How Power Shapes Knowledge-Intensive Work: Worker Ownership and Governance in the U.S. Automation Industry

By

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Abstract

Even as knowledge-intensive firms adopt modes of work design that distribute authority across the workforce, the distribution of ownership and governance, termed "structural power", continues to vary in these companies. Extant research suggests competing views that, in a knowledge-intensive industry, structural power is (a) irrelevant, (b) less consequential than work design, or (c) reinforces work design. Given these competing views, this project seeks to explore the consequences of variation in the distribution of structural power for knowledge-intensive work. Data comes from a multi-method comparison of knowledge-intensive work practices at two competing automated manufacturing equipment firms with contrasting distributions of structural power.

The first empirical chapter examines the structure and performance of cross-functional project teams. While frequent cross-functional interaction within teams is thought to help solve complex and uncertain tasks, I show that greater cross-functional interaction lowers team performance in the context of distributed structural power. By lowering the costs of conflict resolution and increasing the information gaps between occupations, concentrated structural power actually makes cross-functional interactions within teams more valuable.

The second empirical chapter examines how structural power shapes the navigation between internal and external demands in the boundary spanning responsibilities of sales representatives and project managers. Though earlier literature posits that firms with distributed structural power more effectively manage boundary spanning roles, I find that distributed structural power also

inhibits the internal coordination of these boundary spanning efforts. This highlights both the limits and advantages of distributed structural power for knowledge-intensive work.

The third empirical chapter examines decisions about compensation and task allocations at the two firms. It is commonly accepted that firms with distributed structural power will have a less heterogeneous workforce. I show that widely distributed structural power compresses pay differences, but enhances task specialization among workers. While task expertise is a threat to concentrated structural power, and thus restricted in that context, it is encouraged at the firm with distributed structural power to reduce monitoring costs and build worker capacity.

In sum, I argue that structural power continues to matter, even in the knowledge economy, shaping which work practices are adopted and which practices are more conducive to complex problem solving.

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Chapter One – Knowledge-Intensive Work and Structural Power: An Introduction to the Study

In the growing knowledge economy (Powell and Snellman 2004), firms are often envisioned as environments where workers operate with unprecedented autonomy and authority. One need only think of archetypal knowledge economy firms like Google, Valve Software, or Zappos, where workers define how they allocate their time, work remotely, collaborate with external partners as if they were internal partners, self-select onto projects, and pursue their own interests on company time. Prominent analysts have come to the conclusion that, with technological change and the shift towards more knowledge-intensive work, concentrated hierarchical authority is being replaced by a decentralized organizational form in which control is dispersed (Malone 2004; Appelbaum et al. 2000).

Yet, this description only captures some dimensions of organizational control in the knowledge economy. Behind these elements of work design that diminish hierarchy, enhance worker autonomy, and encourage flexibility are power structures that vary substantially in their degree of centralization. In the three archetypal examples just mentioned, either ownership or governance rights remains narrowly concentrated. At Google, the founders retain majority control of the board of directors. At Valve Software, there is a single individual who owns the firm and is the sole executive. Finally, Zappos is a wholly owned subsidiary of another firm, Amazon, whose CEO holds the highest proportion of shares of any individual or institution. Conversely, some knowledge economy firms have widely distributed ownership and governance. For example, many of the world's largest law, management consulting, and accounting firms are partnerships with widely distributed ownership and governance (Greenwood and Empson 2003).

Thus, even as the knowledge-intensive firms of advanced industrialized economies adopt workplace practices that distribute hierarchical authority, other dimensions of organizational power, namely ownership and governance, continue to vary substantially in the degree to which they are concentrated or widely dispersed. Therefore, this project seeks to explore the consequences of variation in the distribution of ownership and governance, which I define as two dimensions of "structural power", for knowledge-intensive work. In order to consider knowledge-intensive work, however, it is essential to also consider the work design practices thought to reshape power in these industries (Stark 2010). This is particularly important, given that extant research on high involvement work practices has been conducted nearly exclusively in contexts where ownership and governance rights are concentrated (for overviews, see Appelbaum et al. 2000 and Becker et al. 2001). Therefore, this project explores how variation in the distribution of structural power shapes the content and consequences of these knowledge-intensive work practices.

Beyond this effort to advance our understanding of organizational design in the knowledge economy, this study is also motivated by the goal to better understand the viability of market-based organizational forms that diverge from the hierarchical investor-owned firm. Given the accruing evidence of a strong association between concentrated investor ownership and inequality, both within and across firms (Cobb 2014), there is rising interest in the viability of alternative organizational forms that distribute ownership and governance more widely within the firm (Alperovitz 2012; Wright 2010). The viability of organizational forms with widely distributed structural power will be partially shaped by external institutions that support and legitimize these forms, like state subsidies and regulations, but it will also be informed by the

way these organizations respond to the challenges created by changing technologies. Because knowledge-intensive work is becoming increasingly prevalent with advances in automation and digital communications technology, a better understanding of the viability of alternative organizational forms requires that we better understand the interaction structural power and knowledge-intensive work practices. This is particularly important given that most studies of worker cooperatives, the archetypal organizational model of distributed structural power, examine firms in lower-skill, less technology-intensive industries (Palmer 2014). To understand their future viability, the relevant questions are both whether these organizational forms operate effectively in knowledge-intensive environments and how they operate effectively in these environments.

Towards those ends, this project examines the content and consequences of knowledge-intensive work practices in a pair of competing knowledge economy firms with contrasting distributions of structural power. Northern Cooperative and Southern Incorporated operate in the United States automation industry, designing, building, and installing customer-specific systems of automated manufacturing equipment. The firms are one year apart in age, are located 100 miles down the road from each other, compete for clients, recruit from the same colleges, and recognize each other as competitors. However, Northern is a worker cooperative where most workers are owners and on the board of directors, while Southern has ownership and governance concentrated in the hands of four individuals. To gather data from these firms, I undertook internships at the two companies, giving me an in-depth perspective on the way they organize work. With a combination of ethnographic data and archival administrative data, collected during these internships, this dissertation examines how contrasting distributions of structural power

shape the content and consequences of knowledge-intensive work practices central to the operation of these two firms.

The three main empirical chapters of the dissertation each examine a distinct knowledge-intensive work practice. In some chapters, I examine how structural power shapes the content of practices. In others, I examine how it shapes the consequences of practices. In the first of these chapters, Chapter Three, I look at the structure and performance of cross-functional project teams in these two firms. In particular, I examine the consequences of particular modes of team design, thought to shape how different occupations interact and share information within teams. In Chapter Four, I examine how structural power shapes the content of customer relations management roles, often called inter-organizational boundary spanning. In particular, I examine how structural power shapes the tension between external demands and internal goals. In Chapter Five, I examine decisions about compensation and task allocations at the two firms. Given strong expectations that firms with distributed structural power will have a less heterogeneous workforce, yet prior studies find conflicting evidence, I focus on decisions over compensation and task heterogeneity among workers.

In short, I find that structural power continues to matter, even in the knowledge economy, and scholarship of knowledge-intensive work practices are limited by their omission of structural power. Consideration of the surrounding distribution of structural power shifts which knowledge-intensive work practices are likely and which practices best solve complex and uncertain problems. In the case of cross-functional teams, structural power moderates the effects of particular modes of team organization generally thought to support complex and novel problem solving, altering our assumptions about their universal optimality. While frequent cross-

functional interaction within teams is thought to be universally beneficial for solving complex and uncertain tasks, I show that their benefits are actually contingent on the surrounding distribution of structural power. In the case of inter-organizational boundary spanning, I find that contrasting distributions of structural power reinforce a tradeoff between coordination with external partners and alignment with internal organizational goals. Though earlier literature posits that firms with distributed structural power more effectively manage boundary spanning roles, I find that distributed structural power also inhibits the internal coordination of these boundary spanning efforts. Finally, in decisions about compensation and task allocations, I show that wider distribution of structural power compresses pay differences but, counter to expectations, enhances task distinctions among workers.

In sum, I find that structural power continues to matter in the knowledge economy, but that the relationship is more nuanced than previously understood. Widely distributed structural power encourages some knowledge-intensive work practices and undermines others. Not only does this analysis illuminate the effects of structural power in the knowledge economy, but it also reveals how the effects of certain knowledge-intensive work practices are contingent on the surrounding distribution of structural power.

The dissertation is structured as follows. The following chapter introduces the motivation, research design, and general format of the dissertation in greater detail. The following three empirical chapters each address a particular knowledge-intensive work practice and the effects of variation in the surrounding distribution of structural power. The concluding chapter summarizes the project, identifies linkages between the findings, and extracts lessons for future scholarship on structural power and knowledge-intensive work

Chapter Two – Prior Literatures and the Study's Research Design

This chapter lays the groundwork for the following chapters, explaining the research question and the research design meant to address it. It motivates the research project and design by highlighting an unexplored, but important, area of scholarship on knowledge-intensive work. I will discuss the absence of structural power, by which I mean distributions of ownership and governance, in research on the knowledge economy and the need to consider it with greater precision. In the remainder of the chapter, I will lay out how this project seeks to fill this gap. I will introduce three categories of knowledge-intensive work practices where I will examine the consequences of contrasting distributions of structural power. Finally, I will present the research design for the project, explaining how I selected cases and collected data.

2.1 The Absence of Structural Power in Research on Knowledge-Intensive Work

Variously attributed to the advancement of digital technologies, globalization, and financialization, the economies of advanced industrialized countries are shifting towards more diversified, modular, and dynamic modes of production (Bell 1976). The terms post-fordist or postindustrial (Block 1990) have been frequently used to describe the phenomenon, but this project will use the term "knowledge-intensive work" (Powell and Snellman 2004), as it avoids emphasizing particular sectors or industries and emphasizes the organization of work.

The change has been attributed to both socio-political and technological factors. On one hand, shifts in the content in work have been driven by socio-political changes in advanced industrialized countries. Institutional investors, whose ownership stakes in large corporations have grown in the past 30 years, prioritize short-term shareholder value maximization at the

expense of long-term employment creation and job stability (Davis 2011). Liberalized trade policy has encouraged globalization of supply chains, enhancing competition from foreign competitors in lower cost labor markets and encouraging outsourcing of lower value areas of production (Bardhan, Bowles, and Wallerstein 2006). Combined, the result has been a proliferation of the "Nike" model, epitomized by the Apple company, where the core knowledge-intensive work is kept within firm boundaries while all other production tasks are outsourced to foreign contractors. At the same time, these shifts in the content of work have been partially driven by the declining cost of digital technology (Violante 2008), automating many more routinized production tasks (Brynjolfsson and McAfee 2014) and facilitating closer coordination between distant partners through advanced communication technologies. These multiple pressures push contemporary economies towards more knowledge-intensive, non-routine, and innovation-oriented areas of work.

Frequently labeled as the "knowledge economy", these areas of economic activity are defined by an increasing proportion of market value coming from intellectual capabilities (Powell and Snellman 2004). First, this work is defined by simultaneous increasing reliance on and increasing capability enabled by digital technology. Digital technology has been described as codifying previously tacit tasks, thereby introducing greater transparency and a wider responsibility for systemic knowledge beyond the immediate tasks that previously occupied workers (Zuboff 1988). Relatedly, advancing digital technology has been described as abstracting tasks that were previously perceived to be context specific, due to the availability of wider information with which to compare phenomena. For these reasons, roles previously focused on particular task completion have shifted towards a greater focus on system

improvement. For example, an individual who was previously a machine operator on a production line is now responsible for maintenance and improvement of an automated manufacturing system. Autor, Levy, and Murnane (2003) document how, across occupations in the United States, the ratio of non-routine analytic and interactive tasks relative to routine cognitive and manual tasks has increased sharply. Second, these growing areas of work emphasize the production of novelty, innovation, and scientific advance (Powell and Snellman 2004). Relatedly, they rely on and accelerate the pace of technological obsolescence. Enhanced logistics technologies and automated production processes shorten production times, reducing product life cycles. Improved data processing technologies shorten the time required for complex computation and lower the cost of data storage.

In light of these changing demands, management, industrial relations, and organizations scholars have increasingly recognized the importance of organizational forms that leverage human capital through knowledge exchange and learning within small groups and organizations, and across organizational boundaries. Some have emphasized how alternative modes of trust-based coordination, beyond either hierarchies or markets, are necessitated by the pace of technological change and the uncertainty of task requirements (Heckscher and Adler 2006). Some have focused on the increasing importance of organizational capacity to learn from prior experience and adjust organizational routines, as a source of competitive advantage (Argote 1999). Some have emphasized the need to break down organizational boundaries, thereby encouraging knowledge exchange and collaboration across firms (Chesbrough 2003). Some have emphasized human resource management practices that provide workers the skills, resources, and incentives to contribute their knowledge to production processes (Appelbaum et al. 2000;

Becker et al. 2001). The removal of formalized rules, unitary roles, managerial control, and organizational boundaries are key features of this model, enabling processes of continuous knowledge recombination and revision (Nonaka and Takeuchi 1995). In the United States, economy-wide inventories of these practices show that they have diffused widely, albeit inconsistently, across multiple sectors and industries (Blasi and Kruse 2006).

Ultimately, a common feature of all these analyses is that they take the hierarchical corporation, with specified roles, fixed boundaries, centralized control, defined rules, and stable routines as an outmoded artifact of a prior paradigm. Instead, in the context of knowledge-intensive production, these scholars argue that these different work practices complement and reinforce each other, operating best when combined in bundles to encourage knowledge exchange and continuous improvement (Becker et al. 2001). In short, these analyses posit that survival in the knowledge economy requires combinations of work practices that devolve hierarchical authority, understood as control over production-related decision making and resources.

While the knowledge economy literature is diverse and active, particularly in relation to the implications for organizational design, one strikingly absent organizational feature is the distribution of structural power. To articulate this claim, it is first useful to more precisely define which elements of power are relevant to this discussion. First, I will define "structural power" and, second, explain its exclusion from contemporary literature on knowledge-intensive work.

Considerations of power have a long pedigree in sociological (Simmel 1896; Weber 1947) and organizational research (Perrow 1986; Etzioni 1975), and the concept has been defined in a range of manners. Given that organization entails the coordination of actors and

resources towards some shared goal, and that process is often contentious, some have suggested that the study of organizations is by definition the study of power (Clegg, Courpasson, and Phillips 2006). From a social psychological perspective, the concept has been used to describe a mental state of efficacy and control (Magee and Galinsky 2008). Alternatively, the concept has been used to characterize situationally-specific relations of influence between individuals (French and Raven 1959). Finally, the concept has been used to describe social structures that shape multiple sets of social relations (Lukes 2005).

In this project, I focus on structural power. Structural power characterizes the codified rules and governing bodies that hold residual control over hierarchical authority within organizations. The term "residual" is essential to this definition. With the possible exception of archetypal collectivist organizations (Rothschild 1979), most if not all formal organizations are necessarily hierarchical, defined as each individual within the organization having relations of superordination or subordination to other individuals (Freeland and Zuckerman 2014). The types of knowledge-intensive work practices discussed earlier involve the flattening of this hierarchy, such that there are fewer individuals above or below other individuals in the authority structure. At the pinnacle of this hierarchy are the individuals who have the right to assign or revoke managerial authority to establish rules and structures (Perrow 1986; Weber 1947). As Baker, Gibbons, and Murphy articulate (1999; 56), "subordinate decision rights are loaned, not owned". In other words, behind managerial authority rests on a set of residual claims on the organization.

In contemporary advanced industrialized economies, it is the holders of property rights and governance representation who "own" residual decision rights. These control rights may result from the legitimacy of ownership and governance rights as defining features of market-

based organizations (Meyer and Rowan 1977). Relatedly, they may derive their power from the specification of a clear organizational identity through the individuals who hold structural power (Freeland and Zuckerman 2014; Zuckerman 2010). Structural power also derives from legal institutions that reinforce the residual claimancy and residual control rights of owners with the state's monopoly over the use of force. In short, ownership and governance rights derive their power from a range of sources.

Thus, structural power is composed of two distinct but interrelated components: ownership and governance rights. I define governance rights as the right to participation in organizational goal setting processes. Goal setting control has long been recognized as a fundamental source of power in organizations (Cyert and March 1963). Organizational goals specify the criteria according to which subordinate decisions will be evaluated. In turn, organizational goals are not codified and consequential to subsequent behavior unless they are articulated through discursive processes. Governance rights may also be assigned independently of ownership rights, as in the case of political systems where participation of certain stakeholder groups in firm governance is mandated by law. One of the best known examples is the German co-determination system, where the state assigns labor unions representation in firm governance (Rogers and Streeck 1995).

Ownership can be defined as residual rights to the profits and obligations over the losses of the firm. Also described as property rights, in many legal systems, ownership assigns individuals the right to use the property according to their interests, in proportion to their ownership stake (Dow 2003; Hansmann 1996). While often unrecognized, employee ownership is enormously prevalent. In 2014, in the United States, 44.7% of employees worked in a firm

with some sort of profit sharing, gain sharing, or employee stock allocation (NBER Shared Capitalism Project 2014; see Kruse, Freeman, and Blasi 2010 for further information). Meanwhile, ownership does not necessarily confer equivalent governance rights, as in the case of firms with multiple classes of shares with differing voting rights in governance processes. For example, the majority of shares of the software firm Google are owned by institutional investors, but they hold a class of shares that provide them limited governance representation relative to the minority-owner founders.

We can categorize different organizations by the degree to which ownership and governance rights are dispersed among individuals within the organization. This initial categorization scheme captures the concentration or dispersion of structural power, understood as the degree to which ownership and governance rights are equally dispersed across the full workforce. If a single individual holds allow ownership and governance rights, I define this as extreme concentrated structural power. Conversely, if each employee holds equal ownership and governance rights, I define this as extreme distributed structural power. Most importantly, for this project, this categorization scheme easily translates to the individual level, as we can specify which individuals are formally empowered and which are not. Lastly, as illustrated in Table 2.1 below, this categorization scheme captures a relatively wide range of cases.

		OWNERSHIP	
		Concentrated	**Distributed**
GOVERNANCE	**Concentrated**	• single-owner firm • family-owned firm • institutional investor-owned firm	• Employee Stock Ownership Plan (ESOP)
	Distributed	• representative governance (ex. holacracy) • co-determination • internal board members	• worker cooperative • ESOP with board representation • partnerships

Table 2.1: Typology of Structural Power Distributions

Different organizational types serve as exemplary cases of these different categories. The single owner small firm is a typical case of concentrated ownership and governance, where all the assets are the property of a single individual and that individual has exclusive control over organizational goal setting. The case of an American firm with majority ownership through an Employee Stock Ownership Plan and governance through an executive committee without broader worker representation or participation is an exemplary case of distributed ownership and concentrated governance. Here, the assets of the firm are distributed widely to the employees, where no individual owns more than 5% of the firm (NCEO). Emblematic of distributed governance and concentrated ownership, as mentioned before, are German firms implementing the co-determination model (Rogers and Streeck 2015). In this case, mandated by national law, boards of directors are required to include representation from the labor unions that organize their employees. At the same time, workers have no residual claimancy. Lastly, emblematic of distributed ownership and governance is the worker cooperative organizational form, in which

most or all workers hold both equal equity stakes in the firm and either directly participate on or have representation in firm governance (Hansmann 1996). The table above offers additional cases that fill these categories. Yet, despite this substantial variation, there has been little consideration of structural power in research on knowledge-intensive work. There are two main reasons for this neglect of structural power in the literature.

First, many scholars see the uncertainty of contemporary market demands undermining the effects of these structural power disparities within firms. According to a pragmatist view of learning, which undergirds much of the organizational learning and innovation literature, the uncertain and complex character of problems undermines established roles and resource hierarchies (Stark 2010; Sabel 2006; Dewey 1938). In this view, the demands on organizations are sufficiently dynamic and unpredictable that no particular resource is consistently valued over another, reducing the power that any individual derives from unique control over a particular resource. Instead, individuals are simultaneously dependent on access to a range of potential resources. Therefore, the resources an individual derives from ownership and governance rights are not particularly consequential, compared to other resources like expertise, relationships, or experience. Moreover, when problems are highly uncertain, individuals cannot know which resources will be most valuable, so control over any one resource does not serve as a viable bargaining chip. More valuable, instead, is the presence of a system of routines that facilitates regular experimentation with and recombination of strategies and resources (Helper et al. 2001).

Second, the work design practices that have become so common in knowledge-intensive contexts may sufficiently reshape power dynamics in contemporary firms that distributions ownership and governance rights become much less consequential. These are the efforts to

devolve hierarchical authority commonly described in the knowledge economy literature. Variously described as high involvement work practices or high performance work practices (Appelbaum et al. 2000; Becker et al. 2001), elements of work organization like collaborative teams, open organizational borders, flexible roles, inter-organizational partnerships, enhanced worker autonomy, and continuous training may distribute resource control widely enough that structural power becomes far less consequential. If production is self-contained within autonomous work teams with control over budgets, hiring, and self-evaluation (Gittell et al. 2010), the surrounding distribution of structural power may be relatively unimportant. For example, at the video game design company Valve Software, workers select which project teams they will join, take unlimited vacation, vote for their peers' pay rates, hire their co-workers, and have no direct supervisors (Daft 2015). Nonetheless, the company is owned and governed by a single individual. This can be described as a case of extreme decentralized authority and concentrated structural power. When authority is so highly decentralized and workers have nearly complete autonomy, the distribution of ownership and governance may not matter. This claim, however, remains purely speculative. To date, all scholarship of knowledge-intensive work practices has been carried out in firms with concentrated ownership and governance.

In contrast to the general literature on knowledge-intensive work, in analysis of worker cooperatives and professional partnerships, one does find arguments that variation in the distribution of structural power shapes the content of knowledge-intensive work practices and their consequences. This body of research draws on two perspectives: one that views organizations with widely distributed structural power as approximations of a collectivist organizational ideal type (Rothschild-Whitt 1979) and another that views them as groups of self-

interested rational actors (Dow 2003). While the former emphasizes the types of practices these organizations are likely to adopt, the latter makes claims about both likely practices and likely outcomes. Interestingly, they come to similar conclusions that firms with widely distributed structural power are more likely to adopt organizational practices that encourage knowledge creation and exchange, and more likely to operate efficiently in knowledge-intensive industries.

A line of sociological scholarship on organizations with widely distributed ownership and governance has argued that the behavior of individuals within these organizations can be best understood in relation to the ideal type they see the organization as approximating. In turn, members of organizations with widely distributed structural power identify more closely with collectivist logic of authority than the bureaucratic logic of authority that many contemporary market-based organizations recognize as an ideal (Rothschild-Whitt 1979). One of the features of the collectivist ideal type is that each individual's interest has equal representation in organizational decisions. This has implications for work organization, specifically encouraging the dissemination of knowledge and skills across the organization. Russell (1985) highlights how these organizations often reduce the challenge of diverse interest representation through socialization processes that instill a common identity, loyalty to tradition, and familiarity with common practices. He uses the example of law firm partnerships, where young attorneys are socialized to the traditions of the firm upon arrival and the most successful partners are memorialized in the firm's name. Rothschild and Whitt (1979) describe how collectivist organizations use job rotations, team-based work organization, orientations, and trainings to ensure that knowledge and skills are evenly distributed across the workforce. An explicit goal of these practices, in their view, is to ensure that no individual has disproportionate informal power,

due to unique expertise or knowledge. Thus, this literature anticipates that, for ideological reasons, organizations with widely distributed structural power are more likely to adopt practices that encourage wide knowledge exchange and learning.

A far wider literature, based in methodological individualism and largely generated by economists, sees firms with widely distributed structural power as collections of individuals with incentive structures that differ from conventional workers (for review, see Dow 2003). Shared ownership stakes increase their incentive alignment with other workers and the firm, while governance participation both aligns individual and organizational goals, and lowers the costs of participation and information gathering. For a number of authors, these factors encourage firms with widely distributed structural power to adopt workplace practices frequently associated with knowledge-intensive work. Distributed ownership and governance rights are thought to give a higher proportion of workers the incentives and opportunities to share more information that improves production processes (Harden et al. 2010; Pencavel 2001). Several works on the Mondragon worker cooperatives (Azevedo and Gitahy 2010; Lopez et al. 2009) argue that these organizations are more likely to make financial investments in innovation to pre-emptively adapt to market changes, as a means to ensure the long-term employment of their owners. Relatedly, some studies of corporate ownership structures have shown that firms with internal ownership have higher risk tolerance and a longer time horizon, and thus are more likely to invest in risky innovation efforts than firms owned by external investors (Hoskisson et al. 2002; Ortega-Argiles et al. 2005; Zahra et al. 2000). Finally, Smith (1994) finds that worker cooperatives in Italy rely more heavily on external partnerships and collaborations to facilitate production growth, instead of internal workforce expansion, in order to maximize per-worker owner income. Thus, all of

these workplace practices that facilitate knowledge-intensive production are thought to result from the individual incentives created by distributed ownership and governance.

Finally, from a methodological individualist perspective, a number of authors have suggested ways that variation in the distribution of structural power is likely to shape the outcomes of knowledge-intensive work. Some scholars emphasize how the market performance effects of structural power distribution are contingent on the type of knowledge-intensive work pursued. While worker cooperatives are thought to have difficulty accessing capital resources at competitive rates, due to the limited resources of members and mistrust from external investors, they are thought to do a better job incentivizing labor contributions than conventional firms, and are therefore thought to have a competitive advantage in areas of knowledge-intensive production where labor constitutes a more important source of added value but is difficult to monitor, due to task complexity (Aghion and Tirole 1993; Dow 2003). Others suggest that firms with widely distributed structural power will perform better in market segments that emphasize minor process innovations and incremental improvements in product quality, as opposed to radical innovations that are less attractive to worker owners because they may undermine employment (Smith 1994; Vanek 1970). Finally, research on professional services firms argues that partnerships where a higher proportion of professionals are owners will tend to be more profitable in market segments where worker effort is more difficult to monitor, and personal relationships with clients are more important for generating sales (Levin and Tadelis 2005; Lowendahl et al. 2001; Maister 1993).

More broadly, scholarship on the emergence of Silicon Valley shows the importance of stock options as compensation schemes to incentivize collaborative work in an uncertain but

knowledge-intensive context (Blasi et al. 2003). Overall, these papers share the common theme that firms with widely distributed structural power will be more competitive in market segments where high skill labor is a primary source of added value.

Thus, given the evidence that distributions of structural power encourage workplace practices that facilitate knowledge sharing and thrive in market segments where labor contributions are central, the earlier literature suggesting the irrelevance of structural power structures for knowledge-intensive work is puzzling. Other scholars have recognized this puzzle (Pfeffer 2012; Felin et al 2009), but little work has sought to resolve it.

We can point to two possible explanations of this disagreement between the two literatures. First, conceptually, there has been limited engagement between the literatures. The knowledge-intensive work practices literature either ignores distributions of structural power or makes a general claim that they are irrelevant in the context of complex and uncertain work. Conversely, the literature on distributions of structural power points to consequences for workplace behaviors consistent with knowledge-intensive work, but that research has not explicitly examined these work practices across organizational contexts. For example, Blasi et al. (2003) clearly document the centrality of distributed ownership in early Silicon Valley firms, but they do not closely compare different knowledge-intensive work practices and their outcomes across comparable firms with different distributions of structural power. It may be the case that, when we explore these knowledge-intensive work practices with this literature as a guide, that we can develop a more nuanced view of the relationship between structural power and knowledge-intensive work.

To the author's knowledge, no studies of knowledge-intensive work practices have considered these practices across different distributions of structural power. As mentioned earlier, research on knowledge-intensive work practices has occurred primarily in firms with concentrated ownership and governance (Becker et al. 2001), but these scholars do not consider how the context of structural power may shape these practices and their consequences. Most research on organizations with widely distributed structural power has been based on case studies or samples of firms, all of which have widely distributed structural power, rather than on comparable firms that vary in their distribution of structural power (for an exception see Pencavel 2001), few studies of structural power have collected data from comparable firms that vary in their distribution of structural power. Moreover, these studies have not collected data on different kinds of knowledge-intensive work practices across these contexts. The current project seeks to address these two limitations of the prior literature.

Therefore, the project is guided by two research questions. In order to understand the relationships between the distribution of structural power and knowledge-intensive work practices we need to understand the consequences of structural power for both process and outcomes. Regardless of the consequences for organizational performance, structural power structures may encourage or inhibit the emergence of particular practices thought to facilitate knowledge-intensive work. Past research on high performance work practices suggests that some are adopted less frequently than others, particularly when they challenge centralized authority (Blasi and Kruse 2006), but scholars have not considered how distributions of structural power might shape these practices. Past research suggests that distributed structural power encourages

worker autonomy (Maister 1993), but does not consider different work practices. Therefore, I ask:

In an industry context of complexity and uncertainty, how does variation in the distribution of structural power within organizations shape knowledge-intensive work practices?

Second, while past work on knowledge-intensive work practices has suggested that their benefits for complex and uncertain problem-solving are conditional on the complexity and novelty of production tasks, they may also be conditional on the surrounding distribution of structural power. Past studies of worker cooperatives and professional partnerships suggest that distributed structural power facilitates knowledge-intensive work, but often lack the appropriate research design to test these hypotheses. Research in strategic human resource management argues that these practices operate most effectively in bundles (Becker et al. 2001), where the practices reinforce each other, yet this scholarship has not considered these bundles in relation to different distributions of structural power. To better understand the viability of organizations with widely distributed structural power, we must better understand how their organization impacts their ability to complete complex and uncertain production tasks. Thus, second, I ask:

How does variation in the distribution of structural power within organizations shape the performance of knowledge-intensive work practices in complex and uncertain problem solving?

2.2 Research Design

To address these questions, I conducted a multi-method examination of knowledge-intensive work practices in a matched pair of firms with contrasting distributions of structural power, operating in an industry where production is complex and uncertain. This research design, specifically targeted to examine high performance work practices across comparable firms with contrasting distributions of structural power, has not been used previously.

The prior discussion highlighted how structural power can be distributed to varying degrees along two axes, in order to show the range of organizations where this analysis is relevant. This project, however, examines two extreme cases where both dimensions of structural power are either narrowly concentrated or widely distributed. Given the absence of prior research, this project serves as an initial effort to identify the consequences of structural power for knowledge-intensive work. Because the two axes taken together offer more extreme variation in the key independent variable, this helps to more starkly identify the consequences (Eisenhardt and Graebner 2007). The second motivation for this research design is the difficulty of collecting data on multiple sets of micro-level organizational practices in contexts with varying distributions of structural power. An ideal study would gather data on micro-level organizational practices across a large sample of firms with varied distributions of structural power. Yet, proprietary firm data on nuanced organizational practices like team structure, inter-organizational collaborations, and compensation practices is highly sensitive and difficult to access, much less in multiple firms. By collecting data in a smaller matched pair of firms with contrasting distributions of structural power, we are able to collect a range of different types of data on a range of organizational practices. By simultaneously analyzing qualitative and quantitative data from the firms, we can triangulate claims, helping to improve validity (Jick

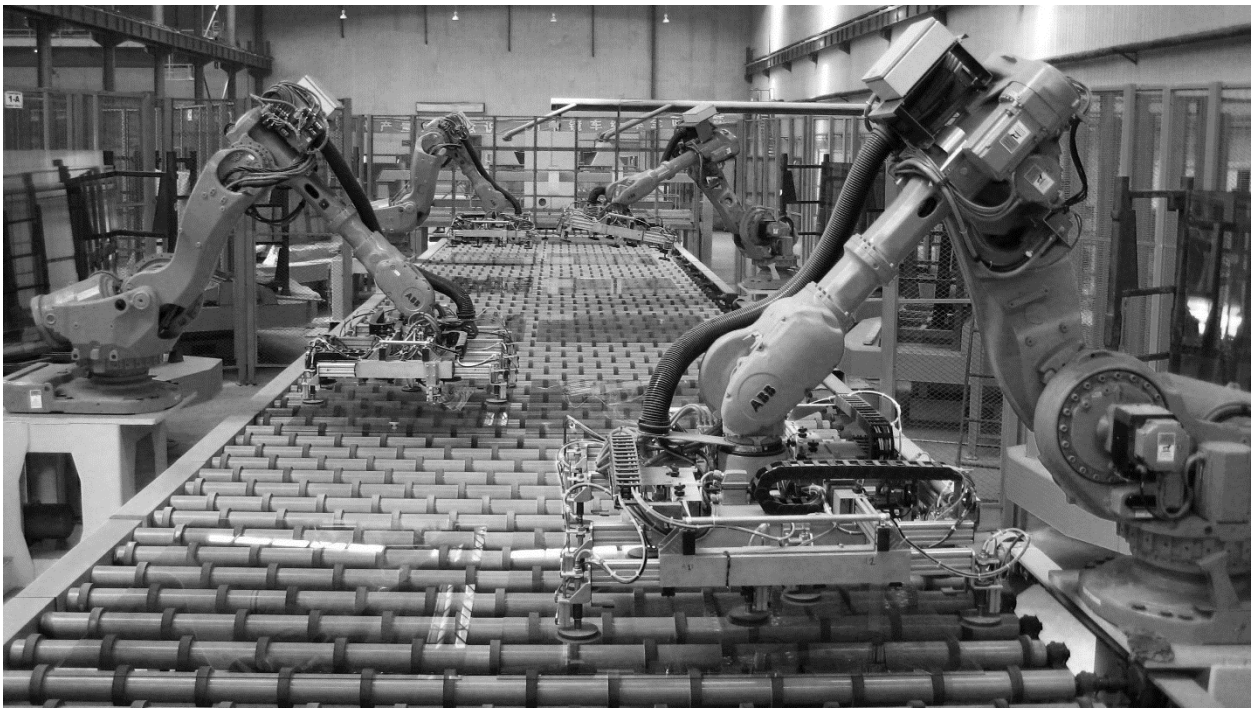
1979). By examining multiple distinct knowledge-intensive work practices simultaneously, I begin to construct theory about the common interactions between structural power and knowledge-intensive work design practices.

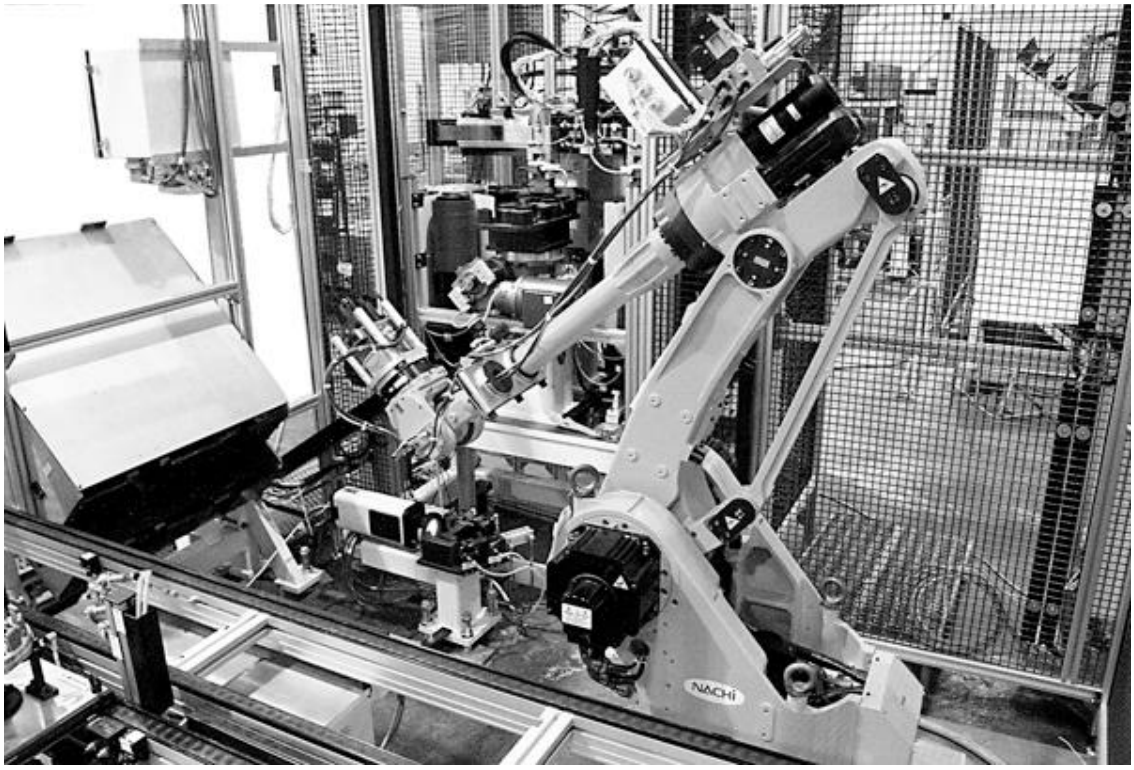
The two firms operate in the custom automated manufacturing equipment industry, a context ideal for the study of knowledge-intensive work. Often called automation or system integration firms, these companies are contracted by manufacturing firms to design, build, install, and service the unique systems of automated manufacturing equipment that populate many contemporary manufacturing facilities. The firms employ a workforce of mechanical and electrical engineers, electricians, mechanical assemblers, and machinists who work in cross-functional project teams.

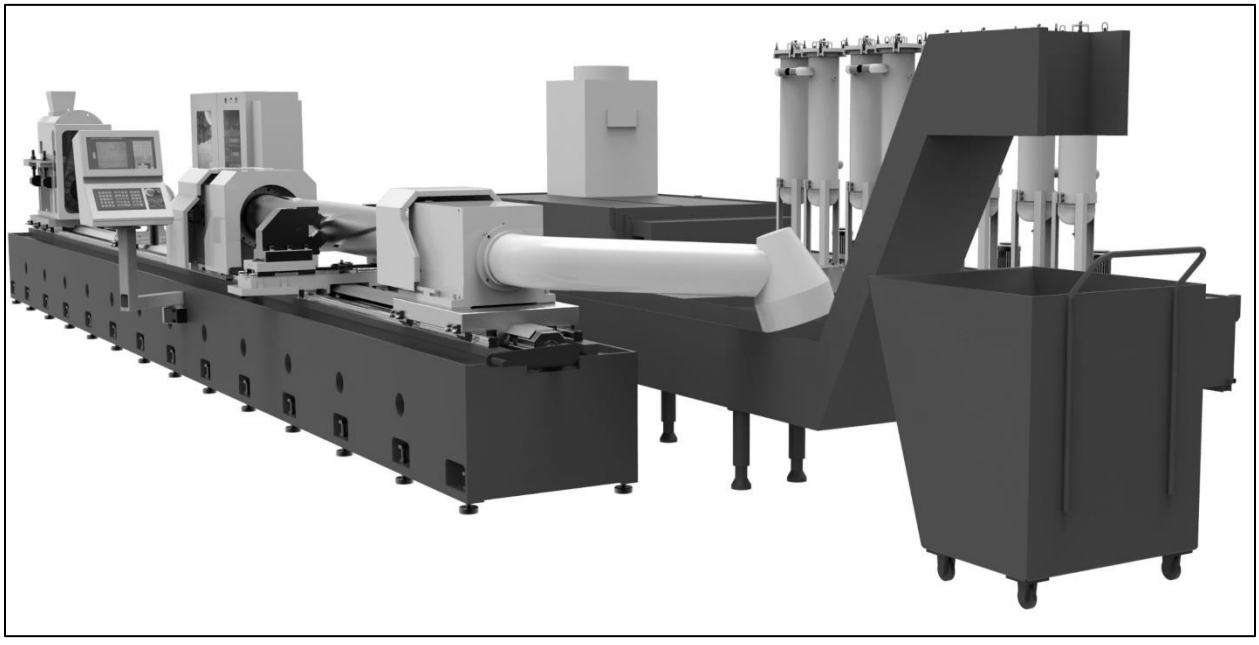
Scholarship on distributions of structural power may also benefit from analysis in this industry context. While there is no existing data charting the prevalence of employee ownership in the automation industry, which is not surprising given that it is sufficiently new that it lacks a Department of Labor NAICS (North American Industry Classification System) industry code, 19% of the largest majority worker owned firms in the United States in 2015 were in engineering-related industries (NCEO 2015). Thus, the current study may shed light on a type of work where questions of structural power distributions are relevant.

The industry emerged as a result of the increasing technological complexity of automated production practices and the increasing financial pressures, which compelled end user manufacturers to close their production engineering departments and contract out for production design and manufacturing system building (OTA 1984). As a result, these firms are responsible for the conceptualization and design of the production process as well as the machines. These

firms work with end-user producers, often called Original Equipment Manufacturers, to design and build their production systems. In turn, they ship these systems to manufacturing facilities, often located outside of the country of origin, and install them. The images in Figure 2.1 below give the reader a sense of the types of machines designed and built by these firms. As the illustrations suggest, the systems vary in their complexity and technological novelty.




NACHI



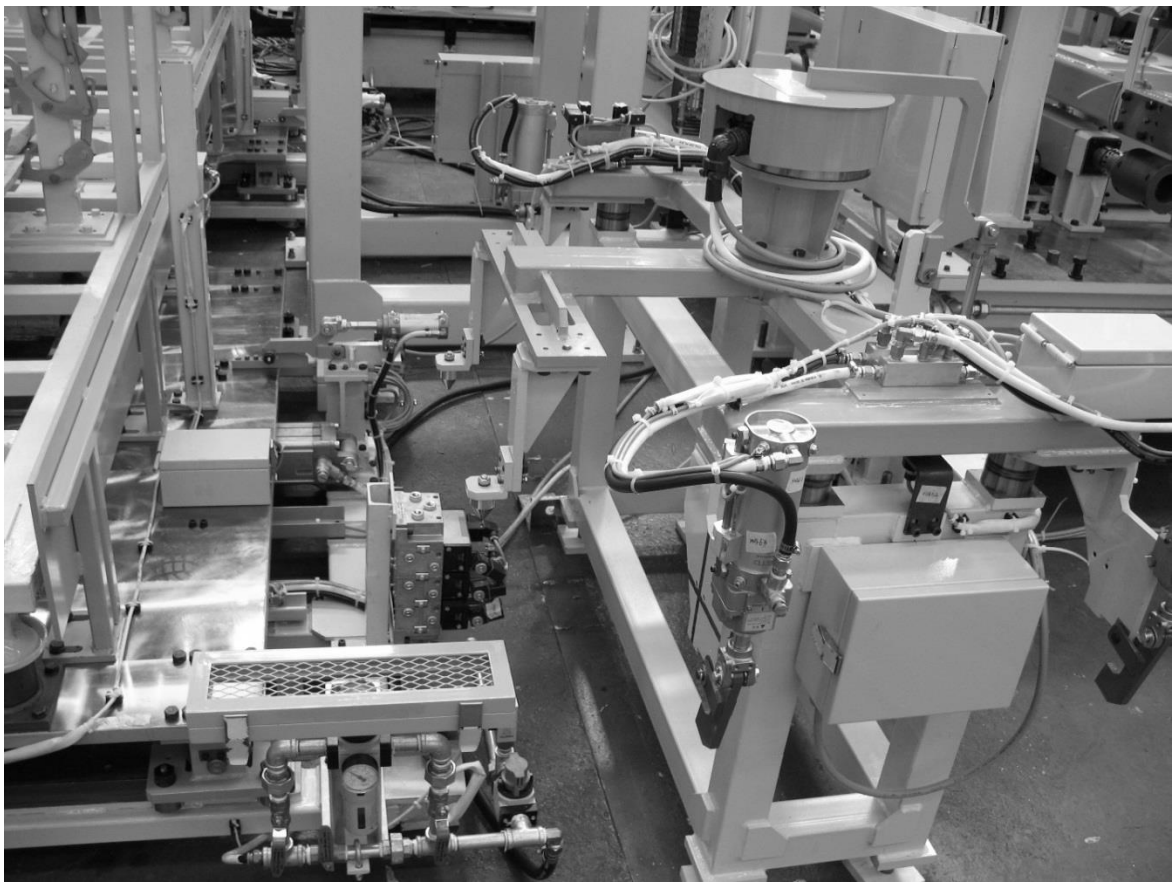


Figure 2.1 – Illustrations of Automated Manufacturing Equipment

Frequently, automation firms engage in ‘simultaneous engineering’, in which they will design the production process at the same time that the product is being designed. In other words, these firms are similar to engineering consulting firms, with the key exception that they also employ individuals responsible for the execution stage of the project. They may be best considered as analogous to professional services industries that employ a more heterogeneous set of workers, like architecture, construction, or graphic design firms, which employ both white collar and blue collar workers.

2.3 Data Collection and Analysis

Preliminary fieldwork for the project began with site visits and background interviews at Northern Cooperative, a worker cooperative in the automation industry, where I was able to gain access through a university-based contact. In this organization, between fifty and seventy five percent of the approximately fifty workers (depending on the year) hold ownership stakes and sit on the board of directors. During this preliminary fieldwork, I gathered background information on the industry, documented key organizational learning practices, and identified opportunities to gather archival quantitative data. I was able to negotiate future access for observational data collection and collection of material from their project archives. Finally, I was able to compile a list of their top competitors, in order to solicit an appropriate comparison case. Without revealing the source of my information, I contacted each of the firms on their competitor list and was able to negotiate access to a similarly sized, proximally located competitor firm with a single managing partner and three minority partners.

The two firms were founded within one year of each other, are located within 100 miles of each other, serve an overlapping set of clients, rely on an overlapping set of suppliers, and draw from some of the same schools for their workers. To protect their identity, I use pseudonyms for the two firms. I label the worker cooperative as Northern Cooperative and the firm with concentrated structural power as Southern Incorporated. Table 2.2 below summarizes their similarities and differences.

	Northern Cooperative	**Southern Incorporated**
Industry	Automated Manufacturing Equipment/System Integration	Automated Manufacturing Equipment/System Integration
Location	Upper Midwestern United States	Upper Midwestern United States
Employees (2013)	48	32
Founding Year	1980	1979
Distribution of Structural Power	50% to 75% of workers owners and on board	3% to 8% of workers owners and on board
Occupations in Ownership and Governance Group	Engineers, Assemblers, Machinists	Engineers

Table 2.2 – Descriptions of Matched Firms

This mode of matched case sample selection offers the advantage that it helps to isolate the effect of a particular variable, namely ownership and governance distribution, but also poses limitations. First, it introduces the potential for sampling bias. In particular, the two firms I have selected for study are both relatively successful, compared to their competitors, given that they have both survived nearly 30 years in the shrinking American manufacturing sector. Furthermore, they are relatively free from internal conflict. Two other firms allowed me preliminary site visits and substantial workplace conflicts quickly became apparent. Ultimately, my requests for further access at these two firms were declined and one manager explicitly explained that he did not want the organization's problems publicized. This leads me to assume that the two firms selected perceive themselves to be relatively successful and to have peaceful workplace dynamics. While this is likely not representative of most firms in this industry, if we assume that the effects of differences in structural power would be reduced, then this suggests that any remaining differences between them will be even more revealing.

Second, the mode of case selection poses certain limits to generalizability. The two firms selected are from a particular region within the United States and are of a similar age, meaning that their experience may not be representative of automation companies from different regions or of different ages. With respect to economic geography, the industry composition of the Upper Midwestern United States is varied, including automotive, pharmaceutical, medical device, consumer goods, and industrial machinery. This client diversity means that conclusions from this study may not be relevant for knowledge-intensive firms operating in more narrow and volatile market contexts. Second, both firms have had fewer than 60 employees over their lives, so the study may not be relevant to large firms, where broader distributions of ownership and governance may introduce additional governance costs (Nilsson 2001). However, given the relative lack of research on small firms and the decreasing average employment size of firms, particularly in knowledge-intensive industries, a focus on smaller firms may be of practical importance (Bureau of Labor Statistics 2012). Finally, a recent census of worker cooperatives in the United States shows that they are primarily in industries that produce less complex goods and services (Palmer 2014). Thus, the findings from this study do not generalize to worker cooperatives, writ large, but may be particularly applicable to worker cooperatives in future, more technologically-intense industries.

To gather qualitative data, I spent eight months as a part-time intern in each of the two firms. I wrote field notes for 88 days of observation, collected audio recordings of 24 meetings, and conducted 57 semi-structured interviews. I carried out the two internships during overlapping periods of time, as a means to gather additional comparative data as I discovered phenomena at one of the two firms. I received approval from the firm management to spend half

of my time working on tasks for their organization and half of my time with open access to management meetings, engineering reviews, and the shop floor. I also received approval to run an audio recorder during meetings, which provides an additional source of qualitative data. With respect to my sample selection, for the interviews, I selected workers from each occupational group and, in the case of the worker cooperative, both owners and non-owners from each occupational group.

After several months at each of the firms, I requested and was granted permission to access their financial and administrative databases, and merged the two data sources into a ten-year longitudinal project dataset. This dataset offers extremely detailed information at and below the project level with information on project performance, supplier characteristics, client characteristics, personnel data, and purchased capital inputs. For each of the nearly 1,300 projects in the dataset, I have data on the number of hours and the type of work that each worker completed each week over the duration of each project. Because these data come from the internal payroll and accounting files of the two organizations, and the firms have incentives to closely monitor these data, there is reason to expect higher data quality.

I focused this collection of qualitative and quantitative data around three sets of work practices occurring in both firms. During my preliminary fieldwork at Northern Cooperative, I began to seek out micro-level organizational practices that were frequently used in the firm, served as a means for knowledge exchange and complex problem solving, and received attention in the literature on knowledge-intensive work practices. After I began to collect data at Southern Incorporated, I confirmed that these organizational practices were also used in this firm and that rich data would be available with which to analyze these practices. Through this process, I

identified the following three sets of work practices to compare across the two firms: cross-functional project teams, customer relationship management, and compensation and task allocation decisions. While none of these organizational practices are exclusively used in industries characterized by complex and uncertain work, each can be managed to enhance knowledge exchange and complex problem solving, and have been studied as dimensions of knowledge-intensive work (Combs et al. 2006). Therefore, I looked at the degree to which these work practices were organized and shaped firm performance in a manner consistent with prior literature, when the firms were engaged in complex and uncertain work. Each of the following three empirical chapters focuses on one of the three knowledge-intensive work practices.

In Chapter Three, I examine the organization and performance of teams in these two contexts. Cross-functional project teams are a widely used organizational practice in knowledge-intensive work (Denison, Hart, and Kahn 1996). They are thought to be valuable as a means to effectively coordinate tasks between workers over a short time frame. Cross-functional interactions and task rotations within teams are thought to facilitate knowledge exchange and solve highly interdependent problems, when sub-tasks are less decomposable (Gittell et al. 2010). Therefore, in the two firms, I analyzed ethnographic data on interactions between team members from different occupations and payroll data on individual team member labor allocations over the course of projects. With the quantitative data, I was able to identify consistent differences in the organization of teams in the two firms and the consequences of different team structures for project performance. With the qualitative data, I was then able to identify mechanisms linking team structure to project performance. Therefore, this chapter looks

at the effect of structural power on both the content and consequences of knowledge-intensive work practices.

In Chapter Four, I examine how structural power shapes the content of customer relationship management efforts, often called representative inter-organizational boundary spanning roles. Prior literature on professional partnerships suggests that distributed structural power provides workers the autonomy and incentives to manage external relationships on behalf of the firm (Levin and Tadelis 2005). This view, however, gives insufficient attention to the complex internal coordination challenges when production is highly interdependent, meaning that it requires close collaboration between multiple parties within the firm, and firm goals change over time. In this chapter, I use longitudinal ethnographic data to examine how distributions of structural power shape the internal and external dimensions of representative inter-organizational boundary spanning. In particular, I track two boundary spanning roles, the sales and project manager role, as the firms seek to revise them in light of changing internal demands. I find that that the contrasting distributions of structural power magnify a tradeoff between external and internal coordination, enabling one but inhibiting the other.

In Chapter Five, I examine how Northern Cooperative and Southern Incorporated manage compensation and task allocation. Higher compensation levels and task rotations are frequently used in knowledge-intensive contexts, as a means to attract skilled workers and facilitate knowledge exchange across occupational boundaries. Prior literature in this area suggests that, in order to lower conflict among owners, compensation and task composition in firms with widely distributed structural power must reduce heterogeneity (Hansmann 1996). This suggests that high skill workers will be undercompensated but task rotations will be emphasized. However, past

studies of worker cooperatives document simultaneous task heterogeneity and compensation compression. I use payroll records to show a similar trend at Northern Cooperative, in comparison to Southern Incorporated, and then examine interview-based qualitative data to theorize the underlying mechanisms linking these distinctions to the distribution of structural power.

To summarize the chapter, this project seeks to provide a more nuanced picture of the relationship between structural power and knowledge-intensive work. The knowledge economy has received substantial attention over the past 20 years, while scholarship on organizations with widely distributed formal power has a long lineage. Yet, to understand either phenomenon, we need to understand their interaction. This project advances that aim by focusing, somewhat narrowly, on particular knowledge-intensive work practices and their differing content and consequences in varied contexts of structural power. Through a combination of qualitative and quantitative data from Northern Cooperative and Southern Incorporated, two competitor automated manufacturing equipment firms with contrasting distributions of structural power, I seek to enrich our understanding of structural power, knowledge-intensive work, and their interaction.

Chapter Three - Cooperating Without Co-Laboring: How Structural Power Affects Cross-Functional Interaction in Project Teams

For many scholars, the team or work group is the core organizational building block for the coordination of knowledge-intensive work (Keller 2001; Lovelace, Shapiro, and Weingart 2001; Van de Ven, Delbecq, and Koenig 1976). Small groups that combine workers from multiple functional backgrounds for limited durations, often described as cross-functional project teams, are used in a range of knowledge-intensive areas of production: new product design (Gibson and Gibbs 2006), strategic planning (Denison, Hart, and Kahn 1996), organizational change initiatives (Ericksen and Dyer 2004), crisis response (Klein et al. 2006), health care (Gittell, Seidner, and Wimbush 2010), and executive leadership (Bunderson and Sutcliffe 2002; Hambrick, Cho, and Chen 1996). In knowledge-intensive areas of work, a central determinant of cross-functional team effectiveness is the degree to which they facilitate knowledge exchange and continuous adaptation through interactions between heterogeneous team members (Stewart and Barick 2000; Wageman 1995)

At the same time, the organizational context of teams is one of the least studied dimensions of team-based work (Mathieu et al. 2008). More broadly, consideration of the organizational context of micro-organizational behavior remains an understudied area of organizational research (Bamberger 2008; Cappelli and Sherer 1991). Conversely, scholarship on internal distributions of ownership and governance rights has paid little attention to the alignment mechanisms simultaneously operating at the task level. Literature on structural power has tended to emphasize the consequences for individual-level interest alignment and worker motivation (Greenwood and Empson 2003; Dow 2003; Pencavel 2001).

Yet, consideration of the interaction between these two organizational design features could benefit each literature. When scholars have considered the organizational context of teams, they tend to conceptualize the impact of context as consistent across all members of the team (Bresman and Zellmer-Bruhn 2012; Mathieu et al. 2008; Langfred 2005; for a key exception, see Joshi 2014). Yet, different sub-groups within teams may be differentially impacted by the broader organization. By focusing on the distribution of ownership and governance rights at the organizational level, this conceptualizes organizational context in a manner that more precisely specifies which sub-groups within teams are empowered or constrained.

Given the absence of research on this topic and the empirical challenges of multi-level organizational research (Bamberger 2008; Klein and Kozlowski 2000), I adopt a multi-method explanatory research design (Creswell and Clark 2003). A key challenge of multi-level organizational research is that quantitative studies can identify robust patterns of interactions between levels, but risk reducing organizational context to "error variance" (Bamberger 2008; 840), while qualitative approaches richly elaborate multi-level mechanisms but have difficulty demonstrating their generalizability. Therefore, with an explanatory multi-level research design, I use quantitative data to identify relationships between phenomena and outcomes at multiple levels of analysis, and then use qualitative data from the same field sites to elaborate the mechanisms that link these levels of analysis.

Given the combination of rich qualitative and quantitative data I was able to gather at Northern Cooperative and Southern Incorporated, and the similarity of the team-based work undertaken by the two firms, they offer an ideal setting for this study. First, using administrative archival data from Northern and Southern, I show evidence of a consistent relationship between

organization-level design, team structure, and project performance. Distinct from prior studies based on survey data, archival proprietary data allows me to operationalize team-based knowledge exchange through a more precise measure of cross-functional interaction based on task and time-specific labor allocations. Second, using ethnographic data from the two firms, I explicate the mechanisms behind the statistical relationships found in the first section.

Ultimately, I find that project teams with higher levels of cross-functional interaction complete projects less efficiently in the context of widely distributed structural power, while greater cross-functional interaction improves project completion efficiency in the context of concentrated structural power. In turn, drawing on ethnographic data from the two firms, I show that the overarching mechanism behind this contingent relationship is the impact on role and status distinctions between organizational sub-groups. In particular, the distribution of structural power shapes occupational status distinctions, knowledge exchange processes outside of teams, and the availability of autonomy-enhancing knowledge management technology. Through these three mechanisms, distributed structural power makes higher levels of cross-functional interactions within teams less productive, diminishing the occupation-specific knowledge to be exchanged and increasing the costs of exchanging this knowledge.

3.1 Guidance from the Extant Literature

In this section, I begin developing the conceptual framework with which to explore the relationships between organization-level structural power, cross-functional team structure, and knowledge-intensive work outcomes. Using the extant literature, I specify key concepts in each

literature, identify the limited dialogue between these literatures, and generate propositions to guide analysis in the following sections.

Cross-Functional Interaction in Project Teams

Cross-functional project teams are a core organizational practice in areas of knowledge-intensive work where integration of heterogeneous knowledge is required to solve novel problems (Keller 2001; Denison, Hart, and Kahn 1996). They can be defined as groups of workers from different functional areas, organized to participate in the completion of an interdependent and temporally delimited set of tasks. While cross-functional interactions may be costly because they draw worker effort away from role-specific tasks (Bunderson and Boumgarten 2010), they are thought to improve performance in knowledge-intensive work through two avenues. First, increased interaction helps to align interest differences resulting from heterogeneous membership within teams (Van der Vegt and Janssen 2003; Jackson, Joshi and Erhardt 2003). Second, increased cross-functional interaction between team members offers a means to exchange information and coordinate tasks in the course of team-based project work (Stewart and Barick 2000; Wageman 1995; Saavedra, Earley, and Van Dyne 1993; Van de Ven, Delbecq, and Koenig 1976) As the tasks teams face become more novel and more complex, the need for frequent information exchange between participants increases because solutions are less familiar and there are a greater number of component tasks to be integrated. Going back to foundational work by J.D. Thompson, this is often described as high "task interdependence" (Thompson 1967). Therefore, when cross-functional teams face collective tasks with high

novelty and complexity, the degree of interaction between functional groups within teams is central to their effectiveness.

Ownership and Governance Rights as Structural Power

At the same time, teams operate in a broader organizational context that may impact their behavior. Though long recognized as relevant to team performance (Hackman 1987; Gladstein 1984), the organizational context of teams remains one of the least developed areas of this literature. Of what exists, scholars generally highlight the degree to which teams are empowered or constrained by the organizational environment (Edmondson 1999). Scholars have long suggested that the broader organization in which teams operate may provide them with access to technical knowledge and material resources to more effectively solve problems (Griffith, Sawyer, and Neale 2003; Hackman 1987). A different literature has emphasized the demographic diversity of the organization's broader workforce as a source of novel information and inter-personal conflict, which may be either productive or costly (Lovelace, Shapiro, and Weingart 2001; Denison, Hart, and Kahn 1996; Jehn, Northcraft, and Neale 1995). The emerging literature on multi-team systems highlights how organizations establish practices to coordinate resource distribution between teams (Mathieu et al. 2001) and ensure that teams align their behavior with the interests of the broader organization (Lanaj et al. 2014). Thus, this dimension of organizational context is thought to constrain team behavior.

While emphasizing different dimensions of organizational context, the common feature among these approaches is their treatment of organizational context as having a homogenous impact within teams. This may be due to an effort to distinguish between levels of analysis, only

characterizing dimensions of organizational context as characteristics that are commonly experienced by all groups and individuals at lower levels of analysis. Yet, it is wholly plausible that some functional groups within teams may receive greater resources or may face less constraint from the broader organization.

A conceptualization of organizational context that can account for variation in control over resources and rule setting entails a consideration of power, defined as control over resources needed or valued by others (Bunderson and Reagans 2010; Emerson 1962). It is important to emphasize that consideration of power not only highlights what resources are distributed but *who* controls distribution of and access to those resources. Consistent with the broader framework of this dissertation, in this chapter, I focus on two key dimensions of structural power: ownership and governance rights.

The Interaction of Cross-Functional Team Structure and Structural Power

In the limited existing literature, we find competing expectations about the relationship between structural power and the effective organization of project teams. In the organizational design literature, scholars have long argued that organizations engaged in uncertain and complex work benefit from the combination of distributed structural power and team-based work organization, as these two organizational design features are thought to facilitate rapid adaptation to changing problems and integration of knowledge at the task level (Burns and Stalker 1961). Harden, Blasi, and Kruse (2010) write about the interaction between ownership structures and high involvement work practices, understood as task structures that increase worker involvement in decision-making. They find evidence that distributed ownership provides workers the

incentive to share tacit knowledge, while high involvement work practices provide workers the opportunity to share tacit knowledge. While not referring specifically to ownership, Druskat and Pescosolido (2002) usefully highlight how the shared experience of ownership among team members not only encourages additional individual effort, but may generate expectations of aligned interests, further encouraging knowledge exchange. In sum, these papers suggest a complementarity between cross-functional interaction within teams and wider distributions of structural power, in which one enhances the beneficial effects of the other.

Conversely, some research suggests that wider distributions of structural power may undermine the benefits of interaction within teams. Several studies highlight how teams benefit from a minimum degree of role clarity for team members (Bresman and Zellmer-Bruhn 2012; Hollenbeck, Ilgen, Seko, Hedlund, Major, and Phillips 1995). Increased interactions among functional groups facilitates knowledge exchange, but also diminishes role clarity, as each team member is involved with, exposed to, and participating in the tasks of other team members. Distributions of structural power across functional groups may further diminish role clarity, in contrast to contexts where structural power is exclusively held by one functional group, thereby passing a tipping point where the costs of role blurring outweigh the benefits of information exchange. Using simulation modeling, some recent research on organizational design shows that, when engaged in uncertain tasks, organizational forms that balance moderate knowledge depth and breadth outperform organizational forms that prioritize either knowledge breadth or depth (Turner, Bettis, and Burton 2002). Counter to their expectation that diminished team hierarchy and organizational hierarchy would reinforce each other in undermining team performance, Bresman and Zellmer-Bruhn (2012) found a negative interaction between organizational and

team structure. In sum, these literatures emphasize the costs of information exchange and the importance of preserving knowledge heterogeneity. Together, they suggest that the combination of widely distributed structural power and higher interaction levels may lead to excessive role blurring and information exchange.

Thus, ultimately, the existing literature does not suggest a clear proposition to guide our expectations about the interaction between structural power, team task structures, and team performance. For this reason, in the following study, a multi-method analysis is particularly helpful. I first use quantitative analysis to specify a general statistical association between the phenomena of interest and, next, use qualitative data to theorize the mechanisms behind this finding.

3.2 Multi-Method Explanatory Research

To examine these proposed relationships, I pursue an explanatory multi-method analysis of project teams in competitor firms with contrasting distributions of structural power. In this section, I introduce the motivation for this particular research design and methodology.

An explanatory multi-method research design entails a preliminary quantitative analysis to narrow the scope of interest, followed by explication of the results through analysis of qualitative data (Creswell and Clark 2003). This design is particularly well suited for the demands of this study, as there are competing expectations and limited theorization of this phenomenon. The quantitative analysis helps to narrow the scope of analysis by specifying a distinct subset of concepts, operationalizing them in discrete variables, testing their associations on a large sample of observations, and identifying patterns of relationships within the data. In

turn, by analyzing qualitative data from the same sites where the quantitative data was collected, one is able to richly explicate the mechanisms behind the relationships identified in the statistical analysis. Furthermore, common in research on educational institutions, multi-method research is particularly well suited for exploration of multi-level relationships (Tashakkori and Teddlie 2003). Confidentiality concerns and the time required to gain approval make access to detailed administrative data on team-level behavior within a large number of distinct but comparable sites challenging. Therefore, a smaller number of purposively sampled organizational sites with access to detailed data is optimal. Such a sampling strategy allows access to rich quantitative data on team-level processes in varied contexts. However, the small number of sites prevents precise quantitative analysis of organization-level factors. In the case of this project, the distribution of structural power in the two firms is difficult to statistically disentangle from other relatively static characteristics of the two firms. Conversely, qualitative analysis offers a means to examine multi-level processes linking the organizational level to the team level, and disentangle the organization-level variable of interest from other organizational characteristics. Therefore, I use statistical analysis to demonstrate an interaction between static organization level variables and detailed team-level characteristics, but use analysis of qualitative data to specify the mechanisms with which the distribution of structural power, as a particular dimension of organizational context, shapes team dynamics.

The automation industry, in which Northern Cooperative and Southern Incorporated operate, serves as a useful context for an analysis of the relationship between distributions of structural power and cross-functional teams. Work is novel and complex, in that each system designed by these companies is unique to the request of the client, involves thousands of parts,

must meet high standards of production precision, and requires heterogeneous skills to design and build. Frequently automation companies engage in 'simultaneous engineering', in which they are tasked to design and build a production process for a product while the product is being designed. Finally, production occurs in cross-functional project teams, composed of changing combinations of engineers, machinists, assemblers, and electricians.

In this chapter, I rely on qualitative data collected while observing project teams and quantitative archival data from Northern Cooperative and Southern Incorporated. The qualitative data includes transcripts of meetings, field notes, and interview transcripts. The quantitative data includes weekly payroll data charting the number of hours and category of tasks each individual worked on each project. The archival data also provided information on the technological content of the projects and data with which to construct performance metrics. These data serve as the basis for the multi-method analysis that follows.

3.3 Quantitative Analysis: Testing the Interaction of Organizational Power Structure and Team Structure

In the first stage of analysis, to test the relationship between the macro-level distribution of structural power, team-based cross-functional interactions, and team performance, I analyze data from the two companies' administrative and human resource archives. This is consistent with prior research on cross-functional project teams in professional services firms (Reagans, McEvily, and Zuckerman 2004). Both firms maintain detailed archival data on labor allocations, technological inputs, and project performance. To help track project profitability, workers document on which projects they work, how many hours they allocate, and in what occupational category their work falls. This data is aggregated weekly and entered into the payroll system,

which is then used to calculate pay and estimate labor costs on projects. This data allows me to construct various measures of team composition and team process for each project. In turn, I am able to merge these data with information about project characteristics, technological novelty, and performance outcomes.

As mentioned in the earlier section, this research design and case selection offer unique benefits but also pose certain constraints. While analysis of project-based work in two proximate, similarly sized, similarly aged direct competitors allows collection of rich qualitative and quantitative data on multi-level relationships, the reliance on two firms poses key limitations. The inability to clearly disentangle the distribution of structural power from other organization-level variables was discussed earlier, and motivates the qualitative analysis in the second section. The second empirical challenge of this research design is the possibility that, though the companies are proximally located direct competitors, they are nonetheless engaged in distinct and incomparable portfolios of projects. In other words, any differential effects of team structure in the two firms may be attributable to differences in the content of projects, and not due to differences in the distribution of structural power. To address this issue, I use a coarsened exact matching data pre-processing technique (Blackwell, Iacus, King, and Porro 2009) to select a matched sample of projects with which to conduct the quantitative analysis. In the following section, I explain the sampling strategy I use to reduce unobserved bias from the two companies, describe how I operationalize key variables, and present the results of the statistical analysis.

Data Pre-processing and Sampling Strategy

The datasets required some pre-processing, both to address missing data and to ensure the comparability of the two datasets. The two original company databases include projects that occurred between 1999 and 2013, with 956 projects from Southern Incorporated and 605 projects from Northern Cooperative.

Because of unavailable payroll data, I excluded projects from Southern Incorporated prior to 2004, leaving 821 projects from that company. Also, in the archives for Southern Incorporated, hourly payroll data was also missing for one of the engineer owners. To model his participation in the project, I imputed his weekly hourly contribution to each project and tested variation in my imputation procedure to assess sensitivity (Graham 2009). I assumed that he worked a total of 45 hours per week and then distributed those hours across all ongoing projects. I only included ongoing projects in their first half of completion, as this is the stage when engineers are more likely to work, and then distributed the hours in proportion to the proportion of total ongoing work that a project constituted. When I varied the total number of weekly hours or the allocation equation, this did not change the results.

In turn, much of the work in the two companies entails updates to completed projects, warranty-related tasks, repairs, retrofits, and short engineering consultations. As these tasks involve familiar technologies, require small amounts of labor, often only involve a single occupation, and often only involve a single employee's time, they are inappropriate objects of analysis for this study. To identify these projects, I used the total number of labor hours as a proxy. In this analysis, I only include projects that entail 1,200 hours of labor or more. 1,200 hours of labor would allow a team of four workers to work twenty hours per week on a project for nearly four months, which was consistent with the project durations I observed during

fieldwork. This leaves a total of 223 unique projects, which constitutes 15% of total projects. When I conducted the analysis on the larger sample of projects, I found consistent coefficient signs but non-significant results. The cutoff point, at which results became non-significant is under 1000 hours (n=254). This is consistent with the idea that smaller projects are qualitatively different tasks where the same team dynamics are not relevant. In the analysis, I report results above both 1000 and 1200 hours.

From this pool of projects, I use a matching technique to ensure the comparability of the observations from the two companies. The coarsened and exact matching (CEM) technique uses a set of selected control variables, which would impact the variables of interest and their relationship, coarsens them into categorical variables, and then selects pairs of observations from the two samples such that the distribution along these control variables is identical in the two samples (Blackwell, Iacus, King, and Porro 2009; Malter 2014). The matching process ensures that the mean and variance along all relevant control variables, except the variables of interest, are statistically indistinguishable between the two firms.

With this matching technique, the challenge is to strike a balance between controlling for enough characteristics to ensure internal validity, while not matching on so many variables that the sample size is overly constrained (Azoulay, Stuart, and Wang 2013). This chapter is centrally concerned with the relationship between the degree of cross-functional interaction within teams and their performance. Thus, I match on variables that may influence (1) the degree of cross-functional interaction, (2) project performance, and (3) the relationship between these two. As discussed earlier, the benefits of cross-functional interaction within teams are thought to be contingent on the novelty and complexity of tasks (Langfred 2005; Thompson 1967). Therefore,

I match pairs of projects from the two firms on the technological novelty of the project and the complexity of the project tasks. Below, I explain how these measures are operationalized.

	N	Novelty	Complexity
All obs. over 1,200 hrs	223	3.69 (0.72)	7.09 (0.97)
All obs. over 1,200 hrs, CEM	119	3.26 (0.36)	7.04 (0.66)
Northern over 1,200 hours Northern	156	3.96 (0.66)	7.31 (0.84)
Southern over 1,200 hours Southern	67	3.08 (0.38)	6.60 (1.06)
Northern over 1,200 hours, CEM	66	3.43 (0.29)	7.18 (0.61)
Southern over 1,200 hours, CEM	53	3.06 (0.33)	6.87 (0.68)

Table 3.1 – Sample Descriptives for Matched and Unmatched Samples

Table 3.1, above, shows the mean and standard deviation values for the different matched and non-matched sub-samples. That table shows that the sample mean complexity and novelty of the matched and non-matched samples are statistically indistinguishable, but that those sample means are statistically distinct in the non-matched samples from Northern Cooperative and Southern Incorporated. This suggests that the matched sample is representative of the non-matched sample as a whole, but that the two company samples are not comparable, making a matching strategy appropriate. In turn, in the matched samples, the sub-samples from the two companies are statistically indistinguishable. A final consequence of this matching process is that the sample means of the cross-functional interaction measure become statistically indistinguishable between the samples from the two companies. Figure 3.1 plots the sample means and confidence intervals for the degree of cross-functional interaction in the two company samples.

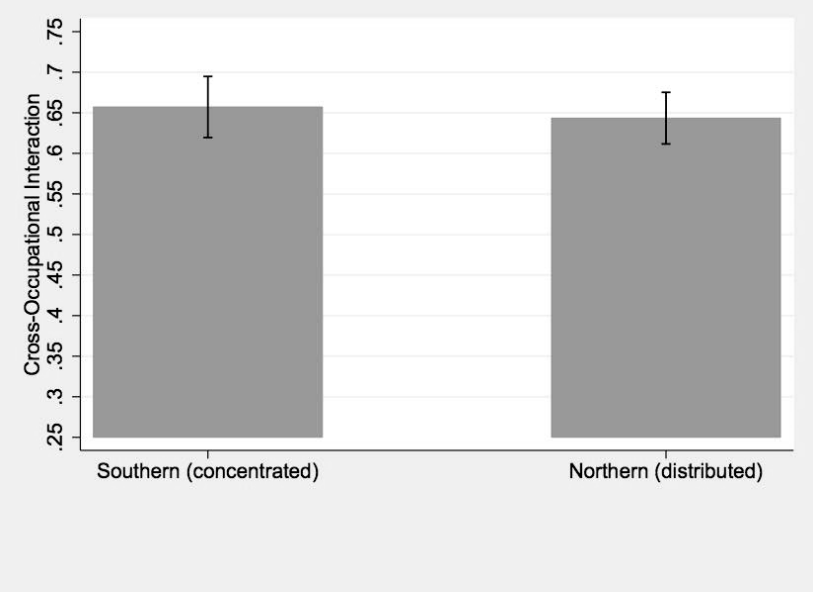


Figure 3.1 – Sample Mean and Confidence Intervals for Cross-Functional Interaction

Measuring Cross-Functional Interaction

Because the degree of cross-functional interaction within teams is a central concept in this analysis, its effective measurement is particularly important. Prior studies of cross-functional interaction and task interdependence rely on survey-based measures. Researchers have asked team members how much they rely on other team members for information, how involved they are in different stages of projects, or how much they rely on others to complete their tasks (Langfred 2005). However, surveys necessarily capture perceptions, which, though important, often vary from lived behavior. This distinction between perception and behavior has been highlighted in discussions of measuring interdependence (Wageman 2006). Furthermore, such measures are susceptible to social desirability bias, measurement error in question wording, or potential error resulting from only surveying a subsample of team members.

As a result, in this chapter, I use archival payroll data to measure cross-functional interaction as labor hours allocated on the same day, in the same geographic location, on the same project by individuals from different occupational groups (see also Saveedra, Earley, and Van Dyne 1993). Figure 3.2 illustrates how labor hours can be used to measure cross-functional interaction. It offers two examples of projects and the allocation of human resources over the course of the project. The x axis indicates the number of weeks since the start of the project. The y axis indicates the aggregate number of hours worked by week. The light grey sections indicate mechanical and electrical assemblers. The dark grey sections indicate engineers. The light grey and white sections indicate machinist labor hours. These two examples show how this data can be used to differentiate between different degrees of cross-functional interaction (Bernhardt-Walther and Young-Hyman 2013). Projects with less overlap between occupational groups can be understood as engaging in less cross-functional interaction, while projects with greater overlap between occupations can be understood as engaging in greater cross-functional interaction. Specifically, I measure cross-functional interaction as the proportion of total weeks of a project where individuals from both blue and white collar occupations contributed labor hours. Blue collar occupations include machinists and assemblers, and white collar occupations include all engineers.

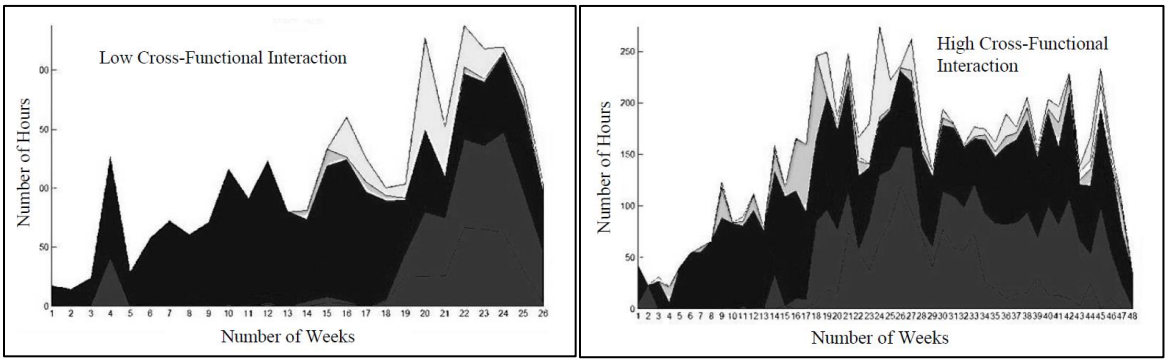


Figure 3.2: Illustrations of Variation in Cross-Functional Interaction

A key concern is that this measure only captures workers from different occupational groups working simultaneously on a project but not necessarily interacting. However, the measure's construct validity is apparent when one considers particular characteristics of the organizations studied. First, each firm operates in a single small facility and has fewer than 60 employees. This precludes the possibility that two workers could work simultaneously in different locations on the same project. Second, projects follow a common sequence in which engineering tasks necessarily precede assembly tasks. As a result, if an engineer is allocating hours to a project during the assembly phase, they are necessarily allocating time towards tasks primarily related to assembly, and vice versa. Furthermore, the sample of projects selected includes only larger unique systems, in which the specific content of tasks is unknown in advance. As a result, the modularity of tasks is low, meaning that workers cannot complete tasks without information from other team members about the particular demands of the wider project. Lastly, to confirm face validity, this measure was presented to and received approval from managers at the two companies.

Other Measurements: Novelty, Complexity, Structural Power Distribution, and Project Performance

Novelty and Complexity: The information processing costs of projects, which impact the effects of cross-functional interaction, are frequently attributed to two dimensions: the novelty of the technology involved and the complexity of the task (Clark and Fujimoto 1991; Griffin 1997). These were the two variables with which the two samples were matched in the coarsened exact matching process.

To measure technological novelty, for each project, I calculated the mean value of the number of previous projects in which purchased commercial technologies on a project had been used. At the two companies, each project integrates thousands of externally purchased technologies, which were listed on commercial parts inventory lists. Due to within-company inconsistencies in entry of product descriptions, I used the OpenRefine data cleaning tool and a fingerprint clustering method to match descriptions. This approach increases identification of common entries by transforming characters to lowercase representation, removing punctuation, and identifying word tokens in different sequences. After merging these product lists for each company, along with project identifiers and start dates, I was able to calculate the number of previous projects in which any commercial technology had been used. Finally, I took the mean value for all parts in the project. The lower this number, the greater the novelty.

As a proxy for complexity, I use the total number of electrical engineering hours on a project. While some measures of complexity focus exclusively on the number of components to be integrated, Tatikonda and Rosenthal (2000) point out how that measure does not account for variation in the difficulty in combining components. A project may have a large quantity of components, but these components may be similar or they may be more modular, such that they

do not all need to be integrated with each other. Because the electrical or process engineer's primary task on a production system team is to integrate the electrical circuitry of the components that constitute the full system, the number of electrical engineering hours provides a measure of both the number of components to be integrated and the difficulty of integration. In the regression itself, as we expect a multiplicative effect of complexity and novelty, I multiply the novelty of the project's commercial technology and the number of engineering hours. First, I transformed the novelty measure so that it increases in the same direction as the number of engineering hours. Next, I use the logged version of each measure, as the two measures are highly right skewed. Finally, I multiply the two measures to generate an aggregate measure.

Ownership and Governance Distribution: I use a binary dummy variable (Northern Cooperative = 1) to proxy for the two companies and their ownership and governance distributions. A measure of the proportion of owners in the workforce or across occupations may more precisely capture the phenomenon of interest, but these measures are bi-modally distributed in the sample and highly correlated with other unobserved differences between the companies. Therefore, as discussed above, the quantitative analysis does not seek to demonstrate empirically what particular organization-level distinction between the two companies affects the impact of team structure on performance. That is the goal of the qualitative analysis that follows.

Team Labor Productivity: As an outcome measure, I use team labor productivity, measured as the logged value of the total revenue earned from the project over the total labor hours. This measure is particularly useful because it is a success metric used by the companies. When a company signs a contract to build a manufacturing system, the price is fixed and the automation company seeks to complete the project to the needs of the client as efficiently as

possible. This entails minimizing the internal resources allocated, while still effectively meeting the customer's requirements. As labor is a key resource allocated towards projects and one that can be managed to improve performance, this is a useful efficiency metric. The two companies both used a similar measure in their weekly oversight meetings, tracking the percent of initially estimated labor hours that had been completed as a metric of ongoing project team performance. Because I do not have the initial estimation of labor hours for each project, I use total revenue as a proxy and control for worker wage rates. Other studies of project and new product development teams (Reagans, McEvily, and Zuckerman 2003; Tatikonda and Rosenthal 2000) have used similar measures of total labor hours relative to project size. While profit margin was considered as additional performance metric or possible dimension of an aggregate performance index, it was found to be negatively correlated with the time to completion measure. Profit margin may be a key goal for more routine work, but less important for novel projects and is likely to have a less significant association with client retention (Griffin and Page 1996)

Controls: I also include a number of control variables at both the team and macro-organizational levels. One alternative explanation of a differential effect of cross-functional interaction between the two companies may be a difference in the experience or skill level of the workers. More experienced workers may benefit more from interactions with other co-workers or may require fewer interactions to accomplish their tasks effectively. As a proxy for skill, therefore, I include a control for median wage of the project team members. A second alternative explanation of differential effects of cross-functional interaction is that the composition of team membership varies between the two companies. For example, in a team with a highly uneven balance of labor allocations between occupations, workers from one occupational group will

have fewer team members from within that group and may need to rely more on other occupational groups to gain information. Therefore, I include a control for the proportion of total labor hours on a project conducted by engineers. Lastly, I control for the proportion of the total workforce consisting of machinists and assemblers at the start of each project.

Results

The analysis involves a series of ordinary least squares regressions with varying adjustments to account for potential sources of bias in the estimation procedure. In all of the regressions, to account non-identically distributed residuals, I use Huber-White robust standard errors. All results are presented in Table 3.2. Regression 1 presents the main effects of the company dummy and cross-functional interaction measure, without interacting the two variables. The coefficients on both variables are non-significant. While counter to the expectation that distributed formal organizational power and greater cross-functional interaction improve project performance in the context of knowledge-intensive work, this finding also suggests that the effects of the two phenomena are contingent on each other. That hypothesis is substantiated in regression 2, which interacts the company dummy variable and the degree of cross-functional interaction. The main effect of the company-level variable becomes positive and significant (1.251, $p<.01$) but, more importantly, the interaction term is negative and significant (-1.758, $p<.01$). This suggests that the positive effects of widely distributed structural power are offset at higher levels of cross-functional interaction.

In regressions 3 through 7, I examine a number of alternative models to test robustness. Recognizing that observations from each of the companies may be non-independent, in

Regression 3, I interact the company dummy variable with each of the covariates. This allows each coefficient to vary independently for observations from each company. The results remain consistent with Regression 2, with a larger effect size and relatively smaller standard error on the interaction term (-2.197, $p<.001$). In regression 4, I estimate the fully interacted model with the logged value of total revenue as the dependent variable and control for the total number of labor hours. Here, the results remain consistent. In regression 5, I estimate the same fully interacted model with a matched sample of observations from all projects that entail over 1,000 hours. As mentioned earlier, this is the point at which coefficients become non-significant, but at this point, the interaction term remains negative and significant (-1.215, $p<.01$).

In regressions 6 and 7, I remove the company dummy and organization-level controls, and estimate the effect of cross-functional interaction in the separate samples of observations from the two companies. This robustness check is particularly important because it addresses the concern that, despite the prior matching effort, the observations in the pooled sample are not independent. If that were the case, it may yield standard errors that are smaller than they should be. This issue is avoided, however, when the samples from the two companies are analyzed separately. Regression 6 shows that cross-functional interaction is negatively and significantly associated with efficient project completion in the firm with widely distributed structural power (-0.730, $p<.05$). Regression 7 shows that cross-functional interaction is positively and significantly associated with efficient project completion in the firm with concentrated structural power (1.392, $p<.01$).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Main Effects	Main and Interaction Effects	Fully Interacted Main and Interaction Effects	Fully Interacted Main and Interaction Effects	Fully Interacted Main and Interaction Effects (expanded sample)	Main Effects (Northern sample)	Main Effects (Southern sample)
Dependent Variable	Team Labor Prod. (log)	Team Labor Prod. (log)	Team Labor Prod. (log)	Total Revenue	Team Labor Prod. (log)	Team Labor Prod. (log)	Team Labor Prod. (log)
Novelty and Complexity	-0.394	-0.439	-0.804	-0.498	0.0363	-0.601	-0.259
	(-0.726)	(-0.62)	(-0.623)	(0.588)	(-0.236)	(-0.988)	(-0.533)
Total Labor Hours (log)				1.289***			
				(0.577)			
Cross-Functional Interaction	0.15	1.365**	1.392**	1.352**	0.404	-0.730*	1.392**
	(-0.366)	(-0.472)	(-0.451)	(0.438)	(-0.281)	(-0.364)	(-0.422)
Company (0 - Southern, 1 – Northern)	0.14	1.251**	-6.370*	-3.841	0.732		
	(-0.11)	(-0.398)	(-3.064)	(4.244)	(-2.301)		
Company x Cross-Functional Interaction		-1.758**	-2.197***	-2.150***	-1.215**		
		(-0.593)	(-0.611)	(0.592)	(-0.448)		
Company x Novelty and Complexity			0.508	-0.0580	-0.284		
			(-0.3)	(1.159)	(0.210)		
Company x Total Labor Hours (log)				0.488			
				(1.184)			
Controls	YES	YES	YES	YES	YES	YES	YES
N	119	119	119	119	153	66	53
r2	0.344	0.388	0.49	0.788	0.484	0.377	0.338
Standard errors in parentheses							
* p<0.05 ** p<0.01 *** p<0.001							

Table 3.2 – Models Testing Interaction of Structural Power, Cross-Functional Interaction, and Team Labor Productivity

To visually demonstrate the interaction between the organizational context and the degree of cross-functional interaction within teams, I plot simple slopes for the two companies in Figure 3.3. I plot the predicted team labor productivity values and confidence intervals ($p<.05$) for levels of cross-functional interaction two standard deviations above and below the sample mean levels of cross-functional interaction. The chart shows that project teams in the worker cooperative clearly outperform those in the conventional firm when levels of cross-functional interaction are low. Conversely, as levels of cross-functional interaction increase, the benefits of distributed organizational power diminish and the performance outcomes become indistinguishable. At higher levels, teams in the context of concentrated structural power have higher mean performance levels, though not statistically distinct from those in the firm with widely distributed structural power.

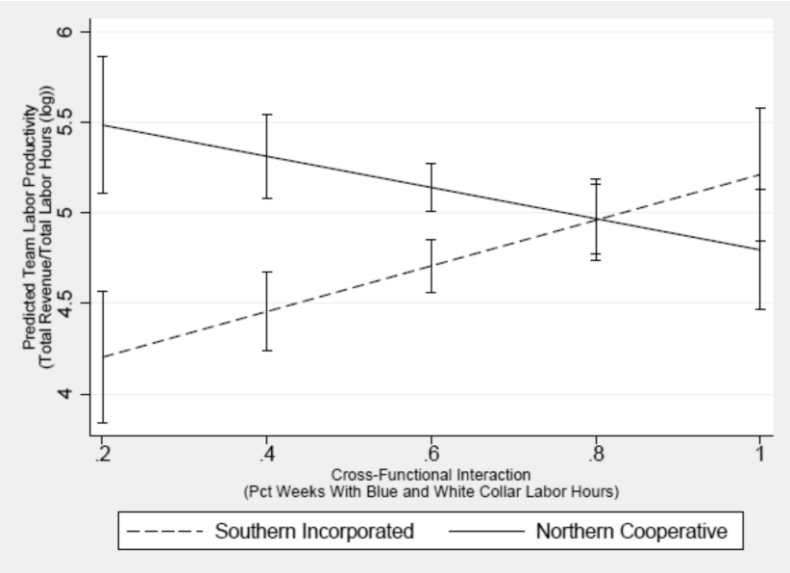


Figure 3.3 – Predicted Team Labor Productivity and 95% Confidence Intervals at Different Levels of Cross-Functional Interaction, by Firm

In sum, this analysis helped to identify an empirically robust interaction between the distribution of structural power, cross-functional interaction within teams, and project performance. The prior literature review anticipated that, independently, both higher levels of cross-functional interaction and widely distributed structural power should be associated with improved team performance. Conversely, prior literature offered conflicting expectations about the interaction of these variables. The findings in this analysis do not find a consistent effect of either measure, but instead suggest that the benefits of increased cross-functional interaction within teams and the distribution of structural power are contingent on each other. In the context of widely distributed structural power, increased cross-functional interaction reduces team performance, while in the context of concentrated structural power, increased cross-functional interaction improves team performance.

However, given that this data comes from two firms where other unobserved distinctions may be highly correlated with the distribution of structural power, the quantitative analysis alone cannot distinguish the impact of structural power from other organization-level characteristics that may alter the consequences of cross-functional interaction. Furthermore, the quantitative analysis gives little indication of the mechanisms that mediate the relationship the distribution of structural power and cross-functional interaction. Therefore, in the following section, I use ethnographic evidence from these two firms to reveal mechanisms linking the distribution of structural power, in particular, to the operation of cross-functional teams.

3.4 How Structural Power Shapes Project Team Behavior and Outcomes

The following analysis relies on *in situ* accounts of day-to-day practices in the two firms to unpack the interaction between organizational context and team structure, and show how the distribution of structural power, in particular, shapes the experience of team members. The prior quantitative analysis was conducted after beginning fieldwork at the second firm and my data collection was informed by those results. Because I both analyzed data based on expectations from the quantitative analysis and also openly interpreted the qualitative data, this mode of qualitative research combined induction and deduction, which some have described as abduction (Tavory and Timmermans 2014). Several overarching questions guided my data collection. How did occupations interact within teams? How did occupations interact outside of teams? Lastly, how were teams linked to the wider organization? Following an extended case method approach (Burawoy 1998), as I gathered and read through the qualitative data, I also read literatures on cross-functional project teams and their organizational context. As I developed narratives of team-based work at the two companies, I explored the points of agreement and divergence with the aforementioned literatures and my quantitative findings, and sought out potentially disconfirming data to rule out alternative explanations.

A central goal of this section is to disentangle the distribution of structural power from other organization-level distinctions between the two companies. A key alternative organizational characteristic, which may have a similar moderating effect on the relationship between cross-functional interaction and team performance is the presence of an empowering organizational culture (Spreitzer 2008). Organizational culture has been defined as a "pattern of shared, basic, taken-for-granted assumptions" (Schein 2010; 32) that emerge from particular prior shared experiences. In particular, some have suggested that some organizations develop a

set of norms that encourage workers to "act like owners" (Spreitzer 2007; 54) and foster "psychological ownership" (Pierce and Jusilla 2011). This set of shared norms may encourage workers, regardless of their formal empowerment through the distribution of residual claimancy and governance rights, to behave differently. Therefore, a key challenge of this qualitative analysis was to interrogate the possibility that differences in norms and values distinguish the companies.

Ultimately, the qualitative analysis revealed three mechanisms through which the distribution of structural power shapes the performance of cross-functional project teams. While there are also cultural differences between the companies, these norms and standards are derivative of structural power. First, I show that the distribution of structural power modifies occupational status distinctions, which impacts the time required to resolve conflict through cross-functional interaction within teams. Second, I show that the distribution of structural power shapes decisions about access to knowledge exchange processes outside teams. In turn, distribution of this access across occupational groups diminishes the benefits of cross-functional information exchange within teams. Thirdly, I show how choices about the distribution of autonomy-enhancing knowledge management technology are shaped by the distribution of structural power, which shapes the need for cross-functional interactions to exchange information within teams. In the appendix, I include additional evidence from field notes, interview transcripts, and meeting transcripts that support these three themes, allowing the reader to analyze the plausibility of the mechanisms I propose.

3.4.1 Status Hierarchy and the Cost of Conflict Resolution

As suggested in the earlier literature review, some studies of teams and their organizational context argue that diversity and conflict in the broader organizational context may impact team performance by altering the degree of conflict within teams (Lovelace, Shapiro, and Weingart 2001; Denison, Hart, and Kahn 1996; Jehn, Northcraft, and Neale 1995). To date, however, attention to diversity within the broader context has generally excluded consideration of the degree of status hierarchy across these groups. Similar to Joshi's (2014) finding that greater status equity in the broader organizational context shaped the acceptance of expertise by different demographic groups within teams, in the sites studied here, the distribution of structural power across occupational groups influenced how different occupational groups received each other's views and opinions. In turn, this impacted the effective mode of conflict resolution within teams. In both organizations, the workforce was split between mechanical engineers, electrical engineers, electricians, mechanical assemblers, and administrative workers. Furthermore, in both organizations, most engineers held bachelor's degrees while assemblers and electricians had associates degrees. The key distinction, however, was in the status differences between these occupations.

At Southern Incorporated, where owners were exclusively engineers, that occupational group held distinctly higher status in the organization, meaning that their views and behaviors were received with greater esteem. One young worker described being "demoted" from electrical engineer to electrical assembler, even though his pay did not change. Another young worker was described as "being given a chance", when he was moved from assembly work on the shop floor to a draftsman position in the engineering office, though his pay also did not change.

Most striking, however, was the way that this manifested within project teams. In short, engineers were not questioned to the same degree as assemblers and electricians. One day, as I was standing out on the shop floor with two assemblers named Michael and Chris[1], a project manager engineer named Dave walked up. The following comes from my field notes:

> "Dave walks over. Not clear why. "How am I doing on hours?" Michael asks Dave, as if he has been accused of something. "You're fine" Dave replies. Michael is aware that Dave is tracking the hours on the project. Dave explains [to the other workers] that he's looking at the ratio between weeks left and number of hours used. He says that assembly is pretty on target, but that actually design was over on hours. "But I can only yell at *you* guys." Dave jokes. "If we're over, it's his fault" Michael says, sarcastically, as he points at Chris. "No," Chris replies, "we're working as a team, like we're supposed to be, right?"

In this quote, Dave clearly expresses his understanding of the status difference between engineers and assemblers at Southern Incorporated. Though a project manager, he does not feel that he has the status to yell at other engineers, though he feels that it is appropriate to yell at assemblers.

In turn, as this scene demonstrated, status disparity legitimized cross-functional interactions as a monitoring and information gathering mechanism. When there were disagreements or miscommunications about responsibilities in teams, for engineers, the costs of confronting a lower status team member were relatively low. In other instances, I sat out on the shop floor with assemblers as engineers would pass by their work stations multiple times in the course of the day, "checking in" on their progress. This was a sufficiently regular occurrence that engineers would also use project team meetings to elicit commitments from lower status workers, in an effort to enhance their motivation. An assembler described his inclusion in an

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[1] To preserve anonymity, I substitute pseudonyms for workers' actual names.

early planning meeting as intended to produce "a number to hold us accountable to". Thus, as an assembler described it, engineers were "constantly" initiating check-ins at different stages in projects, as part of an effort to improve project outcomes. This mode of behavior was a taken-for-granted routine of the production process at Southern Incorporated, and therefore accepted by those who worked there, reducing the costs of resolving conflict through cross-functional interactions within teams.

At Northern Cooperative, status disparities were diminished by the distribution of ownership and governance across occupations, leading to resistance against this type of behavior. When one worker owner confronted another team member who he felt was not contributing sufficiently to a project, other workers in the organization accused him of "trying to be a hero" and told him that "you're not their boss". In the most literal sense, this was the case, as ownership was distributed across occupational groups. One engineer described how, when he was unhappy with an assembler's performance, he had to first lobby support from other owners informally and then bring the issue up to the board of directors. In other words, conflict resolution between occupations required more time in the context of widely distributed structural power.

As a result, engineers expressed greater hesitation to use interactions within the project as a means to coordinate between occupations. There were strong norms against status-based oversight. One afternoon, while I sat in a project meeting, I listened to a non-owner engineer explain how he was choosing not to engage in the exact type of interaction that was previously described at Southern Incorporated, based on prior experience and his perception of his status position. He articulated how he planned to pre-emptively adjust his designs to avoid costly

conflict with owner assemblers on the team. As documented in my transcription of an audio recording from the meeting, the engineer explained to another engineer:

> "So, due to building many machine centers and working with many assemblers who have whined incessantly, you don't want to set this up so that the clearance is line to line. You want it to tilt a little sideways, depending on how you set up the tolerance…. I, unfortunately, have to deal with the ones who come over and spend over half an hour complaining to me about why does he have to go back to the machine every single time."

This quote from the engineer illuminates how diminished occupational status differences generate the potential for conflict, which can be alternatively resolved without direct interaction. Unlike in the case of Southern Assembly, where the engineer's visit to the shop floor is received as legitimate behavior and the assembler seeks to adjust their behavior, the legitimacy of the engineer's initiated communication is questioned. The engineer at Northern Cooperative sought to anticipate the interests of the assembler, in order to minimize conflict.

In sum, occupational diversity on a team created conflict and required coordination in both organizations, but the cost of conflict resolution was moderated by the distribution of structural power. At Northern Cooperative, where structural power is distributed across occupations, the status hierarchy is not clearly demarcated along occupational lines and conflict is costly to resolve. Furthermore, in the worker cooperative, governance processes provide a setting for different occupations to resolve conflict, while different occupations are not represented in formal governance processes at the traditional firm. In turn, individuals from traditionally higher status occupations both anticipate and experience greater resistance when they try to exert authority over traditionally lower status occupations. Ultimately, the result is that cross-functional interactions within teams are less productive in the worker cooperative and more productive in the conventional firm.

3.4.2 Knowledge Exchange Processes Outside of the Team

If diminished occupational status hierarchy increases the marginal cost of information gathering through cross-functional interaction at Northern Cooperative, how do different team members gather information about project needs? This question points to a second mechanism that links structural power to the operation of cross-functional teams: participation in knowledge exchange processes outside of teams.

As mentioned earlier, the multi-team systems literature highlights how the surrounding organization can facilitate knowledge exchange between teams (Lanaj et al. 2013; Mathieu et al. 2001). This was the case at both Northern Cooperative and Southern Incorporated. Both companies used weekly meetings to share information about ongoing projects, exchange advice, and flag potential resource conflicts. However, the multi-team systems literature does not consider how participation in these coordination processes is distributed within teams.

At Southern Incorporated, over coffee each Monday morning, the owners and several non-owner engineers met in the lunchroom and would walk down the list of ongoing projects, discussing the status of each, sharing potential problems and conflicts. Those who were not owners or project managers were kept out of the meetings. During one of these meetings, when one of the non-owner engineers suggested that a wider set of workers participate in this meeting, the majority owner Richard explained his reasoning in terms of the difference of interests between owners and non-owners:

> "I said all along I want open book, I want people to see what's important to them, but not what's important to me… I mean, I want them to understand what's important to me, but they need to understand, everyone needs to have a number that they're shooting for. We need to give them that information, that needs to be

> the open book stuff that they see so they have something to shoot for, they know if they're succeeding or not. That's what we've got to get to. So I'm on board with what you're saying, I'm just not sure I want [company budget information] on one big chart that's floating around because I don't want to confuse people. I don't want them going, "Shit, we're way ahead. I don't have to work so hard."

Richard, the majority owner, explains that he limits access to the oversight meeting because this would disseminate information that could be used against the interests of ownership. As the multi-team systems literature suggests, the oversight meeting is intended to align project teams behavior with broader organizational goals. However, beyond that literature, this scene illustrates how workers who participate in those meetings have more information with which to exercise autonomy over their tasks, while those kept out of the meeting are more constrained.

By consequence, assemblers and machinists had to interact more with engineers who sat in those meetings, both to gather information and to ensure that their needs were addressed within them. Assemblers expressed how they felt compelled to regularly share information with engineers about changes to the project, in order to ensure that the information reached the oversight meetings. In one instance, I followed an assembler as he searched for an engineer owner on a Friday afternoon, seeking to find the engineer so that he could bring new information on their ongoing project into the Monday oversight meeting.

The picture at Northern Cooperative looked markedly different. Once per week, for the final 20 to 30 minutes of a lunch provided by the company, the workers ran through each ongoing project. All workers from the company attended the meeting. The budgetary numbers were projected on a screen and workers asked questions of other teams concerning schedules, resource demands, and problems. At times, team members would ask questions of other

individuals, to clarify potential issues on their own projects. Often, however, individuals asked few questions, simply gathering information on the status of other projects.

One afternoon, while attending the weekly lunch, I was struck by the number of individuals other than project managers who had given updates on projects. After the meeting was over, I pulled an engineer aside and asked him why this was occurring. In my field notes, I described the conversation:

> "I asked Sheldon why a person who isn't the project manager would report on a project at the lunch meeting. He explained that when a project is big enough or when it has moved to a different stage of completion, that the person who is most informed about the project at the point where it is, is likely to report on it. He went on to explain that when a project is bigger or a project manager is managing multiple projects simultaneously, that he may not have the best understanding of the project at the time."

As a result, project team members reported gathering information about their projects through oversight meetings. In one instance, I sat with a mechanical assembler on his first day of involvement in a project and he revealed that he had been "tracking" the project through the engineering stage during weekly oversight meetings. As a result, when his work on the project began, he had a general familiarity with the project. In describing how he understood the systems he was helping to build, a machinist explained that he had a "general idea of what projects are about" because he heard about them in the weekly meetings.

In sum, at Northern Cooperative and Southern Incorporated, the distribution of ownership and governance rights shaped who participated in multi-team oversight meetings, and ultimately the benefits of cross-functional interactions within teams. At Southern Incorporated, a smaller subset of owners, managers, and engineers participated in the coordination meeting because these were the groups whose interests were perceived to be aligned with those of ownership. At

Northern Cooperative, all groups were assumed to have interests aligned with those of the organization and, therefore, concerns about interest alignment had no impact on participation in these oversight meetings. In turn, this impacted the optimal structure of team processes. Teams at Southern Incorporated allocated more time towards cross-functional information sharing, in order to disseminate knowledge gathered from the central coordination meetings, while teams at Northern Cooperative could operate effectively with less frequent cross-functional interaction.

3.4.3 Autonomy Through Knowledge Management Technology

Distribution of access to knowledge management technology constitutes the third mechanism explaining how the distribution of organizational power altered the marginal benefits of cross-functional interactions within teams. As mentioned earlier, scholars studying teams have long recognized how organizations provide teams with access to wider bases of knowledge and technical information with which to solve problems, but they have rarely considered how that access is distributed within teams (Griffith, Sawyer, and Neale 2003; Hackman 1987). In both companies, workers had access to knowledge management technology to improve their understanding of tasks. Libraries of technical drawings for current and past projects constituted the main source of technical information with which workers could adjust their strategies. Furthermore, on current projects, even if a worker's role was limited to a particular sub-section of a larger system, access to the technical drawings allowed workers to understand how their particular task fit into the broader project.

Yet, between the two companies, access to this information varied across occupations. At both Northern Cooperative and Southern Incorporated, engineers had access to the three-

dimensional drawings of current and past projects through their desktop computer workstations. However, while assemblers and machinists at Northern Cooperative also had access to these digital libraries, this access was considered but rejected by the ownership at Southern Incorporated.

Assemblers at Northern Cooperative used laptops on rolling caddies and, through the internal computer network, they could view all of the three dimensional drawings for current and past projects. These were 3 dimensional drawings, so they could rotate the images and look at the full assemblies from different perspectives. They could also look at drawings of similar sub-assemblies for other systems. By contrast, the assemblers at Southern Incorporated were given packets of 3 dimensional printouts of the subassemblies and, sometimes, the stations for which they were responsible. These were drawings that had been printed from 3 dimensional renderings created by the engineers. They could also access drawings for other systems, but this required them to go into the engineering office and request assistance to search through engineering files. While assemblers and machinists in both companies, therefore, had access to the technical archives, it was only the assemblers and machinists at Northern Cooperative who could access them autonomously.

Because the assemblers and machinists at Northern Cooperative had access to the digital drawings, they had more information with which to critique the logic behind these drawings, pointing out areas where a design was not optimal. They could even alter the drawings and, on several occasions, I watched assemblers correct mistakes that engineers had made without informing them. Access to this software blurred the lines between conception and execution roles (Braverman 1974), but it allowed this blurring to occur with little face-to-face interaction.

Alternatively, at Southern Incorporated, the assemblers were encouraged to inform the engineers when they identified a mistake or assembled the machine in a manner that diverged from the drawings. Inconsistencies between the final machine construction and the drawings were a substantial source of inefficiency, as they prevented teams from drawing on these lessons for future projects. Ensuring that drawings were updated was listed as a priority in annual organizational reviews, and this required increased cross-functional interaction within teams. Therefore, conception and execution was also blurred at Southern Incorporated, but could only occur through interactions between occupations.

The link to the distribution of structural power was revealed in decisions about distributing access to this technology. Access to the technology was literally distributed along the lines of ownership. One of the assemblers at Northern Cooperative explained to me how he had convinced others in the company to purchase laptop stations for each of the assemblers. In my field notes, I wrote:

> "Jeff explained that several years ago, there were only 4 computers for 7 assemblers. It was always the [owner] members who got the computers, which he said he found "unfair". They had their names written on them, so it was several workers fighting to work on the computers. Jeff says that for two years straight, he complained about not having enough computers for the assemblers. After two years, the company bought enough computers so that each assembler has one."

This story of distributing technology, first to the owners, but then to the non-owners illustrates how decisions about disseminating technology were shaped by the distribution of structural power. Furthermore, Jeff appealed to the principle of equity across owners and non-owners in convincing the company to invest in this technology. Thus, the distribution of structural power first established the boundary of access to technology, but then legitimized an argument based on a logic of equity.

By contrast, at Southern Incorporated, neither an appeal to equity nor an appeal to productivity widened the distribution of the technology. The company resisted investing in access to 3D drawing software for the assemblers, despite multiple suggestions. In an interview with Carl, an assembler, I asked him about the reasons behind this. He explained:

> "I think we brought it up in one of those how do we save time meetings, I was like oh if there's laptops out there we don't have to walk to the office, ask a question, if the engineer's even available, ask a question have them pull up the print look at it try to remember what he did… And I was like that would be such a time-saver and they were just kind of like 'yeah… we don't want people to start being' I don't know how exactly it was it was 'interpreting things the wrong way'. We want the engineer to give them the correct, the exact way that they want it done… It was well like that's the engineering job that's not your job to look over it, it was really kind of the response I got."

Carl tells a story in which his proposal to use information technology was rejected because it would undermine the role distinctions that reinforce hierarchy. It is "not your job", he explains. In his view, managers see engineers as having a distinct expertise. Even though Carl suggests that the technology would be used to enhance his productivity, saving him time, managers are concerned that the assemblers would "interpret things the wrong way", indicating a clear hierarchy. By limiting technology access, those in power are able to more explicitly define roles and, in their view, reduce the risk of worker behavior that would undermine organizational interests.

Furthermore, as Carl points out, due to limited distribution of information access, engineers and assemblers within a team had to allocate time together in order to clarify questions an assembler might have about a drawing. Thus, the allocation of information technology increases the value of cross-functional interactions at Southern Incorporated. Alternatively, at Northern Cooperative, the broader distribution of information technology allowed assemblers

and machinists to address questions about systems with less interaction. As levels of interaction within teams increased at Northern Cooperative, the marginal knowledge gained from these interactions decreased.

3.4.4 The Contingency of Optimal Project Team Process

Given the inability of the prior quantitative data to distinguish between different static organization-level characteristics, this section sought to specify the mechanisms behind the contrasting effects of cross-functional team-level interaction in the two firms, and specify the unique consequence of structural power. The analysis found that, within teams, variation in the distribution of structural power shapes occupational status hierarchy, participation in knowledge exchange processes outside of teams, and access to information management technologies. These differences, in turn, held consequences for the effective organization of team-based work at the two companies. At Northern Cooperative, ownership and governance rights distributed across occupational groups reduced cross-functional status disparities and cross-functional differences in information access within teams.

By contrast, at Southern Incorporated, the concentration of ownership and governance rights reinforced occupational status hierarchy and disparate information access between occupations. In turn, these differences in occupational status hierarchy and role distinctions impacted the effective organization of intra-team work processes (Stewart and Barrick 2000). In particular, these differences shaped the optimal degree of interaction among occupations. Scholars of knowledge-intensive work have long hypothesized that the optimal degree of coordination among workers engaged in a collective task is contingent on the character of the

production technology; namely, increasing with the degree of uncertainty and task interdependence (Grant 1996; Van de Ven, Delbecq, and Koenig 1976; Thompson 1967). The analysis in this chapter, however, suggests that the structure of social hierarchy also shapes the optimal degree of team-level interaction. A clear status hierarchy reduced the level of resistance during cross-functional interactions, improving their performance. Disparities in access to oversight processes and information technology increased the benefits to be gained from cross-functional interactions within teams. By contrast, in the context of status equality and wide access to information, cross-functional interactions held less marginal value. The amount of information gained from each additional hour of cross-functional interaction began to diminish at a lower level in the worker cooperative.

This section also specified the distinct consequences of structural power in contrast to the informal organizational culture. The distribution of structural power, in the form of ownership and governance rights, directly determined who participated in knowledge exchange processes outside of teams and who received access to autonomy-enhancing technologies. With respect to the impact of structural power on status distinctions, ownership at Northern Cooperative was shown to serve as a salient status marker. Thus, one might say that organizational culture was derivative of the distribution of structural power in these two organizations.

In sum, this analysis identifies three particular mechanisms with which the distribution of ownership and governance rights, in particular, shapes the effectiveness of particular team structures in the two contexts. The general mechanism behind this moderating effect is a difference in occupational role and status distinctions. Figure 4 visualizes the relationships demonstrated in this study.

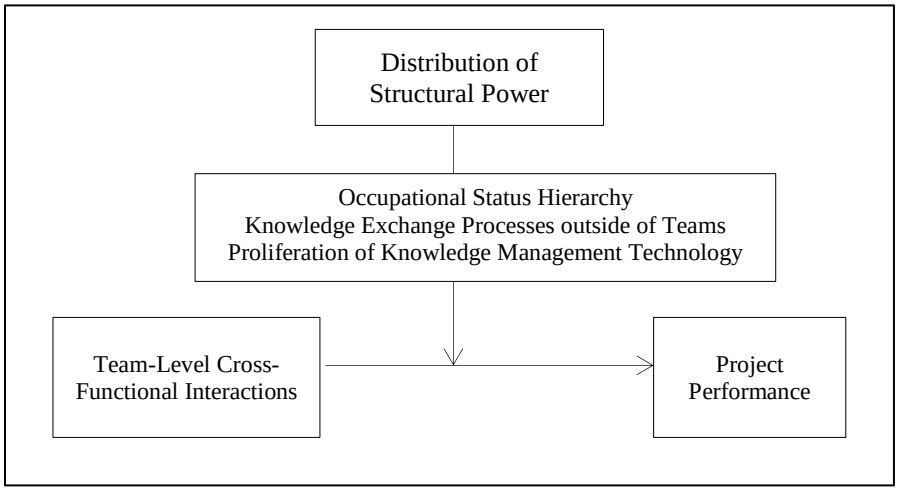

Figure 3.4 – Mediation/Moderation Model of Structural Power, Cross-Functional Interaction, and Team Performance

3.5 Recapitulation

This chapter sought to better understand how different levels of organizational design interact to facilitate knowledge integration for the realization of complex and uncertain work. In particular, I explored how macro-level structural power moderates the association between cross-functional interaction and project outcomes. A review of prior literature highlighted the importance of cross-functional interaction as a determinant of team effectiveness, revealed the absence of research on the distribution of structural power as a dimension of the organizational context of teams, and offered competing expectations concerning the interaction of structural power and team-level structure. Therefore, the first empirical section of the chapter explored this interaction. The results showed that, for a matched set of knowledge-intensive tasks, that teams in the context of widely distributed structural power performed more efficiently when occupations interacted at lower levels within teams, while the optimal level of cross occupational

interaction was higher in the context of concentrated structural power. This analysis was limited, however, in that it could not precisely disentangle the distribution of structural power from other unobserved differences between the companies. Therefore, the second stage of analysis used ethnographic data from the two companies to reveal three mechanisms with which structural power altered the benefits and costs of cross-functional interaction within teams. By increasing the costs of conflict resolution due to status equity across occupations, and diminishing the benefits of interaction by providing other avenues for information exchange, an organizational context of widely distributed formal power reduced the marginal benefits of cross-functional interaction. Furthermore, beyond informal beliefs and standards, the distribution of ownership and governance rights had a distinct impact on worker behavior.

To conclude, this chapter makes three key claims. First, a consideration of structural power enriches our understanding of the relationship between organizational context and team-based work. Second, when tasks are complex and novel, higher levels of cross-functional interaction will improve team performance in the context of concentrated structural power, but will diminish performance in the context of widely distributed structural power. Third, this contingent relationship between structural power and cross-functional interaction within teams is driven by the fact that distributed organizational power undermines status and role distinctions within teams, while concentrated power reinforces them. Future scholars of knowledge-intensive work would benefit from greater considerations of structural power and the multi-level interactions of which they are part.

Chapter Four – Limited Either Way: How Different Distributions of Structural Power Encourage Internal or External Boundary Spanning

In the automation industry, as in most knowledge-intensive service-based industries, customer relationship management is central to the production process. These firms do not produce "off the shelf" products, but "customized solutions", as an engineer at Southern Automation described it. In order to receive orders for projects, in the first place, firms invest substantial effort on "cocktail napkin" conversations and multiple rounds of quoting projects. This communication challenge continues on through the production process, as project managers must continuously update customers on emergent issues, while customer needs often change as the project progresses.

These responsibilities – often called boundary spanning roles (Shrum 1990) – require workers with strong relationships to external parties. This is particularly the case when boundary spanning roles are "representative" (Aldrich and Herker 1977), in that the boundary spanner serves as the delegate of the parent firm in negotiating the parent company's resources. It is also particularly important where the relevant issues are complex and uncertain, as the terms of the negotiation are less easily specified in advance (ibid). Effective inter-organizational boundary spanning enable firms to gather otherwise tacit information and manage potential conflict between the parties.

Past research suggests that this is an area of knowledge-intensive work where distributed structural power is beneficial. Studies of professional services firms commonly argue that a unique advantage of the partnership form, where structural power is widely distributed, is that partners simultaneously have the autonomy to pursue the most promising customers and the

incentive to manage those relationships in the interest of the organization (Levin and Tadelis 2005; Greenwood and Empson 2003; Maister 1993). In other words, distributed structural power is thought to facilitate effective representative inter-organizational boundary spanning.

This scholarship, however, pays insufficient attention to the challenges of coordinating boundary spanning relationships internally. To effectively mediate between the demands of customers and interests within the home company, boundary spanners must be able to coordinate both externally and internally (Foss et al. 2013). The partnerships literature focuses exclusively on the external component, partly because it is applied in industries, like law, where relatively low project-specific internal coordination is required. By contrast, in interdependent industries like automation, where production entails complex combinations of distinct skills and tasks, internal coordination is particularly important. Moreover, even in industries with lower interdependence, like law, alignment of external coordination and long-term internal goals remains relevant.

This chapter, therefore, looks into the relationship between representative boundary spanning and structural power at Northern Cooperative and Southern Incorporated. Specifically, I seek to expand the current literature on structural power and representative boundary spanning by asking: how does the distribution of structural power shape the internal and external elements of representative boundary spanning?

Towards that end, I examine changes in boundary spanning roles at Northern Cooperative and Southern Incorporated over the eight months I spent at the companies. The analysis follows a longitudinal comparative case design (Barley 1990). In this approach, I analyze two boundary spanning roles as they change over time, in the two firms. The cases all draw on ethnographic

data collected during sixteen months of participant observation at the firms, allowing me a more nuanced picture of both internal and external dimensions of the phenomenon.

In sum, I will argue that different distributions of structural power privilege either external or internal coordination in boundary spanning roles. Northern Cooperative encourages external coordination in boundary spanning, but faces high costs coordinating those boundary spanners internally, either in the short or long-term. Conversely, the concentration of structural power at Southern limits external coordination, as external coordination is a source of power that the majority owner seeks to constrain, but allows more internal coordination, as coordination occurs through fiat. Importantly, the mechanisms underlying this tension are based in the norms and governance processes of the two firms, and not individual incentive structures as hypothesized in prior literature.

The chapter is structured as follows. First, I introduce the basic conceptual framework underlying the analysis. Next, I present the research design. In the majority of the paper, I analyze ethnographic data examining internal and external dimensions of boundary spanning practices in the two firms, and their change over time. Finally, in the discussion, I extract key themes and integrate the results with existing literature.

4.1 Internal and External Coordination as Dimensions of Representative Boundary Spanning

Boundary spanning allows firms to gather resources from and adapt to changes in the external environment. Yet, when firms are engaged in areas of production where a more differentiated set of tasks must be integrated to take advantage of those external resources, internal coordination is central to boundary spanning. Internal coordination is also needed as

organizational goals shift internally. Firms may need to change how they interact with external parties. Others have talked about how effective boundary spanning entails both attentiveness to external demands and coordination with internal needs (Foss et al. 2013). In this chapter, as opposed to boundary spanning practices (Levina and Vaast 2005), I focus on boundary spanning "roles" (Ancona and Caldwell 1990) to emphasize how the organization places a set of responsibilities and constraints on individuals engaged in boundary spanning.

I understand boundary spanning roles to be shaped by internal and external coordination practices. I use the term "external coordination" to characterize practices that provide boundary spanners with resources to increase information and resource exchange with external parties. These practices can provide material or non-material resources. Expense accounts, for example, provide sales representatives resources with which to develop relationships with external partners. Authorization to work remotely allows boundary spanners to meet external parties more frequently. In industries where work is complex and customized to the demands of customers, these relationships facilitate the information exchange necessary to negotiate contracts and learn customer needs.

I use the term "internal coordination" to characterize practices that seek to align boundary spanning roles with internal organizational goals. Because boundary spanners negotiate organizational resources and can shape which sources of revenue the firm pursues, particularly in knowledge-intensive service-based industries where work is project-based, organizations must ensure that external representation is aligned with internal needs. These coordination practices may have a short-term or long-term orientation. Marketing plans, for example, define the types of markets that a sales representative will explore over a longer period of time. Weekly oversight

meetings, however, encourage short-term coordination with internal parties and alignment with internal concerns.

Internal and external coordination have some inherent tension. Internal definition of performance goals inherently constrains a project manager's ability to address customer needs in whatever way best suits them. Yet, a practice can increase both internal and external coordination, as in the case of an oversight meeting where a project manager can lobby for additional resources to meet customer demands. Thus, I consider the two sets of practices as distinct. In the following discussion of boundary spanning roles at Northern Cooperative and Southern Incorporated, I focus on internal and external coordination practices, and the way they are shaped by the distribution of structural power.

4.2 Background of Cases and Methodology

When I arrived at Northern Cooperative and Southern Incorporated, in the fall of 2011 and the spring of 2012 respectively, I found the owners in the two firms both discussing changes to their customer relationship management processes. In my initial interviews, owners at both firms volunteered problems with the "sales mentality" and "sales department", when asked about the current challenges the firms were facing. Owners and managers were organizing internal meetings to discuss these problems, developing plans for process revisions, hiring new workers for customer-focused functions, and allocating time towards training to increase their customer relationship management capacity. Owners at both firms were in the process of reconsidering and reorganizing boundary spanning practices.

Thus, I began to track these efforts. In particular, these efforts focused around two sets of roles. The first was the sales role. This was the initial relationship with customers, prior to starting a project. Those involved in the sales role engaged in a range of tasks in the effort to "win" projects. They would search out potential customers, engage them with to learn about initial interests, filter out unattractive leads, develop proposals, and negotiate over contract terms. Once a customer agreed to a project, the customer relationship management shifted to the project manager role. This role involved interactions with customers as the project progressed through the company. These individuals would update the customer on progress, receive requests for changes, and, generally, handle information exchange throughout the project.

The analysis that follows draws on qualitative material, collected over eight months at each company, from company documents, emails with participants, field notes, interviews, and meeting transcripts. I conducted recorded interviews with a subset of involved participants at the beginning and end of the eight months at the two companies. At both companies, I attended and was permitted to record conversations at a number of internal meetings. At Northern Cooperative, I attended six instances of a monthly scheduling meeting to match workers to projects and eight instances of an ad-hoc Board committee meeting on strategic planning. At Southern Automation, I attended eight scheduling meetings where customer issues were frequently discussed, two management meetings to discuss customer relations strategy, and two meetings of a newly formed sales group. During my eight months at the company, I wrote field notes after each visit to the companies, some of which discussed the customer relations change effort. Finally, I attended and recorded several other meetings where customer relations

management issues were discussed. Table 1, below, provides information on the volume of data from each source, by the number of pages:

Source Type	Northern	Southern
Company Documents	4	15
E-Mail	0	2
Field Notes	229	317
Interview transcripts	394	419
Meeting transcript	410	310
Total Pages of Data	1037	1063

Table 4.1 – Volume of Data Collected, by Typed Pages

These processes of change were ongoing during my fieldwork and after the fieldwork ended, but they offered an opportunity to examine the internal coordination of boundary spanning roles. Because these change processes were only partially completed, I was able to observe the old processes, the problems that owners recognized in these processes, and the applied and aspired efforts to address them. Because these changes to the sales and project management roles remained partially incomplete, as I left the field, I was not able to observe the effectiveness with which they were adopted. However, I was able to closely observe their deliberations over these change processes and their efforts to implement them.

My access was also limited in certain respects. Given that these change processes involved sensitive discussions of customer relationships and worker performance, I was not permitted to attend some of these meetings. At Northern Cooperative, I was explicitly prohibited from attending the meetings of the Customer Relations committee, one Board-level committee involved with decisions around these issues. I sought to gather information on this committee's activity from interviews and discussions in other settings. At Southern, I was not explicitly prohibited from a particular regular meeting. However, after I requested that owners and

managers include me in any meetings related to this change effort, I was invited into some meetings and discussions, but not others. There were instances in which I would arrive at the company, to find out about an ongoing meeting concerning the customer relationship management change process. Here, as well, I sought to gather information about the meetings I did not attend through interviews and observations from other meetings.

I organized and analyzed the data following a comparative case method, where I consider multiple cases that are comparable, except on the key explanatory variable: the surrounding distribution of structural power (Eisenhardt 1989). To make both static comparisons and temporal comparisons, I follow what Barley (1990) calls a triple comparative design. This involves synchronic, diachronic, and parallel axes of comparison. Synchronic axes of comparison are multiple phenomena that occur within a single organizational context at a fixed point in time. Diachronic axes of comparison are phenomena within a single organizational context at multiple points in time. Parallel axes of comparison are phenomena that occur within two organizational contexts. In this chapter's design, I have all three axes of comparison. Here, I analyze two "mini-cases" of change in boundary spanning roles, each occurring in the two firms across two points in time. The synchronic axes are based around the two boundary spanning roles: (a) sales and (b) project management. The diachronic axes of comparison are (c) these two roles prior to the organizational change effort, (d) the deliberations around the organizational change effort, and (e) these two roles after the organizational change effort. Lastly, the parallel axis of comparison is (f) the comparison of these synchronic and diachronic axes across the two firms. Following Barley (1990), the research design can be visualized as in Figure 2.

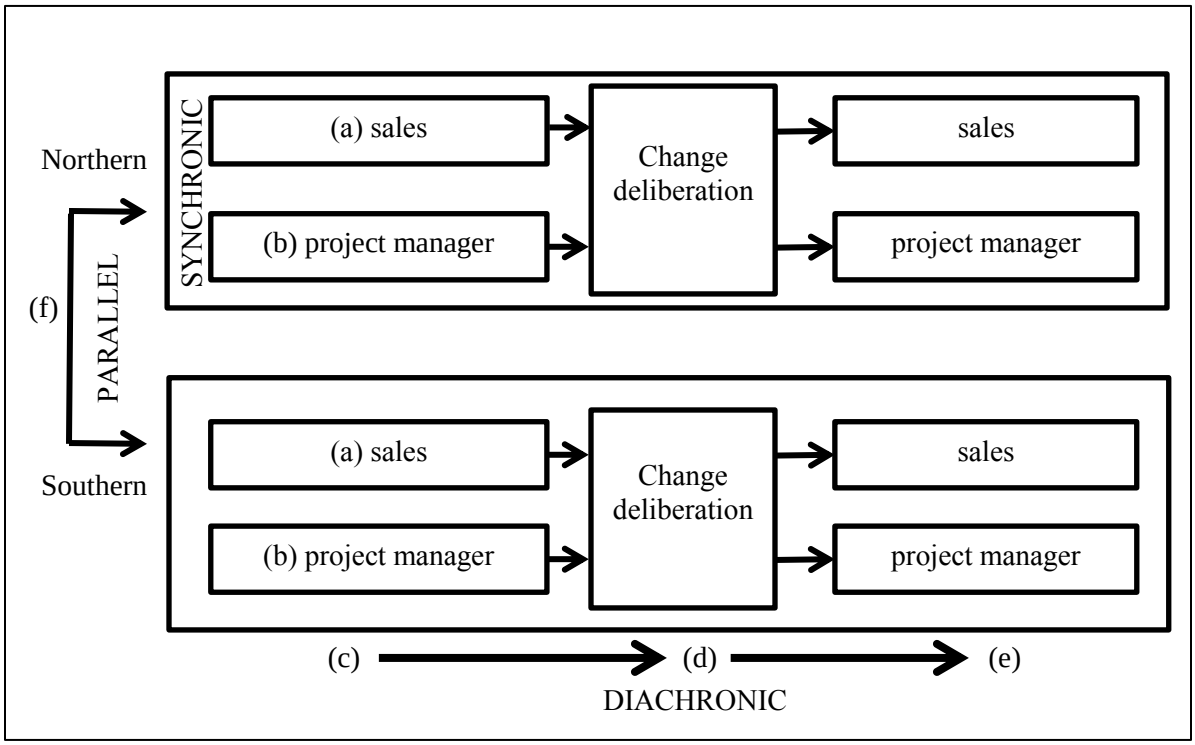

Figure 4.2 – Parallel Diachronic Case Design

Below, the cases are compared synchronically and then diachronically analyzed. In the synchronic comparison, I focus on the relative strength of internal and external coordination practices around the two boundary spanning roles at the two firms. Next, I examine how these practices changed over time, in response to longer-term internal coordination efforts. Here, I first present material illustrating the deliberations around change efforts, then present the emergent practices from those change efforts. At the end of each discussion, I include an "analytic overview", where I extract key themes.

4.3 Prior Boundary Spanning Roles

In this section, I examine the sales and project manager roles at Northern Cooperative and Southern Incorporated prior to the change effort. In the discussion of each role, I describe

how which individuals filled the role within the firm. In turn, I present the internal and external coordination practices that defined these roles.

4.3.1 Prior Boundary Spanning Roles at Southern

Sales Role

At Southern Incorporated, the sales role was tied closely to the majority owner. It had been passed down as ownership switched hands over time. Chuck, one of the original owners, "started grooming [the current majority owner] Richard to take the business over early on" and "was always involved in those meetings and going to visit a new customer". As the prior owners stepped away from the business in the late 1990's, Richard took over this responsibility. He simultaneously became the majority owner and the lead sales manager. In turn, Richard had begun to "include" one of the minority owners, Sam, in some of his sales visits after he "earned Richard's trust". These visits to customers, alongside Richard, "taught" Sam about how to discuss sales with customers. Thus, external boundary spanning practices around the sales role were assumed as privileges of ownership.

Richard was not the only person engaged in external boundary spanning practices around the sales role, but he focused in areas of external boundary spanning with the least structure. New customers were "directed" to Richard and he also took responsibility for large systems. "Pretty much, anything of any size for sure, that's all going through him right now," one engineer explained. Customers would call the manager in charge of electrical assemblers "to ask for a service person" or the parts manager "to bring a new conveyor", but these were decisions

where less discretion was required. This division of labor within Southern was taken for granted, as a function of the distribution of structural power. While these responsibilities were not codified, customers would follow this division of labor when contacting sales group members to make requests.

Richard's unique autonomy as an external boundary spanner was enabled, however, by his control over several external coordination practices. As a privilege of ownership, he was the only person with unfettered authority to use these practices. He managed the use of "verbal" agreements. With established customers and only with Richard's approval, Southern would conduct sales based on informal agreements where the customer did not have to provide a purchase order guaranteeing the parent company's legal obligation to pay, prior to ordering a machine. This helped customer engineers quickly solve problems, as they did not need to go back to their bosses to generate a formal purchase order. He would regularly "have lunch" with managers from other companies to cultivate relationships with customers. Others involved in sales did not do this.

Richard also controlled the decision whether to develop a quoted proposal for a project, as it came into the company. He described how, over time, he led the company to become more selective in its pursuit of projects. The company's formal protocol document on quote development stated that "all quotes must be reviewed by the President before sending to the customer." Other engineers were regularly sent out to collect information from a potential customer, but they would bring that information back to Richard to decide on a response. Thus, a number of the external coordination practices were limited to Richard. While he could operate autonomously in external relationship management, others were constrained.

Once Richard decided to approve a prospective project, the sales process shifted to internal coordination. The group needed develop a proposed project that aligned with internal labor resources. Even in that process of developing a project proposal, they needed to draw on internal design resources. In internal coordination, however, the hierarchy provided an accepted framework for assigning responsibilities. Responsibilities trickled up and down the organizational hierarchy, depending on their importance. One afternoon, I sat in the engineering office and watched this trickling process in action. Dave, who had initially received the request for a quote, consulted with Phil, the minority owner in charge of mechanical design, who then passed the task along to a junior engineer, named Alan. I wrote in my field notes:

> "Dave and Phil are discussing a project concept, standing at the drafting table, looking down at some printed drawings. Dave explains that he was talking earlier with Richard and got his input. After explaining their proposed system, "He thinks this is the way to go on it." Dave says, referring to Richard's response to the concept they discussed. Now, Phil is putting together the layout of the design. They are talking about the relationship with the customer. Phil asks for clarification of the customer's goals for the project. "What does he really want?" Phil asks. He wants "help" with problems, Dave explains. [several minutes pass] Alan is talking to Phil about how to print the drawings [after the revisions from Phil]. "What do we need to be able to see?" Phil instructs him to focus on the detailing of particular stations on the system and how to translate concepts into drawings that can then be easily converted into manufactured parts."

This scene illustrates how internal coordination in the sales role was aligned with the ownership structure. Dave is leading external coordination, interacting with the customer. Yet, he checks with Richard to ensure that his concept is "the way to go". Thus, Richard oversees internal coordination. He then coordinates internally with a peer, Phil, with whom he discusses the physical drawings and the most effective visualization. Dave provides clarification on the customer's needs, as he is the one interacting with the customer at this stage. Finally, Alan, a lower level engineer, receives direction from Phil about how to revise the drawings. In sum,

while external coordination practices were limited to a single individual by the concentrated power structure, the same power structure diffused internal coordination practices through the organization.

Project Manager Role

If Southern won the bid and received an order to start a project, the project was handed off from sales to engineering and production. As the engineering group began to design the detailed components of the machine, they needed to remain connected to the customer, updating them on changes to the technology or the timeline. Conversely, the customer needed a means to stay connected to the company, informing them of changing needs. This was the role of the project manager.

The project manager function was codified in various documents. Company protocol documents called "for identification of Project Lead" by Richard after Southern received a purchase order. Each week, during the project review meeting attended by the managers, a list of ongoing projects listed a "Project Manager". The person listed was nearly exclusively Richard or one of the minority owners.

However, even among the minority owners, their autonomy as project managers was constrained. As projects moved through the company, boundary spanning responsibility would shift between the minority owners in charge of particular areas of work. Multiple leads would temporarily manage their part of the project, but not take general responsibility for the customer relationship as a whole. This became most evident when different owner managers would interact with the same client in reference to the same project. In one managerial meeting, I

recorded the following exchange. First, Richard called out the name of a project, asking for an update. Then, three leads responded, each describing interactions with the different workers from the same customer company:

> Richard: Alright, BagPack 12? Anything?
>
> Sam: No, nothing. They're just working on validation paperwork. I fielded a couple of calls from Lloyd Dell. He's doing the validation. Just little stuff, so, they don't need anything from us right now.
>
> Bill: I got a little bit of feedback from Shane on Friday. I talked to him about those plastic totes, about sending those back. I asked how things were going. He said that site acceptance testing was all complete and they were doing IO stuff and it would probably be three weeks before they officially fired it up and got things rolling.
>
> Ryan: I also talked to Shane and he said he'd get me a purchase order for the installation. I haven't seen anything.

In this scene, three managers each report on interactions with the client related to a different dimension of the project. Sam reports on interactions with the customer concerning the controls engineering aspect of the project, system runoff, and testing on the customer floor. Bill reports on interactions about fabricated parts on the system. Ryan reports on interactions with clients around administration and accounting. In other words, external boundary spanning practices were constrained at Southern Incorporated, even among owners.

A second key external coordination practice was the negotiation of contentious issues with customers. This was a practice limited to Richard and the minority owners. When I asked one junior engineer about the experience of interacting with customers, he explained how he filtered his interactions with customers through the owners:

> "The banging heads, we'll leave that to leads and Richard. If we feel like we've been wronged by a customer we can inform Richard of it, tell him the situation

> and he can deal with that end of the situation. It's not up to us to confront the customer or cause any bad blood that way."

Thus, highly conflictual issues required discretion to "confront the customer", and this was exclusively the purview of the owners. The prior engineer's description highlights the degree to which this behavior was institutionalized. He describes the division of labor as a rule, even though it is nowhere codified.

Moreover, even among owners, Richard maintained ongoing involvement in projects to manage high-level conflict. This was particularly apparent in the weekly meetings where the leads sat down to discuss projects. The following excerpt from a project review meeting illustrates the division of labor in customer interactions. In this scenario, Mark, Ken, and Leslie are lower level engineers from the customer firm and Tom is a higher level manager. Ryan and Phil are the two Southern leads reporting on the project. They are discussing the delivery schedule and customer requests around that:

> "[Sam is explaining updates on production of machine]
> Richard: Tom called me last week and reiterated how important it is that they get these cells. They want to have; I forget which one they want to go in first. I know they want one installed and running validation, and running on the week of the 18th, and the other on the week of the 25th. That's what they have on their schedule.
>
> Ryan: And Ken called Friday. Because I owe you [talking to Richard] a quote for shipping. Remember we talked about that. I have that information from Mark. And then Ken called and said, 'Best case, we'll put both machines on the truck on the 15th of June" [starts to laugh] Yeah, right, in theory…
>
> Phil: Not gonna happen.
>
> Ryan: So I talked to Richard and then called Ken back and said, you know, we're not on the same schedule with that. And he said, 'well, that's your best case, but that's our worst case' And I'm like, uh, ok. So he wants me to quote it both ways. Both leaving Friday and leaving separately.

> Phil: I talked to Leslie and she said they weren't going to be at the same time.
>
> Ryan: Well I came to these guys right away and I was like, what he's saying is not what Phil was saying at all.
>
> Richard: And he's not being driven by Tom. So, again, that's the second time that now Ken's gone off the reservation and doing his agenda thing. And Tom has to whack him and bring him back in line. So, let that be a warning, anything that Ken brings up, that sounds like it's unusual, whatever Ken brings up, bring it up the chain so we don't start plodding along this path and find out that Ken misdirected like he did last time. Because nothing Tom and I had a discussion about had anything to do with shipping both on the same day. He wants one going in on the 18th and one going in on the 25th. That's all he cares about."

In this scenario, Richard first mentions how he received a call from the higher level customer manager to set goals for the project. Ryan responds that she received a call from a lower level engineer about changing the delivery dates. Ryan proceeds to explain how she reported that information back to Richard and, based on his advice, responded to the customer engineer. Phil and Ryan share conflicting information, and then Richard unilaterally resolves the situation. Richard is the intermediary with the higher level customer manager and, based on that role, he defines for the group whom is to be trusted. He provides the group with a general instruction about how to interact with the lower-level engineer in the future. In reminding the other owners to "bring it up the chain" on controversial issues, Richard reinforces the expectation that external boundary spanning practices are constrained

Internal coordination occurred along the same hierarchical lines, which were clearly demarcated. Thus, a common internal coordination practice involved updating team members on changes to projects. This created communication chains, where customer information would pass through the project manager in order to reach the team member in question. In one of my field

notes, I described one of these scenes. Alan is a junior engineer. Sam is the project manager and Colin is another manager who had gathered information from a customer:

> Alan is sitting at his computer, working on a drawing and bill of materials for a new project. Colin walks into the engineering office, up to Sam's desk. [Sam's desk is directly next to Alan's] Colin explains to Sam that he has been talking to the customer about changing one of the stations. Colin walks away. Sam leans his head out around the cubicle wall. "Did you hear that?" Sam says, "We may be taking that inspection station off."

Thus, at Southern Incorporated, internal coordination followed a clear hierarchical structure. Colin receives the information from the client and transmits it to Sam, the minority owner and project manager, who then passes it on to Alan. These practices were taken for granted.

Analytic Overview

The prior discussion of sales and project manager roles at Southern Incorporated illustrates how concentrated structural power constrained external boundary spanning practices but provided a framework for internal practices.

In both sales and project management, external coordination practices were limited to the majority owner and, to a lesser extent, minority owners and managers. External coordination practices like "verbals" allowed Richard to develop "trust" with customers. For these, other boundary spanners required his approval. Their external coordination practices were limited to information search. In project management, the external coordination practices involving the highest level of uncertainty were "passed up the chain" to Richard. Further down the ownership structure, non-owners left the "banging heads" up to the owners. Yet, even among owners, Richard them to "bring it up the chain" when conflict emerged during a project.

Internally, the concentrated power structure was reflected in the selection process for project managers and the divisional assignment of project management responsibility. Established communication chains governed quoting and coordination during the project phase, allowing internal coordination processes to diffuse across the organization. When Dave and Colin brought new information from a customer, they immediately passed this information to an owner, recognizing this practice as the accepted mode of internal coordination.

4.3.2 Prior Boundary Spanning Roles at Northern Cooperative

In contrast to Southern Incorporated, at Northern Cooperative, external boundary spanning practices were encouraged while internal coordination was limited.

Sales Role

For the 10 years up to my time with the firm, the sales process at Northern Cooperative had been organized and led by the Sales Manager, an individual named Peter. He operated autonomously, seeking out sales opportunities for the company, and was more frequently on the road than many other employees. Others in the company repeatedly described him as the “lone snake” or “lone wolf”, emphasizing his autonomy. Peter’s office was located in a section of the building separate from the engineering group and the shop floor. Peter was understood as the most common entry point for projects into the company. As one engineer described it, he’s “the only person who consistently delivers quotes to customers and closes deals”. Other individuals within the company had relationships to customers and were regularly asked to explore job opportunities. Yet, even when job prospects did come through workers other than the Sales Manager, they would generally “send it along” to him.

Peter's autonomy in external boundary spanning was reinforced by the presence of a dedicated sales staff that assisted him. These individuals helped to write quotes, develop concept drawings, and help maintain contact with clients. Their offices were also located in his section of the building, away from others. Peter had been authorized to hire a part-time salesperson, primarily to prepare marketing materials and conduct preliminary market research. Bill, the part-time salesperson, was an old personal contact of Peter's from college. Thus, Peter had selected him directly. This range of support resources enabled Peter to operate with substantial autonomy, not needing to coordinate with others internally to develop sales opportunities.

As jobs came in through Peter, he and his sales group would begin to "filter" potential projects into different priority "lists". As one engineer explained, "each incoming inquiry from a customer or each prospect kind of gets internally ranked, A level, B level, or C level". Peter had an infamous "white board" in his office, where he would rank potential projects according to their importance. The process for categorizing potential projects was described as a "gut check", emphasizing its informality.

Once a request for a quote was received and the sales group decided to pursue the project, responsibility shifted to a different set of individuals within the sales team. Unlike the hierarchy of involvement at Southern, quoting was primarily the responsibility of a subset of workers who engaged in very specialized sub-tasks. One of the sales group members, Stephen, explained the breakdown of responsibilities:

> "We have our Sales Manager, who is involved before and after. And that person deals with management at levels above the person who is doing the actual purchasing… Then an individual like Greg, he's good at spec reading, some of the things that come in and there's a stack of printed documentation that defines what we are going to deliver. And he's good at developing pricing. I do the graphical design, with the motors and the feeders. Then that goes to Greg and Peter. And they will stick their head out the door and ask how much that machine

> should cost and we're pretty close in our estimates. This is all part of the sales process."

Thus, Stephen explains how the sub-components of the sales role are divided within the group. Talking to other members of the sales group, they reinforced how specified each member's task was. The division of responsibilities also did not have a clear division along lines of risk and there was no hierarchical devolution of responsibilities. For example, Greg worked on pricing proposed projects, which had key implications for profitability. When asked about this division of labor among external boundary spanning roles, members linked it to the ownership and governance structure. One engineer described it as "the peter principle in reverse"

> "Because we are how are, I own one vote, and Stephen owns one vote. Stephen is very good at concepting, but he's horrible at running projects. He'll tell you that himself. The same thing with Robert, and the same thing with Greg. Either they are lackadaisical or customers can't get along with them, but when it comes to quoting this stuff, their idea process is really good. So it's maybe like the peter principle in reverse. They actually migrate to where they're more effective, instead of being promoted up to a position where they're useless. We don't have that, it doesn't work here."

In this quote, the engineer refers to "the peter principle", a popular business management theory of hierarchical workplace organization developed by Laurence J. Peter in the 1960's (Lazear 2000). The theory states that effective organizational members will be promoted based on their effectiveness in their prior position as opposed to their anticipated effectiveness in their future position. This tendency is thought to lead to the promotion of individuals into positions of ineffectiveness. Yet, this engineer argues, when the ownership and governance structure reduces managerial hierarchy and need for managerial oversight, individuals can only move laterally into positions that better fit their skills. In sum, multiple workers engaged in external boundary

spanning practices at Northern Cooperative because widely distributed structural power because no single individual could become the organizational representative.

At the same time, however, the Northern Cooperative Board did seek to impose internal coordination on the sales role. Yet, given Northern's distribution of structural power, some internal coordination practices were motivated by norms of equity. For example, Peter was one of the only workers not permitted to apply for ownership. They perceived that this could lead to an "imbalance of power". Early on, one of the members explained why the Sales Manager and General Manager, were not permitted to apply:

> "Those two positions have a lot of power in and of themselves. I mean, the General Manager, they know everything about what's going on. The Sales Manager has the ability, they can steer the company. [Like] I'm not going to go out and quote that job, I'm going to quote this job. We feel that if they became members, they'd be too empowered. And we want a balance of power. So we keep those as hired positions and we do give them a part of the profits, not the same percentage. A similar deal. The idea is that if they don't work out as an employee, they would be easier to replace. At least, that's the idea."

This quote, from a long-time member highlighted the group's awareness of the power held by the Sales Manager. The group recognized how the Sales Manager could "steer" the company towards particular industries, types of work, and workloads. The member goes on to explain who the Sales Manager's employee status should allow for internal coordination, or "to replace" Peter if there is a problem. Yet, he admits the limitation on this internal coordination practice.

This limited ability to impose internal coordination was heightened by the Northern governance structure. They sought to do this through oversight from Board committees. As such, Peter sat on two Board committees: Marketing and Customer Relations. Yet, the deliberative nature of these committees and Peter's unique knowledge of customer demands limited the

constraint exerted through these mechanisms. This was apparent in the Marketing committee. This committee managed the company website, selected advertising venues like trade journals, developed promotional materials to share with potential customers, and decided on trade shows to attend. On one hand, the presence of two owner members on the Marketing committee provided some Board oversight over Peter's external coordination efforts. At the same time, as one of the committee members recognized, "Peter is really the driving force, ultimately what he says kind of goes to be honest." Sitting in one of the Marketing meetings, the power dynamic was apparent. One day they were discussing an investment in advertising:

> "Lucas: The print ads are so expensive in general. You want to see the whole media kit?
>
> Ken: For an extra 500 bucks; this is going directly to the folks at PlusTech; it's not like it's going to hundreds of companies you don't know whether the guys are going to read them.
>
> Peter: If its 5000, you still do it. It's one of those things where, if this has any bearing to the reason why we have done four PlusTech projects this year, versus 0 in the past 3 years, it's worth it taking a flyer on it. This isn't the sole reason, but, that show last year was a major tipping point in us meeting new contacts at PlusTech. If this PT Weekly is another avenue into PlusTech exposure, let's do it.
>
> Lucas: So, yes, to half page in color?
>
> Peter: Let's do it."

This was an example of the way that external boundary spanners at Northern Cooperative faced limited internal coordination. PlusTech was a company where Northern was already doing substantial business, so investments in that company served to deepen an existing relationship. Alternatively, as Ken pointed out and members in other instances suggested, company resources could be used to "fish in other ponds". Yet, the deliberation process allowed Peter to advocate for his position and leverage his unique knowledge of the industry.

Project Management Role

As projects shifted from sales to production, at Northern Cooperative, the boundary spanning role explicitly shifted to a new set of individuals. As at Southern Incorporated, a key boundary spanning role in the project phase was the project management role.

However, contrary to Southern, "there's nobody sitting over watching all the projects go through" at Northern. The project managers had substantial autonomy in their boundary spanning role, managing customer relationships. In the formal project management protocol, project managers were instructed to hold weekly meetings with the customer. Thus, the project management protocol listed a required external coordination practice. Comparing his role as a project manager at Northern Cooperative with his role at a previous company, one mechanical engineer explained:

> "Here, the project manager has more overall responsibility. At my previous employer, you had a larger contract administration department, you had production planners and all those departments and resources to pull from. Here, we essentially don't have that. We're doing all of the interface with the customer. Depending on the project, you might be the mechanical lead designer so you're directing all the efforts yourself, as well as designing. You're asking for resources, manipulating the project schedule, all the communication with the customers and suppliers."

While the project manager became the primary contact for the customer after the project transitioned into the design stage, other workers would also interact with them as well. In the same way that internal coordination diffused through Southern Incorporated, external coordination diffused through Northern Cooperative. Different team members would engage directly with customers to exchange information, across the workforce. I described in my field

notes where a mechanical engineer was interacting with a customer engineer to gather information on one of their existing machines:

> "Robert also interfaces independently with the customer. The customer has provided him directly with the drawings (or will) of the feeders at the top of the dispenser systems"

Thus, information did not necessarily pass through project managers. Walking through the shop, on a different occasion, I would observe different project members showing customers around equipment. One assembler had to cut an interview short so that he could "be in early to meet a customer." In an interview with an assembler, he explained how the wider responsibility to interact with clients was linked to the ownership and governance structure:

> "We're exposed to a lot more customer relations. Here we're allowed to interact with the customers a lot more. With my former employer, I used to be at the plant, talking to the customers, but there was always a higher level, where things were really discussed. Here it's less formal, smaller, and we talk to the customers. The project manager is in charge of the detail, the money and the scheduling, but we all talk to the customers… Here you explain problems, bring up solutions, talk to the project manager. At the old job, the project people would say "you're a shop guy". At Northern Cooperative they welcome ideas. There's a mutual respect, a mutual respect for everyone's skill, we're working towards some ultimate goal"

Paul's explanation helps to specify how the power structure shaped the project manager role. He highlights how he is not discouraged from interacting with clients and he is expected to take greater involvement in problem solving. His knowledge is held in higher regard and he perceives this to be based on assumptions about a common goal. Thus, assumptions about aligned goals and "mutual respect" justify diffusion of external boundary spanning practices.

This is not to say that there were no efforts at internal coordination of the project management role. Because the project manager was perceived as "the representative of the company", the selection of the project manager was a key internal coordination practice. The

process of selecting a project manager was a combination of formal process and informal deliberations. An engineer member explained that, formally:

> "General Manager in charge of scheduling assigns the resource. So he looks at the best fit, he looks at what's available, who's coming available, what talent they have."

Thus, in this framework, the General Manager was authorized to select a project manager. Formally, the Sales Manager, who "had strong opinions" about the right project manager based on his interactions with customers, was also authorized to provide input on the selection. There was also an oversight mechanism for this selection process. The Customer Relations committee was mandated to oversee decisions related to customer relationship management, including the selection of project managers. That committee consisted of the General Manager, the Sales Manager, and approximately four members, depending on the year.

Also, during the project, the Board served an oversight function for project managers. One engineer explained how:

> "there are some people here that get put into a management role who are not as good at handling the management role, especially with some of the customer communication or when it gets to some sensitive commercial type issues when they are not skilled or comfortable with that. So Peter the Sales Manager knows who those people are and he tries to insert in that, he gets involved with those people. But I rarely have, when I am dealing directly with the customer, I usually handle that on my own."

Thus, informally, the Sales Manager would "insert" himself around contentious issues. There were also situations where the project manager was mandated to engage with oversight processes outside of the team. As one project manager described it:

> "If there is any sensitive discussion, if we have to draw a line in the sand and a decision needs to be made, regarding schedules or money on a project, I'll usually consult with the Sales Manager or GM. And just have a quick discussion. That's kind of in our framework, we shouldn't be making decisions on our own; who we

> go to get buy-in. If the issue is big enough, we'll get the whole Customer Relations committee together. That doesn't happen frequently, but it happens enough, particularly when a customer is getting really upset or a lot of money is involved."

Yet, in these cases, the responsibility for interactions with the customer formally rested with the project managers. Project managers highlighted how they had a great deal of leeway in their management of customer relationships. They were held accountable if their projects were not profitable or generated problems with the customer, but these were ex post outcomes. For example, some project managers would choose to push their project schedules more intensely, requiring that they sometimes worked up to 80 hours per week. Other project managers refused to work more than 50 hours per week. As one engineer described it, "we don't have very close oversight of our project managers".

Analytic Overview

In sum, across the sales and project management roles at Northern Cooperative, external coordination was more prevalent than internal coordination. Peter operated as a "lone wolf" pursuing sales leads, with little constraint over which projects ended up on the "white board" in his office. Project managers perceived themselves to have "more overall responsibility" than in previous jobs. Workers attributed widespread participation in external boundary spanning practices to "the Peter principle in reverse", where capable individuals did not come to dominate external boundary spanning roles but specialized within particular dimensions of external boundary spanning. Moreover, boundary spanners received resources to enhance their autonomy, like Peter's support staff and the mandate that project managers meet once per week with customers.

Efforts at internal coordination were limited to "oversight", in that the Board was more likely to evaluate boundary spanner than to intervene directly. Internal coordination practices, like project manager selection and committee meetings, occurred at intervals in between periods of external coordination. Some internal coordination occurred informally, like in the case of Peter getting "involved". Other efforts occurred through Board committees. As in the case of the marketing committee, however, the participatory nature of Board committees limited the degree of control that could be imposed on external boundary spanners.

Strikingly, boundary spanning practices were not primarily allocated along the lines of structural power divisions. Project managers were exclusively owners, though this was not formalized. Peter was the key illustration of the misalignment between boundary spanning and ownership. Moreover, governance costs and norms of participation limited constraint over all workers, whether owners or not.

4.4 Change in Boundary Spanning Roles Over Time

In the following sections, I shift from a synchronic to a diachronic perspective, evaluating the change process that occurred during my time at the two firms. Evidence from the deliberation process illustrates how owners at the two firms conceived problems with boundary spanning roles. Even their understanding of these problems reveals how the distribution of structural power limited their efforts to manage them. Next, I examine their efforts to revise these boundary spanning roles. In both firms, they recognize their limitations. However, the distributions of structural power inhibit their ability to address them.

4.4.1 Deliberations over Boundary Spanning Roles at Southern Incorporated

When I arrived at Southern Incorporated in Spring 2012, the company was "in the process of changing", as one of the minority owners described it. Richard and the minority owners would meet at night and before work, talking about their need to change the customer relationship management effort. Richard described it as the problem of being a "reactive company". This concern started with the "sales mentality" but, as one of the minority owners described it, it entailed a "culture change". One of the minority owners explained:

> "We react to a [project] deadline staring us in the face, we react to not being to where we should be, we react to the economy, and that's how we perceive it. We react with our spare parts because the economy's down or we react to you know just when the customer needs something"

This "reactivity" pervaded both sales, in reacting "when the customer needs something", and project management, in reacting to "a deadline staring us in the face". It captured a limited capacity to engage and be "proactive" with customers. Richard put it boldly, stating "we're totally at the mercy of our customers". He was describing a lack of external coordination practices.

With respect to the sales role, there was a widespread perception that the inability to be proactive resulted from Richard's over involvement in other parts of the organization. Even in my earliest meetings at Southern, the owners talked about the costs of his over-commitment. Richard described how, when he went on vacation, he would call the business every day. Other workers in the company had come to accept the concentration of structural power and strong internal coordination. One of the engineers explained:

> "People don't know what to do if they're not here. And they're not wrong, they're just, cause right now that's just the way that kind of works, get the questions right

> from the top, if something is critical enough you won't get an answer from anybody but [Richard]"

This explanation not only spoke to the lack of capacity to decentralize, but the fact that strong internal coordination became an accepted norm. As this engineer explained, "that's just the way that kind of works".

The problem with the sales role stemmed from the extent of internal coordination in the project management role. Richard's continued involvement in the production process, as the liaison to customers, limited the time he could spend developing other relationships. One of the engineers described it in an extreme fashion:

> "If Richard's basically helping still draw designs and answering questions all the time that's every minute he's doing that it's [a] minute away from long-term strategy, growing, looking at other cities to acquire a custom automation company, new customers, and things like that every minute away is another one lost."

Thus, the focus on daily issues with projects and constant updates to engineers took time away from longer-term efforts. "He's dealing with all the tactical stuff, so he can't focus on strategy."

The consequence of all this was that Richard could not spend enough time developing customer relationships and evaluating project opportunities. Sitting in an early morning meeting with the other owners, Richard talked about how requests "sat on my desk for weeks before I'd even quote them." His inability to extract himself from other parts of the production process felt like "we're throwing the anchor out, dragging it along". He also worried that his limited time was preventing him from allocating sufficient attention to the most important jobs. He described wanting to "clean up this system, these quotes, what's still alive, what's viable. I'd love to have

them prioritized." This emphasis to "clean up" and "prioritize", however, only suggested a reinforcement of internal coordination mechanisms.

A second key theme in these deliberations was the poor fit between workers and particular boundary spanning roles. In our first interview, Richard explained, "we're just trying to put the round pegs in round holes, and square pegs in square holes". In the past several years, the minority owners had been moved around into different oversight positions. Sam, one of the minority owners, had managed the assembly group for a period and now managed the electrical engineering group. In the project manager role, their system required that individuals could manage team members and assert authority if necessary. Talking about one of the minority owners who did some of the project management, Richard explained "He struggles with, 'Hey, this has got to be corrected,' and I could tell he doesn't want to talk with the guys and stuff like that." One of the other minority owners, he explained, "shouldn't be a project manager". Here, despite seeking to strengthen external boundary spanning practices, Richard was only willing to consider the minority owners in these roles. The concentration of structural power shaped the range of possibility for solving this problem.

Analytic Overview

The owners at Southern recognized that their boundary spanning efforts were too "reactive" and that they were "at the mercy of our customers". This acknowledged an insufficient capacity to "proactively" manage external relationships. Richard's over-involvement in other areas of the business was an "anchor" on their external boundary spanning efforts.

Yet, even in defining the particular problems that limited their capacity, they highlighted the degree to which the power structure reinforced internal coordination and constrained external boundary spanning. One identified problem was that workers took constraints on external boundary spanning for granted, as "the way it works". In other words, concentrated power was institutionalized. Resolution of this issue would require a "culture change", as one person described it. Additionally, as Richard examined limitations on external boundary spanning roles, he only considered the fit of owners in those roles, assuming that it was only owners who would be appropriate. Finally, Richard sought to "clean up the system", "prioritize", and establish other rules and definitions to clarify responsibility. These changes all involved efforts to formalize and specify roles; behaviors consistent with a bureaucratic ideal type.

4.4.2 Deliberations over Boundary Spanning Roles at Northern Cooperative

When I arrived at Northern Cooperative, in Fall 2011, changes to boundary spanning roles were an active topic of debate at Monday night Board meetings. In the past year, two events instigated more targeted reconsideration of customer relationship management practices.

First, a subset of workers had expressed particular concern about limitations in the company's sales process. This was, in part, spurred by volatility in workloads. The past two years had been "like a rollercoaster", "working 30 hours one week and 50 hours the next". Members expressed concern that the sales role was not aligned with the needs of the membership, which sought greater stability. Instead of pursuing clear goals in its pursuit of projects, the company was too "sales driven", meaning that the efforts of the sales manager drove which projects the company received. Instead of "targeted campaigns", they worried that

sales was too “reactionary”. The members expressed concern, in sum, that the sales role lacked internal coordination.

Here, distributed structural power shaped the way these problems were defined. On one hand, the lack of internal coordination was understood as a technical issue. Members worried that the company has “a pretty small group of sales people that are trying to supply a lot of business to keep a lot of people employed”. Thus, the problem was framed as a need to build “strategic marketing capacity”. At the same time, however, the group discussed the challenge as a governance problem. Describing a conversation with the Sales Manager about the Board’s motivation to create a strategic marketing ad-hoc committee, a member explained,

> “what the Board is trying to do is wrest [control] to some level, without knowing how or how far to go or how much to invest, to put some type of proactive element to that”

Here, the member highlights that the Board did not know the exact technical challenge it faced, “how far to go or how much to invest”, but it was clear that they wanted to “wrest” control. In vivid terms, one member recounted how he had explained the problem to the Sales Manager:

> “In this organization there's a point of diminishing returns when you're the only guy. The entire place is based on consensus, on more heads are better than one and everything else. And you're a single head… You have to be part of something... If there was a single guy to follow around, in a position, you’re probably the best at what you do. That’s not the issue. It’s the fact that you are only a guy.”

In this quote, the owner emphasizes that the problem is not only technical but normative. Internal coordination of boundary spanning roles is not only evaluated based on whether a worker aligns their behavior with organizational interests. The speaker recognizes the value of Peter’s work. Instead, internal coordination is evaluated according to a principle of “consensus”,

on which “the entire place is based”. In other contexts, they described this as “getting buy-in”. The speaker downplays the technical alignment with a particular set of goals, but instead highlights the principle of participation. This high normative standard for internal coordination practices, however, made them less likely to emerge in practice.

The second event compelling reconsideration of boundary spanning roles was the departure of the General Manager. Months before my arrival at Northern Cooperative, the company had fired him. This had key consequences for the project manager role. In the company’s prior routines, the General Manager selected the project manager, who became the key intermediary between the company and the customer after a contract was signed. The General Manager’s departure forced the owners to reconsider the process for project manager selection. Here, members expressed concern that the selection process did not align with members’ individual or collective interests.

Members worried that “some members have strong opinions, but you can’t demand” a project manager. They sought to “mix up” project managers in order to give them experience with different customers and team members, but individuals with strong external ties had preferences for project manager selection. As one member put it, “people have their buds, if you will.” In particular, members worried that the Sales Manager exerted undue influence on the project manager selection process, based on his relationship to customers, and “gets his way a lot.”

However, in describing the problem, owners presented this issue as a lack of sufficient oversight. In the project manager selection process, members talked about “uncomfortable situations” where they needed to “bring in someone else to take another look.” More broadly,

members expected that changes to the project manager selection routine would put some "buy-in into the process". Therefore, beyond the technical goal to expose workers to a wider set of customers, owners also sought to reinforce participation and oversight.

Analytic Overview

At Northern Cooperative, the members were concerned about the management of "volatility" and "uncomfortable situations" in boundary spanning roles. These instances highlighted a lack of internal coordination practices. The Board sought to "wrest" some control in sales and project management.

Yet, the owners defined the problem in a manner that highlighted the challenges of internal coordination in the context of distributed structural power. On one hand, they defined problems as technical challenges, like reducing "volatility" and increasing worker exposure to customers. At the same time, the goal was not only to align with particular goals, but to ensure "consensus" in the process of aligning with those goals. This high bar for internal coordination practices, in the short-term, highlighted the additional cost of internal coordination at Northern Cooperative.

4.4.3 New Boundary Spanning Practices at Southern

At Southern, the owners expressed a desire to escape the spiral of being too "reactive", and increase their external boundary spanning capacity. In the months while I was at the company, Richard and the other owners began to implement a rapid succession of changes. While they recognized external coordination as a key challenge, their effectiveness was limited

by Richard's resistance to changes that undermined his control over boundary spanning practices.

Sales Role

One of the limitations identified by the Southern ownership concerned lack of capacity to be "proactive" in the pursuit of sales opportunities. During my time at Southern, Richard implemented two sets of changes to the sales role: hiring a new salesman and implementing a new set of practices to formalize the sales process. That the first reform failed while the second succeeded illustrates how concentrated structural power inhibited the development of new external boundary spanning practices.

Several months into my time at the company, I learned that Richard had hired a new salesman. He was the son of a former customer, who was a friend of Richard's, possibly attenuating the risk of placing a non-owner into an external boundary spanning role. Brendan did not have a background in engineering, but had previously worked in sales. His appearance revealed an effort to distinguish himself from the organization, acting like an external boundary spanner. He dressed more formally than most other workers. His car, a sleek black sedan, stood out in the rows of pickup trucks in the parking lot. While he was still interviewing Brendan, Richard and I stood outside of his office, talking about his vision of the position and Brendan's potential to fill it. I recorded in my field notes:

> "Richard has a better sense of the job he wants the guy for than that the guy is right for the job. He wants another sales person. This guy has connections at BottleTech and this could be part of his portfolio, but Richard doesn't want this to be 'more than 20%'. He wants this guy out there 'shaking trees'; they are always so reactive, Richard says."

Thus, there was an immediate tension between an individual who brought external coordination practices into the company and a majority owner who sought to preserved internal coordination. Even in seeking to expand boundary spanning capacity, Richard pre-empted Brendan's autonomy, specifying how he allocated his time. Brendan, however, challenged Richard's efforts to constrain his role. This conflict was evident from his first appearance in a project oversight meeting. As Richard walked the group through the list of ongoing projects, Brendan sat quietly. Then, abruptly and in his first contribution, he interrupted with a suggestion veiled as a question:

> "Is there any way, because right now anything measuring time is by weeks. Is it too complicated to go by hours? Full hours? Work hours? Whenever you're measuring productivity, you already measure it by hours. If we could break it out, where we have hours, where we are behind on hours."

The difference between his tone and the tone of others in the room was striking. He was less deferential to Richard than the others, asking questions as if he knew that they were important questions to be asked. His first contribution to the meeting was a proposal to change oversight measures, explicitly challenging existing internal coordination practices. As he settled in at the company, Brendan began to introduce a range of proposals for new sales strategies. He proposed that the company work more closely with "vendors" to "harvest" their client lists. Brendan also talked about more radical redirection for the company, like doing "contract manufacturing" or selling customers "production and development space" in Southern's facility.

Richard and Brendan "agreed to part ways" after one year at the company. One worker said, "either Richard was going to tame Brendan, or he was going to kick him out". Comparing Brendan to another recently hired employee, Richard explained,

> "Colin gets the fact that he's going to wear a lot of hats and he likes it. Brendan has got his vision, what he wants to do, and it's not multiple hats. It's, I want to see the big picture. If I wasn't here, I think Brendan would be a good person to have here. He sees the numbers. And I don't mean that he would do the same thing that I'm doing. He would do it differently. He could drive this place from seeing the numbers. Well, we're too small a company to have a driver who's doing it this way and another guy who sees the big picture and is driving it the other way. I don't think we're way far off in where we want to go, but how we want to get there is vastly different."

In Richard's estimation, Brendan's failure had to do with two factors. First, Brendan had an idea of a particular role he wanted to play, while Richard wanted him to serve a role that he had defined. Second, the particular role that Brendan wanted to play was the same role played by Richard. They both sought to be "drivers" and think about the "big picture", but the presence of both individuals was impossible to resolve. They both wanted to engage in external coordination practices. Yet, repeatedly, Brendan's tendency to "think big picture" and "challenge Richard" was referenced as a source of conflict.

The second and more effective effort to build external boundary spanning capacity in the sales role involved the development of tools to routinize and formalize sales processes. Some created metrics with which to evaluate the sales effort. At the regular sales meeting, they would update a "confidence level" measure to quantify their expectations of winning a job prospect. Colin was tasked to develop a "quote qualification info path". This was a data entry tool meant to help salesmen gather the most useful information as they developed quotes. The tool would ask for basic information on the potential project and each entry would lead the tool to particular additional information requests. This new external coordination practice sought to increase the quantity of information gathered from potential customers. These new practices both increased

external coordination, but they also provided Richard increased information with which to evaluate sales efforts. In other words, they were both internal and external coordination practices.

Relatedly, Richard undertook a set of reforms to define and clarify roles within the sales function. He described it as "drawing a line in the sand" to "commit to sales". Richard sought to pull himself and Sam out of managing production. Sam was a minority owner recognized as having strong sales skills, but who had previously concentrated on managing the electrical engineering group. This also meant that the other minority owners, Bill and Phil, would "take over manufacturing". Explaining this to them, in an early morning meeting, he described needing to establish a clear "divide" in order to "commit" to the sales role. Similarly, in the quoting process, Richard defined who would have "the ability to start a quote", removing some individuals who previously served this role. These distinctions sought to strengthen external coordination, but they also reinforced internal coordination, by more precisely defining roles.

Within the committed sales group, Richard also wanted to define responsibilities. In a meeting with the other owners, he explained that he wanted to distinguish the project types managed by the different individuals involved in sales. This was most evident when talking about the types of sales done by Dave, a non-owner engineer involved in sales. He explained, "I gotta find out where the dividing line is, I gotta feeling right now it's spare parts." This already occurred in practice, but Richard sought to formalize and publicize that Dave would become responsible for managing all spare parts orders. He had recently instructed Dave that he should no longer update Richard when Dave received a spare parts order, as he had done previously. Richard articulated that he would focus on key customers and large systems, Dave would focus

on quotes for spare parts and fixtures, and the new salesperson, Brendan, would focus on new customers.

Finally, even as Southern undertook efforts to build external coordination practices, these new practices were sometimes overwhelmed by Richard's oversight. Around conflictual exchanges with customers, Richard would "step in". In one instance, the minority owner Sam was managing the sales effort for a potential new customer. Sitting in a sales meeting, I observed as Richard provided Sam with detailed instructions on customer communication and encouraged him to pursue the project even though Sam explained that "everything I'm doing right now is trying to prove to them that they shouldn't do it". Sam even articulated that his view on the project "was exactly the opposite" of Richard's. Ultimately, Richard convinced Sam to pursue the project and volunteered to join in a phone call with the client to address it. Thus, even as Richard sought to define roles and enhance sales capacity by bringing Sam into a sales function, he continued to exert control over the process.

Project Management

During my eight months at Southern, the central effort to expand external boundary spanning capacity in the project management role entailed hiring a full time "project manager" to oversee the full portfolio of projects. This effort was highly effective and its success can be explained, at least in part, by the way it fit with the existing power structure

The new project manager, Colin, was a young guy, in his early 30's. He had not previously worked in the automation industry, but he had a background in project management

and operations. Richard explained how he initially envisioned Colin replacing his role in project management, but quickly realized that this was not possible:

> "We brought Colin in to be a project manager. And the thing was, be a project manager because that's what we determined I was. So he was going to come in and be me. Well, we quickly learned, well, he's not going to be me. It's not that I'm cool, it's not going to work out that way. But what he is doing is stuff that I wouldn't do and couldn't do, but the customers love it. So the mindset was, I'm a project manager, we need another project manager and then we can calculate out, if we do this many millions of dollars, you need this many project managers, that's how it's going to work. Well, it's like, what he's doing, because he's not in it to the level that I was, he can maybe handle this much stuff at his level, I can now have my time freed up to do stuff at other levels. So instead of being slivers, it's layers."

Instead of replacing Richard, Colin worked in roles subordinate to Richard. As Richard described it; horizontal "layers" in the hierarchy versus vertical "slivers." Colin explained that he was "helping to clear their plate", giving Richard and the other owners "more time to focus on long-term strategy". He also described it as developing "chain of command", an "avenue for questions" for workers, or a "filter". I asked Colin why he thought that Richard was so willing to abdicate his control over the production stages of the project.

> "He was ready to free himself from headaches of running an operation. Plus I know he wanted to shape more of a vision for the company. I told him once before that the best way to do that at a company this size is to start at sales and control what jobs you do and don't want and the company will start to take shape based upon that."

Therefore, Colin recognized that his increased involvement in the production process left Richard the time to focus on external boundary spanning. Moreover, as Colin recognized, control over the sales process was the best way to "shape" the vision of the company. However, even after Colin took over the majority of project oversight, Richard retained some interaction with customers post-sale. Colin explained:

> "I maintained most of the post-sale interactions with clients through 2012-2013. As we got busier and I took on more responsibilities in Q4, 2013, I relinquished some of that communication on a project-by-project basis to the others who were managing projects. Richard was able to minimize his client interactions to sales, which became his primary focus; project escalations, and occasional check-ins with clients."

As Colin, explained, he took over many of the external boundary spanning responsibilities around the project management role, with several exceptions for "project escalations" and "check ins". When Colin first started, I observed meetings where Richard demonstrated some uncertainty about handing off customer interactions to project managers. Yet, over time, it did occur. However, Richard did maintain some external boundary spanning responsibilities around project management. I asked him about them:

> "TYH: What types of "project escalations" are you thinking of? Do any particular examples come to mind?
>
> Colin: Project escalations typically revolved around a large change-order that essentially needed re-scoping or that would force the project on hold. I handled most of those discussions, but he'd get involved and help communicate if the issue started receiving higher visibility, at a client's senior/executive levels. An example I can think of is Med-Tech's welder machines, where they essentially had to re-scope the entire project midway through, after the frame had already been delivered.
>
> Another example is of Pharma-Brand's dual-robotic packaging machine. In this case the senior managers had to decide when to travel and stay for a week, and needed to be in constant communication on updates so they didn't waste travel time to Southern if we weren't ready. Plus they were under a huge time crunch of delivering before their July 4th shutdown. In those times, I handled 95% of the communication on updates and delivery. However, when at the highest risk and uncertain times, Richard led or at least joined the calls to demonstrate he was aware of the issue and is helping to resolve."

Colin mentions a "large change-order" as an instance in which Richard would become involved. Change orders were revisions to the initial contract. This meant that financial negotiations were occurring and, under these circumstances, Richard retained involvement in the

"highest risk and uncertain times". I observed other instances where Richard "stepped in". I sat in one project kickoff meeting and watched Richard walk into the room, update the group on some ongoing negotiations with a subcontractor, and then leave. As Colin explained, Richard was more likely to step in when the negotiation involved a higher level manager in the customer company, like a "vice president". Finally, Richard would join customer interactions because, as the president and majority owner, his involvement demonstrated the organization's seriousness about a problem. I also asked about the "check-ins" that Colin mentioned, he explained:

> "these usually occurred when the clients were on site for testing, design reviews, etc. It was very informal and mostly showing them love. There were a lot of quick handshakes, talking about hunting or sports, and a quick gut-check on the system/project. If there was an issue, then he usually dove all in and helped troubleshoot on the spot. The check-ins were rarely connected to an issue; just friendly chats."

Thus, in this case, Richard also maintained informal connections to the customers. Similar to his demonstrations that he was aware of problems, these informal interactions demonstrated that the customer was a priority. Thus, project manager role, much of the external boundary spanning responsibility did shift to Colin. However, Richard retained limited involvement to maintain social ties to customers, "showing them love" and "demonstrating that he was aware" of problems.

Analytic Overview

At Southern, the ownership recognized problems in their external boundary spanning capacity and sought to address this through a number of changes in the sales and project manager roles. These changes were driven by Richard and he implemented them quickly during my eight months at the company. As the majority owner and president, these efforts themselves were

illustration of the effectiveness with which internal coordination occurred in the context of concentrated power.

However, some of these reforms were more durable than others, highlighting the limitations of developing external boundary spanning in the context of concentrated structural power. The effort to hire Brendan, a new salesman, failed after one year. Brendan sought to emphasize the external boundary spanning element, pushing his "vision" and proposals for new sales strategies. Explaining his dismissal of Brendan, Richard explained his assumption that this was "too small a company" to have two individuals setting the direction of the sales effort. This assumption reflected an implicit ideal type of a hierarchical organization.

Conversely, the new project manager, Colin, supported the "chain of command" and allowed Richard to "focus on long-term strategy". Colin took on external boundary spanning responsibilities, but during the "highest risk and uncertain times", Richard stepped in. Colin could effectively remove responsibilities from Richard's "plate" and handle customer interactions without challenging his control over the organization. In order to do this, Richard would continue "check-ins" with customers to reinforce his role as head of the organization. Most strikingly, Colin was not an owner but received substantial autonomy in his external boundary spanning role.

Finally, in the new "rules" and "roles" defined in sales, individuals shifted in and out of external boundary spanning roles, but under clearly defined conditions. These new information gathering tools and clear role definitions allowed individuals to more effectively coordinate externally, but without sacrificing internal coordination. Moreover, they reflected an ideal of bureaucratic efficiency, consistent with concentrated structural power.

In these cases, the company was able to build external boundary spanning capacity, when internal control by the majority owner was preserved. Moreover, the reforms were based on bureaucratic ideals and leveraged the majority owner's ability to exercise efficient oversight.

4.4.4 New Boundary Spanning Practices at Northern Cooperative

Over my eight months at Northern Cooperative, the owners began to explore a new set of boundary spanning practices to address concerns about insufficient internal coordination. Yet, change was slower at the worker cooperative, inhibited by norms of equity and the high costs of participatory governance.

Sales Role

To address concerns about reactivity in initial sales efforts, the Board needed to approve policy changes. As introduced earlier, a subset of owners had lobbied the Board to create an "ad-hoc committee" to explore a reform of the sales process. This subset of owners, exclusively engineers, presented a proposal to the Board to create an exploratory fixed-term committee. In the Northern Board, there is a process for gaining approval to allocate time and money towards new projects. Following this protocol, the group was required to write a charter to guide their activity. Each of these steps illustrated the challenges of internal coordination.

One of the sections in the charter was a "need statement". It expressed the simultaneous goal of an immediate plan and organizational change to revise the sales process:

> "We need a strategy to define target markets geographically and by industry type. We will also need to define resources to compete in those markets, we need to develop both immediate plans and a way to continue that planning on a regular basis… marketing strategy, both plan and metrics for judging success."

Thus, the proposal entailed developing a marketing plan and developing internal capacity to manage that plan in the future. This change process would necessarily impact Peter, but the group recognized both benefits and costs to his involvement. On one hand, the members of the group recognized his expertise. "Is he good at what he does? Absolutely!" one of the members exclaimed in a meeting of the ad-hoc committee. To begin to develop a new sales strategy, members recognized that Peter had "key information" about the sales process that would be valuable in this change effort.

Yet, the group explicitly decided to limit Peter's involvement. They recognized that participation was a source of inefficiency. In fact, Peter knew in general terms that this ad-hoc group was operating and had asked one of the members, "why wouldn't you involve me from the beginning?" Instead, they decided that they did not want to get him involved "too early". They emphasized how a key value of the ad-hoc committee was that it created the distance to critically evaluate the sales process. One member explained how he directly informed Peter about his exclusion from the group:

> "I said, if we leave everything the same, it would have been irresponsible not to include you from day one. But we're not interested in it being the same. It's going to be different. And because it's going to be different, you don't need to be there from day one."

The members wanted to enact change and they anticipated that Peter would, at least seek to, if not effectively resist this. The group members referenced how Peter had "taken over" other ad-hoc processes. The group's decision to exclude Peter was explicit recognition that internal coordination was inhibited by participatory governance.

In order to improve internal coordination of the sales role, the group needed to convince the Board to support this change. They described the need to "sell" the change. This was particularly important due to Peter's high status in the organization. In a meeting, one group member discussed the challenges of convincing Peter to share information about his project selection process and change his behavior in the future. He explained with colorful language:

> "If we went to Peter right now and said, 'dude you got to take care, you got to keep track of that.' What's he going to do? He's going to flip you off, kick you in the nuts and push you out of his office. In that order, okay?
>
> Now if we get a Board that's actively engaged in this, and we say, 'you know what, this is why this is important.' If we keep track of that, we can do something with it because it's exactly what you want. I make a motion that we make Peter do that, all in favor? [Imitating a vote in the Board] We couldn't do that in the Board we have now, but we've got to be able to present some of these things. Some of these things we're talking about are going to affect the way we do things around here which means the Board is going to have to understand that. But I think we're going to get a lot more buy in if we do it incrementally along the way."

This quote highlights the additional challenge of internal coordination in the context of distributed structural power. Not only did Peter's autonomy based on the "Peter principle in reverse" limit the firm's ability to sanction him, but the need to convince the other members posed an additional cost on the imposition of constraint. In turn, this required them to develop their plan "incrementally" and keep the Board "actively engaged".

This led to a slow incremental process, where the group allocated substantial time to developing arguments and explanations of the plan they sought to carry out. Members focused on "understanding" the problem before seeking to solve it. Discussing whether to hire a marketing consultant, one member emphasized the degree to which they were taking incremental steps. He explained to the group:

> "First thing is education for us. How are we going to be smart enough to know to hire someone or convince ourselves that we are smart enough to do it ourselves?"

This comment illustrates the degree of incrementalism with which the group approached the problem. Before they could begin to develop a plan, they needed to first "convince" themselves that this was the appropriate course. The group invited a marketing consultant to have lunch with several members of the group, to learn about how a marketing role would fit into the Northern Cooperative organizational structure. Two of the group members took three-day executive education courses on marketing at the local university. In that course, they received a general overview of key marketing concepts, with small opportunities to think practically about the role of marketing in their organizations.

As this group advanced in their research effort, conversation shifted, but still did not reach plan development. Instead, they entered into conversations about the goals of the organization. Behind considerations about the appropriate markets to pursue were questions about the direction the firm should be headed. During a meeting, a member interjected:

> "Where I struggle with all this, and maybe I'm just too textbook, but I think we need to formalize what our goals are first. I think everything that we're talking about doing is going down a path, assuming we know the goal. It seems pretty obvious that we want to get sales, but are we talking about, do we want a whole lot of sales to keep us busy, but we're just getting by with the skin of our teeth? Or do we want high margin sales where we may not hit as many, but we make a whole lot of money? You know, I think that those kinds of decisions need to get established."

For the next 30 minutes, the group discussed organizational goals. Yet, this was not without purpose. This high level information about the purpose of marketing and organizational goals helped the committee members to make a compelling case to the Board. They described the new sales plan as a "philosophy" and a "significant change". In order to sell this change, they

needed to articulate how the change would advance the organization's goals. Thus, they needed to understand the organization's goals. Not only would it help them convince the Board, but the members expressed the need to be "convinced" themselves.

During my time at the company, the group did not get far beyond initial explorations. However, they did hold a number of information gathering sessions with Peter. In those, they asked about his process for prioritizing jobs and focusing on industries. One member explained that, whether or not sales increased from this process, it was inherently valuable:

> "To me, the exercise of asking these questions, we learn, we understand, it becomes brutally apparent how seat of the pants some of this stuff is, and gut feel. That's my biggest thing. Whether we get anything that we can use quantifiably or objectively to determine our direction from here on out? Just doing it, in my mind, I think we get that."

Thus, the ad hoc committee members saw increased transparency as a valued outcome of this effort at internal coordination. They did not, in this time, develop particular policies to constrain the sales role but removed some opacity around Peter's work. While these reforms did not directly constrain Peter or reduce his autonomy, they exposed him to scrutiny. Yet, this degree of internal coordination was more limited than even what the group had initially proposed to do.

Project Manager Role

Around project management, Northern Cooperative was also seeking to strengthen internal coordination. These had been spurred by the departure of the General Manager, but this event only revealed a lack of control members perceived around project manager selection. On one hand, the members wanted to be able to select the project manager strategically, in order to

coordinate resource allocation across projects and build long-term capacity. At the same time, the Sales Manager was encouraging particular project managers based on his knowledge of customer demands. Seeking to improve internal coordination, the members implemented two changes to the project manager selection process. Like the issues with the sales process, efforts to improve internal coordination were limited by the assumption that oversight would occur through participatory processes.

First, the Customer Relations committee started to take a more active role in overseeing project manager selection for projects. Northern Cooperative had hired a new General Manager, but he worked with one of the members, the Production Manager, to identify proposed project managers. Yet, they would frequently turn to a Board committee for oversight. In scheduling meetings, when the two would reach an impasse or a controversial selection for a project manager, they would pause and one would state "we should bring this up at Customer Relations, get the input from the group". This was already a familiar means of internal coordination at Northern Cooperative. Members recognized that the Customer Relations committee served as an oversight mechanism to address conflict. In field notes from a scheduling meeting, I described how one project manager asks the new General Manager to use this mechanism:

> "As he is leaving, Sheldon says two things. First, he is emphatic about the fact that he does not want to be put in a lead role on the South-Tech project. He says that in April and May, he wants to 'be taking lots of vacation days. Long vacations." He is emphatic about it and says it with authority to Mark. "Just so you all know", he says. Second, he asks Mark if he is the chair of the Customer Relations committee. Mark says that he's a co-chair. Then Sheldon asks Mark to update the committee on the status of the project. He says that he wants Peter "off his back", as he keeps asking when the floor will be ready. Mark replies that they will bring it all up in Customer Relations"

In this scene, the project manager explains his preference to not be assigned as a project lead in the near future so that he can take "long vacations" after a difficult project. Sheldon also expresses concern about pressure he receives from Peter to move on to another project, "when the floor will be ready". Sheldon knows that the Customer Relations committee is the established mechanism for oversight and asks Mark to implement this mode of internal coordination, as this validates his request and documents his concern. Thus, in the challenge to balance concerns between multiple boundary spanning roles, the project manager and the sales manager, the Customer Relations committee served as a means to mediate their concerns.

The second change to the project manager selection process was the increasing use of one-time member committees within the scheduling meetings. This was not an established mechanism for internal coordination. The General Manager and Project Manager, when conducting their weekly scheduling meeting, began to invite a group of members into the meeting to deliberate on a decision. Members were invited when they were potentially under consideration for the project in question or their ongoing projects would be impacted by the choice. Like with other internal coordination efforts, the challenge was not only technical, but also sought to increase "buy-in" on a decision as an end in and of itself. In the following scene, the schedulers were deliberating over a project manager for the ProSys company, which was a new and potentially valuable customer. They called six engineer members into the meeting. In turn, the Production Manager explained the purpose for the meeting:

> Bill: So the main reason I wanted to get a group of people is, from sales, we highly anticipate that we're going to get this ProSys job; another large job. We should look at who would be an anticipated project lead and controls lead. Um, and there's actually work that we should do as soon as next week, right Rick, as far as going back on the firm numbers on the quote itself.

> [some explanation of the initial work to be done by project manager]
>
> Bill: And the reason I wanted to do this is, um, we got a couple, the way I see it, available resources that we could consider as the project lead. Peter, himself, has requested strongly and he has told me. In Customer Relations, Monday, we will be discussing this. And, so I just wanted to get some thoughts from you guys before. But he's. He wants Rick to do this. So I'm just going to lay that right out there. But Rick has a lot on his plate. So it would affect you Dave, it would affect the work in process as far as documentation and all that, finishing up. So if that was to be what we did, we would have to come up with some support for Rick, support for your CompTech efforts.

Here, Bill explains that he is calling this meeting of owners outside of the formal Customer Relations committee to get additional "support" for the selection of Rick as the project manager. Bill wants to ensure that Peter is not exerting excessive influence on the project manager decision. To ensure that the decision has "buy-in", as others would call it, he calls this meeting. Later in the meeting, after the rest of the group had left, Bill explained to Mark why he had called the meeting:

> "Bill: This whole meeting and the whole previous meeting on Machine Inc. were all about who's representing Northern Cooperative to the customer. Because they're both new [customers]. And we want really you know, shine as best as we possibly can. And that's the only reason why we're meeting. It's not that we don't have enough resources overall. It's that we have to get the right choice. And then there's lots of information scatters. And Peter is already talking to Rick about doing ProSys and we don't even have the order in. Scheduling hasn't said yes he would be the resource. That's our protocol. So I wanted to have a meeting to get the buy-in from everybody about who the resource really should be and do it that way. And make it more formal. That's why we'll send out an email to Peter and Charlie and Russell, probably to Customer Relations, letting them all know that we met and determined that, with this potential ProSys job, we recommended that, yes, we go with these resources."

Here, Bill highlights how there is a "protocol" to project manager selection, which involves selection by the scheduling group and oversight from the Customer Relations

committee. However, he is concerned that this will be insufficient to achieve "buy-in". He highlights the problem of "information scatters", meaning that individuals will deliberate the decision outside of the meeting. The one-time meeting serves as a way to reinforce internal coordination. Here, the internal coordination problem does not revolve around finding an effective solution. The group is agreeing to select the project manager that Peter proposes. Instead, the goal is ensure that "protocol" has been followed and the group adheres to the norm of consensus. He goes on to explain that he will send this information along to Peter and the Customer Relations committee to "make it more formal". He wants to publicize to the company that the group sought "consensus", as a member described it in another context. Sitting afterword, we continued to talk about this process:

> "TYH: So, before this meeting, you had another one that was similar on Machine Inc?
>
> Bill: yeah, I did the same thing a week ago. We had the same concern. Sales working hard, nurturing this customer for over a year, finally getting really close and then, internally, I want to say sales had an idea of a lead but, internally, other project leaders didn't think that was a good choice. And so, I just wanted to get a group together, have some buy-in. have some shared information to take to Customer Relations to say, hey, I met with the project leaders and this is what other project leaders recommend. And that's what we did."

In this case, Bill explains how sometimes this procedure overturned the influence of the Sales Manager, Peter. Thus, here, internal coordination was both a technical challenge to find a "good choice" and a normative challenge to get "buy-in". He went on to explain:

> "You know, it's a lot of talking and stuff. But just in our environment, doing what we just did it gets a nice buy-in from everybody and what it does is it gets support for any changes if there were. And it helps. And then, ok, you think, we just had a number of people in here. We just spent an hour and a half talking about this. But it cuts down, because we talked about it. It cuts down on all the side conversations that we would have in any business about management decisions. We got the buy-in so there will be no little side conversations."

Bill explains that he formalizes the deliberation process so that others recognize that a legitimate deliberation has occurred. Bill wants to avoid "side conversations", which are instances of second-guessing the decisions that get made. He suggests that these would occur in "any business". The difference at Northern Cooperative, however, is that the individuals engaged in the side conversations are owners and expect their interests to hold weight.

Analytic Overview

At Northern Cooperative, the members undertook efforts around the sales and project manager roles to "wrest" control. They sought to strengthen internal coordination practices, yet these efforts were limited by the power structure. In a context where internal coordination required "a nice buy-in", efforts were more costly.

This was most apparent in the ad-hoc strategic marketing committee, where the high costs of governance impeded substantial internal coordination. The group was created to establish a "marketing plan" and "capacity" for planning in the future. They avoided including Peter, "too early", recognizing that his participation only exacerbate internal coordination costs. Yet, even without his presence, the process was slowed by the need to deliberate "goals" and even "convince themselves" of a project they themselves had proposed. Ultimately, they achieved a weaker form of internal coordination, convincing Peter to share information about his decision-making process. This, in and of itself, was viewed as an accomplishment, illustrating the limitations on internal coordination in the context of distributed structural power.

In the project manager selection process, the internal coordination effort was more effective. The scheduling team implemented new practices to increase "buy-in" on decisions. In

describing the need to build "buy-in" around coordination efforts, Bill refers to the need to follow "protocol" highlighting the degree to which participatory oversight is institutionalized at Northern. Adherence to this norm is facilitated by the use of an existing mechanism, the Customer Relations committee. As Sheldon demonstrated when he asked them to use it, this committee was a familiar means to achieve internal coordination. Thus, there was no need to deliberate about goals. While still costly, in the context of distributed structural power, participatory oversight is facilitated by the use of established mechanisms.

4.5 Extracting General Themes and Integration with Existing Literature

This chapter began from the observation that, while firms with distributed structural power are thought to more efficiently undertake representative inter-organizational boundary spanning (Levin and Tadelis 2005; Maister 1993), this view ignores the presence of both internal and external dimensions. External coordination entails the development of relationships to external parties, while internal coordination entails alignment of external relationships with goals and demands inside the parent organization. I sought to explore how these two dimensions of boundary spanning are shaped by distributions of structural power.

The data presented here suggests that different distributions of structural power enable and constrain different dimensions of boundary spanning work. At Northern Cooperative, external coordination practices are widespread, while internal coordination is limited and weak. Conversely, at Southern Incorporated, internal coordination practices are well established while external coordination practices are limited. This problem even persisted after the companies recognized their limitations and sought to address them. Thus, distributed structural power is

both an advantage and disadvantage in inter-organizational boundary spanning efforts. Below, I present two key themes from the prior analyses, which revise current understandings in the literature on structural power and boundary spanning.

Structural Power and Boundary Spanning as an Organizational Phenomenon

This analysis diverges from prior conceptualizations of the relationship between structural power and boundary spanning. Literature on professional service firms argues that allocation of partnership rights to workers aligns incentives, such that workers can receive autonomy without risk of exploiting the firm (Levin and Tadelis 2005). Maister writes that "the autonomy of the partner would be one of the supreme virtues" of the partnership model (1993, 24). Thus, these authors highlight individual-level incentive structures as the mechanism driving differences in boundary spanning roles. Yet, at Northern Cooperative and Southern Incorporated, individual allocations of ownership did not explain how boundary spanning roles were defined. There were externally coordinated boundary spanners, like Peter at Northern Cooperative and Colin at Southern Incorporated, who were not owners. Conversely, the minority owners at Southern Incorporated and project manager owners at Northern Cooperative both experienced internal coordination in their boundary spanning roles.

Instead, this analysis suggests that the mechanisms operate at the organizational level. One set of mechanisms related to the governance structure. Hansmann highlights how internal coordination is more costly when structural power is distributed (1996). At Southern, where internal coordination only required a decision from Richard, they occurred frequently. Minority owners would "check" with Richard on project proposals and he would "dive in" to conflictual

project management issues. Even after Richard decided to “draw a line in the sand”, he continued to intervene in boundary spanning issues. Conversely, at Northern Cooperative, each effort at internal coordination entailed an “hour and a half” meeting to get “buy-in”. Efforts at internal coordination entailed deliberation over “what is the purpose of Northern”, as one engineer described it.

Hansmann does not, however, consider how distributed governance might lower the costs of governance over external relationships. Peter and the project managers operated as “lone wolves” because “there’s nobody sitting over watching all the projects go through.” An assembler explained that he engaged in more external coordination because there is no “higher level, where things are really discussed”. It was the distribution of governance rights and associated governance costs that encouraged more external coordination at Northern Cooperative, and not individual incentives.

A second organizational mechanism was the pursuit of organizational ideals aligned with the distribution of structural power (Rothschild-Whitt 1979). At Southern Incorporated, the set of norms that shaped boundary spanning roles resembled a “bureaucratic organization” (ibid). Appeals to managerial authority were taken for granted as “that’s just the way it kind of works”. Workers assumed that it was inappropriate for them to “get involved” in external conflict and used phrases like “chain of command” and “bring it up the ladder”. Richard took it for granted, in his relationship with Brendan, that it was impossible to have two “big picture” thinkers setting goals. Problems with boundary spanning roles at Southern were solved through definition of rules and roles.

At Northern Cooperative, the norms resembled a "collectivist-democratic" ideal. The norm of "consensus" permeated the organization and was perceived as "what this entire place is based on". Even when issues were not conflictual, as in the case of the project manager selection process where the group agreed with Peter's recommendation, they still allocated time towards formalizing "buy-in". Even when the ad-hoc committee did not manage to impose constraint on Peter, they perceived increased transparency as a desired outcome, in and of itself. Here, it was not incentives that increased external coordination practices at Northern Cooperative, but norms of equity.

A Tension Between Internal and External Coordination

Past literature on boundary spanning has noted the distinction between internal and external coordination (Foss et al. 2013). These two dimensions are seen as complementary, as they align external demands with internal resources. While they may be complementary, in principle, this analysis shows how they are conflicting in practice.

Effective external coordination can be a source of authority, which challenges efforts at internal coordination at Northern Cooperative. The ad-hoc committee seeks to impose constraint on Peter by excluding him from the committee, but they also recognize the need for his "knowledge" in order to effectively develop a marketing plan. Conversely, strong internal coordination constrains external coordination at Southern Incorporated. Richard fires Brendan because his effort to develop new external coordination practices like marketing to vendors undermines the "vision" that Richard has defined. One explanation for the strength of this tension in the cases studied is that these boundary spanning roles entail management of highly

valuable customer relationships, as opposed to more informational boundary spanning roles studied in other contexts (Foss et al. 2013). When more resources are at stake, the tension between external responsiveness and internal coordination is heightened.

4.6 Recapitulation

To conclude, this chapter shows how both concentrated and distributed structural power both pose limitations for boundary spanning efforts. First, it challenges the view that firms with distributed structural power will be more effective in inter-organizational representative boundary spanning, instead presenting a tradeoff between external and internal coordination. Distributed structural power encourages external coordination, but limits internal coordination, while the opposite is true of concentrated structural power. Second, the tradeoff is grounded in the governance mechanisms associated with different distributions of structural power and the organizational norms associated with these distributions of structural power. Given the importance of effective boundary spanning for knowledge-intensive work, these findings highlight both the advantages and disadvantages of distributed structural power.

Chapter Five – Structural Power and Its Contrasting Effects on Task and Compensation Heterogeneity

A common assumption about worker cooperatives and other organizations with distributed structural power is that they tend to have less heterogeneous workforces than their counterparts with concentrated structural power. "Workforce heterogeneity" captures the degree of similarity among members of a workforce according to a certain set of lower-level characteristics. A workforce can be more or less heterogeneous along a range of dimensions, from occupation to demographics. When aggregate differences between workers are greater, workforce heterogeneity is higher.

Firms with distributed structural power are thought to have less heterogeneous workforces due to the heightened costs of conflict resolution between diverse members (Hansmann 1996) and due to the way heterogeneity complicates the pursuit of egalitarian norms (Rothschild-Whitt 1979). The claim is most familiar with respect to worker cooperatives (Greenberg 1980), but has been applied to other organizational forms where the majority of workers hold equal ownership and governance rights Similar arguments have been made about partnerships (Greenwood and Empson 2003), Israeli kibbutzim or collective farms (Abramitzky 2008), and worker collectives (Cornforth 1995). This constraint has important implications for the viability of these organizational forms because it inhibits their ability to draw more diverse skillsets, experience levels, or backgrounds, all of which might be particularly valuable in knowledge-intensive contexts.

Compensation and job responsibilities are frequently viewed as dimensions of difference where we are likely to see less heterogeneity in firms with distributed structural power. Both are dimensions of difference that potentially create conflict and are manipulable by managers. Yet,

in a range of cases, from advertising partnerships with multiple occupational groups (Nordenflycht 2007) to the Mondragon worker cooperative group (Cheney 2002), we see greater wage compression but consistent task heterogeneity. Similarly, at Northern Cooperative and Southern Incorporated, I find these opposed trends. This chapter, therefore, seeks to reconsider how distributions of structural power shape compensation and task heterogeneity.

In what follows, I set up the problem by presenting quantitative evidence from the two firms and, next, develop theory using qualitative evidence. I use payroll data to show that task and compensation homogeneity tend in different directions within the two firms, and in opposite directions between the two firms. Individuals engage in more specialized tasks at Northern Cooperative, but receive compensation closer to that of their peers, in comparison with Southern Incorporated. In turn, I draw on ethnographic data to theorize the mechanisms behind these trends.

I argue that the task and compensation allocation processes in the two firms can be usefully conceptualized as a multi-stage negotiation between individual workers and the ownership group (Avent-Holt and Tomaskovic-Devey 2013). In turn, the differing outcomes for task and compensation heterogeneity are explained by differences in the object under negotiation, the interests of the actors, and the bargaining tools provided by the distribution of structural power. Compensation is more compressed at Northern Cooperative because workers at the lower end of the pay distribution have more tools to negotiate over this pot of resources, while low pay workers at Southern lack those tools due to the power structure. Task heterogeneity is greater at Northern Cooperative because owners prefer to hire specialist workers who do not require managerial oversight, these workers prefer to work in their areas of expertise,

and owners encourage skill development based on an expectation of long-term commitment. Conversely, workers engage in a more uniform set of tasks at Southern because owners hire more generalist workers and limit skill development, to avoid risks of exploitation by expert workers, while workers hesitate to develop specialized skills to avoid additional monitoring.

5.1 Structural Power, Workforce Heterogeneity, and Conflicting Evidence

The most well-known claim about workforce heterogeneity and widely distributed structural power comes from Hansmann (1996), who highlights the additional decision-making effort required when a workforce is heterogeneous and they participate in governance decisions. While investors are thought to have a relatively homogenous set of interests, namely maximizing return on their investment, workers have more diverse interests for firm behavior. The time and effort required for coordination between these perspectives will only be enhanced when the workforce is more heterogeneous. Therefore, organizations with distributed structural power are more efficient if they have less workforce heterogeneity or enact policies to reduce workforce heterogeneity. Hansmann suggests that high governance costs are the reason for the rarity of worker cooperatives.

A different set of scholars come to the same conclusion, but through a different avenue. They highlight how workforce heterogeneity violates the norms of equity that give legitimacy to firms with distributed structural power (Abramitzky 2006; Rothschild-Whitt 1979). Rothschild-Whitt argues that, just as most conventional capitalist firms adhere to an ideal of bureaucratic rational decision-making, firms with distributed structural power tend to adhere to an ideal of value-rational decision-making, where the organization's authority to manage its participants'

behavior is conditional on the pursuit of a set of values. In "collectivist organizations", of which worker cooperatives and other organizations with distributed structural power are a part, a central goal is the pursuit of participatory democratic ideals. Organizational policies that undermine equality, like unequal pay or unequal participation in governance, challenge the ideal of democracy. Moreover, greater workforce heterogeneity makes appeals to equity more costly. Therefore, while this argument does suggest that such organizations will never achieve full homogeneity, they will pursue it to a greater degree than their counterparts with concentrated structural power.

The two prior arguments apply broadly to any dimensions of workforce heterogeneity that either shape worker interests or undermine norms of equity. Yet, two particular dimensions are frequently discussed, as they are both manipulable by managers and place important potential constraints on organizations. Most prominent are discussions of compensation heterogeneity, understood as variance in compensation across the workforce. Compensation heterogeneity is an important axis of heterogeneity, because disparate pay levels allow firms to hire workers with differing credentials and may have a motivating effect, encouraging workers to compete in a "tournament" for advancement (Galanter and Palay 1990; Mahy et al. 2011). In firms with distributed structural power, however, rules that compress compensation distributions are thought to reduce conflict among workers and advance norms of equity (Kremer 1997; Abramitzky 2006).

A second commonly cited dimension of heterogeneity is the content of an individual's work within an organization. Task heterogeneity is referenced, by many authors, alongside compensation heterogeneity as an equally important constraint on organizations with distributed

structural power. Task heterogeneity can be understood as the degree to which task categories are divided among sub-sets of workers. Tasks are an important axis of heterogeneity because they allow firms to engage in production tasks requiring more specialized skills and knowledge. When workforce has greater task heterogeneity, worker spend more time within a single task category and can develop expertise in that area. However, in firms with distributed structural power, prior research suggests that such task heterogeneity will be discouraged. Hansmann writes:

> "employee-owned firms also commonly strive to ensure that not only pay, but also amount and even type of work, is equalized among members of the firm." (1996, 94).

Similarly, Rothschild-Whitt writes:

> "Differentiation is minimized in the collectivist organization. Work roles are purposefully kept as general and wholistic [sic] as possible. They aim to eliminate the division of labor that separates intellectual workers from manual workers, administrative tasks from performance tasks." (1979; 517)

While the assumption of low task heterogeneity in firms with distributed structural power is less widely recognized than the assumption of low composition heterogeneity, it is thought to follow the same logic.

Yet, when we look at cases of distributed structural power, the evidence for low task heterogeneity is not as clear. Numerous cases of firms with distributed structural power exhibit the simultaneous occurrence of compressed compensation and sustained task heterogeneity. Abramitzky describes how equal compensation occurred alongside occupational diversity in the Israeli kibbutzim:

> "Because an average kibbutz consists of about 400 members with different occupations and abilities, working in different industries, equal sharing provides

> members and their families with valuable insurance against productivity shocks." (2008; 1117)

Rothschild-Whitt (1979), herself, describes policies that decrease compensation heterogeneity, while acknowledging the presence of heterogeneous "skills and experience". She writes,

> "At the Free Clinic, for instance, all full-time staff members were paid equally, no matter what skills or experience they brought to the clinic. At the Law Collective and Alternative Newspaper pay levels were set "to each according to his need." Here salaries took account of dependents and other special circumstances contributing to need, but explicitly excluded considerations of the worth of the individual to the organization." (Rothschild-Whitt 1979; 516)

Another striking case of simultaneous task heterogeneity, compensation homogeneity, and widely distributed structural power is the Mondragon Corporation, one of the largest clusters of worker cooperatives in the world, located in Northwestern Spain and employing nearly 80,000 individuals (Thomas and Logan 1982). While pay at the Mondragon cooperatives is compressed relative to comparable firms with concentrated or investor ownership, both within and across individual cooperatives, occupations vary widely (Bradley and Gelb 1981). In fact, in cases where conflict has emerged between occupational groups in Mondragon cooperatives, it has often focused around compensation disparities, and not task content (ibid).

These cases suggest that a closer consideration may be warranted, but they lack points of comparison. The firms with distributed structural power above preserve some task heterogeneity, but it may be lower than comparable firms with concentrated structural power. Given their common industry, location, and size, Northern Cooperative and Southern Incorporated offer an opportunity to make this comparison.

5.2 Contrasting Trends in the Two Firms

To what extent do we see less task or compensation heterogeneity at Northern Cooperative than at Southern Incorporated? Though the comparison of two firms limits our ability to identify the associations between distributions of structural power and workforce heterogeneity, at least several of the factors that might shape workforce composition are removed through the paired case selection. The two firms are located within a one hour and 30 minute drive from each other, and their workers come from an overlapping set of technical schools and universities. Thus, they can be plausibly described as drawing on a similar labor market. Second, they are serving an overlapping set of clients and their workers recognize the other firm as a competitor, suggesting that they are engaged in similar work. Thus, while we cannot separate differences in structural power distributions from other differences that might shape workforce composition, some of the most immediately obvious alternative explanations can be excluded.

First, I compare compensation heterogeneity in the two firms. Whether owners or non-owners, at both firms, all production workers are compensated according to the number of hours they work. This excludes managers and administrators, who constitute less than 5% of the workforce in both companies. Therefore, I focus on hourly labor rates, which change at most once per year. I take each worker's modal labor rate for the year, as entered in their payroll documents, and use that as their wage rate. In Chart 5.1, I present the worker/year observations in separate histograms for the two firms. At their request, I have removed the numeric wage scale, though the scales in the two histograms represent equivalent values. At Southern Incorporated, where structural power is concentrated, the wage rates are more widely and unevenly distributed. There is a substantial cluster of individuals on the low end of the range and

the high end of the range has a long tail, showing the subset of owners receiving the highest wages. At Northern Cooperative, the distribution is approximately normal with relatively few individuals at the higher and lower ends of the spectrum.

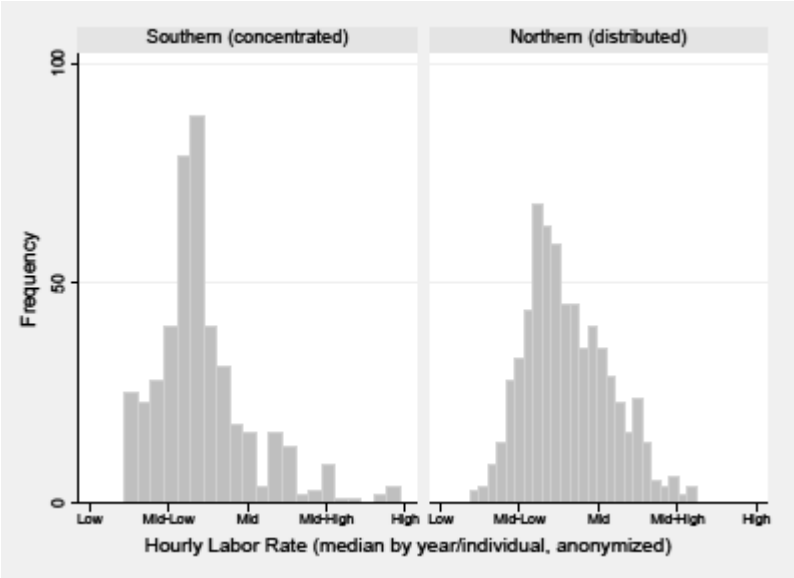

Chart 5.1 – Distribution of Median Wage Rates by Year/Individual

As a measure of dispersion, I calculated the standard deviation of individual-level wages for each year in each company. As Chart 5.2 below illustrates, the standard deviation is substantially higher at Southern Automation, by nearly a quarter, and the difference is highly statistically significant ($p<.001$). Thus, consistent with expectations, compensation homogeneity is greater at Northern Cooperative than at Southern Incorporated.

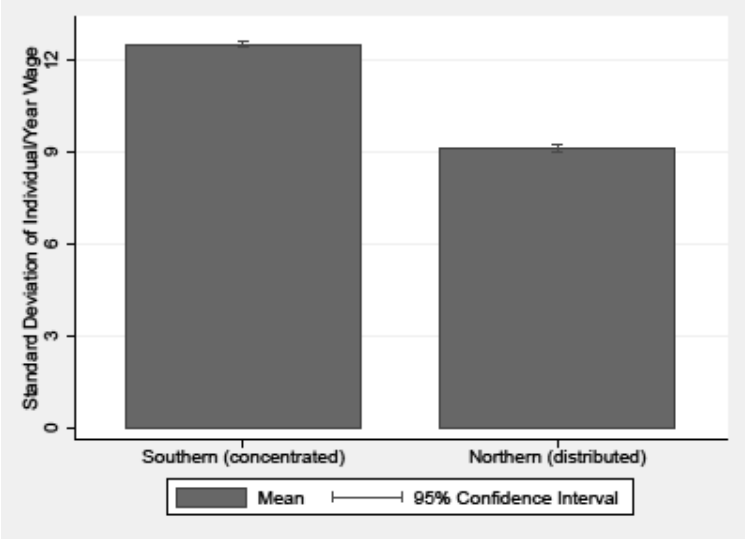

Chart 5.2 – Wage Standard Deviation by Firm

Next, I examine the degree of task homogeneity at the two firms. In the two firms, aggregate work is distributed similarly between the two core occupational categories. Blue collar work includes all labor hours in machining and assembly. White collar work includes all labor hours in engineering. Chart 5.3 presents total firm-level work distributions between these two task categories by year and company. In both companies, the companies engage in a higher proportion of blue collar work than white collar work in an average year. On average, the ratio is slightly higher for Southern than Northern. However, the overlapping confidence intervals between the two firms, in blue and white collar work respectively, indicate that the differences between the two firms are not statistically distinguishable.

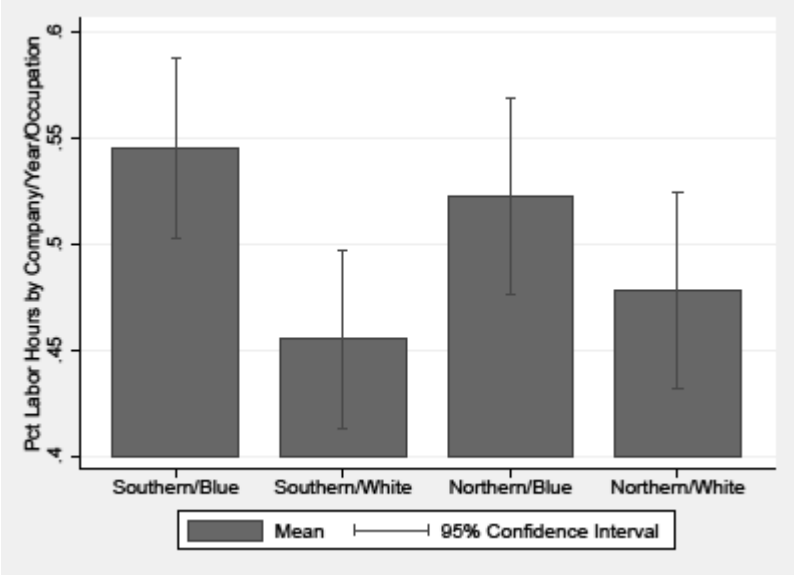

Chart 5.3 – Year Mean Labor Hours by Main Occupation Groups, by Company

What varies in the two firms, however, is the degree to which those categories of work are divided among distinct subsets of workers. To measure task heterogeneity, I examined the highest proportion of an individual's total labor hours that they spend within an occupation. The higher the proportion of hours that an individual spends in their top occupation, the more specialized I take them to be. Given that the distribution of labor across task types is statistically indistinguishable between the two companies, a more specialized average worker indicates that the distribution of tasks is more heterogeneous across individuals.

First, I examine the ratio of blue collar to white collar work by individual and company. In Chart 5.4, I plot the proportion of hours an individual spends in their dominant general occupational category by year. In both companies, individuals allocate the vast majority of their time to a single occupation. Yet, individuals at Northern Cooperative are more specialized and the difference is statistically significant ($p<0.01$). Moreover, there degree of specialization at Southern Incorporated has four times as much variance (.015) as Northern (.003). The distinction

between Northern and Southern, with respect to task heterogeneity, becomes even starker when we examine more detailed occupational categories. I grouped each individual's work according to four occupational categories: mechanical assembly, electrical assembly, mechanical engineering, and electrical engineering. This categorization, coming from the companies' payroll records, captures distinctions within the general blue and white collar categories. As Chart 5.5 indicates, when we consider task categories within general occupations, the workers at Southern Automation are even less specialized, relative to workers at Northern Cooperative. In a 40 hour work week, an average worker at Northern Cooperative would only spend approximately two hours outside of their specific occupational category, while an average worker at Southern Cooperative would spend approximately seven hours outside of their specific occupational category.

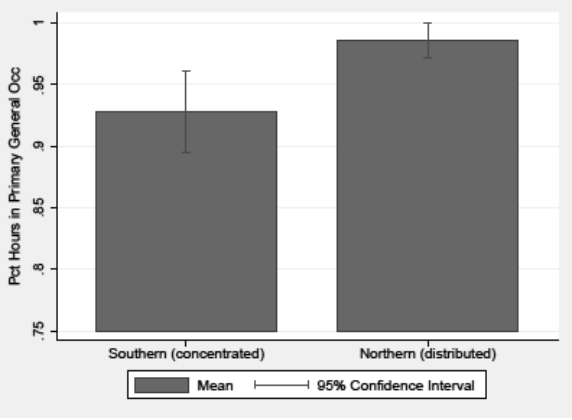

Chart 5.4 – Task Homogeneity by Company, Two Task Categories

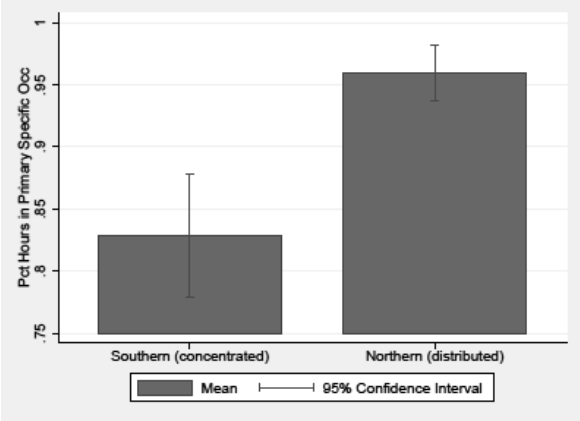

Chart 5.5 – Task Homogeneity by Company, Four Task Categories

Thus, while the firm-level distribution of compensation across individuals is more homogenous at Northern Cooperative, the firm level distribution of tasks across individuals is substantially more heterogeneous. Workers at Northern, where formal power is widely distributed, are paid more similarly but engage in tasks that are more different. The inverse is true at Southern Incorporated.

5.3 Qualitative Data Analysis

In the following section, I draw on observations and interviews about day-to-day life in the two companies, to explain the mechanisms behind these divergent trends. I analyze qualitative data from interviews, observations, and proprietary documents gathered during fieldwork at Northern Cooperative and Southern Incorporated. In total, I rely on data from three internal documents, nine field notes, and fifty-three interviews from the two firms.

I approached the data with a grounded methodology, in which I inductively generated categories from iterative coding of the data. During fieldwork, individuals in both firms repeatedly referenced decisions about task allocations and compensation as central to the

organization of work in these firms. Therefore, I directed my observations and interviews towards gathering data on how compensation and task allocation decisions were made. I then began to open code a sub-sample of open ended interviews and field notes where the participants placed substantial focus on the management of task and compensation decisions within the firms. Decisions about similarity and difference repeatedly emerged in open coding, which aligned with prior knowledge about heterogeneity claims in the power literature. This led me to consider task allocations and compensation as two dimensions of heterogeneity. I began to generate general categories within each of these areas of heterogeneity and iteratively revised them as I explored more data. Ultimately, within each of these categories of heterogeneity, I excavated three mechanisms that operate in both firms but push the companies in different directions. In the analysis that follows, I use as much *in situ* language as possible to describe the phenomena, as indicated by double quotation marks. Also, in the appendix, I provide a full inventory and coding of all excerpts analyzed for this chapter, so that the reader can assess the plausibility of my interpretations.

A grounded ethnographic approach was a particularly useful complement to the prior theoretical framing because it can help to specify mechanisms linking the power structure to decisions about task and compensation heterogeneity. This is important because one could argue that differences in workforce heterogeneity between the two firms, as highlighted in other chapters, is simply a result of differing management strategies or organizational routines (Schein 2010) independent of the distribution of structural power. Therefore, a central task of the ethnographic analysis is to show how these decisions about heterogeneity are directly shaped by the ownership and governance structure. In what follows, I emphasize how norms associated

with distributions of structural power and the associated governance costs shape how these decisions occur.

5.3.1 Contests over Compensation

The descriptive data presented in the previous section showed that there was less compensation disparity at Northern Cooperative than at Southern Incorporated. Wage disparities are expected to be lower in firms with distributed structural power than in firms with concentrated structural power, because they lower governance costs and align with norms of equity. The norm-based argument provides some indication of the underlying mechanisms, suggesting that arguments based on appeals to equity should hold greater weight at Northern Cooperative, but the governance-based theory does not offer a clear mechanism. Hansmann does not specify whether firms with distributed structural power and compensation heterogeneity will fail due to inefficiency, shift into areas of production that require less workforce heterogeneity, or revise their compensation structures to reduce conflict. Therefore, the following inductive analysis begins to unearth the mechanisms with which structural power shaped compensation heterogeneity.

First, while workers at Northern Cooperative tended to specialize in their occupational area, when they became owners, they began to adopt common oversight responsibilities. Owners found evaluations of these different dimensions of work difficult to distinguish, particularly because the opportunities to participate in oversight were so diverse. Conversely, at Southern, the opportunities to participate in organizational oversight were limited, drawing a stark distinction between the owners and non-owners. Second, the wide distribution of structural power at Northern Cooperative encouraged a degree of transparency that exposed pay disparities and

subjected the compensation decision making process to wide scrutiny. Conversely, at Southern Incorporated, pay secrecy provided a cover for pay disparity and most workers had limited understanding of the process with which pay was allocated. Thirdly, workers at the two firms differed in their views towards inequity. While pay disparities were a contentious issue at Northern Cooperative, and one that received substantial discussion, disparity in compensation was largely accepted at Southern Incorporated as a function of concentrated ownership. In the presentation of qualitative data below, I include events related to the determination of direct pay, bonus pay, and allocation of benefits. Though somewhat distinct, the mechanisms that shaped these different dimensions of compensation were largely consistent. The three mechanisms are summarized in Table 5.1. Below, I present each of the three mechanisms, showing its application in Northern Cooperative and in Southern Incorporated.

	Opportunities at the Top	**Transparency in Evaluation**	**Inequity as a Norm**
Northern Cooperative	• Wide governance participation blurs compensation distinctions	• High transparency about compensation decisions provides ammunition for claims making	• Wide governance gives space for different views of inequity
Southern Incorporated	• Limited governance participation creates competition, which justifies compensation distinctions	• Low transparency about compensation decisions limits ammunition for claims making	• Limited governance participation excludes different views on inequity

Table 5.1 – Three Mechanisms for Determination of Compensation

Opportunities At The Top

At Northern Cooperative, the structural power structure provided a great deal of opportunity for individuals to "be more involved in the business and help steer decisions". Specifically, when a worker became an owner, as one worker described it "it does put more responsibility. You've got to do things outside of your normal job, like serving on committees… [and] influence certain decision making within the company, like what kinds of jobs we take.". This occurred regardless of occupational grouping, as individuals engaged in both blue and white-collar work served as owners and took leadership positions on committees. One assembler described how some of his greatest accomplishments were achieved through leadership on the personnel committee, where he had helped to shape the workforce. Furthermore, workers described a strong norm against individuals or occupational groups monopolizing power in governance processes. As he described it, people who are "power hungry. They get eaten alive. The whole group gets them back on the straight and narrow." In one Board meeting, I observed white-collar workers being chastised for giving insufficient credence to the concerns of blue-collar workers and blue-collar workers being chastised for not being sufficiently forceful in their self-advocacy.

As more workers received ownership stakes, expansion of worker roles into managerial responsibilities proliferated so widely that multiple workers expressed worry that there was "too much growth at the top", which would result in excessive overhead costs from indirect labor. For efforts to distinguish between workers, these expanding roles made comparisons difficult. Discussing the challenge of setting wage rates among owners, one worker owner stated:

> "In the absence of clear roles and responsibilities, here we've got the machinist on one hand who's really good at what he does and he's up to his neck in the finance committee and we've got this other guy named Zachary who is a very good machinist but he has nothing to do with the finance committee, but is really

> instrumental in the marketing committee. So you color all these people and you've got lines blurring, and how you compare apples to apples?"

In sum, because the majority of workers had opportunities to participate in managerial roles, beyond their immediate occupations, this blurred evaluative schema. Furthermore, the range of opportunities to participate in management varied widely, offering unclear axes for comparison. It is notable, however, that the interviewee distinguishes between occupation-specific tasks, which are not blurred, and the governance responsibilities that are the source of blurring.

At Southern Incorporated, as well, increased managerial responsibilities outside of one's immediate occupational role served as an opportunity to expand roles. Yet, given the concentration of structural power, the range of opportunities was quite different from Northern Cooperative. Advancement was a widespread concern in interviews. Numerous workers talked about how their goal was to "get where Richard [the majority owner] is" or described it as the "I'm going to own this place one day mentality". The minority owners also saw themselves as potential successors to the majority owner. Even the majority owner, based on his own experience taking ownership from the founders, encouraged this mentality. As he described it:

> "I tell other people, I'm not dangling a carrot. I'm showing you an opportunity but you have to get it. I'm not handing anything to anyone, so I'm very partial to how it happened to me."

Yet, in comparison to Northern Cooperative, there was far less room at the top at Southern and this generated conflict when workers sought to take on greater responsibility. One worker complained that he wanted more managerial responsibility, but the management "didn't give them any room to do that stuff". This led him to the conclusion that "the only way that you really move up is going somewhere else". When workers did try to take on greater

responsibilities, they quickly came into competition with other workers seeking to "keep moving up". One engineer, who had recently taken a significant role on a highly profitable project, perceived that other senior employees felt threatened by his success. One could compete to expand one's roles and responsibilities, but it was a conflictual endeavor. As one worker described it:

> "You're going to end up driving yourself crazy just butting heads with everybody and not making friends with anybody, because your trying to push ahead of everybody all the time... because you starting to take over."

In sum, at Southern Incorporated, working across occupational boundaries was expected and there were ample opportunities, but rising up the hierarchy was costly, as there were few spaces at the top. This presented the primary opportunity to capture more compensation, but because it was highly constrained, the distribution had a long right tail.

Information Transparency

Second, differences in the degree of transparency around evaluation and compensation practices shaped way pay disparities were deliberated. At Northern Cooperative, more widely distributed structural power mandated transparency around pay and evaluation processes, encouraging deliberation over pay equity and constant efforts to manage it. Each year, the full set of employee owners would meet and vote on the pay ladder. A list of all owner and non-owner hourly rates would be shared with the group and the group deliberated on adjustments. Over time, the ownership group used different evaluation techniques to provide a basis for the deliberation, but continued to adjust their approach. Over time, there had been sufficient scrutiny of the evaluation processes as one worker described it, they had "gone through about ten

different methods of trying to figure out a good way to review each other… [and] haven't figured it out yet". Some individuals focused more on performance and levels of responsibility, while others focused on norms of equity. The result, however, was that the group tended to be highly conservative in their adjustments to the scale. According to one owner, "it takes about twenty years" for there to be a substantial change in the structure of the pay ladder.

This transparency and deliberation, however, excluded non-owners. One long-time non-owner employee explained, "I'm not a member so I'm not privy to that information as far as breakdown." He proceeded to explain his understanding of it, but then expressed reservation, saying "I'm kinda sketchy on this but this is my interpretation." Even within Northern Cooperative, the information boundary between owners and non-owners allowed for the reinforcement of pay disparity. When I was interviewing one of the owners about the pay structure, he expressed concern that my research would highlight pay differences between owners and non-owners, thereby creating conflict. On the other side, non-owner workers seemed to assume that they made less than the owners and accepted this as a function of being outside of the ownership group. One explained, in hypothesizing about his ranking relative to other individuals of the same occupation, "when you're the only non-member, how could I ever not be the bottom?"

At Southern Incorporated, given the concentration of structural power, access to information was limited. Most workers knew little about the pay structure and had little understanding of the evaluation process. Only the four owner partners knew about pay rates across the organization. Each of the three minority owners was involved in evaluation of workers with whom they worked closely and the majority owner oversaw all pay decisions. The majority

owner retained the right to unilaterally change pay levels and had done this on different occasions. In a most extreme case, as recounted by the majority owner himself, he changed his mind about a worker's performance on the day that he was handing out Christmas bonuses and decided not to give it to him.

Information about the pay structure was closely guarded by the owners. The only other employee able to see pay rates was the office administrator in charge of entering time sheets. As I copied into my field notes, he explained, "Southern doesn't track pay rates over time. Richard [the majority owner] insists that they don't do it. There is a field in the payroll database with which to track pay rates… but Richard insists that we just change the saved pay rates as they change. He doesn't want them floating out there." Another worker, conducting an internal financial analysis, asked for information on employee wage rates but denied access and instructed to use a generic figure for all employee labor rates.

As part of this lack of transparency, non-owner employees were exposed to evaluation from owners but did not have the opportunity to conduct evaluations themselves. This information asymmetry was, in turn, used to justify heighted compensation discrepancies between owners and non-owners. In one instance, one salaried employee lost pay because he used too many vacation days. He contested the decision, arguing that the policy was not clear and that one of the minority owners, who held similar responsibilities, had taken a similar number of days off. The majority owner responded that, while the employees had a clear number of allotted vacation days based on their seniority, information on the number of vacation days the owner had taken was not available to the employee. In another instance, a worker explained how

his lack of knowledge about the determination of his bonus prevented him from contesting it. Explaining the allocation of his bonus money, he stated:

> "Every year at the end of the year before Christmas we have a meeting. [Impersonating the majority owner] 'Oh year, sales were good this year, we did this, efficiency went up.' But I don't think he actually said we profited this much. Cause then we'd be like, hey, why am I only getting a little sliver? How much do you put into your pocket?"

Thus, distributed structural power involved wide information transparency at Northern Cooperative while concentrated structural power involved limited information transparency at Southern Incorporated. In turn, these differences in information availability provided different arenas and differing resources for deliberations about compensation equity. Most workers at Northern were owners, so they had the opportunity and resources to contest intra-organizational inequity. The opposite was the case as Southern.

Inequity as the Norm

Finally, related to the prior two mechanisms, the third feature distinguishing deliberations over compensation at the two firms was the degree of acceptance for inequity. At Northern Cooperative, the appropriate level of compensation disparity was actively deliberated and contested. Some workers viewed greater disparity as appropriate and justified it based on evaluations of merit. One explained, "If their work results in a bigger pie then, sure, give them a bigger piece." Others emphasized egalitarian norms. One engineer explained,

> "I see membership as a little different from other people. I'm of strong belief that when I became a member and when I signed my contract, that means that I became a member with them, I became an equal… we're here to share the profits, not distribute them unequally"

This debate played out in deliberations within the board, particularly with respect to decision rules on profit allocation. In one particularly consequential event, the board deliberated on whether to adjust the compensation rules. As one owner recounted it:

> "We've got disciplines that have greater responsibilities; a higher level of accountability to higher stakes with the decisions they make. They are engineers as opposed to tradespeople. In the real world they are compensated at a clip a lot higher than our distribution formula is resulting in. In other words the total compensation was too squashed. So discussions ensued, the board deliberated and an adjustment was made to the distribution formula."

Thus, concerns about compensation disparity were actively and widely debated at Northern Cooperative and a subject of frequent discussion. Owners differed in their acceptance of pay disparity, but the issue was neither ignored nor taken for granted. By contrast, at Southern Incorporated, most workers took pay disparity for granted. In particular, it was rationalized in terms of levels of responsibility. One worker explained:

> "There are a lot of people who are like I'm just here for the paycheck. It's not that they don't care about the quality of the work. It's just that they don't need to worry about it. They're like that's what they get paid the big bucks for; to worry about that shit. I'm here to worry about what I'm doing."

Some of those who remained at the company described their pay as both fair and insufficient. One worker said, "I don't make enough money, but I'm happy here. I make an honest wage." Another worker, one of the lowest paid in the organization, explained: "We do Christmas bonuses. It's really nice of them. They don't need to do it." He then went on to explain how he worked two additional jobs outside of this job in order to support himself. Other individuals were less accepting of compensation disparities, but they tended to leave the organization. However, instead of referring to internal disparities, their reference point was external occupational standards for compensation. The external labor market served as a

benchmark with which they could justify their insufficient pay, with some legitimacy. Several employees left because they thought they were not receiving appropriate salaries and raises, relative to their formal education. Recounting an employee's recent departure, another worker explained, "Mike Lewis from engineering quit. I guess in college, you're told you're worth more as an engineer."

Thus, not only did workers at Northern Cooperative have the information and opportunity to deliberate pay disparities, but concerns about internal pay disparities were legitimate topics for deliberation. As Southern, pay disparities were taken for granted. They were accepted as a natural result of concentrated ownership. Even when individuals did bring up pay disparities, they referenced external labor markets as points of comparison, instead of internal differences.

In sum, differing degrees of compensation heterogeneity at the two firms stemmed from differences in the opportunity and, even, conceivability of debating internal pay equity. In turn, these differences were directly shaped by the distribution of structural power. At Northern, a higher proportion of individuals held governance responsibilities and participated in debates about pay dispersion. Thirdly, pay dispersion was a legitimate, though contested, point of concern. All of these factors allowed the limitation of compensation dispersion and derived from the distribution of structural power. By contrast, at Southern Incorporated, a smaller proportion of individuals had the opportunity to advance up the pay ladder, secrecy about pay deliberations limited individuals' abilities to contest pay dispersions, and internal pay disparities remained either unrecognized or an illegitimate point of contention. In sum, at Southern Incorporated, the concentration of structural power led to factors enabling compensation heterogeneity.

5.3.2 Task Heterogeneity as a Reflection of Structural Power

Counter to prior literature, task heterogeneity moved in the opposite direction from compensation heterogeneity at Northern Cooperative and Southern Incorporated. The quantitative evidence from Northern and Southern made this case, but here I examine the mechanisms with which task heterogeneity was reinforced at Northern Cooperative and undermined at Southern Incorporated. To preview the findings, I identify three particular processes with which task heterogeneity was encouraged at Northern Cooperative and discouraged at Southern Incorporated: conceptions of ideal worker types, hiring routines, and perceptions of risk around new skill development. Through each of these mechanisms, decision-makers at Northern sought to expand valued knowledge and skills in order to preserve distributed power, while decision-makers at Southern sought to limit valued knowledge and skills in order to protect power. They are summarized in Table 5.2. Before examining these three mechanisms in detail, however, I briefly address an alternative explanation of the prior findings.

	Worker Ideal Types	**Hiring Routines**	**Perceptions of Risk in New Skill Development**
Northern	• Preference for more "self-motivated" workers	• Hiring process emphasizes professional credentials	• Lower perceived risk
Southern	• Preference "to hire guys that want to follow the leader"	• Hiring process emphasizes personal ties to ownership	• Higher perceived risk

Table 5.2 – Mechanisms Shaping Task Heterogeneity

Inter-Occupational Conflict at Northern Cooperative

Hansmann (1996) offers an alternative explanation of the task heterogeneity found at Northern Cooperative; namely, it's just not a source of conflict and therefore not constrained. He posits that heterogeneity will be inefficient in the context of distributed structural power when that heterogeneity generates conflict in governance processes. If the occupational groups on which task heterogeneity is based do not have differing goals and concerns for governance decisions, task heterogeneity is unlikely to cause conflict. Examining qualitative evidence from observations at Northern, however, we do find conflict. Specifically, inter-occupational interest conflicts emerged around two categories of governance decisions: job selection criteria and asset investments.

The Northern Cooperative Board had the responsibility to review decisions about potential jobs and decide the criteria for job selection. Different types of jobs differentially impacted occupational groups. For example, the Board had "talked about doing a standard product," which would entail repeated production of a commercial product. Some mechanical assemblers and machinists argued that it would "smooth out fluctuations in production," providing more regular work for them when there was less custom production. However, these standard products would not provide less work to engineers, as product design would change infrequently, and was thus never pursued. Similarly, Northern had limited opportunity to do "exclusive controls automation", but this only provided work to electrical engineers. Its expansion would change the necessary occupational workforce distribution, contrary to the interests of mechanical engineers and other occupations, and was thus rejected.

Finally, different occupations were differentially impacted by projects that would be installed in more remote locations. In particular, electrical engineers and electrical assemblers

were most severely impacted by these remote installations, because they were the occupational groups that would need to deliver and set them up. In one contentious exchange during a Board meeting, mechanical engineers forcefully lobbied for a profitable project that would require installation in a remote location, but electrical engineers and assemblers rejected their argument, stating that "a small group of individuals are going to make a big sacrifice for this project, even though the organization talks a lot about equity." Thus, criteria for job selection was a key governance decision that differentially impacted occupational groups, even dividing sub-groups within occupations, like electrical and mechanical engineers.

Second, interest differences emerged around investment decisions. The Board approved both financial investments and investments of labor hours. In some cases, as in the construction of a new building, interest differences did not divide along occupational lines. However, around more occupation-specific investments, inter-occupational conflict was substantial. In one instance, the machinists lobbied the Northern board for a new CNC machine. While the machinists recognized the "severity if his machine goes down", other occupations "are not into machining; they don't understand the plusses and minuses". One machinist described it as "very tough to convince" non-machinist occupations to make these investments. In a different case, the decision was around investment of labor hours in volunteer work. One of the engineers wanted to donate company time to his alma mater's engineering club, to help them fabricate some parts for a project. This investment, however, would disproportionately impact machinists and mechanical engineers, as they would be the ones whose time would be used. In a Board decision, the vote was split nearly 50/50 along occupational lines, pitting machinists and mechanical engineers against other occupations.

In sum, the higher level of task heterogeneity at Northern Cooperative cannot be explained by the lack of conflict between occupations in Board decision-making. While not the only source of differing interests, occupations were clearly differentially impacted by Board decisions. Therefore, to explain differences in task heterogeneity at the two firms, we must look at the process with which decisions over task allocation were shaped by the distribution of structural power.

Worker Ideal Types

At the two firms, contests over task definition began during the hiring process. In interviews, workers repeatedly described distinct ideal-types of candidates that their companies sought to hire. At Northern Cooperative, workers repeatedly referenced searching for workers "with experience" who are "self-motivated". A worker described their selection criteria in the following manner: "when we look to hire people, we look for people with experience, people that will fit in and kind of hit the ground running because we know that we're not good at training people." In particular, those involved in hiring sought out individuals who had experience in their particular occupation. Another worker explained "they were hired on because they were good engineers". Even individuals in the less professionalized occupations of the organization, like machinists, were also hired based on their occupational experience. One machinist, hired during my time at the company, had a highly specialized background working in fabrication for a custom aerospace engine manufacturer. In these interviews, the workers connected these preferred characteristics to the distribution of structural power through the high costs of managerial oversight. One worker explained:

> "We're not real good at training someone, so hiring someone right out of college and saying 'okay, now here's how you do this, and here's how you do this,' and that type of program we tend to not do very well, because everyone's sort of on their own and it's up to them to, you know, make sure they're on task and know what they're doing"

In another instance, an owner recounted being chastised for sanctioning a non-owner worker for behavior they perceived as lazy. At Northern Cooperative, there was a strong set of norms against hierarchy and explicit monitoring, and this led them to seek out workers who could operate without oversight. Thus, it was a resistance to hierarchical modes of management that created the preference for more occupationally specialized workers.

By contrast, the owners at Southern Incorporated described a different type of ideal candidate. The majority owner described how, when looking for employees, "the perfect employee for us is a jack-of-all-trades guy". This meant hiring workers who would be willing to work across occupational boundaries. As the majority owner explained, "I need a guy that can start wiring the panels that he designs". His concerns about the development of expertise and fights over control were illustrated in a story about a failed hire of an experienced electrical engineer. As he explained an encounter early in the employee's tenure that predicated his termination,

> "We were doing some stuff in electrical and we got behind and I said, 'Okay Jeffrey, can you go out there and do those panels?' 'Well, I got a guy that can do that,' he said to me. And I'm like, 'What do you mean you have a guy?' 'Well I got a couple of friends that are wirers.' 'We're just behind here a little bit, and if we could just get you to do that.' [Jeffrey responded] 'Well it just comes down to production [costs], you know. Where you're best going to spend your money.' And I'm not exaggerating… And he did that several times. From a design standpoint he was a sharp guy."

Thus, the majority owner was resistant to individuals who wanted to be highly specialized, even when recognizing that they had valuable skills. He perceived that specialized individuals, like Jeffrey, would try to leverage their expertise to manage company resources.

Thus, the company tended to hire less experienced and specialized workers. One worker had a bachelor's degree in engineering, but had no professional experience in the industry. He had only worked in retail and food service but described "being given a chance". Another worker described how he was told in his first interview that Southern will "invest in employees even if they have no experience in the industry." Another worker described how his job description fluctuated during the hiring process. He explained, "They were more so looking for someone to do machining and I think in-between the couple weeks of them hiring me and starting they kind of flip-flopped and said okay actually we can use some electrical work done". This individual, ultimately, worked as both an electrical engineer and an electrical assembler.

Relatedly, Southern Incorporated also tended to hire, what the majority owner described as "low A people". This was a reference to A and B personality theory, a categorization scheme for personality types based on individuals' responses to stress. High A type individuals respond positively to stress, demonstrate a sense of time urgency, and seek control, while High B types exhibit tolerance, conflict avoidance, compliance, and patience. Thus, Southern had traditionally hired individuals whose personalities contrasted with those hired at Northern Cooperative. As a non-owner worker described it, Southern "tends to hire guys that want to follow the leader."

This ideal type also had a basis in the power structure. When the majority owner reflected on his past hiring decisions, he attributed them to his desire to consolidate power after he took over ownership of the company. He explained to me:

> "When I took over I was immediately looking for a coalition and that's where I came up with Sam and Phil, and some of those A's got weeded out."

Another longtime employee described how, when the current majority owner took over from the previous owners, he clashed with some of the more outspoken workers and some of them left. In this worker's words, he "wanted control". Notably, the majority owner claimed that his tendency to hire workers who would support him had not been an explicit decision. As he explained to me, "I can't tell you that I did that consciously. I was like, shit! Did I do that and not realize I was doing it?"

Hiring Routines

A second point of differentiation between hiring processes in the two companies was in the routines used to recruit and hire job candidates. In particular, the two companies recruited candidates through different avenues and interviewed them in different manners. In essence, while the routines at Northern Cooperative drove the company to hire individuals with more clearly defined occupationally-specific credentials, the routines at Southern Incorporated drove the company to hire generalists who had demonstrated allegiance to the majority owner.

At Northern Cooperative, recruitment had evolved over time. Early on, the company hired workers through informal networks. However, over time, they shifted away from personalized networks. As one longtime worker owner described it:

> "We used to hire a lot of family and friends. This was a huge barrier to crawl out of. They didn't come to the company because they had the skills we needed. It took us fifteen years to get out of that. But as we've gotten bigger, we have increased the demands in terms of skill level."

He went on to explain that the problem with hiring friends and family without valued skills was that they didn't "pull their weight". This was a reference, again, to desire for a flat managerial structure without hierarchical control. Those involved in hiring at Northern Cooperative experienced that individuals hired through personal networks required more oversight and were less self-sufficient. The shift towards more professionalized recruitment processes culminated during a market downturn in the early 2000's. Northern had rapidly converted a number of workers to ownership status but, after the downturn, voted out a number of members who had entered through personal networks. Northern increasingly recruits through professional networks and these networks differ by occupational group. Assemblers and machinists maintain ties to a local technical college, where they serve on a board that oversees training curricula. Northern engineers maintain relationships with local engineering schools and their more distant alma maters.

Consistent with this effort to professionalize and increase the rigor of the hiring process, and reflecting the wide distribution of structural power, hiring currently operates through a committee of worker owners called the Personnel Committee. During the period in which I was doing fieldwork, the committee had members from each occupational group. As one member described it, membership on the Personnel Committee allows owners to "shape the direction of the company." The group is responsible for reviewing applications and interviewing candidates. Several employees, in interviews, described the types of questions that are asked. One mechanical assembler described how he preferred to ask personal questions about the candidates, but that this line of questioning had been challenged. As he explained these discussions over hiring practices "there was an ongoing debate at Northern… Did it matter what they did in their

free time?" Another worker owner described his own experience being interviewed. He recounted how "the hiring committee that was interviewing me definitely wanted to focus on the job-related portion of it" and avoided discussion of the cooperative organizational structure. Thus, the hiring process was exposed to wider critique due to broad participation. In that context of broad critique, considerations based on professional credentials were viewed as legitimate, while considerations of personal characteristics faced scrutiny.

By contrast, at Southern Incorporated, the company continued to largely recruit through personal networks, the majority owner held a veto over final decisions, and the personalities of candidates was of central importance. Consistent with the hiring criteria described above, these hiring processes increased the likelihood that the company would find workers committed to the majority owner's leadership. Recently hired workers described finding jobs at Southern through "being neighbors", "through a mutual friend", "through a friend who was a high school teacher" and because one's father had a longstanding commercial relationship with the company. Exemplary of this, Southern had recently hired a senior assembler who had experience primarily as a mechanic on industrial waste machines, but no experience in the automation industry. He explained how he went on a fishing trip with the majority owner and "didn't know it but I was having a job interview" and was offered a job a week later.

When workers did not come to the company through personal networks, many came to the company through online job boards like Craigslist and CareerBuilder. Southern had tried recruiting from technical colleges and universities, but had been deterred. The ownership group perceived that they could not compete with opportunities for professional advancement and compensation offered by the larger companies that recruited at those schools.

At the same time, as mentioned earlier, the company recognized problems in their recruiting techniques. The ownership had unintentionally recruited "Low Type A's" and was trying to change that. One difficulty was that the majority owner took ultimate responsibility for reviewing candidates, so there were limited perspectives on a candidate. If the company was recruiting through an online job board, an administrator would submit a job posting and the interested applicants would send their resumes to the majority owner. The majority owner would then select the individuals to receive interviews. Sometimes they would be interviewed by other owners and always by the majority owner. Yet, the owners recognized that they were collecting limited information on the candidates and had made some poor choices. The majority owner described one recent and alarming failed hiring experience that had, he explained, "just killed my confidence". He perceived the candidate to be an extremely strong one and they were fired within the first six months, leading the majority owner to the conclusion that he had a "huge hole" in his system. His response was to bring in an external consultant who administered and evaluated written personality tests for candidates. During my time at the company, this became part of the company's hiring and workforce evaluation routine. The company even administered the survey to current employees, to help identify a better fit for the worker.

Notably, the owner's response was not to distribute control over the hiring process more widely, in order to gather more diverse perspectives on candidates. Instead, he chose to implement a technological solution managed by an external contractor. This solution preserved control in his hands. It also did not, necessarily, lead the firm to hire more experienced or specialized individuals. The goal was to, in the case of one particular occupational group, "hire people who better fit the traits that we think of an engineer". Thus, instead of hiring individuals

whose background demonstrated their competence as an engineer, the mechanism focused on psychological traits that were thought to benefit an engineer.

Perceptions of Risk in New Skill Development

The tendencies towards task specialization at Northern Cooperative and task blurring at Southern Incorporated persisted as individuals progressed through their careers in the two organizations. While individuals at Northern Cooperative developed their skills and expertise with organizational support, at Southern Incorporated, skill development was constrained and fraught with concerns about power dynamics.

Opportunities to integrate new technologies and receive formal training to apply those technologies were more widespread at Northern Cooperative than at Southern Incorporated. In both companies, workers referred to the "risk" of investments in technology and training, but at Northern Cooperative, the perceived risk was lower and the perceived risk tolerance was greater. As one Northern Cooperative machinist, who was not an owner, described it, "they're not afraid to spend money for… for my work, tooling, software, and then training." In separate interviews, two engineers, one an owner and the other a non-owner, described their tolerance for investments in technology as "the leading edge, not the bloody part of the edge because there is a limit to our level of risk". The result was that workers described themselves deepening their skills and areas of specialization over time. Describing his evolution after starting in the company, an experienced engineer with tertiary education explained

> "If it's something that's needed for a project, you need to learn how to do it… So I have learned so much in the past three years that I had not been able to do before."

Thus, at Northern, workers had autonomy to develop skills that deepened their expertise within their areas of work. Individuals had greater autonomy to deepen their skills, but they were also responsible for initiating these skill development efforts. As one worker described it:

> "In our cooperative structure, the roles and responsibilities that each individual takes on is [sic] based on that individual's personal fabric. How much they do, how they operate, how they make adjustments, how much do they put into it. All those things are left up to the individual."

In order to receive approval to attend an external training, purchase a new piece of equipment, or take on a new managerial role, approval was required from the board of directors. Yet, workers described the approval process for external training as a "rubber stamp". This prescription to support role expansion was formalized in the company handbook, where "Education and Training" were listed as principles of the worker cooperative model. Thus, at Northern Cooperative, the owners did not perceive investments in worker skill development as risky. At the same time, these opportunities were only realized when initiated by workers. Yet, because Northern sought out self-motivated workers who fit their power structure, workers tended to deepen their expertise over time.

By contrast, the risk tolerance around investments in training and technology was understood to be lower at Southern Incorporated, leading to less specialized skillsets and responsibilities. Discussions about investments in training and technology often focused around the risk that workers or owners would take advantage of each other with new training and technology. In contrast to Northern Cooperative, decisions about investments in technology and skills resembled a tense negotiation. In one instance, Southern resisted investing in 3D drawing technology because the owners perceived it as a "crutch" that would "just enable a bad engineer to look better." Ultimately, however, as one owner described it, it was not until they received a

"push" from their clients that the company adopted the technology. One worker described an instance in which he received training but was criticized for not machining useable parts during the training, leading him to be "always worried about the bottom dollar" when he proposed training. On the part of workers, there was also hesitation about the development and utilization of new skills. New skills and capabilities were both a resource to be horded and a source of risk for exploitation. One worker explained how he experienced some hesitation to develop a new skill because "they're gonna expect people to know that stuff". If workers did develop new skills or develop capacity with a new technology, as one worker described it, they would sometimes "keep it to themselves… to have, how do I put it, job security". Thus, underlying considerations about skill development on both the parts of workers and owners were shaped by the consequences for power dynamics within the organization.

As a result, at Southern Incorporated, receipt of additional training required delicate negotiation and the trust of the owners. One worker described how he organized his training in computer numerical control (CNC) programming to be completed as efficiently as possible, in order to "prove it to them that I'm not just standing around doing nothing". He also explained how he felt the need to be delicate in his presentation of the idea and just "put the idea in the back of their head" so that they did not worry that he was trying to take advantage of them. The individual primarily responsible for procuring raw materials described how he identified a source of inefficiency in the raw material handling system they were using and proposed a new organization scheme. The majority owner approved it but emphasized that he should not allow this project to interfere with his immediate project tasks.

Thus, the two companies differed quite substantially in their recruiting, hiring, and training practices, and these differences had consequences for the degree of task heterogeneity in the two organizations. Northern Cooperative sought workers who would fit a context without a managerial hierarchy, and those workers tended to be more experienced and specialized. In turn, owners perceived less risk in investing in worker skills and "self-starting" workers were more likely to propose additional training and skill development. By contrast, at Southern Incorporated, those hired tended to be "Low Type A's" and workers without experience, as a means to maintain control and avoid exploitation. In turn, decisions about investments in skills were shaped by concerns about interest alignment and exploitation, on behalf of both parties. The ultimate consequence was less specialized skill development and, in the aggregate, a less heterogeneous workforce.

5.4 Workforce Composition as a Negotiation

In the remainder of the paper, I extract a more general conceptual framework with which to tie together the findings of the ethnographic analysis above. I develop the idea of workforce composition as a negotiation and consider its alignment with prior theory of the relationship between workforce heterogeneity and structural power.

This chapter began with the goal to better understand the relationship between the distribution of structural power and workforce heterogeneity. One of the most common assumptions about firms with widely distributed structural power is their tendency towards lower compensation and task heterogeneity, relative to their peers with concentrated structural power (Hansmann 1996; Rothschild-Whitt 1979). Yet, a range of counter examples suggest otherwise.

We repeatedly find higher task heterogeneity and lower compensation heterogeneity in firms with widely distributed structural power, relative to their counterparts with concentrated structural power.

A comparison of payroll data at Northern Cooperative and Southern Incorporated found the same results. The standard deviation of hour-weighted wages by company and year, an organization-level measure of wage dispersion, was 25% higher at Southern Incorporated than at Northern Cooperative. Conversely, looking at task heterogeneity, workers at Northern Cooperative spent 12.5% less time outside of their primary occupation than workers at Southern Incorporated. This motivated a closer consideration of the mechanisms with which higher task heterogeneity and lower compensation heterogeneity are encouraged at Northern, while lower task heterogeneity and higher compensation heterogeneity are encouraged at Southern. Towards that end, I inductively analyzed interview-based and observational data related to task allocation and compensation decisions at the two firms. Below, I seek to extract more general claims about the compensation and task allocation process, and consider how these claims align with prior theory.

The qualitative data above suggests that distributions of structural power shape compensation and task allocations through a process that resembles a multi-stage negotiation. Others have argued that resource allocations within firms can be understood as a result of negotiations between stakeholders with different degrees of power (Avent-Holt and Tomaskovic-Devey 2013). I found that a similar negotiation process occurs around compensation and task allocations. With respect to compensation, at Northern and Southern, repeated negotiations occur around pay determination and opportunities for advancement. With respect to task allocation,

negotiations begin in the hiring process and continue through an individual's tenure at the company. Decisions about investments in training and skill development constitute negotiations over an individual's specialization within their task area. Compensation and task allocations are two distinct outcomes at stake in these negotiations. The contrasting treatment of compensation and task allocation, in each of the two firms, is explained by the interaction of two factors: the distribution of benefits across these dimensions of heterogeneity and the way structural power shapes these negotiation processes.

5.4.1 Compensation Heterogeneity as a Negotiation

Compensation, at a single point in time, can be understood as a fixed pot of resources that must be distributed across the workforce. It is necessarily a zero sum game, in that the higher one individual's compensation, the lower another's will be. For the owners at Southern, the optimal outcome was to garner higher compensation for themselves, which necessarily left non-owners with lower compensation. This was a contested negotiation, however, as non-owners sought higher compensation. Constraints on the negotiation, deriving from the concentration of structural power, enabled the owners to extract higher compensation. The concentration of structural power meant that fewer individuals could advance up the hierarchy into positions that would allow them to more credibly argue for higher compensation. Limited transparency about compensation decisions reduced information with which non-owners could argue for higher compensation. Finally, limited participation in governance decisions meant that those who did question compensation heterogeneity had little opportunity to contest it through governance processes.

By contrast, at Northern Cooperative, the wider distribution of structural power limited any individual's attempt to garner higher compensation at the expense of others. The same mechanisms that allowed owners to extract higher compensation at Southern prevented them from doing so at Northern. Widespread opportunities to participate in managerial work blurred clear comparisons between individuals' contributions to the organization. Among owners, who constituted the majority of the workforce, full transparency with respect to wages provided individuals additional material with which to criticize disparities. Finally, widespread participation in governance processes allowed for more diverse perspectives around wage inequity. Not all workers adhered to the norms of equity that Rothschild-Whitt (1979) discussed, but some did and they had a voice in governance deliberations. Through these mechanisms, compensation heterogeneity was negotiated down.

Alignment With Prior Theory

The argument advanced here is consistent with and moves beyond prior views of compensation heterogeneity and structural power (Hansmann 1996; Rothschild-Whitt 1979). Hansmann anticipates lower compensation heterogeneity in firms with distributed structural power due to the governance conflicts that pay disparities create. Yet, he does not specify whether higher compensation heterogeneity leads firms with distributed structural power to fail or whether firms with distributed structural power tend to actively limit compensation heterogeneity. At Northern Cooperative, the owners actively constrain compensation disparities and the distributed power structure helps them to do so. This case extends Hansmann by showing

how information transparency and widespread governance participation provide rationales for lower compensation heterogeneity.

Rothschild-Whitt (1979) argues that firms with distributed structural power are more likely to adhere to a norm of equity, driving them to limit compensation dispersion. At Northern Cooperative, I find some workers explicitly articulating this norm. However, the norm of equity is only one of several tools applied in the negotiation over pay distribution. Others appeal to meritocratic norms in order to limit pay dispersion, citing the diverse contributions that owners make to the firm and leveraging information transparency. Thus, the distribution of structural power creates conditions that make an instrumental argument for pay compression more compelling. The presence of norms of equity may neither be necessary nor sufficient to limit compensation heterogeneity in the context of distributed structural power.

5.4.2 Task Heterogeneity as a Negotiation

Negotiations around task heterogeneity took on a very different character. A key condition for the differing treatment of task heterogeneity, compared to compensation heterogeneity, was the complexity and interdependence of tasks. Complexity and interdependence made heterogeneous tasks into sources of valued expertise. Complexity meant that tasks were not highly circumscribed and allowed greater opportunities for improving productivity in the production process as a whole. Whether an engineer or an assembler, individuals could develop substantial skill and expertise as they specialized within their task areas. Higher interdependence meant that the production process, as a whole, required close coordination between each set of tasks (Thompson 1967). Each occupational group working on a

project could not complete their task in isolation, but required coordination with other groups. As a result, increased specialization or task heterogeneity entailed greater mutual dependence. Task complexity and interdependence made specialization a source of power (Pfeffer 1981). This, in turn, shaped the negotiation over task heterogeneity.

At Southern, given the lack of interest alignment between workers and owners, development of expertise exposed the owners to risk of exploitation. Specialized workers could seek to extract additional resources from the firm, as in the case of the expert engineer who sought to negotiate work for his friends. The owners at Southern were hesitant to invest in worker skill development, for fear that they might not reap the benefits. One of the Southern workers described the delicate negotiation required to convince the owners to let him invest in new skill development. The owners at Southern managed to pre-empt these risks by avoiding workers who sought to specialize and pursuing workers with more closely aligned interests. They preferred hiring "jack of all trades" types through personal networks, where new hires had ties to the majority owner. Finally, the hierarchical management structure, backed by concentrated ownership, allowed for monitoring of inexperienced workers.

By contrast, at Northern Cooperative, task specialization aligned efficiently with the wide distribution of structural power. Specialization posed less risk to the ownership. Increased task specialization built mutual dependence, as each individual became more expert within their task area. Therefore, the negotiation over new skill development involved little conflict. It was a positive sum game, in that each party benefited. The assumption of aligned interests, based on shared ownership, removed the perceived risk of hiring experienced workers or investing in new skills. Moreover, the wide distribution of structural power meant that managerial oversight was

costly at Northern Cooperative. As a result, for the owners, individuals who did not require substantial oversight were a more attractive solution to labor needs.

Alignment with Prior Theory

The findings in this study diverge from the expectations of prior theory, which posit that both task heterogeneity and compensation heterogeneity will be constrained in firms with distributed structural power. Moreover, prior literature sees these outcomes as driven by the same mechanisms. Rothschild-Whitt (1979) highlights norms of equity and Hansmann (1996) highlights governance costs.

In Rothschild-Whitt's view, norms of equity are violated when the division of labor "separates intellectual workers from manual workers, administrative tasks from performance tasks." This is because these distinctions would place some workers in positions of greater importance in the organization. Implicitly, she refers to differences in the status of different positions and the power associated with them. She neglects to consider, however, that certain characteristics of production processes reduce the power and status distinctions between task categories. When production processes are more interdependent and tasks are more complex, as in the automation industry, power and status distinctions become blurred. Engineers and assemblers are conventionally thought to have clear power and status differences, but in this context, the hierarchy is less clear. Moreover, organizations can implement practices that allow workers to increase their status and deepen their power within task categories. Northern's distribution of structural power encourages the adoption of practices, like training and hiring experienced workers, which enhances the power of their occupational role.

Hansmann (1996) focuses on the governance costs of task heterogeneity under distributed structural power. Yet, he ignores the monitoring costs of task heterogeneity in the two contexts. At Southern Incorporated, specialization through task heterogeneity is avoided because owners risk exploitation by expert workers. Conversely, the cost of monitoring generalists is relatively low, as their knowledge is less unique, so Southern pursues this strategy. At Northern Cooperative, by aligning incentives, distributed ownership negates the risk of exploitation by experts. Moreover, at Northern, distributed governance makes monitoring costs particularly costly, motivating the firm to hire more experienced workers. Thus, in ways not considered by Hansmann, distributed structural power makes task heterogeneity more efficient.

5.4.3 Participation in Governance as a Source of Task Heterogeneity

One final concern involves task heterogeneity and governance participation at Northern Cooperative. While the prior evidence suggests higher task heterogeneity at Northern Cooperative, that data did not include hours spent involved in governance. If the majority of workers at Northern Cooperative are all involved in governance tasks, across occupational groups, this would presumably reduce the task heterogeneity. Hansmann (1996) suggests that firms with distributed structural power may establish representative governance bodies, in order to reduce governance costs. Yet, he does not consider how these governance bodies could reinforce task heterogeneity.

At Northern Cooperative, most governance responsibilities are delegated to committees of owners, working in different task categories. Owners at Northern are required to serve on at least one committee, but decide which committee they will join. I acquired a list of committee

members for the year that I conducted participant observation and coded the members by primary occupational group, based on the occupational group in which they allocated the highest number of hours that year. I then grouped the occupations by blue and white collar. Table 5.3 below shows the number of blue and white-collar owners on each committee. I excluded committee members who are managers or administrators, like the purchasing manager or the sales manager. I also calculated a "balance ratio" by subtracting the proportion of blue-collar workers on the team from the proportion of white-collar workers on the team. A positive number indicates more white-collar workers than blue-collar workers, and a negative number indicates the opposite. The following table is sorted by the "balance ratio" measure:

	White (Count)	Blue (Count)	Blue/White Balance Ratio
Finance	6	0	1.00
Energy	3	0	1.00
Marketing	2	0	1.00
Customer Relations	5	1	0.67
Office Tools	3	1	0.50
Co-Op Affairs	3	1	0.50
Safety	2	1	0.34
Social	1	1	0.00
Personnel	2	3	-0.20
Building/Maintenance	0	4	-1.00
Shop Tools	0	5	-1.00

Table 5.3 – Distribution of Owners by Occupational Group in Board Committees

The membership distribution reveals a clear division of labor, where committees are either dominated by blue or white collar workers. On committees that focus on issues primarily related to a particular occupational group, that occupational group dominates that committee.

Building/Maintenance and Shop Tools both manage investments in machinery and infrastructure, which primarily impact those working on the shop floor. Finance and Customer Relations focus on project contracts and customer interactions, both of which are responsibilities primarily handled by engineers. Several committees with strong representation from one occupation group reflect the interests of particular members. For example, the members on the Energy and Co-Op Affairs Committees have particular interests in these topics. Some committees with clear inter-occupational relevance have a more balanced representation, like the Personnel, Social, and Safety Committees.

This analysis shows the substantial heterogeneity across governance tasks at Northern Cooperative and the way that workers select into particular categories of tasks. This provides some indication that task heterogeneity is preserved, even when governance participation is included at Northern Cooperative.

5.5 Conclusion

To briefly conclude, this chapter looked into the widely held understanding that firms with distributed structural power, like worker cooperatives, will tend to have less workforce heterogeneity than their counterparts with concentrated structural power. This is a constraint on the viability of such firms, as worker heterogeneity allows for specialized skills and knowledge, central to knowledge-intensive work. Reflecting other studies of worker cooperatives, however, this study found task heterogeneity at Northern Cooperative, in fact, greater than at its competitor Southern Incorporated. Instead of viewing heterogeneity as a consequence of high governance costs or norms of equity, as prior work has done, the findings in this chapter argue that decisions

about workforce composition are usefully viewed as a negotiation between individuals and owners. The owners at Northern Cooperative compress wages and specialize tasks because this is the most attractive outcome for the respective parties, given their interests.

Chapter Six - Conclusion

Having delved into the details of knowledge-intensive work at Northern Cooperative and Southern Incorporated, this final chapter takes a step back to identify common themes, acknowledge the limitations of the study, and propose directions for future research. I will propose a more general framework that links the various relationships between knowledge-intensive work practices and structural power analyzed in this project. Next, I will consider how this study speaks to the literatures on structural power and knowledge-intensive work practices. Finally, I will discuss the limitations of these conclusions and identify directions for future research.

6.1 Recapitulation of the Study

This project began with the recognition that, while we observe knowledge-intensive firms with varied distributions of structural power, we have conflicting views of the relationship between structural power and knowledge-intensive work. Some scholars suggest that the complexity and uncertainty of knowledge-intensive work undermines the power relations that result from ownership and governance structures (Stark 2010). Others simply ignore structural power, instead emphasizing the range of knowledge-intensive work practices thought to facilitate knowledge generation and exchange. Alternatively, studies of firms with widely distributed structural power highlight how they encourage knowledge-intensive work practices and enhance their benefits. The underlying problem with these competing claims, however, is that no study has explicitly examined multiple knowledge-intensive work practices in comparable sets of firms with contrasting distributions of structural power.

Towards that end, I collected ethnographic and archival quantitative data on knowledge-intensive work practices at Northern Cooperative and Southern Incorporated. Ultimately, I found repeated evidence that structural power does shape work processes and their outcomes, even in complex and uncertain contexts. Moreover, by paying attention to the distribution of structural power that surrounds these work practices, we better understand when they are likely to emerge and when they are effective. Unlike the prior strategic human resource management literature suggesting that knowledge-intensive work practices support each other when implemented in clusters, i.e. more is better, this project shows how some practices are more beneficial than others, depending on the surrounding power structure. Moreover, unlike prior professional services firm literature, widely distributed structural power does not uniformly enhance or undermine knowledge-intensive work practices. The findings of this study suggest that widely distributed structural power and knowledge-intensive work practices sometimes complement and sometimes impede each other.

6.2 Categorizing Knowledge-Intensive Work Practices and Their Relationship to Structural Power

As a means to conclude, here, I propose a broader framework for the contingent relationship between structural power and the adoption of knowledge-intensive work practices. Given the range of knowledge-intensive work practices left unexplored by this study, it may be helpful to consider how the findings of this project can generate hypotheses about the relationship between structural power and other dimensions of knowledge-intensive work design. Therefore, this section considers the common features of the practices inhibited by the wider distribution of structural power and those that are encouraged.

Moving to a higher level of abstraction, one can consider knowledge-intensive work practices as efforts to encourage knowledge exchange within organizations. This may occur in two ways; either encouraging workers to share unique knowledge they already possess or providing workers the incentives and opportunities to gather more knowledge. Looking at the two dimensions of boundary spanning practices studied earlier, these operate through these two mechanisms. While internal coordination efforts require that boundary spanners share their distinct knowledge of external partner demands with the organization, allocation of rights to represent the organization externally allows workers to gather additional knowledge independently of the group. Put more broadly, in some knowledge-intensive work practices, the flow of resources moves from the worker to the collective organization. In some cases, the resources flow from the collective organization to the individual worker.

In the findings from this study, owners at Northern Cooperative are less supportive of practices that shift resources from the individual to the collective. This resource is, primarily, knowledge. Cross-functional interactions within teams, efforts to align boundary spanning practices with organizational goals, and task rotations all entail practices in which individuals either share unique knowledge or are prevented from acquiring unique knowledge. One can think of other knowledge-intensive work practices that extract and publicize unique worker knowledge, like 360 degree job evaluation schemes, quality circles, and open workspaces. The relative resistance to these types of practices, in a context of distributed structural power, occurs for two reasons. First, alignment of unique worker knowledge is more costly in a context where there is greater status equity between different sets of unique knowledge. The long deliberations over project manager selection and strategic marketing were illustrative of this at Northern.

Second, unique knowledge in a context of interdependence is a source of power and owners, in a context of distributed structural power, have less motivation to curtail the power of expertise. This was evident in the hiring practices at Northern. Thus, the costs of governance and principal-agent concerns underpin the diminished support for these types of knowledge-intensive work practices.

Conversely, other knowledge-intensive work practices entail a distribution of valued resources from the organization to the individual. At Northern Cooperative, the owners were more supportive of these types of practices, while owners at Southern Incorporated resisted them. The sales and project managers at Northern held greater autonomy to engage with external partners, in comparison to their peers at Southern. Similarly, a different kind of valued resource, compensation, was more widely and evenly distributed at Northern than at Southern. Other knowledge-intensive work practices that might fall into this category would include flexible work hours, investments in training, and "open book management", where firms increase the level of information sharing around firm financial decisions. The underlying mechanisms were similar to the prior set of practices, yet pushed them in the opposite direction as they entailed a downward transfer of resources. While principal-agent concerns encouraged cross-functional information exchange at Southern, it discouraged the majority owner from sharing financial information or invest in training. While high governance costs discouraged internal goal alignment in boundary spanning efforts, it encouraged increased autonomy for boundary spanners. I summarize this distinction in Figure 6.1.

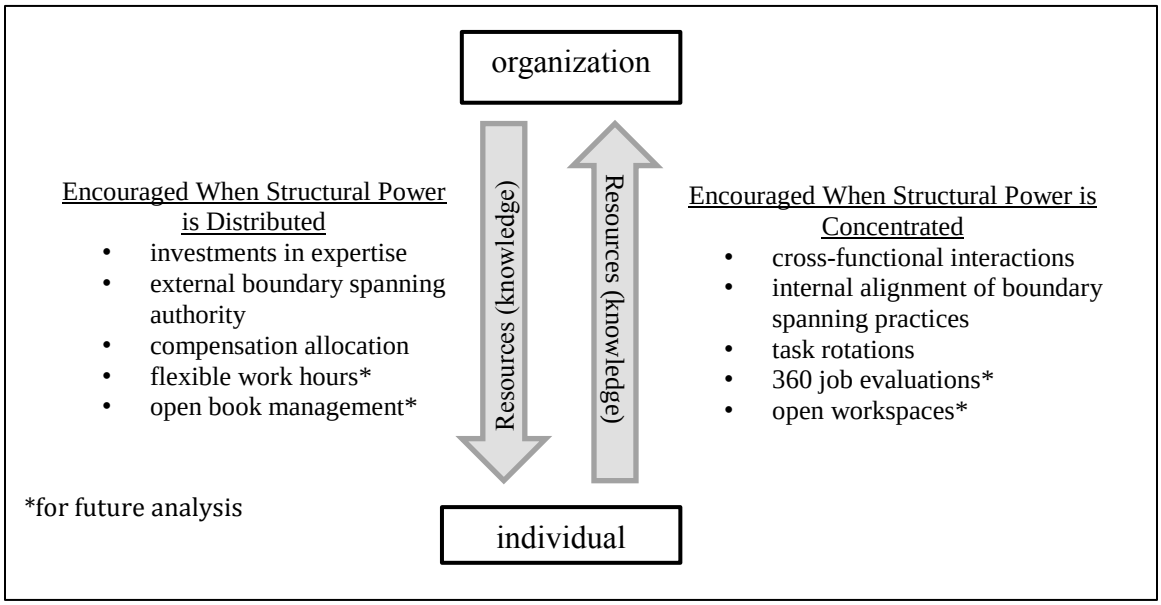

Table 6.1 – Types of Knowledge-Intensive Work Practices Encouraged by Different Distributions of Structural Power

6.3 Lessons for the Knowledge-Intensive Work Practices and Structural Power Literatures

As a second effort to draw more general conclusions from the prior analysis, it may be useful to consider how the findings inform the individual literatures that were integrated in this project: the knowledge-intensive work practices literature and the literature on structural power.

Extensions of the Knowledge-Intensive Work Practices Literature

As stated throughout the prior chapters, the knowledge-intensive work practices literature emphasizes how these practices are used to encourage knowledge exchange and problem solving (Becker et al. 2001; Appelbaum et al. 2000). This project finds some supporting evidence that well recognized knowledge-intensive work practices, like highly interactive cross-functional teams, can facilitate complex and uncertain problem solving. At the same time, this project finds evidence that some knowledge-intensive work practices are inefficient, even when engaged in

complex and uncertain work. This challenges the view that these practices have a multiplicative effect, when combined (Becker et al. 2001).

The reason, as this project shows, is that these practices not only help to exchange technical information relevant to production, but also help to exchange information on worker motivations and interests. In other words, knowledge-intensive work practices serve additional purposes to reinforce structural power. More critical scholars of knowledge-intensive work have suggested this point in past works, showing how self-managed teams may be used to instill mutual monitoring where the complexity of tasks makes monitoring by managers difficult (Batt and Doellgast 2005; Sewell 1998; Barker 1993). Others have made the argument that the open spatial design of workplaces, while often viewed as a valuable knowledge-intensive work practice, is used to reinforce managerial authority (Bernstein 2012). This project supports those claims.

Yet, the current project advances those arguments in two ways. First, this research explicitly links those control efforts to the power structure. The prior literature builds on the assumption that firms face a principal-agent problem between owners and workers, requiring additional monitoring, but they do not actually test whether the problem would dissipate if structural power was distributed. This project shows that, in the absence of those misalignments, high levels of cross-functional interaction within teams and task rotations become inefficient allocations of labor resources.

Second, this project highlights how some knowledge-intensive work practices operate this way and others don't. In particular, some practices concentrate knowledge and material resources, while others distribute them more widely. When knowledge-intensive work practices,

like skill specialization and external boundary spanning, distribute resources outward, we are less likely to see them in the context of concentrated structural power.

Extensions of the Structural Power Literature

With respect to the literature on structural power, this study speaks to the effects on both knowledge-intensive work process and outcomes. An important body of literature on firms with widely distributed structural power portrays them as pursuing a "collectivist-democratic ideal type" (Rothschild-Whitt 1979). In this view, internal equity is an end in and of itself, and this norm is manifested in task homogeneity and democratic decision making, among other equalizing practices. In some cases, at Northern Cooperative, I found norms of equity to be salient reference points. For example, around compensation heterogeneity and internal coordination of boundary spanning processes, appeals to "consensus" and being an "equal" were legitimate claims.

Yet, in some cases, the practices did not align with the ideal types described by Rothschild-Whitt. For example, Southern Incorporated pursued greater task homogeneity in order to exercise control over the workforce. Thus, an organizational practice described as consistent with collectivist democratic norms was encouraged according to a norm of bureaucratic control. By contrast, Northern Cooperative allowed task specialization, in part, to reduce managerial hierarchy. Thus, a bureaucratic practice was justified according to a collectivist norm. Thus, not only is it the case that firms in practice blend these norms, but this project showed that the norms do not always align with the envisioned practices.

Part of the limitation with the set of practices described in Rothschild-Whitt's collectivist-democratic ideal type is that they assume a clear hierarchy of occupations and tasks. Redistributive efforts become particularly important, in the pursuit of equity, when responsibilities and roles are unequal. When production is highly interdependent, as in the automation industry and other knowledge-intensive industries, equity can be achieved through differentiation. Thus, future scholars drawing on her work should be attentive to the industry context in which they apply her framework.

Second, an important body of work on distributed structural power focuses on the limitations of high governance costs (Hansmann 1996). The expectation is that widespread involvement in governance by workers, who have inherently more heterogeneous interests than investors, will generate inefficiencies. This project found that governance at Northern Cooperative is costly, but it is also valuable. Governance costs do pose some clear constraints, as in efforts to coordinate boundary spanning efforts and the Board deliberations on job selection. However, there are also benefits to governance participation. Widespread worker participation in governance allows information sharing that would otherwise occur within teams, reducing the time allocated towards cross-functional interaction.

The transaction-cost view of distributed structural power, as Hansmann's work can be described, also emphasizes that successful worker cooperatives and other firms with distributed structural power must limit workforce heterogeneity in order lower governance costs. While I do document high governance costs at Northern Cooperative, workforce heterogeneity also reduces the need for oversight, in this industry context, as more specialized workers have clearer responsibilities and more capacity to work autonomously. In sum, Hansmann's emphasis on

governance costs is useful, yet the conclusion that it is a source of inefficiency is overly simplistic. Future scholars incorporating Hansmann's framework may consider the efficiencies that coincide with the costs he proposes.

Finally, the results of this project speak to the literature on knowledge-intensive work outcomes and structural power, in studies of professional service firms (Levin and Tadelis 2005; Greenwood and Empson 2003; Maister 1993). These scholars have argued, in the past, that distributed structural power is particularly useful for complex and uncertain work. They emphasize the interest alignment benefits and the valuable autonomy provided to partners. The current project, however, identifies some of the costs of distributed structural power for knowledge-intensive work. Internal coordination of boundary spanning, for example, is an area of knowledge-intensive work where prior professional service firms scholars have not recognized the inefficiencies of distributed structural power.

These literatures also tend to focus on industries where occupations are relatively homogenous and tasks have relatively low interdependence. A partner can work on a major case with little reliance on other workers in the firm, with the exception of some associates and support staff. Workforce heterogeneity has been described as a constraint on the partnership form, generating conflict among partners (Nordenflycht 2010). Yet, the current project shows how these governance costs are diminished by decentralization and offset by other efficiencies. Even where the workforce is more heterogeneous, distributed structural power still generates some of the key anticipated benefits of the partnership model, namely an expert workforce and external boundary spanning capacity.

6.4 Limitations and Future Research

There are a number of limitations that should be acknowledged when extending these findings and considering future research. Given that the study is based on a pair of firms, unique characteristics of this industry context, geographic location, or firm size may limit their application to other contexts. The industry is knowledge-intensive and complex, which may make the findings less relevant to many of the industries where American worker cooperatives currently operate. The industry also employs a more occupationally heterogeneous workforce than many industries where the partnership form is prevalent. Future research may consider whether more nuanced occupational differences, like those between specializations within occupations, operate similarly to the occupational differences studied here. The small size of the firms allowed for widespread governance participation at Northern Cooperative, which was a central factor in explaining the differences in knowledge-intensive work practices. Governance participation shaped team information sharing and internal coordination of boundary spanning. These findings may be less relevant for large firms.

Finally, the matched pair research design makes isolation of ownership and governance from other organization-level characteristics difficult. While I sought to identify mechanisms linking norms and governance processes, directly tied to the distribution of structural power, with work practices, I did not positively demonstrate that other organizational distinctions did not explain the outcomes. Towards that end, future research should seek to examine the interaction of structural power distributions, knowledge-intensive work practices, and performance outcomes in a larger sample of firms. A larger organization-level dataset in a professional service industry might provide a useful opportunity. Such a dataset would also

provide the opportunity to examine the wider range of knowledge-intensive work practices discussed earlier in this chapter.

6.5 Conclusion

In sum, structural power continues to matter in the context of knowledge-intensive work, but in sometimes unanticipated ways. Consideration of the distribution of structural power reveals how some high performance or knowledge-intensive work practices are not necessarily beneficial when tasks are complex and uncertain. The relationship is neither uniquely synergistic nor uniquely conflictual, but varies with the practice in question. As the prior discussion suggested, there are a range of other dimensions of knowledge-intensive work that may be importantly shaped by structural power, and merit examination in this regard. This project helps to generate expectations for future analyses, suggesting that distributed structural power will encourage practices that distribute resources and resist practices that concentrate them. As interest in structural power and knowledge-intensive work grows, the findings of this project suggest, understanding each will require consideration of the other.

Chapter Seven - Appendices

Chapter 3 Appendix

	Southern Incorporated	Northern Cooperative
Status Hierarchy and Conflict Resolution	**Hierarchy reduces costs of conflict resolution through interaction** • "At one point in the meeting, Keith stepped away. It wasn't evident that the assemblers found the project to be particularly complicated. In fact, when I asked them about how hard the project was going to be, one assembler shot back at me, "I could get this done in a few days." I asked them, then, what this meeting was about. One assembler explained: "They want a number to hold us accountable to." • "I can only yell at you guys" • "The story went that Paul had not received a 2D drawing for one side of a part, so he had taken the liberty to extend the lines from another drawing in order to create the Master CAM drawing to fabricate the part on the CNC. He had pulled the wrong line and was off by 20 thousandths of an inch. Months later, when there were problems assembling the machine, they came back and found Paul. For three days, Claude came and yelled at Paul. Paul explained that Richard told him that "you should have had them draw it up for you." • "Rich passes through early in the morning, around 7:30. He stands by Clark, on Clark's side of the workbench that separates the	**Lack of hierarchy increases costs of conflict resolution through interaction** • "People around here have a lot of autonomy." • "People punch their own time cards. There has always been an expectation that people would just act like adults around here." • "Fewer people knew what he was doing than at his previous job." • "One of the main points when I was interviewed here was how well can you trouble shoot, how well can you work with engineers? Can you be that multi-faceted individual that can be just really self guided?" • "Right, right yeah man it's you know and if you think about the way it would be like in kind of a traditional business well nobody would ever say like hey why is the CEO asking what I've been up to? No one ever kind of asks about that cause that's the boss they have the right to do whatever they wanna do. But here you got sort of a bunch of different bosses so it kinda makes sense that people are like okay I understand you're gonna do that." • "Nobody says, "you have to work 10 hours today." • "It's a way more relaxed, in my opinion, environment. They'll

	two CNC machines, looking at Clark's parts that he has made so far and asks him whether he is staying on track. Clark asks Rich if he's planning to go up north over the weekend for snowmobiling. "I don't want to come back and find you guys sitting around saying 'I don't' have anything to do!" "We'll be ok," Clark replies. "This will take me until Monday" Clark explains. "You going to be ok without me?" Rich asks." • "Phil talked about how they were constantly being approached by managers and engineers asking them about the status of work. It wasn't just one person, but two or three different people asking them about the same part."	say that you since nobody has a boss you don't have anyone to report to, so there's nobody you have to report to, but in a way, especially if you ask me as an employee, you really have to report to everybody. You know? But you don't have very often, very often you don't have people coming in and telling you how to do your job, as long as you get you're capable of what you do, and as long as you get things done when they're supposed to be done, as long as you don't give anybody a reason for anybody to come at ya." • "Some of the people, when we looked at their resume, when we looked at people, we looked at people but they were jumping around jobs a lot. There was discussion around that. We were wondering, why are they moving and changing so much? But what we found was that people, when they went into those jobs, they were trapped. They couldn't do what they had to do to make it better. There was a big guy at the top holding them back. People kept searching for a place that would allow them to do the right thing, and use their power and knowledge to make better products."

Access to Information Through Oversight Processes	Limited access to oversight processes increases benefit of interaction within teams • "How's the project lead thing going?" I asked him. This is the first project where he has been titled an "electrical assembly lead". He says that it hasn't made much of a difference because he has been working largely alone on it. He hasn't needed any help yet. He says that he still goes to Frank for information about the project when he needs it. He says that he still doesn't know the schedule on the job, though." • "I asked Ross if the Baxter job is on schedule. Ross is supposed to be the lead on the project. He says that he thinks so, but he's not sure. "If it wasn't, they'd let us know" he says." • "Yeah, I don't want that sheet floating around the shop… And I'm not trying to hide something, I'm just trying to keep confusion out of it. Okay, great. Now what if you got the JBX project and you saw the hours to machine, we have a week left and it says 3000 hours left to machine. What would you do? Probably take a day off." • "people don't know what to do if they're not here. And they're not wrong, they're just, cause right now that's just the way that kind of works, get the answers right from the top, if something is critical enough" • "we were talking about it the other day … needing to allow people more flexibility and more room to grow and more ability to	Broad involvement in oversight processes reduces benefit of interaction within teams • "So, just as my update, John is out a little longer on this Cobb Manufacturing job. He told me it won't wrap up until really next month. I think he kind of alluded to that in Wednesdays lunch meeting. He still has some percentage of work on this Chicago quote. So that's all on his front." • "We have our Wednesday lunch meetings so I mean there's a lot of visibility, a lot of critique of spending. So in one way even though there's not a decision maker stamping it, things get looked at by a lot of people, and if something falls out of line, it gets brought up." • "I'm empowered to make decisions. If something is happening on a project and I think that this isn't the direction we should go to make the customer happy, by myself or usually with other people, I can make the decision. It doesn't need to go through layers of management. I like having the power over the project." • "The employees can see this job is quoted at X amount of dollars, and this is where we're currently at as far as the money that's been spent on it, you know. Most businesses, you wouldn't see that. In that aspect, I'm kind of disputing or refuting what I said earlier as far as, you know, you're not privileged to some information that maybe you

	make mistakes and things to learn from, but at the same time completely strict authoritative oversight in like, no this is too critical." • "If they [the owners] were to unfortunately all 4 to be in the same car that goes over a cliff tonight there's not really anything right now I think the company would just be done because there's no way, nobody to pick it up." • "I asked Michael about whether he will check with others about changes he is making to the panel layout. He responds that he will let Bill [one of the owners] know. He'll "get his approval. Just so he knows", Michael explains. "We've worked together for long enough that I kind of know what he wants and he knows what I do. But it's courtesy. Professional courtesy. So that when he goes into that Monday management meeting, I'm not throwing him under the bus when somebody asks him about a change I made to the machine."	would like to be, well this is an example just the opposite, where you are privileged to information that in most businesses, you wouldn't be. So by going to board meetings, by being at the Wednesday lunch meetings, you do get exposed to parts of the business you wouldn't be aware of elsewhere."
Knowledge Management Technology	Limited technology access increases need for cross-functional interaction • "Mike tells me that he has worked in some shops where there were computer stations in the shop. They discussed it at Southern and decided against it…. They have questions, sometimes, about why the drawings are the way they are and in those cases, they will go to the engineers and ask. " • "he explains the resistance is that	Broad technology access blurs occupational lines and reduces benefits of cross-functional interaction • "Partially to demonstrate to me, and probably because he would have done it anyway, he looked at the location of the part in the machine, looking up the drawings in SolidWorks. He talked about how sometimes he would make alterations to a part without

	they are afraid of the assemblers destroying laptops, because of the dirtiness of the shop floor. Chris said, "just look at our workbenches"." • "He said that it would be great if they had access to SolidWorks, so that they could see inside the machine better. Pat also said that it would be free to do, since one could get free copies of SolidWorks viewer. Pat learned how to use SolidWorks at technical school. When Pat first arrived at Southern, he mentioned the idea to management, but they were "not keen at the time". They ultimately came around to shifting to SolidWorks because of demands from their customers, he mentioned. But the assemblers don't have access." • "They only see the drawings that are given to them by draftsmen. Each part is different, as each machine is unique, so there's no way to learn about how to achieve efficiencies, or cut corners. Because they don't know where parts go into machines, as they don't have the full system drawings, they don't know when they can be less precise and save time. Furthermore, in order to get that information, they have to walk to the office and ask the engineer. Phil said, "I don't mind walking, but that walk feels like a really long walk. And when you're working and trying to get stuff done, you don't want to keep making that walk. And it's go,	even asking the engineer." • "He says that the people at Northern Automation work hard and they work long hours, but they are not stressed. They are not crazed. The freedom allows you to focus on quality. He says that it's the technology and the tools that allow you to go faster. Good resources allow the workers to become more efficient, but then they can take the time to increase the quality of the work they do." • "I do all the wiring, as I'm doing the wiring I'm also helping to edit the drawings, the guys up front can only look at them so long and see certain things, when you're out on the shop floor you really see things from a different perspective and you see if something is being done wrong, or something is sized wrong, or the wrong breaker so its kind of a two way street; I'm not a controls engineer by any means but I help those guys a lot." • "We don't always run everything by the project lead for smaller things. On a larger scale, you go to the project engineer and let him know your ideas… If it's very small, yeah. If it's gonna involve modifying a part… for obvious things, we do it on ourselves." • "If I wanted to go back for a class, I have to bring it to the board and then they'll I'm sure decide if it's something for the company and it's again coming

	go, go.””	right out of their pocket. So I guess that’s what I mean by fair… we are just employees, we aren’t… we just work here, we don’t have a stake in anything… Coming from a union shop, we never got anything like that…” • “you just use whichever machines you need to get that job done.”

Appendix Table 7.1: Additional Evidence of Three Mechanisms that Mediate Interaction Between Structural Power Distribution and Cross-Functional Interaction Within Teams

Chapter 5 Appendix

Southern Incorporated	**Northern Cooperative**
Worker Ideal Types • “They hired very young, go getter type people, that didn’t have a lot of experience but wanted to learn. So the actual age of the group was young. We were all in our 20’s.” • “When he came in here we look for a—the perfect employee for us is a jack-of-all-trades guy. I mean that’s what we --- we move people around stuff and people that fit that mindset are—can be so productive because they’re not bored, things keep moving.” • “But it’s more on getting the right people and who we think are the right people. I think one thing that this culture index has shown me I think is that in looking back, there was a time when Fred hired all Type A people and I think I hire low A people. I can’t tell you I did that consciously, I didn’t but it was one of those that—I think we have the best group of people we’ve ever had. When I took over I was immediately looking for a coalition and that’s where I came up with Sam and Phil	**Worker Ideal Types** • “If you’re not self-motivated and you get into this organization, it takes its toll on you. We’ve had really good engineers come in here from a structured pyramid and they just can’t handle it, and they don’t last. Typically, if you can handle stuff like this, you never leave. Like me. I’ve been here 20 years. And that’s how it works. So, you know, that’s kind of the definition of why I don’t think if everything was a coop, it just wouldn’t work; because people can’t handle it.” • “Through the years, we have made some really good decisions finding people out there. Paying them for what they’re worth. Making them a member. Really tying them in to this place and keeping them around. It really helps.” • “Some of the people, when we looked at their resume, when we looked at people, we looked at people but they were jumping around jobs a lot. There was discussion around that. We were wondering, why are they moving and

and some of those A's got weeded out. I think --- and I'm assuming they were A's. But I mean there were some head-butting and stuff." • "If you look at the surveys of the people who I had answer it, they're all on the low end of A's and those are most of the people that I brought in. I was like, Shit did I do that and not realize I was doing it?" • "We just kind of take the approach of, instead of hiring people in the industry, because we've had such a hard time doing that, because it seems like it's such a close knit group, because it seems like once they're in, they're in. Let's just hire new." • "It's both communication and it's the first/second class citizen thing. "it's going to kill him" people walking out left and right. he doesn't care; he'll just hire someone else. Richard isn't looking for dependable or long-term" • "I think that's kind of why we've been having a lot of turn around with the younger guys is we've been trying to get more guys straight out of college and stuff like that and the general perception is when you get out college, oh I know what I'm doing so I'm just going to design. I want to be a thinker and not a drawer so but the whole purpose of mechanical engineer and designing is you got to think while your designing and you've got to accept the experiences around you that's part of the company to learn and work your way up. Luckily, I'm out of the well, all my ideas keep getting shot down so I'm not going to worry about it type thought process. I can throw ideas out and I can argue with the head guys and not be worried about it because I mean they actually will respect it sometimes as long as you don't get it out of hand and that type of stuff." • "With Spencer, Spencer has always been real quiet but he seems to take direction pretty well. He seemed to follow some of our templates but he had issues with	changing so much? But what we found was that people, when they went into those jobs, they were trapped. They couldn't do what they had to do to make it better. There was a big guy at the top holding them back. People kept searching for a place that would allow them to do the right thing, and use their power and knowledge to make better products." • "In our past few years, we have hired a bunch of controls engineers, but we had to let one go. Kind of the same story as Fred [previously mentioned], just wouldn't listen. He felt that the way he learned was the only way to do controls." • "I would say we've whittled ourselves down to a group that we really like as far as, you know, everybody can do their jobs well, they're valued people, they're here to do the job when you want. Everybody's pretty much highly valued. So yeah, anytime the work slows down to a point where it can't support the people, yeah it's...laying off...it's not very often we let people go, just go and gone forever. A lot of times people are gone for a couple months or whatever but they come back. And we prefer that, we really like to get people that have left back. Especially if we know their skills and everything, no training, just boom they're in doing the job. And I think the employees like it around here, because they know that we're not just gonna get rid of someone and just go hire someone else. So they feel pretty safe as far as their jobs go." • "In hiring and firing decisions, usually those are on the conservative side." • "I can't think of anyone who came here specifically because it was a cooperative. I think it was all about, they've heard about the jobs that we're doing, and might know about some of the people here, and it seemed like it would be a really good place to work at, but I haven't heard anyone wanting to work for a cooperative specifically. There's people who've thought, you know, I would really like to

doubling up dimensions and stuff like that where he was." • "Chester doesn't really have a whole lot of experience." • "Richard tends to hire guys that want to follow the leader… Like all of the longer employees there, I noticed like Richard didn't hire them or if he did they were real young and they have evolved into something different, even Frank. Frank is a completely different person than when he first started there… He does what he wants, you know he knows how to work the system like I do too if you ever watch. He doesn't work super hard but he does work hard he just doesn't but he doesn't do anything that nobody else wants him to do you know." • "The perfect employee for us is a jack-of-all-trades guy. I mean that's what we --- we move people around" • "we still have a lot of jack of all trades guys. So if I had to pick a guys who are dedicated controls guys, I would pick 3, but there are three other guys who can do controls that are electrical guys or machinists" • "Richard wants kind of more everybody to be a plug in, he can put you here, he can put you here, he can put you there, he can put you there." • "(describing characteristics that led him to offer partnership) And they couldn't be more opposite. I found myself having to manipulate them to get to finish jobs, get them to travel. I hired Shawn. Shawn was a breath of fresh air. He went in and installed, whatever I needed, I'll do it boss.... I could pull George in this room, put a million dollars on this table and he wouldn't take it."	own my own business or something like that, but it's sort of a hard market to get into because it requires a lot of capital start-up, and this seems like something that would sort of fit halfway in between that where you take part in the ownership, but it's not...doesn't require the effort of startup." • "We're not real good at training someone, so hiring someone right out of college and saying "okay, now here's how you do this, and here's how you do this," and that type of program we tend to not do very well, because everyone's sort of on their own and it's up to them to, you know, make sure they're on task and know what they're doing, and if you don't, you have to figure out who you need to talk to to sort that out. So it's a little more independent, which I think everyone likes, but it's a little harder to have someone come in new, because there's not a formal training associated with that." • "Okay, so at Northern, again, you really...since it's a super flat management structure, you know, everybody there is essentially your peer, and there's nobody that's gonna be telling you what to do on a daily basis, they're just assuming that you're getting your stuff done. And I think some of the reasons, a lot of the reasons that people have been let go is that they are hired on because they were good engineers, they had a good personality, it seemed like they were gonna fit in, but when it came down to it they just weren't self-motivated." • "Membership is an opportunity to use skills and qualities that have almost nothing to do with the relatively narrow task you were hired to do as an employee. You may be an assembler, but your greatest contribution to the co-op may turn out to be as a member of the finance committee. You may be a machinist, but the soundness and clarity of your opinions may entice the board to elect you President."

	• "Yeah, when this engineer had left, we hired someone with a manufacturing background, you know, he had a four-year degree and that, but...you know, the coop brings...you know, we do it all, and you gotta be an aggressive worker to survive here. And I remember the first day with that candidate, you know, I had to train him, show him how to use the system and stuff, and first day, he said "well, who sends out the faxes?" This was before email was big. I said, "well you do. You just do everything, you do the whole job." And that just floored the person coming from a little different background where he's gonna have all this support staff. And, I mean, my opinion is that the person didn't like how much...it was a very busy job, and a challenging job, so that person moved on after just a year." • "There is no formal training here by any means. In general, when we look to hire people, we look for people with experience, people that will fit in and kind of hit the ground running because we know that we're not good at training people necessarily."
Hiring Routines • "And that just killed my confidence. [Richard the majority owner explains] I was like, shit. And again, it's not devastating or nothing, it just shows that you've got a huge hole in your system that—and so when this thing kind of—I kind of stumbled on this thing here and this looks like it's going be exciting." • "Years ago, when I first took over we had a hard time hiring people and we've seen, in the time that I've been running the place, I've seen three—at least three particular waves where one, it was just hard to get people to even interview or to apply. And then I've seen once you've had a glut of applicants and now I've seen the latest one where you can get a lot of applicants but I think my perception is people truly let go of the dead weight." • "When we would hire someone, Alexander	**Hiring Routines** • "He says he is most proud of having been on personnel, however. He liked the ability he had to shape the direction of the company, which he felt that he was able to do through the personnel committee. When he was on the committee, he liked to ask weird questions of the interviewees. He wanted to know if they had bad habits. He said, "I wanted to know if they shot up heroin in their free time." He would ask people what they liked to do on the weekends. He said that people, after they had been hired, would tell him about how strange they though his questions had been. He said that there was an ongoing debate at Northern about how much people needed to know about an applicant. Did it matter what they did in their free time?" • "I only knew about it through reading up on Northern, formed as a worker-owned

would do all this, he would, Richard would say here's a résumé I got call to this guy and set up an interview, and it would all progress through Alexander." • "I saw resumes strewn across his desk, each with a chart attached from the culture index program that he has been using to evaluate current and potential employees. I commented, "so you're looking to hire someone?" "Yeah," he responded. "We're looking at electrical engineers. I'm almost ready to pull the trigger on someone but not quite yet." • "I asked where they were posting and he mentioned Monster.com and Careerbuilder." • Interviewee: "He is friends with Richard, Mike, all those guys. I think he is a neighbor with them or something like that, close to them; that kind of helps. Trevor: Right, so it's funny, you act like you own the place. Interviewee: Yeah cause you're friends with the guys who own the place. You can tell me… when Charles worked there, Charles and Frank would go to the bar together and you can kind of tell cause we all like kind of like act the same where were like were chill, all f's aside. We don't cause no ripples, you know?" • Interviewee: Oh, bringing in employees. Okay they just went through a two-day culture index training where the guy came and actually took them through the whole thing. And Richard's goal is to try to hire people who better fit the traits that we think of an engineer. So an engineer the most important might be absolutely critical for him to be a detailed-oriented person. You should have Richard send you one of your surveys. Trevor: I did. Interviewee: I didn't even know there were that many traits in the world. So we can determine not just detail-oriented but absolutely isn't detail oriented and you might want to take another look." • "we're going to sign up with this guy [HR	cooperative. Even in my interview, I didn't have that much knowledge of what it was." • "Yeah so, we could back up a little bit to when I first interviewed here. And okay, researching the company and saw that it was a cooperative, so I looked up what the definition of that was but I certainly didn't really understand it. And...at least the hiring committee that was interviewing me definitely wanted to focus on the, you know, job-related portion of it. So there wasn't a lot of discussion, and in fact, I think it was...one person in that meeting had said, "yeah, Northern is a cooperative, but that's not gonna mean a lot for you right now, this is an engineering job, it's just like working at any other place, so here's how we're organized, but you're being hired for an engineering job and that's what we're looking for, not someone who necessarily has experience and understands the cooperative structure." • "They interviewed me twice. I knew a few people that worked here, 2 from Gilson. One guy had come up here awhile ago, and another was more recent. I was laid off in 2006 and I interviewed here and in Rockford. I got the Rockford job and took it, since I needed a job (I have a family), but it was 3rd shift, maintenance. I had the second interview at Northern, was offered the job, and quit at Rockford. It was a day job here and a lot better. I even took a slight cut in pay to start here."

consultant]. In about a month we're going to have, he's going to come in here, he's going to basically coach us. He's going to tell us what we need to know about each other or should know about each other"	
Perceptions of Risk in New Skill Development • "We've established we have to improve ourselves, how we physically directly invest the dollars at, no. But do we know it's cost us to do some of those things? Yeah. And we just recently had a discussion here in the last couple of months saying we talked about training guys, we got ISO certified, we promote training, we do that. But that's all we do is our own training, we need to start looking at where we need to put the money in and do that. We have made that statement. We haven't done it yet. But we have made some commitments where we're getting trained, we've moved to SolidWorks, we're getting the guys trained, we're sending some guys out. We're making those investments right now." • "I ask Chuck if he has ever been to training for his job. He says no but that he wishes that he had. Chuck has never been to trainings for this job." • "I'm kind of showing him cause I've kind of took it on myself to help as many people as I can with Solidworks cause Terrance doesn't know a lot about Solidworks. David doesn't know a lot about Solidworks." • "They used to make a lot of our production parts so they had lots of c&c's up there. They would always have to let me go up there and pick their brains for questions and how do you program this, how do you run this? But then I kind of developed our own Southern way of doing things" • "We had, ok when we got master cam we had a guy come in and give me two 8 hour training days, that's it." • "You know, Phil's always like 'you shouldn't have done that' and I'm like	**Perceptions of Risk in New Skill Development** • "My preference is what I can do really well is listen what people's needs are… Then an individual like Jim Thomas, he's good at spec reading, some of the things that come in and there's a stack of printed documentation that defines what we are going to deliver." • "With Jones Co [former employer], I used to be at the plant, talking to the customers, but there was always a higher level, where things were really discussed. Here it's less formal, smaller, and we talk to the customers. The project manager is in charge of the detail, the money and the scheduling, but we all talk to the customers." • "This group is only as good as the people it's made out of. And that's true of every group everywhere. So some of us are really obsessive compulsive about all our products and others aren't. And I don't have any jurisdiction about anybody's attitude and the way they conduct themselves. So it's a patchwork of how that works and how from my work attitude or when I show up and when I leave or how my study is. Versus the next engineer who's into something completely different, it's a lot more lackadaisical. Or people who are so structured that they're here at the same time every day because they're really anal about it. It's all. So… so that whole thing where everybody's the boss. It really gets down to, I think, it's hard to just conduct themselves through the day." • "In our cooperative structure, the roles and responsibilities that each individual takes on is based on that individuals personal fabric. How much do they do, how do they

why? ‘ Now they’re gonna expect people to know that stuff.” • “what I got yelled at the most for when we did the 2 days of training was the guy came and trained me for two days and he was like “Well, what parts do you make?” What do you mean? Well you could have done stuff on our prints instead of their prints. What if our prints didn’t have what they wanted to teach? But I was told we should have made money during that time. And that part has calmed down a little bit I think. I think Richard’s started to, he’s also opened up to the idea that maybe I was too focused, everything’s gotta push forward. But it’s ruined me kind of in the sense where I’m always worried about the bottom dollar.” • “The first guy we had trained on it, he had back problems so he couldn’t run it, you know, he just couldn’t do it. We tried to get Frank Coulter but he had some lung thing go on, heart thing go on. And I don’t think he ever would have learned it anyway so it was just, well we know Louis’s not stupid and he can kind of jump into things, let’s let him try it. That’s how I learned, so it was trial by fire, if you watch the way I do stuff compared to anybody else like c&c-wise, it’s like, let’s get her done ‘cause someone’s breathing down my throat the entire time.” • “Ok, so that’s what you’re talking about when you’re thinking about maybe he could train us…? Yeah, while he’s doing something, even if it’s an hour or two and then I can come back and be like alright I know how that works and I can do it later on on a part, if it takes me an extra hour or so, no big deal, at least that part got made.... Prove it to them that I’m not just standing around doing nothing. • “Well, we were working on, I had designed that welding table, that rolling welding table I've got, and it finally came in and I was in the back room in the middle of something and Chris says ' well, hey the new welding table is here, you	operate how, do they make these adjustments, how much do I put into it, all of those things are left up to the individual” • “And we have members that perennially work more hours than others. And I'll admit that I'm usually in the upper half of that group. We had members who are perfectly happy to work as few hours as possible. Others of us just gravitate towards more hours. Some members who work more hours than I do, they just have a general tendency to do that. Everyone’s got their own reasons to work as many hours as they do.” • “The majority of people take on the responsibilities and gravitate to what they do best.” • “They actually migrate to where they’re more effective, instead of being promoted up to a position where they’re useless.” • “I believe I’m the only mechanical assembler that doesn’t have a degree… they all went to MATC [local technical college] for machine tool type of thing” • “Everybody has their strengths. Some people know this equipment better or that equipment”; people “do what they do best”, there are some people who work better on the high accuracy machines and others that work well on the big stuff” • “They offered a week of classes, there are probably 10 different classes we could have taken. Through the company who makes the software. Paid for by the company. And that time is compensated.” • “Trevor: Since you have come to Northern Cooperative do you feel like you have picked up new skills? Interviewee: oh yes! I’ll go back to my old job. I was a controls engineer for 8 to 10 years of that, then I moved to project management, then back to controls engineering as a team leader, but the stuff that we did there, there was not as much variety as we are doing here. We had some specific people over there. So on fluid

want to go take a look at it?' I says, 'well, I've got to get this done first.' I'm in the middle of something (inaudible 01:09:00) It's going to be there for the rest of the time I'm here. So I didn't go look at it. Well, Chris went to Richard and said "Frank's not even interested in the welding table.' I got hauled in the office and I got yelled at. "Oh. We bought you this welding table.' I'm sitting there thinking, you bought me this welding table! Didn't you buy this welding table to do a more efficient job in this place? You didn't buy this for me, I'm not taking this home with me when I leave this place."	power, or vision programming, we had a dedicated vision or robot person. Here, we have some people who are better at certain areas, but if its something that's needed for your project, you need to learn how to do it. You still need to learn how to do it. So I have learned so much from the last three years that I have not been able to do before." Trevor: has that been formal? So it's just like on the fly. You do you take courses? Interviewee: that exists, if you look at a project and look at where you need to be. I'll give an example. I did a project where I needed to learn to use on particular robot and I needed to use it in a complex way. And nobody I could go to here and it was a bit more than a guy could learn himself. And so I went to a training session to learn that. And so its kind of by feel. If you think you can just do it on your own. You do it yourself. And if you start to do it and you realized that you need to do something differently… Trevor: was that suggested to go outside for the training? Interviewee: it was offered to us by the manufacturing company that did those robots. And the training they just trained me for three days. It was just me. Unfortunately, that particular knowledge is old. That was the particular deal with the project." • "I have got some electrical training that the board has asked me to get licensed as an electrician in the state of Minnesota. The board directed me to do that so I got the training. But I needed to get some continuing education. So I just spoke with HR. The board needed to authorize this but I just went to HR and told them this. And then a while later HR and said that I need to get some training and asked if the Board needed to authorize this, and I said that it

	was going to cost this much, so can you take this to the Board or can you do what needs to be done for this to happen, and the next thing I know, the HR manager sends me a message back saying, 'you're approved'." • "Once people take the project management course, they want to use those skills, so they allocate too much time to them." • "education and training " listed as a cooperative principle in the Worker Manual • "You're kind of expected to take it upon yourself. If you want to take additional training, then you are encouraged to set that up. You need to get board approval if there's going to be a cost involved or overnight stay or whatever. Typically the board rubber stamps it and is very cool with additional training, but the impetus is on you as an individual to seek that out. I mean, unless OSHA mandated forklift training or something like that, software training would be something that you need to take on yourself." • "Northern is good about staying up with technology. Northern is good about...they're not afraid to spend money for...for my work, tooling, software, and then training. They're not afraid to spend money on any of those areas. Because I think that Northern gets the fact that an educated and well-equipped workforce is happier and more productive, and in the long run makes more money for everybody. So, that is a definite perk about working here." • "Interviewee: You're kind of expected to take it upon yourself. If you want to take additional training, then you are encouraged to set that up. You need to get board approval if there's going to be a cost involved or overnight stay or whatever. Typically the board rubber stamps it and is very cool with additional training, but the impetus is on you as an individual to seek that out. I mean, unless OSHA mandated forklift training or something like that,

	software training would be something that you need to take on yourself. Trevor: So when you say board rubber stamps it, that means they support you somehow? Interviewee: Yeah, they're good about...yeah, if you wanted to go for two days of software training, Northern pays for the class, Northern typically will pay a hotel room if it's an overnight stay, they pay mileage to and from, some meal allowances. So I guess, that goes back to what I was saying earlier, they're very good about supporting education for their employees."
Opportunities at the Top • "Because everyone here is not the next president of the company; can't we be happy that people are fulfilling their roles that we need them to fill? We need assemblers; we needs assemblers who are happy doing that who don't want to be the lead because if they do, they're going to be leaving here because there's no where for them to go; we need some drones, we need some worker bees; it's like he can't accept people's limitations" • "So we had talked about, "Okay yeah, someday you can take this over, you can do this." (What the founders told Richard)" • "The founders were very open on how things went and I believe in it so I'm laying it out there not as a carrot---. I tell other people I'm not dangling a carrot, I'm showing you an opportunity but you have to get it. I'm not handing anything to anyone, so I'm very partial to how it happened to me. I think a lot of things clicked just right for it happen so I'm not so foolish, "I guess I'm just going to pick a guy and go and do it."" • My end goal is to be where Richard is at since like, that's where I want to be and I devoted a lot of time to the company, just trying to make the company better and I	**Opportunities at the Top** • "You get to speak your peace and not get crucified for it. Everything gets handled in the meeting. That's not the way it is in other places… people learn to use that power correctly, use it don't abuse it. That's the thing, if you do something in the best interest of the business, you're ok, you're respected. We have had a few people come in and be power hungry. They get eaten alive. The whole group gets them back on the straight and narrow, tells them to get back in line, tells them what they should be focusing on." • They're the first ones to complain about me working, always being the high hour assembler… very rarely, you see them average, even 40 hours a week… you're working 65-70 hours a week , they're still back with 38 or 40 and it was their project to start out with. And I'm not the only one who gets pulled off… I look at the schedule, the due date…. I'd do everything to get it done... They'd make the comment, 'are you trying to be the hero, boy?' and they're the members, you know… I don't like that, it's accountability… it's your project, you should do your best to complete it… they need assistance in their projects and they're not that big projects…

take pride in the fact that I've helped make the company better and I eventually want to get where Richard [the majority owner] is" • So I've always told them whatever you need help with I'm there. so that's always the thing I try to tell them is like do you need someone to start watching over people? It kind of bugged me when they hired Colin cause like yeah someone in your company with [inaudible] management you don't give them any room to do that stuff. It bugs the shit out of me. Like I know I think I've heard this from a lot of people the only way that you really move up is going somewhere else. I'm always gonna be the 20 year old kid that started there • Man 1: Yeah well you try and I want to learn always. I always want to learn new, faster ways. You try to like learn, I don't know, it's cause I swim and that's more individual sport. You kind of think in your head, you got yourself instead of everybody. I like to try to set goals for myself but I don't try to like, I'm going to own this whole place. This is all mine. Trevor: Yeah that's a phrase that, like I've heard that come up before, like the. Man 1: The I'm going to own this place one day mentality. Trevor: Yeah, yeah. Man 1: Yeah you can't be that way because it is not going to work out cause your going to end up driving yourself crazy just butting heads with everybody and not making friends with anybody then because your trying to push ahead of everybody all the time. • Trevor: Yeah. So you were saying a second ago like that mentality of, I'm going to own the place someday, that leads people to kind of butt heads? Man 1: Yes cause you start taking over I'm in charge. You start thinking your in charge at least all the time. I think it blinds you to like realizing what other	

people's ideas are good or bad cause other people sometimes you know, you got to listen to everybody because their idea might be better. I mean you have to come up with a decision fast. Don't sit there an do, "I don't know." It also helps like if you just hear something real quick and be like, "you know that might work."	
Transparency in Evaluation • "He fired Mario and then brought him back. He's done that to a few people; it's heat of the moment, like pissed off, and then I don't know if he cools down; one guy he did it to, I'm totally in Richard's corner; he had an alcohol issue and it was affecting his work, so he let him go; I mean, we had complaints from customers" • "Well I don't know what Frank gets paid but he's told me that he hasn't gotten a raise in four years. Frank's duties have doubled in the last two years, you know, and we've lost John Roberts, Claire, and an engineer since in the last like four months. Where is all that income going? Where is all that salary going? How come none of us have seen it?" • "Interviewee: He wants me to start tracking more of their vacation time well the salary people we don't really track because they're paid regardless but that was part of my understanding was with Claire was that she had, she was always really good about telling me I'm gonna be out. well and I knew I mean she was my you know sidekick pretty much just she's not here, she's on vacation or whatever. Whereas like if Fred leaves or isn't in, well I don't know if he's out sick of if he's on vacation, he's just not here. So I couldn't really track accurately all the other salaried people. Whereas Claire would, she was more accurate, which kind of got her in trouble, but like what to do you? You know Trevor: What do you mean?	**Transparency in Evaluation** • A: Well I guess to go more into the layoff thing, we sit as a board, and go through all the different jobs and look at hours and maybe we'll decide not to lay somebody off and say, "alright, you three people, instead of working 40 hours we want you to work 30 or 25 and do that until business picks up," or gets worse, one way or the other, then you have to make more decisions. It's kind of up to each department, too, that's something we've kinda done new the last two years is actually let the departments seal their own fates. You guys come up with a solution, tell us what you think you wanna do. Because maybe someone will say, "well it's summertime and I really wouldn't mind being laid off for 2 or 3 months," and the (indistinguishable) people say, "well sure, we'll each work 40 instead of working 30," and the board will make decisions like that. You can go for 2 months and we'll call you up as soon as things pick up again. • Hugh: As a member, we see the financials every couple of weeks. Actually on Wednesday lunch, we see the jobs, each job financially, everybody does… what is hard is we make a quote on the job… it's really luck… those projects, you run into terrible problems, you're lucky if you make a profit, break even or lose money… but this is not held against a person, it is what it is… • It's the tricky part because it's a cooperative is that it's a small company so people tend to pay attention to what you're doing. You add on to the fact that half of

Interviewee: Well that, part of it, the issue was that she had used an extensive amount, she had three weeks vacation from the start and she had used vacation plus some time off but that time was non-paid so we would deduct even though she was paid salary, the time she went over her vacation well that didn't whatever didn't go well with Richard. He felt she abused the vacation policy and I said were you with him well its not really fair and he says well I said well I have no way of tracking these other guys. "I know Charles doesn't take over" and its true there are ones that never take vacation and probably have an overabundance of vacation time that they should be taking and don't. But Richard said and as far as owners go he said, well, you're owners. That's up to you guys but the other salary people should just like she was." • "I don't think he gives us direct like profits. Like every year at the end of the year before Christmas we have a meeting oh yeah sales were good this year, we did this, efficiency went up or not, but I don't think he actually said we profited this much. Cause then we'd be like, hey, why am I only getting a little sliver, how much do you put into your pocket?" • "Talking to Francis, she explained that Southern doesn't track pay rates over time. Richard insists that they don't do it. There is a field in the payroll database with which to track pay rates, where one can put in historical pay rates so one can see how employees' wage rates have changed over time, but Richard insists to Francis that they just change the saved pay rates as they do so. Richard doesn't want them "floating out there"." • Talking to Theo about it on the shop floor, he mentioned that he had been trying to get a handle on profit levels, as part of his analysis effort, but that he had had difficulty. He mentioned how Richard was hesitant to give up some of the information, particularly around payroll,	the people who work here are members and are therefore my boss, makes you be more on your toes. Not that they create this atmosphere of 'you better watch' but you just know. Any one of them knows how much I make, what I'm working on, how many hours I'm working. I feel there is accountability on me that I definitely didn't have at the big companies. • "In a traditional company, you've always got my jerk of a boss, just slap me on the fanny because he doesn't think what I'm doing...here, it's horizontal. Okay, junior, let's rock, you know. It can be like that." • "A number of folks at the top of the distribution said this is it. This is enough we've got disciplines that have greater responsibilities a higher level of accountability to higher stakes with the decisions they make they are engineers as opposed to tradespeople. In the real world they are compensated at a clip a lot higher than our distribution formula is resulting in. In other words the total compensation was too squashed. So discussions ensued the board deliberated and an adjustment was made to the distribution formula, to basically, and I don't remember all the nuts and bolts of it. But what it basically did was they took a portion of the distribution and weighted scale factor higher. So it took the average member skill factor and then their difference between your skill factor in that again multiplied by the number of hours and factor back into the calculation. So it wasn't a total swing on waiting hours but it put more weight back on the scale factor for a portion of the overall compensation." • "Interviewee: As far as where I am at wage-wise, my 45, 50 fellow employees, I honestly don't have a clue about what any one of them make Trevor: Do members know everybody's? Interviewee: Yes but employees know only their wage… I know that when they group people into mechanical assemblers, electricians, machinists, everybody also

that would be useful to calculate costs. So he had been using commercial costs and the labor plus overhead cost. I asked Theo if he had pushed to get the payroll data. He replied that he had gotten some pushback and gave up on it." • He was slated to get the highest bonus but then, on the day that they were going to hand out bonus checks, Dennis got "upset about the dust during renovations or something; he said that it was bad for his health" and he walked out. "There was no way he was getting his bonus check then," Richard said, and he ripped up his bonus check."	has a rank and they're numbered… I think we have 7 mechanical assemblers and I am one of those 7 numbers… I don't have a clue what it is…" • "I've been here long enough that we've gone through about 10 different methods of trying to figure out a good way to review each other. I would go on record as saying we don't currently have a good method, okay. And it's not that we never tried, we haven't figured it out yet." • "The other thing that I noticed that's really weird: everybody knows what I make, they know the background of why they hired me, so there's this information sharing that doesn't happen in typical companies that happens in little subtle ways. Like I'll be getting a cup of coffee, and maybe Randy, one of the other engineers, will say, "I heard you're working on this or that". Normally they wouldn't even hear about that, but they do because they have these weekly meetings, where they share all this stuff. And I thought, without managers, how do they share all this stuff? But that's how they do it, it's a weekly board meeting, and I don't know if they all show up for every meeting, but there's a huge amount of information sharing." • I'm not a member so I'm not privy to some of that information as far as the breakdown. I do know, or I believe that the way the structure is set up as...each position is given, and again I'm kinda sketchy on this but this is my interpretation, each position in the company is given like a value rating, so engineers are worth this amount of money, machinists are worth this amount of money, blah blah, and within there there's obviously variation as far as wages, I think. But I think that in addition to that, then, the members are paid by number of hours of work within the year, and then the way they breakdown the profit, I don't exactly know, but that's my basic understanding of it.

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Inequity as a Norm • "I don't make enough, but I'm happy here. I make an 'honest wage' he says." He worked at Goodwill and KFC before this. This was his first job in automation. He did an associate's degree in electrical engineering. • "Mike Lewis from engineering quit. In college, you're told that you're worth more. It was a pay issue. Left in December." • "We do Christmas bonuses, Jerry explains, but not profit sharing. It's really nice of them, Jerry says, they don't need to do it."	**Inequity as a Norm** • "the members that are been there the longest we typically find them with the highest skilled dollars per hour" • "there are individuals that will purposefully downgraded another person's skill factor because they know they have a tendency to work more hours and therefore their total compensation will be inordinate overtime. If he works a lot hours allotted him as big of a raise because that will skew his year-end compensation too much. So I'm gonna scale him back on the skill factor and so he doesn't walk out of here with too much money compared to everyone else." • "Back in the day a long time ago the skill factors and the relative amounts of the skill factors very closely followed the market value of an engineer or what the shop labor would get paid or the floor sweeper. Back in the day was equated very closely. As time has gone on, and this is when the founding members came up with it, over the years there is been little or no effort to keep those numbers paralleling the market value or what you would expect to see an engineer to get paid out the real world as we call it and because there's no explicit effort to do so they have fallen out of touch so now the numbers that we have although expressed in dollars per hour quite often our errantly associated with the going rate of what most people would hire someone at." • "if you have a hard charging individual in other words if I valued someone and they put in a lot of hours because they're willing to forsake your wife and children may be the single and got nothing better to do, why wouldn't you want them working as many hours as possible." • "If that resulted in a larger pie for us to divide well sure then give them a bigger

	piece." • "If I work a lot of hours, I should take in a lot of money because if I'm doing what I'm doing on growing the pie for everyone." • "I know that raises last year, everybody's increase in pay was the same percentage, for all employees… I don't know the members, a member actually told me that they haven't given themselves raises in the last three years which tells me that they're making too much right?… I always wonder about that ranking thing too… when you're the only nonmember, how could I ever not be the bottom? None of those people will vote against somebody else who has a vote against them… I'm always going to be at the bottom but I accept that because I don't have a vote…" • "A lot of them have nothing to do with merit, should a mechanical engineer make more than a shop guy? Is this discipline worthy of more because they've got a greater responsibility that the shots there calling our bigger? With design if they screw something up it costs tens of thousands of dollars but machinists caused $100 if they screw something up the gravity of the decisions that are making are different." • "Overall, it is a great place to work but there are cliques… financially, I don't think the best people are making the best pay and some people do because of not what they do but who they're with… I'm generally very quiet at board meetings, I probably bring up what I think is applicable but some people won't bring up anything because they're afraid" • "when you're the only non-member, how could I ever not be the bottom?" • I see membership as a little different from other people. I'm of strong belief that when I became a member and when I signed my contract, that means that I became a member with them, I became an equal with them

Table 7.5 – Additional Qualitative Data on Structural Power and Workforce Heterogeneity

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