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MANAGEMENT PRACTICES IN SHORT-TERM NETWORK ORGANIZATIONS: THE PERFORMANCE IMPACT OF THE SHADOW OF THE FUTURE AND PSYCHOLOGICAL CONTRACTS IN THE U.S. MOVIE INDUSTRY, 1931-1940

by

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You can take Hollywood for granted, like I did, or you can dismiss it with the contempt we reserve for what we don't understand. It can be understood too, but only dimly and in flashes.

F. Scott Fitzgerald
"The Last Tycoon"

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ABSTRACT

Organizational theorists have become increasingly interested in the study of organizational networks and how they differ from markets and hierarchies. However, the majority of the research has focused on long-term, open-ended relationships. In contrast, my dissertation investigates how a short time frame of collaboration challenges network coordination and safeguarding practices. A short-term network organization (STNO) is defined as *an intentionally created organizational entity that combines independent contributors for the objective of accomplishing a single short-term task.*

Applying transaction cost economics and institutional theory, I hypothesize that network organizations experience performance advantages if they: (1) strengthen psychological contracts between the network contributors and (2) strengthen the population-wide shadow of the future. These performance improvement effects are hypothesized to be stronger for STNOs compared to long-term network organizations (LTNOs). Hypotheses are tested in a stratified random sample of Hollywood movie projects from 1930-1940 (n = 239). Both STNO practices investigated involve the communication of network contributor information via on-screen credits to non-network members. The study finds moderate support for a positive performance effect of the psychological contract practice and strong support for a positive performance effect of the population-level shadow of the future practice. However, only the population-level shadow of the future practice has the hypothesized stronger performance effects for STNOs.

The dissertation contributes to the organizational network research by conceptualizing STNOs and the governance challenges short time frames of collaboration

imply. It provides some first evidence for the importance of institutionalized population-level practices in understanding the performance impact of STNOs. Such practices can establish an industry-wide sanctioning system that creates a shadow of the future that protects STNOs against opportunistic behavior and leads to overall performance improvements. The findings support contemporary institutional theory that argues widespread practices can have value in addition to legitimacy. In the context of transaction cost economics, these findings underscore the importance of expanding the research focus to account for relevant population-level practices. While the archival nature of the study limited the detail with which causal processes could be observed, the findings encourage future research investigating the performance implications of short-term collaborations and their management practices.

CHAPTER 1 – INTRODUCTION

In both scholarly and popular accounts of organizational structure, observers claim that mass production and large, vertically integrated firms are giving way to more flexible, fragmented, and disintegrated network forms of organization (Piore & Sabel, 1984; Storper, 1989; Zenger & Hesterly, 1997). Academic research over the last three decades has accumulated substantial evidence on the prevalence and functionality of interorganizational networks (e.g., Granovetter, 1973, 1985; Galaskiewicz & Wasserman, 1981; Burt, 1982, 1987; Powell, 1990; Davis, 1991; Baum & Oliver, 1991; Haunschild, 1993; Podolny, 1994; Uzzi, 1996, 1997). Studies have also convincingly challenged the view that interorganizational networks are a new phenomenon, but rather demonstrated their importance throughout our economic history (e.g., Padgett & Ansell, 1993; Granovetter, 1995; Best, 1991; Sabel & Zeitlin, 1985). However, the majority of the network research has focused on long-term, open-ended relationships (e.g., strategic alliances) and neglected the more elusive, but equally prevalent highly flexible, short-term networks (e.g., single project collaborations). As the 'time horizon of collaboration' fundamentally changes the nature of network relationships, this raises important questions regarding the applicability of traditional LTNO management practices.

Stinchcombe (1959), Bennigson (1971), and Mintzberg (1979) were among the first to systematically conceptualize these highly flexible organizational networks. Early empirical studies were limited to descriptive industry histories (e.g., Hirsch, 1972; Peterson & Berger, 1971) and small convenience samples (e.g., Eccles, 1981; Goodman & Goodman, 1976). Only recently, flexible network organizations have received more rigorous research

attention in studies of the movie industry (Faulkner & Anderson, 1987; Baker & Faulkner, 1991), construction industry (Brynman, et al., 1987), knitwear industry (Lazerson, 1995), bio-tech industry (Pisano, 1989), investment banking (Baker, 1990), Silicon valley start-up companies (Suchman, 1995), and the L.A. Olympic committee (McDonald, 1991).

Some of this work emphasizes the potential advantages of STNOs in terms of specialization and flexibility. Other work (e.g., Meyerson, Weick &Kramer, 1996; McDonald, 1991) suggests unique challenges that short term networks face. A first goal of this research is to examine evidence related to these contrasting two claims about the impact of STNOs.

A second goal of this research is to conceptually outline the nature of STNO challenges as well as the management practices that may address them. As mentioned, some scholars (e.g., Meyerson, Weick & Kramer, 1996; McDonald, 1991) have suggested that there are drawbacks to STNOs. However, the literature does not present a clearly articulated set of STNO challenges, nor evidence about the impact of potential solutions strategies. I argue that transaction cost economics, institutional theory, and theories of psychological contracts illuminate both potential challenges and remedies.

Conceptually, I define an ideal type network governance form that fall in the extreme ends of the 'time horizon of collaboration' continuum. This ideal type of a flexible organizational network I call a Short-Term Network Organization (STNO). I define an STNO as *an intentionally created organizational entity that combines independent contributors for the objective of accomplishing a single short-term task.* An STNO disbands upon completion of this task. The short-term nature of STNOs has three dimensions: (1) the short duration of the underlying network relationships, (2) the lack of recent prior

collaborations with the same partners, and (3) the expectation that the network will permanently disintegrate after the task is completed. A long-term network organization (LTNO) in contrast is based on open-ended or long-term contracts (e.g., strategic alliances). In contrast to most prior STNO research which focused on these flexibility advantages (e.g., Miles et al., 1997; Kanter, 1989), my work focuses on the unique challenges flexible networks present from a governance standpoint.

Several research streams investigate the implications of short-term organizational forms, which focus on different aspects and apply different theoretical perspectives. For example, project management literature (Williams, 1999; Evaristo & Van Fenema, 1999) has investigated implications of short-termness on a functional organizational level (e.g., operations management, financing). Most of the literature is focused on the network and organizational level and oriented towards narrow applications. In contrast to the related research on contingent workers (Davis-Blake & Uzzi, 1993; Barling & Gallagher, 1996; Belous, 1989), STNOs constitute settings where the entire organization is temporary, not just a subset of its internal employment relationships.

My study draws primarily on transaction cost economics and institutional theory to develop more general models of fundamental causal relationships between specific network governance structures, industry-level institutionalized practices, and organizational performance. It adopts a population level of analysis to investigate the effects of industry-level institutionalized management practices. The dissertation identifies two such management practices and investigates their performance implications for both STNOs and LTNOs.

CHAPTER 2 – THEORY

Transaction Cost Theory

Hierarchies, Markets, and Networks

Transaction cost economics (TCE) (Coase, 1937; Williamson, 1975, 1985) hypothesizes the effects of alternative governance structures on the overall cost of transformation and exchange processes. Transformation and exchange processes are imperfect due to: (1) bounded rationality of actors, (2) opportunism, (3) environmental turbulence, and (4) asset specificity (Williamson, 1985, 1991a). Williamson (1975) proposed two alternative governance structures to address these imperfections: (1) *hierarchies* (based on neo-classical contracts), and (2) *markets* (based on classical contracts). Later, Powell (1990) added a previously neglected third option, the *network* structure based on relational contracts that he considered a separate organizational form (see also similar arguments by Macaulay (1963) and MacNeil (1978)).

In my opinion, Powell's argument is correct that relational contracts constitute an organizational form sufficiently distinct from markets and hierarchies with unique configurational characteristics. Williamson (1991a) later acknowledged the importance of relational contracts. He argues that they can provide the basis for a third discreet form of governance which he calls 'hybrid.' In his most recent work, Williamson (1999, 1994, 1993) further elaborates on the configurational characteristics that differiantiate hybrids from markets and hierarchies. These include: (1) adaptability differences, (2) contract law differences, (3) incentive intensity differences, and (4) bureaucratic cost consequences (Williamson, 1999, 1994).

Adopting the perspective that hybrids are a discrete form of governance with a unique configuration of characteristics, I will use rather the term 'network' than hybrids to avoid the connotation that hybrids simply represent the combination of certain market or hierarchy elements. In addition, I define and investigate two different and unique configurations, STNOs and LTNOs, among the network forms of organization using the time frame of collaboration as the main differentiating criterion.

Networks and Markets

How do STNOs differ from market relationships? Market relationships can provide high degrees of flexibility if contracts have a short-term time frame and the market facilitates contracting with different suppliers over time. A high degree of standardization of market exchange relationships reduces transaction costs associated with repeated contracting. Market transactions are primarily coordinated via the price mechanism (Hayek, 1945). As Williamson (1991b) outlined, market transactions provide high-powered incentives for adaptation. In these adaptation processes prices serve as sufficient statistics, and individual consumers and suppliers can reposition autonomously. Williamson calls this Type A adaptation where 'A' denotes autonomy. The high-powered incentives are the consequence of neither of the traders having any legitimate claims against the gains or losses of the other. Opportunism is controlled by inspecting goods exchanged and by penalizing for breach of contract. Other control or monitoring activities (e.g., of the production process of the other party) are not necessary. Market contracts typically require that the features of the goods exchanged are known and specified at the time when the contract is established (e.g., Macaulay, 1963; MacNeil, 1978). Opportunism threatens market relationships in the case of

ill-defined and difficult to measure goods exchanged. According to Williamson (1985), this can be the case if goods are the output of complex and emergent production processes involving product or process innovations.

Compared to markets, network organizations are coordinated on much broader information processes (Powell, 1990). At the outset of the cooperation network members agree on global goals, general contributions, and coordination systems. The coordination systems then are the means for further specifying goals, contributions, and benefits during the period of collaboration (Macaulay, 1963; MacNeil, 1978). For example, in R&D networks the emergent process of discoveries through trial and error determines the further course of investigation, thereby determining member contributions and benefits (e.g., Pisano, 1990). The unknown characteristics of this emergent process preclude an 'ex-ante' specification of contributions and benefits. The production of a movie is another example of a complex, creative, and emergent process that limits the ex-ante determination of contributions. In some cases it is even ex-post extremely difficult to evaluate the contributions from different network partners in order to enforce contractual agreements (e.g., quality of acting as contribution to a movie project).

Networks and Hierarchies

Hierarchies based on neo-classical contracts offer a different set of practices to accomplish adaptation, coordination, and motivation. Organizations represent a conscious, deliberate, and purposeful kind of collaboration based on bi-lateral dependencies between the members of the organization. It uses formal organizational structures and processes to coordinate the activities of its members and control against opportunistic behavior through

fiat and forbearance. Neo-classical contracts establish and determine the frame within which fiat and forbearance are used by organizations to influence the behavior of their individual members. This set of practices offers advantages in the case of bi-lateral dependencies. However, these practices and the bureaucratic structures and processes that administer them imply additional cost. In addition, they degrade the incentive intensity found in market relationships even if incentive systems are put in place to compensate for this deficiency. Also, in the case of required adaptations to environmental changes, the bureaucratic structures and processes will likely make such changes substantially more costly.

Network relationships differ from hierarchical relationships due to the independence of the organizations whose production processes are combined through the network. According to Bidlingsmaier (1968), organizational independence hinges on two necessary conditions:

(1) *Autonomy* (legal independence) being the legal right of each partner organization to exit the relationship (Troendle, 1987; Merle, 1968). In contrast, a division of a corporation might experience a certain degree of independence, but it cannot by itself decide to exit the corporation. In general, autonomy is a necessary condition differentiating network relationships from hierarchical relationships.

(2) *Autarchy* (economic independence) being the ability of each partner organization to survive outside the network (Troendle, 1987; Soelter, 1966). This requires the absence of an economic or other dependency between partners that would eliminate the alternative of terminating the relationship. Without autarky the legal independence is meaningless and vice versa.

Networks and Time Frame of Collaboration

A network's limited time frame of collaboration can present unique challenges for controlling opportunistic behavior. For example, the frequent repeated network formation with new partners leads to scheduling conflicts and the risk that partners are not available at and for the agreed upon time period. The limited importance and duration of any single project for each partner limits the opportunities for retaliation in case of opportunistic behavior. The lack of a 'higher' authority to govern arising conflicts reduces the chances for managing or preventing opportunistic behavior. For these reasons, I argue that STNOs face unique opportunism challenges and safeguards against opportunistic behavior will be a main focus of this dissertation.

Opportunism and Trust

TCE has been repeatedly criticized for assuming inherently opportunistic behavior on the part of individuals (Goshal & Moran, 1996; Donaldson, 1990; Hill, 1990; Enzioni, 1988; Shapiro, 1987; Granovetter, 1985). Most of the controversy centers on whether opportunism or trust more closely describe how exchange partners behave. Consistent with 'refined' versions of TCE, I assume here that social actors are only opportunistically inclined, but that it is difficult to identify opportunistic actors ex-ante (Rindfleisch & Heide, 1997: Barney, 1990). These assumptions are supported by empirical research that has identified opportunistic behavior in organizational settings characterized by environmental uncertainty (Pilling, Crosby & Jackson, 1994), behavioral uncertainty (Anderson & Schmittlein, 1984), and asset specificity (Joskow, 1987).

Institutional Theory

For these reasons, TCE is a useful frame for the analysis of STNOs, due to its focus on exchange relationships and coordination challenges, but its emphasis on economic factors and calculating behavior has a tendency to underestimate the importance of social embeddedness and institutional norms.

Institutional norms play an important role in the TCE literature. For example, spontaneous market coordination guided by price mechanisms requires a taken-for-granted population-level institutional frame (Hayek, 1945). This frame includes, for example, laws governing exchange relationships. If these laws are known and generally accepted, outcomes can be inferred with certainty by all parties. The parties would never actually appear in court, as they don't violate the norms or in the case of a violation find a private solution (Williamson, 1993). Even though laws are not generally known and accepted, but rather leave room for interpretation, legal enforcement of contracts, and institutional frame in general, have received relatively little attention in TCE. The same is true for institutional norms that are not formalized in form of laws. Again, either sanctioning mechanisms lead to compliance or their internalized nature ('taken-for-grantedness') prevents parties from even considering alternative courses of action. TCE acknowledges the importance of such institutional frames for market, hierarchy, and network relationships, but treats them mostly as exogenous to their models (Williamson, 1993).

Institutional theory (Tolbert & Zucker, 1983; DiMaggio & Powell, 1983) provides an important frame for analyzing how network organizations are influenced by conformity pressures from their social and cultural environment. There is substantial empirical support

for the importance of institutional processes especially with regard to legitimizing organizational forms and organizational practices (e.g., Baum & Oliver, 1991; Meyer & Rowan, 1977; Abrahamson, 1991; Zucker, 1977; Leblebici & Salancik, 1982; Baker, 1984; Mezias, 1990). Population-level institutional norms provide organizational actors with guidance and a stable frame of reference that I argue is particularly important for STNOs to compensate for the lack of stability in their network exchange relationships.

In the organizational network literature, several recent studies have shown how social factors, such as power, influence network formation (e.g., Eisenhardt & Schoonhoven, 1996; Kogut, Shawn & Walker, 1992; Gulati, 1993), network structure (Hart & Saunders, 1997; Baker, 1990), and diffusion of practices (Haunschild, 1993; Davis, 1991; Mezias, 1990). Eisenhardt & Schoonhoven (1996), for example, argue that while cooperative relationships are driven by a logic of strategic resource needs and network management capabilities - networks only arise based on social resource opportunities. They present evidence from the semiconductor industry that a strong social position (e.g., a large, well-connected, and high-status top management team) enables organizations to form networks. Hart & Saunders (1997) describe how power and trust determine the structuring of interorganizational buyer-seller networks when implementing electronic data interchange systems.

The dissertation builds on this stream of research. With respect to STNOs, there are two potentially crucial institutional effects influencing STNO implementation:

(1) *Legitimacy of Organizational Form.* As outlined, I assume STNOs to be a distinct organizational form. Increased legitimacy of the STNO as a form of governance implies increased acceptance by organizational stakeholders and improved access to

outside resources. Several studies have shown that the legitimacy of the network form influences network performance (Venkatraman et al., 1994; Sharfman et al., 1991; Baum & Oliver, 1991).

(2) *Institutionalized Organizational Practices*. Any organizational form represents a bundle of organizational or management practices. An *organizational practice* is a particular organizational action that becomes an ingrained behavior pattern of an organization (Nelson & Winter, 1984; Cyer & March, 1963; Miner, 1987, 1991). Different organizations implementing network strategies may differ greatly with regard to their organizational practices. On a population level the institutionalization can lead to industry-wide standardization of organizational practices (Porac, Thomas & Baden-Fuller, 1989; Leblebici & Salancik, 1982; Baker, 1984). Such collective practices can provide important substitutes for organizational-level and partner-specific organizational practices (Jones, Hesterly & Borgatti, 1997; Miner & Haunschild, 1995; Miner & Anderson, 1999).

The industry-wide institutionalized organizational practices hold the promise of providing continuity and guidance that can facilitate coordinating behavior across network boundaries and across time. These practices may be crucial for decreasing transaction costs and making STNOs a feasible organizational alternative. Determining the impact of population-level norms may be crucial for understanding how and when governance mechanisms function as well as estimating their performance impact. For these reasons, two industry-wide institutionalized management practices are the main focus of this dissertation.

CHAPTER 3 - HYPOTHESES

STNO Performance Implications

Introduction

Both the academic (e.g., Ilinitch, D'Aveni & Lewin, 1996; Powell, 1990; Kanter, 1990; Piore & Sabel, 1984; Storper & Christopherson, 1987) and the practitioners' literatures (e.g., Miles et al., 1997; Ciborra, 1996; Davidow & Malone, 1992) have claimed that flexible networks offer specialization and flexibility advantages. I argue that STNOs lead to network coordination challenges that simultaneously increase transaction cost. These coordination challenges may offset specialization and flexibility advantages. In order to conceptualize these complex trade-off relationships, I will first briefly introduce the sources of STNO specialization and flexibility advantages and then outline how they simultaneously lead to increased transaction costs.

STNO and Specialization

Theorists in many traditions have long argued that resource owners, to a degree, can increase productivity through specialization (e.g., Alchian & Demsetz, 1972). In any network organization, STNO as well as LTNO, specialization can be increased if the independent network partners have the opportunity to adapt their organizational structures, processes, and cultures more closely to the nature of their respective production tasks. This has also been called 'cooperative specialization.' For example, an independent computer special effects company is able to maintain an organizational structure and culture consistent with the needs of its highly specialized task and highly specialized workforce (e.g., software engineers). It might resemble a small, state-of-the-art software company more than a traditional movie

studio. Beyond unique configuration of internal processes, a unique market position based, for example on a focus strategy, can enable network partners to contribute unique resource access or resource distribution capabilities to a project (Hagedoorn, 1993; Miner et al., 1990; Oliver, 1990; Contractor & Lorange, 1988; Pfeffer & Nowak, 1976). In this context, the network establishes means for sharing such special resource access (Seabright, Levinthal & Fichman, 1992; Pfeffer & Salancik, 1978).

From a transaction cost perspective, spreading productive processes across independent network members changes the nature of the coordination challenges that are faced. Under conditions of substantial task interdependence, the intra-network member coordination challenges increase as the number of intra-network interfaces increase and specialization leads to increased incompatibilities between the organizational structures, processes, and cultures of network members. Higher degrees of specialization likely lead to greater differences between organizational structures, processes, and cultures of network members. These greater differences may create increasing challenges for internal network coordination (Osborn & Baughn, 1990; Kogut, 1989; Borch, 1994).

Specifically, a network organization has to address issues related to: (1) what are the optimal domains for the different sub-units (organizational boundaries) and (2) how to facilitate effective coordination among the sub-units (boundary spanning processes) (Tushman & Nadler, 1978; Galbraith, 1973).

The investment in network coordination structures must be weighted against the cost of less control and potentially increased response times (Tushman & Nadler, 1978; Galbraith, 1973). A production cost advantage related to 'cooperative specialization' in a network may lead to additional coordination challenges. The production processes that are spread across

independent network members have to be integrated. This implies additional transaction costs. The economic rationale for implementing a network is therefore:

(1) Cooperative specialization investments have to increase the efficiency of the network members' internal production processes.

(2) The internal production costs reduction must be larger than the increase in transaction costs caused by the necessary internal network exchanges and network coordination.

As outlined, this evaluation problem is complicated by the fact that specialization gains and transaction costs may not be independent from each other (Lawrence & Lorsch, 1967; Van de Ven, Delbecq & Koenig, 1974).

STNO and Flexibility

Assuming a mostly exogenous and changing environment, an organization's survival depends on its adaptive capabilities (e.g., Cohen & Levinthal, 1990; Burgelman, 1994; Miner, 1994). Compared to LTNOs, STNOs may offer the following five additional adaptability advantages: (1) recombination flexibility, (2) adaptive speed, (3) entrepreneurial zeal, (4) operational flexibility, and (5) learning capacity.

Across projects STNO-based production systems provide *recombination flexibility* (Storper, 1989; Piore & Sabel, 1984; Berger & Piore, 1980). For each project, a new set of partners is assembled in an attempt to optimize the fit between task characteristics and network member capabilities. Recombination flexibility allows STNOs to address both: (1) changes in the overall task characteristics, and (2) changes in network partner capabilities over time (Storper, 1989). In addition, STNOs may experience *adaptive speed* advantages if they need less time to combine the necessary capabilities for a specific task due to their

developed proficiency in identifying and responding to new partners and new tasks (Burns & Stalker, 1961; Volberda, 1996). This argument is supported by research on inertia of large, complex, and hierarchical organizations, especially when they are confronted with unexpected non-routine change (e.g., Parkinson, 1957; Hannan & Freeman, 1984).

Entrepreneurial zeal is the opportunity seeking behavior of smaller independent organizational entities (Fagenson, 1993). STNOs may attract more entrepreneurial-minded managers and transmit to its members a stronger sense of responsibility for organizational performance and survival. This special zeal argument is also supported by research conducted by critics of capitalism. They find evidence for harder work, longer hours, less pay, less union protection, and higher absorption of risk in smaller firms (e.g., Hyman, 1988; Murray, 1987, 1983; Smith, 1989; Wood, 1988). Their explanations mostly center around collective bargaining in small organizations. As negative as they perceive 'big organizations', they acknowledge that they by and large have better labor practices. Besides collective bargaining explanations, Perrow (1992) argues that 'self-exploitation' may be an important underlying reason for higher productivity of smaller organizational units. Self-employed or quasi-self-employed personell working for a very small firm seem to be more willing to exert more effort at times even without immediate compensation (e.g., Miner et al., 1999).

Research also indicates that the lack of stable exchange relationships creates incentives for network members to maintain or increase their internal *operational flexibility* of their own internal operations by, for example, reducing inventory levels, shortening manufacturing cycles, using temporary employment, and outsourcing peripheral activities (Richardson, 1996; Volberda, 1996). Finally, recombination flexibility has been suggested to

stimulate *organizational learning* due to an increased variety of experiences from the frequent exposure to new project tasks and new network partners (Hanssen-Bauer & Snow, 1996; Smith, 1996; Krijnen, 1979). In summary, production systems based on STNOs hold the potential for substantial flexibility advantages.

STNO Governance Challenges

The higher degrees of flexibility in STNOs are accomplished by shortening the duration of network relationships which may increase transaction cost. For example, the STNO's flexibility advantages imply that the repeated forming of new STNOs leads to repeated partner search costs and repeated efforts for establishing coordination systems between STNO members. This should result in higher transaction costs compared to LTNOs and hierarchies. The shorter duration of network relationships may also limit the effectiveness of traditional LTNO governance processes like: (1) contractual safeguards, (2) threats of substitution, and (3) trust building strategies. Again, this should lead to increased transaction costs.

Contractual Safeguards. The short-term nature of STNOs limits the time period during which the network members can benefit from contractual agreements between them. Ceteris paribus, any shortening of the network duration further limits the willingness of network members to invest in devising detailed contractual agreements.

Of course this does not imply that the contractual agreements between STNO partners are necessarily less elaborate. Given the additional governance challenges, STNOs may attempt to devise more elaborate contracts despite inherent problems of enforceability. These efforts in themselves may be cost effective – but compared to an LTNO or hierarchical

settings, the relative effort is substantially higher and the resulting protection likely to be lower. Thereby, a relative transaction cost disadvantage is incurred and the extensive legal contract between the parties may actually signal that disadvantage.

In addition, STNO exchange processes are often ill-defined at the outset, which further limits the network participants' ability to construct enforceable contracts (e.g., construction industry, consulting projects, movie production). Problems of writing enforceable contracts can be the consequence of:

(1) *Task uncertainty*: The inability to predict contributions needed from participants when the contract is signed.

(2) *Behavioral uncertainty*: The inability to evaluate the actual contributions made by participants during the collaboration.

(3) *Outcome uncertainty*: The inability to evaluate the overall task accomplishment after the collaboration.

These three factors again may be affected by the time frame of the network collaboration. Generally, long time frames, ceteris paribus, increase task, behavioral, and outcome uncertainty – while shorter-time frames reduce it. But project task characteristics can imply high levels of task uncertainty, behavioral uncertainty, and outcome uncertainty that can lead to market failure even in the case of short-term exchange relationships due to the inability to write enforceable contracts. It seems that STNO specialization advantages and flexibility advantages are especially prominent in task settings with such characteristics. The certainty gained by the short-time frame of the collaboration can be lost due to overriding uncertainties inherent in the task. Instead, the contracting parties will have to rely on other

additional safeguarding instruments as substitutes. Obvious candidates would be traditional LTNO safeguarding practices such as, 'threat of substitution' and 'trust building strategies.'

Threat of Substitution. Substituting opportunistic partners during an STNO project is generally less feasible as the integration of a new member may prove difficult given time constraints of the project. The alternative of terminating the entire STNO has negative consequences for both opportunistic and non-opportunistic partners, especially when STNO gains are tied to successful project completion. For these reasons, threat of substitution is expected to be a less effective safeguarding mechanism in STNO settings. To some degree, the effectiveness can be increased if organizations gain a reputation over time for terminating STNOs when opportunistic behavior is detected because if other partners believe a threat, it prevents opportunistic behavior without the need for exercising the threat and incurring the associated cost. Therefore, it seems that the applicability of the threat of substitution in STNO settings as a safeguarding practice is limited.

Trust Building Strategies. Trust is the general belief that the other party has respect and concern for one's welfare (Robinson, 1996; Gambetta, 1988; Barber, 1983) and is based on relational social bonds between the parties (Lewis & Weigert, 1985). The network literature has recently focused on the concept of trust as an alternative safeguarding mechanism, especially in situations where the application of contractual safeguards is limited (Uzzi, 1997; Parkhe, 1993; Seabright, Levinthal & Fichman, 1992; Shapiro, 1987).

Several empirical studies have made claims that prior collaboration and duration of collaboration produce trust (Gulati, 1995; Zucker, 1986; Parkhe, 1993; Larson, 1992). The rational is that prior collaborations create a social network in which the current collaboration becomes embedded. Both knowledge-based trust, which is based on the ability to better

predict partner behavior, and deterrence-based trust can be differentiated (Ring & Van De Ven, 1994, 1992; Shapiro, Sheppard & Cheraskin, 1992). Deterrence-based trust requires costly sanctions that exceed potential benefits of opportunistic behavior.

As Williamson (1993) outlines trust-based behavior does necessarily imply the absence of calculative behavior aimed at utility maximization. Instead, it can be understood as being intentional risk taking behavior protected by sanctioning systems. Sanctioning may take the form of exclusion from future beneficial exchanges with the same partners (relationship-specific) or other partners (not relationship-specific), or in the form of accepted social norms that constrain opportunistic behavior. In cases of strong social norms, the opportunistic behavior is eliminated from actors' evoked set of decision choices. In extreme cases actors do not even perceive them as potential decision alternatives. In the case of weaker social norms, opportunistic behavior alternatives are known to the actor, but associated with social sanctions. The strength of the sanctions determines in these cases the degree of protection.

Again, the short duration of STNO relationships limits the applicability of the trust building strategies found in LTNOs. The short time-frame prevents STNOs from reaching higher levels of trust when applying *escalating commitment strategies* (Ring & Van de Ven, 1994; Bobocel & Meyer, 1994). Similarly, *hostage taking strategies* (Williamson, 1983; Telser, 1981) based on, for example, the swap of ownership rights are more difficult to justify given a short-term network relationship. For these resaons, LTNO trust building strategies seem to be limited in their applicability to STNO settings.

Overall Performance Effect

The potential flexibility and specialization advantages of STNOs imply substantial coordination challenges. The overall performance effect of STNOs will depend on the complex trade-off between specialization gains, flexibility advantages, and transaction cost disadvantages. Following the majority of the prior research, I hypothesize that only in settings with very unstable and emergent task characteristics which require the flexible combination of a very diverse set of organizational capabilities, STNO specialization and flexibility advantages may outweigh the higher transaction costs. Accordingly, I hypothesize:

Hypothesis 1: *STNOs are more successful than LTNOs in settings with unstable and emergent project task characteristics that require the combination of a highly diverse set of capabilities.*

STNO Safeguarding Practices

One of the proposed reasons for increased transaction costs in STNOs is the reduced effectiveness of some traditional LTNO safeguarding practices. Mowery et al. (1997) and Doz (1996) found empirical evidence that LTNOs tend to develop and codify partner-specific coordination practices. These practices are customized to the specific needs of the network members and the specific task. Madhok & Tallman (1998) call this phenomenon of partnership specific coordination practices 'relational specificity.' The short-duration of an STNO offers less time for designing such practices and limits the time period during which the members can employ them. In addition, their partner-specific nature renders them obsolete when the STNO disbands. Ceteris paribus, STNOs will incur additional transaction

costs. However, transaction costs are not a fixed condition; rather, STNOs can actively seek alternative safeguarding solutions. Specifically, I will investigate to what degree STNOs can rely more on: (1) psychological contracts and (2) population-level shadows of the future to reduce transaction costs.

Psychological Contracts

As Atiyah (1981) and others have argued, formal contracts between parties are inherently incomplete. They are always subject to interpretation. In essence, all contracts are fundamentally psychological, as the beliefs of individuals have regarding an exchange relationship determine their behavior (MacNeil, 1978). As Karl Weick (1979) has shown, the ability of individuals to construct 'reality' is impressive. In order to understand exchange relationships, their social context and the psychological processes involved have to be taken into account (Rousseau, 1998). The construct of the psychological contract and its related research stream promises to address these issues (Rousseau, 1995).

The psychological contract construct was introduced into organizational studies previoulsy by Argyris (1960) and Schein (1965), but has only recently received renewed conceptual and empirical research attention (Tunley & Feldman, 1999). Psychological contracts refer to an individual's belief about mutual obligations in an exchange relationship. The psychological contract is a subjective, individual perception of obligations towards another party and of obligations of the other party towards the individual (Rousseau, 1989; Robinson, 1996). These social obligations motivate individuals to keep promises in order to remain consistent with their self-perception, and to avoid negative effects upon their perception by others (Rousseau, 1989). McLean Parks et al. (1998) focusing on

psychological contracting in contingent employment settings, point out that depending on task and organizational setting psychological contracts can substantially differ across these dimensions. A temporary factory worker differs substantially from a nurse or a business consultant. One of the challenges faced when applying a psychological contract construct to movie production is that their impact and nature can be difficult to assess given the extremely heterogeneous set of jobs that a movie project combines (e.g., experienced actor, chief electrician, wardrobe designers, stage hands). In addition, movie projects likely have multiple parties involved in the psychological contract. The setting more appropriately may be perceived as a complex network of interdependent psychological contracts. As a consequence, according to Rousseau & McLean Parks (1993), more fragmented and ambiguous contracts have to be expected.

Rousseau & McLean Parks (1993) introduced five core dimensions of psychological contracts: stability, scope, tangibility, focus, and time frame. McLean & Smith (1998) added particularism (e.g., dependency on the labor, skills, talents). Based on these dimensions, the contract literature differentiates between different types of psychological contracts. The two main categories of psychological contracts are transactional and relational contracts.

Historically, psychological contract research has focused on 'traditional' or full-time employees involved in a continuos or open-ended employment relationship (McLean Parks et al., 1998; Rousseau, 1990). However, the current interest in psychological contracts is closely linked with developments in organizational employment relations towards greater flexibility, mobility, and self-reliance (Tunely & Feldman, 1999). It has been argued that under certain conditions psychological contracts can establish binding, but flexible relationships as they allow parties to reinterpret the specifics based on the broader context of

their exchange relationship (Rousseau, 1989). Meyerson, Weick & Kramer (1996) have argued that under certain conditions, such social obligations can be established quickly. This is a phenomenon they have labeled 'swift trust' (see also McKnight, Cummings & Chervany, 1998).

Morrison & Bies (1991) and Morrison & Cummings (1992) found that contingent workers felt more isolated and restricted in their social interaction. Newton-McClurg (1996) found higher levels of commitment for contingent workers when they experience personal support and sensitivity to their needs (socio-emotional focus). Rogers (1995) reports that coworkers frequently felt it pointless to interact with known contingent colleagues and this reluctance denied contingent workers social support and socio emotional benefits. As satisfying socio-emotional needs seems to be a general challenge in temporary employment situations, I speculate that the temporary nature of STNOs leads to similar challenges, which could inhibit STNO performance. I hypothesize that any cost-efficient practice that substantially enhances socio-emotional returns and that strengthens identification with the project will have a positive effect across psychological contracts in network settings and leads to performance improvement.

Anecdotal evidence from the movie industry indicates that movie credits may serve the function of strengthening psychological contracts between the different contributors to a project and provide additional socio-emotional benefits. For example, during the transition to sound movies (1926-1934), engineers from electrical laboratories, telephone companies, radio stations, and engineering colleges were hired for sound recording. The integration of these engineers, who possessed their own professional standards, led to recursive problems. Lawrence (1929, p. 11) of the editor's union described these engineers as "hopelessly

ignorant of the existing public demands and high artistic standards of the motion picture production world." Clark (1932) noted that as a consequence of this conflict, sound engineers were typically denied screen credits, and their low self-esteem reinforced a cycle of degenerative neglect.

It is also interesting to notice how this conflict eventually was resolved. Both the American Society of Cinematographers (ASC) and the Academy of Motion Picture Arts and Sciences (AMPAS) created forums for debate and reconciliation. AMPAS set up a special producers-technicians committee in order to ensure that everybody on the set was working roughly from the same set of assumptions about sound recording. AMPAS also established a series of courses on principles of sound recording which were open to personnel from all parts of the industry. Working through the education program at the University of Southern California, at least 900 employees completed these courses in approximately two years. Thereby, the industry trained studio employees to become sound personnel instead of integrating employees from other industries. (Lastra, 1994)

Publicly recognizing an individual's contributions to a project may indicate an attempt to actively strengthen this person's identification with the project, to increase his or her commitment to the project. In psychological contracting terms such a focus on the relationship part of the contract may provide important socio-emotional rewards. In TCE terms such a focus may provide safeguards for the exchange relationship. Rousseau & Tijoriwala (1996) found that psychological contracts congruent with an organizational practice (in their case empowerment) enhanced implementation of this practice while they found no relationship between the implementation of the practice and incongruent contracts. I expect network organizations that use on-screen credits to strengthen psychological

contracts to experience performance advantages, but because of the limited applicability of other safeguarding mechanisms, I expect this performance improvement to be stronger for STNOs. Finally, if such a moderated effect exists, rational behavior would suggest that STNOs use this practice more frequently.

Proposition 2a: Network organizations strengthening psychological contracts by communicating more information about the contributions of individuals to their personal 'social environment' are more successful than network organizations that do not communicate such information.

Proposition 2b: The performance improvement effect of strengthening psychological contracts by communicating more information about the contributions of individuals to their personal 'social environment' is stronger for STNOs than for LTNOs.

Proposition 2c: STNOs are more likely to strengthen psychological contracts by communicating information about contributions of individuals to their personal 'social environment' compared to LTNOs.

Population-level Shadow of the Future

Game theory (Axelrod, 1984) reputation effect literature (Kreps, 1990; Milgrom, North & Weingest, 1990) and empirical LTNO research (Provan & Gassenheimer, 1994; Parkhe, 1993; Heide & Miner, 1992) show that if opportunistic behavior threatens future beneficial exchanges between parties, a 'shadow of the future' will discourage opportunistic behavior during the current exchanges.

The basic idea is related to the prisoner's dilemma game that deals with a sequence of two moves on every decision round of the game. First, party A has to decide whether to 'trust B' or 'not to trust B.' If party A 'trusts B,' then party B decides whether to take advantage of A ('abuse A's trust') or not ('honor A's trust). The incentive structure of the game is so that joint gains are maximized by trust/honor outcomes, but B's immediate gains are maximized when B is abusing A's trust. If played as a one-shot game, the no trust/no trust result will be obtained. (Axelrod, 1984)

Repeated games change the outcome dramatically. If, for example, A says to B "I will begin by trusting you, hoping that you will honor that trust. Indeed, I will continue to trust you as long as you do not abuse that trust. But if you ever abuse my trust, I will never again trust you" (Kreps, 1990, p. 103). If B believes this statement, the honor-trust arrangement is self-enforcing (Williamson, 1993). In such settings 'calculative trust' can emerge as the behavior in the current decision situation is influenced by considerations about their consequence for future exchanges. If such future considerations are taken into account, a 'shadow of the future' emerges that influences current decision behavior.

Traditionally, this research has focused on settings where the 'shadow of the future' depends on the continuation of an exchange relationship. Due to their short-duration and single-project focus, STNOs have virtually no network-level shadow of the future. While the termination of the STNO limits its shadow of the future, it simultaneously leads to a need for STNO members to join other STNOs in the future, even though they will most likely be with a different set of partners. If future selection into STNOs is based upon non-opportunistic behavior in past projects, a population-level shadow of the future emerges which extends beyond the current project (Meyerson, Weick & Kramer, 1996; Jones, Hesterly & Borgatti,

1997). An organization's reputation as a successful contributor to past STNOs becomes a key success factor for STNO contributors. It is important to recognize that even under the condition that past behavior has no predictive power for future behavior, the mere threat of being excluded from future exchanges provides a collective sanctioning mechanism that will prevent opportunistic behavior in currently on-going STNOs. The effectiveness of this shadow of the future depends on: (1) the dependence of STNO members on future STNO membership, (2) the availability and quality of information about past opportunistic behavior of potential STNO members, and (3) the importance of partner capabilities to future STNOs.

The logic of a population-level shadow of the future is also supported by game-theoretic considerations. In the context of the prisoner's dilemma, outlined earlier, if a sequence of As who have to decide whether or not to trust a single trading partner B, the honor/trust outcome prevails if the experience of the most recent game is known to all potential As and all As follow the rule not to trade with a party that has abused trust (Kreps, 1990). Milgrom, North & Weingest (1990) expand Kreps' analyses by considering many As and many Bs in many periods. They also assume that a court that serves as a repository for reputation and punishes a party in the event of defection from cooperating. Again, according to game theoretic considerations honor/trust outcomes prevail.

Still, game theorists acknowledge that in the case of "noisy, indirect observations, the problem of finding self-enforcing arrangements is vastly more complicated" (Kreps, 1990; p. 105). Most of the problems are linked to limited cognitive capabilities. Williamson (1993) adds several other factors that could limit the efficiency of reputation effect mechanisms, including: (1) communication problems, (2) hubris, (3) forgiveness, (4) multiple actors for single party, (5) penalties not automatic and permanent, and (6) strategic behavior (e.g., if all

As are competitors). These concerns imply that only in settings with certain characteristics the reputation effect will lead to a shadow of the future that controls opportunistic behavior. One of the crucial elements are effective and efficient population-wide communication mechanisms to communicate 'abuse' behavior. Another would be a rather consistent interpretation of what constitutes opportunistic behavior and an effective punishment of opportunistic behavior. Populations may establish industry institutions to facilitate these processes (e.g., information clearing houses) and institutionalize norms to reinforce reputation effect consistent behavior.

Anecdotal evidence supports the existence of such a powerful population-level shadow of the future in today's movie industry. Bach (1985, p. 309, 319-322) describes, for example, how the 'Heaven's Gate' debacle (conflict between producer and director which culminated in the director's intentional misrepresentation of actual expenditures) "led to at least temporary unemployment for almost everyone associated with the picture." The director's opportunistic behavior ended his very promising career. Prior to 'Heaven's Gate' he had been in high demand due to the success of his movie 'Deer Hunters.' Interesting enough, even individuals who could not possibly have anything to do with the opportunistic behavior that had occurred experienced re-employment problems as a consequence of their association with this project (Bach, 1985).

Besides these extreme cases of collective sanctioning, there is anecdotal evidence which shows that every partner selection process is generally based on norms emphasizing reputation. For example, director Sidney Pollack explains that his strategy for picking a crew is to "research the background of a tentative crew member religiously" (cf. Jones & DeFillippi, 1993, p. 92). Faulkner & Anderson (1987, p. 881) also found empirical evidence

that actors and directors "with successful performances and track records move ahead in their careers, [while] those with [a] moderate reputation do not, [and] those with poor reputations experience employment difficulties."

As every new STNO combines a different set of partners, the availability of 'first-hand' information about STNO partners' prior behavior is limited. Therefore, 'second-hand' information about the past behavior of potential partners becomes crucial. The necessary industry-wide communication processes can be facilitated by industry institutions (e.g., Academy of Motion Pictures), industry publications (e.g., Variety), or informal social networks (e.g., opening night parties). One important input into these communication processes that STNOs can actively initiate is showing detailed credit information at the beginning or ending of a movie presentation. Such on-screen credits (OSC) can provide the basis for a more detailed information search about potential collaborators. Even the informal gossiping that seems to be one of the backbones of the information exchange processes in Hollywood is facilitated if every industry member is supplied with contributor information. While my terminology stresses 'sanctioning,' of course the theory also accounts for 'incentive' systems. An 'incentive' shadow of the future implies that on-screen credits enhance future employment opportunities. A future employer may notice acting talent or the performance of other contributors while watching the movies of competitors. The name information facilitates identifying the contributor and contacting him or her. In cases where there is a high quality contribution such an incentive-based shadow of the future simultaneously controls for opportunistic behavior whereas a low quality contribution reduces the future employment enhancing effect of the movie. Quality may be judged by

outsiders based on both the overall quality of the movie and the quality of single contributions if they are visible on the screen.

I expect the shadow of the future effect to be especially relevant for main contributions to a project because: (1) the quality of a contribution can be directly judged by the quality of the final product (e.g., contribution of a special effects company by evaluating the special effects), and (2) the importance of the contribution for a project justifies the effort of investigating a potential partners track record. Therefore, only the on-screen credit listing of main contributors are hypothesized to have a shadow of the future effect. If main STNO contributors expect that such information will be disseminated, they will be less likely to engage in opportunistic behavior.

Thereby, the expectations about the future collaboration with other network partners promises to prevent opportunistic behavior in currently on-going collaborations. The more long-term the collaboration, the weaker the performance improvement effect a population-level shadow of the future as a powerful network-specific shadow emerges based on first-hand information. Formally, I hypothesize:

Hypothesis 3a: Network organizations strengthening the population-wide shadow of the future by communicating more information about main network contributors to their potential future network partners are more successful than network organizations that do not communicate such information.

Proposition 3b: The performance improvement effect of strengthening the population-level shadow of the future by communicating more information about main network contributors to their potential future network partners is stronger for STNOs compared to LTNOs.

Hypothesis 3c: ***STNOs are more likely to strengthen the population-wide shadow of the future by communicating information about the main network contributors to their potential future network partners compared to LTNOs.***

CHAPTER 4 - METHODOLOGY

Empirical Setting

The movie industry has been repeatedly used by researchers to test organizational theories related to 'industry & organizational structure' (Miller & Shamsie, 1999, 1996; Robins, 1993; Aksoy & Robins, 1992; Storper, 1989; Christopherson & Storper, 1989; Hirsch, 1972), 'employment & labor relations' (Baker & Faulkner, 1991; Christopherson & Storper, 1989; Faulkner & Anderson, 1987), 'contracting and other legal aspects' (Weinstein, 1998; Chisholm, 1997, 1993), and anti-trust issues (DeVany & Eckert, 1991; Kenney & Klein, 1983).

The movie industry from 1931 to 1940 provides a rich empirical setting for testing STNO hypotheses because: (1) it allows the comparison of STNOs and LTNOs in a single-industry setting, (2) the inherent task characteristics of movie production provide a setting in which prior research has suggested STNO performance advantages, (3) movie production is also prone to opportunistic behavior, thereby the investigated safeguarding practices are likely relevant, (4) the rich documentation of movie production promises the construction of a dataset with reasonable internal validity. Each of these arguments is outlined in more detail below.

STNO and LTNO Comparison. According to secondary sources (Balio, 1987, 1996; Schatz, 1988; Staiger, 1985), already in the 1930s the integrated studio system of production was challenged by more flexible project-based productions. This promises the construction of a single-industry sample containing projects that in their time horizon of collaboration. While the movie industry and movie historians may consider Hollywood in the 1930s relatively stable compared, for example, today's dynamics. From an organizational theory

perspective collaboration patterns at least on the principal contributor level have to be classified as very dynamic (e.g., short duration of any single project) and flexible (e.g., project contributor configuration) compared to other industries.

Task Characteristics. The second criterion for selecting the empirical setting was based on the organizational task characteristics. As discussed earlier, performance advantages of STNOs are expected in settings with unstable and emergent project task characteristics that require the direct collaboration of a highly diverse set of specialized experts. In spite of all the attempts to 'script' the movie production process prior to the actual shooting, the production process requires continuous adjustments and creative solutions to unanticipated problems or opportunities. For these reasons, movie production should be classified as an unstable and emergent task. With regard to the coordination of a highly diverse set of specialized experts, movie project brings together a set of contributors whose with expertise ranges from optical processes, acting, electricity and lighting, inspiriational leadership, organizational skills, woodcrafting, accounting, and many others in the functions of director, producer, actors, art directors, editors, cinematographers, make-up artists, electricians, special effects experts, or stage hands. Paul & Kleingartner (1994) and Hartsough (1988) in their analysis of industrial relations conclude that in movie production a wide-variety of employees with very different expertise and skills engage in complex collaboration. These impressions are supported by other descriptive accounts of the movie production process by movie historians (Balio, 1987, 1996) and by contemporary anthropological research (Powdermaker, 1950). Based on this information, I assume that the Hollywood movie production in the 1930s was characterized by unstable and emergent project task characteristics that required the direct collaboration of a highly diverse set of

specialized experts and meets the task characteristics under which prior research would expect STNOs to experience performance advantages.

Opportunities for Opportunistic Behavior. Opportunistic behavior in a movie project can take many different forms and each form has likely different implications for the project outcome. In addition, different forms of opportunistic behavior are likely more effectively addressed by a different set of safeguarding practices. Two forms of opportunistic behavior seem to be especially relevant and problematic in the movie project setting: (1) *unavailability* during the time period when contribution is needed and the necessary scheduling flexibility as this time period is often difficult to predict with regard to both point in time and duration, and (2) not performing tasks to *quality* standards expected.

Unavailability is a main challenge as it may bring movie production easily to a costly stand still due to the high interdependence and simultaneity of task performance on the set. For example, absence or unavailability of a key actor prevents shooting any scenes he or she is needed for. If a lead actor completely withdraws from a project, potentially all scenes involving the person will have to be redone or the script will have to be altered substantially. This dependence on a specific contributor may extend beyond the lead cast (e.g., lower level and non-cast contributors). It may also be relevant with regard to non-cast contributors if, for example, their contribution is unique (e.g., special effects skills), partner-specific (e.g., Greta Gabor insisted on working with the same cinematographer), or requires substantial lead time and effort in the case of substituting a contributor (e.g., development of specialized equipement or renewed coordination with other functions). Therefore, even the function of a script clerk who is responsible for monitoring coherence between the script and the shooting, documenting changes to the script and editing instructions, and assuring continuity of story

development may be as indispensable in the middle of a movie shoot as a lead actor. Replacing the script clerk would require that the new clerk familiarizes himself or herself with the script and watch all prior scenes to note changes in the script. As script clerks were using a highly idiosyncratic documentation system, the notes of the former script clerk, if available, would likely be of little use. As this example illustrates, the high interdependence and non-routine nature of the production process leads to relational dependencies, especially after the production process has started. The issue of availability not only involves substitution of contributors, but also the willingness to accommodate unexpected changes due to weather, technology, stage set-up, or other disruptions of the complex production process. Given the complexity and emergent nature of the task, such changes are inherent in the production process. Again the relational dependence outlined could lead to costly delays if even single contributors cannot adjust their schedules to accommodate the project. Quality evaluation presents similarly severe challenges with regard to opportunities for opportunistic behavior. The challenges are related to establishing and enforcing agreements between contributors with regard to certain quality dimension of the contribution. Given the emergent nature of the production process it is often difficult to a priori specify tasks in sufficient detail. In addition, the objective evaluation of the quality of task performance due to their unique nature and their high degree of interdependence creates substantial challenges. For these reasons, the effectiveness of contractual agreements becomes limited as the up-front definition of tasks and the monitoring of tasks performance creates challenges. For example, it will be difficult to prove in a court of law that an actor was, intentionally or unintentionally, not performing at his or her full potential and seek damages for breach of contract as long as he or she showed up on time and knew the lines. High quality outcomes

require a diligent, committed, and qualified contributor that gives everything to tackle problems and exploit opportunities as they present themselves. This diligence and commitment is not only needed with regard to delivering one's own contribution, but also to integrate and coordinate this contribution with the contribution of others. Such decentralized coordination is often an unscripted process that the network captains, like the director and his assistants, can only monitor and support to a limited degree.

In summary, the combination of difficulties to specify and evaluate task performance with a decentralized, complex, highly interdependent task coordination provides opportunities for opportunistic behavior, which are difficult to control by traditional contractual safeguards.

Extensive Archival Records. The extensive archival records (e.g., movie credits, legal contracts, internal production records, trade papers, biographies, memoirs, oral histories, interviews, and surveys) provide rich and detailed information about numerous aspects of the movie projects for an entire industry over a nine-year time period. This level of documentation promises the construction of a data with reasonable internal validity.

Sampling Units

Between 1931 and 1940 approximately 4,980 U.S. feature movies were released (Bahn & Andrus, 1950; Table 4-1). A feature film is defined by a minimum length of 40 minutes (Munden, 1993). Feature movies fall into two distinctive categories, A-movies and B-movies.

A-movie production was the main focus of attention of the major studios, the movie industry, and the general public. Studios invested substantial amounts of money into A-

movies. According to Taves (1993), studios invested on average $ 350,000 for an A-movie production during the 1930s in anticipation of high box-office revenues and winning Academy awards.

In contrast, B-movie production was intended to turn out pictures rapidly on low budgets. In his historical study of Hollywood's B-movies, Taves (1993) identified the following unique B-movie production characteristics:

(1) Quick and simple set-up (e.g., arranging lighting and camera angles).

(2) Editing in the camera without wasting footage.

(3) Concealing cheapness in sets with fast pacing and shadowy lighting.

(4) Eliciting effective performances with few rehearsals.

A-movie and B-movie production requirements were so distinctly different that they represented two separate production systems. Principal production contributors, once identified with A-movies or B-movies, tended to get pigeonholed. According to Taves (1993), this even happened at the major studios, which simultaneously produced both A-movies and B-movies. The focus of this study is on A-movie production because of their far better archival documentation that promises more reliable measures.

Pilot Study

A pilot study based on a random sample of 24 movie projects from 1930-1950 was conducted to test the feasibility of the initial research design, especially the validity and reliability of the proposed measures. Based on findings of the pilot study measures and research design were refined.

Sample

Sampling Procedure

For the actual study, a random sample of 339 A-movie projects was constructed covering the time period 1931-1940. Sampling was based on weekly movie production announcements in the Hollywood Reporter (1930-present). A-movies were identified based on a production time of more than three weeks. This stratified random sample (SRS) of movie projects was used to test the proposed hypotheses (Table 4-2).

For each of the sampled movie projects information about project characteristics (e.g., production duration, names of main contributors) was collected from available movie catalogs (King-Hanson & Gevinson, 1993; Nash & Ross, 1986), internet databases (www.imdb.com), and clipping files (e.g., Academy of Motion Picture Libraries and Archives). In addition, information about relevant changes in the industry environment was collected based on documentation of movie history (e.g., Powdermaker, 1950; Schatz, 1988; Balio, 1987, 1996). Both the project information and the industry information were merged into a single movie project database for hypotheses testing.

Removal of Sampling Units

Unknown and Foreign Movies. Only one of the movie projects ("Secret Agent X-9") in the sample left no traces in available movie catalogs and was removed from the sample for lack of further production information. One foreign movie ("The Rebel") was removed from the sample as only its financing was U.S. based, but the movie, an Alpine drama, was shot on location in Europe with a German and Austrian crew and cast.

B-Movies. In a second screening 39 movie projects were removed from the sample because their small cast (less than 10) and lack of above-the-line cast credits (indicating the lack of audience-drawing stars) suggested that they were B-movies (Table 4-3).

Core Production Structure. The intent of the study is to differentiate STNOs from LTNOs based on the degree of repeated collaboration between a standard set of principal project contributors. 42 more movie projects were removed because their fundamentally different network structure made them unsuitable subjects for the intended comparison across movie projects. For example, the movie "If I had a Million" was removed as it combined several short sequels shot by different sets of famous directors (e.g., Lubitsch, Taurog) and actors (e.g., Gary Cooper, Charles Laughton). In 28 other movie projects the director assumed simultaneously the role of the producer. In 2 cases the main actor was also the producer of the movie. For another 11 early movies (1931-1933) neither the American Film Institute catalogue (King-Hanson & Gevinson, 1993) nor the Motion Picture Guide (Nash & Ross, 1986) was able to identify a producer suggesting that either the director or an unknown person fulfilled the producer functions. Table 4-4 indicates that projects with such different core network structures (14% of all movies in sample) were not an emergent phenomenon, but rather occurred throughout the time period.

Independent Variable and Dependent Variable Missing Data. Missing on-screen credit information was the final reason for removing 12 projects from the initial sample. This information is needed for operationalizing the independent variables of psychological contracting and shadow of the future. Of those 12 movie projects eight were not listed in the American Film Institute Catalog (King-Hanson & Gevinson, 1993) that provides on-screen credit information. The production of these movies started in 1940, but their release date

(1941) fell outside the time period the catalog covers. The other four movies were listed in the catalog, but the American Film Institute was neither able to find an actual copy of the movie for viewing nor was it able to obtain editing information stating on-screen credits. All 12 movies were removed from the sample.

Finally, missing data in the dependent variable Box-office Revenue lead to the removal of another 6 projects achieving a final sample of 239 movie projects. Table 4-5 shows the number of movie projects across years in the sample. The lower number of projects in earlier years is attributed to data availability problems and a higher proportion of B-movies in the population. The lower number during the final year is a reflection of the described censoring problems as eight movie projects that were started during 1940, but were not released before the next year (Table 4-5).

Dependent Variables

Introduction

> "In all field work there is usually one piece of esoteric data which is hidden by the natives. Among the Melanesians in the Southwest Pacific it is black magic. Among the Hollywood executives it is net profit."
>
> Hortense Powdermaker (1950)
> Anthropologist studying the Hollywood production process

Performance information is required for each movie project in order to test H1, H2a, H2b, H3a, and 3b. Cones (1997) suggests that the Hollywood community has an ambiguous relationship to the net-profit concept. On one hand, everybody admits that movie making is a

very competitive business. On the other hand, cultural norms embrace movie making as an art form and the myth prevails that all you have to do to be profitable is make a great movie. Available profit information challenges this claim. Cones (1997) lists numerous blockbuster movies (e.g., Blues Brothers, Fatal Attraction, Rain Man) that supposedly have not broken even. He also points out that comparable net-profit figures are difficult to obtain. To illustrate this point, he lists seven different profitability measures used in the movie industry. In addition, in the cases of profit-sharing agreements, any net profit figures become sensitive information and suspicions have been raised regarding potential manipulations. Weinstein (1998), in his historic analysis of profit-sharing contracts in the movie industry, ascertains that this type of contract existed during the studio era, but was a very rare exception. He also eludes to the difficulties of objectively evaluating movie profits. In the Warner Brothers and the Universal Studio archives, he was able to find only 5 such contracts for the time period 1930-1940. For Metro-Goldwyn-Meyer he found evidence for a studio policy to categorically not sign profit-sharing contracts.

For the time period studied, only for Warner Brothers and Paramount is internal financial performance information for individual movie projects available. This information was recorded and used to assess the validity of the performance proxies applied. In the absence of industry-wide movie project net-profit data, information on the following three different sets of performance proxies was collected: (1) Movie Release, (2) Profitability Proxies, and (3) Academy of Motion Pictures Award Nominations.

Movie Release

Movie Release is a binary measure and differentiates between failed projects and projects that completed their task. Completed movie projects are defined as movie projects that produced an output of sufficient quality to justify distribution to movie theaters. Aborted movie projects are defined as projects that started filming scenes, but never led to a movie release.

In the pilot study one movie was produced, but never released. In the final sample, the release of one movie could not be determined. It remained unknown if the project was actually abandoned or simply released under a different name. As mentioned earlier, this movie project was removed from the sample. In summary, both the pilot study and the final study revealed that unreleased movies are an extremely rare event in this industry. The lack of variance in this measure makes it less interesting for statistical analysis, but the virtual lack of unreleased movies in the sample improves on the survival bias typical in organizational network research.

Financial Performance

Construct. Financial Performance captures the monetary return generated by a movie project. As studios are for-profit organizations, they have to be concerned about the financial performance of a movie both to regain their current investment and to secure financial backing for future projects. The primary source of movie revenue at the time were box-office returns as the period predates revenue opportunities through merchandising, TV release, or video release (Stuart, 1982). When controlling for production cost differences (project investments), revenue differences between movie projects provide a proxy for profitability

differences. Revenue information, in contrast to profit and loss information, is available from several trade journals that published estimated box-office revenues from major first-run movie theaters throughout the U.S. (e.g., Variety (1905-present), Hollywood Reporter (1930-present), Motion Picture Herald (1931-1972), Boxoffice (1932-1977)). Even though first-run theaters comprised only about 25% of the total movie theater seating capacity, they are estimated to have returned 50-75% of the box-office receipts (Balio, 1987; Huettig, 1985). In addition, the publication of box-office revenue likely influenced returns from subsequent-run theaters as booking decisions for second-run and third-run movie theaters may have been influenced by the observed success in first-run movie theaters (Huettig, 1985).

The above listed trade journals provide no information on the foreign revenues a movie generated. Even though international releases played a significant role, their influence was smaller compared to the domestic revenues of the movie. For 96 movie projects, domestic and foreign revenue information is available from accounting ledgers. The average domestic revenue was $736,000 (S.D. =$558,000). The average foreign revenue was $469,000 (S.D. =$429,000) and strongly correlated with domestic revenues ($r=.82$; $p<.001$). A regression analysis controlling for studio effects indicated that domestic revenue is strongly correlated to foreign revenues ($b=.60$; $p<.001$) (Table 4-6). These results suggest that performance evaluation based on domestic revenue is not a perfect performance measure, but a feasible proxy for evaluating overall project performance.

Measurement Procedures. In the pilot study, box-office revenue was estimated based on Variety (1905-present) revenue reports from first-run movie theaters in New York and Chicago. New York and Chicago combined accounted for about 48% of the US movie theater seats during this time (Variety, 1937, May 12). For the final sample box-office

revenue was estimated based on a survey of first-run movie theaters conducted by the staff of Boxoffice (1931-1951), a weekly publication for movie theater owners. From 1937 on, results of the survey were published aggregated for the preceeding year in an annual publication called the Boxoffice Barometer (1937-1951). The Boxoffice surveys covered first-run movie theaters in 27 major U.S. metropolitan areas (Table 4-7). Pictures with fewer than 5 runs in first-run movie theaters were not listed. Theater owners were asked to evaluate the revenue generated by the movies they were showing during the last week compared to the expected revenue from an average movie shown under the same conditions (e.g., weather, season). These estimates were expressed in percent with 100% being equivalent to the revenue generated by an average movie. This variable will be called Box-office Revenue rating.

From 1932 to 1935, weekly and monthly Boxoffice publications based on a similar survey methodology were aggregated into annual averages. A dummy variable was used to control for any fixed differences related to this aggregation process.

For 16 movies before 1936, no box-office ratings were found in Boxoffice (1932-1977). 9 of these movies were produced in 1931. For the movies produced in 1931 the most likely explanation is that they were released prior to Boxoffice's first surveys. For the other 7 movies they either were released during a month for which no preserved copy of Boxoffice (1932-1977) was available or they never received 5 or more runs in the cities covered by Boxoffice. The latter would indicate poor revenue performance. Instead of dropping these movies, their box-office revenue was estimated based on box-office revenue estimates provided by an alternative trade paper source, the Motion Picture Herald (1931-1972).

Based on the 17 movies from 1932 in the sample, for which both Motion Picture Herald (1931-1972) and Boxoffice (1932-1977) information was available, I developed a regression model for estimating box-office figures based on Motion Picture Herald reports. The Motion Picture Herald (1931-1972) also surveyed the owners of first-run movie theaters. This publication offers an estimate of the absolute revenue earned during the week and the absolute weekly revenue of the best and the worst movie during the last year. Best and worst movie revenues were used to estimate the revenue generated by an average movie at this movie theater. The actual weekly revenue was then converted in a percent comparison to this estimated average with the average set equal to 100%. This procedure roughly reflected the type of estimation made by theater owners for the Boxoffice survey. While the Motion Picture Herald (1931-1972) covered first-run movie theaters in 31 major U.S. metropolitan areas, the initial model construction was restricted to first week revenue reports from New York. It turned out that neither adding the next most important city (Chicago) nor including a second or third week of estimates improved the model. New York and Chicago accounted for 48% of the US movie theater seats during this time (Variety, 1937, May 12). The simple model used for the estimation was:

(4.1) BOX-OFFICE REVENUE = 32.4 + .71 (NEW YORK 1st WEEK VARIETY REVENUE)

Definition:

BOX-OFFICE REVENUE = Based on box-office ratings of movie theater owners published in the Boxoffice trade journal.

NEW YORK 1st WEEK VARIETY REVENUE	=	Percent comparison of the 1st week box-office revenue of the movie in New York in comparison to box-office revenue of an average movie in the same theaters. The average movie revenue was estimated based on information about the best and the worst box-office revenues during the last 12 months.

This model explained 79% of the variance of Box-office Revenue (adj. R^2=.79; p<.0001; n=17). Based on this model, Box-office Revenue equivalent box-office ratings were calculated. The 16 movie projects for which the estimation procedure was used were dummy coded to protect against any fixed differences in the dependent variable due to the estimation procedure.

Descriptive Statistics. The performance of the sampled movie projects was rated on average as 105% by movie theater operators in comparison to the expected performance of an average movie. The standard deviation of the box-office rating was 18.7%. The lowest and highest movie ratings were 45% and 180% respectively. The box-office rating was available for 239 of the movies in the final sample. The performance of 5 movies produced after 1935 was not found in the annual Boxoffice Barometer (1936-1952). Assuming they were not listed because they did not meet the Boxoffice's requirement of a minimum of 5 runs at first-run movie theaters, their performance was likely similar or worse than the 45% rating received by low performing movies listed in the Boxoffice publications, and they were assigned this value.

Table 4-8 shows the frequency distribution of Box-office Revenue ratings. The distribution of box-office ratings based on a visual examination shows sufficient characteristics of a normal distribution for OLS regression. Especially, considering that the regression model has been shown to be fairly robust against modest violations (Cohen & Cohen, 1975).

Movie Production Cost. As mentioned above, revenue estimates only reflect profitability of movie projects if one controls for differences in production costs between projects. The three main cost proxies used in this study are production time, size of the cast, and contributor quality.

Production Time was defined as the number of days of actual 'shooting.' It was derived from information about the starting and ending dates of movie 'shooting' based on either information from the American Film Institute Catalog (King-Hanson & Gevinson, 1993) or production announcements in Hollywood Reporter (1930-present). This measure assumes that every day 'shooting' increases a movie's production cost. The significance of this cost factor is supported by anecdotal evidence that reports the studio's tight control of shooting schedules and their concerns whenever a movie started to fall behind its shooting schedule (Schatz, 1988; Staiger, 1985).

The second important cost factor in movie production is related to the size of the production crew. Only fragmented information about the size of the non-cast production crew was found. In contrast, the American Film Institute Catalog (King-Hanson & Gevinson, 1993) lists the names of the cast members based on credit lists, studio records, central casting agency records, and viewing of the actual movie. I used the size of the movie cast as a proxy

for the size of the total production staff. This proxy is supported by the assumption that a larger cast implies the need for more support staff (e.g., make-up, costumes).

Length and size of the project are necessary, but not sufficient cost controls. In addition, the use of high quality contributors can substantially raise the production cost. The quality of the contributors in a dual sense represents an alternative explanation for a project's revenue success. On one hand, the higher quality contributors will demand a larger share of the profits and when comparing the box-office success of different project this needs to be accounted for. On the other hand, the higher quality contributors can be the reason for box-office success. When empirically testing the performance impact of management practices these alternative explanations need to be controlled for. The analysis uses sixteen different measures to capture contributor quality differences. Eight are based on the number of prior academy nominations of individual contributors in the director, producer, cinematographer, art-director, editor, and three main actor categories. Seven are based on the total number of prior films an individual principal contributor was involved in the same contribution category. These seven measures capture differences in the contributors' accumulated experience. In addition, the number of above-the-line credits for the three main actors was counted. A movie with above-the-line actor or actress credits indicates that the movie studio attempted to use the reputation or appeal of these actors to draw audiences.

These control variables will be discussed in more detail in the section 'control variables.' They are mentioned here only to underscore that when the both Box-office Revenue estimates and production cost proxies are entered in regression equations, the Box-office Revenue estimates become profitability proxies.

Academy Nominations

Construct. In contrast to the financial performance measure discussed above, Academy Nominations represent a separate performance dimension based on quality evaluations by industry insiders of a movie's artistic value and craftsmanship.

The construct validity of this measure is supported by the following theoretical arguments:

(1) Academy Awards are frequently an explicit goal of A-movie production. Balio (1996, 1987) in his analysis of Columbia, Eagle-Lion, United Artist and other studios found evidence that several studios produced especially elaborate movies targeted not only at high box-office revenues, but also winning prestigious Academy Awards and developing 'stars.'

(2) The voting of the Academy members should be interpreted as a ranking by movie experts (or at least movie business insiders) along several product quality dimensions.

(3) The chances of being nominated increase if the movie has been seen by a majority of the selection committee and received wide public attention. Therefore, Academy Nominations indicate extended runs at first-run movie theaters which likely generated substantial box-office returns.

(4) Academy Nominations and Academy Awards may stimulate additional audience interest in the movie leading to additional revenues (e.g., re-releases).

The Academy Nomination information for all movie projects is available from highly reliable sources (e.g., the Internet Movie Database: www.imdb.com). In order to earn an

Academy Nomination, a movie had to surpass a very high quality threshold. Thereby, this measure differentiates between a few very high quality movies and a bulk of movies that received no Academy Nominations. This limits the measure's effectiveness in differentiating movie performance for the entire sample. In addition, the pilot study and prior research (Faulkner & Anderson, 1987) indicate that Academy Nominations were more likely given to dramas than to musicals or comedies. In the regression analyses genre dummies are used to control for this bias. However, if few Academy Nominations are granted to musicals and comedies, which together represent 44% of the movie projects in the sample, this further limits the ability of the measure to effectively capture performance differences between movie projects.

There have also been repeated indications of Hollywood politics influencing the nomination process (Faulkner & Anderson, 1987). This questions the objectivity of the movie quality evaluation. Hollywood politics may have contributed to the unreliability of the measure if their changing and unpredictable influence was random over time. Of course, if Academy Nominations are interpreted as objective quality evaluations, then any fixed effects across years would lead to biases. The year dummy variables and the studio dummy variables in the regression models control for any fixed effect differences due to Hollywood Politics on Academy Nomination decisions across years and across studios. Fixed effects independent of the studio and year bias this measure. These inherent problems associated with the Academy Nomination measure limit its effectiveness with regard to detecting performance differences between the movie projects.

Still, the Academy Nomination measure, in spite of its limitations, was included in the study because it captures a dimension of movie project performance that is of paramount

importance for contributor careers and potentially not adequately covered by the financial performance measure. Therefore, all performance hypotheses were tested with both Financial Performance and Academy Nomination as the dependent variables. Of course, the interpretation of results has to take into account the strengths and limitations of the measure as discussed above.

Measurement. The database contains the Academy Nominations and Academy Awards for every released movie. An aggregated measure was constructed that combines a movie's nominations in the following categories: (1) best film, (2) best director, (3) best actor, (4) best actress, (5) best cinematography, (6) best supporting actress, (7) best supporting actor, (8) best art direction, and (7) best editing. These categories correspond to the principal contributor categories included in the construction of the main independent variable Repeated Collaboration discussed later. These award categories have been used with relative consistency by the Academy of Motion Pictures since 1929. Only the following changes occurred: In 1931 best pictures were nominated in two separate genre categories: Drama and Comedy. Starting in 1932, best pictures were nominated in a single category that included all genres. Starting in 1934, the best editing category was added. Starting in 1936, best supporting actor and best supporting actress categories were added. Starting in 1939, nominations for cinematography were made in two categories: color and black/white. Starting in 1940, art director nominations were made in two separate categories: color and black/white. Otherwise, the categories remained consistent. However, the number of nominations in a given category varied by year. Due to these changes in the number of categories and the number of nominations per category, dummy-coded year variables are used

to control for these differences in regression models using Academy Nominations as a dependent variable.

Descriptive Statistics. Academy Nomination represents a non-negative count variable of a relatively rare event and a poisson-like distribution is expected. Table 4-9 shows that 91% of the movies in the sample did not earn any Academy Nominations in the categories: best film, best director, best actor, best actress, best supporting actor, best supporting actress, best cinematography, best art direction, best editing. Nine movies earned one nomination, nine movies earned two nominations, and four movies earned four or five nominations. The visual evaluation indicates that the data has poisson-like distribution characteristics.

Summary Performance Measures

The main dependent variable for investigating performance differences of movie projects is Financial Performance. It represents the overall project goal and promises a fine-grained performance differentiation among projects. In addition, the Academy Nomination measure captures top performances of movie projects on the artistic and craftsmanship quality dimension. Despite its limitations discussed above, Academy Nominations represent an important and unique performance dimension that is highly relevant for a subset of the movie projects and a subset of the principal contributors.

The third proxy, movie release, was not used as a dependent variable due to its lack of variance. Still, this measure provided important information as the absence of uncompleted movies indicates that the study encountered no substantial survivor bias. Survivor bias is a problem frequently associated with organizational network studies on the industry-level.

The validity of the different dependent variables was further explored by evaluating whether their expected theoretical characteristics in relationship to each other are reflected in the data. As mentioned earlier, accounting information was available for 96 movie projects. For 44 of the 48 movies produced by First National, Warner Brothers/First National, or Warner Brothers box-office accounting information was available from accounting ledgers (Glancy, 1995). For 58 of the 64 movies produced by Metro Goldwyn Meyer (MGM) box-office revenue and net-profit information was available from accounting ledgers (Glancy, 1992). The average Warner Brothers movie in the sample generated $562,000 in domestic accounting revenues (S.D.=$384,000). The average MGM movie in the sample generated $851,000 in domestic accounting revenues (S.D.=$623,000). The average accounting profit of these MGM movies was $224,000 (S.D.= $452.000).

The strong positive correlation ($r=.76$; $p<.001$) between the Box-office Revenues as reported by theater operators and actual accounting ledger entries for domestic revenues supports the validity of using Box-office Revenue ratings as a proxy for financial performance (Table 4-10). Even without controlling for cost differences between projects, the moderately strong positive correlation between Accounting Profits and Accounting Revenues ($r=.68$; $p<.001$) and Accounting Profits and Box-office Revenue ratings ($r=.58$; $p<.001$) are consistent with expectations based on construct characteristics. Finally, the positive, but much weaker correlations between Award Nominations and the different financial performance measures ($r=.13$-$.31$; $p<.001$-$.364$) are consistent with the argument for a partially independent second performance dimension based on a movie's artistic value and craftsmanship as evaluated by industry insiders, as well as the lower efficiency of the Academy Nomination measure.

Dramas (including romances and westerns) were more likely to win awards than comedies or musicals. Such an imbalance is not expected for a movie's box-office success. When analyzing only dramas, the Box-office Revenues correlates stronger with Academy Nominations ($r=.38$; $p<.0001$) (Table 4-11). Again, the dependent variables behaved as theoretically expected.

Independent Variables

Repeated Collaboration

Construct. An ideal-type STNO was defined as *an intentionally created interorganizational entity that combines independent contributors for the objective of accomplishing a single short-term task.* The STNO disbands upon completion of this task. By contrast, an ideal-type LTNO establishes long-term or open-ended collaborations. The short-term nature of STNOs has two dimensions: (1) the short duration of the network relationships and (2) the expected disintegration of the STNO after task completion. In order to test for differences between STNOs and LTNOs, these need to be identified based on the difference in the time horizon of collaboration for the relationship between contributors. This requires (1) identifying both the set of relevant network contributors and (2) measuring the time horizon of their collaboration.

Focusing only on the principal contributors is supported theoretically as the coordination between the principal contributors is at the core of the networks coordination challenge. In addition, anecdotal evidence suggests that a principal contributor typically is the head of a team of subordinates (e.g., director of photography with camera assistants and camera operators; director with typically two assistants; actor with agent and trainers) with

whom he or she has an on-going work relationship. In such cases, relationships between principal contributors captured simultaneously relationships between teams collaborating on a movie set.

Principal contributors were identified based on organizational charts of motion picture production. Seven principal contributor categories were identified: the lead actors, director, head camera person, head producer, head writer(s), head art director, and head editor. This research focuses on the coordination challenge during and after the shooting of the movie. For this reason, I excluded the writer category, which is primarily involved in the pre-production process.

Secondly, the measure has to capture the duration of collaboration over time between the principal contributors. The Repeated Collaboration measure captures simultaneously current and past collaborations between the principal contributors. An LTNO is a project of principal contributors who have a long and frequent collaboration history and/or anticipate future collaborations. In an STNO principal contributors have never worked together before and are not anticipating to work together again in the future.

Faulkner & Anderson (1987), in their study of Hollywood careers, reported that in some respects the old studio system was more like the present system than it appears at first glance. Specifically, the people working on A-movie projects generally had, like today, records of accomplishment. The main difference with regard to network formation was that the studios and their producers managed the matching of contributors. In contrast, today the individual contributors to a movie project often play a more active and more central role. Successful individual contributors in the 1930s often had more long-term exclusive contracts with a studio (Weinstein, 1998; Schatz 1985).

The operationalization has to take into account that in the movie business any single project is inherently short-term and future collaboration inherently uncertain. The average movie project in the sample has a production time of 46 days (S.D. = 22.49 days). For 80% of the projects 'shooting' was completed within two months (Table 4-12). In such an industry environment long-term relationships depend on the Repeated Collaboration across single movie projects. Given the very dynamic nature of the movie business even during what has been labeled the 'studio era,' future collaborations were inherently uncertain. They typically depended on the success of the current project. DeVany & Walls (1996) and Weinstein (1998) documented the high degree of uncertainty with regard to predicting a projects financial performance during the pre-production and the production stage. Some stability was provided by long-term exclusive employment contracts between contributors and studios. With regard to principal contributors, such contracts were only signed with a small number of highly successful contributors. Their long-term nature was limited as they were typically option contracts (up to 6 or 7 years). They gave the studio not only the right to release the employee after every year, but also to lend his or her services to other studios. Hellmuth (1950) estimates that between 1933 and 1939, over 2,000 loans of principal contributors were made between the major studios.

The 'long-term' option contracts did also not specify with whom a principal contributor would work in the future, nor could principal contributors predict with whom they would collaborate simply based upon who else was employed by the same studio because of the multiple production units within a studio and the possibility of hiring, firing, lending and borrowing of talent to and from other studios. This suggests that even the few

'long-term' contractual arrangements that existed at the principal contributor level provided little certainty with regard to future movie project collaborations.

The inherent uncertainty of future collaboration limits a contributor's ability to anticipate a likely continuation of a relationship with the same contributors. Instead, I assume that contributors perceived it as generally unlikely to collaborate with the same set of principal contributors again in the future. A network-specific shadow of the future does not exist or is rather weak in this industry, while a strong studio-specific shadow of the future may very well exist and fixed differences between the strength of this shadow between studios are controlled for via studio dummy variables.

Still, movie projects differ with regard to their time horizon based on the number of prior collaborations. Any specific movie project can have a prior collaboration history. In this case a current relationship is more long-term as it is the continuation of a collaboration with the same principal contributors in the past.

This Repeated Collaboration measure also captures effects of long-term contracts on collaboration patterns. If, for example, the studio contracted with a set of principal contributors to use the same production configuration repeatedly, this would be captured by the Repeated Collaboration measure in later stages of its implementation when several projects have already been completed. This operationalization is neural with regard to the underlying cause leading to repeated collaboration. Therefore, in the rare case of long-term contracts, they are captured by the Repeated Collaboration measure, even though not perfectly.

Measurement. The names of principal contributors were collected for each movie from credit listings in the American Film Institute Catalog (King-Hansen & Gevinson, 1993)

and Motion Picture Guide (Nash & Ross, 1986). The following dyadic linkages were identified as crucial for the production coordination processes based on movie production organizational charts (Hines, 1984):

(1) Director – Producer
(2) Director – Cinematographer
(3) Director – Art Director
(4) Director – Actor 1
(5) Director – Actor 2
(6) Director - Editor
(7) Producer – Actor 1
(8) Producer – Actor 2
(9) Producer – Cinematographer
(10) Producer – Art Director
(11) Producer – Editor
(12) Actor 1 – Actor 2

Queries of the Internet Movie Database (www.imdb.com) provided for each pair of principal contributors a list of prior projects for which they had received credit in their respective contributor category. Based on these lists, the number of prior collaboration during the same year, and each of four preceding years was counted. In addition, the number of joint projects more than five years in the past was recorded.

'Short-termness' in this empirical setting is operationalized by the absence of collaboration during the four prior years or during the same year of the project. An *ideal type STNO* is a project in which not one of the principal contributors has worked together in movie projects during the current or prior years. An *ideal type LTNO* is a project where all of the principal contributors collaborated on a maximum number of prior projects in the past.

The Repeated Collaboration measure is continuous. The limiting factor for the maximum number of collaborations is typically the director. In contrast to the actors, cinematographers, and editors, the director is involved not only in the actual movie 'shooting,' but also in pre-production and post-production processes. In contrast to the producer and art director, the director's degree of involvement prohibits working on several movie projects simultaneously, at least during the actual shooting. However, the other principal contributors may have collaborated in projects under a different director. For each dyadic relationship, a different maximum number of projects was possible with the limiting factor being the number of prior projects of the principal contributor with less prior projects. Focussing on dyadic linkages provides the advantage of capturing repeated collaboration of sub-parts of the network which was, as expected, not the exception, but the rule (Hines, 1984). The number of dyadic collaborations between principal contributors were aggregated for each project into a single measure of Repeated Collaboration. Collaborations with a release date during the year of the current project and collaborations with release dates during the four preceding years were included in this measure.

The strengths of the measure are the availability of reliable information identifying the principal project contributors for an industry-wide sample, the highly similar configuration of principal contributor functions across projects, and the availability of principal contributors' collaboration histories including listings of all (or most) prior projects. The main limitations of the measure are the lack of accounting for: (1) difference in importance between relationships, (2) time effects, (3) interruption effects, and (4) differences in degree of project involvement. The following paragraphs briefly discuss these limitations.

Relationship Importance. The Repeated Collaboration measure does not account for some dyadic linkages having a stronger effect on the success of the current network (e.g., the director-producer linkage compared to the director-editor link). The lack of strong theoretical or any empirical evidence about the relative importance of different links or the stability of these effects across projects prevented the development of a model assigning weights based on relative impact differences. Instead, all links were aggregated with equal weight which in itself represents an arbitrary weighting model.

Time Effects. The measure does not account for the fact that more recent collaborations may have a stronger (or weaker) impact on the current collaboration. For example, contributors may forget coordination practices over time. In contrast, some researchers have argued that after a first collaboration, partners start accumulating knowledge about each other even without directly collaborating again. The assumption is that they are more receptive to indirect information about recent collaborations of former partners. This background knowledge then changes the next interaction. A more distant first collaboration in this context provides more time to accumulate such knowledge and would have the strongest impact on current relationships. While the measure used adopts neither of these perspectives, it is not neutral, but rather assumes that collaborations during the same year or the four prior periods have an equally large effect on the current relationship. It also does not capture the effect of collaborations more than 4 years prior to the focal project.

Interruption Effects. The measure does not capture the potential effect of interruptions. Argote, Beckman & Epple (1990), for example, reported disruptive effects of interruptions on organizational learning processes. In the movie setting, being involved in

numerous projects with other partners before collaborating with a prior partner again, may be more disruptive than collaborating again after only a few in-between projects.

Project Involvement. Finally, the measure does not differentiate between degrees of project involvement within principal contributor categories. While it is relatively safe to assume that all directors, actors, camera personnel, and editors were substantially involved in the production coordination process, anecdotal evidence suggests for the producer and art director this is a less safe assumption. The sheer number of movies for which some producers and art directors were credited in a given year suggests that they must have delegated a substantial amount of their responsibility. At some studios, for example, the head of the art direction department received art direction credit for all produced movies. Of course, one may argue that in these cases a repeated collaboration indicated collaboration with the same art direction department. Still, given the size of the studios, and the size of their respective art departments, the person directly responsible may have varied and the measure would indicate more stability in relationships than actually occurred.

Descriptive Statistics. As outlined above, Repeated Collaboration was operationalized based on the number of prior or parallel collaboration relationships between principal contributors. These dyadic relationships included Director/Producer, Director/Camera, Director/Actor1, Director/Actor2, Director/Editor, Director/Art Director, Producer/Camera, Producer/Actor1, Producer/Actor2, Producer/Editor, Producer/Art Director. The equally weighted aggregation of the number of relationships during the same and four prior years led to the measure of Repeated Collaboration. On average, movie projects had 16.7 prior collaborations (S.D.= 14.7). Except for eight projects, all projects had at least one prior collaboration between two of their principal contributors. The maximum

number of prior collaborations was 87. Repeated Collaboration is a non-negative count variable whose distribution is strongly skewed with weak normal distribution tendencies (Table 4-13).

Psychological Contracts Practice

Construct. In order to test H2a, H2b, and H2c the psychological contract construct has to be operationalized. The psychological contracting practice is measured using personal on-screen credits based on the assumption that recognizing the contributions of individuals and communicating this recognition to the general public (including the person's friends and relatives) will enhance the individual's identification with and commitment to the project and lead to a moral obligation towards the project. Thereby, the underlying psychological contracts are strengthened. 'Personal' implies that an individual's name is included in the credit listing shown to the audience at the end or the beginning of the show. Two measures were constructed to capture the implementation of psychological contracting practices: Minor Non-Cast On-Screen Credits (Minor Non-Cast OSC) and Main Cast On-Screen Credits (Main Cast OSC).

Measurement. The application of psychological contracts as a protection against opportunistic behavior will be measured based on personal on-screen credit listings. Categories of contributions are selected based on two criteria:

(1) The on-screen credit should have no or negligibly small shadow of the future effects. This implies that potential future employers will not use the on-screen credit listing to identify contributors. In the case of minor contributors investigating track records is less likely. Thus on-screen credits are unlikely to

have a shadow of the future effect or the effect is likely to be small. Any detected performance effect of on-screen credits for minor contributors is therefore attributed to psychological contracting. Another case in which shadow of the future effects of on-screen credits are likely to be small, is when a strong population-level sanctioning system already exists for a contributor category. In such a case, on-screen credits would contribute little or nothing to strengthening the existing shadow of the future and any detected performance enhancement can be attributed to psychological contracting.

(2) The contributor category has to be a standard element of movie production. Thereby, any case of no on-screen credits listed is not the result of a specific movie project not employing somebody to fulfill this function.

Minor Non-Cast OSC. On-screen credits for all movies in the sample were obtained from the AFI Catalog (King-Hansen & Gevinson, 1993). Minor contributors were identified based on a combination of low hierarchical status (rank order in the credit listings within a contribution category) and descriptive job titles (e.g., set-lighting assistant). Minor contributor on-screen credits were identified in the following categories: advisors (24), camera crew (2), costumes (2), editing (3), gaffer (0), grip (0), make-up (0), sound (3), production management (0), script clerk (2), stand-ins (0), and set execution (5).

On-screen credits for minor contributors were aggregated with equal weight into a single Minor Non-Cast OSC measure for each movie project (Table 4-14). An average movie granted .21 Minor Non-Cast OSC that could have strengthened psychological contracts (S.D.=.53). Most movies (89%) did not grant any such credits and only six movies

granted multiple such credits to minor contributors. The distribution of the variable is highly skewed and does not follow a normal distribution. Instead it represents a non-negative count variable with a poisson-like distribution.

Main Cast OSC. A second psychological contracting measure was constructed based on cast members' on-screen credits. In the case of cast members, a powerful population-level information clearing-house in the form of the 'central casting agency' already existed. The central casting agency was jointly founded by major Hollywood studios to facilitate the hiring of acting talent. It quickly became the largest placement bureau in the U.S. (more than 1000 requests per day were filled) and proved extremely efficient (Ross, 1941). It concentrated in one place the entire demand for and supply of extra acting labor ranging from extras without lines to extras with lines and second and third tier roles. It matched requests received from the studios with available acting talent. The central casting agency exchanged cast information directly with the studios. Via its agents and files it provided an industry-wide medium for collecting, storing, retrieving, and communicating project participation information and performance information for second-tier or lower cast (Ross, 1941). For example, the researchers at the American Film Institute today use central casting agency records to verify on-screen credit information (King-Hansen & Gevinson, 1999).

In addition, an actor's visible appearance on the screen already strengthened the population-level shadow of the future and influenced future employment opportunities as it allowed future employers to identify, evaluate, and contact cast members relatively easy. Therefore, I expect Main Cast OSC had less impact on controlling opportunistic behavior because alternative powerful population-wide communication and sanctioning systems were already in place.

Still, both Minor Non-Cast OSC and Main Cast OSC likely include a shadow of the future component. After all, it cannot be ruled out that contributors may have believed such credits enhance their future employment opportunities and lead to the desired career breakthrough even when the chances for that may have been slim. However, for both measures, based on the arguments outlines above, I assume that the psychological contracting effect dominates shadow of the future effects.

Based on the American Film Institute Catalog the number of on-screen credits for cast members was determined. In combination with controlling for the total cast size, collected from the same source, this measure captures the degree to which a movie gave on-screen credits to its cast members. This industry-wide dissemination of cast main contributor information is assumed to have strengthened psychological contracts. On average, movie projects gave 14 main cast credits (S.D.=5.70). This measure is a non-negative count variable with moderate normal distribution tendencies (Table 4-15).

Shadow of the Future Practice

Construct. Testing H3a, H3b, and H3c requires operationalizing the industry-wide shadow of the future practice. I argue that dissemination of information about main contributions of non-cast members can serve as an instrument to protect against opportunism through the creation of a shadow of the future by influencing future employment opportunities of these main contributors. Such dissemination is measured based on the number of on-screen credit listings in specific main non-cast contribution categories. Main non-cast contributor categories are selected based on two criteria:

(1) The contribution has to be a substantial contribution to the project, so that it can be assumed that future employers are motivated to investigate a potential contributor's performance record. On-screen credit listings support such information search processes especially if contributors do not visibly appear on the screen. Thereby, the credit listing influences future employment opportunities and strengthens the industry-wide shadow of the future. The rationale for on-screen credits as instrumental for reputation building efforts is further supported by anecdotal evidence of negotiations about credit listings (Ross, 1941) and efforts to avoid credit listings in cases of expected project failure (Schatz, 1985). For example, in later periods the name 'Allen Smithee' has been used by the Director's Guild as a pseudonym to disguise the identity of the actual director in cases when substantial changes by the producer or others give the director cause to demand the removal of his name from the credits.

(2) The contribution has to be essential across movie projects to assure that cases of no credit listings are not the result of a specific movie project not employing somebody to fulfill this function.

The Shadow of the Future measure used captures the number of on-screen credits granted to main non-cast contributors. Based on the level in the hierarchy and job titles, main contributor credits are separated from principal contributor credits and credits to minor contributors. Main non-cast contributors are: art directors, camera crew, costume staff, directing staff, editors, make-up staff, sound staff, production managing staff, and set execution staff. The sample contains the following number of on-screen credits for main

non-cast contributors per category: sound (230), costume (191), and set execution (92), directing (46), art direction & set design (29), camera crew (23), make-up (14), and production management (9). On-screen credits for editing (4) and still photography (1) were rare.

The on-screen credit information for all sampled movies was obtained from the American Film Institute catalog (King-Hansen & Gevinson, 1993). For each movie project, the numbers of on-screen credits in these categories is aggregated into a single Main Non-Cast OSC index. On average, movie projects gave 2.63 on-screen credits to main non-cast contributors with a S.D. of 1.54. Twenty-two movie projects gave no on-screen credits to main contributors (Table 4-16). The maximum of on-screen credits granted was seven. This measure is a non-negative count variable that is moderately normally distributed.

Control Variables

Studio Effects

The producing studio of each movie project is identified based on listings in the American Film Institute Catalog (King-Hanson & Gevinson, 1993). In the case of joint productions between major studios, the studio listed first is credited with the movie production. Dummy-coded variables for each of the following studios were assigned: Columbia, First National, Fox, Metro-Goldwyn-Meyer, Paramount, RKO, United Artists, Universal, Warner Brothers, and 20th Century. Two major studio mergers occurred during the time period. These led to the formation of Warner Brother/First National (1932) and 20th Century/Fox (1935). Separate dummy codes for these merged studios were assigned. The

dummy-codes provide a powerful control for any constant differences between studios which may have affected the investigated causal relationships.

The studio controls are also important to account for studio differences with regard to movie distribution. Several studios (e.g., Warner Brothers) held substantial ownership of first-run movie theaters. Collectively the major studios controlled approximately 3,000 out of 8,000 theaters nation-wide. The majority of these were first-run theaters in large metropolitan areas and accounted for 50-75% of the national box-office revenue (Balio, 1987; Huettig, 1985). The studio dummies also control for differences in the studio's top management and differences in their production practices. Weinstein (1998) reports that the average tenure of executives in charge of production at Warner Brothers, Fox, Columbia, Fox, Metro-Goldwyn-Meyer, and Paramount was around twenty years during the 1940s and only declined there after to about four years in the 1970s and 1980s. This suggests a relatively more stable management style and management practices at the different studios during the time period studied.

Production Time

Production Time measures the days needed to actually 'shoot' the movie based on information about the starting and ending dates of the production as listed in the American Film Institute Catalog (King-Hanson & Gevinson, 1993) and production announcements in the trade journals (e.g., Hollywood Reporter, 1931-present). This variable controls for differences in production time investment as potential alternative explanations for movie performance. The use of this variable as a cost proxy is based on anecdotal evidence and theoretical considerations indicating that Production Time is a main cost driver in movie

production (Balio, 1996, 1987; Schatz, 1985). For example, the analysis of movie contracts (e.g., Warner Brothers' Legal Files at the University of Wisconsin - Madison) revealed that many of the contributors to a movie project were hired on a weekly basis (with daily pro-rates). Even in the case of a unionized closed-shop situation, longer production times imply that the involved employees cannot be utilized for other movie projects. The average movie production time was 46 days (S.D.=23). About 80% of the movies were completed in 60 days or less. Production Time is a non-negative count variable. Its distribution is strongly skewed and not normal (Table 4-17).

Cast Size

Besides the duration of the production process, the second important cost factor in movie production is related to the size of the production crew. Only fragmented information about the size of the non-cast production crew was found. In contrast, detailed information of the cast size (excluding extras) is available. For example, the American Film Institute Catalog (King-Hanson & Gevinson, 1993) lists the names of the cast members based on credit lists, studio records, central casting agency records, and viewing of the actual movie. In this dissertation the cast size information is used as a proxy for the size of the total production staff. This proxy assumes that: (1) cast members represent a substantial portion of the overall production staff and (2) a larger cast implies a larger non-cast crew. The second assumption is supported by every additional cast member requiring additional direct support staff (e.g., make-up, costumes) and larger cast size indicating more complex scripts, stage sets, and even multiple production units. The average cast size in the sample is 35 with

a S.D. of 22.37. The project with the largest cast employed 130 actors. The Cast Size distribution is strongly skewed with very weak normal distribution tendencies (Table 4-18).

Quality of Principal Contributors

Project duration and project size are necessary, but insufficient cost controls. In addition, the quality of the project contributors has to be taken into account. The quality of the contributors in a dual sense represents an alternative explanation for a project's revenue success. On one hand, higher quality contributors will demand higher salaries and indicate a higher monetary investment in the movie project. On the other hand, the higher quality contributors can be an alternative explanation for project success. When empirically testing the performance impact of management practices such alternative explanations have to be controlled for.

The dissertation uses 16 different measures to statistically control for contributor quality differences. Eight are based on the number of prior academy nominations of individual principal contributors. Seven are accumulated experience measures based on each individual principal contributor's total number of prior films. In addition, the number of above-the-line cast credits for the three main actors was captured. These above-the-line cast credits indicate that a movie studio believed that the reputation or appeal of these actors or actresses would draw audiences. Each of the three sets of contributor quality control measures is discussed in more detail below.

Prior Academy Nominations. For the principal contributor categories (director, producer, cinematographer, art-director, editor, and three main actors or actresses), quality as contributors was measured based on the number of Prior Academy Nominations. The use of

prior nominations as a quality control measure is supported by Faulkner & Anderson's (1987) study of careers in Hollywood between 1965 and 1980 which indicated that a prior award nomination for a producer increased movie revenues on average by 15 million dollars in the subsequent project. An actual Academy Award for a camera person increased revenues of the next movie by 7 million dollars, and a nomination by 1 million dollars. These prior findings indicate that nominations in the different categories have substantially different impact on movie performance. Thus, the number of Prior Nominations was not aggregated into a single control variable. Instead, for each principal contributor category a separate measure is included in the regression models. Year dummy variables are used to control for changes in nomination categories, change in the number of nominations within categories, and the fact that the Academy of Motion Pictures only started its award competition in 1929 (for movies produced in 1928).

On average art directors (mean=1.89; S.D.=2.44), producers (mean=.75; S.D.=1.26), and cinematographers (mean=.41; S.D.=.88) were most likely to have prior nominations. The least likely to have been nominated for their contribution to prior projects were first lead actor/actress (mean=.11; S.D.=.42), third lead actor/actress (mean=.06; S.D.=.25), and head editor (mean=.08; S.D.=.30) (see Tables 4-19 to 4-26).

Number of Prior Films. For the principal contributor categories (director, producer, cinematographer, art-director, editor, and three main actors or actresses) their quality as contributors is also measured based on the number of prior movie projects. The Number of Prior Films is a proxy for a principal contributor's accumulated experience. In addition, the continuing participation in different projects also indicates a contributor's success and perceived quality of his or her contribution. While accounting for accumulated experience

and perceived quality are the main motivation for including this measure, it simultaneously serves as a control for the number of potential prior collaborations between two principal contributors. Obviously, the larger the number of prior projects of a principal contributor, the easier it would have been to collaborate with him or her before. The perfect measure for controlling for these effects would have captured the number of projects during the year of production and the four years preceding production, thereby corresponding to the time frame used measuring Repeated Collaboration. However, a single prior collaboration will have far more impact for a contributor who was only involved in 5 prior projects during his or her entire career compared to a contributor who was involved in 125. This argument together with the desire to capture overall accumulated experience led to the decision to collect the total number of prior movie projects instead of number of prior movies up to four years preceding the current project. The Number of Prior Films measure still promises to control (even though not perfectly) for differences in collaboration chances. Table 4-27 reports the means and standard deviations for the different principal contributor categories.

Above-the-line Cast Credits present another alternative for capturing the quality of principal contributors on the cast side without relying on Academy Nominations. The limitations of the Academy Nomination measure are: (1) it only identifies a few top performances every year, (2) uses artistic and craftsmanship standards, and (3) favors certain movie genres. Instead, the Above-the-line Cast Credit measure captures the producer's belief about the reputation and appeal of the leading actors to draw audiences. It promises to be a more sensitive measure as compared to Academy Nominations. Again, including this measure in regression models controls statistically for alternative explanations of project success and controls for potential cost differences between projects assuming the above-the-

line stars were able to demand higher salaries. The dummy-coded above-the-line credits for each of the three leading actors were aggregated into a single Above-the-line Cast Credit index. On average a movie gave .97 Above-the-line Cast Credits to its three leading actors/actresses (S.D.=.94). Most movie projects (40%) gave no Above-the-line Cast Credits. Twenty-eight percent gave one such credit and twenty-six percent gave two. Only five percent of the projects received all three leading actors/actresses Above-the-line Cast Credits (Table 4-28).

Movie Genre

Movie genres (e.g., drama, comedy, musical) are an alternative explanation for success or failure of movie projects during the time period. Movie genres were identified based on the genre categorization in the Motion Picture Guide Index (Nash & Ross, 1986). I collapsed their categorization which typically involves two keywords into three main categories: Drama, Comedy, and Musical (Grant, 1977). Based on this nominal variable dummy codes were generated to protect against potential genre effects. Genre-specific differences may have existed with regard to project investment, collaboration patterns, and academy nominations. For example, Faulkner & Anderson (1987) report that musicals and comedies are less likely to receive an Academy nomination. The sample contained 132 dramas, 59 comedies, and 48 musicals (Table 4-29).

Serials

Movies identified by the American Film Institute Catalog (King-Hansen & Gevinson, 1993) as belonging to a series of movies that were intentionally connected by a similar plot,

characterization, and cast were dummy coded except for the instances in which they were the first movie in the series. Shooting later movies of a series was dependent on the success of the first movie which was highly unpredictable. Therefore, the time horizon of the collaboration is unlikely to have been more long-term during the first movie of an eventual series of movies. Actually, anecdotal evidence in the American Film Institute Catalog suggests that the idea for a serial often only arose after the exceptional success of a movie (King-Hanson & Gevinson, 1993). Once a second movie goes into production I expected that participants perceive the collaboration as more long-term especially with regard to the key cast members. In addition, the distribution and audience reaction towards serials may have been different, supporting the dummy coding of serials. The nine serial movies in the sample were dummy coded (Table 4-30).

Application of Innovative Technology

The application of innovative technology is an alternative explanation for movie performance. Such application of innovative technology (e.g., sound systems, screen sizes, color systems) is measured based on information from American Film Institute Catalog (King-Hanson & Gevinson, 1993). All sampled projects were sound movies. The main innovation during the time period studied was the move from black and white to color cinematography. Ninety-eight percent of the movies were black/white. The six color films are dummy-coded (Table 4-31).

Changes in the Institutional Environment

Despite some labor unrest and union activity at the minor contributor level, the production system on the principal contributor level remained considerable stable during the period studied (Ross, 1941). Of course, this is a relative judgement, but it is especially true in comparison to later time periods for which historical records document more substantial labor conflicts. For example, in 1945 and 1948, Hollywood experienced substantial strikes at major studios that may have influenced organizational change processes and movie performance (Schatz, 1988). Also, two other crucial institutional changes that influenced the production system on the principal contributor level fell outside the time period studied. These two institutional changes were: (1) Anti-trust legislation and (2) income tax legislation. Both changes are briefly discussed below.

Anti-Trust Legislation. Since the 1920s major studios controlled large parts of their distribution channels through the ownership of movie theaters, as well as, special movie selling practices. By 1945 the Justice Department resumed its efforts to disintegrate the movie industry as a response to the majors' restraining of trade and other monopoly practices. One of the primary objectives was to force the majors to divest their controlling ownership of movie theaters. In addition, anti-trust actions were levied on large theater chains of 150 to 300 houses, which had worked out privileged deals with one or more studios and controlled certain cities. The Justice Department's ultimate objective was an industry in which movies were sold on a picture-by-picture and theater-by-theater basis. The end of the monopoly practice came with the Paramount Decree issued by the Supreme Court in May, 1948 (U.S. vs. Paramount Pictures, 1948; U.S. Temporary National Economic Committee, 1941; DeVany & Eckert, 1991).

Income Tax Legislation. In order to finance the war effort, the U.S. government introduced the Revenue Act in 1941 (U.S. Government Revenue Act, 1941). The act placed an extremely high tax on high incomes. This additional tax burden encouraged producers, directors, writers, actors, and actresses to consider free-lance status or to create their own companies in order to avoid salaried income. In cases where they remained studio employees they preferred profit-sharing agreements and one-picture deals where the salary was invested in the picture and taxed as capital gains. For example, Warner Brothers set up a company for Bette Davis during this time period. These arrangements were tax evasion instruments, but not necessarily limited the control of the studios over their production processes. With the end of the WWII came the end of the Revenue Act.

Compared to the time period after 1941, the 1930s experienced a relatively stable external environment. Still, a combination of studio and yearly time dummies is used in all models to control for the fixed effects of changes in unionization or any other relevant institutional variable across studios or across time.

Start of Production

The production starting date is used to assign a movie project to a specific year. Year dummy variables are assigned to movie projects based on the production start date. The inclusion of these dummies in any regression models controls for any fixed difference between years. Using the starting date of production makes sense as numerous unique combinations of factors in any given year may have influenced underlying causal relationships during the production process investigated. The use of only the starting date of production and not also the release date to control for differences in the movie market was

supported by anecdotal evidence suggesting that during the time studied movie studios rarely tied up capital by stockpiling films. For example, Variety (May 3, 1937) reported in 1937 that although three-fourth of the releasing season had passed, studios had yet to produce one-third of the season's film. The year dummies based on starting date of production provide a strong control against fixed year effects.

Releasing Quarter of Year

In addition, the releasing date was used to control for potential seasonal effects on movie performance. Dummy variables were constructed to account for the quarter of the year in which the movie was released. The Releasing Quarter controls for both seasonal differences in movie demand and intentional release strategies of studios. Table 4-32 reports that thirty-three percent of the movies were released in the last quarter of the year. Each of the other quarters account for about twenty-two percent of the movie releases.

Analyses

Introduction

The dissertation investigates two types of hypotheses. The first type of hypotheses (H1, H2a, H2b, H3a, and H3b) investigates causal effects of repeated collaboration and the two management practices on movie project performance. Ordinary Least Square (OLS) regression analysis is used for hypothesis testing for models with dependent variable Financial Performance. Depending on the degree of overdispersion encountered either negative binomial or poisson regression analysis is used for hypothesis testing of models with

the dependent variable Academy Nominations. One-tailed tests are used to evaluate the support for the directional hypotheses.

The second type of hypotheses (H2c and H3c) suggests that the two management practices were used more frequently by STNOs. The dependent variable for these hypotheses are Main Non- Cast OSC, Main Cast OSC, and Minor Non-Cast OSCs. OLS regression analysis and one-tailed tests are used to test these directional hypotheses.

Performance Effects of STNO Management Practices

Financial Performance. The performance hypotheses related to Repeated Collaboration (H1), the Psychological Contract Practices (H2a, H2b), and the Shadow of the Future Practice (H3a, H3b) are tested using OLS and the dependent variable Financial Performance. All models are based on the following equation:

(4.2) $$\text{FINANCIAL PERFORMANCE} = b_0 + b_1 (\text{REPEATED COLLABORATION}) + b_2 (\text{MAIN NON-CAST OSC}) + b_3 (\text{MAIN CAST OSC}) + b_4 (\text{MINOR NON-CAST OSC}) + b_5 (\text{MAIN NON-CAST OSC*REPEATED COLLABORATION}) + b_6 (\text{MAIN CAST OSC*REPEATED COLLABORATION}) + b_7 (\text{MINOR NON-CAST OSC*REPEATED COLLABORATION}) + \text{Control Variables}$$

Control Variables:

PRODUCTION TIME	=	Number of days shooting movie
CAST SIZE	=	Number of cast members (excluding extras)
CAST ABOVE LINE CREDIT	=	Number of above-the-line cast credits
PRIOR ACADEMY	=	For each principal contributor (plus 3rd lead actor/actress)
NOMINATIONS		the number of prior academy nominations
NUMBER OF PRIOR FILMS	=	For each principal contributor total number of prior films
COLOR DUMMY	=	For each color movie
RELEASE QRT DUMMIES	=	Quarter of movie release
YEAR DUMMIES	=	For each year (1931-1940)
STUDIO DUMMIES	=	For each major studio
BOXOFFICE-DUMMIES	=	For each of the three sources for box-office estimates
NO ART DIR DUMMY	=	For each movie without an art director credited
NO EDITOR DUMMY	=	For each movie without an editor credited

Hypothesized effects assuming interactions are present:

- H1 predicts $b_1=b_5=b_6=b_7=0$ is significant and the joint effect of b_1, b_5, b_6, and b_7 is negative across plausible values of Main Non-Cast OSC, Main Cast OSC, and Minor Non-Cast OSC.
- H2a predicts $b_3=b_6=0$ and/or $b_4=b_7=0$ are significant and the joint effect of b_3 and b_6 as well as the joint effect of b_4 and b_7 is positive across plausible values of Repeated Collaboration.
- H2b predicts b_7 is significant and negative.
- H3a predicts $b_2=b_5=0$ is significant and the joint effect of b_2 and b_5 is positive across plausible values of Repeated Collaboration.
- H3b predicts b_5 significant and negative.

Academy Nominations. The performance hypotheses related to Repeated Collaboration (H1), the two Psychological Contract Practices (H2a, H2b) and the Shadow of the Future Practice (H3a, H3b) are tested using negative binomial regression or poisson regression with the dependent variable Academy Nominations based on the following equation:

(4.3) ACADEMY NOMINATIONS = b_0 + b_1 (REPEATED COLLABORATION)
+ b_2 (MAIN NON-CAST OSC)
+ b_3 (MAIN CAST OSC)
+ b_4 (MINOR NON-CAST OSC)
+ b_5 (MAIN NON-CAST OSC*REPEATED COLLABORATION)
+ b_6 (MAIN CAST OSC*REPEATED COLLABORATION)
+ b_7 (MINOR NON-CAST OSC*REPEATED COLLABORATION)
+ Control Variables

Control Variables:

PRODUCTION TIME	=	Number of days shooting movie
CAST SIZE	=	Number of cast members (excluding extras)
CAST ABOVE LINE CREDIT	=	Number of above-the-line cast credits
PRIOR ACADEMY	=	For each principal contributor (plus 3rd lead actor/actress)
NOMINATIONS		the number of prior academy nominations
NUMBER OF PRIOR FILMS	=	For each principal contributor total number of prior films
COLOR DUMMY	=	For each color movie
RELEASE QRT DUMMIES	=	Quarter of movie release
YEAR DUMMIES	=	For each year (1931-1940)

STUDIO DUMMIES	=	For each major studio
GENRE DUMMIES	=	For each drama, musical, and comedy
NO ART DIR DUMMY	=	For each movie without an art director credited
NO EDITOR DUMMY	=	For each movie without an editor credited

Hypothesized effects assuming interactions are present:

- H1 predicts $b_1=b_5=b_6=b_7=0$ is significant and the joint effect of b_1, b_5, b_6, and b_7 is negative across plausible values of Main Non-Cast OSC, Main Cast OSC, and Minor Non-Cast OSC.
- H2a predicts $b_3=b_6=0$ and/or $b_4=b_7=0$ are significant and the joint effect of b_3 and b_6 as well as the joint effect of b_4 and b_7 is positive across plausible values of Repeated Collaboration.
- H2b predicts b_7 is significant and negative.
- H3a predicts $b_2=b_5=0$ is significant and the joint effect of b_2 and b_5 is positive across plausible values of Repeated Collaboration.
- H3b predicts b_5 significant and negative.

Use of STNO Management Practices

Main Cast OSC. The OLS equation for testing H2c that STNOs use the Main Cast OSC practice more frequently than LTNOs is as follows:

(4.4) MAIN CAST OSC	=	$b_0 + b_1$ (REPEATED COLLABORATION)
		+ Control Variables

Control Variables:

PRODUCTION TIME	=	Number of days shooting movie
CAST SIZE	=	Number of cast members (excluding extras)
CAST ABOVE LINE CREDIT	=	Number of above-the-line cast credits
PRIOR ACADEMY	=	For each principal contributor (plus 3rd lead actor/actress)
NOMINATIONS		the number of prior academy nominations
NUMBER OF PRIOR FILMS	=	For each principal contributor total number of prior films
MOVIE GENRE DUMMIES	=	For each drama, musical, and comedy
COLOR DUMMY	=	For each color movie of director
NO ART DIR DUMMY	=	For each movie without an art director credited
NO EDITOR DUMMY	=	For each movie without an editor credited
RELEASE QRT DUMMIES	=	Quarter of movie release
YEAR DUMMIES	=	For each year (1931-1940)
STUDIO DUMMIES	=	For each major studio

Hypothesed effect:

- H2c predicts that b_1 is significant and negative.

Minor Non-Cast OSC. The OLS equation for testing H2c that STNOs use the Minor Non- Cast OSC more frequently than LTNOs is as follows:

(4.5) MINOR NON-CAST OSC = $b_0 + b_1$ (REPEATED COLLABORATION) + Control Variables

Control Variables:

PRODUCTION TIME	=	Number of days shooting movie
CAST SIZE	=	Number of cast members (excluding extras)
CAST ABOVE LINE CREDIT	=	Number of above-the-line cast credits
PRIOR ACADEMY NOMINATIONS	=	For each principal contributor (plus 3rd lead actor/actress) the number of prior academy nominations
NUMBER OF PRIOR FILMS	=	For each principal contributor total number of prior films
MOVIE GENRE DUMMIES	=	For each drama, musical, and comedy
COLOR DUMMY	=	For each color movie of director
NO ART DIR DUMMY	=	For each movie without an art director credited
NO EDITOR DUMMY	=	For each movie without an editor credited
RELEASE QRT DUMMIES	=	Quarter of movie release
YEAR DUMMIES	=	For each year (1931-1940)
STUDIO DUMMIES	=	For each major studio

Hypothesized effect:

- H2c predicts that b1 is significant and negative.

Main Non-Cast OSC. The OLS equation for testing H3c that STNOs use the Main Non-Cast OSC practice more frequently than LTNOs is as follows:

(4.6) MAIN NON-CAST OSC = $b_0 + b_1$ (REPEATED COLLABORATION) + Control Variables

Control Variables:

PRODUCTION TIME	=	Number of days shooting movie
CAST SIZE	=	Number of cast members (excluding extras)
CAST ABOVE LINE CREDIT	=	Number of above-the-line cast credits
PRIOR ACADEMY	=	For each principal contributor (plus 3rd lead actor/actress)
NOMINATIONS		the number of prior academy nominations
NUMBER OF PRIOR FILMS	=	For each principal contributor total number of prior films
MOVIE GENRE DUMMIES	=	For each drama, musical, and comedy
COLOR DUMMY	=	For each color movie of director
NO ART DIR DUMMY	=	For each movie without an art director credited
NO EDITOR DUMMY	=	For each movie without an editor credited
RELEASE QRT DUMMIES	=	Quarter of movie release
YEAR DUMMIES	=	For each year (1931-1940)
STUDIO DUMMIES	=	For each major studio

Hypothesized effect:

- H3c predicts that b_1 is significant and negative.

Interaction Effect Analysis

The hypotheses H2b and H3b imply a moderated causal effect of STNO management practices on movie performance. I expect that the effect of the STNO management practice on performance is moderated by the degree of 'short-termness' of the collaborative network relationships. As discussed the independent variables included in the models are continuous with a theoretical range from 0 to positive infinity. There has been continuing discussion within and across disciplines about the best statistical approach for testing interaction effects for continous independent variables (e.g., Aiken & West, 1991; Jaccard, Turrisi & Wan, 1990; Cohen & Cohen, 1983). Fundamentally, interaction effect analysis has to answer the following questions for the intended hypothesis tests (Jaccard, Turrisi & Wan, 1990):

(1) Does an interaction effect exist?

(2) How strong is the interaction effect?

(3) What is the nature of the effect?

Significance of Interaction Effect. Significance tests provide probability estimates of the likelihood that a decteded interaction effect also exists in the population. At least three different approaches for investigating interaction effects and their significance have been suggested:

(1) Based on the analysis of variance perspective researchers have suggested to dichotomize the main effect variables using median splits (or other 'cutting' rules) and then conducting a standard analysis of variance.

(2) In a very similar approach it has been suggested to dichotomize the sample on the moderator variable, compute the slopes of the main effect variable in the two samples

and perform hypotheses tests for the difference between the slopes (e.g., Arnold, 1982).

(3) Cohen & Cohen (1975) have suggested to use hierarchical multiple linear regression analysis with multiplicative interaction terms for each moderated relationship.

Compared to the other two approaches, hierarchical moderated regression analysis, as suggested by Cohen & Cohen (1975, 1983), has the advantage of exploiting all of the available information contained in a data set to detect differences of main variable effect on the dependent variable across different values of the moderator. In addition, hierarchical moderated regression analysis does not require 'arbitrary' sub-grouping rules that may influence results. In a hierarchical moderated regression analysis an interaction effect is detected by comparing the R^2 values of the models with and without the multiplicative interaction terms controlling for degrees of freedom. The hypothesis of an interaction effect being present in the population is accepted if the difference between the R^2 values is statistically significant. The following equation yields a test of H_0 that the change in R^2 is zero in the population:

$$(4.7)\quad F = (R_2^2 - R_1^2)/(1-R2^2) \times (N-K_2-1)/(K_2-K_1)$$

$R2^2$ is the multiple R^2 for the equation for the model with the interaction term, R_1^2 is the multiple R^2 for the model without the interaction term, K_2 is the number of predictors in the model with the interaction term, K_1 is the number of predictors in the model without the interaction term, and N is the total sample size. The resulting F is distributed with K_2-K_1 and

$N-K_2-1$ degrees of freedom (Jaccard, Turrisi & Wan, 1990). When adding only a single interaction term the hierarchical F-test yields the same results regarding significance as the t-test for the regression coefficient of the interaction term. Similarly, a Wald test can be used to calculate an F-test for the regression coefficient of the interaction term. In the case of several interaction terms in the same model, the Wald test allows evaluating the significance of joint effect of several interaction variables based on a F-test.

Strength of the Interaction Effect. The strength of an interaction effect can be evaluated also based on the R^2 difference (Cohen & Cohen, 1983). The difference indicates the amount of variance in the dependent variable accounted for by the interaction terms added to the model.

Form of the Interaction Effect. The hierarchical moderated regression analysis based on multiplicative interaction terms tests for what are called 'bilinear interactions.' A bilinear interaction exists when every unit change in the moderator leads to a constant change in the effect of the main effect variable on the dependent variable. In other words, there is a linear and monotonic relationship between the changes in main effect slope and unit changes in the moderator variable (Jaccard, Turrisi & Wan, 1990). Of course an infinite number of alternative functional forms of the moderator relationship exists. The failure to detect an interaction using a multiplicative interaction term can be the consequence of the presence of an alternative form rather than the absence of a moderated relationship. This illustrates again the importance of theory in conducting statistical testing including interaction effect analysis.

In the case of STNO practices, no prior empirical evidence or strong theory was available suggesting a nonlinear functional form of the interaction effect. By measuring the application of the STNO practices for restricted and rather homogenous sets of main

contributors (shadow of the future practice) and minor contributors (psychological contracts practice) a constant change effect seems likely. For example, based on a broader definition of 'main contributors,' I would have been more concerned that the performance effect of granting another on-screen credit may become more marginal as less and less important contributors receive on-screen credits. This would have suggested a non-bilinear form of the interaction term. However, based on the outlined considerations, I believe that assuming a bilinear interaction is a reasonable starting point for the intended investigations.

Decomposition of the Interaction Effect. Given a statistically significant interaction effect, it may be of interest to further understand the nature of the moderating effect. For this purpose it has been suggested to decompose the interaction effect in a fashion similar to decomposition of interaction effects in the analysis of variance perspective (Jaccard, Turrisi & Wan, 1990; Aiken & West, 1991). The decomposition is accomplished by estimating the effects of unit changes in the main effect variables and the moderator on the dependent variables based on the regression equation including the significant interaction term. By substituting specific values for the main variable and the moderator their effects on the dependent variable value are calculated. Following a suggestion by Aiken & West (1991), values one standard deviation above and below the mean will be substituted for the main effect variable and the moderator. This provides information about the dependent variable value for: (1) low value of the main variable and low of the value moderator; (2) low value of the main variable and high value of the moderator; (3) high value of the main variable and low value of the moderator; and (4) high value of the main variable and high value of the moderator. These four data points are then plotted out to evaluate the nature of the relationship.

Interpretation of Main Effects in Interaction Models. If a moderating effect exists and an interaction term is added to the statistical model then the simple and standard interpretation of the regression coefficient of a main effect variable as a constant effect on the dependent variable controlling for the effect of all other included variables is no longer valid. The regression coefficient of a main effect variable in a regression model containing an interaction term has to be interpreted as a conditional relationship. The regression coefficient of the main effect variable reflects the influence of this variable on the dependent variable only for the case when the moderator is equal to zero. In all other cases the effect cannot be determined by only considering the regression coefficient of the main effect variable, but requires taking into account the interaction effect which depends on the value of the moderator. The same conditional interpretation holds for the standard error of the main effect variable. In the model without the interaction term the standard errors of the main effect variable's regression coefficient reflects estimates of sampling error across all levels of the main effect variables. In the model with the interaction term, the standard error of the regression coefficient of a main effect variable is conditional on the value of the moderator, except for cases when the moderator variable is equal to zero.

Data Transformations. Centering data or the use of deviation scores has been frequently suggested in the methodological literature on interaction terms analysis (Aiken & Goldberg, 1991; Jaccard, Turrisi & Wan, 1990; Cronbach, 1987; Tate, 1984). The main argument for transforming data is related to reducing the multicollinearity in the interaction model. Additive transformations of independent variables are suggested prior to constructing the interaction term. Deviation scoring (Tate, 1984), for example, leads to minimized

collinearity between the main effect variable, moderator, and interaction term. Similarly, mean centering usually leads to results similar to deviation scoring.

What are the effects of such centering through additive transformations for the hierarchical moderated regression analysis? The non-centered and the centered model lead to an identical fit of the data. This means identical results for R^2 improvement and the significance of this improvement. Also the regression coefficient and standard error for the highest order interaction effects are the same. The regression coefficients and standard errors of all other predictors are likely to change.

The only advantage of centered regression coefficients relates to the interpretation of regression coefficients of the main effect variables and moderators in the interaction model. As mentioned above in cases when the moderator variable equals zero, the main effect variable's regression coefficient expresses its effect on the dependent variable. Now in centered models the mean of the moderating variable is zero (or is very close to zero) due to centering. Thereby, the regression coefficient conveys the effect of the main effect variable for the average moderator value. In non-censored data, the regression coefficient still represents the effect of the main effect variable when the moderator value is zero, but the value zero may be a far less plausible moderator value or may even fall outside the range of moderator values.

In contrast to studies using arbitrarily assigned measurement scales, the measures used in this study are meaningful and externally determined. Any transformation of these externally determined scales would raise theoretical concerns and complicate the interpretation of results (Townsend & Ashby, 1984). For these reasons, all regression analyses reported in this dissertation were conducted on original raw scores.

CHAPTER 5 - RESULTS

Descriptives

Table 5-1 reports the mean, standard deviations, and correlation coefficients for the theoretical variables. Among the independent variables, only low statistically significant positive correlation exist. The strongest correlation is between Main Cast OSC and Repeated Collaboration ($r=.27$; $p<.0001$). This indicates that for the intended main effect regression model multicollinearity between the independent variables is less of a concern. The correlation between the Main Cast OSC and Main Non-Cast OSC measures is surprisingly low. Based on pilot study results, I expected a higher positive correlation. A potential explanation for the weaker correlation is the more fine-grained categorization process for determining non-cast main contributors based on both job title and hierarchical level. In the pilot study only hierarchical level was used as the only criterion.

Correlations between independent main effect variables and control variables as well as between interaction terms and control variables are weak or not significant. The strongest correlation is between Main Cast OSC and Cast Size ($r=0.36$; $p<.0001$). As expected, the three interaction terms that were constructed by the multiplication of Repeated Collaboration with each of the other three independent variables are correlated. Several of the significant correlations are larger than .60. In summary, multicollinearity has to be a concern when analyzing models including the interaction terms.

Financial Performance Models

Baseline Model.

Model 1 in Table 5-2 reports the results for the OLS regression of the control variables on Box-office Revenue. As this model includes controls for differences in project investments the regression on Box-office Revenue becomes an evaluation of project profitability or financial performance. As those cost control variables are included in all of the following models, the Box-office Revenue effects will from here on be referred to as Financial Performance effects. The control variables included: Production Time, Cast Size, Number of Cast Above-the-line Credits, Prior Academy Nominations for principal contributors, Number of Prior Films of principal contributors, and dummy variables for: Source of Box-office Revenue Estimates, Serials, Color movies, Unidentified Art Director, Unidentified Editor, Release Quarter, Year, and Studio.

The control variables alone explain 25.9% of the variance in Financial Performance (adj. $R^2 = .259$; $F(48, 190) = 2.74$; $p < .0001$, n=239). The two main controls for differences in overall project investment: Production Time (b=.17; p<.002; two-tailed) and Cast Size (b=.12; p<.032; two-tailed) have the expected statistically significant positive influence on movie performance. A Wald test indicates that the joint effect of the project investment variables is highly significant (p<.001) suggesting these variables jointly explain a significant part of the variance in Financial Performance.

Similarly, the quality of the following principal contributors measured in Academy Nominations has the expected strong positive effect on Financial Performance: Director (b=5.38; p<.006; two-tailed), second lead actor (b=3.93; p<.028; two-tailed), and third lead actor (b=9.83; p<.040; two-tailed). The joint effect of all principal contributors' Prior

Academy Nominations is also highly significant (Wald test: F(8, 190)=3.25; p<.002; two-tailed). A release in the second quarter has a negative impact on performance (b=-7.72; p<.019; two-tailed). However, the joint effects of Quarter of Release dummy variables (Wald test: F(3, 190)=1.92; p<.128; two-tailed), Year dummy variables (Wald test: F(9, 190)=1.07; p<.390; two-tailed), and Studio dummy variables (Wald test: F(12, 190)=.71; p<.745; two-tailed) are not statistically significant.

Main Effects Model

Model 2 in Table 5-2 adds the independent variables Repeated Collaboration, Main Non-Cast OSC, Main Cast OSC, and Minor Non-Cast OSC to the Model 1 variables. The model is regressed on Financial Performance. The main effect variables improve the adjusted R^2 by .034 to .293 and a Wald test indicates that these variables significantly improve the explanatory power of the model (Wald test: F(4, 186)=3.27; p<.0013; two-tailed).

The effect of Repeated Collaboration (b=-.13; p<.110; one-tailed) is not statistically significant. Main Non-Cast OSC has statistically significant positive effect on a project's Financial Performance (b=2.41; p<.021; one-tailed). Main Cast OSC has a significant positive effect on financial performance (b=.58; p<.009; one-tailed) and Minor Non-Cast OSC has no significant effect on Financial Performance (b=2.64; p<.138; one-tailed). The joint effect of the two psychological contract variables is statistically significant (Wald test: F(2, 186)=3.20; p<.0043; two-tailed).

Interaction Effects Models

Models 3 in Table 5-2 adds the interaction terms Main Non-Cast OSC*Repeated Collaboration, Main Cast OSC*Repeated Collaboration, and Minor Non-Cast OSC*Repeated Collaboration. The adjusted R^2 increases by .032 to .3247. The increase in variance explained by the overall model is statistically significant at the .01 level.

A Wald test indicates that the interaction terms significantly improve the model ($F(3,183)= 3.89$; $p< .010$; two-tailed). The introduction of the interaction terms does not substantially change the direction, effect size, or significance of the control variables. In Model 3 the number of cases per variable drops to 5 indicating potential power problems.

Due to the presence of interaction effects (Equation 5.1), the performance effects of the variables included in the interaction terms can no longer be directly interpreted based on a variable's regression coefficient. Instead the effect has to be estimated conditional on the value of the moderating variables. A Wald test of the Repeated Collaboration, and the three interaction terms Main Non-Cast OSC*Repeated Collaboration, Main Cast OSC*Repeated Collaboration, and Minor Non-Cast OSC *Repeated Collaboration indicates a significant combined effect of these variables ($F(3,183)=3.31$; $p<.012$; two-tailed). This suggests a significant conditional effect of Repeated Collaboration on Financial Performance which is a necessary condition for supporting H1.

(5.1) $Y = b_0 + b_1$ (Repeated Collaboration) $+ b_2$ (Main Non-Cast OSC)
$+ b_3$ (Main Cast OSC) $+ b_4$ (Minor Non-Cast OSC)
$+ b_5$ (Main Non-Cast OSC*Repeated Collaboration)
$+ b_6$ (Main Cast OSC*Repeated Collaboration)
$+ b_7$ (Minor Non-Cast OSC *Repeated Collaboration)
+ CONTROLS

(5.2) Y/ (Repeated Collaboration) = b_1 + b_5 (Main Non-Cast OSC)
+ b_6 (Main Cast OSC)
+ b_7 (Minor Non-Cast OSC)

= -.032 - .166 (Main Non-Cast OSC)
+ .020 (Main Cast OSC)
+ .240 (Minor Non-Cast OSC)

Because equation 5.2 includes negative regression coefficients (b_1=.032; b_5=-.166) and positive regression coefficients (b_6=.020; b_7=+.240), the direction of a change in Repeated Collaboration on financial performance depends on the values of the moderating variables. Following suggestions by Jaccard, Turrisi & Wan (1990) and Aiken & West (1991), point estimates of regression coefficients are calculated for values: (1) one standard deviation below the mean, (2) at the mean, and (3) one standard deviation above the mean for all moderator variables. Table 5-3 reports those point estimates.

Of the twenty-seven point estimates, thirteen are significant. Of the thirteen significant, eleven are negative and two are positive. This suggests a tendency for the conditional effect of repeated collaboration to be negative for plausible values of the moderator variables. These results lend moderate support to H1 that STNOs experience general performance advantages compared to LTNOs in settings with unstable and emergent project task characteristics that require the combination of a highly diverse set of capabilities.

A Wald test of Main Cast OSC and Main Cast OSC*Repeated Collaboration indicated a significant joint effect of these variables ($F(2, 183)=4.48$; $p<..013$; two-tailed).

This suggests a significant conditional joint effect of these two variables on Financial Performance – a necessary condition for empirical support for H2a.

(5.1) $Y = b_0 + b_1$ (Repeated Collaboration) + b2 (Main Non-Cast OSC)
+ b_3 (Main Cast OSC) + b4 (Minor Non-Cast OSC)
+ b_5 (Main Non-Cast OSC*Repeated Collaboration)
+ b_6 (Main Cast OSC*Repeated Collaboration)
+ b_7 (Minor Non-Cast OSC *Repeated Collaboration)
+ CONTROLS

(5.3) Y/ (Main Cast OSC) $= b_3 + b_6$ (Repeated Collaboration)
$= .139 + .020$ (Repeated Collaboration)

In the case of Main Cast OSC (H2a) the direction of the effect can be inferred directly from the equation 5.3. The effect of changes in Main Cast OSC on Financial Performance is positive across possible values of Repeated Collaboration because both b_3 and b_6 are positive and Repeated Collaboration is a non-negative count variable. These findings support H2a that network organizations strengthening psychological contracts experience performance advantages.

A Wald test of Minor Non-Cast OSC and Minor Non-Cast OSC *Repeated Collaboration indicates a non-significant joint effect of these two variables on Financial Performance ($F(2, 183)=1.95$; $p<.145$; two-tailed). This suggests rejecting H2a.

A Wald test of Main Non-Cast OSC and Main Non-Cast OSC*Repeaded Collaboration indicates a significant joint effect of these variables ($F(2, 183)=5.95$; $p<.003$; two-tailed). This suggests a significant conditional joint effect of the two variables on

financial performance – a necessary condition for empirical support for H3a. The unequal signs of the two regression coefficients in equation 5.4 require the point estimation of regression coefficients for plausible values of the moderator variable in order to evaluate the direction of a change of Main Non-Cast OSC on financial performance.

(5.1) $Y = b_0 + b_1$ (Repeated Collaboration) $+ b_2$ (Main Non-Cast OSC)
$+ b_3$ (Main Cast OSC) $+ b_4$ (Minor Non-Cast OSC)
$+ b_5$ (Main Non-Cast OSC*Repeated Collaboration)
$+ b_6$ (Main Cast OSC*Repeated Collaboration)
$+ b_7$ (Minor Non-Cast OSC *Repeated Collaboration)
+ CONTROLS

(5.4) Y/ (Main Non -Cast OSC) $= b_2 + b_5$ (Repeated Collaboration)
$= 5.014 - .166$ (Repeated Collaboration)

(5.5) Y/ (Main Non -Cast OSC) at (Repeated Collaboration =1.97) = 4.69

(5.6) Y/ (Main Non -Cast OSC) at (Repeated Collaboration =16.73) = 2.24

(5.7) Y/ (Main Non -Cast OSC) at (Repeated Collaboration =31.49) = 0.21

The point estimates for plausible values of the moderator (one standard deviation below the mean (Equation 5.5), at the mean (Equation 5.6), and one standard deviation above the mean (Equation 5.7)) indicate that in this range a change of Main Non-Cast OSC always has a positive effect on Financial Performance. The results of the Wald test and the regression point estimates suggest that for plausible values of the moderating variable, Main Non-Cast OSC has a significant positive effect on financial performance. This finding lends

support to H3a that network organizations applying the population level of the future practice experience performance advantages.

The interaction term Main Cast OSC*Repeated Collaboration is not significant (b=.020: p<.051; one-tailed). This suggests to reject H2b. The interaction term Minor Non-Cast OSC*Repeated Collaboration is significant (b=.24: p<.042; one-tailed), but not in the hypothesized direction. This also suggests to reject H2b. The interaction term Main Non-Cast OSC*Repeated Collaboration is significant (b=-.166; p<.0035; one-tailed) and in the hypothesized direction. This suggests accepting H3b.

Main Cast OSC Interaction Effect Model

As outlined in the discussion of the single-order correlation analysis, multi-collinearity problems suggest caution with regard to the interpretation of regression coefficients in Model 3. To reduce the effect of multi-collinearity in the model, the three interaction effects were also entered separately into the regression equation to test if their effects substantially changed. While the separate entry reduced the multicollinearity between the independent variables, the analysis does not protect against an interaction term picking up variance better explained by one of the other two interaction terms and it lacks any error variance reducing effects of the other interaction terms. These complex effects have to be taken into account when interpreting results.

Model 4 in Table 5-2 reports the regression results of a model including controls, main effect variables, and the interaction term Main Cast OSC*Repeated Collaboration on Financial Performance. The addition of this interaction term marginally improves the overall variance explained by the model compared to Model 2 (delta adj. R^2=.005). The

improvement is not significant (p<.131; two-tailed). A Wald test of Main Cast OSC and Main Cast OSC*Repeated Collaboration indicates a significant joint effect (F(2,185)=3.97; p<.021; two-tailed) – a necessary condition for supporting H2a. The interaction term Main Cast OSC*Repeated Collaboration is not significant in Model 5 (b=.02; p<.065; one-tailed). The interaction term Main Cast OSC*Repeated Collaboration is neither significant in Model 3 nor in Model 5. In summary, the analysis in Model 5 supports the conclusion reached with regard to H2a and H2b in Model 3.

Minor Non-Cast OSC Interaction Effect Model.

Model 5 in Table 5-2 reports the regression results of a model including controls, main effect variables, and the interaction term Minor Non-Cast OSC*Repeated Collaboration on Financial Performance (adj. R^2=.3008; F(53, 185)=2.93; p<.0001). The addition of this interaction term only marginally improves the overall variance explained by the model (adj, delta R^2=.0076) and the improvement is not significant at the .05 level (two-tailed). A Wald test of Minor Non-Cast OSC and Minor Non-Cast OSC*Repeated Collaboration indicates a non-significant joint effect on Financial Performance (F(2,185)=2.11; p<.125; two-tailed). This finding suggests no significant conditional effect of Minor Non-Cast OSC on Financial Performance and leading to the rejection of H2a. The regression coefficient of the interaction term and its standard error remain the same compared to Model 3 with all three interaction terms. The interaction term is significant, but in the wrong direction (b=.23; p<.043; one-tailed). Thus H2b is rejected. In summary, the analyses in Model 5 support the conclusions reached with regard to H2b in Model 3.

Main Non-Cast OSC Interaction Effect Model

Model 6 in Table 5-2 reports the regression results of a model including controls, main effect variables, and the interaction term Main Non-Cast OSC*Repeated Collaboration on Financial Performance. The interaction term has a significant and negative effect on Financial Performance, but with a one-third smaller regression coefficient compared to Model 3 (b=-.12; p<.0254; one-tailed). The higher overall variance explained by Model 3 compared to Model 6 suggests that the other interaction variables added to the explanatory power of the model and may have removed error variance. Adding only the interaction Main Non-Minor Cast OSC*Repeated Collaboration improves the overall variance explained by the model (delta adj. R^2=.011, F=3.89), and the improvement is significant at the .05 level (two-tailed).

A Wald test for the variables Main Non-Cast OSC and Main Non-Cast OSC*Repeated Collaboration indicates a significant joint effect (F(2, 185)=4.11; p<.036; two tailed) – a necessary condition for supporting H2a. The interaction term Main Non-Cast OSC*Repeated Collaboration has a significant negative effect on Financial Performance. A finding that supports H3b. Model 6 findings generally confirm the interpretation of Model 3 results.

Academy Nominations Performance Models

Baseline Model

As discussed in detail earlier, the second dependent variable Academy Nominations received by a movie project is a non-negative count variable of a rare event with an expected poisson-like distribution. It has a mean of .19 and a S.D. of .72. The visual evaluation of the frequency distribution of the Academy Nomination measure in Table 5-4 offers some support for the expected poisson-like distribution. As discussed earlier, negative binomial regression or poisson regression are appropriate to analyze models with Academy Nominations as the dependent variable. Negative binomial regression makes less rigorous assumptions about the distribution of the dependent variable as it allows for overdispersion. Poisson regression models should be used if the overdispersion hypothesis is rejected at a .05 level of significance (Greene, 1997). Testing for overdispersion lead to the rejection of the overdispersion hypothesis for all models with Academy Nominations as dependent variable. Thus, poisson regression is used for the statistical analysis of Academy Nomination models. However, the results obtained using poisson analysis do not differ substantially from the results obtained with negative binomial regression. To the contrary, both statistical procedures lead to consistent results with very similar parameter estimates.

Table 5-5 reports the results for the poisson regression of Model 7 that includes all relevant control variables. For Model 7 the overdispersion hypothesis was rejected at the .05 level of significance (alpha=.003; p<.1.00). The control variables included in Model 7 are similar to the ones included in the financial performance models except for two changes: (1) the variables controlling for different Sources of the Box-office Revenue estimates are irrelevant for the nomination data and were removed; and (2) genre control variables

(Comedy dummy, Musical dummy) are added to protect against biases of the Academy members which supposedly favor dramas over musicals and comedies (Faulkner & Anderson, 1987). The overall model has a log likelihood of –64.85 and is significant (n=239; p<.001; two-tailed). The following variables have a significant positive nomination performance effect: Production Time (b=.040; p<.018; two-tailed), Cast Size (b=.041; p<.005; two-tailed), Director Prior Nominations (b=1.24; p<.009; two-tailed), Actor1 Prior Nominations (b=-2.40; p<.008; two-tailed), Actor2 Prior Nominations (b=.88; p<.034; two-tailed), Actor2 Number of Prior Films (b=-.04; p<.016), Producer Number of Prior Films (b=.04; p<.033; two-tailed), Editor Number of Prior Films (b=.04; p<.041; two-tailed), and Color (b=4.28; p<.004; two-tailed). Color has no effect on the financial performance (e.g., Model 1), but is significant when regressed on Academy Nominations. I speculate that this innovation may have been initially received more favorably by the industry insiders who decide about Academy Nominations than by theater owners and general audiences. The market might have reacted to this innovation much slower because the investment in projecting equipment may have initially limited opportunities for showing the color product in many theaters.

The analysis of joint effects based on Wald tests reveals that project investment (Production Time, Cast Size, and Cast Above-the Line Credits) have a significant impact on Academy Nominations ($Chi^2(3)=12.90$; p<.005; two-tailed). The joint effect of principal contributors' Number of Prior Films is not significant ($Chi^2(7)=13.15$; p<.068; two-tailed), neither is the joint effect of principal contributors' Prior Academy Nominations ($Chi^2(8)$; p<.200; two-tailed). The same is true for the Year dummy variables ($Chi^2(9)=5.20$; p<.817;

two-tailed), Studio dummy variables ($Chi^2(12)=5.95$; $p<.918$; two-tailed), and the Release Quarter ($Chi^2(3)=6.11$; $p<.106$; two-tailed).

Main Effects Model

Model 8 in Table 5-5 adds the main effect independent variables Repeated Collaboration, Main Non-Cast OSC, Main Cast OSC, and Minor Non-Cast OSC to the control variables included in Model 7. The overdispersion hypothesis is rejected (alpha=.0001; $p<.998$). The poisson regression analysis of Model 8 leads to a log likelihood of –54.71 ($p<.0001$; two-tailed) which represents a model improvement of 10.14 compared to control Model 7. A Wald test of the hypotheses that the regression coefficients of all main effects variables entered are zero cannot be rejected at a significance level of .05 ($Chi^2(4)=8.08$; $p<.089$; two-tailed), but a likelihood ratio test indicates that the overall model improvement is highly significant ($Chi^2=20.32$; $p<.0004$; two-tailed). These results indicate that the main effect variables contribute significantly to the explanatory power of the model.

Of the independent variables, Repeated Collaboration (b=.08; $p<.0225$; one-tailed) and Main Non-Cast OSC (b=1.39; $p<.006$; one-tailed) have significant positive effects on Academy Nominations suggesting that projects with principal contributors who had collaborated before were more likely to earn Academy Award Nominations. Main Cast OSC (b=.13; $p<.073$; one-tailed) and Minor Non-Cast OSC (b=-.36; $p<.325$; one-tailed) have no significant effect on Academy Nominations.

A logit regression of the main effects model on Academy Nominations leads to no significant regression coefficients for any of the independent variables and indicates that the OLS regression results depend on the differentiation between movies that received one or

more Academy Nominations. Given the general power problems due to limited sample size (less than 5 cases per observation) this is not surprising.

Interaction Effects Models

Model 9 in Table 5-5 adds the interaction terms of Main Non-Cast OSC*Repeated Collaboration, Main Cast OSC*Repeated Collaboration, and Minor Non-Cast OSC *Repeated Collaboration to the variables included in Model 8. The overdispersion hypothesis is rejected (alpha=.0014; p<1.00). The log likelihood decreases by 3.11 indicating an improvement in model fit compared to Model 8. A log likelihood ratio test indicates that the model improvement is not significant ($Chi^2(3)=6.22$; p<.101; two-tailed). A Wald test of the joint effect of the interaction terms also reports no significant effect ($Chi^2(3)=3.73$; p<.287; two-tailed).

The regression coefficients of all interaction terms are not significant. The standard errors of all the main effects variables are substantially increased (Repeated Collaboration:3.5 times; Main Non-Cast OSC:1.5 times; Main Cast OSC: 1.5 times; Minor Non-Cast OSC: 2.5 times). The increase in the standard error may be the effect of multicollinearity between the interaction terms as well as the interaction terms and the main effect variables from which they were constructed by multiplication. In order to reduce potential multicollinearity problem the different interaction terms were also entered separately into the regression equation.

Model 11 in Table 5-5 reports the results of entering only the interaction term Minor OSC*Repeated Collaboration. The log likelihood ratio test indicates no significant model

improvement ($Chi^2(1)=3.73$; $p<.054$; two-tailed), but the interaction term is significant, but not in the hypothesized direction ($b=.08$; $p<.035$; one-tailed). This suggests rejecting H2b.

Table 5-5 also reports the results of entering only the interaction term Main Cast OSC*Repeated Collaboration (Model 10) and Main Non-Cast OSC*Repeated Collaboration (Model 12). Neither of the models leads to a significant reduction of the log likelihood value and in none of the model is the interaction term significant. These findings suggest rejecting H2b and H3b respectively.

Summary Performance Effects of STNO Practices

Table 5-6 summarizes the empirical findings with regard to the different performance hypotheses. The study finds moderate support for the positive performance effect of the psychological contract practice and strong support for the positive performance effect of the population-level shadow of the future practice. However, only the population-level shadow of the future practice has the hypothesized stronger performance effects for STNOs.

Use of STNO Management Practices

H2c and H3c propose that STNOs are more likely to implement STNO management practices compared to LTNOs. Regression analysis with the STNO practice measures of Main Non- Cast OSC, Main Cast OSC, and Minor Non-Cast OSC as dependent variables are used to test these hypotheses. As outlined earlier both Main Non-Cast OSC and Main Cast OSC measures are non-negative count variables that approximate a normal distribution close enough to justify OLS regression analysis. In contrast, the Minor Non-Cast OSC is a non-negative count variable with a distribution possessing characteristics of a poisson-like distribution. Therefore, negative binomial regression analysis or poisson regression analysis is used for testing hypotheses with Minor Non-Cast OSC as the dependent variable.

Main Cast OSC Model

H2c proposes that STNOs use the Shadow of the Future practice more frequently compared to LTNOs. As discussed earlier Main Cast OSC is a non-negative count variable, but its distribution approximates a normal distribution. Thus, OLS regression is used for hypothesis testing.

Table 5-7 reports the results of the regression of a control model (Model 13) on Main Cast OSC. Cast Size ($b=.08$; $p<.001$; two-tailed) has a significant positive effect on cast on-screen credits and indicates that projects with more cast members granted on average more cast on-screen credits. As expected the actor quality variables were significant when regressed on cast credits. Year control dummies are included to control for any fixed difference between years. The year dummy variables are all not statistically significant suggesting no fixed difference in the industry-wide frequency of granting on-screen credits to

cast members between different years. Studio dummy variables are included in the model to control for any fixed studio effects, for example differences in general studio policies with regard to on-screen credit decisions. The combination of year and studio dummies promises a strong statistical control for both time and studio effects. The control Model 13 explained 34% of the variance in Main Cast OSC (adj. R^2=.3412; p<.0001; two-tailed).

Model 14 in Table 5-7 adds the independent variable Repeated Collaboration to the control variables included in Model 13. The addition of Repeated Collaboration in Model 14 significantly improves the overall variance explained by .10 compared to Model 13 (delta adj. R^2=.010; F=7.45; p<.01; two-tailed). The regression coefficient of Repeated Collaboration has a significant positive effect on Main Cast OSC in Model 14 (b=.06; p<.022; one-tailed). This implies LTNOs used the practice more frequently. These findings suggest to reject H2c that STNOs use the psychological contract practice more frequently compared to LTNO.

Minor Non-Cast OSC Model

Hypothesis 2c proposed that STNOs use the psychological contracting practice more frequently compared to LTNOs. As discussed earlier Minor Non-Cast OSC is a non-negative count variable and it possesses characteristics of a poisson-like distribution. Negative binomial regression or poisson regression are used for hypothesis testing.

The hypothesis that Minor Non-Cast OSC is poisson distributed (without overdispersion) cannot be rejected (alpha=.0014; p<1.00). Thus, poisson regression is used for statistical analysis. Table 5-8 reports the results of the poisson regression of a control model (Model 15). The model contains Production Time (b=.009; p<.450; two-tailed), Cast Size (b=-021; p<.133; two-tailed), and Cast Above-the-line Credits (b=-.21; p<.482; two-

tailed) as project investment measures. Of the year dummy variables only 1939 has a statistically significant effect (b=-2.74; p<.037; two-tailed). The control Model 15 has a log likelihood measure of -69.15 (Chi^2=103.75 ; p<.0001; two-tailed).

Model 16 in Table 5-8 adds the independent variable Repeated Collaboration to the control variables included in Model 15. The addition of Repeated Collaboration in Model 15 decreases the log likelihood of the overall model only marginally by .85. The improvement is not statistically significant based on a log likelihood ratio test (Chi^2=1.69; p<.193; two-tailed). In addition, the regression coefficient of Repeated Collaboration is not statistically significant (b=.01; p<.178; one-tailed). These findings suggest rejecting H2c that STNOs use the Psychological Contracting practice more frequently compared to LTNOs.

Main Non-Cast OSC Model

H3c proposes that more short-term collaborations use the shadow of the future practice more frequently compared to more long-term collaborations. Table 5-9 reports the results of the regression of a control model (Model 17) on Main Non-Cast OSC. The model contains Production Time (b=.01; p<.008; two-tailed), Cast Size (b=.01; p<.008; two-tailed), and Cast Above-the-line Credits (b=-.0003; p<.997; two-tailed) as project investment measures. In this model they control against projects with a higher project investment receiving more on-screen credits. Individual principal contributor quality control variables (both Prior Academy Nominations and Number of Prior Films) are included to control for higher quality principal contributors having a better chance to earn an on-screen credit. Year control dummies are included to control for any fixed difference between years. The variables for the years 1931-1936 have a highly significant negative effect on Main Non-Cast

OSC (regression coefficient range from –1.29 to –3.00; p<.001). These results indicate that this practice was used more rarely during the earlier years and became more common during 1938-1940. Studio dummy variables were included in the model to control for any fixed studio effects, for example differences in general studio policies with regard to on-screen credit decisions. The studio dummies indicate that Fox (b=1.42; p<.014; two tailed), Twentieth Century Fox (b=1.49; p<.004; two-tailed), RKO (b=1.28; p<.010; two-tailed), MGM (B=1.66; p<.006), and United Artist (b=1.07; p<.046; two-tailed) gave significantly more Main Non-Minor Cast OSC credits. In contrast, Columbia gave significantly less Main Non-Cast OSC (b=-1.63; p<.002; two-tailed). The combination of year and studio dummies promises a strong statistical control for both time and studio effects. The control Model 17 explained 59% of the variance in Main Non-Cast OSC (adj. R^2=.59; p<.0001; two-tailed).

Model 18 in Table 5-9 adds the independent variable Repeated Collaboration to the control variables included in Model 17. The addition of Repeated Collaboration in Model 14 reduces the overall variance explained, by -.001, compared to Model 17. The regression coefficient of Repeated Collaboration is not statistically significant in Model 18 (b=-.005; p<.235; one-tailed). These findings suggest rejecting H3c that STNOs use the Main Non-Cast OSC practice more frequently compared to LTNOs.

CHAPTER 6 - DISCUSSION

General STNO Performance Advantages (H1)

H1 states that STNOs are more successful than LTNOs in settings with unstable and emergent project task characteristics that require the combination of a highly diverse set of capabilities. As outlined above the task and environmental characteristics of the Hollywood movie production during the 1930s meet the criteria under which I hypothesized STNO performance advantages.

The hierarchical regression analysis revealed that the hypothesized three interaction effects significantly improved the variance explained by the statistical model with Financial Performance as dependent variable (delta adj. R^2=.0315; p<.01). Therefore, Model 3 which includes all the controls, all main effect variables and all three interaction terms is used for hypothesis testing. With regard to the belief of general performance advantages for more short-term collaborations, the empirical data provide support for H1 that STNOs are more successful than LTNOs across plausible levels of the moderating variables. As reported earlier (Table 5-3) thirteen of twenty-seven point estimates across plausible levels of the moderating variables are significant. Of the thirteen significant, eleven are negative and two are positive. This suggests a tendency for the conditional effect of repeated collaboration to be negative for plausible values of the moderator variables. These results lend moderate support to H1 that STNOs experience general performance advantages compared to LTNOs in settings with unstable and emergent project task characteristics that require the combination of a highly diverse set of capabilities.

In the absence of the management practices (values of zero for all moderation variables), the regression coefficient of Repeated Collaboration is negative, but not

significant. This suggests that the significance of the conditional effect of Repeated Collaboration depends on the presence of the management practices. This contradicts the notion of absolute overall performance advantages of STNOs (H1) and suggests that such a performance advantage depends on the implementation of the psychological contract practice and the shadow of the future practice. For these reasons, the findings are only interpreted as moderate support for H1 that STNOs experience general performance advantages compared to LTNOs in settings with unstable and emergent project task characteristics that require the combination of a highly diverse set of capabilities.

For the Academy Nomination models, hierarchical regression analysis leads to the conclusion that no significant interaction effects are present. Therefore, Model 8 is used for hypothesis testing. In the absence of interaction effects, the effect of Repeated Collaboration on Academy Nomination can be evaluated based on the variables regression coefficient ($b=.08$; $p<.0225$; one-tailed). The significant positive effect supports the rejection of H1 that STNOs experience performance advantages compared to LTNOs. With regard to H1 the two performance models lead to conflicting conclusions (Table 6-1).

Psychological Contracts (H2a, H2b)

The psychological contracting practice was operationalized via two measures: Main Cast OSC practice and the Minor Non-Cast OSC practice. The findings are discussed for each of the measures in the following two sections.

Main Cast OSC Practice

For main cast contributors the on-screen credit practice is expected to lead to performance improvements based on psychological contracting (e.g., higher levels of project identification and higher socio emotional returns) rather than via strengthening of the population-level shadow of the future as a powerful industry-wide sanctioning system in form of on-screen physical appearance and the central casting agency already existed. As reported earlier a Wald test of the combined effect of Main Cast OSC and Main Cast OSC*Repeated Collaboration is significant (Wald test: $F(2,183)=4.48$; $p<.013$; two-tailed).

The effect of changes in Main Cast OSC on Financial Performance is positive across possible values of Repeated Collaboration because both b3 and b6 are positive and Repeated Collaboration is a non-negative count variable. These findings support H2a that network organizations strengthening psychological contracts experience performance advantages.

The graphical decomposition of the interaction effect for plausible values (one standard deviation around the mean) of Main Cast OSC and Repeated Collaboration reveals that the Main Cast OSC practice improved both the performance of STNOs and LTNOs (see Figure 6-1).

Main Cast OSC has no statistically significant effect on performance in the Academy Nominations Model 8 ($b=.13$; $p<.0.72$; two-tailed). This finding suggests rejecting H2a for applications targeted at cast main contributors.

H2b proposed that the performance improvement effect of strengthening psychological contracts would be stronger for STNOs compared to LTNOs. With regard to the Main Cast OSC practice, the regression coefficient of the corresponding interaction term Main Cast OSC*Repeated Collaboration has no significant effect on Financial Performance.

Thus, H2b is rejected. The same conclusion is reached with regard to effects on Academy Nomination as no significant interaction effect is found.

Minor Non-Cast OSC Practice

On the minor contributor level the Minor Non-Cast OSC practice is expected to lead to performance improvements based on psychological contracting (e.g., higher levels of project identification and higher socio emotional returns). The Minor Non-Cast OSC measure captures the personal on-screen credits given to minor project contributors. The idea was stimulated by the knowledge that in today's movies 'endless' on-screen credits are given to nearly everybody involved in the project. I suspected that this practice emerged during the time period investigated. I was wrong. In the sample only 32 movies gave any on-screen credits to minor contributors and that these few typically granted only one or two credits. Only two projects gave more than 2 credits - three and four respectively. Most of the categories identified as minor contributors did not receive any credit in any movie project in the sample.

Due to the very indirect and limited influence of minor contributors on overall project performance, I expected an overall performance effect only for movies giving a substantial number of on-screen credits. Upon closer inspection of the minor non-cast contributor categories which received on-screen credit listings, the following pattern emerges: The most frequent category is 'advisor' with 62% of the on-screen credits (the next most frequent category accounted only for 13%). I suspect that these advisor credits (e.g., Count Tolstoi for the movie Anna Karenina or military experts in war movies (King-Hanson & Gevinson, 1999)) may have been intended to increase the legitimacy of the movie as a serious treatment

of historical events or literature source. These circumstances should be taken into account when interpreting the findings related to Minor Non-Cast OSC practice.

H2a predicted that network organizations strengthening psychological contracts experience performance advantages. As reported earlier a Wald test of the combined effect of Minor Non-Cast OSC and Minor Non-Cast OSC*Repeated Collaboration is not significant (Model 3: Wald test: $F(2,183)=1.95$; $p<.145$; two-tailed). Thus, H2a is rejected. In the Academy Nomination model. Minor Non-Cast OSC is also not significant (Model 8: $b=-.36$; $p<.325$; one-tailed). Again, this leads to the conclusion to reject H2a.

H2b stated that the performance improvement effect of strengthening psychological contracts is stronger for STNOs compared to LTNOs. The regression coefficient of the corresponding interaction term, Minor Non-Cast OSC*Repeated Collaboration, in Model 6 is significant, but in the wrong direction ($b=.24$; $p<.022$; one-tailed). These findings lead to the rejection of H2b in the financial performance model. For the Academy Nomination model the hierarchical regression analysis indicates no significant improvement of model fit when interaction terms were included. Thus, H2b is again rejected. Table 6-2 summarizes the interpretation of the empirical findings with regard to the psychological contracting hypotheses H2a and H2b.

Shadow of the Future Practice (H3a, H3b)

H3a proposed that network organizations strengthening the population-wide shadow of the future by communicating more information about substantial contributions of network members are more successful than network organizations that do not communicate such information. Main Non-Cast OSC captures the on-screen credits given to main non-cast

contributors. The on-screen credit communicates contributor information to non-network members including potential future network partners.

The interaction Model 3 requires a conditional analysis for Main Non-Cast OSC effects based on levels of the moderating variable Repeated Collaboration. The Wald test of Main Non-Cast OSC and Main Non-Cast OSC*Repeated Collaboration indicates a significant joint effect of these variables ($F(2, 183)=5.89$; $p<.003$; two-tailed). The unequal sign of the two regression coefficients in equation 5.4 requires the point estimation of regression coefficients for plausible values of the moderator variable in order to evaluate the direction of a change of Main Non-Cast OSC on financial performance.

The results of the Wald test and the regression point estimates suggest that for plausible values of the moderating variable, Main Non-Cast OSC has a significant positive effect on financial performance. This finding lends support to H3a that network organizations applying the population level of the future practice experience performance advantages

H3b hypothesized that the performance improvement of strengthening the population-level shadow of the future by communicating more information about substantial contributions of network members is stronger for STNOs compared to LTNOs The empirical support for H3b is evaluated based on the interaction term Main Non-Cast OSC*Repeated Collaboration. Model 3 reports a significant negative regression coefficient for the interaction term Main Non-Cast OSC*Repeated Collaboration ($b= -.17$; $p<.0035$; one-tailed) suggesting a moderated effect of the Main Non-Cast OSC practice on Financial Performance. This finding supports H3b that STNOs profit more from population-level shadow of the future for main contributors compared to LTNOs.

In the academy nomination models, adding the three interaction terms did not lead to a significant improvement of model fit ($Chi^2(3)=6.22$; $p<.101$) and the interaction terms were not statistically significant. This suggests the use of the model without interaction terms (Model 8) to estimate the effect of the Main Non Cast OSC practice. In Model 8 the regression coefficients represent constant effects across all values of other variables. Therefore, the positive and significant regression coefficient of Main Non-Cast OSC indicates a performance enhancing effect ($b=1.39$; $p<.006$; one-tailed). The corresponding incident ratio indicates that every on-screen credit increased the probability of earning an academy nomination by 4.01. Based on these findings H3a which hypothesized that the network organizations profit from strengthening population-level shadows of the future is supported with regard to Main Non-Cast contributors and Academy Nomination.

H3b proposed that the performance improvement effect of strengthening the population-wide shadow of the future by communicating more information about substantial contributions of network members is stronger for STNOs than for LTNOs. The financial performance Model 3 reports a significant negative interaction effect for Main Non-Cast OSC*Repeated Collaboration ($b=-.17$; $p<.0035$; one-tailed) suggesting a moderated effect of the Main Non-Cast OSC practice on financial performance and supporting H3b

Figure 6-1 shows a visual representation of the conditional effects for plausible values of Main Non-Cast OSC and Repeated Collaboration. Again, values one standard deviation above and below the mean are considered plausible. The visual examination of the graph indicates that STNOs profited more from the application of the practice as indicated by the steeper slope of the STNO line compared to the LTNO line.

A network project with a Repeated Collaboration measure one standard deviation below the sample mean (STNO), improved its financial performance by 14.42 via implementing the Main Non-Cast OSC practice (one standard deviation above the mean of on-screen credits to main contributors) compared to not implementing the practice (one standard deviation below the mean of on-screen credits to Main Non-Cast contributors) holding all other variables in the model constant. In contrast, a network project with a Repeated Collaboration measure one standard deviation above the sample mean (LTNO), improved its financial performance by -.67 when implementing the Main Non-Cast OSC Practice (one standard deviation above the mean of on-screen credits to main contributors) compared to LTNOs not implementing the practice (one standard deviation below the mean of on-screen credits to Main Non-Cast contributors) holding all other variables in the model constant. The slope difference is significant as indicated by the significance of the interaction term Main Non-Cast OSC*Repeated Collaboration and in the expected direction (Model 3: $b = -.17$; $p < .0035$; one-tailed). Thereby, the financial performance models support H3b that the performance improvement effect of strengthening the population-wide shadow of the future by communicating more information about substantial contributions of network members is stronger for STNOs than for LTNOs.

In summary, the empirical evidence suggests that the Shadow of the Future practice improved financial performance of networks (support for H3a) for non-cast main contributors. Financial performance improvements are stronger for STNOs compared to LTNOs (support for H3b). The Academy Nomination model supports H3a, but rejects H3b. Table 6-3 summarizes the findings for the Shadow of the Future practices H3a and H3b.

Rival Interpretations

Population-level Shadow of the Future

While I argue that with regard to the Main Non-Cast OSC practice, population-level shadow of the future effects are the dominant explanation for their performance improvement effect, this perspective can be challenged as the personal credits to main non-cast contributor simultaneously constitute a potential strengthening of psychological contract. The results reported for the Main Non-Cast OSC practice could therefore also be interpreted as lending support to H2a and H2b.

My reasoning for not interpreting Main Non-Cast OSC in this way, is based on theoretical and empirical arguments related to the comparison of Main Non-Cast OSC and Main Cast OSC. The measures both focus on main contributors and each group is likely important enough to justify investigating a person's prior performance history before signing him on to a project. They are also both reasonably frequently applied in the industry and the performance improvement effect could potentially be explained for both by a psychological contracting rationale or by a population-shadow of the future rationale. Any plans to decompose the shadow of the future effect and the psychological contracting effect in this measure, for example, by comparing performance effect for credits to individuals vs. credits to companies, were prevented by data availability and the lack of credits to companies. The one known fundamental difference between the two practices is that for the Main Cast OSC practice already a powerful shadow of the future in the form of the central casting agency was firmly established during this time frame. In addition, the contributors were visible on-screen during a movie performance and an interested future employer could easily identify and contact any player with the help of the central casting agency based on the title of the movie

and a role description. I argue therefore that the Main Cast OSC practice added relatively little with respect to strengthening the shadow of the future. Its performance improvement effect is interpreted as supporting a psychological contracting explanation.

In contrast, non-cast contributors were not visible and no central agency existed that could have provided the information on who was responsible for a specific task in a given movie. Assuming the only difference between Main Non-Cast OSC practice and the Main Cast OSC practice is that for Main Non-Cast contributors no equally strong industry-wide sanctioning system was available, then the results indicate that psychological contracting helps both STNO and LTNO as indicated by the performance effects found for the Main Cast OSC practice, while the population level shadow of the future adds a performance improvement element that is stronger for STNOs than for LTNOs. Based on these considerations, Main Non-Cast OSCs are classified and discussed as a shadow of the future phenomenon (even though they very likely contain a psychological contracting element), but the shadow of the future element is likely the reason behind the differences in performance effects found compared to the other measures.

Causal Direction

Another challenge to the internal validity of the shadow of the future effects and psychological contract effects found in the study is related to the causal direction of this relationship. My argument for the on-screen practices causing changes in financial performance or academy nomination assumes that (1) contributors expected to receive on-screen credits or at least perceived the chance to receive on-screen credit while contributing

to the project and (2) the number of eventually assigned on-screen credits was independent of the final evaluation of the quality of the movie.

If the credits were assigned at the completion of movie production (e.g., during editing), rather then during the production process only the expectation of a potential on-screen credit can have an effect on contributor behavior. Such a process implies that a network captain may have instrumentalized the desire for an on-screen credit and used it as a contingent incentive to motivate network contributors. In such cases the opportunity or expectation to earn an on-screen credit should motivate contributors. If network captains in the end decided to use more or less credits based on the actual performance of the contributors, then the credits would measure the performance of the contributors on the set. A lack of credits would be interpreted as a lack of opportunity to earn a credit and signal that the associated network management practice was not implemented while actually the practice was implemented, but did not lead to desired results. If such cases occurred, the performance impact attributed to the management practices would be inflated. But if credits were either determined prior to the movie shooting or if network captains used a rather fixed number of on-screen credits for which different contributors competed, then the number of on-screen credits per project is independent of the performance of the single contributors and on-screen credits reflect the implementation of the associated management practices. There is evidence for each of these processes occurring.

The argument for credit decisions preceding performance is supported by evidence of contractual agreements about credits prior to the shooting for principal contributors. Only union or guild contracts were found for non-principal contributors. In these cases the credit assignment clearly precedes movie performance. In addition, low number of credits given

during the time period rather supports the fixed number of credits argument because industry norms demanded a minimum number of credits (e.g., cinematography, main actors). The range within the network captain could vary number of credits was limited. Also on the actor side it would have been inconceivable that a significant role would be completely left out on the main cast credit chart. Instead performance incentives could also be exercised by the order and size of the on-screen credits. For these reasons, the study assumes that the number of on-screen credits indicates the degree to which a network captain used the practice during the movie production.

Besides the network captain, contributors may have influenced their on-screen credits based on their quality evaluation after or towards the end of movie production. Anecdotal evidence suggests that at times, network contributors successfully influenced on-screen credits based on movie quality evaluations. However, these incidences involve principal contributors (not main or minor contributors) and they were usually about a contributor trying to prevent receiving on-screen credit or about receiving better on-screen credits than other contributors. For example, Errol Flynn supposedly had the copies of a movie in which he played the lead character, stolen from the film laboratory in order to prevent its release (King-Hanson & Gevinson, 1993). Even these powerful individuals met substantial resistance from the studios who considered on-screen credits an instrument at their discretion. Movie contracts typically include clauses pertaining to credit rights and the studio typically retains these rights even after the end of the employment contract (Litwak, 1994). Unfortunately, far less is known about similar events on the main contributor and minor contributor level. The power of lower level contributors to demand or prevent on-screen credits was likely much lower, but at the same time the importance of such a credit to the studio with regard to

promoting the movie was far less. Thereby, especially with regard to preventing an on-screen credit the studio might have been far less resistant to such a demand. In summary, this leads me to conclude that based only on the information regarding the on-screen decision process it cannot be ruled out that evaluation of the final movie influenced the assignment of on-screen credits.

In any case, on-screen credits have to be decided before the actual showing of the film. Even if network captains or movie contributors had the opportunity to influence credit assignment after or towards the end of movie production, a reversed causal relationship between movie performance and credit assignment requires that the movie success can be predicted with reasonable accuracy at the end of production, but before the movie's release. As discussed earlier, the empirical research on the predictability of movie project success (e.g., DeVany & Walls, 1996) as well as anecdotal evidence from movie failure (e.g., Bach, 1985) lend strong support for the inherent uncertainty with regard to predicting movie performance. The notable exception may be serials which constitute less than 4% of the movies in the sample and a serial dummy was included in all models to control for serial effects. The difficulty of predicting movie success is even greater for lower level contributors as they typically lack the information access to evaluate the overall movie quality (e.g., they are only involved in small part of the project and typically do not see edited film material before release). Of course uncertainty does not prevent contributors strategic behavior, but the inability to 'pick winners' prevents such strategic behavior and explains the observed relationship between on-screen credits for contributors and movie performance.

Effects of Prior Project Success

One of the limitations of the archival field study design is the lack of random assignment to the different treatments. The decision to cooperate again is likely not blind, but based on expectations. For example, successful past collaborations may have led contributors to attempt repeating the success. By repeating a successful collaboration partners may either attempt to recreate a unique fit of complementary capabilities that they experienced during a former collaboration with the same partner (partner-specific fit argument) or they may attempt to re-deploy partner-specific capabilities that they developed during a past successful collaboration (Argote et al., 1990). These capabilities include, for example, recreating a cast combination that has gained external legitimacy (e.g., audience appeal, financial backers).

Regressing the success of the current collaboration on the frequency of collaboration during the following year indicates that past success indeed increases the probability of future collaboration. The regression coefficient of financial performance of past project is positive . and significant ($b=.04$; $p<.009$; one-tailed). But even if past project success increases the probability of future collaboration this does not necessarily imply that past success causes future project success. For example, it is conceivable that the network members believe that a past success can be repeated and engage in repeated collaboration even though their belief is incorrect. A better understanding of this relationship requires investigating its underlying causal processes. If past success indicates partner-specific knowledge gained during these past projects and the future collaboration is a successful attempt to re-deploy this knowledge, then not the past success itself is the cause of future success, but rather the cause of the

underlying accumulated knowledge. The same is true for the partner-specific fit argument outlined before. Repeated Collaboration measures actual collaboration behavior independent of the underlying reasons that might have motivated contributors to collaborate again. As partner-specific learning or discovery of partner-specific fit can also happen during average successful project and even during project failures, Repeated Collaboration in the past projects promises to be a superior proxy for capturing the accumulated knowledge than past movie project success.

Long-term Performance Effects

The support for H2a, H3a, and H3b indicates that industry-wide institutionalized practices can be effective at improving organizational performance. In the case of on-screen non-cast credits, the performance enhancing effect of the population-wide shadow of the future practice is stronger for STNOs compared to LTNOs.

The dissemination of contributor information via on-screen credits has to be understood as one key practice supporting a much more complex industry-wide institutionalized sanctioning system. Beyond the exchange of contributor information, the sanctioning system requires, for example, a shared understanding about the use of such information for placement into future networks. Therefore, the STNO management practices have to be understood as part of a bundle of institutionalized practices that constitute the industry-wide sanctioning system.

Institutional theory has accumulated evidence that social processes at the population level can lead to such standardized organizational practices (Tolbert & Zucker, 1983; Meyer & Rowan, 1977; Meyer, Scott, & Deal, 1983; Haunschild, 1994; Podolny, 1994; Porac, et al.,

1995). These practices often initially address organizational challenges (e.g., Tolbert & Zucker, 1983; Uzzi, 1997). Frequently, however, they outstrip the conscious intentions of their actors, and after their institutionalization they may persist even if the factors change which supported their emergence (David, 1986; Arthur, 1989; Westphal, Gulati & Shortel, 1997).

Abrahamson & Fombrun (1994), for example, took an even more negative perspective of such sets of social norms which they refer to as 'macro cultures.' They argued that 'macro cultures' lead to strategic similarity, inertia, and a tendency to stay with traditional technologies. Other studies have supported the path-dependent nature and potential performance inhibiting effects of institutionalized practices as they may lock an organizational population into the application of inferior practices (Arthur, 1989; David, 1986). For example David (1986), in a historical analysis investigated how the institutionalization of a specific keyboard design (QWERTY) led initially to increasing returns, but prevented any change to superior keyboard designs in later years due to increasing switching costs. Liebowitz & Margolis (1990) have recently challenged this interpretation with regard to QWERTY. Ingram & Baum (1997) reported both positive effects (e.g., economies of scale) and negative effects (e.g., strategic inertia) of network associations for the Manhattan hotel industry. Uzzi (1997), in an ethnographic field study of the women's better dress industry, found evidence suggesting that the embedding of interorganizational relationships initially improved allocation efficiency and complex adaptations, but beyond a certain threshold these positive effects derailed economic performance as they made organizations more vulnerable to exogenous shocks and insulated them from relevant information outside their network.

In contrast, Huff (1982), Spender (1989), and Porac & Thomas (1990) have argued for the positive effects related to population-level routinization of transactional relationships among competitors, suppliers, retailers, and customers. Empirically, Leblebici & Salancik (1982) showed how the institutionalization of practices at the Chicago Board of Trade addressed environmental uncertainty challenges associated with coordinating transactions between a large number of participants and the rapid turnover of participants. Suchman (1995) described how standardized contractual norms emerged and supported venture capital financing in Silicon Valley between 1975 and 1990. Bourdieu (1977) outlined how the institutionalization of coordination practices can create a durably installed frame for regulated improvisation.

In the end, I agree with Walsh (1995) that in spite of these multiple empirical investigations, organizational research on industry-level mental models and the processes of their emergence demands further theoretical and empirical investigations. For example, recent advances in the development of dynamic models based on population-level learning processes promise to lead to a better understanding of how industry-level practices emerge and how they affect future actions (Miner & Anderson, forthcoming; Anderson, forthcoming; Miner & Haunschild, 1995)

The movie industry results support the notion that industry-level sanctioning systems can have important positive performance effects. It extends the existing literature by pointing out that, especially for STNOs or other short-term project based production systems, such stable industry-wide safeguarding practices are important substitutes for a weak organizational or network-level shadow of the future. While questions remain regarding other key practices that are needed in order for on-screen credits to work – still, the study

offers empirical evidence for the existence and performance impact of such informal industry-level sanctioning systems.

Additional Results

Network Flexibility on Principal Contributor Level

The data collected revealed some of the underlying factors that provided incentives in the movie industry for flexibility on the principal contributor level. The first reason is related to the efficient allocation of human resources to projects. The data indicate differences in the maximum number of projects per year for the different principal contributors. One of the underlying reasons may be differences in project involvement and resulting differences in the required time commitment. While a director is involved both in the pre-production and post-production process, an actor is likely to be involved only during the actual shooting and potentially the later stages of pre-production. I expect the efficiency of the overall production system to increase if the different contributors optimize the number of projects they can be involved in during a year. For example, while a director may be able to lead up to 6 serious projects per year, an actor may be able to participate in substantially more. Producers were responsible for the overall project including pre-production, production, and post production, but their involvement level varied allowing them, in contrast to directors or cinematographers, to be involved in several projects simultaneously. Art directors who were often heads of a department with a substantial staff were able to be involved in 20 or more projects per year (e.g., Cedric Gibbons at MGM during the time period consistently received on-screen credits for about 30 movies per year). Exclusive repeated collaboration with the

same set of principal contributors would have underutilized the available skills and capabilities.

Of course complex scheduling problems arise as soon as one tries to maximize skill and capability allocation by scheduling principal contributors independently. This is especially so when recognizing the difficulty of predicting the length of a movie production given its emergent nature (e.g., needed number of takes per scene), dependency on weather, the health of difficult to replace principal contributors (e.g., lead cast), and other potential disruptions of the fragile and highly interdependent production process. Given these characteristics planning collaborations with a specific partner becomes a true challenge and extra effort has to be exerted to arrange a collaboration with a desired partner.

The second reason for the constant change of network partner configurations may be related to every new project requiring a different set of specialized capabilities to accomplish the task. For example, a specific role may require a certain appearance, speech pattern, and acting capability. A specific script may require certain special effect skills on behalf of the cinematographer. These needs for specialized skills based on the subject to be filmed may force producers to include somebody in the network who promises to possess precisely the needed skills instead of including somebody whom they have worked with before. Past successful collaborations then only give contributors an advantage compared to other contributors with the same qualifications or the same special skill set, but not necessarily when competing with contributors in the same category who possess substantially different skills or expertise. The collaboration decision is consequently multidimensional with past successful collaborations only representing one dimension.

A third reason for switching network partners may have been related to the creative nature of the production process. The frequent change of network partners may stimulate creativity as a new network partner introduces different perspectives and challenges taken-for-granted solutions (e.g., Levinthal & March, 1993; March, 1991). While there is anecdotal evidence for individual learning and individual reputation building as reasons for collaborating with different sets of partners – there is little evidence for this aspect of group learning explicitly being discussed or considered as an aspect of movie production. On the pre-production script writing side though, there is evidence for adding writers to 'stir' things up and provide a stimulating alternative perspective if script production was at an impasse (Powdermaker, 1950; King-Hanson & Gevinson, 1993). It is unclear to what degree network captains were aware of this potential advantage of flexible recombination of network partners.

These speculations, based on the empirical data, anecdotal evidence, and theoretical considerations, provide a more fine grained and nuanced understanding of potential drivers behind the substantial flexibility in the movie production system on the principal contributor level which made repeated collaboration a more rare occurrence than I initially expected. The collaboration decision has to be perceived as multidimensional as it attempts to balance the respective advantages and disadvantages of repeated collaboration and flexible recombination.

Network Flexibility on the Main and Minor Contributor Level

While I am intentionally investigating the effect of repeated collaboration on the principal contributor level, it shoul be noted that on the main and minor contributor level the

situation was substantively different and potentially even more complex. On one hand, the dependence on these third and fourth tier contributors was low if a sufficiently large pool of willing employees was available. On the other hand, the studios' abuses of employer power led to strikes and unionization that in some areas and for periods of time improved labor conditions, raised wages, and even created closed shops for some low-level functions (Paul & Kleingartner, 1994; Ross, 1941).

There are indications that such unionization as well as the continuous production activities at the major studios led to more stable collaboration patterns for some lower level functions (e.g., stage hands). I believe that these lower level collaboration patterns are not threatening the interpretation of performance effects based on repeated collaboration on the principal contributor level for the following reasons: (1) in spite of closed shops at some studios for some third-tier and fourth-tier contribution categories, many other categories remained open shops with high levels of mobility, (2) even if lower-level contributors remained at the same studio, they may have collaborated with changing sets of principal contributors, (3) the lower level contributors have less impact on the overall production process, thereby, they also have less impact on the overall degree of short-termness of network relationships and overall project performance, (4) the studio dummy variables are a powerful control against any differences between studios (e.g., degree of unionization of minor contributor jobs) and (5) year dummy variables protect against any fixed industry-level difference with regard to changes in unionization and labor market characteristics. In general, the studios were very successful in fighting main and minor contributor unionization developments, often in coordinated efforts. Still, it must be kept in mind that when I am

referring to the dynamism and flexibility of the movie industry production system, the focus is on the principal contributor level.

Frequency of STNO Practices Implementation

The second set of hypotheses (H2c, H3c) suggests that STNOs apply the STNO practices more frequently compared to more long-term collaborations. Based on a functionalist perspective this would make sense if they address STNO-specific coordination challenges. For the Main Non-Cast OSC practice the empirical evidence supports such an argument, as the performance improvement effect is stronger for STNOs.

Model 13 through 18 in Table 5-7, Table 5-8, and Table 5-9 report the findings with regard to testing H2c and H3c. The empirical findings neither support H2c nor H3c. In the Main Cast OSC model, Repeated Collaboration has a significant positive effect which indicates that the practice is applied more frequently by LTNOs. This finding suggests rejection of H2c (Model 14: $b=.06$ $p<.022$; one-tailed). In the Minor Non-Cast OSC model, Repeated Collaboration has no significant effect suggesting to reject H2c (Model 16: $b=.02$; $p<.085$; one-tailed). In the Main Non-Cast OSC model, Repeated Collaboration has no significant effect. This finding suggests to reject H3c (Model 18: $b=-.005$ $p<.236$; one-tailed).

The findings for H3c question the functionalist explanation for STNO practice implementation because in the case of Main Non-Cast OSC practice significantly stronger performance effects for STNOs were found (H3b) that would justify STNOs implementing this practice more frequently than LTNOs (H3c). The fact that STNOs were not

implementing this practice more frequently, leads me to some interesting more general questions regarding the emergence, institutionalization, and application of this practice in the movie industry. The movie industry at the time was considered to be dominated and 'ruled' by a few major studios which supposedly favored more long-term collaboration patterns. Based on my results, the application of the shadow of the future practice for main non-cast contributors was not in the interest of the studios as they favored more long-term collaboration projects. In general, the studios should not have resisted the institutionalization of practices that favored more flexible network production forms. Instead the case of the central casting agency mentioned earlier illustrates that the major studios were instrumental in developing such industry-wide practices. This raises the interesting question of weather or not the major studios in the pursuit of short-term gains innovated, supported, and institutionalized practices that in the end contributed to their demise. This research question is worth future investigation.

Strengths and Limitations

Internal Validity

For a study based on archival records, the proposed research promises reasonable levels of internal validity due to the extensive documentation of movie industry events (e.g., availability of business records which have been donated to library archives). The single industry focus of the study which controls for constant industry specific factors, and the relatively large number of 'similar' projects across time which allows for statistical control of effects. For example, the studio and time dummy variables provide protection against any fixed effect differences across studios (e.g., differences with regard to complementary other

practices at some studios) or across time (e.g., the independent emergence and institutionalization of a complementary industry practice). Finally, the sampling based on project formation announcements protects against survivor biases which are often associated with empirical research based on archival records in general and flexible network studies especially.

A concern with regard to internal validity relates to the reliability of the dependent variable Financial Performance. Several sources and approximation techniques had to be used in early years to compensate for incomplete records. Still the financial performance measure provides at the same time important advantages like: industry-wide coverage of projects, evaluation relative to the expected performance of an average movie, project evaluation by independent and knowledgeable third sources (theater owners). In addition the dummy controls used provide a powerful protection against any fixed effects of different information sources and approximation techniques.

Data availability also constrained the study in other ways. One concern relates to the very broad categorization of network relationships. Another to measuring the mediating processes between the implementation of the management practices and organizational level outcomes (e.g., the occurrence of opportunistic behavior). With regard to the shadow of the future practice (Main Non-Cast OSC), it remains unclear what other practices had to be institutionalized on the industry level in order to form a functional sanctioning system. With regard to the psychological contracting practice, it remains unclear to what degree organizations granting these type of on-screen credits had generally more socio-emotionally anchored relationships and implemented other practices fostering individual socio-emotional integration and identification with the project (e.g., management style on the set). The

inability to more clearly separate psychological contract and shadow of the future effects based on the on-screen credit practices, leaves construct validity concerns. In summary, the available data prevented gaining a more in-depth understanding of related cause and effect relationships.

External Validity

The dissertation investigates rather novel concepts (e.g., STNO, population-level communication practice) with limited empirical support based on past research. Therefore, generalizations must be made with great caution. Still, I believe that the findings are confined neither to the time period nor the industry studied. Especially, settings with similar task characteristics (combination and recombination of highly diverse sets of capabilities) like software development, military task forces, political campaigns, or surgical teams are candidates for potential extensions. While the evidence provided in this dissertation is not sufficient to support such generalizations, it should encourage and guide future research of STNOs in those settings.

In the movie industry at the time studied, STNOs were not an emerging phenomena. The findings should therefore be interpreted as representing an industry setting attuned to STNO production. Straight generalizations to industries in which STNO production is a rare exception or an emerging phenomena would be inappropriate. Again, the relationships as outlined are likely complex and extending interpretations beyond the conditions of the respective empirical setting are speculative.

CHAPTER 7 - CONCLUSIONS

Organizational Networks

My dissertation contributes to organizational theory by conceptualizing STNOs and demonstrating the importance of the 'time horizon of a collaboration' as an explanatory variable in network research. The study outlines the challenges 'short-termness' creates for internal network coordination and introduces two unique solution strategies network organizations in the movie industry may have found to address these challenges. The solution strategies are based on the shadow of the future practice which supports the industry's collective sanctioning systems and the psychological contracts practices which strengthens a network contributor's socio-emotional identification with and commitment to the project.

In the movie industry, strengthening the population-level shadow of the future via on-screen credits for main non-cast contributors addresses these challenges successfully and the performance enhancing effect is stronger for STNOs compared to LTNOs. In contrast, the performance enhancing effect of strengthening psychological contracts via on-screen credits for main cast contributors is not stronger for STNOs, rather all network organizations profit from the implementation of this practice. No support is found of a performance improvement through strengthening psychological contracts for minor non-cast contributors.

These findings contribute to the emergent research on flexible networks and project-based collaboration, and their management processes (e.g., Meyerson, Weick & Kramer, 1996, Suchman, 1995; Baker & Faulkner, 1991). The study extends this literature by providing evidence for the importance of industry-level practices. This population-level focus links the study with the past research on flexible industry-level production systems

(e.g., Piore & Sabel, 1987, Storper, 1989). In this context, the study decomposes the overall system perspective by outlining the network-level effects of two specific industry-level practices. Thereby, it contributes to a better understanding of the underlying organizational practices that enable flexible production systems.

The findings related to the importance of population-level practices lead to questioning the notion of general performance advantages of flexible network forms. A claim explicitly or implicitly found especially in the practitioner literature (e.g., Miles et al., 1997; Kramer, 1989). Instead, the study suggests that only if the unique STNO governance problems are addressed on the industry-level, can STNOs fully exploit their performance potentials.

The investigation of performance effects of the two management practices based on archival data should be regarded as a starting point for more sophisticated empirical investigations to capture a more complete set of STNO management practices and to detail both their implementation and their performance effects. Beyond the movie industry, I regard projects focused on construction, mergers & acquisitions, and software development as promising empirical settings.

Transaction Cost Economics

TCE usually abstracts from issues of social embeddedness and population-level phenomena (Shelanski & Klein, 1995). The theoretical and empirical evidence presented in this dissertation suggests that for understanding how STNOs protect exchange relationships, population-level practices are crucial. Thereby, the study provides empirical support to the recent conceptual work by Jones et al. (1997), Zenger & Hesterly (1997), Williamson (1993),

as well as game theoretic considerations by Kreps (1990) and Milgrom et al. (1990). For example, Jones et al. (1997) discussed the notion of industry-wide sanctioning systems and their importance for reducing transaction cost in the context of project-based production. My dissertation provides empirical evidence for the existence of industry-wide sanctioning systems as well as their stronger positive performance effect for project-based networks.

Beyond providing global empirical support to these conceptual considerations, the dissertation details the nature of the practices that may establish sanctioning systems. For example, it shows the importance of industry-level communication channels to enable sanctioning of past opportunistic behavior. It further extends prior work (Williamson, 1993; Kreps, 1990; Milgrom et al., 1990) by indicating that such a sanctioning system can be based on decentralized and informal processes (e.g., Hollywood gossip) instead of centralized and formal processes (e.g., legal courts).

The dissertation encourages future research allowing a more detailed understanding of opportunistic behavior in STNO settings. This study, due to data availability problems, did not operationalize the mediating opportunistic behavior that it assumes led to performance differences. Future research investigating the relationships between specific types of opportunistic behavior in STNO settings and different safeguarding practices promises a more fine grained understanding of underlying causal relationships. Such research would also strengthen the internal validity of the causal claims made in dissertation.

Psychological Contracts

The dissertation provides moderate support that psychological contract practices focused on socio-emotional returns can have positive performance effects. These findings

contribute to the psychological contract literature, especially current work investigating their relevance in contingent employment settings (e.g., McLean Park et al., 1998). Prior research focused on organizations that combine permanent employees and contingent employees. My study goes beyond the current literature by including settings in which all of an organization's employment relationships are contingent. Thus, the study investigate to which the degree the effects of psychological contracting with temproary employees are contingent upon a company simultaneously employing permanent and temporary workers. For example, to what degree feelings of equity are tied to the internal organizational comparison to the other group. The findings indicate that temporary employees seem to have general socio-emotional needs independent of the presence of permanent employees and these needs can be addressed by psychological contracts. The dissertation also extends prior research by investigating overall organizational performance outcomes. Turnover, job satisfaction, and individual performance have been the dominant dependent variables in prior research.

Future research should measure cognitive processes, like expectations of employees with regard to their employment relationship, in order to capture mediating processes leading from recognizing the contributions of individuals to higher commitment and improved organizational performance. Such research promises to both strengthen the internal validity of the causal claims made in the dissertation and lead to a more fine-grained understanding of how psychological contracts function and how to implement such practices to optimize a contract's performance impact.

The findings in the movie industry also raise the interesting question of how the wide-spread application of the practice may affect the effectiveness of the practice. For example, in today's movie industry everybody involved in the movie project seems to receive an

individual on-screen credit. Research investigating to what degree psychological contracting under such conditions becomes a taken-for-granted benefit and looses its motivational effect would add much to understanding the fundamental nature of psychological contracting practices.

Institutional Theory

The study also contributes to institutional research in the tradition of Tolbert & Zucker (1983) and Meyer & Rowan (1977). The empirical findings are consistent, for example, with findings by Ingram & Baum (1997), Porac & Thomas (1990) or Uzzi (1997) who report that population-level institutionalized practices can have positive performance effects. Thereby, it provides support for contemporary institutional theory that argues widespread practices can have value in addition to legitimacy.

In the movie industry, the standardized practices on the industry-level enabled flexibility on the network and organizational level - the flexibility to collaborate with a different set of partners for every new project without incurring prohibitively high transaction cost. Only when accounting for these institutionalized practices can one start to understand the functioning of flexible collaboration in this industry.

Future research investigating the emergence of industry-wide STNO practices promises to be especially rewarding. Preliminary findings indicate that the major studios were instrumental in developing and institutionalizing the practices investigated. At the same time, the success of flexible production contributed to the demise of the studio system (Storper, 1989; Christopherson & Storper, 1989). Thus, the practices outstripped the intent of the actors involved in developing them. For a better understanding of the dynamic

processes that influenced the institutionalization process, an example based on population-level learning models (Miner & Haunschild, 1995; Miner & Anderson, forthcoming) would be helpful. In general, a better understanding of industry-level institutionalization processes is desirable not only for strengthening the causal claims made in this study, but also for supporting industries currently in transition towards more flexible collaboration patterns.

Summary

In summary, the dissertation illustrates that the time frame of collaboration is an important variable that presents unique challenges as it moderates the effects of management practices. It further provides some first evidence for the importance of population level institutionalized practices in understanding the performance impact of STNOs. While the archival nature of the study limited the detail with which these processes could be observed, the findings should encourage future research in other industries and applying other methodologies to gain a better understanding of the complex relationship between short-term collaboration as an organizational form, its management practices, and their performance implications.

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Table 4-1

U.S. Movie Production and Distribution

Year	U.S. Produced Movies	U.S. Produced Movies by Major Studios	Imported Movies by Major Studios	U.S. Produced Movies by Independent Studios	Imported Movies by Independent Studios	Total Releases	Releases of Imported Movies
1950							
1949	356	224	10	132	113	479	123
1948	366	225	23	141	70	459	93
1947	369	234	15	135	103	486	118
1946	378	239	13	139	76	467	89
1945	350	228	6	122	21	377	27
1944	401	262	8	139	33	442	41
1943	397	279	10	118	20	427	30
1942	488	346	12	142	33	533	45
1941	492	368	11	124	95	598	106
1940	477	348	15	129	181	673	196
1939	483	367	21	116	257	761	278
1938	455	346	16	109	298	769	314
1937	538	393	15	145	225	778	240
1936	522	348	14	174	199	735	213
1935	525	340	16	185	225	766	241
1934	480	350	11	130	171	662	182
1933	507	317	21	190	116	644	137
1932	489	300	18	189	178	685	196
1931	501	307	17	194	104	622	121
1930	509	356	6	153	80	595	86

Source: Bahn, C. B. & Andrus, W. (1950). Motion picture industry statistics. In Allicoate, J. (ed.), The 1950 film daily year book of motion pictures (pp. 71-83). New York.

Table 4-2

Frequency Distribution for Movie Projects in Initial Sample Across Years

	Freq.	
31	33	**********
32	32	**********
33	37	**********
34	37	**********
35	33	**********
36	34	**********
37	36	**********
38	31	**********
39	33	**********
40	33	**********
Total	339	

Table 4-3

Frequency Distribution for B-Movie Projects Across Years

Year	Freq.	
31	9	*********
32	7	*******
33	7	*******
34	7	*******
36	1	*
37	4	****
38	1	*
39	2	**
40	1	*
Total	39	

Table 4-4

Frequency Distribution for Movies with Non-Standard or Unknown Core Production Structures Across Years

Year	Freq.	
31	6	******
32	11	**********
33	1	*
34	2	**
35	3	***
36	3	***
37	2	**
38	2	**
39	6	******
40	5	*****
Total	42	

Table 4-5

Frequency Distribution of Movie Projects in Final Sample Across Years

Year	Freq.	
31	17	**********
32	11	*******
33	28	**********
34	24	*********
35	29	**********
36	28	**********
37	30	**********
38	27	**********
39	25	*********
40	20	********
Total	239	

Table 4-6

OLS Regression for Domestic Revenues on Foreign Revenues

	Coef.	Std. Err	P>|t|
Domestic Revenue	.5966158	.0447814	0.000
MGM Studio Dummy	108.6641	50.79776	0.035
_cons	-36.29434	45.7147	0.429

Adj R-squared = 0.6868
Number of obs = 96
Two-tailed test

Table 4-7

Major U.S. Metropolitan Areas Included in Boxoffice (1936-1951) Revenue Estimation

Baltimore	**Indianapolis**	**Omaha**
Boston	**Kansas City**	**Portland, Me.**
Charlotte	**Los Angeles**	**Portland, Ore.**
Chicago	**Milwaukee**	**Providence**
Cincinnati	**Minneapolis**	**St. Louis**
Cleveland	**New Haven**	**Salt Lake City**
Dallas	**New Orleans**	**San Francisco**
Denver	**New York**	**Seattle**
Detroit	**Oklahoma City**	**Washington D.C.**

TABLE 4-8

Frequency Distribution of Box-office Revenue

	Freq.	
50	2	**
60	3	**
70	7	*****
80	8	******
90	25	********************
100	70	**********
110	55	**********
120	32	**********
130	19	**********
140	11	********
150	5	****
160		
170	1	*
180	1	*
Total	239	

TABLE 4-9

Frequency of Distribution of Academy Nominations

	Freq.	Percent	Cum.
0	217	90.79	90.79
1	9	3.77	94.56
2	9	3.77	98.33
4	1	0.42	98.74
5	3	1.26	100.00
Total	239	100.00	

Table 4-10

Correlation Among Dependent Variables

		1.	2.	3.	4.
1.	Box-office Revenue	1.0000			
		239			
2.	Accounting Revenue	0.7588	1.0000		
		0.0000			
		81	83		
3	Accounting Profit	0.5830	0.6796	1.0000	
		0.0000	0.0000		
		49	49	49	
4.	Academy Nomination	0.2883	0.3097	0.1325	1.0000
		0.0000	0.0044	0.3641	
		239	83	49	244

Table 4-11

Correlation Among Dependent Variables for Movie Projects in Drama Genre

	1	2	3	4
1. Box-office Revenue	1.0000			
	132			
2. Accounting Revenue	0.7136	1.0000		
	0.0000			
	49	51		
3. Accounting Profits	0.6374	0.6647	1.0000	
	0.0006	0.0003		
	25	25	25	
4. Academy Nomination	0.3832	0.3777	-0.0446	1.0000
	0.0000	0.0063	0.8322	
	132	51	25	136

Table 4-12

Frequency Distribution of Production Time

#Days	Freq.	
21-30	59	**********
31-40	64	**********
41-50	31	******
51-60	36	*******
61-70	23	*****
71-80	13	***
81-90	5	*
91-100	3	*
101-110	2	*
111-120	1	*
121-130	0	
131-140	0	
141-150	1	*
151-160	0	
161-170	0	
171-180	0	
181-190	0	
191-200	0	
201-210	0	
211-220	1	*
Total	239	

TABLE 4-13

Frequency Distribution of Repeated Collaboration

cor124h	Freq.	
0	8	****
10	100	**********
20	58	**********
30	38	**********
40	18	**********
50	6	***
60	7	****
70	2	*
80	1	*
90	1	*
Total	239	

TABLE 4-14

Frequency Distribution of Minor Non-Cast OSC

	Freq.	Percent	Cum.
0	207	86.61	86.61
1	26	10.88	97.49
2	4	1.67	99.16
3	1	0.42	99.58
4	1	0.42	100.00
Total	239	100.00	

TABLE 4-15

Frequency Distribution of Main Cast OSC

	Freq.	
0-5	2	*
6-10	60	**********
11-15	105	**********
16-20	47	**********
21-25	14	********
26-30	6	***
31-35	2	*
26-40	2	*
41-45	1	*
Total	239	

Table 4-16

Frequency Distribution of Main Non-Cast OSC

	Freq.	
0	22	**********
1	40	********************
2	47	************************
3	60	******************************
4	41	********************
5	24	************
6	4	**
7	1	*
Total	239	

Table 4-17

Frequency Distribution of Production Time

	Freq.	
21-30	59	**********
31-40	64	**********
41-50	31	*****
51-60	36	******
61-70	23	****
71-80	13	**
81-90	5	*
91-100	3	*
101-110	2	*
111-120	1	*
121-130	0	
131-140	0	
141-150	1	*
151-160	0	
161-170	0	
171-180	0	
181-190	0	
191-200	0	
201-210	0	
211-220	1	*
Total	239	

Table 4-18

Frequency Distribution of Cast Size

	Freq.	
10	5	****
20	69	**********
30	51	*******
40	39	******
50	31	*****
60	14	**
70	11	**
80	7	*
90	4	*
100	4	*
110	1	*
120	1	*
130	2	*
Total	239	

Table 4-19

Frequency Distribution of Director Prior Academy Nominations

Director	Freq.	Percent	Cum.
0	205	85.77	85.77
1	20	8.37	94.14
2	5	2.09	96.23
3	8	3.35	99.58
5	1	0.42	100.00
Total	239	100.00	

Table 4-20

Frequency Distribution of Producer Prior Academy Nominations

	Freq.	Percent	Cum.
0	152	63.60	63.60
1	36	15.06	78.66
2	28	11.72	90.38
3	8	3.35	93.72
4	9	3.77	97.49
5	5	2.09	99.58
6	1	0.42	100.00
Total	239	100.00	

Table 4-21

Frequency Distribution of Actor-1 Prior Academy Nominations

	Freq.	Percent	Cum.
0	220	92.05	92.05
1	14	5.86	97.91
2	4	1.67	99.58
4	1	0.42	100.00
Total	239	100.00	

Table 4-22

Frequency Distribution of Actor-2 Prior Academy Nominations

	Freq.	Percent	Cum.
0	194	81.17	81.17
1	23	9.62	90.79
2	18	7.53	98.33
3	4	1.67	100.00
Total	239	100.00	

Table 4-23

Frequency Distribution of Actor-3 Prior Academy Nominations

	Freq.	Percent	Cum.
0	226	94.56	94.56
1	12	5.02	99.58
2	1	0.42	100.00
Total	239	100.00	

Table 4-24

Frequency Distribution of Cinematographer Prior Academy Nominations

	Freq.	Percent	Cum.
0	183	76.57	76.57
1	28	11.72	88.28
2	19	7.95	96.23
3	3	1.26	97.49
4	6	2.51	100.00
Total	239	100.00	

Table 4-25

Frequency Distribution of Art Director Prior Academy Nominations

	Freq.	Percent	Cum.
0	112	46.86	46.86
1	29	12.13	59.00
2	24	10.04	69.04
3	15	6.28	75.31
4	17	7.11	82.43
5	9	3.77	86.19
6	15	6.28	92.47
7	9	3.77	96.23
8	9	3.77	100.00
Total	239	100.00	

Table 4-26

Frequency Distribution of Editor Prior Academy Nominations

	Freq.	Percent	Cum.
0	222	92.89	92.89
1	15	6.28	99.16
2	2	0.84	100.00
Total	239	100.00	

Table 4-27

Means and Standard Deviations of Principal Contributor Number of Prior Films

Variable	Obs	Mean	Std. Dev.	Min	Max
Director	239	34.09623	26.70999	0	140
Actor 1	239	25.92469	27.86286	0	188
Actor 2	239	30.72385	30.46652	0	204
Producer	239	24.75732	34.76282	0	373
Camera	239	57.159	28.36659	0	125
Art Dir.	239	96.30962	133.3312	0	487
Editor	239	19.79079	13.72441	0	82

Table 4-28

Frequency Distribution of Above-the-line Cast Credits

	Freq.	
0	94	**********
1	69	*******
2	63	*******
3	13	**
Total	239	

Table 4-29

Frequency Distribution of Genre Categories

	Freq.	
GE01-Comedy	59	24.69
GE02-Musica	48	20.08
GE03-Drama	132	55.23
Total	239	100.00

Table 4-30

Frequency Distribution of Serials

	Freq.	Percent	Cum.
not a serial	230	98.33	98.33
a serial	9	3.77	100.00
Total	239	100.00	

Table 4-31

Frequency Distribution of Color Movies

	Freq.	Percent	Cum.
Black & White	233	97.49	97.49
Color	6	2.51	100.00
Total	239	100.00	

Table 4-32

Frequency Distribution of Release Quarter

	Freq.	Percent
1. Quarter	53	22.18
2. Quarter	53	22.18
3. Quarter	53	22.18
4. Quarter	80	33.47
Total	239	100.00

TABLE 5-1

Means, Standard Deviations, and Correlations for Dependent Variables and Independent Variables

Variable	Mean	S D	1	2	3	4	5	6	7	8
1. Finanical Performance	104.57	0.88								
2. Academy Nominations	0.19	4.39	0.29 ***							
3 Repeated Collaboration	16.70	14.69	0.03	0.14 *						
4. Main Non-Cast OSC	2.61	1.54	0.35 ***	0.22 ***	0.17 **					
5. Main Cast OSC	14.00	5.74	0.28 ***	0.28 ***	0.27 ***	0.25 ***				
6. Minor Non-Cast OSC	0.17	0.50	0.11 †	0.07	0.05	0.18 **	0.01			
7. Main Non-Cast OSC* Repeated Collaboration	47.29	54.09	0.16 *	0.27 ***	0.81 ***	0.56 ***	0.37 ***	0.13 *		
8. Main Cast OSC* Repeated Collaboration	256.55	303.26	0.19 **	0.26 ***	0.83 ***	0.23 ***	0.67 ***	0.07	0.78 ***	
9. Minor Non-Cast OSC* Repeated Collaboration	3.19	12.99	0.15 *	0.10	0.36 ***	0.15 *	0.13 *	0.67 ***	0.42 ***	0.39 ***

Two-tailed tests:

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

TABLE 5-2

OLS Regressions on Financial Performance

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	109.72 ***	96.08 ***	87.15 ***	100.19 ***	100.40 ***	83.27 ***
Production Time (#Days)	0.17 **	0.14 *	0.13 *	0.14 *	0.13 *	0.12 *
Cast Size	0.12 *	0.54	0.07	0.04	0.06	0.07
Above-the-Line Cast Credits	1.64	1.85	2.24 †	1.91	1.62	2.24 †
Director Prior Nominations	5.38 **	4.85 *	4.48 *	4.57 *	4.68 *	4.94 *
Actor1 Prior Nominations	1.53	0.94	0.48	0.15	0.78	1.36
Actor2 Prior Nominations	3.93 *	2.98 †	2.51	2.82	3.13 †	2.66
Actor3 Prior Nominations	9.83 *	12.13 *	11.66 *	11.91 *	12.50 *	11.69 *
Producer Prior Nominations	0.92	0.78	0.96	0.60	0.81	1.03
Camera Prior Nominations	0.46	0.87	0.78	1.13	1.08	0.45
ArtDirector Prior Nominations	1.61	1.64	1.78	1.58	1.69	1.75
Editor Prior Nominations	0.76	0.72	3.09	1.24	1.31	1.54
Director Prior Films	-0.03	-0.04	-0.05	-0.04	-0.04	-0.05
Actor1 Prior Films	0.02	0.04	0.04	0.04	0.04	0.04
Actor2 Prior Films	-0.09 *	-0.06	-0.05	-0.06	-0.05	-0.06
Producer Prior Films	-0.04	-0.01	-0.01	0.00	0.01	-0.02
Camera Prior Films	-0.03	-0.01	-0.02	-0.02	-0.02	0.00
ArtDirector Prior Films	-0.03	-0.01	-0.01	-0.07	-0.01	-0.01
Editor Prior Films	-0.17 †	-0.18 *	-0.21 *	-0.18 *	-0.20 *	-0.19 *
No Editor (Dummy)	-10.83	-11.75	-10.64	-10.65	-12.90	-11.00
No Art Director (Dummy)	8.35	4.33	5.59	4.49	3.52	5.70
Release Quarter 1 (Dummy)	-3.24	-3.02	-3.88	-3.40	-3.35	-3.08
Release Quarter 2 (Dummy)	-7.72 *	-7.61 *	-7.90 *	-7.63 *	-7.68 *	-7.75 *
Release Quarter 3 (Dummy)	-3.87	-5.17	-5.83 †	-5.91 †	-5.61 †	-4.71
Color (Dummy)	-5.23	-6.42	-0.14	-5.63	-8.58	-1.02
Serial (Dummy)	11.37 †	11.21 †	10.94 †	11.10 †	12.26 *	10.33 †
Revbox (Dummy)	-18.77	-17.61	-11.79	-14.76	-17.78	-15.66
Boweekly (Dummy)	-8.41	-8.23	-2.24	-5.37	-7.99	-6.47
Time Dummies (8)	Yes	Yes	Yes	Yes	Yes	Yes
Studio Dummies (9)	Yes	Yes	Yes	Yes	Yes	Yes
Repeated Collaboration		-0.13	-0.32	-0.38 †	-0.21 †	0.20
		(0.10)	(0.23)	(0.19)	(0.11)	(0.20)
Main Cast OSC		0.58 *	0.11	0.14	0.57 *	0.60 *
		(0.24)	(0.38)	(0.37)	(0.24)	(0.24)
Minor Non-Cast OSC		2.64	-1.57	2.4	-1.04	2.57
		(2.42)	(3.21)	(2.42)	(3.21)	(2.40)
Main Non-Cast OSC		2.41 *	5.01 ***	2.54 *	2.34 *	4.2 **
		(1.17)	(1.49)	(1.17)	(1.17)	(1.47)
Main Cast OSC Repeated Collaboration*			0.02 (0.01)	0.02 (0.01)		
Minor Non-Cast OSC Repeated Collaboration*			0.24 † (0.14)		0.23 † (0.13)	
Main Non-Cast OSC Repeated Collaboration*			-0.17 ** (0.06)			-0.12 * (0.06)
adj. R2	0.2594	0.2932	0.3247	0.2982	0.3008	0.3042
delta adj. R2		0.0338 **	0.0315 **	0.005	0.0076	0.0110 *
Wald Test (added variables)		3.27 **	3.89 **	2.30	3.01	3.93 *
n	239	239	239	239	239	239

Two-tailed tests:

† $p < .10$;

* $p < .05$

** $p < .01$

*** $p < .001$

Table 5 - 3

Conditional Change in Repeated Collaboration on Financial Performance

Main Non-Cast OSC			Cast OSC			Minor Non-Cast OSC			Repeated Collaboration		
- SD	Mean	+ SD	- SD	Mean	+ SD	- SD	Mean	+SD	b	s.e.	t
x			x			x			-0.638 **	0.162	3.938
x				x		x			-0.523 **	0.167	3.132
x			x				x		-0.518 **	0.149	3.477
x					x	x			-0.408 *	0.197	2.071
x				x			x		-0.403 **	0.146	2.760
x			x					x	-0.398 **	0.167	2.383
	x		x			x			-0.383 **	0.144	2.660
x					x		x		-0.288 *	0.173	1.665
x				x				x	-0.283 *	0.156	1.814
	x			x		x			-0.268 *	0.139	1.928
	x		x				x		-0.263 *	0.122	2.156
x					x			x	-0.168	0.175	0.960
	x				x	x			-0.153	0.166	0.922
	x			x			x		-0.148	0.105	1.410
	x		x					x	-0.143	0.136	1.051
		x	x			x			-0.127	0.181	0.702
	x				x		x		-0.033	0.130	0.254
	x			x				x	-0.028	0.111	0.252
		x		x		x			-0.012	0.169	0.071
		x	x				x		-0.007	0.158	0.044
		x			x	x			0.103	0.184	0.560
		x		x			x		0.108	0.136	0.794
		x	x					x	0.127	0.164	0.774
	x				x			x	0.153	0.126	1.214
		x			x		x		0.223	0.147	1.517
		x		x				x	0.228 *	0.134	1.701
		x			x			x	0.343 *	0.137	2.504

one-tailed
$p < .05$ = *
$P < .01$ = **

Table 5-4

Frequency Distribution of Academy Nominations

	Freq.	Percent	Cum
0	217	90.79	90.79
1	9	3.77	94.56
2	9	3.77	98.33
4	1	0.42	98.74
5	3	1.26	100.00
Total	239	100.00	

TABLE 5-5

Poisson Regression On Academy Nominations

Variables	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Constant	-10.18 ***	-9.93 **	-10.59	-10.43 **	-12.93 **	-7.05
Production Time (#Days)	0.04 *	0.09 *	0.12 *	0.09 *	0.09 *	0.10 *
Cast Size	0.04 **	-0.02	-0.03	-0.01	-0.03	-0.02
Above-the-Line Cast Credits	0.56 †	0.71 †	0.69	0.71 †	0.81 †	0.63
Director Prior Nominations	1.24 **	1.38 **	1.94 *	1.43 **	1.46 *	1.58 **
Actor1 Prior Nominations	-2.40 **	-4.09 **	-4.73 *	-4.07 **	-4.39 **	-4.20 **
Actor2 Prior Nominations	0.88 *	1.44 *	2.72 *	1.51 **	1.68 *	1.88 *
Actor3 Prior Nominations	-0.40	1.39	2.29	1.23	1.42	2.01
Producer Prior Nominations	0.01	-0.59	-0.52	-0.56	-0.49	-0.75
Camera Prior Nominations	0.07	1.26 †	1.73 *	1.19 †	1.61 *	1.27 †
ArtDirector Prior Nominations	-0.51	-1.23 *	-0.92	-1.16 *	-1.02 †	-1.23 *
Editor Prior Nominations	-4.55 *	-8.46 **	-10.17 *	-8.83 **	-8.25 *	-9.41 **
Director Prior Films	0.02	0.00	0.00	0.00	0.00	-0.01
Actor1 Prior Films	0.01	0.03	0.01	0.03	0.03	0.02
Actor2 Prior Films	-0.04 *	-0.05 *	-0.02	-0.05 *	-0.03	-0.05 *
Producer Prior Films	0.04 *	0.09 *	0.17 *	0.09 *	0.14 *	0.10 *
Camera Prior Films	-0.01	-0.04 *	-0.07 *	-0.04 *	-0.05 *	-0.05 *
ArtDirector Prior Films	0.00	0.02	0.01	0.01	0.01	0.02
Editor Prior Films	0.04 *	0.03	0.06	0.03	0.03	0.03
No Editor (Dummy)	-11.34	-4.16	-1.02	-3.50	-3.38	-2.19
No Art Director (Dummy)	-29.19	-56.61	-79.02	-57.90	-72.19	-58.51
Release Quarter 1 (Dummy)	0.91	2.17	3.76	2.48	3.06	2.42
Release Quarter 2 (Dummy)	-0.44	-0.94	-0.20	-0.72	-0.84	-0.56
Release Quarter 3 (Dummy)	1.91	2.67 †	3.83 †	2.96 †	2.97	2.83 †
Color (Dummy)	4.28 **	3.63 †	-1.50	3.63 †	2.50	1.44
Serial (Dummy)	0.58	3.32 †	8.00 *	3.30 †	5.72 *	4.45 *
Genre Comedy (Dummy)	0.06	-0.40	-0.59	-0.33	-0.50	-0.77
Genre Musical (Dummy)	-0.77	-3.60 *	-2.92	-3.59 †	-3.06 †	-3.99 †
Time Dummies (8)	Yes	Yes	Yes	Yes	Yes	Yes
Studio Dummies (9)	Yes	Yes	Yes	Yes	Yes	Yes
Repeated Collaboration		0.08 *	-0.09	0.10	-0.0004	-0.03
		(0.04)	(0.14)	(0.07)	(0.06)	(0.10)
Main Cast OSC		0.13	0.24	0.17	0.16	0.13
		(0.09)	(0.15)	(0.12)	(0.11)	0.10
Minor Non-Cast OSC		-0.36	-3.60	-0.50	-2.22	-0.53
		(0.80)	(2.04)	(0.91)	(1.38)	(0.87)
Main Non-Cast OSC		1.39 *	1.09	1.33 *	1.71 *	0.80
		(0.55)	(0.83)	(0.57)	(0.67)	(0.71)
Main Cast OSC Repeated Collaboration*			-0.002 (0.00)	-0.001 (0.002)		
Minor Non-Cast OSC Repeated Collaboration*			0.11 † (0.06)		0.08 † (0.05)	
Main Non-Cast OSC Repeated Collaboration*			0.04 (0.03)			0.03 (0.03)
Log Likelihood	-64.85	-54.71	-51.60	-54.60	-52.85	-53.90
delta Log Likelihood		10.14	3.11	0.11	1.86	0.81
Log Likelihood-Ratio Test (Chi2)		20.28 ***	6.22	0.22	3.73 †	1.62
Wald Test (added variables)		8.08 †	3.77	0.21	3.27 †	1.46
n	239	239	239	239	239	239

Two-tailed tests:
† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

Table 5-6

Summary of Performance Results

Independent Variable	Financial Performance (b)		Academy Nomination Performance (b)	
	Main Effect Model 2	Interaction Effect Model 3	Main Effect Model 8	Interaction Effect Model 9
Repeated Collaboration	n.s.	n.s.	.08 *	n.s.
Main Cast OSC	.58 *	n.s.	n.s.	n.s.
Minor Non-Cast OSC	n.s.	n.s.	n.s.	n.s.
Main Non-Cast OSC	2.41 *	5.01 ***	1.39 *	n.s.
Main Cast OSC* Repeated Collaboration		n.s.		n.s.
Minor Non-Cast OSC * Repeated Collaboration		.24 †		.11 †
Main Non-Cast OSC* Repeated Collaboration		-.17 **		n.s.

two-tailed significance:
n.s. = not significant
† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$
n = 239

TABLE 5-7

OLS Regression of Repeated Collaboration on Frequency of Main Cast OSC Practice Implementation

Variables	Model 13	Model 14
Constant	16.353 ***	13.210 ***
Production Time (#Days)	0.027 †	0.022
Cast Size	0.076 ***	0.076 ***
Above-the-Line Cast Credits	-0.130	-0.066
Director Prior Nominations	-0.023	-0.032
Actor1 Prior Nominations	1.839 *	1.654 †
Actor2 Prior Nominations	1.095 *	1.095 *
Actor3 Prior Nominations	-1.379	-1.740
Producer Prior Nominations	-0.026	-0.043
Camera Prior Nominations	-0.133	-0.098
ArtDirector Prior Nominations	0.115	0.073
Editor Prior Nominations	-0.209	-0.239
Director Prior Films	0.046 ***	0.040 **
Actor1 Prior Films	-0.020	-0.020
Actor2 Prior Films	-0.033 **	-0.033 **
Producer Prior Films	0.008	-0.003
Camera Prior Films	0.003	-0.003
ArtDirector Prior Films	-0.012 †	-0.013 †
Editor Prior Films	0.005	-0.003
No Editor (Dummy)	3.122	3.269
No Art Director (Dummy)	1.180	1.796
Color (Dummy)	-3.163	-2.997
Serial (Dummy)	-0.701	-0.956
Genre Comedy (Dummy)	-2.500 **	-2.435 **
Genre Musical (Dummy)	-1.146	-1.149
Time Dummies (8)	Yes	Yes
Studio Dummies (9)	Yes	Yes
Repeated Collaboration		0.061 *
		(0.030)
adj. R2	0.3412	0.3517
delta adj. R2		0.0105 *
Wald Test (added variables)		3.92 *
n	239	239

Two-tailed tests:
† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

Table 5-8
Poisson Regression of Repeated Collaboration
Frequency of Minor Non-Cast OSC Practice Implementation

Variables	Model 15	Model 16
Constant	0.139	0.130
Production Time (#Days)	0.002	0.002
Cast Size	0.001	0.001
Above-the-Line Cast Credits	-0.020	-0.015
Director Prior Nominations	0.121 *	0.120 *
Actor1 Prior Nominations	0.041	0.029
Actor2 Prior Nominations	0.004	0.004
Actor3 Prior Nominations	-0.065	-0.089
Producer Prior Nominations	-0.007	-0.008
Camera Prior Nominations	-0.033	-0.030
ArtDirector Prior Nominations	0.004	0.001
Editor Prior Nominations	0.023	0.021
Director Prior Films	-0.001	-0.002
Actor1 Prior Films	-0.003 *	-0.003 *
Actor2 Prior Films	-0.001	-0.001
Producer Prior Films	0.000	-0.001
Camera Prior Films	-0.002	-0.002
ArtDirector Prior Films	-0.001	-0.001
Editor Prior Films	0.001	0.001
No Editor (Dummy)	0.047	0.056
No Art Director (Dummy)	0.181	0.221
Color (Dummy)	0.366	0.377
Serial (Dummy)	0.291	0.275
Genre Comedy (Dummy)	-0.149 †	-0.145 †
Genre Musical (Dummy)	-0.090	-0.090
Time Dummies (8)	Yes	Yes
Studio Dummies (9)	Yes	Yes
Repeated Collaboration		0.004
		(0.003)
Log Likelihood	-69.15	-68.30
delta Log Likelihood		0.85
Log Likelihood-Ratio Test (Chi^2)		1.69
Wald Test (added variables)		1.88
n		239

Two-tailed tests:
† $p < .10$
* $p < .05$
** $p < .01$

TABLE 5-9

OLS Regression of Repeated Collaboration on Frequency of Main Non-Cast OSC Practice

Variables	Model 17	Model 18
Constant	2.104 **	2.116 **
Production Time (#Days)	0.010 **	0.010 **
Cast Size	0.009 *	0.009 *
Above-the-Line Cast Credits	-0.010	-0.016
Director Prior Nominations	0.148	0.149
Actor1 Prior Nominations	-0.128	-0.110
Actor2 Prior Nominations	0.140	0.140
Actor3 Prior Nominations	-0.243	-0.209
Producer Prior Nominations	0.047	0.048
Camera Prior Nominations	-0.134	-0.137 †
ArtDirector Prior Nominations	-0.003	0.001
Editor Prior Nominations	0.109	0.111
Director Prior Films	-0.001	0.000
Actor1 Prior Films	0.002	0.002
Actor2 Prior Films	-0.002	-0.002
Producer Prior Films	-0.005 *	-0.004 †
Camera Prior Films	0.000	0.001
ArtDirector Prior Films	-0.003 †	-0.003 †
Editor Prior Films	0.007	0.008
No Editor (Dummy)	-0.567	-0.581
No Art Director (Dummy)	0.590	0.532
Color (Dummy)	0.535	0.520
Serial (Dummy)	0.115	0.139
Genre Comedy (Dummy)	0.006	0.000
Genre Musical (Dummy)	0.323 †	0.323
Time Dummies (8)	Yes	Yes
Studio Dummies (9)	Yes	Yes
Repeated Collaboration		-0.005
		(0.006)
adj. R2	0.5908	0.5898
Ã adj. R2		-0.0010
Wald Test (added variables)		0.75
n	239	239

Two-tailed tests:
† p < .10
* p < .05
** p < .01
*** p < .001

Table 6-1

Summary of Empirical Support for

General STNO Performance Hypotheses 1

Hypotheses	Hypotheses Label	Financial Performance Model	Academy Nomination Model
General STNO Performance Advantages	H1	Moderate Support	Rejected

Table 6-2

Summary of Empirical Support for

Psychological Contract Performance Hypotheses 2a and 2b

Hypotheses (Measures)	Hypotheses Label	Financial Performance Model	Academy Nomination Model
General Psychological Contract Performance Effects (Main Cast OSC Practice)	H2a	Supported	Rejected
General Psychological Contract Performance Effects (Minor Non-Cast OSC Practice)	H2a	Rejected	Rejected
Stronger Psychological Contract Performance Effects for STNOs compared to LTNOs (Main Cast OSC Practice)	H2b	Rejected	Rejected
Stronger Psychological Contract Performance Effects for STNOs compared to LTNOs (Minor Non-Cast OSC Practice)	H2b	Rejected	Rejected

Table 6-3

Summary of Empirical Support for

Population-level Shadow of the Future Performance Hypotheses 3a and 3b

Hypotheses	Hypotheses Label	Financial Performance Model	Academy Nomination Model
Network organization performance improvement based on population-level shadow of the future practice	H3a	Supported	Supported
Performance improvement of population-level shadow of the future stronger for STNOs compared to LTNOs	H3b	Supported	Rejected

Figure 6-1

Interaction Effect of Main Non-Cast OSC and Repeated Collaboration (Model 3)