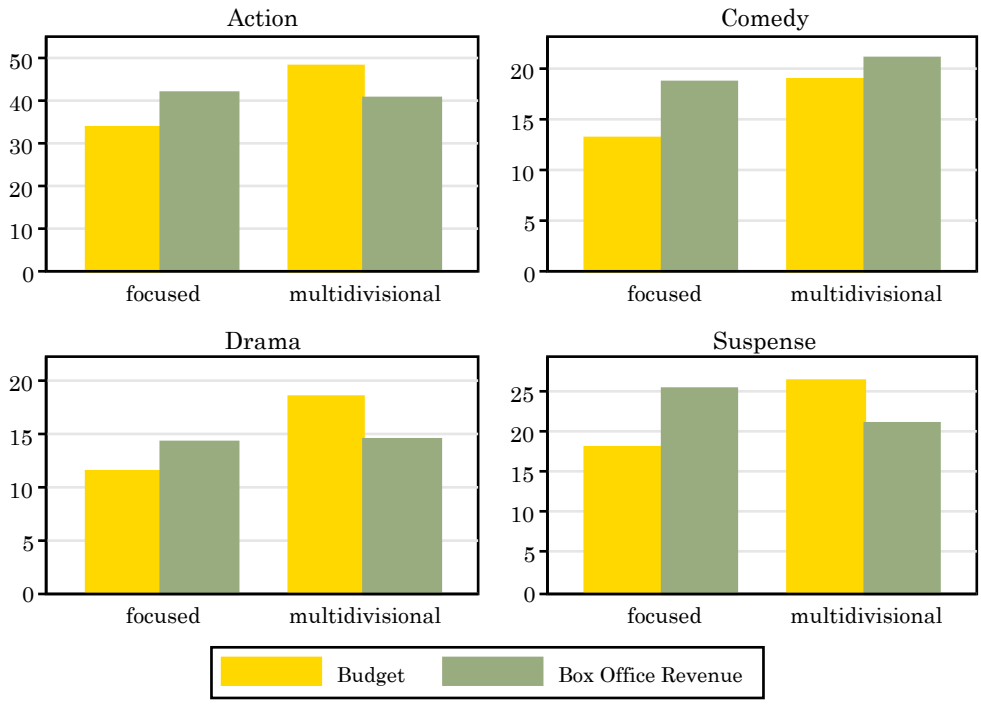

Figure 3: The Distribution of the Instruments for Multidivisional Structure

This figure plots the kernel density of the three instruments modeling the match between a creative team and a multidivisional structure type. The instruments are defined in subsection 2.2, and their characteristics are discussed extensively throughout the paper. The kernel is Epanechnikov's, with the bandwidth that would minimize the mean integrated error if the distribution were normal. The sample consists in 2,152 movies between 1990 and 2005.

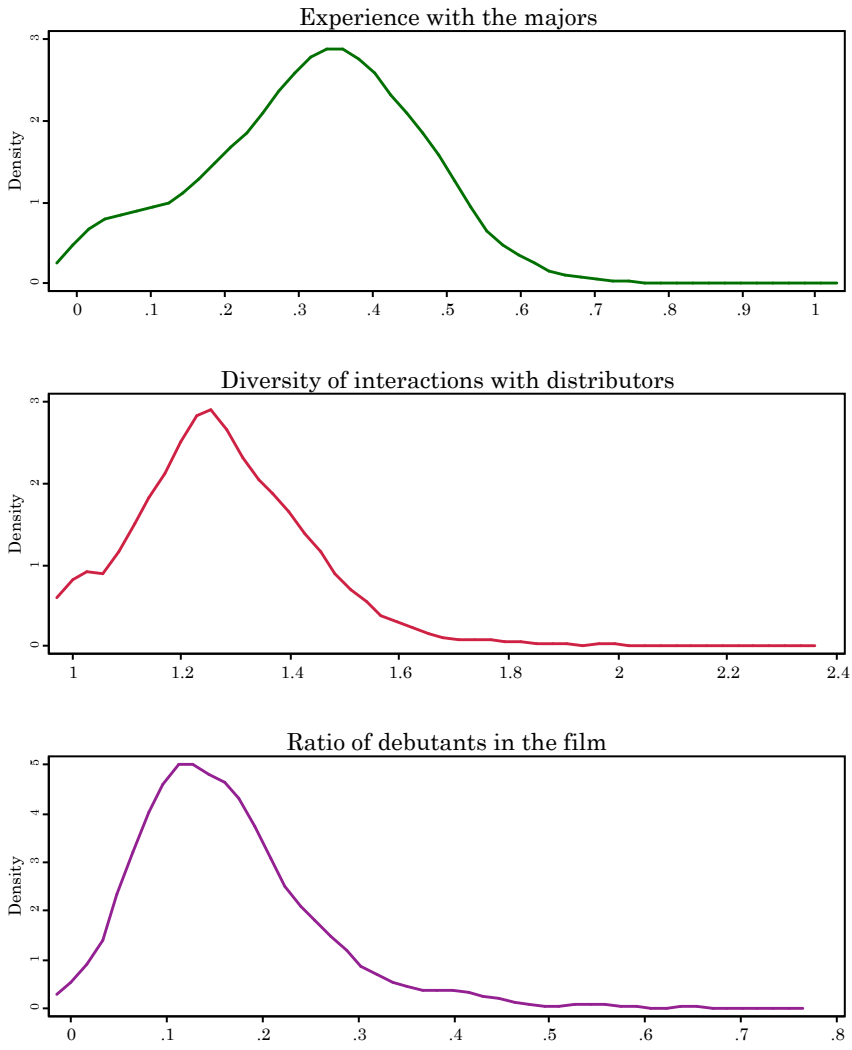

Table 1: Hollywood Major Studios, their Acquisitions and Internally Developed Divisions

This table presents information on the major Hollywood studios and their specialty divisions in existence through acquisition or internal development between 1985 and and the first quarter of 2005. Ownership information is from Hoover's, the *Wall Street Journal* archives, Dun & Bradstreet's *Who Owns Whom*, and Wikipedia. t_0 is the quarter of the first movie launched by the distributor in U.S. theaters in the period 1985.1-2005.1, covered by *Variety*/AC Nielsen EDI; t_f is the quarter of the last movie launched in the same period.

Distributor	**Classification and ownership summary description**	t_0	t_f
Buena Vista	Major, a division of Disney.	1985.1	2005.1
Columbia	Major, acquired by Coca-Cola, then acquired by Sony (1989), ceased distribution in 1993.	1985.1	1993.4
Fine Line	Independent, later specialty division of Time Warner, always related to New Line.	1991.2	2004.4
Focus Features	Specialty division related to Universal, formed merging USA Films and Good Machine.	2001.2	2005.1
Fox Searchlight	Specialty division of Fox Entertainment (News Corp).	1995.3	2005.1
Gramercy	Independent, later specialty division, sequentially owned by Polygram, Seagram, and USA Networks.	1993.2	1999.1
MGM / UA	Major, public and private at different times. Sold library to Turner (1986). Acquired by Sony (2005).	1985.1	2005.1
Miramax	Independent, later specialty division, acquired by Disney in 1993.	1986.4	2005.1
New Line	Independent, later specialty division, acquired by Turner Broad. (1993), absorbed by Time Warner (1996).	1985.2	2005.1
October Films	Independent, later specialty division, bought by Seagram (1997), sold to USA Networks (1999).	1991.4	1999.2
Paramount	Major, acquired by Viacom (1994).	1985.1	2005.1
Paramount Classics	Specialty division related to Paramount.	1999.2	2005.1
Sony Classics	Specialty division owned by Sony.	1991.4	2005.1
Sony Pictures	Major since acquisition of Columbia, owned by Sony.	1994.1	2005.1
Tristar	Major, joint venture of Columbia, HBO and CBS, absorbed by Sony.	1985.1	1993.4
Twentieth Century Fox	Major, public until 1981, then absorbed by News Corp.	1985.1	2005.1
Universal	Major, sequential owners: MCA, Matsushita, Seagram, Vivendi, General Electric/NBC.	1985.1	2005.1
USA Films	Specialty division owned by USA Networks, then Vivendi, General Electric/NBC, renamed Focus Features.	1999.2	2001.2
Warner Bros.	Major, a division of Time Warner.	1985.1	2005.1
Warner Indep. Pics.	Specialty division owned by Time Warner.	2004.3	2005.1

Table 2: Decomposing the Variance of Movie Portfolio Returns

This table presents estimates of a variance components model based on a return relation

$$r_{ikt} = \mu + \alpha_i + \beta_k + \gamma_t + \delta_{it} + \phi_{ik} + \epsilon_{ikt}$$

where r_{ikt} is the return of distributor k on a portfolio of movies in genre i during year t, defined as the logarithm of the sum of box office revenue of those movies divided by the sum of production budgets, μ is a mean return, α_i are movie genre effects, β_k are business unit effects, γ_t are year effects, δ_{it} are genre-year interaction effects, ϕ_{ik} are business unit-genre effects, and ϵ_{ikt} are random disturbances. Organizational effects enter pure (represented by the business unit dummy β_k for each distributor k) or nested as an interaction of business unit and movie genre (entering as a dummy ϕ_{ik}). The estimation is based on linear algorithms described in the appendix of Rumelt (1991), and does not rule out negative values for variance components. The sample is based on the 2934 movies with budget information available, for the period between 1985 and the first quarter of 2005. Observations are based on a total number of genres equal to 14 (Variety/EDI Nielsen) or 10 if rearranged in a broader way. The last four columns use the 14-genre classification. Columns 3 and 4 break down the sample in early and late periods. Columns 5 and 6 classify classify the data for publicly or privately held distributors.

		Number of genres		**Period**		**Type of firm**	
Component	**Symbol**	$g = 14$	$g = 10$	< 1992	≥ 1992	Public	Private
Genre	σ^2_α	4.0	2.8	2.8	3.3	2.7	3.1
Business Unit	σ^2_β	31.3	32.8	25.7	35.6	14.3	23.5
Year	σ^2_γ	7.0	7.6	19.8	1.5	5.7	4.9
Genre-Year	σ^2_δ	2.7	1.5	−1.2	5.5	1.1	8.2
Genre–Business Unit	σ^2_ϕ	15.4	16.6	38.9	10.9	14.9	22.4
Error	σ^2_ϵ	39.6	38.7	14.0	43.2	61.3	37.9
Total		100.0	100.0	100.0	100.0	100.0	100.0

Table 3: Investment, Performance, and Studio Acquisition Events

This table presents estimates of models following the form

$$DV_{ikt} = \beta_0 + \beta_1 1(\text{After acquisition}) + \beta_2 \text{Talent Quality}_{ikt} + \eta_i + \alpha_g + \epsilon_{ikt}$$

for the sub-sample of independent movie distributors i that were acquired by Hollywood conglomerates and continued operating with their former organization (i.e., same business unit). The unit of observation is the feature film. The dependent variable DV is either movie budget (panel I) or box office revenue (panel II), in millions of 1985 dollars. Talent Quality is measured with a financial score equal to the team average of 3-year moving average of box office results for movies in which the talent of movie ik participated preceding year t. The last two columns of each panel use relative year fixed effects, where Year 0 is the year of the acquisition of the movie studio by a Hollywood conglomerate. The baseline coefficient is Year -11. t-statistics are reported in parentheses.

	I. Dependent Variable: **Movie Production Budget**					II. Dependent Variable: **Movie Box Office Revenue**				
After acquisition dummy	10.489**	6.808*	4.878		7.650*	4.359*	−0.632	−2.889		−2.154
	(3.21)	(2.47)	(1.81)		(1.86)	(2.82)	(−0.31)	(−0.61)		(−0.61)
Talent financial score		0.238***	0.211***	0.269***	0.192***		0.323**	0.325**	0.411**	0.220*
		(18.33)	(6.97)	(6.81)	(4.05)		(3.19)	(3.76)	(4.37)	(1.91)
Year -2				−1.084					16.035	
				(−0.37)					(1.61)	
Year -1				−2.834*					2.448	
				(−2.63)					(0.74)	
Year 0				2.033					−4.246	
				(1.24)					(−0.41)	
Year +1				−0.985					0.394	
				(−0.27)					(0.05)	
Year +2				−0.504					−0.910	
				(−0.82)					(−0.29)	
Constant	12.936***	8.315**	8.961	15.300**	9.062	20.212**	13.945***	4.511	16.000*	16.441**
	(6.16)	(3.68)	(2.31)	(4.86)	(1.54)	(5.11)	(10.36)	(0.56)	(2.63)	(2.27)
Other years (unreported)	No	No	No	Yes	No	No	No	No	Yes	No
Year Fixed Effects	No	No	Yes	Yes	No	No	No	Yes	Yes	No
Business Unit Fixed Effects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Prod.Company Fixed Effects	No	No	No	No	Yes	No	No	No	No	Yes
Genre Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.32	0.44	0.48	0.42	0.75	0.25	0.31	0.36	0.33	0.71
N clusters	4	4	4	4	731	4	4	4	4	731
n	392	392	392	392	1267	392	392	392	392	1267

***, **,* significant at the 1%, 5% and 10% level. Standard errors are heteroskedasticity-robust and clustered by distributor.

Table 4: Investment, Performance, and External Capital Markets

This table presents estimates of models following the form

$$DV_{ikt} = \beta_0 + \beta_1 1(\text{Public}) + \beta_2 \text{Talent Quality}_{ikt} + \eta_i + \alpha_g + \gamma_t + \epsilon_{ikt}$$

for the sub-sample of movie distributors i that switched from private to public (or vice versa) at some point in the period 1985–2005. The unit of observation is the feature film. The dependent variable is either the production budget or the box office revenue, in millions of 1985 dollars. Talent Quality is the same as in table 3. t-statistics are reported in parentheses.

	Dep. Variable **Movie Production Budget**		Dep. Variable **Movie Box Office Revenue**	
Publicly traded dummy	1.715	−0.144	1.115	2.200**
	(0.47)	(−0.05)	(1.27)	(3.54)
Talent financial score		0.399**		0.390**
		(8.53)		(3.26)
Constant	36.699**	35.643**	23.556**	20.509***
	(6.37)	(7.61)	(5.65)	(5.93)
Business Unit Fixed Effects	Yes	Yes	Yes	Yes
Genre Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
R^2	0.48	0.57	0.30	0.35
N clusters	3	3	4	4
n	225	225	406	403

***, **,* significant at the 1%, 5% and 10% level. Std. errors are heteroskedasticity-robust and clustered by distributor.

Table 5: Yearly Group Investment and Performance before and after Acquisition

This table reports only estimates of coefficient β_1 from models following the form

$$DV_{jt} = \beta_0 + \beta_1 1(\text{After acquisition}) + \beta_2 \text{Talent Quality}_{jt} + \eta_j + \epsilon_{jt}$$

for the sub-sample of movie studio groups j consisting of acquiring and acquired studios jointly before and after the acquisition event. The unit of observation is group–year. The dependent variables are the average production budget in millions of 1985 dollars; the average opening screens for j; the average box office revenue; the sum of all box office revenue divided by all screens used by j; and the ratio of j's movies in year t for which the box office revenue is greater than the production budget. Talent Quality is measured as before, now averaged at the group level for every year. The number of observations is 63. All models include group fixed effects. t-statistics are reported in parentheses.

Dependent Variable	**Estimate of β_1** Controlling for Talent Financial Score? **No**	**Yes**
Production Budget	12.854^{**}	7.973^{**}
	(6.00)	(5.56)
Opening screens	753.028^{**}	384.978^{*}
	(4.38)	(2.92)
Box office revenue	4.288	2.449
	(1.31)	(1.55)
B.O. revenue per screen	-0.000	0.000
	(-2.42)	(1.12)
Breaking even ratio	-0.175^{***}	-0.161^{**}
	(-17.27)	(-4.33)

***, **,* significant at the 1%, 5% and 10% level.

Std. errors are heteroskedasticity-robust and clustered by group.

Table 6: Summary Statistics and Correlation Matrix (n=2,152)

The panels present summary statistics and correlations for the main variables of the study. The sample is for the period 1990 onwards and corresponds to all movies for which budget information is available. The unit of observation is the feature film. The production budget and domestic box office revenue values are expressed in 1985 dollars. The multidivisional structure dummy gauging the existence of an internal capital market is one if the distributor is affiliated by ownership with other distributors in the market, regardless of whether they were acquired or developed internally. The financial score of talent is defined as the 3-year moving average of box office receipts of movies in which the talent of the movie participated. The dummy for USA production equals one if all production firms involved in the movie are based in the U.S. The film's length is measured in minutes. The experience of creative talent in films is the average of the count of previous feature films done by the principals. The number of principals includes actors, directors, producers, and writers. Debuts in role are ratios for principals participating for the first time in a creative role (e.g., actor), while new director is a dummy for directors in their first feature film. The specialty indicator equals one if the movie was carried by the specialty division of a major studio. The Herfindahl index of genres is calculated for the distributor in the year previous to the release of the movie. Publicly traded is a dummy for studios belonging to publicly traded firms.

	Variable	Median	Mean	Std. Dev.	Min.	Max.
1	Budget ($M)	14.72	22.23	22.69	0.00	155.57
2	Box office revenue ($M)	9.83	23.14	34.30	0.00	402.77
3	Multidivisional structure dummy	1.00	0.66	0.48	0.00	1.00
4	Talent financial score	35.28	37.81	25.01	0.00	223.38
5	USA production	1.00	0.88	0.32	0.00	1.00
6	Film length (minutes)	104.00	107.27	20.33	15.00	259.00
7	Talent experience in film	3.01	3.22	1.79	0.02	13.28
8	Number of principals	48.00	52.76	28.37	1.00	402.00
9	New director dummy	0.00	0.10	0.30	0.00	1.00
10	Debuts in role	0.00	0.01	0.02	0.00	0.50
11	Specialty	0.00	0.25	0.43	0.00	1.00
12	Herfindahl of genres	0.24	0.28	0.14	0.13	1.00
13	Publicly traded	1.00	0.85	0.36	0.00	1.00
14	Av.box office per movie, lagged	17.88	18.38	13.75	0.00	62.03
15	Movies distributed, lagged	15.00	16.23	8.13	1.00	35.00

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1														
2	0.62													
3	0.20	0.04												
4	0.52	0.40	0.17											
5	0.24	0.20	0.02	0.36										
6	0.36	0.28	0.01	0.02	0.01									
7	0.32	0.15	0.24	0.75	0.31	-0.02								
8	0.31	0.24	0.10	-0.02	0.16	0.36	-0.15							
9	-0.13	-0.05	-0.03	0.01	0.03	-0.08	0.02	-0.08						
10	-0.11	-0.04	-0.05	0.03	-0.01	-0.11	0.05	-0.18	0.50					
11	-0.28	-0.19	0.37	-0.19	-0.24	-0.05	-0.05	-0.12	0.06	0.05				
12	-0.35	-0.24	-0.24	-0.28	-0.24	-0.06	-0.20	-0.18	0.05	0.07	0.17			
13	0.19	0.16	0.30	0.17	0.07	0.08	0.12	0.15	-0.01	-0.04	0.15	-0.34		
14	0.48	0.35	0.23	0.40	0.30	0.09	0.25	0.26	-0.08	-0.11	-0.36	-0.49	0.32	
15	0.21	0.11	0.43	0.15	0.09	0.07	0.12	0.12	-0.02	-0.05	0.03	-0.42	0.43	0.21

Table 7: Mechanisms to Instrument for Multidivisional Structure

This table presents two-stage least squares (2SLS) estimates of the complexity mechanism for the instruments to affect the choice of a multidivisional studio

$$ICM_{ikt} = \beta_0 + \beta_1 \widehat{\text{Complexity}}_{ikt} + \beta_2 \text{Talent Quality}_{ikt} + \alpha_g + \gamma_t + \epsilon_{ikt}$$

using three team-level instruments: the average of principals' individual share of movies with major distributors in the 3 years prior to the movie; the diversity of interactions, measured as an average of the total number of distributors with whom the team members worked in the year prior to the movie; and the ratio of principals making their debut in feature films. The unit of observation is the feature film. The dependent variable of interest is equal to one if the distributor has a multidivisional structure, and zero otherwise. The variables gauging complexity are the shooting time, defined as the days between the beginning and the end of a movie; the post-production wait time, defined as the days between the end of shooting and the release in theaters; and the number of writers involved in a movie. The sample is all movie releases from 1990 onwards for which shooting dates (first four columns) and budget information is available. Columns 6 and 7 differ in number of instruments used: column 6 uses all three instruments, and column 7 uses only diversity of interactions and the ratio of debutants. All models control for genre and year fixed effects. t-statistics are in parentheses.

	Dependent Variable:						
	Shooting time	**ICM=1**	**Wait time**	**ICM=1**	**Number of writers**	**ICM=1**	
	Two-stage least squares (2SLS) models						
	First	Second	First	Second	First	Second	Two inst.
Experience with majors	-92.902^{**}		-439.580^{***}		-0.005		
	(-2.55)		(-2.76)		(-0.02)		
Diversity of interactions	-21.356^{*}		-43.920		-0.517^{**}		
	(-1.91)		(-0.68)		(-2.21)		
Ratio of debutants	63.660		-204.936		1.127^{***}		
	(1.41)		(-1.07)		(5.19)		
Talent financial score	0.853^{***}	0.001	-0.218	0.000	0.009^{***}	0.001	0.001
	(6.31)	(0.79)	(-0.27)	(0.30)	(4.55)	(1.04)	(1.04)
Shooting time (Inst.)		0.000					
		(0.03)					
Wait time (Inst.)				-0.000			
				(-0.81)			
Number of writers (Inst.)						0.160^{*}	0.160^{*}
						(1.68)	(1.69)
Constant	169.269^{***}	0.035	448.137^{***}	0.107	2.573^{***}	-0.386^{*}	-0.388^{*}
	(5.18)	(0.23)	(4.12)	(1.20)	(8.29)	(-1.94)	(-1.95)
Genre Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.31	0.35	0.23	0.35	0.18	0.12	0.12
N clusters	32	32	32	32	83	83	83
n	452	452	452	452	2135	2135	2135

***, **,* significant at the 1%, 5% and 10% level. All standard errors are heteroskedasticity robust and clustered by distributor.

Table 8: The Effect of Multidivisional Structure on Investment

This table presents two-stage least squares (2SLS) estimates of the effect of multidivisional structure on investment

$$I_{ikt} = \beta_1 \widehat{ICM}_{ikt} + \beta_2 \text{Talent Quality}_{ikt} + \beta_3 X_{1,ikt} + \beta_4 X_{2,it-1} + \alpha_g + \gamma_t + \epsilon_{ikt}$$

by modeling the choice of a multiple-division distributor using three team-level instruments: the average of principals' individual share of movies with major distributors in the 3 years prior to the movie; the diversity of interactions, measured as an average of the total number of distributors with whom the team members worked in the year prior to the movie; and the ratio of principals making their debut in feature films. The unit of observation is the feature film. The sample is all movie releases from 1990 onwards for which budget information is available. The dependent variable I is movie k's budget in millions of 1985 dollars. X_1 are controls based on the movie k, and X_2 are distributor i's variables, mostly lagged; all controls are defined in table 6. All models include a constant, unreported. Models in columns 1 and 2 show the good features of the instruments to predict the variable to be instrumented, and to correlate with the dependent variable of interest. The third column regresses budget directly on the ICM dummy using business-unit fixed effects. The last three columns show second-stage results of 2SLS and 2-step GMM models. In the first stage, a linear model predicts ICM using the instruments and all the exogenous variables from the first columns, with genre and year fixed effects. In the second stage, the instrumented ICM is included with the controls to explain investment, keeping genres and year fixed. t-statistics are in parentheses.

	ICM=1	Dependent Variable: **Movie Budget**				
	Logit	**OLS**	**OLS**	**2SLS**	**2SLS**	**GMM**
Experience with majors	1.176*	8.544*				
	(1.76)	(1.66)				
Diversity of interactions	−0.509	−4.190*				
	(−1.30)	(−1.73)				
Ratio of debutants in film	2.313***	5.586				
	(3.27)	(1.53)				
Talent financial score	0.006	0.358***	0.314***	0.351***	0.303***	0.279***
	(1.23)	(7.45)	(6.99)	(6.99)	(6.36)	(6.33)
USA production	−0.050	3.176***	0.165	3.628**	−0.322	−0.730
	(−0.25)	(3.21)	(0.18)	(2.11)	(−0.40)	(−0.99)
Film length	0.004	0.317***	0.300***	0.301***	0.299***	0.281***
	(1.21)	(9.61)	(6.60)	(6.10)	(6.59)	(7.59)
Talent experience in films	0.144**	−0.694*	−0.618	−1.224**	−0.661*	−0.407
	(2.32)	(−1.67)	(−1.48)	(−2.36)	(−1.68)	(−1.28)
Number of principals	0.013***	0.159***	0.119***	0.119***	0.108***	0.125***
	(4.70)	(7.96)	(3.97)	(4.03)	(3.68)	(4.89)
New director dummy	0.047	−5.764***	−4.944***	−5.621***	−4.607***	−4.831***
	(0.21)	(−4.75)	(−4.49)	(−4.89)	(−4.23)	(−4.55)
Debuts in role	−4.261	−10.193	0.619	5.103	4.370	8.776
	(−1.13)	(−0.41)	(0.04)	(0.29)	(0.30)	(0.63)
Multi-division structure			3.955***			
			(3.14)			
Multi-division structure (Inst.)				24.099*	20.721*	27.299**
				(1.93)	(1.71)	(2.52)
Specialty			−6.220***		−13.607***	−16.505***
			(−6.55)		(−2.62)	(−3.49)
Herfindahl of genres			−3.837		−1.612	−0.920
			(−1.50)		(−0.42)	(−0.25)
Publicly traded			−0.087		0.135	−0.199
			(−0.09)		(0.05)	(−0.07)
Av.box office per movie, lagged			0.210***		0.089	0.041
			(4.52)		(0.76)	(0.39)
Movies distributed, lagged			0.055		−0.288	−0.486*
			(0.97)		(−0.98)	(−1.94)
Genre Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Log likelihood	−1011.64					
R^2		0.57	0.60	0.43	0.55	0.49
Overidentifying restrictions (p)				0.58	0.38	0.38
N clusters			85	85	85	85
n	2051	2152	2152	2152	2152	2152

***, **,* significant at the 1%, 5% and 10% level. Std.errors are heteroskedasticity robust, last 4 models also clustered by distributor.

Table 9: The Effect of Multidivisional Structure on Performance

This table presents two-stage least squares (2SLS) estimates of the effect of multidivisional structure on performance

$$R_{ikt} = \beta_1 \widehat{ICM}_{ikt} + \beta_2 \text{Talent Quality}_{ikt} + \beta_3 X_{1,ikt} + \beta_4 X_{2,it-1} + \alpha_g + \gamma_t + \epsilon_{ikt}$$

by modeling the choice of a multiple-division distributor using three team-level instruments: the average of principals' individual share of movies with major distributors in the 3 years prior to the movie; the diversity of interactions, measured as an average of the total number of distributors with whom the team members worked in the year prior to the movie; and the ratio of principals making their debut in feature films. The unit of observation is the feature film. The sample is all movie releases from 1990 onwards for which budget information is available. The dependent variable R is movie k's box office revenue in millions of 1985 dollars. X_1 are controls based on the movie k, and X_2 are distributor i's variables, mostly lagged; the controls are defined in table 6. All models include a constant, unreported. Column 1 regresses box office revenue directly on multidivisional structure (ICM) with controls. All other columns show second-stage estimates of 2SLS or 2-step GMM models. In the first stage, a linear model predicts ICM using the instruments and all the exogenous variables from the first columns, with genre and year fixed effects. In the second stage, the instrumented ICM is included with the controls to explain market performance, keeping genres and year fixed. Column 3 modifies the dependent variable to consider only box office revenue in the first three weeks of exhibition. Column 4 uses the sub-sample of holiday releases. Column 5 uses box office per screen as the dependent variable. Column 5 has the same specification and sample as column 2 but uses a 2-step GMM estimation procedure. t-statistics are in parentheses.

	Dependent Variable: **Movie Box Office Revenue**					
	OLS	**2SLS**	**2SLS** 3 weeks	**2SLS** Holiday	**2SLS** per Screen	**GMM**
Multi-division structure	-3.036^{*}					
	(-1.87)					
Multi-division structure (Inst.)		-22.624	-9.697	4.469	-0.069	-22.204
		(-1.17)	(-0.92)	(0.06)	(-0.08)	(-1.20)
Specialty	0.389	9.019	2.516	-6.487	0.128	8.981
	(0.31)	(1.01)	(0.52)	(-0.20)	(0.34)	(1.03)
Talent financial score	0.552^{***}	0.565^{***}	0.391^{***}	0.560^{***}	0.012^{***}	0.561^{***}
	(9.28)	(8.51)	(9.54)	(5.63)	(6.90)	(8.90)
USA production	3.932^{***}	4.501^{**}	2.373^{**}	0.243	-0.037	4.489^{***}
	(2.84)	(2.55)	(2.06)	(0.07)	(-0.45)	(2.85)
Film length	0.431^{***}	0.432^{***}	0.215^{***}	0.492^{***}	0.012^{***}	0.433^{***}
	(7.02)	(7.27)	(7.19)	(3.54)	(8.26)	(7.42)
Talent experience in films	-3.890^{***}	-3.841^{***}	-2.432^{***}	-3.663^{***}	-0.097^{***}	-3.798^{***}
	(-5.50)	(-5.47)	(-6.10)	(-2.67)	(-4.37)	(-5.63)
Number of principals	0.113^{**}	0.126^{***}	0.090^{***}	0.115	0.002^{**}	0.138^{***}
	(2.34)	(2.90)	(3.46)	(1.36)	(2.55)	(3.45)
New director dummy	-2.114	-2.509	-1.902	-2.901	-0.019	-2.228
	(-0.76)	(-0.97)	(-1.24)	(-0.65)	(-0.25)	(-0.90)
Debuts in role	31.959	27.577	16.035	16.298	1.120	25.367
	(0.87)	(0.72)	(0.69)	(0.40)	(1.15)	(0.67)
Herfindahl of genres	0.158	-2.442	-0.435	-3.213	0.229	-2.295
	(0.04)	(-0.46)	(-0.15)	(-0.28)	(1.01)	(-0.45)
Publicly traded	2.724^{**}	2.465	1.068	7.153^{***}	0.008	2.684
	(2.30)	(0.59)	(0.50)	(2.69)	(0.07)	(0.64)
Av.box office per movie, lagged	0.301^{***}	0.443^{**}	0.285^{***}	0.209	0.004	0.424^{**}
	(5.61)	(2.33)	(2.90)	(0.39)	(0.55)	(2.32)
Movies distributed, lagged	0.071	0.472	0.225	-0.171	0.002	0.481
	(1.07)	(1.08)	(1.01)	(-0.10)	(0.13)	(1.16)
Genre Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.35	0.33	0.41	0.39	0.21	0.33
Overidentifying restrictions (p)		0.77	0.77	0.10	0.86	0.77
N clusters	85	85	85	53	85	85
n	2152	2152	2152	602	2152	2152

***, **,* significant at the 1%, 5% and 10% level. All standard errors are heteroskedasticity robust and clustered by distributor.

Table 10: Efficiency of Externally Contracted and R-Rated Movies

This table presents two-stage least squares (2SLS) estimates of the effect of multidivisional structure on investment and performance

$$DV_{ikt} = \beta_1 \widehat{ICM}_{ikt} + \beta_2 \text{Talent Quality}_{ikt} + \beta_3 X_{1,ikt} + \beta_4 X_{2,it-1} + \alpha_g + \gamma_t + \epsilon_{ikt}$$

using two different sub-samples. In panel I, the sample consists of movies for which the distributor did not participate in production. In panel II, the sample consists of R-rated movies. In panel III, the sample consists of movies with a financial score of talent based only on top-20 billing actors that is above a threshold value of 50. The choice of a multidivisional distributor is modeled using three team-level instruments: the average of principals' individual share of movies with major distributors in the 3 years prior to the movie; the diversity of interactions, measured as an average of the total number of distributors with whom the team members worked in the year prior to the movie; and the ratio of principals making their debut in feature films. All instruments and controls are as in table 8, including a constant unreported. t-statistics are in parentheses.

	I. External Movies		II. R-Rated Movies		III. Star-studded Movies	
Dependent Variable:	**Budget 2SLS**	**Box Office Revenue 2SLS**	**Budget 2SLS**	**Box Office Revenue 2SLS**	**Budget 2SLS**	**Box Office Revenue 2SLS**
Multi-division structure (Inst.)	16.855***	−6.681	25.025***	8.984	60.959***	65.044**
	(2.76)	(−0.59)	(2.82)	(1.01)	(3.21)	(2.01)
Specialty	−13.551***	1.420	−16.232***	−5.325	−26.537***	−21.840**
	(−3.31)	(0.20)	(−3.94)	(−1.27)	(−4.11)	(−1.99)
Talent financial score	0.157***	0.301***	0.237***	0.253***		
	(3.08)	(3.64)	(4.38)	(5.73)		
Talent-20 financial score					0.139***	0.278***
					(3.79)	(4.48)
USA production	−1.216*	2.783	−0.213	2.465**	0.228	5.640
	(−1.72)	(1.64)	(−0.26)	(2.26)	(0.07)	(1.61)
Film length	0.207***	0.282***	0.337***	0.420***	0.379***	0.554***
	(4.95)	(3.60)	(7.30)	(8.59)	(4.85)	(5.33)
Talent experience in films	0.182	−2.108***	−0.762*	−1.487***	0.765*	−1.332*
	(0.40)	(−3.20)	(−1.80)	(−3.84)	(1.72)	(−1.68)
Number of principals	0.083***	0.052*	0.087***	0.061**	0.076**	0.054
	(2.85)	(1.72)	(3.20)	(2.46)	(2.18)	(0.85)
New director dummy	−3.403***	−0.972	−2.311*	−1.289	−5.401***	−2.761
	(−3.04)	(−0.54)	(−1.70)	(−0.64)	(−2.58)	(−0.65)
Debuts in role	5.723	−21.592	−12.413	0.225	43.791	150.129*
	(0.38)	(−1.09)	(−0.65)	(0.01)	(1.10)	(1.81)
Herfindahl of genres	−0.203	−0.645	−4.012	−1.297	−5.213	13.931
	(−0.10)	(−0.16)	(−0.95)	(−0.36)	(−0.31)	(0.77)
Publicly traded	0.166	4.404**	0.650	0.830	3.196	4.393
	(0.10)	(2.52)	(0.22)	(0.41)	(0.23)	(0.26)
Av.box office per movie, lagged	0.064	0.389**	0.026	0.157	−0.091	0.125
	(0.61)	(2.27)	(0.19)	(1.29)	(−0.35)	(0.38)
Movies distributed, lagged	−0.115	0.065	−0.348	−0.070	−1.275**	−1.450*
	(−0.93)	(0.41)	(−1.40)	(−0.36)	(−2.34)	(−1.77)
Genre Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.53	0.32	0.52	0.38	0.01	0.05
Overidentifying restrictions (p)	0.88	0.19	0.42	0.36	0.60	0.24
N clusters	83	83	62	62	44	44
n	921	921	1140	1140	1123	1123

***, **,* significant at the 1%, 5% and 10% level. All standard errors are robust to heteroskedasticity and clustered by distributor.

Table 11: Acquired vs. Internally Developed Specialty Divisions

This table reports only coefficient estimates β_1 from models

$$DV_{jt} = \beta_0 + \beta_1 1(\text{Acquired Specialty Division}) + \beta_2 \text{Talent Quality}_{ikt} + \beta_3 X_{1,ikt} + \beta_4 X_{2,it-1} + \alpha_g + \gamma_t + \epsilon_{ikt}$$

for the sub-sample of movies distributed by the specialty divisions of Hollywood major studios. The unit of observation is the feature film. The dependent variables are the production budget in millions of 1985 dollars; the opening screens; the box office revenue; the box office revenue per screen; and the indicator variable equal to one if the box office revenue is greater than the production budget. The regressions from which the estimates reported in column 1 are obtained include the movie-level controls described in table 6 with labels 4-10. The regressions summarized in column 2 include also the controls with labels 12-15. The regressions summarized in column 3 are exactly as those in column 2 but excluding MGM from the sample. All regression models include year and genre fixed effects. t-statistics are reported in parentheses.

	Estimate of β_1		
Dependent Variable	Movie level controls	All controls	All controls No MGM
Budget	6.314^{***}	3.982^{**}	4.076^{**}
	(4.43)	(2.55)	(2.52)
Opening screens	508.762^{*}	136.886^{*}	135.788^{*}
	(2.17)	(1.84)	(1.93)
Box office revenue	8.030^{***}	1.511	1.609
	(3.38)	(1.06)	(1.18)
B.O. revenue per screen	0.232^{**}	0.046	0.046
	(2.31)	(0.37)	(0.37)
Breaking even ratio	0.095	0.013	0.010
	(1.81)	(0.20)	(0.15)

***, **,* significant at the 1%, 5% and 10% level.

Std. errors are heteroskedasticity-robust and clustered by distributor.

Table 12: Multidivisional Structure and the Ancillary Revenue Hypothesis

This table presents linear panel and two-stage least squares (2SLS) estimates of the effect of multidivisional structure on investment and performance

$$DV_{ikt} = \beta_1 \widehat{ICM}_{ikt} + \beta_2 \text{Talent Quality}_{ikt} + \beta_3 X_{1,ikt} + \beta_4 X_{2,it-1} + \alpha_g + \gamma_t + \epsilon_{ikt}$$

using coefficient estimates from independent studies to simulate performance data beyond the box office, or using real data but restricting the sample to large studios. The unit of observation is the feature film. Panel I uses predicted ancillary-market "ultimate" movie revenue as the dependent variable gauging performance. Panel II adds DVD sales to box office revenue. Panel III uses theatrical data only, as in previous tables, but restricts the sample to the 18 largest distributors in Hollywood. All instruments and controls are as in table 8, including a constant unreported. t-statistics are in parentheses.

	I. Prediction based on Luherman and Teichner (1992)			II. Based on Luan and Sudhir (2005)			III. Real theatrical data		
Dependent Variable:	**Budget**	**Ultimate** Predicted	**Ultimate** Predicted	**Budget**	**B.O.+DVD** Predicted	**B.O.+DVD** Predicted	**Budget**	**Box Office**	**Box Office**
	2SLS	**2SLS**	**OLS**	**2SLS**	**2SLS**	**OLS**	**2SLS**	**2SLS**	**OLS**
Multi-division structure			−8.260			−11.923***			−2.710
			(−1.40)			(−3.67)			(−0.75)
Multi-division structure (Inst.)	30.058***	−40.037		12.701	−45.215*		18.464	−15.105	
	(3.04)	(−0.58)		(1.05)	(−1.83)		(1.35)	(−0.69)	
Specialty	−16.570***	18.025	3.973	−9.699**	16.003	−11.216***	−11.838**	5.182	0.327
	(−4.32)	(0.65)	(0.59)	(−2.13)	(1.56)	(−5.37)	(−2.22)	(0.62)	(0.09)
Talent financial score	0.363***	1.658***	1.619***	0.285***	0.648***	0.608***	0.324***	0.601***	0.586***
	(5.28)	(5.94)	(5.29)	(4.41)	(6.60)	(6.12)	(7.32)	(8.75)	(9.06)
USA production	−2.980*	2.980	0.508	0.545	11.103***	9.335***	0.022	4.370**	3.424*
	(−1.69)	(0.59)	(0.11)	(0.38)	(3.12)	(2.70)	(0.02)	(2.30)	(1.94)
Film length	0.227***	0.952***	0.970***	0.335***	0.654***	0.663***	0.318***	0.455***	0.451***
	(5.94)	(3.91)	(3.54)	(4.28)	(6.78)	(6.16)	(8.39)	(7.26)	(6.85)
Talent experience in films	−2.059***	−13.043***	−13.293***	−0.005	−3.904***	−3.633***	−0.489	−4.109***	−3.945***
	(−3.43)	(−4.33)	(−3.63)	(−0.01)	(−3.58)	(−3.22)	(−1.01)	(−5.78)	(−5.90)
Number of principals	0.083***	0.338**	0.313*	0.134***	0.147**	0.105	0.114***	0.116***	0.111***
	(3.07)	(1.98)	(1.71)	(4.11)	(2.48)	(1.43)	(5.83)	(3.22)	(2.96)
New director dummy	−3.716***	−4.104	−6.747	−4.691**	−1.685	−2.471	−5.311***	−4.574	−4.365
	(−2.59)	(−0.42)	(−0.65)	(−2.34)	(−0.44)	(−0.62)	(−4.04)	(−1.63)	(−1.61)
Debuts in role	5.880	116.283	165.098	2.970	−58.338	−7.406	20.140	77.921*	78.542*
	(0.46)	(1.04)	(1.39)	(0.08)	(−0.91)	(−0.12)	(0.81)	(1.76)	(1.82)
Herfindahl of genres	−6.529	−14.181	−9.174	−2.671	−10.775	1.933	−4.733	−6.121	−2.108
	(−0.93)	(−0.73)	(−0.71)	(−0.72)	(−0.72)	(0.18)	(−1.17)	(−0.89)	(−0.27)
Publicly traded	3.939	2.792	9.079	−3.246	13.228	−11.168***	1.243	1.543	3.726
	(0.84)	(0.26)	(0.85)	(−1.17)	(1.06)	(−3.30)	(0.69)	(0.57)	(0.45)
Av.box office per movie, lagged	0.216	0.843**	−0.284	0.116	0.771**	0.287*	0.066	0.310**	0.032
	(1.36)	(2.44)	(−0.66)	(0.93)	(2.54)	(1.71)	(0.70)	(2.04)	(0.25)
Movies distributed, lagged	−0.607*	0.984	0.306	−0.072	0.703*	0.081	−0.304	0.219	0.071
	(−1.81)	(0.57)	(0.94)	(−0.31)	(1.93)	(0.24)	(−1.06)	(0.47)	(0.34)
Distributor Fixed Effects	No	No	Yes	No	No	Yes	No	No	Yes
Genre Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.39	0.33	0.36	0.61	0.34	0.42	0.54	0.34	0.36
Overidentifying restrictions (p)	0.42	0.11		0.25	0.43		0.23	0.93	
N clusters	51	51	51	60	60	60			
n	1126	1126	1126	1031	1028	1028	1887	1887	1887

***, **,* significant at the 1%, 5% and 10% level. All standard errors are heteroskedasticity-robust and clustered by distributor when indicated.

Table 13: Robustness Checks

This table presents coefficient estimates of multidivisional structure from two-stage least squares (2SLS) models following alternative specifications. The standard errors shown in parentheses are robust to heteroskedasticity and clustered by distributor when not indicated otherwise. The controls in the first and second stages are as in all previous tables.

Coefficient Multidivisional Structure (2SLS)			
Table 8 (5) Budget	**Table 9 (2) B.O. Revenue**	**Observations**	**Specification**
20.72	-22.62	2152	Benchmark specifications from tables 8 and 9
(12.14)	(19.32)		
		A. **Changes in Sample**	
16.05	-18.02	1948	Period from 1994 onwards only
(13.08)	(19.24)		
30.06	-22.65	1126	Period until 1999 only
(9.88)	(16.29)		
36.56	-40.31	2631	Period from 1985 to 2005
(12.81)	(21.15)		
23.52	-16.39	2049	Excluding movies with instrument outliers
(15.38)	(21.17)		
20.44	-21.80	2152	Dropping specialty dummy for MGM
(10.37)	(17.49)		
	-3.73	2599	Missing-budget sample
	(9.64)		
		B. **Changes in Specification**	
25.52	-18.21	2152	Talent financial score, moving average of two years
(12.72)	(19.84)		
50.35	12.53	2152	Dropping genre fixed effects
(15.97)	(18.38)		
20.72	-22.62	2152	Dropping clustering of standard errors
(10.82)	(18.25)		
28.39	-7.85	2152	Including also quadratic instruments
(13.84)	(17.95)		
20.72	-22.62	2152	Bootstrapping standard errors with optimal B.
(13.60)	(18.70)		