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The Role of Social Structure and Financial Incentives in Individual and Organizational Performance

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The Role of Social Structure and Financial Incentives in Individual and Organizational Performance

by

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Dedicated to my family

ABSTRACT OF THE DISSERTATION

The Role of Social Structure and Financial Incentives in Individual and

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by

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This dissertation investigates the role of individuals in firm strategy and performance by exploring how social factors at the individual-level combine with financial incentives to influence individual behaviors and performance. By drawing on unique proprietary datasets from two service settings, I investigate 1) how social affiliations between real estate listing agents and clients influence value creation, appropriation, and the types of transactions agents engage in, and 2) how corporate awards, which primarily reward individuals based off non-pecuniary social factors, are influenced by individual heterogeneity. The results of this dissertation suggest that a more nuanced view of the impact of social structures on individual and firm performance is needed. Moreover, the results suggest that focusing on the micro-macro links is important to both managers and to future theory in strategic management.

PREFACE

Strategy scholars are fundamentally interested in investigating the determinants of firm profitability and performance. In approaching this question, however, scholars have historically tended to ascribe much of the variation in performance outcomes to industry or firm-level variables (e.g., Rumelt 1974; Wernerfelt & Montgomery 1988; Porter 1980; Rumelt 1991; McGahan & Porter 1997; Barney 1991; Teece et al. 1997). Surprisingly, significantly less work has focused on the role of individuals, or the intersection of individuals and organizations, in determining firm performance. Indeed, many scholars have recently called for a more thorough investigation of the micro-macro links of strategy, sometimes called the "microfoundations of strategy", in an effort to address this gap (e.g., Felin & Foss 2005; Felin & Hesterly 2007; Barney & Felin 2013). While some progress has been made to date, there remains much debate about the value of microfoundational research to strategy theory and practice. Moreover, debates continue about how to define micro-macro links, and around which micro-macro links are worth investigating.

This is surprising, given the fact that labor is frequently the largest resource cost to organizations, and is often cited as the key resource underlying a firm's competitive advantage (e.g., Barney & Wright 1998). Indeed, in many service industries, which now represent nearly 70% of US GDP (USTR, 2014), labor is the primary competitive resource. This is likewise surprising because scholars have long noted the potential importance of exploring the role of individuals in firm strategy and performance. For instance, Arrow argued that "There is really no need for the firm to be the fundamental unit of organization…there is plenty of reason to suppose that individual talents count for a good deal more than the firm as an organization" (1962,

p.624). Similarly, Barnard argued that "The individual is always the basic strategic factor of organization" (1968, p.139). Yet, despite the potential importance of individual-level research to strategy, there has been significantly less work focused at this level that links the micro with the macro.

This dissertation seeks in part to fill this gap by investigating the role of social structure and financial incentives in individual productivity and organizational performance. I explore how heterogeneity in individuals, including in their social affiliations and motivations, influence their productivity and behaviors in the face of financial incentives and career concerns. Financial incentives have long been studied as key determinants of individual productivity, behavior, and sorting (e.g., Prendergast 1999; Lazear 2000). Similarly, social structures have been argued and found to significantly impact individual choices and behaviors (e.g., Granovetter 1985; 2005; Coleman 1988; Burt 1997). However, significantly less research has investigated the intersection of these factors, and particularly how social factors at the individual level combine with financial incentives and other organizational variables to influence firm-level outcomes.

To approach this question I use two hand-collected proprietary datasets that link individual-level variables surrounding productivity and social structures with organizational-level variables and performance measures. Both of these datasets are derived from service settings—one from the residential real estate industry, and the other from a commercial laundry cleaning company—where individual productivity is of paramount importance to firm success. Using data from these settings, I investigate 1) how social affiliations between employee-experts and clients impact value creation and appropriation in real estate transactions, 2) how these affiliations influence the selection process and the types of transactions agents engage in, and 3) how non-pecuniary incentives, which primary draw on social factors to motivate employees,

influence individual behaviors and productivity. While the granularity of the data allow me to study individual outcomes and behaviors in each setting, I also explore the impact of individual-level behaviors and productivity on organizational outcomes.

The first chapter investigates how social affiliations between real estate listing agents and home sellers impact value creation and appropriation in transactions. While many studies have emphasized the potential efficiency and costs benefits from transacting within social structures, it remains unclear how transacting with socially-affiliated clients impacts the performance of experts and firms. Using a novel dataset that pairs elements from the Wasatch Front Regional Multiple Listing Service with data on geographically-assigned LDS congregation boundaries in Utah, I identify listings for which listing agents and home sellers share a social affiliation through the formal structure of the church. I then investigate the impact of this affiliation on the value that is created in the transaction, in terms of final sale price, probability of sale, and days on market, and the value appropriation tactics used by agents in transactions, including dual agency. Finally, I investigate the impact of transacting with affiliates on overall firm revenues over time.

The results from this chapter suggest that agents create and appropriate more value in transactions, and significantly improve performance, by engaging in transactions with socially-affiliated clients. First, I find agents sell comparable homes for 2% more when listing for affiliates without increasing time of market, and increase the probability that a home will sale. My results suggest that one avenue through which this occurs is increased marketing efforts. Second, I find that agents increase their use of dual agency by 17% when listing for affiliates, suggesting that affiliations allow agents to employ additional tactics to appropriate value in transactions. Finally, I find that firms significantly improve revenues as the percentage of homes

sold to affiliates increases—A 10% increase in the number of yearly transactions with affiliates leads to an approximately 2% increase in total yearly firm revenues. Overall, these results suggest that firms and employee-experts can significantly improve performance on transactions by leveraging social affiliations between employees and clients.

The second chapter builds on and extends the first chapter, and explores how social affiliations influence the type of transactions listing agents are able to secure, as well as the underlying selection process. In many industries access to valuable transactions is critical to firm performance and survival. However, it is still not well understood how social affiliations influence the selection process, and the types of transactions available to firms. Indeed, the literature argues they could either lead to selection benefits (e.g., DiMaggio & Louch 1998) or to the firm becoming a "relief organization" (Uzzi 1997). Similarly, it is still not well understood how social affiliations interact with observables commonly used to select transaction partners, such as previous experience, reputation, or status. This chapter investigates these questions using the residential real estate data from Utah.

The findings of this chapter suggest that agents list more valuable homes when listing for affiliates, and that the underlying selection process differs when affiliations are present. I find that agents list 14% more expensive homes, 11% larger homes, and are significantly less likely to list low quality homes when listing for affiliates. I also find that while experience, previous performance, fit, and working for a franchise brokerage all typically increase the odds of being chosen by a client to list a home, social affiliations substitute for these variables. Similarly, my results suggest that agents are able to list more expensive homes at lower levels of experience when listing for social affiliates. This creates a feedback loop where agents are able to gain valuable experience listing expensive homes through listing for affiliates. Added experience and

reputation then results in more valuable future sales for agents with non-affiliates. Taken together these results suggest that in addition to the performance benefits found in chapter 1 from transacting with social affiliates, there are also significant selection benefits. Moreover, these selection benefits significantly improve agent and firm performance, and imply important entry and competition benefits.

The final chapter investigates the impact of a corporate award program on employee motivation, productivity, and plant performance. Awards are a commonly used method to incentivize employee behaviors, and today more than 80% of organizations use some type of award program (Garr 2012). In contrast to financial incentives, awards reward primarily through non-pecuniary methods, such as through social or psychological mechanisms. While awards are commonly used in the workplace, surprisingly, we still have only a limited understanding of how awards impact employee motivation and productivity, and particularly when they result in unanticipated outcomes. Indeed, the current literature primarily focuses on the benefits of awards, often viewing awards as cheap subtle motivation that avoids many of the unintended consequences of monetary incentives.

In this chapter my co-authors and I propose and test a theoretical framework of how workplace awards affect employee motivation and performance. Using a proprietary dataset from multiple plants of a commercial laundry cleaning company, we investigate how the implementation of an attendance award program influenced employee attendance behaviors, as well as individual productivity. We find that while the implementation of the award had a positive impact on the intended dimension, significantly decreasing tardy and late behaviors by plant workers, it also led to a host of unintended consequences. First our results suggest it led to employee gaming, where employees used sick days to strategically preserve eligibility. Second,

we find that the award only led to positive attendance impacts when employees were eligible for the award, and that workers reverted to previous behaviors once ineligible. Finally, and most importantly, we find the award led to a significant decrease in daily productivity for employees with high pre-award task motivation, likely out of fairness concerns or because of a violation of psychological contracts. Overall these findings suggest that the implementation of this program led to a 1.4-3.1% decrease in total plant efficiency. Thus, the results of this chapter suggest that awards can be far more costly than anticipated, and do not always function as cheap subtle motivation. Moreover, our results suggest further research is needed to understand when awards are beneficial, and when they may lead to unintended consequences and costs.

Taken together, the results of this dissertation suggest that focusing on micro-macro links is a fruitful avenue for future research. The key idea underpinning the recent push to investigate micro-macro links in strategy is that individual-level factors are responsible for a significant portion of the observed variance in organizational performance, and that scholars have perhaps over focused on firm or industry-level factors in explaining the variation in organizational performance. In each chapter of this dissertation I have found that micro individual-level factors dramatically influence macro organizational-level outcomes. Moreover, the results imply that managing the micro correctly, either through hiring and staffing policies, or through implementing proper policies to manage social factors, are critical to organizational success.

STATEMENT OF CONTRIBUTION

While the first two chapters of this dissertation benefited greatly from the comments of numerous individuals, including my dissertation chair and committee, both chapters represent solo-authored work. Consequently, all data collection, analyses, and writing are my own. The third chapter, however, represents co-authored work with Ian Larkin and Lamar Pierce. My contribution to this chapter included assisting in formulating the initial question, collecting archival and interview data from *LaundryCo.,* cleaning, and analyzing data, and writing and editing the chapter, particularly in its early drafts. The framing and theoretical framework of the chapter benefited greatly from the work of Ian and Lamar, and I am grateful to have the opportunity to work with them as co-author on this project.

CHAPTER 1

It's Who You Know: How Transacting with Socially-Affiliated Clients Impacts Expert and Firm Performance

CHAPTER ABSTRACT

While many studies have emphasized the efficiency and cost benefits from transacting within social structures, it remains unclear the extent to which experts and firms can create and appropriate value when transacting with socially-affiliated clients, especially in the absence of repeat transactions. I investigate this question using a novel approach that pairs data from the Wasatch Front Regional Multiple Listing Service in Utah with hand-collected data on geographically assigned LDS (Mormon) congregation boundaries. By identifying listings for which real estate agents and home sellers share a common church congregation affiliation, I explore the impact of affiliations on the value listing agents create and appropriate in real estate transactions. I find that agents sell comparable homes for 2% more when listing for affiliates without significantly increasing time on market, and exert more care and effort on transactions. Moreover, agents increase use of dual agency by 17% when listing for affiliates, suggesting affiliations provide agents increased flexibility and access to value appropriation tactics. Data on exogenous shocks to congregation boundaries suggest all results are driven by current social affiliations, and not simply by proximity. Overall my results show firms increase revenues significantly as the percentage of listings with affiliated clients increases. This suggests that a more nuanced view of social structures is needed that incorporates individual choice, the context, and the opportunity space created for value appropriation by information advantages and assumed trust.

1.1 Introduction

Professional service industries account for four out of five US jobs and 68% of US GDP (USTR, 2014). Often critical to firm success in such industries are employee experts, or individuals given discretion over their time and firm resources in order to employ specialized skills or knowledge to generate value for the firm. A growing literature has focused on issues surrounding expert productivity, choices, and sorting in various service settings, including legal services (Carnahan et al. 2010; Campbell et al. 2011), science and engineering (Stern 2004; Sauermann & Cohen 2010; Elfenbein et al. 2010), medicine (Huckman & Pisano 2006), financial services (Mullainathan et al. 2012), emissions inspections (Gino & Pierce 2010), and enterprise sales (Larkin 2014). A key takeaway from this literature is that experts significantly impact organizational outcomes, but they often face conflicting incentives that lead to firm inefficiencies or problems of moral hazard.

One important, yet understudied, set of factors that influence expert performance stem from social affiliations with clients (Granovetter 1985; 2005; Burt 1997; Bandiera et al. 2005; Charness & Rabin 2002; Uzzi & Lancaster 2004). When uncertainty is high, clients often choose to transact with socially-affiliated experts in service settings (DiMaggio & Louch 1998). However, such affiliations create a paradox for firms: While transacting with affiliates may provide trust, influence, and information benefits that allow experts to create additional value in the transaction, transacting with affiliates can also create obligations and pressures that limit the value experts appropriate in transactions, leading to ambiguous performance outcomes and potential moral hazard problems for the firm. Indeed, social affiliates often transact in a business setting in order to "get a good deal" or to extract favors (DiMaggio & Louch 1998). Thus, an open question remains: When an employee expert transacts with a socially-affiliated client, what

impact will this have on the value created and appropriated by the expert in the transaction? Moreover, how will this impact firm performance?

In this chapter I argue that in settings where information is incomplete and the shadow of the future is weak,[1] experts can leverage social affiliations, defined as common memberships between experts and clients in formal social institutions, to both create and appropriate additional value in transactions. These advantages stem from information and solidarity benefits created by the social structure, which lead to greater levels of trust and added flexibility in the transaction. I argue that increased value creation and appropriation ultimately result in significant performance benefits for experts and firms. I test my argument using data from the residential real estate industry in Utah, which allows me to investigate how transacting with affiliated home sellers impacts listing agent and brokerage performance through value creation and appropriation. My goal is to show that future research and theory must continue to explore not only value creation from transacting with social affiliates, but also value appropriation through the opportunity space for opportunistic behaviors created by increased levels of information and trust.

The idea that transacting with socially-affiliated clients could lead to opportunistic behavior and increased value appropriation by experts runs counter to extant theory. Theories in social network theory (e.g., Coleman 1990; Granovetter 2005), social identity theory and conflict theory (e.g., Sherif et al. 1961; Tajfel et al. 1971; Billig & Tajfel 1973; Ashforth & Mael 1989), social capital (e.g., Arrow 2000; Adler & Kwon 2002), and social preferences (e.g., Bandiera et al. 2005; Fehr & Fischbacher 2002; Charness & Rabin 2002) all suggest that social affiliations generate trust and goodwill in transactions, and consequently lead individuals to behave more responsibly and eschew opportunistic behaviors. Consequently, the prescription is that when

[1] For an example of work that focuses on transactions and relationships where the shadow of the future is strong, see Elfenbein and Zenger, 2013.

uncertainty and the risk of opportunism are high, value can be created by transacting with social affiliates (e.g., DiMaggio & Louch 1998). This creates a dilemma for experts and firms, however, as they seek to generate profit in transactions. In order to generate the trust and goodwill that facilitates value creation in uncertain exchanges, experts and firms must be willing to accept the obligations and social pressures inherent in the social structure (Granovetter 1985). However, accepting these obligations and pressures makes it difficult for them to behave opportunistically or use affiliations to appropriate additional value, reducing the flexibility afforded by the increased levels of trust. Thus, while transacting with affiliates may lead to greater value creation in transactions, it is unclear the extent to which experts and firms can exploit social affiliations as a resource to appropriate value and improve firm performance.

To address this gap, and test my argument, I pair rich transactional data from the Wasatch Front Regional Multiple Listing Service (MLS) with data on religious congregation boundaries in Utah County, Utah for 1998-2014. In Utah County nearly 90% of the approximately half-million residents report belonging to the Church of Jesus Christ of Latter-day Saints (ASARB 2010).[2] This church geographically assigns each home in the county to a congregation, which church members are required to attend to remain in good standing with the church. By collecting a panel of congregation boundaries, as well as home addresses for real estate agents and the homes being sold, I identify listings for which real estate agents share a common social affiliation with the home seller through the formal social structure of the church congregation. I then investigate the impact of these affiliations on 1) agent effort and performance on transactions, including original listing price, final selling price and time on market, 2) agent flexibility and use of tactics to appropriate additional value in transactions, such as dual agency, and 3) firm outcomes, in terms of brokerage yearly revenues.

[2] This church is also often referred to as the LDS Church of the Mormon Church.

I find that agents exert more effort and increase revenues on transactions when listing for affiliates. After controlling for home vacancy, agents are 4% more likely to require buying agents call them prior to showings and 5% less likely to only use a key box to show the home when listing for affiliates. These results imply increased agent care and marketing effort. I also find agents list and sell comparable homes for 2% (~$4012) more when listing for affiliates, and do so without increasing days on market or decreasing probability of sale. Interestingly, I find these performance benefits increase in size with affiliation strength.

In addition to these value creation benefits, I also find evidence suggesting that listing for affiliates provides agents additional flexibility and access to value appropriation tactics. First, I find agents are 17% more likely to act as dual agents when listing for affiliates, where they represent both the seller and the buyer, and sell homes cheaper and quicker as dual agents when listing for affiliates. This result suggests agents leverage social affiliations to engage in such deals, which effectively double commission revenues on transactions. Second, I find evidence suggesting agents use social affiliations to "break slumps" and relieve associated financial need. These results suggest listing for affiliates provides agents increased flexibility, which may be used to appropriate additional value in transactions.

Finally, I find that these benefits of transacting with social affiliates significantly improve listing agent and brokerage performance. Agents increase commission revenues both through higher sale prices as well as through increased use of dual agency. Similarly, brokerages increase yearly revenues as the percentage of sales to affiliates in a year increases: A 10% increase in the percentage of yearly sales to affiliates increases brokerage revenues by approximately 2%. Multiple robustness checks, including analyses that explore the impact of unexpected changes to

congregation boundaries, add support to these findings and suggest all results are driven by current social affiliations, and not simply by geographic proximity.

This study has important managerial implications and contributes to several important literatures. First, this study contributes to the literatures on incentives and motivation by showing that transacting with social affiliates can significantly increase expert effort, performance, and value appropriation, separate from financial incentives. Moreover, these outcomes do not require repeat economic transactions or transacting within the shadow of the future. My results also suggest that a potential alternative to attracting high-performing experts is to hire experts that can transact with social affiliates.

Second, this study contributes to the literatures on social capital and network ties by presenting a more nuanced view of embeddedness that includes both value creation and appropriation. A constant criticism of many studies in these literatures is that they overlook human agency (Salancik 1995; Coleman 1988; Kilduff & Brass 2010). While actors are regularly characterized as being responsive to social pressures and concerns, relatively few studies have been able to examine the "engine of action" that drives individual choices in the face of numerous motivations (Coleman 1988, p.96). The results of this chapter suggest that experts make conscious choices surrounding value appropriation behaviors when transacting with affiliates that significantly impact transaction outcomes. Moreover, elements of the context, including the strength of affiliation, significantly impact their choices.

Finally, this study contributes to recent calls to investigate micro-macro links in strategy (Felin & Foss 2005; Mollick 2012; Barney & Felin 2013). The results of this chapter suggest that

an important firm resource is embedded in the social affiliations of individual employees.[3] Such affiliations make up an important component of human capital, which is often conceptualized as the knowledge, information, skills, abilities, and other resources of individuals (e.g., Ployhart & Moliterno 2011; Becker 2002; Wright et al. 2014). Deploying this resource in economic transactions can significantly improve firm outcomes. However, firms must understand how the context within which the transaction is embedded influences expert choices when dealing with social affiliates, and provide complimentary policies that support experts appropriating value for the firm. The results of my study also suggest that firms may experience persistent differential performance outcomes that are driven by the number and quality of social structures to which employee-experts belong.

1.2 General Theory

1.2.1 The Organizational Challenge of Experts

A substantial literature has focused on the difficulty of motivating employees to act in the interests of the firm. Much of this difficulty stems from the fact that individuals respond to numerous factors, including financial incentives (see Prendergast 1999 for a review), social pressures and concerns (Coleman 1988; Granovetter 1985; 2005; Charness & Rabin 2002; Fehr & Fischbacher 2002), identity (Ashforth & Mael 1989; Akerlof & Kranton 2005), and intrinsic motivations (Deci 1971; Amabile et al. 1994). Multiple interacting incentives make it difficult for firms to design effective incentive systems and policies (Kerr 1975), and may lead to unexpected outcomes that decrease productivity (e.g., Gneezy & Rustichini 2000; Gubler et al.

[3] Previous work has theorized on the potential benefit of personal relationships and other "intangible assets" to individual productivity and firm performance (e.g., Hall 1993). This study adds empirical evidence and additional theoretical insight to this literature.

2014). Moreover, individuals often face incentives outside the firm, which may lead to problems of moral hazard.

Motivating individuals and avoiding moral hazard problems are particularly difficult when individuals are given discretion in their work. Such individuals may include experts (e.g., Jacob & Levitt 2003; Pierce & Snyder 2008; Snyder 2010), top management teams (Jensen & Meckling 1976), managers (e.g., Frank & Obloj 2014), salespeople (e.g., Larkin 2014), or independent contractors (e.g., Baker & Hubbard 2003). When individuals have unique skills or knowledge they often must be given discretion over the use of their time and firm resources, such as pricing, to generate value for the firm. While allowing discretion potentially creates benefits for the firm and allows flexibility by decentralizing organizational decisions (e.g., Garicano 2000), discretion can also lead to problems of moral hazard for two reasons. First, discretion usually exists with high levels of asymmetric information between experts and the firm. This results in increased opportunity for experts to act in ways counter to firm goals, but which benefit them personally, at low risk of punishment. Second, experts face incentives from both inside *and* outside the firm. In many cases incentives provided outside the firm, such as from social reputation, overwhelm incentives provided inside the firm, creating pressures for experts to use discretion for their own benefit to the detriment of the firm. Consequently, when experts are given discretion this can lead to moral hazard problems and performance decreases for the firm.

1.2.2 Social Structures and Social Motivations

A significant motivator of expert behavior stems from social affiliations between experts and clients. I define social affiliations as connections arising from common membership in formal social institutions that are external to the firm and the economic transaction. Such

institutions define the social structure, and may include churches, schools, the military, clubs, corporations, alumni groups, or charitable organizations. While social affiliations create potential benefits, they also impose obligations and social pressures that may impact expert choices and behaviors in ways important to the firm. Granovetter was among the first to articulate the importance of understanding the impact of social structures and affiliations on economic outcomes. He argued that economics had largely taken an "under socialized" view of individual behavior, and overlooked that "actors do not behave or decide as atoms outside a social context", but that "their attempts at purposive action are instead embedded in concrete, ongoing systems of social relations" (Granovetter 1985, p.487). Similarly, psychologists have long argued that social identities significantly impact individual behaviors, and that these identities are often constructed by social affiliations (Sherif et al. 1961; Tajfel et al. 1971; Falk & Zehnder 2007). Consequently, scholars have argued and found that social structures significantly influence individuals in both positive and negative ways (Ben-Porath 1980; Coleman 1988; Granovetter 1985; Greif 1993; Bandiera et al. 2005; Granovetter 2005; Yenkey 2014).

Social structures may create benefits for experts that lead to value creation in transactions. This value creation can be thought of as either increased revenues or reduced costs in the transaction. There are two primary mechanisms through which this may occur. First, social structures facilitate the flow of quality information between affiliates, resulting in information advantages (Coleman 1988; Krackhardt & Hanson 1993; Uzzi 1997; Reagans & McEvily 2003; Granovetter 2005). Such information is more fine-grained and allows experts to better anticipate customer preferences (Uzzi 1997). Additionally, social structures provide experts increased access to private or tacit information. This comes both from increased observation and

interaction, which are more frequent in social structures, as well as from increased knowledge sharing by clients under weaker concerns of opportunism.

Second, social structures create solidarity benefits. These benefits arise either from in-group preferences (e.g., Tajfel et al. 1971; Billig & Tajfel 1973; Ashforth & Mael 1989) or from shared expectations, norms, and obligations between affiliates (Coleman 1988; Granovetter 1985; Arrow 2000; Adler & Kwon 2002). Such benefits result in increased levels of confidence and trust from clients, as well as feelings of goodwill and reciprocity. Solidarity benefits are supported by a system of reward and punishment in the social structure, which creates pressure for members to behave responsibly to maintain reputation and avoid social punishments (Granovetter 1985; 2005). These features of the social structure may lead to decreased transaction costs (Uzzi & Lancaster 2004; Lancaster & Uzzi 2012), reduced problems from opportunism (Ben-Porath 1980; Greif 1993; Uzzi 1999), and improved transaction outcomes that increase expert performance.

In addition to these two mechanisms, transacting with social affiliates may lead experts to exert additional effort to improve performance on transactions. First, external pressures from shared expectations, norms, and obligations provide incentives for experts to exert more effort when transacting with affiliates, regardless of the strength of financial incentives, in order to deliver a high quality service and avoid reputational losses or social punishments. Second, internal pressures from social preferences (e.g., Charness & Rabin 2002) as well as in-group preferences drive experts to increase effort to improve outcomes for affiliates. Third, solidarity benefits increase expert confidence that affiliates will deal fairly with them and fulfill their obligations, which may lead to improved motivation and additional expert effort. Overall I expect increased effort, improved information, and solidarity benefits to lead to value creation in

transactions when experts transact with affiliates. Such value creation leads to higher revenues and/or lower transaction costs for the transacting parties. This leads to my first hypothesis:

H1: Experts will create more value in transactions with socially-affiliated clients, compared to transactions with non-affiliated clients

In addition to simply creating value in the transaction, however, social affiliations may also influence how value is distributed between experts and clients. Such considerations have been underexplored in the literature to date. Yet, understanding this process, including the pressures influencing the split, is critical to explaining how transacting with affiliates impacts expert and firm performance. The literature has argued that the same obligations and social pressures that create trust and allow for value creation in transactions also necessarily tie the experts hands (Granovetter 1985). This results in reduced flexibility as it prohibits experts from acting in ways that could be perceived as opportunistic without damaging social reputation and future levels of trust. Consequently, the implication is that while value may be created by social affiliations, it may be difficult for experts to appropriate without harming social reputation.

The literatures on social preferences and parochialism/in-group preferences provide similar predictions, suggesting that experts will be less likely to act opportunistically to appropriate value when transacting with affiliates. Social preferences are defined as concern by experts for the welfare and monetary outcomes of other parties in the transaction, which lead experts to take actions that decrease their own monetary gains but increase welfare for other parties. Social preferences may include many types of preferences including pure altruism (Andreoni & Miller 2002), inequity aversion (Fehr & Schmidt 1999; Bolton & Ockenfels 2000), or reciprocal fairness (Fehr & Fischbacher 2002). Social preferences have been shown to be activated by social relationships (Bandiera et al. 2005; Bandiera et al. 2009), especially when

there is potential for inequity in monetary outcomes (Charness & Rabin 2002; Fehr & Schmidt 1999; Bolton & Ockenfels 2000). Relatedly, psychologists have argued and found that individuals tend to act in ways that benefit in-group members (Sherif et al. 1961; Tajfel et al. 1971; Billig & Tajfel 1973; Ashforth & Mael 1989; Falk & Zehnder 2007).

While the above literatures suggest social structures limit expert flexibility and opportunistic behaviors in transactions, paradoxically social structures may also provide experts increased flexibility and access to value appropriation tactics because of information benefits and the assumed trust and goodwill from clients. Granovetter, for instance, noted that increased trust "presents, by its very existence, enhanced opportunity for malfeasance" (1985, p.491). A related literature in criminology (e.g., NASAA 2001; Fairfax 2001) as well as more recent work in management (Yenkey 2014) have found evidence supporting this claim, showing that social similarity and affiliations lead individuals to exercise less vigilance when dealing with social connections, which may lead to increased victimization by socially-connected criminals. While Granovetter and these studies specifically reference unethical or criminal behaviors, the logic applies to opportunistic behaviors. Thus, while pressures exist for experts to avoid opportunistic tactics that can be used to appropriate additional value in transactions when transacting with affiliates, the opportunity space for opportunistic behaviors increases with information and trust.

A key element underlying expert value appropriation from affiliates is individual choice. A consistent criticism of work in social capital and social networks is that these studies often overlook human agency (Salancik 1995; Coleman 1988; Kilduff & Brass 2010). For instance, Coleman argued that while actors are often characterized as being "shaped by the environment… there are no internal springs of action that give the actor purpose or direction" (Coleman 1988, p.96). Consequently, while many studies have emphasized that social structures impose social

pressures on individuals, few studies have focused on how individuals respond to such pressures. Yet, a robust literature in economics highlights that individuals are self-interested, and respond to incentives (see Prendergast 1999 for a review). Moreover, humans have proven remarkably adept in gaming incentive schemes (e.g., Holmstrom & Milgrom 1991). Consequently, when given the opportunity to do so, I expect that agents will sometimes leverage social affiliations to appropriate additional value in transactions, especially when the threat of punishment is low.

In settings where information is incomplete, and the shadow of the future is weak, I argue that experts will leverage social affiliations for their own benefit and purposes. Incomplete information reduces the risk of social punishments, as performance evaluation becomes more difficult and costly. Similarly, when the shadow of the future is weak the potential harm to reputation is dramatically reduced. I expect that under such conditions experts will leverage the flexibility and information benefits afforded by the social structure to engage in tactics that can be used to appropriate additional value. Moreover, I expect that strong financial incentives will drive experts to engage in such behaviors. It is important to note that such appropriation behaviors need not necessarily result in inferior outcomes overall for clients, as appropriation may also flow from other parties in the transaction. Additionally, flexibility may allow experts to increase their use of tactics that may otherwise be unavailable because of inherent conflicts of interest, but which do not necessarily result in negative outcomes for clients. Finally, it is important to note that even if experts appropriate additional value from affiliated clients, clients may still be strictly better off transacting with affiliated experts compared to non-affiliated experts due to the value that is created by social affiliations in the transaction. My second hypothesis now follows:

H2: Experts will appropriate more value in transactions with socially-affiliated clients, compared to transactions with non-affiliated clients

Finally, I expect that firms will improve performance, in terms of accounting profits, as the percentage of deals with social affiliates increases. This stems both from increased value creation in transactions when employee-experts transact with affiliates, as well as from increased value appropriation. While this result follows directly from the previous two hypotheses, the fact that experts exert differential levels of effort on transactions clouds the outcome, as experts only have a fixed amount of time and energy in a given day. Increased effort expended on affiliate transactions could thus result in experts exerting less effort on non-affiliate transactions, resulting in fewer overall transactions, lower performance on non-affiliated transactions, and consequently lower overall performance for the firm. However, because experts have increased flexibility when transacting with affiliates I expect them to manage transactions to avoid such outcomes. My final hypothesis now follows:

H3: Ceteris Paribus, firms will improve performance as the percentage of total transactions between employee-experts and socially-affiliated clients increases

Figure 1.1 provides a visual overview of the preceding three hypotheses, including the primary mechanisms theorized to be driving the results.

1.3 Empirical Setting

The setting for this study is the residential real estate industry, an economically significant industry in the United States that employs over 1 million workers and is roughly equal in size to the brand name pharmaceutical industry, the hotel and motels industry, and the single-location full service restaurants industry (IBISWorld 2014). Estimated revenues for real

estate in the US were about $115 billion in 2013, down from $166 billion in 2005 (IBISWorld 2014). Real estate is a labor-intensive industry where brokerages (firms) and real estate agents assist clients in finding, purchasing, or selling homes or other properties.

At the core of the real estate industry is the real estate transaction, where listing agents assist sellers in selling a home and buyer agents assist buyers in finding and purchasing a home. Figure A1.1 (see Appendix) details the transaction for listing agents, which are the focus of this study. Sellers hire listing agents to assist them in the process of selling their home, including devising a selling strategy, listing the home on relevant databases, marketing the home and finding potential buyers, staging and managing home showings, negotiating offers, and filling out necessary contracts and paperwork to close the deal. For their services listing agents receive a fixed commission, typically 6% of the home selling price, which is then generally split in half with the buyer's agent. Listing agents also split their commission with their sponsoring brokerage. Such broker-agent splits can range from a 50/50 split to as high as a 100/0 split where agents pay a fixed desk fee, but retain the full value of their commissions.[4] When working for a franchised brokerage, agents may also pay a portion of their commission directly to the franchise owner as a franchise fee. Commission splits vary both between and within brokerages.

To sell real estate in Utah agents and brokerages must be licensed by the state. To do business and employ agents, each brokerage must have a broker that is licensed with the state and that oversees the work of employed agents. Often brokers choose to franchise a national company (e.g., RE/MAX, Prudential, etc.) to take advantage of their national brand and other resources. Brokers may alternatively choose to form an independent brokerage and hire agents in an effort to gain market share in a regional or local market. Brokers may also choose to be self-

[4] Recently this traditional model has been challenged by the entrance of "discount brokerages." These brokerages typically charge a flat fee for their services, regardless of the home price, but provide more limited services.

employed, perhaps working primarily out of their home or even remotely from their automobile. Agents are required to have a sponsoring brokerage in order to engage in any deals, unless they become brokers themselves. In Utah County, Utah there are approximately 1500 brokerages and 6450 agents that sell at least one home during my data sample. Forty-three percent of listings are listed by brokerages, 49% by independents, and 8% by self-employed brokers.

Brokerages in the real estate industry compete primarily on labor. Agents are typically hired as independent contractors and negotiate desk fees and commission splits based on experience and previous performance. Consequently, there is low cost to firms to hiring or firing agents, although attracting and retaining high quality agents is critical to firm performance. Brokerages use many different models to attract and retain quality agents. Some provide agents with significant resources, such as access to marketing resources, training programs, office space, office supplies (e.g., copier, telephone, voicemail), or lead generation tools. The cost of providing these resources is covered by fixed desk fees and smaller commission splits. Other brokerages furnish few resources but provide larger commission splits. Overall, financial incentives are relatively aligned between brokerages and listing agents, resulting in few problems of moral hazard from financial incentives.

A primary tool brokers and agents use to list homes in Utah is the Multiple Listing Service (MLS), which is a database of property information operated by the Wasatch Front Regional Multiple Listing Service (WFRMLS). This database includes a wealth of information on sold properties, as well as information on current listings. Much of the information collected in this database, including final sold price, is not shared with government agencies or third party companies, such as Zillow. To gain access to and use the MLS, agents and brokers must pay a subscription fee and be members of the Utah Board of Realtors. This association prohibits

members from sharing confidential information about homes, historic sales, and other agents, and has strict rules surrounding access to the MLS, including the purposes for which it may be used. Agents, for instance, are expressly restricted from sharing their login and password with anyone. Consequently, access to the MLS provides brokerages and agents significant information advantages over clients.

1.3.1 Formal Social Structure in Utah: LDS Congregation Boundaries

In this chapter I focus on the real estate market in Utah County, Utah to take advantage of a setting where a single formal social institution significantly determines the social structure in which real estate transactions are embedded. This formal social institution is the LDS (Mormon) Church. Of the 516,564 Utah County residents (114,350 families/148,350 housing units) reported in the 2010 US Census (American FactFinder 2010), approximately 89% report being adherents to the LDS Church (ASARB 2010). Church members are assigned to congregations, called "wards", with whom they attend church weekly. A collection of geographically proximate wards are assigned to a larger unit, called a "stake", where members meet together less frequently, but often attend large conferences or training events. As of March 2014 there were 147 stakes in Utah County and 961 wards. Thus, the average ward has approximately 450 members, 118 families, and 154 housing units. The average stake has over 3000 members in 7 wards, 826 families, and 1081 housing units.

Each house in Utah County is assigned to an LDS ward and stake based on its geographic location. With few exceptions, homes are assigned to a single ward and a single stake where members are required to attend congregation services to remain in good standing with the

church.[5] Indeed, to enter LDS temples, which represent a significant part of LDS church worship (Mormon.org 2014), it is required that members regularly attend the ward to which they are assigned. In rare instances a member will not attend the ward or stake to which they are assigned, such as if they are an interpreter for the deaf and are needed in a neighboring stake, but permission to do so requires consent from the leadership of the church. Discussions with church leaders indicated that such approval is rare.

Ward and stake boundaries are comprised of a set of houses in a geographic area. Figure 1.2 shows the boundaries for a representative stake in Utah County with seven wards. Because of the high density of LDS church members in Utah County, ward boundaries are quite small and do not line up with significant neighborhood boundaries. For instance, the average *stake* in Orem, Utah covers less than 1 square mile of land, and each stake contains on average seven wards. Consequently, it is quite common that single neighborhoods will be shared between 2-3 wards, and perhaps even bridge stake boundaries. Thus, most homeowners in Utah County have many geographically proximate neighbors with similar homes and socio-demographic backgrounds, but that are members of different wards or stakes. This feature of the setting is important to my empirical identification strategy.

Friendships and social interactions in Utah are directly influenced by congregation boundaries. Table 1.1 contains a list of the typical weekly and monthly activities church members engage in at the ward and stake levels. Given the large number of church events, church members often feel there is little time remaining to spend on maintaining friendships

[5] There are some cases where homes are assigned to multiple wards. These include church wards designed for single individuals only ("singles wards"), wards for newly married couples who are students ("student married wards"), and wards that provide services for a specific ethnic group (e.g., "Spanish wards" or "Tongan wards").

outside congregation boundaries.[6] In addition to these events, the LDS Church employs a lay ministry, and each member is given a responsibility in the congregation called a "calling." Examples of callings include Bishop, secretary to the Bishop, ward financial clerk, youth adviser, nursery teacher, sports director, and Scoutmaster. These callings often require a significant amount of time and facilitate high levels of interactions between individuals at the ward and stake levels. For instance, Scoutmasters and youth advisers take youth on a monthly overnight campout and hold weekly activities outside of church that are typically an hour and a half long. Moreover, youth leaders often frequently visit parents to discuss youth progress in Scouting or other programs. Bishops or Stake Presidents are responsible for giving callings, which may change at any time, and church members have limited input into the callings they receive.

The significance of congregation boundaries on social interactions is most keenly observed when ward or stake boundaries change. Often boundaries are changed unexpectedly by church leaders due to congregation growth or to rebalance units. When boundaries shift it is quite common for members to lament the "loss" of friendships, as changes may put ward or stake members in different church units. While these individuals have not changed their geographic location, the limited time church members have to maintain relationships outside their congregation significantly affects future interactions. My informal discussions with church members revealed that members interact on a social level with other members outside their ward and stake infrequently. One church member, for instance, stated that he barely knew his neighbors across the street, as the neighbors attend a different stake. Another noted that their

[6] The observations about church members in this section are based on informal discussions between the author and church members.

neighbor three doors down "might as well be in another universe," as they are in a different stake.

Overall, this setting has important benefits that make it suitable for addressing my research questions. First, the church social structure in Utah is the primary driver of social interactions and affiliations between individuals, and congregation boundaries are determined by geographic assignment that may change unexpectedly over time. This feature of the setting allows me to use home addresses for homes and agents to identify social affiliations. While still not completely random, using geographic boundaries to identify affiliations helps alleviate empirical concerns that stem from the tendency of individuals to affiliate with similar others (Mouw 2006). Second, strength of affiliation varies between wards and stakes, allowing me to investigate the impact of affiliation strength on transaction outcomes. Third, the real estate industry is characterized by agent discretion and incomplete information, which potentially creates tension when agents list for affiliates as they face financial incentives to leverage social affiliations for their own benefit. Finally, agent productivity on transactions is observed over time, and the link between agent choices, agent productivity, and firm performance is clear.

1.4 Setting-Specific Predictions from the General Hypotheses

In this section I lay out setting-specific predictions. These predictions are derived from the general hypotheses presented earlier, and explore the impact of a geographically-assigned social affiliation between listing agents and home sellers, through the formal social structure of the LDS Church, on agent performance, effort, flexibility, and the value appropriation tactics they employ. A summary of the setting-specific predictions and their corresponding hypotheses are found in Figure 1.3.

1.4.1 Listing Agent Effort and Performance

The first hypothesis argues that experts will create more value in transactions when transacting with affiliates, compared to non-affiliates. This stems both from increased effort as well as from information and solidarity benefits from the social structure. In this setting, I expect that listing agents will increase care and effort on transactions when listing for affiliates through marketing. When listing a home agents can leave instructions for buyer agents on the procedure for showing a home. This may include instructions for how to access the home directly through a key box or electronic keypad, or instructions for how to schedule an appointment. If the home is vacant, agents often place a key box and insert the key box code into the confidential comments associated with the listing. While this allows buyer agents to easily show the home, it does not permit listing agents to actively manage and follow up on showings. Alternatively, agents may require buyer agents call them to schedule an appointment and receive the key or code. This allows agents more control over showings and provides opportunities for agents to receive valuable feedback about the showing, such as reactions to the list price or characteristics of the home that did or did not show well. If the home is not vacant, appointments usually must be made. In these cases listing agents may instruct buyers to call the owner directly to set an appointment or to call the listing agent. When listing agents request buyers call them directly, they are able to manage showings and ensure that the home is ready to be shown. Thus, I expect that listing agents increase marketing efforts and care by requesting buyer agents call them prior to showings when listing for affiliates.

In addition to exerting more effort marketing the home, I expect agents will create value in transactions when listing for affiliates by selling homes at higher prices. Sellers have strong incentives to maximize home sale price. Brokerages and agents similarly desire to maximize selling prices to increase commission, although they also have incentives to underprice homes to

quickly turn inventory (e.g., Levitt & Syverson 2008; Rutherford et al. 2005). When listing for affiliates agents have increased access to private or tacit knowledge about the home, the client, and the neighborhood that allows them to better market and show the home, ultimately resulting in higher selling prices. Higher levels of effort and increased motivation from solidarity factors similarly lead to higher prices, as agents increase care and active management of showings when listing for affiliates. Finally, solidarity factors lead agents to advise sellers to not accept "low-ball" offers, resulting in higher overall selling prices, and may result in sellers being more receptive to agent "coaching." Consequently, I expect listing agents to list and sell comparable homes at higher prices when listing for affiliates.

In addition to home selling price, however, time on market is also important as it influences costs. There is typically a positive correlation between time on market and the sold price premium paid for a home. If a home is priced high this typically increases time on market, as there are fewer potential buyers willing to pay the high price. Moreover, in order for sellers to receive a high price listing agents and sellers may need patience to avoid accepting early "low-ball" offers. While listing for affiliates may consequently result in longer times on market if listing agents are listing and selling comparable homes at higher prices, increased agent effort, solidarity benefits, and information advantages offset this increase. Thus, the overall impact of transacting with affiliates on time on market is ambiguous, although I expect that these forces will offset each other, resulting in no significant difference on average in time on market, despite higher home selling prices.

Finally, I expect agents will be more likely to ultimately sell the home. Sellers and listing agents typically enter into a listing agreement that gives the agent the right to a commission if the

home sells during a specific time period.[7] Interviews with agents revealed that the typical listing agreement in Utah lasts for 180 days. Listing agreements protect agent marketing investments and provide agents a reasonable time period to sell the home. Many factors influence the probability of home sale, including original list price, seller willingness to reduce price over time, characteristics of the home, agent knowledge, agent access to buyers, and agent effort. When listing for affiliates, agents have greater access to quality information, including tacit and private information, better access to potential buyers via the social structure, and exert more care and effort. In addition, decreased concerns of opportunism allow agents to better "coach" sellers on selling strategies and which offers to accept. Thus, I expect that these benefits will result in increased probability of home sale when agents list for affiliates, again reducing costs for agents and the brokerage.

1.4.2 Tactics to Appropriate Value in Transactions

The second hypothesis argues that experts will appropriate more value when transacting with affiliates. This stems from increased flexibility, which allows agents to engage in additional tactics to appropriate value. In this setting one tactic often used to appropriate value is to engage in dual agency, where listing agents represent both the home seller and the home buyer.[8] Dual agency allows firms and agents to capture both sides of the commission in a transaction, and thus significantly increases firm revenues and agent take-home pay. While dual agency may create efficiencies that benefit both the client and agent through information and matching benefits

[7] There are two major types of listing contracts. "Exclusive Agent" listing agreements require sellers to pay a commission on the property if the property is sold through the efforts of any real estate broker. However, the seller is not obligated to pay the commission if the property is sold solely through the efforts of the seller. The "Exclusive Right to Sell" listing agreement requires the seller to pay a commission regardless of whose efforts resulted in a sale. These agreements may stipulate particular individuals that should the property be sold to them the agent is not required to pay the commission.

[8] Dual agency is also referred to as "limited agency." These situations arise when a single agent or a single brokerage represent both the buyer and the seller. In this paper I focus on a single agent representing both the buyer and the seller.

(e.g., Brastow & Waller 2013),[9] agents are limited in their ability to engage in this practice because of the significant potential for conflicts of interest. In a typical real estate transaction listing agents have fiduciary responsibility to sellers, which are seeking to maximize sold price, and buyer agents have fiduciary responsibility to buyers, which are seeking to minimize sold price. When agents represent both parties it becomes impossible for them to act with fiduciary responsibility to both parties. Moreover, dual agency creates incentives for agents to either sell homes at too high a price, because they are compensated by sellers based on the home's sale price, or to sell homes too quickly and cheaply to create dual agency deals with existing buyers. Consequently, many sellers and buyers refuse to allow dual agency, and most states have passed laws restricting dual agency, or requiring agents to disclose dual agency to each party in writing prior to the deal.

When listing for social affiliates I expect that solidarity and information benefits will provide agents increased opportunity to engage in dual agency deals. Solidarity benefits result in increased trust and lessened concerns of opportunism from home sellers. Increased trust results in clients accepting advice from listing agents more, such as advice on how to price the home, when to lower price, and which offers to accept. Such solidarity benefits aid agents in creating successful dual agency deals. Information advantages also provide agents increased opportunity to engage in dual agency. When listing for affiliates agents have increased access to private and tacit knowledge about the reservation prices of sellers and buyers, their financial situation, and their overall goals. Such knowledge allows them to structure the transaction to increase the

[9] Dual agency may create conflicts of interest, but it does not always lead to adverse outcomes for sellers. It may also be used for its informational/matching benefits. For instance, if a listing agent procures a new listing, but already has an existing client-buyer searching for that type of home, dual agency may be used to quickly match sellers and buyers, resulting in benefits for both parties. In such cases agents use existing information about clients to improve matches.

probability that a dual agency deal occurs. It is important to note that while such factors may lead to an increase in dual agency deals for agents, dual agency does not necessarily result in negative outcomes for the seller.

Finally, when agents transact with affiliates I expect that increased flexibility will also allow them to influence transaction outcomes in their favor. In this setting I investigate the extent to which agents reduce selling prices of affiliate homes to "break slumps" and relieve financial need. Financial need, measured as the number of days since the agent's last listing went under contract, creates pressure for agents to earn payment from commission. This pressure pushes agents to use tactics that increase odds of a sale, and particularly of a quick sale. Such tactics may include convincing sellers to reduce home list price to attract more buyers, or convincing sellers to accept low offers instead of waiting for higher offers. I expect that agents can increase the use of such strategies because of information and solidarity benefits associated with social structures.

1.4.3 Impact on Firm Performance

My final hypothesis argues that, ceteris paribus, firm performance will increase with the percentage of sales for affiliates. In this setting brokerage revenues, calculated as the total dollar amount of real estate sales, are the primary metric to evaluate performance. However, dual agency deals also significantly increase brokerage revenues. I measure overall brokerage performance as the dollar amount of real estate sold in a given year, with dual agency transactions counting as double the final sale price for that transaction. I calculate yearly brokerage revenues for each brokerage, and expect revenues to increase with the percentage of total transactions listed for affiliates in a given year. A summary of the above predictions are contained in Figure 1.3.

1.5 DATA

The data for this study originate from numerous sources. The core dataset comes from the Wasatch Front Regional Multiple Listing Services (WFRMLS) in Utah, and contains data on all MLS-listed residential properties in Utah County from 1995-2014. WFRMLS is the sole multiple listing service operating in Utah County, and is the largest MLS in the state. Its database contains data on more than 1 million real estate transactions since 1995. Most agents who list homes for sale in Utah County rely on this service, and at any given time there are usually around 3,000 active listings in Utah County. Listing in the WFRMLS is only done by broker-subscribers, or by agents or assistants working for the broker-subscriber. Listings are required to be entered into the MLS within 5 days of the listing agreement, and information on sold houses, including sold price, commission amounts, loan terms, sale date, and seller concessions, is required to be updated within 10 days of closing (WFRMLS Policies, 2014). WFRMLS has many safeguards in place that require listing agents to enter complete and accurate information, and failure of agents to do their due diligence can result in fines and penalties.

The MLS data include transaction-level data on all MLS-listed transactions entered into by real estate agents and brokerages in Utah County. Each listing includes data on housing characteristics (e.g., street address, square footage, number of bedrooms, age of house, etc.), important dates (e.g., listing date, sold date, under contract date, listing expiration date, etc.), relevant brokerage and agent identities (listing agent, buying agent, and brokerage identities), price information (e.g., original listing price, final listing price, final sales price, amount of seller concessions, etc.), owner information (e.g., agent-owned, government-owned, bank-owned, etc.), show instructions, listing contract terms (e.g., commission offered, type of listing agreement, short sale indicator, etc.), and sold terms (e.g., type of loan, etc.). Table 1.3 details the primary

variables used in my analyses, as well as their summary statistics. The data also include public and confidential comments on each listing that describe the condition of the property and specific show instructions. Following Levitt and Syverson (2008), I analyze the text from the public comments to construct 81 dummy variables that control for house quality and differences unobserved in the other MLS variables. Table A1.1 (appendix) presents the list of these variables as well as their summary statistics.

In addition to the MLS data, I also collected real estate-related data from a few other sources. First, I purchased data from the Utah Division of Real Estate. These data contain agent license information, home addresses, and current brokerage affiliations. Second, I downloaded information on each property from the County Assessor and Recorders offices. Finally, I added in geographic data by running each property address through the Census Bureau's geocoding service.[10] This allowed me to record longitude and latitude for many properties in my dataset, as well as census block and tract identifiers.

1.5.1 LDS Church Boundary Data

LDS congregation boundary data were obtained for every property in Utah County at two points in time. This was done by running each property address through the LDS Church's online "Meetinghouse Locator."[11] The Meetinghouse Locator returns the currently assigned ward and stake for any address in the world. I ran each home found in Utah County's Assessor records through the locator in 2014 to determine the current ward/stake assignment. I then paired these data with 2008 data that were collected using the same procedure. These two snapshots allow me to identify church ward and stake boundaries for the majority of homes in Utah County for 2007-2014. I then link these data with hand-collected dates from various online sources on stake

[10] The geocoder can be found at http://geocoding.geo.census.gov/geocoder
[11] The meetinghouse locator can be found on the church's website: www.lds.org.

creations and boundary changes. This procedure allows me to construct a panel of congregation boundaries for 1998-2014, including boundary changes, for many houses in my sample.

Real estate agent ward and stake boundaries are similarly identified by inputting agent home addresses into the Meetinghouse Locator.[12] Each agent is required to provide a mailing address in order to be licensed in the state of Utah. When address changes occur, agents must update their address with the state within 14 days to avoid penalties. Most agents chose to provide a home address, although some agents provided office addresses. To minimize problems of agents reporting office addresses, I excluded agent addresses from my analysis that include names of major roads that are zoned for commercial purposes (e.g., State Street, Main Street, Center Street), or that reference a suite number. However, including these addresses does not significantly change my results.

1.5.2 Data Construction and Cleaning Process

I follow other major studies in cleaning and preparing the data for analysis. First, I restrict my analysis by dropping the top and bottom 1% of observations from my sample in terms of original list price.[13] This removes homes that originally listed for more than $1,149,000 or for less than $60,000. I also restrict my analysis to homes that were on the market for less than 2 years, and more than 0 days. This dropped approximately 1152 observations from my sample. Restricting my data in these ways removes outliers, such as luxury homes or uncommon short sales that are difficult to sale, and allows me to investigate the impact of social structure on common real estate transactions. Additionally, I drop from my analysis homes that sold for greater than 1.5X the original or final list price of the home as well as homes that sold for less than a quarter of the original or final list price, as these appeared to be errors. This dropped 63

[12] These address lists were purchased from the Utah Division of Real Estate.
[13] Results are similar when dropping the top and bottom 1% of sold price.

observations from my sample. Including these observations does not significantly impact my results. Finally, following Levitt and Syverson (2008) I also dropped houses that reported the total number of bedrooms as zero, the total number of bathrooms as zero, or the total number of kitchens as zero. This dropped a total of 5577 observations from my sample. This cleaning procedure left me with a total of 82,739 home listings and 40,838 sold listings with social affiliation information.

To construct the variable "predicted sold price to original list price", which is used as either a control or dependent variable depending on the specification, I estimated sold price for each home in the sample by regressing the log of sold price on home observables, quality controls, transaction controls (short sale dummy and percentage of sold concessions), time controls (sold year and month dummies, as well as their interactions), and geographic controls. The R^2 value on this regression was 0.87. I then predicted the selling price for each home using the estimates from this regression, and divided this predicted selling price by the original list price of the home. Final values were winsorized to 2.58 standard deviations above and below the mean (top and bottom one half of one percent). This variable measures the degree to which a home is overpriced at first time of listing. A value of 1 implies that the original list price is equal to the predicted sold price, and values above 1 indicate overpricing. A similar variable, "sold price to original list price", was constructed by dividing the final actual sale price of the home by the original list price. Final values of this variable were winsorized following the same method as the previous variable. This variable measures the extent to which a home sells for close to the original list price.

The limitations of these data are well known, and laid out in papers that have investigated the real estate industry. First, the information in the MLS is entered by real estate agents, and

there is not an independent verification system. While the MLS does actively monitor listings to ensure that information is complete, agents may make mistakes or enter estimates for some values, such as square footage. Second, to match up my datasets I had to rely on home addresses or tax ID numbers for each home. In some cases tax ID numbers were not included in the listing, and addresses did not match up between datasets, reducing my sample size. Finally, while these data do include substantial information about each home, there are still home characteristics that are unobserved. While this could lead to concerns about omitted variable bias, the high R^2 on my hedonic regression (R^2=0.87) suggests this is not a significant problem.

There are also important limitations with the congregation boundary data. First, I do not observe when agents move their residence. The license data only include the agent's current address, or the address they last listed before their license expired. Consequently, if agents move I may be incorrectly specifying congregation boundaries for that agent over time. Second, the congregation boundary data only include two snapshots of boundaries (one in 2008 and the other in 2014) for homes in Utah County, and not a panel of boundary changes. These two snapshots, in conjunction with stake boundary change dates gathered online, allow me to identify congregation boundaries and boundary changes for many homes in the sample. However, if multiple stake changes occurred between 2008 and 2014 it is impossible to reliably track congregation boundaries. Consequently, boundaries for these observations had to be coded as missing. Similarly, I am unable to reliably identify congregation boundaries beyond the first stake split event or the first stake creation event for each stake preceding 2008. Finally, I am unable to identify which agents and home sellers are church members in my sample. While 90% of the population in Utah County report being a member of the church (ASARB 2010), my data do not include data on church membership.

1.5.3 Interview Data

In addition to collecting archival data, I carried out interviews with real estate agents and brokers in Utah. These interviews were informal in nature, and asked brokers and agents about their experiences selling real estate in Utah. During my interviews agents expressed feelings that, in general, they were able to be more productive when listing for congregation members. One agent attributed this to increased levels of trust. He noted that the "expectation is everyone is telling the truth, because [we are] all in the same ward. You don't think, 'Is this guy pulling my leg?' You don't get people always saying, 'can you verify that?'" Similarly, another agent shared that information about the home and the financial situation of the seller is an important benefit to listing for affiliates. He stated, for instance, that when listing for affiliates it is easier to assess if individuals are upside down in their house, and to know what price sellers need to sell their home for.

My interviews also uncovered evidence of external and internal social pressures experienced by agents when listing for social affiliates. One agent stated that he felt "more pressure to get the listing right" when working for church members in the ward or stake. He remarked that, "You want to make sure you sell the home for the highest possible value in the neighborhood, as this affects the social community, and you want to do it right." He went on to express his frustration when one client in his ward accepted a low-ball offer, against his advice. He thought, "Oh crap, what do I do now? What will people think about this?" An agent also noted that "you really want to do a really good job for someone in your ward. Maybe less so than your best friend, or your mom, but much more than for the normal client." He went on to emphasize the difference in social pressure experienced when listing for social affiliates: "the relationship is different though than when you list for a family member or your mom. [Your

mom or a family member] won't blame you [if something doesn't go well with the transaction] because they know you did your best. It won't be awkward, and they will still love you." He argued that this isn't the case for congregation members, and that there can be significant pressure because of the social structure.

1.6 Empirical Model

To investigate the impact of congregation boundaries on real estate performance outcomes, I use the following primary specification:

$$Y_{ih} = \alpha_i + \beta_1 * X_h + \beta_2 * Affiliation_{ih} + \varepsilon_{ih}$$

where Y_{ih} is the dependent variable, such as the log of sold price, for listing agent *i* selling house *h* while employed in brokerage *j*. X_h represents a vector of house characteristics, transaction characteristics, quality controls (constructed using text analysis), time controls,[14] and geographic controls. Geographical controls include zip code dummies, which control for heterogeneity in areas and the impact of distance between agents and listed homes.[15] α_i are listing agent fixed effects, and I include brokerage dummies to control for brokerage effects. "Affiliation" is a dummy variable that takes the value of 1 if the home is listed in the same ward or stake as the listing agent's home address, 0 otherwise, and ε_{ih} is the error term. The unit of analysis is the agent/listing for the agent-level hypotheses and the brokerage/year for the firm performance hypothesis. Table 1.3 provides a list of all dependent, independent, and control variables used in my analyses, including their descriptive statistics. All regressions were estimated using ordinary

[14] I use time fixed effects for list dates in instances where listing dates should influence outcomes, such as original list price and days on market, and fixed effects for sold dates in instances where sold dates should influence outcomes, such as for sold price, dual agency, and probability of default. Table notes specify which time controls are used in each model.

[15] The reported results use zip code dummies as geographic fixed effects. Alternative specifications using a dummy variable that takes the value of 1 if an agent and home seller share a same zip code provide qualitatively similar results.

least squares (OLS) with robust standard errors clustered at the listing agent level. Additional analyses are run using Cox hazard and logit models. For discrete choice models I present results from OLS as they avoid bias from the incidental parameters problem (Neyman & Scott 1948). However, logistic regression results for each specification provide similar results.

1.7 Results

1.7.1 Descriptive Statistics

Tables 1.2 and 1.3 provide a list of the variables used in my analyses, as well as the basic descriptive statistics for each variable. Table 1.2 lists the dependent and independent variables, and Table 1.3 the control variables. In my sample, the typical home sells for $200,579 and stays on the market 110 days. It is originally listed at a 5% price premium, based on the predicted sold price estimated using home observables, and sells for 96% of the original list price. The average home has 3.8 bedrooms, 2.5 bathrooms, and 2444 square feet. Approximately 9% of homes sold in Utah County are listed by agents that live in the same ward or stake as the home, and an additional 1 % are sold by agents that previously shared a ward or stake with the home. The average church ward has less than one agent actively listing homes, and approximately 7.5 homes are sold in a ward every year. Agents use a key box as the only method of marketing a home 34% of the time, and request buyer agents call to schedule an appointment 56% of the time. Listing agents serve as dual agents approximately 25% of the time. Figure 1.4 shows the distribution of final sold price divided by the predicted sold price. This figure suggests agents sell homes at higher prices, compared to the home's predicted selling price, when listing for affiliates.

1.7.2 Listing Agent Effort and Performance

The first hypothesis argues that listing agents create more value in transactions when listing for affiliates. The results for this hypotheses are presented in Tables 1.4 and 1.5. Table 1.4 investigates how agent marketing efforts change when listing for affiliates. Column 1 explores the use of a key box. I find that agents are 5% less likely (from a base rate of 34%) to use a key box as the *only* method for showing the home when listing for affiliates. Additionally, the results in column 2 show that listing agents are significantly more likely to request buyers' agents call them to set an appointment for showings. After controlling for home vacancy and original list price, listing agents request a call nearly 4% more often (from a base rate of 56%) when listing for affiliates. Results using seemingly unrelated regressions or seemingly unrelated bivariate probit regressions provide similar results. This suggests agents exert greater care and effort when listing for affiliates.

Table 1.5 presents results for sale price, time on market, and probability of sale when listing for affiliates. The models in Panel A investigate the change in home list and sale price. Because these models include agent fixed effects, home characteristics, transaction controls, and quality controls, the results from these analyses should be interpreted as the within-agent change in selling prices of comparable homes when listing for affiliates. Overall I find that agents sell homes for significantly more when listing for affiliates. Models 1 and 2 show agents list and sell comparable homes for approximately 2% more. Moreover, as shown in model 3, agents list homes for much closer to the final home sale price. The results in model 4 provide further support, and show that agents list homes at higher prices when listing for affiliates, relative to the predicted selling price.[16] These results suggests that agents are listing and selling comparable

[16] I also ran the model in column 4 by constructing a variable that predicted the original list price, following the same procedure outlined earlier for the predicted sold price, and dividing this variable by the actual original list price. Results for this model were nearly identical to the results in column 4.

homes for significantly more when listing for social affiliates, providing additional support for Hypothesis 1.

Finally, I investigate the impact of transacting with affiliates on time on market and the probability of home sale. Typically when homes are sold for higher prices it results in increased time on market and decreased probability of sale. However, I find that the probability of sale increases when agents list for affiliates, and time on market does not significantly change. The results for these analyses are presented in Panel B of Table 1.5. Model 1 shows that the probability of home sale increases by almost 3% when agents list for affiliates, and Model 2 shows that agents are 6.4% more likely to complete the sale during the duration of a typical listing contract (180 days). Relatedly, model 3 shows that time on market does not increase when agents list for affiliates. After controlling for the original home list price compared to the projected selling price, I find that listing agents sell homes for slightly quicker when listing for affiliates. However, this result is not statistically significant at the 10% level (pval=0.13). Results are similar using a hazard model as an alternative specification. Similarly, including unsold houses in the regression and specifying time on market as either time to sale or time to expiration/withdrawal shows affiliate homes sell or expire 3 days quicker (pval=0.06) on average. Overall these results provide strong support for Hypothesis 1, and suggest agents are selling homes at higher prices without increasing costs when listing for affiliates.

1.7.3 Tactics to Appropriate Value in Transactions

My next hypothesis argues that listing agents will experience increased flexibility and engage in additional tactics to appropriate value from clients when transacting with social affiliates. In particular, I expect that agents will increase use of dual agency and decrease home selling prices in order to "break slumps." Table 1.6 provides these results. First, as shown in

model 1, I find that agents are 17% more likely to engage in dual agency when listing for affiliates, a significant increase from the base rate of approximately 25%. Moreover, I find that commission percentages charged to clients do not significantly decrease when agents act as dual agents for affiliates (pval=0.87), and sellers do not contractually negotiate rates significantly differently in anticipation of potential dual agency situations (pval=0.77). Because dual agency effectively doubles commission amounts, this provides strong support for Hypothesis 2.

Table 1.7 provides results on home sale price and time on market when agents engage in dual agency deals with affiliates. I find evidence suggesting that agents sell homes for cheaper and quicker when engaging in dual agency and listing for affiliates. Models 1 and 3 present results on sale price. While the results in model 1 are not quite significant at conventional levels, the results in model 3 suggest agents reduce home sale price when listing for affiliates by increasing seller concessions. These concessions are typically given to cover buyer closing costs, and ultimately decrease the amount paid by the buyer for the home. I find that agents typically have fewer concessions when listing for affiliates under single agency, or when listing as dual agents for non-affiliates. However, when listing for affiliates agents increase sold concessions by approximately 20% (base rate is 1% of the final home sale price). Relatedly, I find that listing agents sell affiliate homes 6 days quicker as dual agents. Overall these results suggest that listing agents may be using their influence with affiliates to reduce sale price prematurely in order to engage in dual agency deals, providing further support for Hypothesis 2. However, it is important to note that even with this decrease in sale price sellers are still receiving a higher price for their home using an affiliated agent compared to using a non-affiliated agent.

Second, I investigate whether agents leverage flexibility from affiliations to relieve financial need and "break slumps." Models 2 and 3 of Table 1.6 present these results. I measure

financial need or "slumps" as the log of the number of days since the agent's last listing went under contract (either as a listing or buyer agent).[17] I then interact this variable with "Affiliation." After controlling for the last sold home's selling price, I find that agents typically sell homes for slightly more when not listing for affiliates and time since last sale increases. However, I find that when listing for affiliates the opposite occurs: agents decrease the selling prices of affiliate homes as time since last sale increases. This result suggests agents use different strategies to sell affiliate homes when experiencing "slumps", and that they may be leveraging affiliations to "break slumps" by decreasing sold price. While my results in column 3 show that time on market is not significantly different as days since last sale increase and agents list for affiliates, agents may engage in this strategy in hopes that they can relieve pressures from financial need. Overall these results provide strong support for Hypothesis 2. Figure 1.5 provides a graphical representation of the creation and flow of value based on the results of these first two hypotheses

1.7.4 Impact on Firm Performance

My final hypothesis argues that ceteris paribus, firm performance will increase with the proportion of total homes listed for affiliates. In particular, I expect the dollar amount of real estate sold in a year to increase for brokerages as the percentage of listings (compared to total number of listings) sold for affiliates increases. The results for these analyses are presented in Table 1.8. It is important to note that for these models the unit of analysis is the brokerage/year. Because these models include brokerage fixed effects, the results should be interpreted as the within-brokerage effect of increasing the percentage of yearly sales to affiliates on yearly brokerage revenues. Column 1 suggests that brokerage revenues increase approximately 2% for a 10% increase in the yearly percentage of transactions with affiliated clients. This provides strong

[17] I use contract date for my financial need measure because this is the date that an agent has confidence a home will be sold, and the approximate price it will sell for. Results using the number of days since last sale are qualitatively similar.

support for Hypothesis 3. Interestingly, the result in Column 2 suggests that brokerages do not list fewer homes when increasing the proportion of listings for affiliates. This result implies that while agents exert more effort when listing for affiliates, this does not result in brokerages listing fewer homes. These results are robust to using logs (instead of levels) or to using count models. Overall, these results suggest both agents and brokerages improve performance by listing for affiliated clients, and provide strong support for Hypothesis 3.

1.8 Robustness and Identifying Mechanisms

In this section I investigate potential alternative explanations and provide additional analyses that give insight into the mechanisms driving the main results.

1.8.1 Geographic Proximity vs Social Affiliations

A conspicuous alternative explanation is that geographic proximity is driving the observed effects, independent of social affiliations, and that the specifications do not adequately control for this using the 26 zip code dummies. To investigate this potential alternative explanation I collected data on census tracts and block groups for each home in my sample. I then re-estimated the models using 339 tract-block group dummies as geographic controls. My results for these analyses are qualitatively similar to the zip code results. Second, I ran additional analyses creating a dummy variable that takes the value of 1 if an agent and home seller share the same zip code. The results of these analyses are also qualitatively similar. As a final check, I geocoded each home in my sample to capture its latitude and longitude. I then constructed a measure of distance (in feet) between agents and homes. This analysis allows me to compare agent performance on homes that are more geographically proximate to their residence, but outside the social structure, to performance on homes that are more geographically distant but within the social structure. My results from these analyses are also qualitatively similar to the zip

code results. These additional analyses suggests that social affiliations, and not simply proximity, are driving my results. Because I am unable to accurately geocode all addresses, or to identify census tracts and block groups for all homes in my sample, my primary specifications present results from the zip code dummies.

1.8.2 Strength of Affiliation

As an additional robustness check, and to explore the mechanisms underlying the results, I exploit varying degrees of affiliation between members in church wards and stakes. As shown in Table 1.1, individuals in church wards interact significantly more frequently than members of church stakes. Given this high degree of interaction, and the fact that ward members live so close to each other, it is rare for ward members to not know each other's names, or to have some experience interacting together through callings or activities. Consequently, ward affiliations are much closer to friendships than simple affiliations or arms-length transactions. In contrast, stake-level interactions are much less frequent, as members meet together less frequently and live further apart. Thus, stake interactions are much more similar to affiliations than friendships, although still stronger than arms-length transactions.

By exploiting these differences between wards and stakes, I investigate how affiliation strength influences value creation and value appropriation by agents. Solidarity benefits are strongest at the ward level, as ward members share common expectations, norms, and obligations with other ward members that are enforced through social pressures and the high degree of interaction. Information benefits are also largest at the ward level, due to the frequency of interaction, the short distances between member homes, and solidarity benefits that lead to increased sharing. At the stake level all these benefits are lessened due to reduced interactions and increased distance between member homes. I consequently expect that the value creation

benefits associated with listing for affiliates will be largest at the ward level. However, I also expect positive benefits when agents list for stake affiliates, compared to listing for non-affiliates. Similarly, I expect that flexibility will be largest at the ward level and consequently lead to increased value appropriation, compared to the stake level or listing for non-affiliates.

The results for these analyses are presented in Tables 1.9 and 1.10. First, shown in Table 1.9, I find that strong affiliations lead to the greatest value creation improvements for agents. Listing agents sell comparable affiliate homes for 1.1% more in the ward than in the stake (T-test p-value<0.01), and sell comparable homes 4 days quicker when listing for ward affiliates. I do not find that agents increase effort when listing for ward affiliates, compared to stake affiliates (T-test p-value=0.59), or that they are more likely to complete the sale in 6 months. However, taken together these results provide additional support for the previous theory, and suggest that strong social affiliations positively impact value creation.

Table 1.10 presents results on flexibility and value appropriation by affiliation strength. First, in column 1, I find that agents engage in dual agency 4% more often when listing for ward affiliates, compared to stake affiliates (T-test p-value<0.01). Moreover, as shown in columns 2-4, agents decrease home sale prices more and sell homes quicker under dual agency at the ward level. This suggests agents leverage the flexibility from strong social affiliations to increase their use of dual agency. Unreported results on the impact of days since last sale find that agents do not significantly change their use of affiliations to "break slumps" when listing for ward affiliates vs stake affiliates (T-test p-value=0.70). However, taken together these results provide additional support for the previous theory, and suggest value appropriation is largest when affiliations are strongest.

1.8.3 Unexpected Changes to Congregation Boundaries

Finally, as an additional robustness check, and to investigate the mechanisms driving my primary results, I exploit unexpected changes to church congregation boundaries. This analysis allows me to explore the differential impact of previous affiliations, compared to current affiliations, on value creation and appropriation by agents in transactions. Congregation boundaries are occasionally unexpectedly changed by LDS Church headquarters due to growth or a desire to rebalance the membership between wards and stakes. When changes occur, this immediately impacts solidarity factors affecting agents. However, information advantages change much more slowly, as agents still have possession of private or tacit knowledge post-change. It is important to note that agents do not change physical location post-boundary change. The changes, however, have significant impact on the social structure as it influences who individuals interact with through the church.

Tables 1.11 and 1.12 present results for current and previous affiliations. Overall the evidence suggests that effort, price, time on market, probability of sale, and dual agency are all positively impacted by current affiliations, compared to previous affiliations. I find that agent effort is not significantly different when agents list for previous affiliates, compared to non-affiliates, and time on market and probability that a listing will stay on the market more than six months increase significantly. While the home sale price and probability of sale are higher when agents list for previous affiliates, compared to listing for current affiliates, it appears that this is driven by the significant increase in time on market. I also find that agents are no more likely to engage in dual agency or to leverage social affiliations to "break slumps" when listing for previous affiliates, compared to non-affiliates, suggesting that current affiliations are driving the use of such tactics. Thus, taken together, these results suggest that the primary effects of this chapter are driven by strong current social affiliations. Moreover, solidarity benefits from the

social structure appear to be important to both value creation and appropriation in the transaction.

1.9 Discussion and Conclusion

While many studies have emphasized the efficiency and cost benefits from transacting within social structures, it has remained unclear the extent to which experts and firms can create and appropriate value when transacting with social affiliates, especially in the absence of repeat transactions. This chapter has argued that information benefits, solidarity benefits, and increased effort lead to value creation in transactions when experts transact with social affiliates. Additionally, this chapter has argued that social structures create flexibility and expand the opportunity space for opportunistic behaviors by experts. When information is incomplete and the shadow of the future weak experts consequently have increased opportunities to leverage social affiliations in transactions to appropriate value.

Overall my results suggest transacting with affiliates leads to an increase in firm and agent performance. I find that agents create and appropriate more value in transactions and exert more effort when listing for social affiliates. Agents sell comparable homes for 2% more without significantly increasing costs and are 17% more likely to serve as dual agents when listing for affiliates. This results in a 2% increase in commission amounts for the average transaction, and a ~50% (~$6017) increase in commission amounts on dual agent transactions. Moreover, I find that improved expert performance significantly impacts brokerage revenues—a 1% increase in the percentage of yearly sales to affiliates increases brokerage revenues by approximately 1.5%. Finally, I find that clients, on average, are strictly better off using an affiliated agent, compared to a non-affiliated agent. However, some of the benefit of using an affiliated agent is mitigated through dual agency.

Theoretically, the results of this chapter imply that under conditions of incomplete information experts make choices about how to behave in social structures. A consistent criticism of studies investigating networks and social structures is that they overlook human agency (Salancik 1995; Coleman 1988; Kilduff & Brass 2010) and treat individuals in an "over socialized" way (Granovetter 1985). Consequently, actors are often theorized to be enabled or constrained by social structures, but are left with little choice regarding their own actions. The results of this chapter suggest that experts make conscious choices when dealing with social affiliates, and that these choices are influenced by other elements of the context. Moreover, experts sometimes behave in ways that do not lead to beneficial outcomes for clients. Thus, as argued by both Granovetter (2005) and Coleman (1988), understanding the impact of social structures on individuals requires understanding all dimensions of the context, as well as the other incentives provided.

More practically, these results have important implications for firms. Apart from financial incentives, experts respond to social factors and in-group preferences that positively impact effort and performance in transactions. Consequently, firms may be able to improve expert productivity, and motivate experts at low cost, by hiring and staffing experts to take advantage of social affiliations. Moreover, heterogeneity in firm outcomes in many service industries may be driven by the number and quality of social structures to which employee-experts belong.

This study also has important implications for markets. My results suggest that social pressures and preferences can, on average, lead to efficiency benefits in transactions and reduce moral hazard problems in markets. Financial incentives and incomplete information in the real estate industry have been shown to lead to problems of moral hazard (Levitt & Syverson 2008;

Rutherford et al. 2005). Such problems contributed to an 8 trillion dollar housing bubble, the collapse of which resulted in the largest financial meltdown in recent history and the loss of 8.4 million jobs (Economic Policy Institute 2014). My results suggest that agents experience increased motivation that leads to increased effort and performance when listing for socially-affiliated clients.

While this chapter has used a distinctive setting to investigate the impact of a social structures on expert performance and behaviors, the results of this chapter are likely generalizable to many settings. The key features of this setting include employee discretion over pricing and the use of firm resources, some degree of incomplete information, transactions embedded in a social structure, and transaction revenues shared between firms and experts, but paid by a social affiliate. Many settings share similar characteristics, and likely lead to similar outcomes. First, settings that involve sales with price discrimination, such as software sales (e.g., Larkin 2014) or car sales, are likely to experience similar results. In these settings salespeople are given discretion in pricing, and information surrounding the cost of the product and customer willingness to pay is incomplete. Thus, salespeople may leverage information and trust benefits to smooth transactions, leading to value creation. However, solidarity and information benefits also provide additional flexibility in transactions that may provide opportunities for salespeople to close more transactions and upsell affiliates.

Second, settings involving service experts, advice, and incomplete information likely experience similar results. Doctors, for instance, are given discretion about when a cesarean section is needed during delivery (e.g., Gruber & Owings 1996). Because patients have limited information about their health status and the true need for a cesarean section, they often rely on the advice of doctors, particularly doctors they trust. However, doctors have incentives to engage

in cesarean sections to increase revenues and decrease risk from lawsuits. Caring for social affiliates may provide physicians increased opportunity to steer patients into cesarean sections. However, it may also create stronger obligations for physicians to minimize costs and avoid downside health complications from the procedure. Similarly, in the financial services industry clients often depend on the advice of financial advisers when deciding investment strategies. However, advisers face financial incentives to steer clients into certain products to increase their commission (e.g., Mullainathan et al. 2012). Sharing a social affiliation with clients may again provide increased opportunity to steer clients to higher-commission products. However, it also may lead to value creation if clients are more receptive to "coaching" and advisers use solidarity and knowledge benefits to more efficiently construct portfolios.

This study is not without limitations. First, while this setting provides an opportunity to improve upon the endogeneity problem encountered from individuals choosing affiliations, social affiliations in this study are still not completely exogenous. Real estate agents choose where to live, and agents and sellers choose who to transact with. Thus, it is difficult to extrapolate these results to all social affiliations. Second, this chapter has largely disregarded the impact of other important affiliations in the transaction, such as between buyers and buyer agents, as well as between real estate agents. This provides an opportunity for future research. Finally, I am unable to observe whether individuals are members of the church, and unable to measure the intensity of social relationships. Thus, this chapter has focused on the impact of "social affiliations" instead of friendships or social connections. Directly measuring the strength of these relationships would provide added insight into the mechanisms driving the observed outcomes and allow for a more detailed understanding of the factors influencing expert choices when dealing with social connections.

Moving forward there is significant potential for expanding and extending this work. First, future work should focus on understanding how varying degrees of incomplete information influence social pressures and in-group preferences for experts, and how this in turn influences expert choices and performance. Second, future studies should extend this work by exploring affiliations between buyers and buyer agents, as well as between agents. Investigating these affiliations would allow additional insight into how professional and social affiliations interact, and how experts utilize professional affiliations when transacting with social affiliations. Third, future work should explore selection issues surrounding which firms and agents are most likely to secure transactions with affiliates. Such an investigation could yield valuable insights into firm entry and hiring decisions. Finally, future research could explore the extent to which survival at entry and subsequent growth is impacted by the quality of an expert's social structure. For instance, it may be that superstars arise because of advantageous social structures at entry, which allow experts to quickly build reputation and experience. The results of this chapter suggest undertaking such research is important to enlarging our understanding of expert productivity and firm performance.

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1.11 Figures and Tables

Figure 1.1: Theoretical Framework

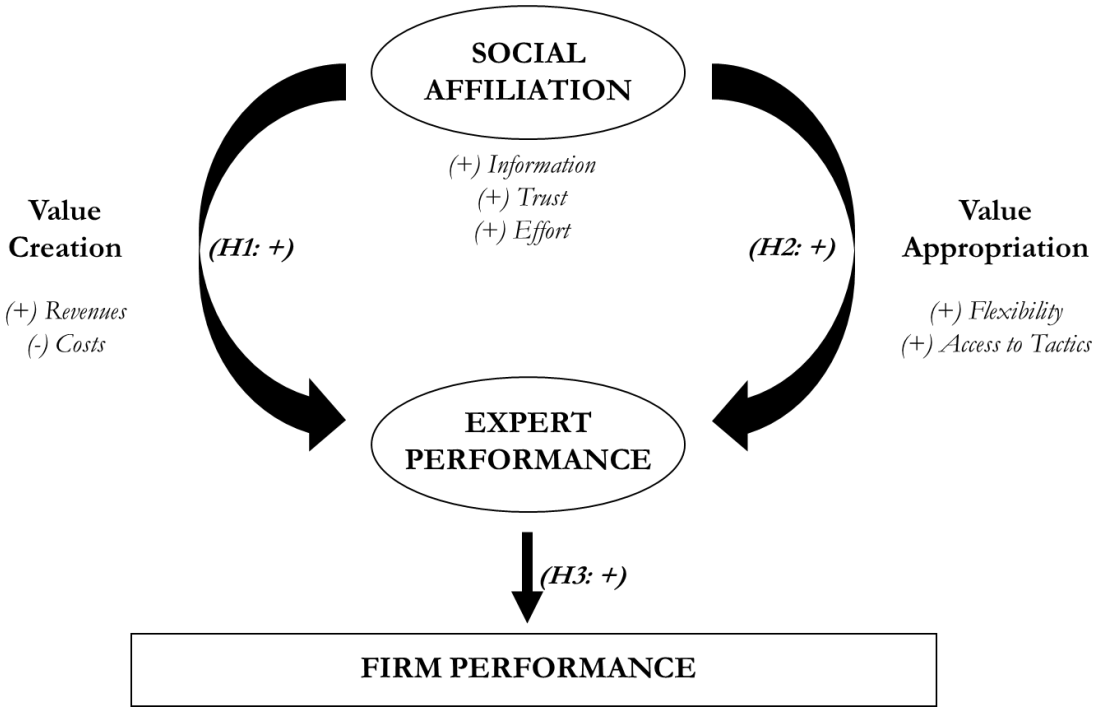
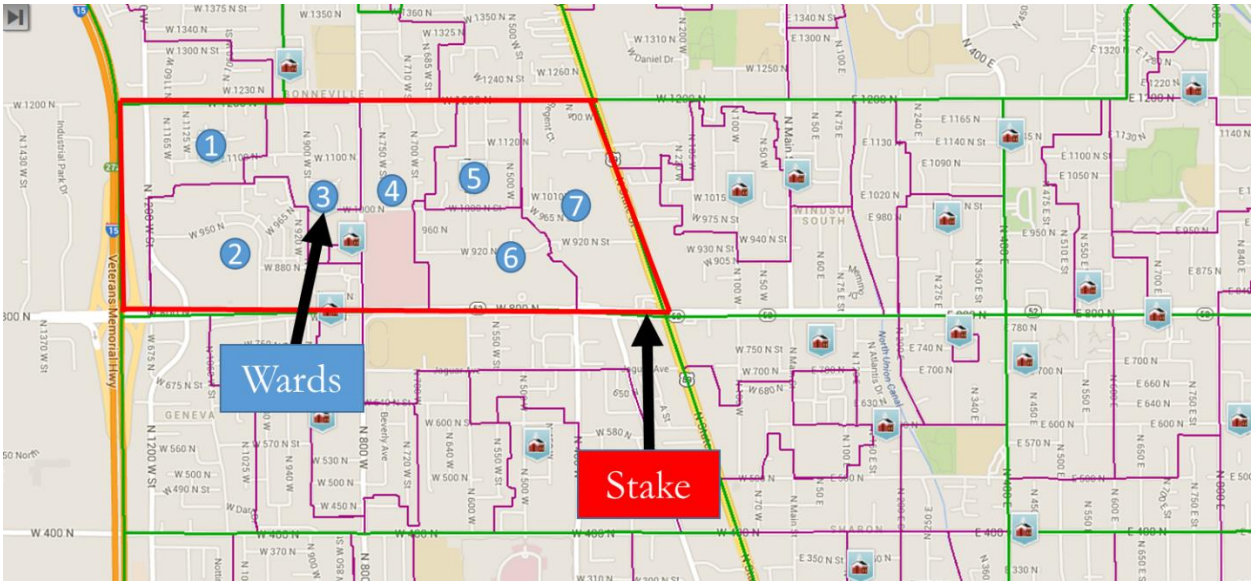


Figure 1.2: Boundaries for a Representative Stake in Utah County with Seven Wards



Note: This figure shows a representative stake in Utah County with seven wards. The green boundaries (including the highlighted red boundary) represent stake boundaries, and the purple boundaries ward boundaries. This map covers approximately 2.5 square miles of Utah County.

Figure 1.3: Setting-specific Predictions Corresponding to the General Hypotheses

When agents transact with socially-affiliated clients…

H1: Increased Value Creation	H2: Increased Value Appropriation
• Increase care and marketing efforts • Sell comparable homes at higher prices • Sell homes without increasing time on market • Increase probability of sale	• Increase use of dual agency • Decrease sale price to engage in dual agency deals • Sell homes cheaper as financial need increases

H3: Increased Firm Performance

- Increase in yearly amount of real estate sold by the brokerage, with dual agency deals counting as double.

Figure 1.4: Agents Sell Homes Higher Above Predicted Sold Price when Listing for Affiliates

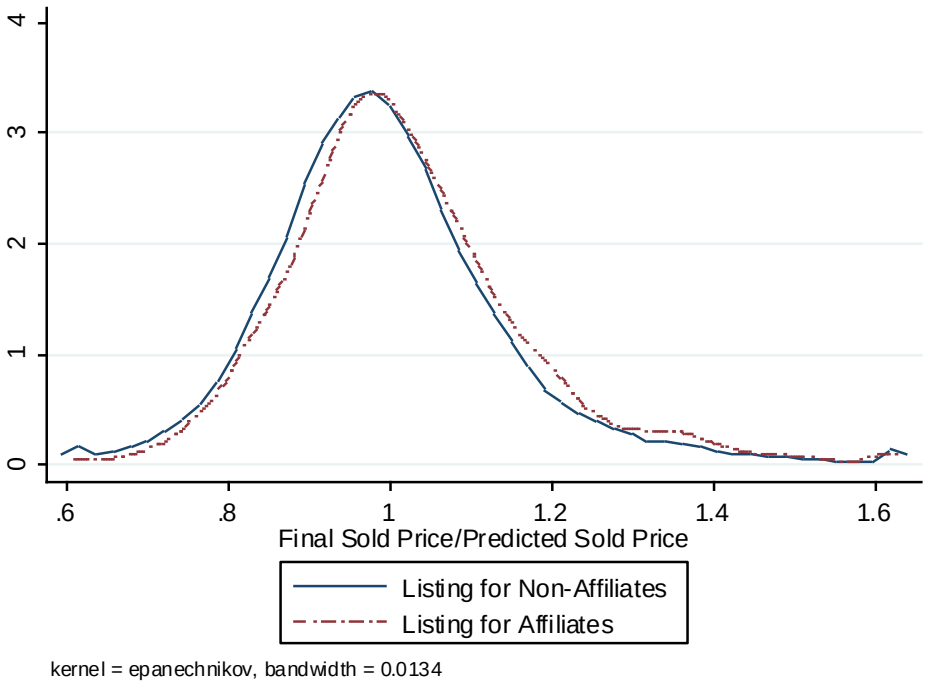


Figure 1.5: Impact of Social Affiliations on the Flow of Value in Transactions

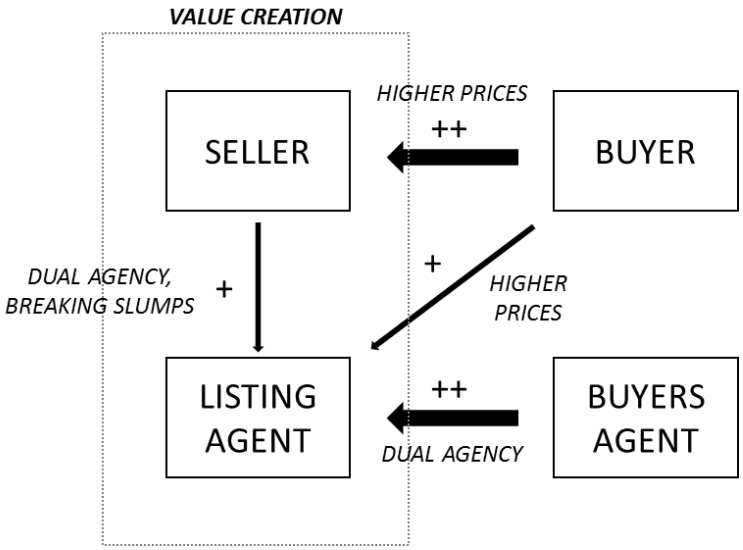


Table 1.1: Typical Interactions in LDS Church Wards and Stakes

Ward Level – (~450 individuals, 188 families, 154 housing units)

Weekly Interactions

-Church services: 3 hours
-Two hours of interactive classes
-Responsibilities associated with callings (e.g., teaching, library, clerk, etc.)
-Multiple leadership meetings for approximately 30 members
-Weekday youth activities (youth and leaders)

Other Interactions

-Bi-monthly social activities
-Monthly women's organization gatherings
-Monthly assigned visits to 2-4 families
-Monthly temple days – members invited to come same day/time
-Calling interactions
-Sports league

Stake Level– (~3150 individuals, 826 families, 1081 housing units)

Regular Interactions

-Bi-annual church conference, all members
-Bi-annual training meetings for leadership
-Monthly scheduled temple days—members invited to come same day
-Youth activities (youth, leaders, and parents)
**Multi-day annual event*
**Full day events (~2/year)*
**Youth dances (~6/year)*
**Annual week long boys and girls camps for youth, leaders, and parents*

Weekly Interactions

-Leadership meetings (5-15 people)

Other Interactions

-Monthly meetings between Stake and Ward clergy
-Stake leadership visits to ward (~6X/year)
-Stake-wide social activities (~2/year)
-Service activities
-Calling interactions
-Sports league

Table 1.2: Descriptive Statistics for Primary Specifications: Dependent and Independent Variables

Variable	N	Mean	Std Dev	Min	Max
Dependent Variables					
Sold	82739	0.49	0.50	0	1
Original list price	40838	211679	119306	60000	1,149,000
Sold price	40838	200571	106456	30000	1,500,000
Days on mkt	40838	109.71	80.08	1	481
Six months	82739	0.25	0.43	0	1
Dual agent	40838	0.25	0.43	0	1
Seller concessions %	40838	0.01	0.02	0.00	0.10
Sold price/original list price	40838	0.96	0.08	0.62	1.19
Predicted sold price/original list price	40838	1.05	0.18	0.66	1.90
Brokerage revenue/yr	2789	3,820,214	8,216,161	71900	894,000,000
Brokerage # sold/yr	2789	14.70	31.88	1	370
Independent Variables					
Affiliation	40838	0.09	0.29	0	1
Previous affiliation	40838	0.01	0.07	0	1
Same ward agent/house	40838	0.04	0.20	0	1
Same stake agent/house	39328	0.05	0.21	0	1
Franchise brokerage	40838	0.46	0.50	0	1
# sold to date, agent	40838	92.25	144.39	1	1138
# list to date, agent	82739	162.39	272.00	1	1870
# sold to date, brokerage	40838	620.07	694.26	1	3435
Key box used	40838	0.61	0.49	0	1
Key box used only	40838	0.34	0.47	0	1
Call agent for appt.	40838	0.56	0.50	0	1
Brokerage % sold to affiliation/yr	2789	11.49	22.54	0	100

Table 1.3: Descriptive Statistics for Primary Specifications: Control Variables

Variable	N	Mean	Std Dev	Min	Max
Control Variables					
Total # bedrooms	40838	3.79	1.22	1	16
Total # bathrooms	40838	2.51	0.96	1	13
Total # kitchens	40838	1.07	0.26	1	4
Total # fireplaces	40838	0.55	0.73	0	5
Total # laundry rooms	40838	1.00	0.34	0	5
Total # dining rooms	40838	0.13	0.34	0	2
Total # family rooms	40838	1.14	0.71	0	5
% of basement finished	40838	41.14	45.37	0	100
Garage capacity	40838	1.50	1.09	0	10
Pool	40838	0.07	0.25	0	1
Square feet	40838	2444	1204	500	18400
Acres	40838	0.28	1.00	0	4.48
Year built	40838	1985	24.63	1860	2014
HOA fee	40838	23.68	70.34	0	10000
Property type					
Condominium	40838	0.10	0.29	0	1
Mobile	40838	0.00	0.02	0	1
Recreational	40838	0.00	0.01	0	1
Single Family	40838	0.79	0.40	0	1
Townhouse	40838	0.09	0.28	0	1
Twin	40838	0.02	0.15	0	1
Short sale	40838	0.06	0.23	0	1
Year	40838	2006	4.30	1998	2014
Commission % offered buyer	40139	2.93	0.25	0	6
Owner agent	40838	0.04	0.20	0	1
Co-agent present	40838	0.24	0.42	0	1
Immediate possession	40838	0.27	0.44	0	1
Other					
# agents in ward	40838	0.86	1.17	0	8
# houses sold in ward/yr	40838	7.45	7.27	0	51

Note: Additional quality dummies were constructed for the following text strings, and their common variants: TLC, Needs Updating, Estate Sale, Foreclosure, Handyman, As-Is, Rehabber, Bank-Owned, Priced to Sell, Motivated, Potential, Close, !, New, Spacious, Elegance, Beautiful, Remodeled/Renovated, Historic/Vintage, Maintained/Well-Cared, Wonderful, Fantastic, Charming, Stunning, Amazing, Granite, Immaculate, Breathtaking, Neighborhood, Spectacular, Landscaped, Stained Glass/Art Glass, Built-in, Tasteful, Must See, Fabulous, Leaded, Delightful, Move-In, Gourmet, Corian, Custom, Unique, Maple, Newer, Hurry/Will Not Last, Pride, Clean, Quiet, Dream, Block, Huge, Deck, Mint, Hardwood, Views, New Roof/New Shingles, Upgraded/Updated, Vaulted, Floor plan, Award, Hot Tub, Tile, Cul-de-sac, Jetted Tub, Park, Brick, Value, Windows, Mother-in-law, Stainless, Theater, Surround Sound, Pickiest, Rare, Starter, Master, Cute, Warranty, Temple, and Fenced. Summary statistics are included in the appendix

Table 1.4: Listing Agents Exert More Care and Effort when Listing for Affiliates

	(1)	(2)
Dependent Variable:	Pr(Key Box Only)	Pr(Agent Appointment)
Affiliation	-0.017*	0.020**
	(0.009)	(0.010)
Vacant	0.406***	-0.327***
	(0.014)	(0.014)
Log(original list price)	-0.046***	0.087***
	(0.018)	(0.016)
Constant	1.288***	0.194
	(0.270)	(0.344)
House Controls	Y	Y
Transaction Controls	Y	Y
Time Controls	Y	Y
Listing Agent FE	Y	Y
Listing Brokerage FE	Y	Y
Experience Controls	Y	Y
Quality Dummies	Y	Y
Geographic Controls	Y	Y
R^2	0.429	0.422
Observations	40838	40838

Note: Robust standard errors presented in parentheses are clustered by listing agent. Transaction controls include dummies for immediate possession, owner agents, presence of a co-agent, use of a dual/variable rate commission, and use of an EAL listing contract. Time controls include year and month dummies for when the house was listed, as well as their interaction. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 1.5: Agents Create More Value when Listing for Affiliates

Panel A

Dependent Variable:	(1) Log(List Price)	(2) Log(Sold Price)	(3) Sold to Original List	(4) Original list to predicted sold price
Affiliation	0.019***	0.020***	0.003**	0.021***
	(0.005)	(0.005)	(0.001)	(0.005)
Constant	4.408***	3.671***	1.076***	2.760***
	(0.168)	(0.186)	(0.076)	(0.180)
House Controls	Y	Y	Y	Y
Transaction Controls	Y	Y	Y	Y
Time Controls	Y	Y	Y	Y
Listing Agent FE	Y	Y	Y	Y
Listing Brokerage FE	Y	Y	Y	Y
Experience Controls	Y	Y	Y	Y
Quality Dummies	Y	Y	Y	Y
Geographic Controls	Y	Y	Y	Y
R^2	0.894	0.898	0.404	0.257
Observations	40838	40838	40838	40838

Panel B

Dependent Variable:	(1) Pr(Sold)	(2) Pr(Six Months)	(3) Days on Mkt
Affiliation	0.014*	-0.016**	-2.323
	(0.008)	(0.006)	(1.490)
Constant	3.849***	-0.668***	-67.179
	(0.265)	(0.234)	(57.761)
House Controls	Y	Y	Y
Transaction Controls	Y	Y	Y
Time Controls	Y	Y	Y
Listing Agent FE	Y	Y	Y
Listing Brokerage FE	Y	Y	Y
Experience Controls	Y	Y	Y
Quality Dummies	Y	Y	Y
Geographic Controls	Y	Y	Y
R^2	0.225	0.193	0.282
Observations	82739	82739	40838

Note: Robust standard errors presented in parentheses are clustered by listing agent. Transaction controls include dummies for immediate possession, owner agents, dual agency, dual brokerage, presence of a co-agent, and short sales, as well as variables for the percentage of sold concessions (except models 1 and 2 of Panel B) and the original list price to predicted sold price (model 3 of Panel B only). House controls include the log of original list price for Panel A model 3 and Panel B models 1 and 2. Time controls include year and month dummies, as well as their interaction, for when the house was listed for Panel A models 1, 3 and 4 and Panel B models 1-3, and for when the house was sold for Panel A model 2. Significance levels: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 1.6: Increased Flexibility and Access to Value Appropriation Tactics when Listing for Affiliates

	(1)	(2)	(3)
Dependent Variable:	Pr(Dual Agent)	Log(Sold Price)	Days on Mkt
Affiliation	0.040***	0.036***	-0.674
	(0.010)	(0.009)	(3.585)
Log(# days since last contract)		0.001*	1.139***
		(0.001)	(0.391)
Affiliation X Log(days since last contract)		-0.005**	-0.426
		(0.002)	(1.056)
Log(last home sold price)		0.003	0.986
		(0.002)	(0.975)
Constant	0.772**	3.634***	-87.353
	(0.318)	(0.189)	(58.746)
House Controls	Y	Y	Y
Transaction Controls	Y	Y	Y
Time Controls	Y	Y	Y
Listing Agent FE	Y	Y	Y
Listing Brokerage FE	Y	Y	Y
Experience Controls	Y	Y	Y
Quality Dummies	Y	Y	Y
Geographic Controls	Y	Y	Y
R^2	0.203	0.897	0.278
Observations	40838	39899	39899

Note: Robust standard errors presented in parentheses are clustered by listing agent. Transaction controls include dummies for immediate possession, owner agents, presence of a co-agent, dual agency and dual brokerage (models 2 and 3 only), and short sales, as well as variables for percentage of sold concessions and the original list price to predicted sold price (model 3 only). Time controls include year and month dummies, as well as their interaction, for when the house was sold for models 1 and 2, and when the house was listed for model 3. Results for models 2 and 3 are robust to excluding part time agents, defined multiple ways, and to excluding observations where # of days since last contract is high. Significance levels: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 1.7: Evidence of Increased Flexibility that Aids in Engaging in Dual Agency

	(1)	(2)	(3)
Dependent Variable:	Log(Sold Price)	Days on Mkt	Sold Concessions %
Affiliation	0.023***	-0.781	-0.001**
	(0.005)	(1.636)	(0.0004)
Dual agent	0.006	7.083***	-0.001***
	(0.004)	(1.733)	(0.0004)
Affiliation X Dual agent	-0.012	-5.554*	0.0013**
	(0.008)	(3.261)	(0.001)
Constant	3.671***	-67.809	0.080***
	(0.187)	(57.753)	(0.014)
House Controls	Y	Y	Y
Transaction Controls	Y	Y	Y
Time Controls	Y	Y	Y
Listing Agent FE	Y	Y	Y
Listing Brokerage FE	Y	Y	Y
Experience Controls	Y	Y	Y
Quality Dummies	Y	Y	Y
Geographic Controls	Y	Y	Y
R^2	0.898	0.282	0.244
Observations	40838	40838	40591

Note: Robust standard errors presented in parentheses are clustered by listing agent. Transaction controls include dummies for immediate possession, owner agents, dual agency and dual brokerage (model 1 only), presence of a co-agent, and short sales, as well as variables for the percentage of sold concessions (except for model 3) and the original list price to predicted sold price (model 2 only). Time controls include year and month dummies, as well as their interaction, for when the house was listed for model 2, and for when the house was sold for models 1, and 3. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 1.8: Listing for Affiliates Improves Firm Performance

	(1)	(2)
Dependent Variable:	Log(Revenue/yr)	Log(# Sold/yr)
% Affiliation/yr	0.002***	-0.001
	(0.001)	(0.001)
Log(# Agents in Brokerage/yr)	0.017	0.832***
	(0.022)	(0.052)
Log(# Listings Sold/yr)	1.026***	
	(0.015)	
Constant	12.282***	0.887***
	(0.050)	(0.111)
Time Controls	Y	Y
Listing Brokerage FE	Y	Y
R^2	0.963	0.836
Observations	2789	2789

Note: Robust standard errors presented in parentheses are cluster by brokerage. Time trends include year dummies. Results using count models for model 2 or logged % of Affiliation/yr are similar. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 1.9: Agent Value Creation Largest at the Ward Level (Strongest Affiliation)

	(1)	(2)	(3)
Dependent Variable:	Log(Sold Price)	Pr(Six Months)	Days on Mkt
Same ward agent/house	0.026***	-0.015*	-4.225*
	(0.006)	(0.009)	(2.252)
Same stake agent/house	0.015***	-0.016**	-0.190
	(0.006)	(0.008)	(1.951)
Constant	3.713***	-0.646***	-85.715
	(0.188)	(0.238)	(58.341)
House Controls	Y	Y	Y
Transaction Controls	Y	Y	Y
Time Controls	Y	Y	Y
Listing Agent FE	Y	Y	Y
Listing Brokerage FE	Y	Y	Y
Experience Controls	Y	Y	Y
Quality Dummies	Y	Y	Y
Geographic Controls	Y	Y	Y
R^2	0.898	0.193	0.282
Observations	39328	78017	39328

Note: Robust standard errors presented in parentheses are clustered by listing agent. Transaction controls include dummies for immediate possession, owner agents, dual agency, dual brokerage, presence of a co-agent, and short sales, as well as variables for the percentage of sold concessions (except model 2) and the original list price to predicted sold price (except model 1). Time controls include year and month dummies, as well as their interaction, for when the house was listed for models 2 and 3, and for when the house was sold for model 1. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 1.10: Value Appropriation and Flexibility Largest at Ward Level (Strongest Affiliation)

	(1)	(2)	(3)	(4)
Dependent Variable:	Pr(Dual Agent)	Log(Sold Price)	Days on Mkt	Sold Concessions %
Same ward agent/house	0.046***	0.032***	-1.222	-0.001*
	(0.015)	(0.006)	(2.535)	(0.0004)
Dual agent		0.006	7.333***	-0.001***
		(0.004)	(1.795)	(0.0004)
Same ward X dual agent		-0.023**	-11.273**	0.001
		(0.011)	(4.656)	(0.0008)
Same stake agent/house	0.037***	0.016***	-0.165	-0.001
	(0.012)	(0.006)	(2.203)	(0.0005)
Same stake X dual agent		-0.004	-0.733	0.001*
		(0.010)	(4.311)	(0.0008)
Constant	0.720***	3.713***	-85.302	0.084***
	(0.326)	(0.188)	(58.099)	(0.014)
House Controls	Y	Y	Y	Y
Transaction Controls	Y	Y	Y	Y
Time Controls	Y	Y	Y	Y
Listing Agent FE	Y	Y	Y	Y
Listing Brokerage FE	Y	Y	Y	Y
Experience Controls	Y	Y	Y	Y
Quality Dummies	Y	Y	Y	Y
Geographic Controls	Y	Y	Y	Y
R^2	0.202	0.898	0.283	0.246
Observations	39328	39328	39328	39092

Note: Robust standard errors presented in parentheses are clustered by listing agent. Transaction controls include dummies for immediate possession, owner agents, presence of a co-agent, and short sales, as well as variables for percentage of sold concessions (except for model 4) and the original list price to predicted sold price (model 3 only). Time controls include year and month dummies, as well as their interaction, for when the house was sold for models 1, 2, and 4, and when the house was listed for model 3. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 1.11: Less Effort and Value Created when Agents List for Previous Affiliates

	(1)	(2)	(3)	(4)
Dependent Variable:	Log (Sold Price)	Days on Mkt	Pr(Key Box Only)	Pr(Agent Appointment)
Affiliation	0.020***	-2.222	-0.017*	0.020**
	(0.005)	(1.487)	(0.009)	(0.010)
Previous affiliation	0.039*	11.754*	-0.020	-0.030
	(0.021)	(6.504)	(0.031)	(0.047)
Constant	3.673***	-66.782	1.287***	0.192
	(0.186)	(57.766)	(0.269)	(0.341)
House Controls	Y	Y	Y	Y
Transaction Controls	Y	Y	Y	Y
Time Controls	Y	Y	Y	Y
Listing Agent FE	Y	Y	Y	Y
Listing Brokerage FE	Y	Y	Y	Y
Experience Controls	Y	Y	Y	Y
Quality Dummies	Y	Y	Y	Y
Geographic Controls	Y	Y	Y	Y
R^2	0.898	0.282	0.429	0.422
Observations	40838	40838	40838	40838

Note: Robust standard errors presented in parentheses are clustered by listing agent. Transaction controls include dummies for immediate possession, dual agents and dual brokerage (models 1 and 2 only), owner agents, presence of a co-agent, and short sales, as well as variables for percentage of sold concessions (except for models 3 and 4), and the original list price to predicted sold price (model 2 only). Models 3 and 4 include controls for home vacancy, original list price, and compensation contract terms. Time controls include year and month dummies, as well as their interaction, for when the house was sold for model 1, and when the house was listed for models 2-4. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 1.12: Value Creation and Appropriation Reduced when Listing for Previous Affiliates

	(1)	(2)	(3)
Dependent Variable:	Pr(Six Months)	Pr(Sold)	Pr(Dual Agent)
Affiliation	-0.016**	0.015*	0.040***
	(0.006)	(0.008)	(0.010)
Previous affiliation	0.074***	0.103***	0.019
	(0.019)	(0.039)	(0.035)
Constant	-0.665***	3.852***	0.773***
	(0.234)	(0.264)	(0.318)
House Controls	Y	Y	Y
Transaction Controls	Y	Y	Y
Time Controls	Y	Y	Y
Listing Agent FE	Y	Y	Y
Listing Brokerage FE	Y	Y	Y
Experience Controls	Y	Y	Y
Quality Dummies	Y	Y	Y
Geographic Controls	Y	Y	Y
R^2	0.193	0.225	0.203
Observations	82739	82739	40838

Note: Robust standard errors presented in parentheses are clustered by listing agent. Transaction controls include dummies for immediate possession, owner agents, presence of a co-agent, and short sales, as well as a variable controlling for the original list price of the home (except Model 3). Time controls include year and month dummies, as well as their interaction, for when the house was sold for model 3, and when the house was listed for models 1 and 2. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

CHAPTER 2

Favored in Selection: The Impact of Social Affiliations on Real Estate Agent Access to Valuable Transactions

CHAPTER ABSTRACT

This chapter investigates how social affiliations between real estate listing agents and home sellers impact the type of transactions agents engage in, as well as the selection process underlying agent selection. While many studies have argued that status and reputation act as entry barriers and create advantages for high status or high reputation firms, it remains unclear how social affiliations impact the selection process, particularly under conditions of incomplete information. Using a unique approach that pairs data from the Wasatch Front Regional Multiple Listing Services with data on LDS church congregation boundaries in Utah County, Utah for 1998-2014, I explore how social affiliations between home sellers and agents through geographically-assigned Mormon church congregations influence the selection process and the type of transactions agents engage in. I find that affiliations allow agents to list more expensive, larger, and higher quality homes compared to when listing for non-affiliates, and to list such homes at low levels of experience. I also find that affiliations create a distinct selection process that substitutes for the positive selection impacts of previous performance, agent experience, and fit, and creates a feedback loop where listing for affiliates allows agents to gain valuable experience and reputation, which then positively impacts future listings with non-affiliates. Overall my results imply that social affiliations between firms and clients can lead to important selection benefits that increase firm performance, and that lead to important entry and competition benefits.

2.1 Introduction

In many industries, access to valuable transactions directly impacts firm performance and survival. Such is the case for numerous service industries, which now are responsible for over two-thirds of US GDP and employ nearly 80% of the US workforce (USTR, 2014). Often critical to securing valuable transactions is overcoming agency problems, and recent studies have noted the potential for reputation (e.g., Shapiro 1983; Fombrun & Shanley 1990; Fombrun 1996), status (Podolny 1993; Benjamin & Podolny 1999), and social or professional networks (e.g., Merton 1968; Stuart et al. 1999) to reduce concerns of moral hazard and provide important signals of quality that aid firms in securing valuable transactions. When information in incomplete, however, and monitoring costly consumers in service settings often choose to transact with social affiliates (e.g., DiMaggio & Louch 1998), as affiliations breed trust and status or reputational mechanisms provide only noisy information. While this may generate advantages for firms if they can leverage trust to reduce transaction costs and engage in more transactions (e.g., Coleman, 1988; Greif 1993; Barney & Hansen 1994), it remains unclear how affiliations influence the type of transactions firms engage in, as well as the underlying selection process. Do affiliations allow firms to secure more valuable transactions with clients? Or do they lead to the creation of a "relief organization" (Uzzi 1997) where firms are obligated to "help out" affiliates by engaging in less valuable transactions?

In this chapter I explore the extent to which social affiliations, bred of common memberships between employee-experts and clients in formal social institutions, impact the types of transactions real estate agents engage in. Moreover, I investigate how the agent-selection process differs when social affiliations are present, as well as how transacting with affiliates influences future agent transactions with non-affiliates through the building of

reputation and the acquiring of experience. My purpose is to build on previous work (Gubler, 2015) to highlight the impact of social affiliations external to the economic transaction on firm performance through selection, and to provide insight into the selection process in non-repeated economic transactions where information is incomplete and social affiliations are present.[18]

The literature has long noted the potential for reputation or status to confer performance benefits, to act as barriers to entry, and to serve as mechanisms that communicate firm quality (e.g., Shapiro 1983; Wilson 1985; Rao 1994; Podolny 1993; Benjamin & Podolny 1999). These factors have been argued to often lead to a "Matthew effect", where more experienced and reputable firms engage in the most valuable transactions (e.g., Merton 1968). Such an effect can result in strong barriers to entry that disadvantage new and inexperienced firms, and lead to sustained performance differences between firms (Podolny & Phillips 1996; Roberts & Dowling 2002). When information is incomplete, however, and the risk of opportunism high, scholars have found that consumers often prefer transacting with social affiliates (DiMaggio & Louch 1998). This consequently imposes a difference selection process that erodes advantages from status or reputation, and allows less experienced and smaller firms to engage in more valuable transactions. However, because of data limitations and empirical challenges it has remained difficult to empirically estimate the impact of such affiliations on selection, and consequently on firm performance. This chapter seeks to fill this gap.

My unique approach mirrors that of the prior chapter, and pairs novel data from geographically-assigned church congregations in Utah County, Utah with real estate transaction data from the Utah Wasatch Front Regional Multiple Listing Services (MLS) for 1998-2014. In Utah County nearly 90% of its over half million residents report being members of the Church of

[18] While the focus of this chapter is on non-repeated economic transactions, recent studies have also focused on the impact of social structures and relationships on transactions in non-repeated exchanges (e.g., Elfenbein and Zenger, 2013).

Jesus Christ of Latter-day Saints (ASARB 2010). This church geographically assigns each home in the county to a congregation which church members are required to attend to stay in good standing with the church. These assignments significantly impact social interactions between individuals, and have been shown to impact both agent and brokerage performance in transactions (Gubler, 2015). By collecting a panel of congregation boundaries I explore the impact of social affiliations on the selection process and the types of listings real estate agents engage in.

My results suggest that there is a strong and significant correlation between listing value and the presence of a social affiliation between listing agents and clients. I find that homes list at approximately 14% higher prices when affiliations are present, are 11% larger in terms of square footage, and are less likely to be low quality, as indicated by the presence of negative quality descriptors in the publically available listing comments. This suggests that higher quality and more expensive listings are being procured by agents with which home sellers share a social affiliation through a shared church congregation boundary.

Similarly, using within-effects models, I find that agents list and sell higher quality, more valuable, and larger homes when listing for socially-affiliated clients. My results suggest agents list homes that will sell for nearly 14% more when listing for affiliates, compared to their other listings, and consequently increase average commission earned by approximately $1121. I also find that agents are 24% less likely to list a home with negative quality descriptors when listing for affiliates. Interestingly, I find evidence suggesting that these effects increase in magnitude with the strength of affiliation, and disappear altogether when congregation boundaries are unexpectedly changed.

While these findings suggest that transacting with affiliates results in higher quality and more valuable transactions on average for agents, I also find evidence suggesting clients use a distinct selection process in choosing agents when social affiliations are present. My results suggest clients are significantly more likely to choose affiliated agents than non-affiliated agents, and that affiliations substitute for the positive selection benefits of agent experience and previous performance. Moreover, my results suggest franchise brokerages are less likely to be chosen when affiliations are present, and fit considerations are less important. These results have striking implications for firms, as they imply different competition and entry effects. For instance, my results suggest that while agents typically list more expensive homes as experience increases, leading to disadvantages for new entrants, when listing for affiliates agents can list and sell more expensive homes at low levels of experience. Moreover, agents receive the same positive benefits of experience when listing for affiliates compared to listing for non-affiliates. Thus, this selection process favors socially-affiliated agents, and not simply the most experienced agents or firms, and leads to potential entry benefits.

Finally, my results suggest that listing for affiliates creates a feedback loop where agents leverage affiliations to gain experience and reputation, which then allows them to secure more valuable transactions with non-affiliated clients in the future. I find that a 50% increase in the number of listings for affiliates in a given year leads to a 1.3-3.25% increase in the average listing price of homes for that agent in the subsequent year. Moreover, I find that this effect is larger for new entrants, again suggesting entry benefits through the use of social affiliations.

These results contribute to a variety of literatures, and have important theoretical implications. First, they suggest that affiliations can erode benefits from reputation, status, or experience, which often act as entry barriers to young firms and lead to Matthew effects where

more established or reputable firms are able to procure the most valuable transactions. My results suggest that the benefits of transacting with affiliates can potentially substitute for these observables, and result in an alternative selection process. Similarly, these results provide empirical evidence in showing an additional avenue through which trustworthiness can lead to heterogeneity in firm performance (e.g., Barney & Hansen 1994). Finally, this study makes an empirical contribution by identifying affiliations in a way that avoids many of the endogeneity issues noted in previous studies, which result from individuals choosing to affiliate with similar others (e.g., Mouw 2006). In this study affiliations are assigned geographically based on church congregation boundaries, which change over time and encompass small geographic areas.

These results also have important managerial implications. First, these results suggest firms can potentially enter crowded markets, or enter markets that heavily reward reputation or previous experience, through employee social affiliations with clients. This is a previously under-researched human capital resource that can be used to improve firm performance. Second, and relatedly, these results suggest managers should take such considerations into account when making hiring and staffing decisions. For instance, firms may realize important benefits from hiring new employees that can leverage social affiliations in valuable markets related to the current strategy of the firm. Finally, these results suggest that managers should craft policies to encourage and support employee experts transacting with affiliated clients, as this leads to higher quality and more valuable transactions that positively impact firm performance.

2.2 Theoretical Background

2.2.1 Defining Social Affiliations

In this study I investigate the impact of social affiliations between employee-experts and clients on the selection process, and the types of transactions firms engage in. I define social

affiliations as current shared memberships in formal social institutions, through which individuals interact and experience common identity, norms, and values. Formal social institutions may include churches, alumni organizations, corporations, clubs, charitable organizations, schools, or other groups. Affiliations through formal institutions may differ in strength, with some becoming close friendships and others remaining simple acquaintances through the common social structure.

When social affiliations are present they have the potential to influence transactions in important ways. First, they may influence information flows between members, and allow for increased transmission of quality information between affiliates, including private, tacit, and fine-grained information (Coleman 1988; Krackhardt & Hanson 1993; Uzzi 1997; Reagans & McEvily 2003; Granovetter 2005). Improved information flows stem both from more frequent interactions through the social institution, as well as from increased information sharing by members under lessened concerns of opportunism.

Second, social affiliations may lead to greater trust and goodwill in transactions. This stems both from shared norms, expectations, and obligations from the social structure (Granovetter 1985; Coleman 1988; Arrow 2000; Granovetter 2005), as well as from in-group preferences and biases activated by the social affiliation (Sherif et al. 1961; Tajfel et al. 1971; Falk & Zehnder 2007). This increased trust and goodwill can potentially be used to improve performance and create competitive advantages (Barney & Hansen 1994; Gubler, 2015), and to decrease transactions costs (e.g., Ben-Porath 1980; Coleman 1988; Greif 1993; Granovetter 2005; Uzzi & Lancaster 2004; Lancaster & Uzzi 2012). Moreover, it is supported by the desire of affiliates to maintain social reputation and avoid social punishments (Granovetter 1985; 2005).

Finally, social affiliations may activate social preferences in affiliates. Such preferences are defined as concern for the welfare and monetary outcomes of other affiliates, and often lead affiliates to take actions that decrease their own monetary gains but lead to improved outcomes for other affiliates (Charness & Rabin 2002; Fehr & Fischbacher 2002; Andreoni & Miller 2002; Bandiera et al. 2005). Such preferences may also lead affiliates to consciously act in ways that benefit the social community, such as through paying a premium to engage in transactions with other affiliates.

2.2.2 Affiliations and Access to Valuable Transactions

There are two competing views surrounding the impact of social affiliations on the types of transactions firms engage in. The first view argues that firms will experience negative impacts from affiliations, as they lead to obligations and social or in-group preferences that lock firms into less valuable transactions. Social obligations are borne of common norms and expectations in the social structure, as well as a desire to maintain social reputation (Granovetter 1985; 2005). Such obligations may also drive employee-experts to engage in less valuable transactions in order to "help out" socially-affiliated clients (e.g., DiMaggio & Louch 1998). Similarly, social and in-group preferences create incentives for employee-experts to act in ways that benefit social affiliates monetarily, even to the potential detriment of the firm. While such behaviors may be utility maximizing for the employee-expert, it may result in inferior economic outcomes for both the employee-expert and the firm. However, a desire to maintain social reputation and to benefit affiliates and the social community may drive employee-experts to engage in such transactions and behaviors. Overall this view argues that affiliations lead firms to engage in less valuable transactions, and to become a "relief organization" (Uzzi 1997) for socially-affiliated clients in markets where information is incomplete (DiMaggio & Louch 1998).

The second view contrasts with the first, and argues social affiliations lead to significant selection benefits from affiliations, as they create information and solidarity benefits that allow firms to identify and engage in more valuable transactions. Solidarity benefits from greater trust and goodwill (Arrow 2000; Adler & Kwon 2002), as well as in-group preferences (Sherif et al. 1961; Tajfel et al. 1971; Falk & Zehnder 2007), lead consumers to prefer transacting with affiliates when quality is difficult to assess and monitoring costly. This preference stems from the expectation by consumers that the expected outcome from transacting with affiliates will be higher than transacting with non-affiliates (DiMaggio & Louch 1998). Information advantages from affiliations similarly provide benefits to identifying and securing valuable transactions. Such informational benefits may include access to private or tacit information about potential affiliate-clients, including their goals and desired outcomes, as well as the timeline for the transaction (Uzzi 1997). This provides firms first-mover advantages in marketing to clients and allows them to present themselves in the best possible light, given client goals. Information advantages also assist firms in avoiding less-valuable transactions and transacting with difficult or dishonest people. Thus, information advantages help in the timely identification of valuable transactions, and solidarity benefits lead to consumer preferences that benefit affiliates in securing such transactions. This consequently allows firms and employee-experts to improve performance by leveraging affiliations to engage in more valuable transactions.

2.2.3 A Distinct Selection Process Imposed by Affiliations

In addition to influencing the types of transactions firms and employee-experts engage in, social affiliations may also influence the selection process used by clients in choosing firms and employee-experts to transact with. Large literatures have focused on the potential for reputation (e.g., Shapiro 1983; Fombrun & Shanley 1990; Fombrun 1996) or status (Podolny 1993;

Benjamin & Podolny 1999) to signal quality and act as barriers to entry. When clients have access to quality information they select firms to transact with based on relevant observables, such as historic performance. However, as these observables become hard to assess consumers may rely more on indirect measures of performance, including reputation or status (Podolny 1993). This selection process consequently allows for sustained heterogeneity in firm performance (e.g., Rao 1994; Roberts & Dowling 2002), as it generates "Matthew Effects" where established firms engage in more valuable transactions due to their better reputations, higher levels of experience, or higher levels of status (Merton 1968; Roberts & Dowling 2002). Such a process makes it difficult for new or less-experienced firms to enter markets. Similarly, it makes it difficult for them to secure valuable transactions, as there is more at stake in these transactions and clients consequently prefer transacting with more proven experts.

When information is incomplete, and monitoring difficult, historic performance, reputation, or status provide only noisy signals to consumers about firm quality. Moreover, in such cases there is often heightened potential for opportunism or unethical behavior (e.g., Yenkey, 2015). Under these conditions, clients may choose to transact with social affiliates to decrease potential for opportunism (DiMaggio & Louch 1998), especially in valuable transactions where there is more to lose. Such a selection process differs from the process described above, and provides potential advantages to affiliates in securing valuable transactions or in working with more valuable clients. This may occur for at least two reasons. First, studies in social psychology have found that individuals tend to trust and have a positive bias towards in-group individuals (e.g., Tajfel et al. 1971; Billig & Tajfel 1973; Ashforth & Mael 1989; Falk & Zehnder 2007). This positive bias and increased trust leads clients to prefer transacting with social affiliates, regardless of experience, status, or reputation, as they perceive their expected

outcomes as being more favorable when transacting with in-group members. Second, solidarity benefits from the social structure may reduce client concerns of opportunism and lead to increased trust (Granovetter 1985; 2005; Arrow 2000; Adler & Kwon 2002). This trust drives clients to prefer transacting with social affiliates, as they expect affiliates to behave less opportunistically than non-affiliates (DiMaggio & Louch 1998). Such trust is supported by the desire of affiliates to maintain social reputation and avoid social punishments (Granovetter 1985; 2005). Both of these mechanisms imply advantages for affiliates in securing valuable transactions when information is incomplete and risk of opportunism high, as affiliations substitute for reputation, experience, or status. Moreover, such a process supports the argument put forth by Barney and Hansen (1994) that trust can lead to sustainable competitive advantages.

2.2.4 Creation of an Affiliation Feedback Loop

Importantly, the distinct selection process outlined above provides potential for a feedback loop that may create significant benefits for young and inexperienced firms from transacting with affiliates. In many service industries firms engage in more valuable transactions based on their reputation, status, or experience. However, because clients may choose to transact with firms based on trust and goodwill from affiliations, this may allow firms to enter crowded or competitive markets at lower relative levels of experience, status, or reputation. The implication of such a selection process is that firms may leverage social affiliations to gain experience and build reputation by participating in valuable transactions with socially-affiliated clients. This subsequently allows them to engage in more valuable non-affiliate transactions in the future, which results in improved firm survival and long-term performance benefits. Such entry and competition benefits from social affiliations have been overlooked in the current literature, but are potentially of significant importance, as they can be used to erode entry

barriers and competitive advantages of rivals based on experience, status, or reputation. Figure 2.1 illustrates this potential feedback loop.

2.3 Empirical Setting

The setting for this study is the residential real estate industry, which was described in detail in the first chapter of this dissertation. This industry is suitable to investigate the questions outlined above for a few reasons. First, this is an economically significant industry in the United States roughly equal in size to the brand name pharmaceutical industry, the hotel and motel industry, and the single-location full service restaurants industry (IBISWorld 2014). The chief productive resource is labor, and the industry employs over 1 million workers (IBISWorld 2014). Second, because the core of this industry is the real estate transaction, I am able to observe and measure the impact of valuable or higher quality transactions on agent and brokerage performance. Third, agents participate in many transactions over time, with heterogeneity in the presence of social affiliations, which allows me to estimate the impact of transacting with an affiliated home seller on selection outcomes for the agent, and consequently the firm. Finally, brokerage productivity and revenues directly increase with the dollar amount of real estate sold by agents. Agents are required to work for a licensed brokerage to sell real estate in Utah, and are typically compensated a percentage (3%) based on the final home sale price. This commission is then shared with the employing brokerage, such splits ranging from a 50/50 split to a 100/0 split (agent keeps full commission but pays a fixed desk fee). Consequently the link between agent and firm productivity is quite clear.

In order to sell real estate in Utah, agents must belong to a licensed brokerage that oversees their work. The typical brokerage in my sample employs 23 agents a year, with the largest employing 178 and the smallest 1 (self-employed). Forty-three percent of the listings in

my sample are by nationally franchised brokerages, such as RE/MAX or Prudential, 49% are by independent brokerages, and 8% are by self-employed brokers. Agents often move between brokerages throughout their career, as they seek out better fit or opportunities. Because brokerage revenue is directly influenced by agent ability and the types of transactions agents engage in, it is or paramount importance for brokerages to identify, hire, retain, and support high-performing agents.

Sellers use real estate agents for a variety of reasons. First, agents have access to valuable information. In Utah, many variables relating to real estate transactions, including final sales price, are not public information. While this information exists on the MLS database, it is not accessible through the county assessor or recorder offices, and is not used in tax assessments. Consequently, it is difficult for sellers or buyers to conduct independent market research, or to understand the local market, and thus drives clients to use agents. Second, listing agents have access to potential buyers through their professional network. These connections may allow sellers to sell their homes faster and at higher prices. Third, listing agents have experience that sellers rely on to price the home and develop a marketing strategy. Most sellers in Utah have only limited experience selling real estate. Given the economic magnitude of the transaction and the potential emotions involved, sellers often rely on real estate agents to help them make informed decisions.

Fourth, listing agents have experience marketing homes, and can potentially provide valuable advice that will help the seller increase the sold price of the home and reduce time on market. This includes insight into the buyer's mentality. For instance, real estate agents may know how to best present or stage a home to attract buyers, or what aspects of the home, if improved, would lead to a higher selling price. Fifth, listing agents negotiate final prices, and

may have more leverage to drive a "hard bargain" as an outside party. Finally, listing agents help sellers to navigate the closing process, including filling out necessary paperwork to legally transfer ownership of the home to the homebuyer. All these benefits from using an agent provide advantages to sellers that decrease time on market, increase sold prices, reduce stress, and avoid costly errors.

However, using a real estate agent can also lead to problems of moral hazard for sellers. Because sellers have limited information about agents, comparable homes, and the market, agents may have incentive to use their knowledge advantages to engage in behaviors not beneficial to the seller. First, listing agents may lead sellers to underprice homes and sell them too quickly (Levitt & Syverson 2008; Rutherford et al. 2005; Hendel et al. 2009; Jia & Pathak 2010). Such behavior follows from the relatively weak financial incentives faced by agents. For instance, the difference between a home selling for $300K and $315K is approximately fifteen thousand dollars for the seller. However, after splitting the commission with the buyer's agent and the listing agent's employing brokerage, this may translate into a difference of only $243 for the listing agent.[19] Consequently, many listing agents may opt to sell homes quickly and reduce their cost of effort and increase probability of sale. Second, agents may have incentive to engage in dual agency (also called "limited agency"), where they serve as both the listing and buyer's agent. This allows agents to capture the entire commission amount, but leads to potential conflicts of interest. Studies have found that homes sell for quicker and cheaper than they otherwise would under dual agency (Gardiner et al. 2007; Brastow & Waller 2013; Turnbull & Dombrow 2007). Finally, listing agents may have conflicting incentives that lead them to act in the interest of the buyer's agent or the homebuyer. For instance, if the listing agent is socially

[19] This assumes a 50/50 split with the cooperating broker, a 60/40 split with the listing agent's broker, and a 6% franchise fee.

connected to the homebuyer they may act in ways not beneficial to the seller. While listing agents have fiduciary responsibility to the seller, social or financial incentives may lead them to act in ways undesirable for the seller.

2.3.1 Selection in Real Estate and Acquiring More Valuable Listings

In this setting I explore the impact of social affiliations through geographically-assigned LDS church congregation boundaries on the types of listings real estate agents engage in, and the overall selection process. The data used on social affiliations were outlined in detail in the first chapter of this dissertation. As members of the social structure, agents have access to private and tacit information. Such information may include insight into potential affiliate-clients, such as when they would need an agent, their goals for selling the home, the state of their finances, and their personality. This information may also include insight into the home, including the quality of the home, how easy it will be to show, and potential selling price. These information advantages provide listing agents relative advantages in choosing clients to work with, which houses to list, and how best to secure potential listings. Moreover, listing agents may have access to this information earlier than non-affiliated agents. Such access to private, tacit, and timely information may provide affiliated agents advantages in identifying and securing valuable listings with affiliates, compared to non-affiliated agents.

In addition to impacting information flows, social structures also create social pressures and preferences. Such social factors may lead listing agents to represent clients they would prefer to avoid, or to attempt to sell homes they otherwise would not. For instance, in an effort to maintain social reputation and avert social punishments agents may feel obligated to help clients list homes that are difficult to sell, or that are in poor repair. Similarly, social preferences may lead agents to take on less valuable listings (in terms of sale price) as they seek to “help out”

affiliated sellers. Such obligations and preferences may drive agents to list less valuable or lower quality homes, resulting in inferior economic outcomes for the agent and the firm.

Conversely, social factors may lead to solidarity benefits that allow agents to engage in more valuable transactions. In-group preferences and shared norms, obligations, and expectations reduce concerns of agent opportunism and increase seller confidence that listing agents will deal fairly, give quality advice, and ultimately sell their home at a high price. These benefits may lead sellers to prefer transacting with affiliated agents to avoid potential for agent opportunism. Additionally, social factors may allow listing agents to list more valuable homes at lower levels of experience or reputation. When information is incomplete sellers are unable to use observables, such as sale prices of previously sold homes, to select a listing agent. In such cases, sellers may use outside referrals or rely on indirect measures of agent quality, including agent reputation, status, or experience. However, such information provides only noisy signals of agent quality, and may not convey useful information about the listing agent's propensity to engage in opportunistic behavior. In the face of these uncertainties and the risk for opportunism, sellers may opt to use socially-affiliated agents, regardless of agent experience or reputation. This may especially be the case when sale prices (and consequently potential losses) are higher. Using affiliated agents mitigates seller concerns of opportunism, as they rely on social pressures and agent social preferences, and leads them to believe that agents will provide additional effort and a higher quality of service to maintain social reputation.

2.4 Data

The data used in this study were outlined in detail in the previous chapter. However, there are a few notable differences relative to this study. First, the sample includes all listings from 1998-2014, regardless of whether they sold or not. This also includes listings that expired prior

to being sold. Second, I include listings only for agents whose first listing was after 1997. This allows me to more accurately measure agent experience, as it excludes agents from the sample who had been selling homes previous to 1998, for which data is unavailable. It is important to note, however, that these agents are included in the relevant control variables, such as the measure of current brokerage size. Third, in contrast to the first chapter, I do not restrict this sample by house price. While the previous study removed homes that were in the top and bottom ½ of 1% in order to focus on common real estate transactions, this study uses no such restriction, instead including luxury and very inexpensive homes. It is important to note, however, that my results are not sensitive to excluding these observations. Finally, while the previous study focused mainly on listings that sold and the resultant selling price, this study focuses on initial listings and the resulting listing price. Consequently, control variables are also measured using data from the initial listing. For instance, agent experience is measured as the number of homes listed to date, and time controls include year and month dummies for when the home was listed.

In addition to the variables outlined in the previous chapter, I construct new variables that are important to this study. First, I construct a variable that compares the predicted original list price, based on home observables, with the actual original listing price. This variable helps control for the fact that homes may be over/underpriced when affiliates are used/not used. Second, I construct a measure of low home quality using the 81 descriptive dummy variables (from the public comments) detailed in the previous chapter. To measure low quality I create a variable that indicates whether or not the agent referenced low quality (e.g., “fixer-upper”, “tlc”, estate sale”, etc.) in the listing comments. Relatedly, I construct an additional measure of low quality that is the count of references to low quality. Finally, I include a subset of the 81 dummy variables as additional quality controls in many regressions.

2.5 Empirical Approach

To investigate the impact of social affiliations from LDS congregation boundaries on selection, I use a variety of approaches and specifications. The first set of specifications treats the data as a cross-section, and explores the controlled correlations between affiliations and home listing price, size, and quality. The basic specification follows:

$$Y_h = \alpha + \beta_1 * X_h + \beta_2 * Affiliation_h + \varepsilon_h$$

where Y_h is the dependent variable, such as the log of original list price, X_h represents a vector of transaction controls, zip code dummies that act as geographic fixed effects, and year and month dummies that act as time fixed effects. $Affiliation_h$ is a dummy variable that takes the value of 1 if the home is listed in the same ward or stake as the listing agent's home address, 0 otherwise. I estimate this specification using ordinary least squares (OLS) and logistic regression, with robust standard errors. The results of these models provide insight into the controlled correlations between social affiliations and the dependent variables.

The second set of models are "within" models, and investigate the impact of social affiliations on home listing price, size, and quality for a given agent or brokerage. These models are related to the first set of models, but include agent and/or brokerage fixed effects to investigate the within effect of listing for a social affiliate. The basic specification is:

$$Y_{ihj} = \alpha_i + \beta_1 * X_h + \beta_2 * Affiliation_{ih} + \eta_j + \varepsilon_{ihj}$$

where Y_{ihj} is the dependent variable, such as the log of list price, for listing agent *i* selling house *h* while employed in brokerage *j*. X_h represents a vector of transaction characteristics, time fixed effects, and zip code dummies that act as geographic fixed effects. α_i are listing agent fixed effects, η_j are listing brokerage fixed effects, and ε_{ihj} are error terms. The unit of analysis is the agent/listing, or the brokerage/listing when agent fixed effects are omitted. These specifications

are estimated using OLS with robust standard errors clustered by listing agent or listing brokerage. For discrete choice models I present results from OLS as they avoid bias from the incidental parameters problem (Neyman & Scott 1948). However, logistic regression results for each specification provide qualitatively similar results.

The third set of models used are similar to McFadden's consumer choice models (McFadden 1973; McFadden 1980), and investigate the factors influencing the client's choice of which listing agent to use. These models require the specification of a choice set, which can be thought of as the agents available to be chosen by clients for each listing. In such models specification of the choice set is important to the estimation and results, and consequently I specify this choice set in numerous ways. The primary results specify the choice set as those agents that live in the same zip code as the client selling their home (median=30 agents). Additional future analyses will specify the choice set as those agents that live in the same census tract, or within 2 or 5 miles of the client selling their home. These models then regress a dummy variable indicating the choice of agent on agent and brokerage characteristics, including presence of a social affiliation, agent experience, agent previous performance, typical agent listing price, geographical distance between the agent's home address and the listing address, and brokerage characteristics. I also include interactions between the affiliation indicator and the agent and brokerage characteristics to estimate how affiliations influence the impact of each variable. The models are estimated as conditional logits, with robust standard errors clustered by listing. Because these models include listing fixed effects, the results are interpreted as the impact of affiliations and agent and brokerage characteristics on the probability that an agent in the choice set is chosen to list a home. The key assumptions are that the choice set is correctly defined, and that the choice of agent maximizes client utility.

The last specification moves the unit of analysis to the agent/year level. This specification investigates the impact of the number of listings listed for affiliates in the previous year on the average price of listings listed by a given agent in the subsequent year. After controlling for time, agent success, and experience, this model provides insight into the feedback loop created by listing for affiliates in the recent past. The model is as follows:

$$Log(Y_{it}) = \alpha_i + \beta_1 * Log(Experience_{it}) + \beta_2 * Log(Affiliate\ Listings_{it-1}) + \beta_3 * Log(\#Sold_{it-1}) + \beta_4 * Log(\#Sold_{it}) + \gamma_t + \varepsilon_{it}$$

where Y_{it} is the average listing price for agent *i* in year *t*, $Experience_{it}$ is the median level of experience for agent *i* in year *t*, $Affiliate\ Listings_{it-1}$ is the number of homes listed by agent *i* for affiliates in the previous year, $\#Sold_{it-1}$ and $\#Sold_{it}$ are the number of homes listed by agent *i* in the previous/current year, α_i are agent fixed effects, and γ_t are year fixed effects. This model is estimated using OLS, with the errors clustered at the agent level, and estimates the impact of the previous year's number of affiliated listings on the current year's average listing price for a given agent.

It is important to note that a key aspect of this setting is that affiliations are imposed based on small geographically-assigned congregation boundaries. While not perfect, this allows me to largely avoid the endogeneity problem encountered in many related studies that occurs because affiliates are endogenously chosen (e.g., Mouw 2006). Given the small geographic areas of the congregations, and the difficulty in choosing certain wards or stakes to live in as they may change unexpectedly over time, the affiliations in this study are more exogenous than those encountered in many other studies. Moreover, many of these affiliations are formed through church interactions, or through church responsibilities. Consequently, interactions are often imposed on individuals, instead of chosen, and affiliates may differ significantly in preferences

or characteristics. While some affiliations will lead to friendships, many affiliations will likely remain acquaintances.

2.6 Results

2.6.1 Descriptive Statistics

Table 2.1 provides descriptive statistics for the variables used in my analyses. The average home in my sample lists for approximately $267,000, has 2723 square feet, and stays on the market 130 days. Eleven percent of homes are listed by agents that share a ward or stake with the home seller, and homes are listed on average for close to the predicted list price, based off home observables. About 8% of homes are short sales and 9% of homes are defined as low quality. The average agent has listed 84 homes. Table 2.2 provides these same statistics by affiliation, including T-tests for differences. The results of this table suggest that when social affiliations are present in a transaction homes are significantly more expensive, larger, and of higher quality. Interestingly, agents and brokerages appear significantly less experienced on affiliate listings. Table 2.3 presents descriptive statistics and T-tests on the 81 quality and descriptive dummies constructed from the public comments. Each T-test reports the difference between a given quality or descriptive indicator when an affiliation is present, compared to when it is not. The results of this table provide detailed insight into quality differences by affiliation, and suggest that social affiliations are correlated with higher quality listings.

Figures 2.2-2.6 graphically represent the differences between affiliate and non-affiliate listings. Figure 2.2 shows homes are typically more expensive when listed by affiliates, as evidenced by the distribution being shifted to the right. Results are similar when using final sale price. Figure 2.3 shows homes have fewer negative quality indicators when listed by affiliates, again suggesting listings for affiliates are higher quality. Figure 2.4 shows sellers typically use

smaller brokerages to list their home when affiliations are present, and Figure 2.5 shows that chosen agents are also significantly less experienced. Figure 2.6 shows that affiliations are correlated with higher listing prices for agents regardless of experience level. Moreover, the returns to experience appear similar when affiliations are present compared to when they are not. Consequently, the overall picture that emerges is that higher quality and more expensive homes are listed by social affiliates, on average, but that chosen affiliated agents typically work for smaller brokerages and are much less experienced. However, as these results do not include relevant controls, more complex analyses are needed.

2.6.2 Acquiring More Valuable Listings

I investigate the overall correlation between social affiliations and home price, size, and quality first using cross-sectional between effects models. Table 2.4 presents the results. After controlling for geography and geographical distance, time, agent experience, and other transaction differences, I find that social affiliations are associated with homes listing and selling for nearly 14% more than non-affiliated homes. Moreover, social affiliations are associated with 11% larger homes, and higher quality homes. These results provide support to the results presented from the descriptive statistics, and again suggest that social affiliations may lead to better listings for agents and firms. However, because these analyses are between effects models they do not hold constant important variation within agents or brokerages that may lead to unobserved selection effects. The next results presented use fixed effects to investigate the correlations between home price, size, and quality within brokerages and agents.

Table 2.5 presents results including brokerage fixed effects, with errors clustered by brokerage. These results can be interpreted as the within brokerage change in average listing price, home size, and home quality based on the presence of a social affiliation. I find that the

results are similar to the between models. These results suggest brokerages list 13% more expensive homes when listing for socially-affiliated clients, list larger homes, and are less likely to list low quality homes. Table 2.6 builds on these results by including agent fixed effects. These results are interpreted as the within agent change in average listing price, size, and quality when listing for affiliates. Again, these results are similar to the previous results. Agents list nearly 14% more expensive homes when listing for affiliates, list 14% larger homes, and list homes with 25% fewer negative quality attributions. Taken together, these results suggest that agents and brokerages list more expensive, larger, and higher quality homes when listing for socially-affiliated clients.

To test the robustness of these results I ran multiple additional tests. The first test included a measure of distance in linear feet between the agent's home address and the listing address. This variable more accurately controls for the impact of geographic distance between agent and client home addresses. The results from these analyses are similar to the results presented. However, because I am unable to accurately geocode all addresses results are presented from the zip code specifications to avoid reductions in sample size. For the second set of robustness tests I reran the models including a control for the ratio of the predicted list price to the actual list price. This variable controls for the over or underpricing of homes when affiliated agents are used. The results from these analyses are also similar to the presented results, suggesting that the observed increase in list price is not due simply to agents listing homes at higher prices. Overall, the results of multiple robustness checks indicate that the relationships presented in Tables 2.4-2.6 are robust to alternative specifications and the inclusion/exclusion of multiple control variables, including geographic distance.

2.6.3 A Different Selection Process

I next investigate the difference in the selection process when social affiliations are present. Table 2.7 presents these results, which are estimated using conditional logit specifications with odds ratios reported. These models regress the probability that an agent is chosen to list a home on agent and brokerage characteristics. The results in column 1 suggest that both previous experience and social affiliations significantly increase the odds of an agent being chosen to list a home. However, the effect on affiliation is much larger, and the interaction between affiliation and experience is negative. Column 2 includes previous agent experience as an explanatory variable. The results for this model again suggest experience and affiliations have positive impacts on selection. However, it also suggests that previous agent performance is positively correlated with selection, and that there is a negative impact of affiliation on previous performance. Overall, these models suggest that affiliations lead to selection benefits and substitute for agent experience and previous performance.

The third column of Table 2.7 includes a variable for brokerage size, a dummy for franchise brokerages, and a variable that measures the overall fit between agents and homes based on the difference between a given home's price and the previous average home listing price for the agent. After including these variables the results again suggest there are significant positive effects from experience and previous performance, which are mitigated by affiliations. Additionally, the results suggest that franchise brokerages are more likely to be chosen by clients, but that the affect is again mitigated by affiliations. Finally, the fit variable suggests that as fit decreases (moves away from zero) agents are less likely to be chosen. However, the opposite occurs for affiliated agents. Even when fit is low they are more likely to be chosen.

The last column presents results that include a measure of linear distance between each agent and the home being listed. While this significantly decreases the sample size, due to the

current difficulty in accurately geocoding addresses for agents and homes, the estimated results are unchanged. Even after controlling for distance affiliated agents are significantly more likely to be chosen than non-affiliated agents. Moreover, the negative impacts on experience and previous performance from affiliations remain.

2.6.4 Creation of a Feedback Loop

Finally, I investigate whether agents can secure more valuable listings at lower levels of experience when listing for affiliates. Table 2.8 presents these results. The results in column 1 suggest that agents generally list more expensive homes as experience increases. Column 2 provides additional insight, showing that agents list homes that are 2.7% more expensive when they move into the lower middle 25% of the experience distribution, 4.4% more expensive homes when they move into the upper middle 25% of the distribution, and 5.3% more expensive homes when they move into the top 25% of the experience distribution. Interestingly, however, I find that agents list 12-14% more expensive homes when listing for affiliates, even after controlling for the effect of experience. Moreover, the results in column 3 suggest that agents list more expensive homes on average at low levels of experience when listing for affiliates than they do when listing for non-affiliates at the highest levels of experience. The results in column 3 similarly show that agents don't receive any additional penalty or benefit from experience when listing for affiliates than when listing for non-affiliates. This suggests agents may be able to leverage affiliations to list more expensive homes at low levels of experience. Moreover, it implies agents may be able to use such benefits to enter competitive markets.

Table 2.9 presents results investigating the impact of listing for affiliates on subsequent average home list prices. These models regress the log of the average listing price for a given agent in year *t* on the log of the number of homes listed by that agent in the previous year, *t-1*.

Additionally, these models control for agent experience and the number of homes listed overall by the agent in the current and previous year. Columns 1 and 3 present results without agent fixed effects, and columns 2 and 4 results with agent fixed effects. The primary results, shown in the first two columns, suggest that listing homes for affiliates leads to a significant increase in the average agent list price of homes in the subsequent year. I find that a 50% increase in the number of homes listed for affiliates leads to a 1.3-3.25% increase in the average home listing price for agents in the subsequent year. Column 3 presents results restricting the sample to the first two years for each agent. The results from this analysis suggest that the effects are even larger for new entrants. Agents see an increase of over 3.5% in average home listing price for a 50% increase in the number of homes previously listed for affiliates. Finally, the model in column 4 omits affiliate listings in year *t* from the calculation of the average list price. The estimated results are similar to those presented in column 2. Overall, the results of Table 2.9 suggest that listing for affiliates has a significant positive impact on future home list prices, and provides support in favor of the feedback loop. Moreover, these findings suggest that affiliations can be leveraged as a resource to build experience and reputation, which then carries over to future transactions with non-affiliates.

2.7 Robustness and Identifying Mechanisms

Table 2.10 provides results from two additional sets of models. The first set of models estimates the impact of previous social affiliations on agent home list price and quality. As noted in the first chapter, congregation boundaries are often unexpectedly changed because of church growth or a need to rebalance church units. When such changes occur individuals do not relocate geographically, although the new boundaries significantly alter the social structure, including social interactions. In columns 1 and 2 I explore the impact of such shifts on the types of homes

agents list. I find that when listing for previous affiliates agents do not list homes that are significantly more expensive or that are of higher quality. This suggests that strong current social affiliations, and not simply geographic proximity, are driving the main results.

The second set of models estimate the impact of affiliation strength on the types of homes agents list. As shown in the previous chapter (see Table 1.1 of Chapter 1), individuals in wards interact much more frequently that individuals affiliated only through the stake. Consequently, information and solidarity benefits are much stronger at the ward level than the stake level. It is important to note, however, that geographic distance between stake affiliates is still quite small on average. My results in columns 3 and 4 show that the selection effects are largest when affiliations are strongest. Agents list homes that are nearly 15% more expensive when listing for ward affiliates, and list homes that are approximately 9% more expensive when listing for stake affiliates (T-test p-value<0.01). The results in column 4 show that agents are no less likely to list low quality homes at the ward level compared to the stake level. Overall these results suggest that strong affiliations are driving the observed selection results.

2.8 Discussion and Conclusion

This chapter has investigated the impact of social affiliations between real estate listing agents and clients on the types of transactions agents engage in and the underlying selection process. The results suggest that affiliations lead to agents listing more expensive, larger, and higher quality homes. Moreover, agents list more expensive homes even at low levels of experience, and social affiliations substitute for the positive impacts of experience, previous performance, brokerage reputation, and fit in the selection process. Additionally, the results suggest that transacting with social affiliates generates a feedback loop that positively impacts

future transactions with non-affiliates, implying that agents can leverage affiliations to build valuable experience and reputation.

Theoretically, this chapter makes a few key contributions. First, the results imply that the Matthew Effect and the positive benefits of status and reputation can be eroded by strong social affiliations between firms and clients. This suggests that incomplete information plays an important role in understanding the benefits of status and reputation, including their potential to lead to sustainable performance advantages, as it also may drive clients to prefer transacting with social affiliates. Second, and relatedly, while the literature has argued that those with strong reputation benefit most from social structures, the results of this chapter suggest that this is not the case under conditions of incomplete information. Finally, this research highlights the importance of understanding the link between trust, status, and reputation in explaining firm performance.

This chapter similarly has important implications for firms. First, this study suggests that firms can potentially leverage social affiliations to enter crowded or competitive markets. Thus, managers need to carefully assess the potential impact of affiliations between employee-experts and clients when making hiring and staffing decisions. Second, these results suggest that allowing service experts to transact with socially-affiliated clients can lead to significant performance benefits for the firm. Instead of creating a "relief organization", these affiliations provide key advantages to firms that can be leveraged as a resource to improve firm performance. Finally, this study suggests that sustained performance differences between firms in service industries may be driven, at least in part, by social affiliations between employees and clients.

There are a number of limitations to this study. First, while my setting allows me to improve upon the endogeneity problem encountered in many network or social capital studies, which is inherent from individuals choosing who to affiliate with (e.g., Mouw 2006), the affiliations in this study are still not truly exogenous. Agents chose where to live, and agents and clients choose whether or not to engage in a transaction together. Second, as noted in the previous chapter, I am unable to measure the strength of affiliation (aside from the ward vs stake comparisons), or to identify which individuals are members of the LDS church. Finally, while the data include numerous elements that give insight into the selection process, many characteristics of agents and clients are unobserved. This includes variables such as age or gender. Including such variables may improve the selection model and provide added insights.

Moving forward there is significant potential to extend this work. For instance, future work should investigate how varying levels and types of incomplete information influence the selection process, as well as returns to status or reputation. Future work could also more deeply investigate the competitive and entry implications from social affiliations. For instance, such work could focus on how access to valuable transactions at entry influences the emergence of superstar agents. The results of this chapter suggest that continued research focusing on the role of social structures in individual and firm performance is a worthwhile endeavor.

2.9 References

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2.10 Figures and Tables

Figure 2.1: Illustration of Potential Feedback Loop Created by Social Affiliations

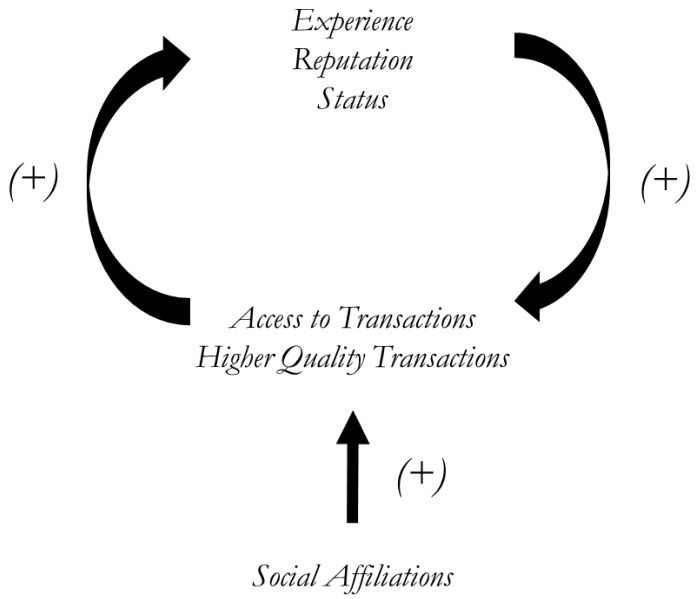

Figure 2.2: Affiliations Correlated with Higher List Prices

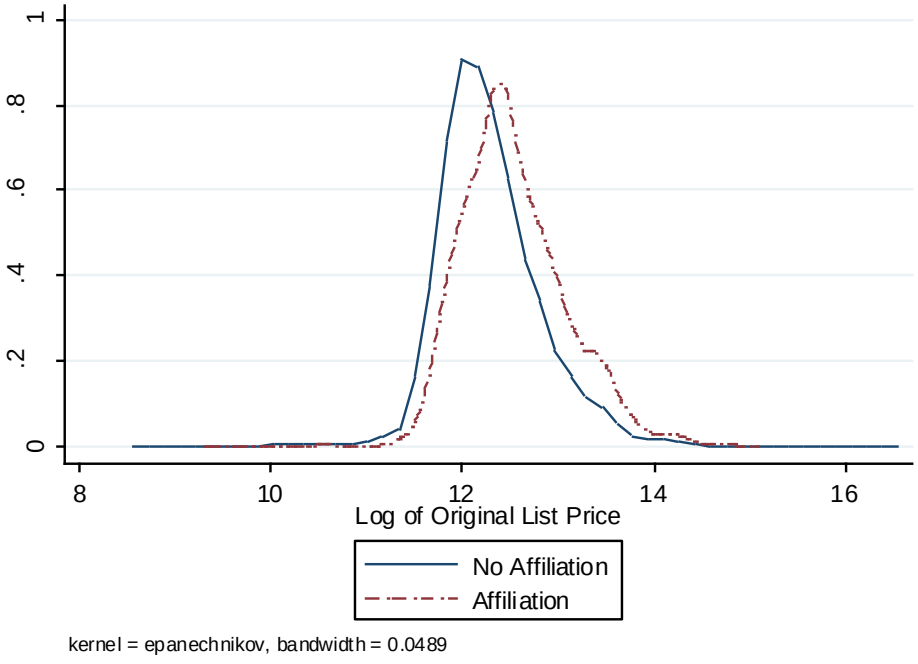

Figure 2.3: Affiliations Negatively Correlated with Listing Low Quality Homes

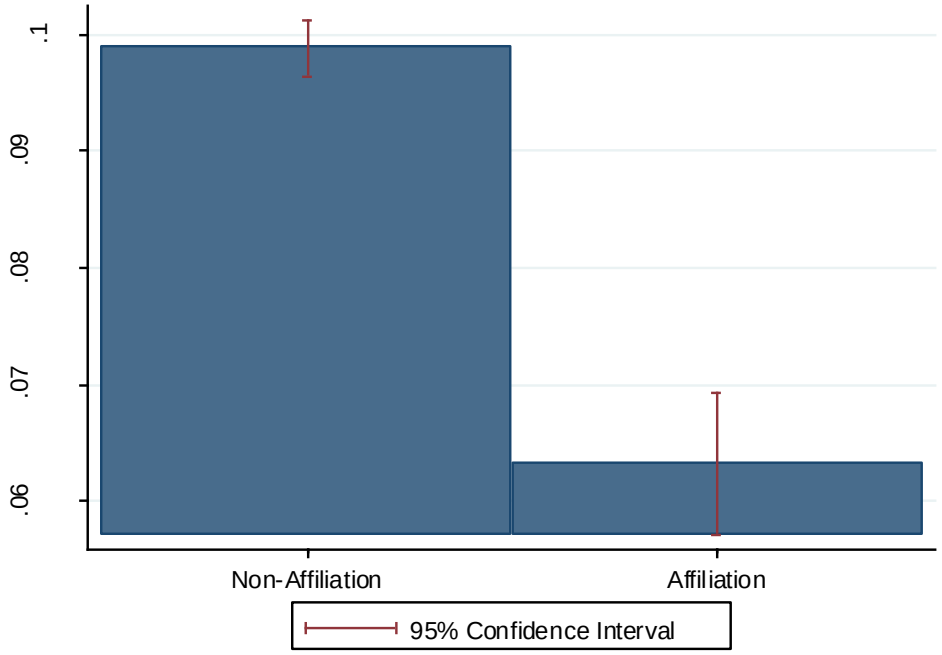

Figure 2.4: Affiliations Negatively Correlated with Brokerage Size

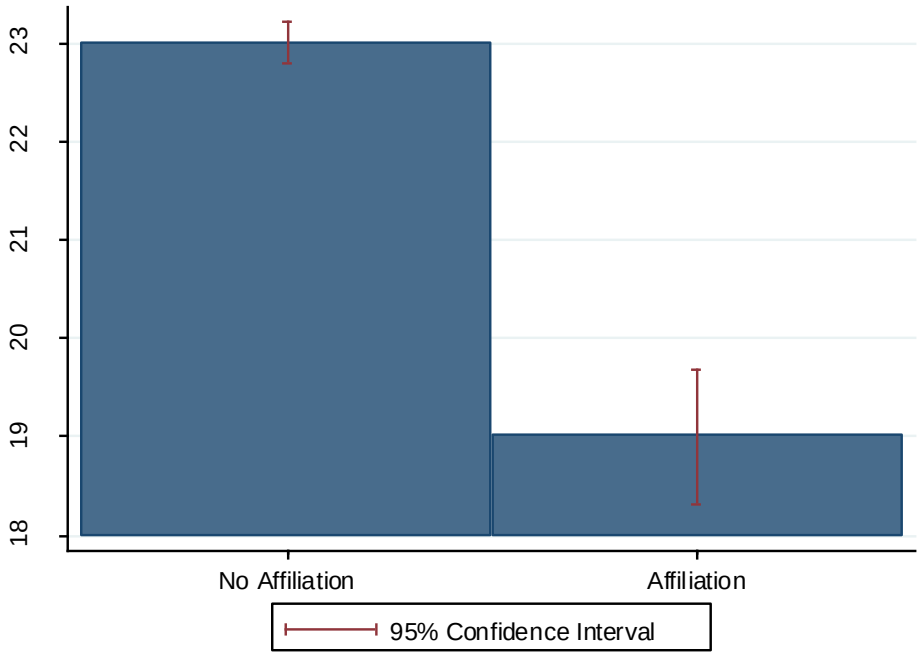

Figure 2.5: Affiliations Negatively Correlated with Agent Experience

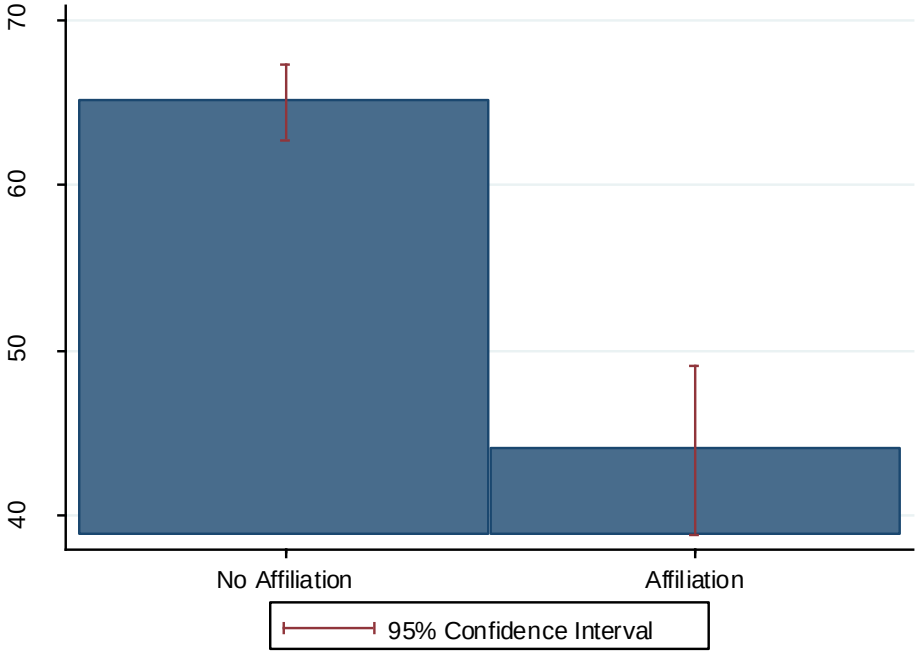

Figure 2.6: Correlation between Original List Price and Agent Experience, by Affiliation

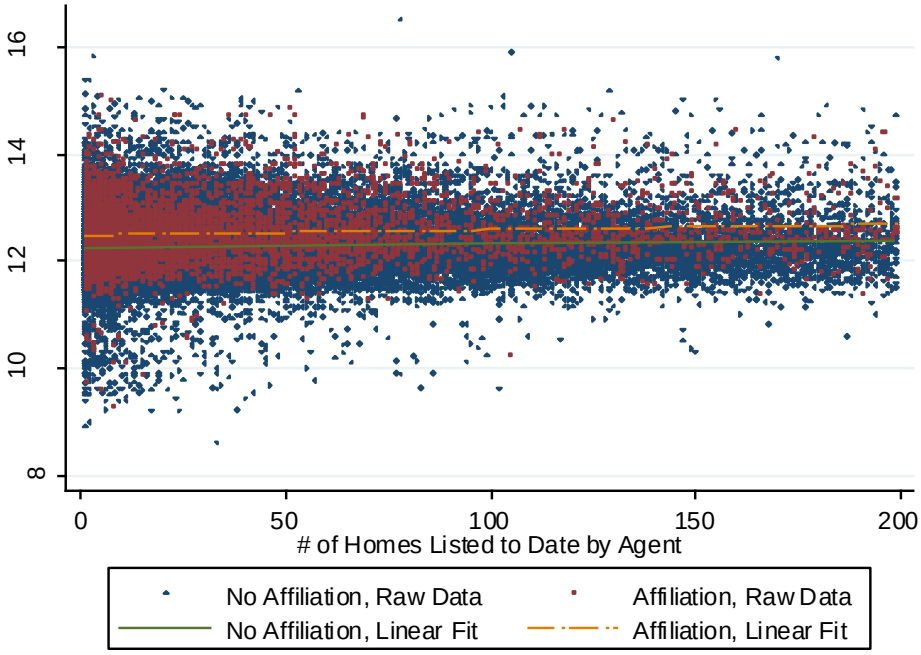

Table 2.1: Sample Descriptive Statistics

Variable	N	Mean	Std Dev	Min	Max
Original list price	49823	266837	243415	5500	14.9 MM
Square feet (sqft)	49823	2723.36	1447.12	500	28260
Low quality (count)	49823	0.10	0.33	0	4
Low quality (dummy)	49823	0.09	0.29	0	1
Predicted list price/original list price	49823	1.00	0.20	0.55	2.15
Predicted sold price/original list price	22637	1.05	0.18	0.66	1.90
Sold	49823	0.46	0.50	0	1
Days on mkt	49823	129.78	99.59	1	730
Affiliation	49823	0.11	0.31	0	1
Previous affiliation	49823	0.01	0.07	0	1
Same ward agent/house	49823	0.05	0.22	0	1
Same stake agent/house	46562	0.06	0.24	0	1
Franchise brokerage	49823	0.42	0.49	0	1
# list to date, agent	49823	84.01	188.51	1	1758
# list to date, brokerage	49823	1087.81	1316.40	1	6219
Short sale	49823	0.08	0.26	0	1
Immediate possession	49823	0.24	0.42	0	1
Co-agent present	49823	0.26	0.44	0	1
Comments length	49785	201.61	62.75	0	244
Year	49823	2007	3.73	1998	2014
Month	49823	6.14	3.24	1	12
Zip	49823	84306	297.78	84003	84664

Table 2.2: Sample Descriptive Statistics, by Affiliation

Variable	Mean	Std Dev	Mean	Std Dev	T-Tests
	No Affiliation		*Affiliation*		*P-value*
Original list price	258863	240714	331650	255290	0.000***
Square feet (sqft)	2664.29	1416.47	3203.55	1596.58	0.000***
Low quality (count)	0.11	0.34	0.06	0.26	0.000***
Low quality (dummy)	0.10	0.30	0.06	0.23	0.000***
Predicted list price/original list price	1.00	0.20	1.01	0.20	0.000***
Predicted sold price/original list price	1.05	0.18	1.07	0.18	0.000***
Sold	0.47	0.50	0.40	0.49	0.000***
Days on mkt	128.35	96.29	141.47	122.55	0.000***
Franchise brokerage	0.43	0.49	0.41	0.49	0.020**
# list to date, agent	85.63	190.75	70.84	168.57	0.000***
# list to date, brokerage	1094.2	1320.59	1035.83	1280.77	0.002***
Short sale	0.08	0.27	0.06	0.24	0.000***
Immediate possession	0.24	0.43	0.20	0.40	0.000***
Co-agent present	0.26	0.44	0.26	0.44	0.410
Comments length	200.31	63.49	212.32	55.13	0.000***
	N= 44365		N= 5458		

Table 2.3: Difference between House Quality Indicators for Affiliates and Non-Affiliates

Quality Indicators	Mean	Difference	P-value	Quality Indicators	Mean	Difference	P-value
TLC †	0.008	-0.0030	0.010***	Custom ‡	0.077	0.0369	0.000***
Needs Updating †	0.001	-0.0013	0.023**	Unique	0.007	0.0011	0.331
Estate Sale †	0.001	-0.0002	0.664	Maple	0.022	0.0152	0.000***
Foreclosure †	0.003	-0.0017	0.024**	Newer ‡	0.041	-0.0080	0.005***
Handyman †	0.001	-0.0005	0.261	Hurry/Will Not Last ‡	0.290	-0.0108	0.000***
As-Is †	0.009	-0.0054	0.000***	Pride ‡	0.002	0.0013	0.047**
Rehabber †	0.0003	-0.0003	0.206	Clean ‡	0.053	-0.0099	0.002***
Bank-Owned †	0.005	-0.0033	0.001***	Quiet ‡	0.077	0.0007	0.848
Priced to Sell	0.020	-0.0004	0.825	Dream ‡	0.010	0.0021	0.151
Motivated	0.030	-0.0006	0.799	Block	0.139	-0.0035	0.038**
Potential †	0.012	-0.0030	0.052*	Huge	0.098	0.0126	0.003***
Close	0.190	-0.0224	0.000***	Deck	0.062	0.0181	0.000***
!	0.440	-0.0104	0.145	Mint ‡	0.001	-0.0009	0.040**
New ‡	0.294	-0.0282	0.000***	Hardwood	0.073	0.0079	0.035**
Spacious	0.068	0.1450	0.000***	Views	0.124	0.0458	0.000***
Elegance ‡	0.007	0.0018	0.146	New Roof/New Shingles ‡	0.013	-0.0012	0.485
Beautiful ‡	0.208	0.0352	0.000***	Upgraded/Updated ‡	0.153	0.0056	0.282
Remodeled/Renovated ‡	0.049	-0.0078	0.011**	Vaulted	0.116	0.0043	0.351
Historic/Vintage	0.003	-0.0027	0.001***	Floor plan	0.111	0.1709	0.000***
Maintained/Well-Cared ‡	0.025	-0.0036	0.107	Award ‡	0.002	0.0006	0.408
Wonderful ‡	0.056	0.0131	0.000***	Hot Tub	0.019	-0.0000	0.995
Fantastic ‡	0.029	0.0035	0.152	Tile	0.132	-0.0209	0.000***
Charming	0.013	-0.0007	0.652	Cul-de-sac	0.042	0.0112	0.000***
Stunning ‡	0.009	0.0031	0.022**	Jetted Tub	0.053	0.0072	0.026**
Amazing ‡	0.034	0.0048	0.062*	Park	0.140	0.0644	0.000***
Granite	0.087	0.0331	0.000***	Brick	0.036	0.0046	0.084*
Immaculate ‡	0.031	0.0036	0.148	Value †	0.030	-0.0119	0.000***
Breathtaking ‡	0.005	0.0038	0.000***	Windows ‡	0.047	-0.0018	0.543
Neighborhood	0.137	0.0303	0.000***	Mother-in-law	0.029	0.0052	0.031**
Spectacular ‡	0.013	0.0089	0.000***	Stainless	0.032	0.0039	0.119
Landscaped ‡	0.100	0.0124	0.004***	Theater	0.028	0.0524	0.000***
Stained (Art) Glass	0.001	0.0004	0.177	Surround Sound	0.010	0.0043	0.002***
Built-in ‡	0.028	0.0081	0.001***	Pickiest ‡	0.007	0.0001	0.927
Tasteful	0.003	0.0003	0.688	Rare ‡	0.008	0.0023	0.069*
Must See ‡	0.079	-0.0010	0.792	Starter †	0.033	-0.0153	0.000***
Fabulous ‡	0.144	0.0024	0.168	Master	0.164	0.0073	0.167
Leaded †	0.001	-0.0004	0.344	Cute	0.017	-0.0061	0.001***
Delightful	0.001	-0.0009	0.043**	Warranty ‡	0.022	0.0042	0.050**
Move-In ‡	0.031	0.0002	0.922	Temple	0.009	0.0052	0.000***
Gourmet ‡	0.010	0.0052	0.000***	Fenced	0.082	-0.0025	0.520
Corian	0.005	0.0017	0.099*		N=49823		

Note: "Difference" if the difference in means, computed by subtracting the mean for non-affiliate houses from the mean for affiliate houses for each variable. P-values are from T-tests with the null hypothesis that the difference between affiliate and non-affiliate homes for each variable is zero. Significance levels: * p<0.10, ** p<0.05, *** p<0.01. † indicates variables used in the *low quality* measure. *Quality controls* in the tables below include all variables denoted with either † or ‡.

Table 2.4: Affiliations Correlated with More Expensive, Larger, and Higher Quality Homes

Dependent Variable:	(1) Log(List Price)	(1) Log(List Price)	(2) Log(Square Feet)	(3) Low Quality	(4) Pr(Low Quality)
Affiliation	0.135***	0.113***	0.109***	-0.041***	0.594***
	(0.007)	(0.006)	(0.006)	(0.004)	(0.037)
Log(# of houses listed to date)	0.013***	0.012***	0.114***	-0.003***	0.965***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.010)
Owner agent	0.021**	0.023***	0.038***	-0.005	0.966
	(0.009)	(0.008)	(0.009)	(0.007)	(0.072)
Co-agent present	0.007	0.005	0.036***	-0.009***	0.928**
	(0.005)	(0.004)	(0.005)	(0.003)	(0.034)
Immediate possession	-0.033***	-0.016***	0.007	0.023***	1.188***
	(0.005)	(0.005)	(0.005)	(0.004)	(0.043)
Short sale	-0.045***	-0.045***	0.054***	0.054***	1.613***
	(0.008)	(0.008)	(0.008)	(0.007)	(0.090)
Comments length				0.0002***	1.002***
				(0.0000)	(0.0001)
Constant	12.185***	12.163***	7.824***	0.070***	0.074***
	(0.017)	(0.017)	(0.016)	(0.013)	(0.010)
Geographic Controls	Y	Y	Y	Y	Y
Time Controls	Y	Y	Y	Y	Y
Quality Controls	N	Y	N	N	N
Brokerage Fixed Effects	N	N	N	N	N
Agent Fixed Effects	N	N	N	N	N
R^2	0.327	0.419	0.207	0.016	0.025
Observations	49823	49823	49823	49785	48776

Note: Robust standard errors presented in parentheses. Models 1-4 are estimated using OLS, and Model 5 using Logistic regression with odds ratios reported. Difference in observation numbers in Model 5 is due to a zip code predicting failures perfectly. Results for Model 4 are robust to estimating using count models. Time controls include year and month dummies for when the home was listed; Geographic controls include zip code dummies; Quality controls include low quality descriptive indicators as well as the other quality indicators noted in Table 2.3. Significance levels: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 2.5: Affiliations Correlated with More Expensive, Larger, and Higher Quality Homes (Within Brokerage)

Dependent Variable:	(1) Log(List Price)	(1) Log(List Price)	(2) Log(Square Feet)	(3) Low Quality	(4) Pr(Low Quality)
Affiliation	0.130***	0.109***	0.109***	-0.033***	-0.029***
	(0.016)	(0.015)	(0.022)	(0.005)	(0.005)
Log(# of houses listed to date)	0.016***	0.014***	0.116***	-0.004*	-0.004**
	(0.005)	(0.005)	(0.005)	(0.002)	(0.002)
Owner agent	0.029**	0.026**	0.037***	-0.011	-0.008
	(0.013)	(0.011)	(0.013)	(0.009)	(0.008)
Co-agent present	0.006	0.002	0.025**	-0.011	-0.010
	(0.012)	(0.011)	(0.012)	(0.008)	(0.008)
Immediate possession	-0.027**	-0.011	0.011	0.032***	0.024***
	(0.010)	(0.010)	(0.010)	(0.007)	(0.006)
Short sale	-0.040***	-0.040***	0.056***	0.054***	0.048***
	(0.015)	(0.013)	(0.013)	(0.009)	(0.007)
Comments length				0.0002***	0.0002***
				(0.0001)	(0.0001)
Constant	12.180***	12.159***	7.837***	0.070***	0.080***
	(0.034)	(0.037)	(0.034)	(0.013)	(0.022)
Geographic Controls	Y	Y	Y	Y	Y
Time Controls	Y	Y	Y	Y	Y
Brokerage Fixed Effects	Y	Y	Y	Y	Y
Quality Controls	N	Y	N	N	N
Agent Fixed Effects	N	N	N	N	N
R^2	0.380	0.462	0.265	0.063	0.068
Observations	49823	49823	49823	49785	49785

Note: Robust standard errors presented in parentheses. Models 1-5 are estimated using OLS. Results for Model 4 are robust to estimating using count models. Time controls include year and month dummies for when the home was listed; Geographic controls include zip code dummies; Quality controls include low quality descriptive indicators as well as the other quality indicators noted in Table 2.3. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 2.6: Affiliations Correlated with More Expensive, Larger, and Higher Quality Homes (Within Agent and Brokerage)

Dependent Variable:	(1) Log(List Price)	(1) Log(List Price)	(2) Log(Square Feet)	(3) Low Quality	(4) Pr(Low Quality)
Affiliation	0.135***	0.112***	0.139***	-0.025***	-0.022***
	(0.019)	(0.016)	(0.017)	(0.006)	(0.006)
Log(# of houses listed to date)	0.016**	0.010*	0.018***	-0.004	-0.004
	(0.006)	(0.006)	(0.006)	(0.004)	(0.003)
Owner agent	0.032**	0.034***	0.028**	-0.014	-0.012
	(0.013)	(0.012)	(0.014)	(0.009)	(0.008)
Co-agent present	0.024*	0.022*	0.024*	-0.006	-0.007
	(0.012)	(0.011)	(0.014)	(0.006)	(0.005)
Immediate possession	-0.033***	-0.021***	0.002	0.033***	0.025***
	(0.008)	(0.007)	(0.008)	(0.006)	(0.005)
Short sale	-0.035***	-0.035***	0.051***	0.046***	0.042***
	(0.013)	(0.013)	(0.012)	(0.010)	(0.009)
Comments length				0.0002***	0.0001***
				(0.0000)	(0.0000)
Constant	12.217***	12.191***	7.87***	0.127***	0.117***
	(0.051)	(0.051)	(0.045)	(0.030)	(0.026)
Geographic Controls	Y	Y	Y	Y	Y
Time Controls	Y	Y	Y	Y	Y
Brokerage Fixed Effects	Y	Y	Y	Y	Y
Agent Fixed Effects	Y	Y	Y	Y	Y
Quality Controls	N	Y	N	N	N
R^2	0.480	0.547	0.372	0.164	0.176
Observations	49823	49823	49823	49785	49785

Note: Robust standard errors presented in parentheses, clustered by listing brokerage. Models are estimated using OLS. Results for Model 4 are robust to estimating using count models. Time controls include year and month dummies for when the home was listed; Geographic controls include zip code dummies; Quality controls include low quality descriptive indicators as well as the other quality indicators noted in Table 2.3. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 2.7: Investigating how Affiliations Impact the Selection Process- Conditional Logit Models

	(1)	(2)	(3)	(4)
Dependent Variable:	Pr(Chosen)	Pr(Chosen)	Pr(Chosen)	Pr(Chosen)
Affiliation	6.735***	7.803***	8.074***	6.799***
	(0.380)	(0.608)	(0.755)	(0.768)
Log(Avg. # homes sold overall$_t$)	1.549***	1.272***	1.286***	1.274***
	(0.016)	(0.023)	(0.024)	(0.036)
Affiliation X Log(Avg. # homes sold overall$_t$)	0.905***	0.930**	0.930**	0.931*
	(0.015)	(0.027)	(0.027)	(0.039)
Log(# homes sold in year$_{t-1}$)		1.575***	1.517***	1.498***
		(0.040)	(0.039)	(0.058)
Affiliation X Log(# homes sold in year$_{t-1}$)		0.858***	0.862***	0.725***
		(0.034)	(0.035)	(0.043)
Franchise brokerage			1.125***	
			(0.041)	
Affiliation X Franchise brokerage			0.829***	
			(0.049)	
Log(# of agents in brokerage$_t$)			0.967**	
			(0.013)	
Affiliation X Log(# of agents in brokerage$_t$)			0.974	
			(0.021)	
Difference from avg. list price			0.328***	
			(0.019)	
Affiliation X Difference from avg. list price			1.170**	
			(0.088)	
Linear distance between agent and home				0.999***
				(0.000)
Listing Fixed Effects	Y	Y	Y	Y
R^2	0.101	0.102	0.114	0.122
Observations	389438	256622	256622	69551

Note: Robust standard errors presented in parentheses, clustered by listing. Odds ratios reported. Choice set is specified as all agents that live in the same zip code as the home being sold. Future models will include additional specifications of the choice set. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 2.8: Social Affiliations and Relationship with Experience or Reputation

	(1)	(2)	(3)
Dependent Variable:	Log(List Price)	Log(List Price)	Log(List Price)
Affiliation	0.123***	0.135***	0.123***
	(0.030)	(0.019)	(0.016)
Log(# of houses listed to date)	0.015**		
	(0.006)		
Affiliation X Log(# of houses listed to date)	0.004		
	(0.011)		
# of houses listed to date (lower middle 25%)		0.027**	0.026***
		(0.011)	(0.011)
# of houses listed to date (upper middle 25%)		0.044**	0.039**
		(0.019)	(0.019)
# of houses listed to date (top 25%)		0.053*	0.053*
		(0.029)	(0.029)
Affiliation X # houses (lower middle 25%)			0.008
			(0.023)
Affiliation X # houses (upper middle 25%)			0.043
			(0.037)
Affiliation X # houses (top 25%)			-0.002
			(0.073)
Constant	12.218***	12.241***	12.244***
	(0.051)	(0.050)	(0.050)
Geographic Controls	Y	Y	Y
Time Controls	Y	Y	Y
Brokerage Fixed Effects	Y	Y	Y
Agent Fixed Effects	Y	Y	Y
Transaction Controls	Y	Y	Y
R^2	0.480	0.480	0.480
Observations	49823	49823	49823

Note: Robust standard errors presented in parentheses, clustered by listing agent. Models are estimated using OLS. Time controls include year and month dummies for when the home was listed; Geographic controls include zip code dummies. Transaction controls include dummy variables for owner agents, presence of a co-agent, immediate possession, and short sales. Results are similar to including quality controls. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 2.9: Feedback Loop Generated by Listing for Affiliates

Dependent Variable:	(1) Log(Average List Price)$_t$	(2) Log(Average List Price)$_t$	(3) Log(Average List Price)$_t$	(4) Log(Average List Price)$_t$
Log(# of homes listed for affiliates)$_{t-1}$	0.065***	0.026**	0.071***	0.024*
	(0.016)	(0.012)	(0.026)	(0.014)
Log(# of homes listed to date, median for year)$_t$	0.034***	0.043**	0.033	0.055**
	(0.011)	(0.022)	(0.042)	(0.024)
Log(# of homes listed total)$_{t-1}$	-0.045***	-0.012*	-0.031	-0.024*
	(0.011)	(0.013)	(0.034)	(0.014)
Log(# of homes listed total)$_t$	0.036***	0.049***	0.034	0.048***
	(0.010)	(0.012)	(0.027)	(0.013)
Constant	11.952***	11.893***	11.942***	11.869***
	(0.040)	(0.050)	(0.059)	(0.057)
Time Controls	Y	Y	Y	Y
Agent Fixed Effects	N	Y	N	Y
R^2	0.152	0.615	0.180	0.599
Observations	7032	7032	1809	6602
Sample	All Years	All Years	First 2 Years	All Years

Note: Unit of analysis is the agent/year. Robust standard errors presented in parentheses, clustered by listing agent. Column 4 omits affiliation listings in year *t* from the calculation of the mean list price. Difference in observations is due to years where agents listed exclusively for affiliates. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 2.10: Selection Effects Largest with Strong Affiliations and Disappears with Affiliations

Dependent Variable:	(1) Log(List Price)	(2) Low Quality	(3) Log(List Price)	(4) Low Quality
Affiliation	0.113***	-0.025***		
	(0.016)	(0.006)		
Previous affiliation	0.032	0.008		
	(0.038)	(0.024)		
Same ward agent/house			0.147***	-0.024***
			(0.020)	(0.008)
Same stake agent/house			0.087***	-0.027***
			(0.019)	(0.008)
Constant	12.190***	0.127***	12.188***	0.130***
	(0.051)	(0.030)	(0.049)	(0.029)
Geographic Controls	Y	Y	Y	Y
Time Controls	Y	Y	Y	Y
Brokerage Fixed Effects	Y	Y	Y	Y
Agent Fixed Effects	Y	Y	Y	Y
Transaction Controls	Y	Y	Y	Y
Quality Controls	Y	N	Y	N
R^2	0.547	0.164	0.552	0.157
Observations	49823	49823	46562	45574

Note: Robust standard errors presented in parentheses, clustered by listing agent. Models are estimated using OLS. Time controls include year and month dummies for when the home was listed; Geographic controls include zip code dummies; Quality controls include low quality descriptive indicators as well as the other quality indicators noted in Table 2.3. Transaction controls include dummy variables for owner agents, presence of a co-agent, immediate possession, and short sales. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

CHAPTER 3

Motivational Spillovers from Awards: Crowding Out in a Multitasking Environment

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CHAPTER ABSTRACT

This chapter proposes and tests a theoretical framework on how workplace awards affect employee motivation and performance, arguing that award programs have complex consequences that critically depend on individual differences in motivation across tasks. Our theory builds on the existing literature's focus on the direct, positive effect of awards on employees who previously lacked motivation for the now-awarded task, and argues that awards can have deleterious effects on performance for employees with high pre-existing task motivation. Most novelly, the theory predicts that these employees also suffer reduced motivation and performance in tasks not included in the award program. Data from an attendance award program implemented at one of five industrial laundry plants shows evidence consistent with our theory. The program improved performance for employees with attendance issues prior to award introduction, but this effect disappeared once an employee lost award eligibility, and was achieved partly by gaming the award rules. In contrast, workers with perfect pre-program attendance suffered worse attendance after losing eligibility. This employee group also lost 8% efficiency in daily laundry tasks after introduction. Our chapter suggests that even purely symbolic awards can generate gaming and crowding out costs that may spill over to other important tasks.

3.1 Introduction

A large literature in management, social psychology, and economics has focused on how monetary reward policies such as pay for performance can motivate employee productivity (Prendergast 1999; Gerhart et al. 2009; Larkin et al. 2012). Although monetary rewards can powerfully motivate productive behavior (Eisenberger et al. 1999; Prendergast 1999), they also can generate dysfunctional consequences (Lepper and Green 1978; Gneezy et al. 2011). Multitasking theory holds that workers who engage in multiple tasks will focus on rewarded tasks at the expense of others (Milgrom and Roberts 1991), leading to costly gaming that increases an individual's pay while harming the organization (Kerr 1975; Obloj and Sengul 2012). The introduction of monetary rewards, which increase extrinsic motivation for a task (Amabile 1993), may also "crowd out" an employee's intrinsic or other non-reward based motivation (Deci et al. 1999).

These and other costs of monetary rewards are one reason that managers often use nonmonetary but still extrinsically oriented rewards such as status and prestige (Silverman 2004). Corporate award programs are one of the most common nonmonetary extrinsic rewards in firms (Frey 2007). One recent survey suggests that over 80% of corporations use award programs such as "employee of the month," "top sales club," and awards for innovative ideas or suggestions (Garr 2012). Although practitioners have long argued that awards extrinsically motivate employees without the financial or psychological costs of formal compensation (e.g., Davidson 1999), academics have only recently studied such programs (Frey and Neckermann 2008). The small but growing awards literature has focused almost exclusively on the benefits, arguing that awards motivate employees through mechanisms that include status-based competition and social comparison (Markham et al. 2002; Moldovanu et al. 2007; Kosfeld and

Neckermann 2011), increased self-esteem (Kuhnen and Tymula 2010), and strengthened identification with the employer (Akerlof and Kranton 2005; Neckermann et al. 2014). Furthermore, this literature argues that corporate awards and performance recognition programs achieve this motivation with little or no cost (Besley and Ghatak 2008; Blanes i Vidal and Nossol 2011), avoiding the costs associated with monetary rewards by habituating positive behavior through mechanisms such as increased organizational loyalty (Frey and Neckermann 2008; Neckermann et al. 2014).

In this chapter, we argue that existing work on awards largely ignores three dimensions that are critical to a comprehensive theory of award-based motivation. First, the literature seldom considers individual differences in employee motivation and thus ignores the impact of an award on employees who were already highly motivated towards the now-awarded task. Second, the literature almost exclusively examines the impact of the award on the task for which it is given, and not on other tasks. Finally, the literature does not consider the effect of losing eligibility for an award during the program, which is common in awards based on specific, well-defined rules (Garr, 2012). Our theory suggests that awards carry costs beyond the simple prize money and program implementation costs, and can even negatively affect the motivation of some employees on certain tasks. While the net impact of an award program may still be positive, it is crucial to consider not just the direct effect of awards on the intended employees and tasks, but also the indirect effects previously ignored by the literature. Our chapter builds a comprehensive theory that combines these direct and indirect effects. Given the widespread use of corporate awards and the growing scholarly interest in them, we see the need for a more nuanced and realistic theory—one that incorporates task, employee, and eligibility.

We address this need by integrating theories of multitasking and crowding out to

construct a theory of how employees with heterogeneous levels of motivation towards a task react to the introduction of an award, with respect to both the awarded task and other tasks. Our theory also builds predictions about how losing the opportunity to win an award affects these same employee-and-task pairs. Crucially, we hold that an employee's response to the introduction of a task-specific award will depend on her pre-existing motivation for that task. Specifically, we hypothesize that a corporate award will increase performance of the awarded task by employees who had previously performed it poorly, and who therefore had low task motivation in the absence of formal rewards. We classify these workers as "reward-motivated."

However, drawing from multitasking theory, we hold that these reward-motivated employees will strategically respond to the formal program rules and only take actions that directly increase their chances of winning. We further argue that multitasking theory implies that once a reward-motivated employee loses award eligibility, her performance will return to pre-reward levels. These hypotheses directly contrast with arguments in the existing awards literature that awards enhance organizational loyalty and habituate positive behavior.

We also build hypotheses about how the introduction of a task-specific award affects employees who were already performing that task well. Research in social psychology and economics suggests a host of reasons that employees might be motivated to perform a given task well, even without a formal reward, and strong individual differences in which of these reasons primarily motivates an employee (Grant, 2007; Sauermann and Cohen 2010). These primarily "internal" mechanisms include pure intrinsic motivation, prosocial motivation, social pressure, and others. We classify workers with such motivations as "internally motivated," identifying them by high task performance in the absence of a formal financial or nonmonetary reward. We argue that with the institution of an award program, internally motivated employees will suffer

from motivational crowding out, manifesting as reduced performance when they lose their eligibility.

Our most novel contribution is to extend and combine the theories of crowding out and multitasking to predict that the introduction of an award will lead to the crowding out of internal motivation in domains other than the awarded task. Although multitasking theory does consider indirect spillovers that reduce performance on nonrewarded tasks, the mechanism for this reduction is a rational decrease in effort due to an overall effort constraint and not due to a decrease in intrinsic motivation. We argue that the introduction of a task-specific award will lead to *negative motivational spillovers*, whereby an employee who had been internally motivated for the awarded task will lose motivation for a different task, even without the effort constraint central to multitasking theory. We argue that negative motivational spillovers result from the award program violating a psychological contract between the firm and its internally motivated employees that is based on perceptions of fairness and equity. The award program, by offering recognition to employees who had previously shown little concern for the task, insufficiently acknowledges the prior contributions of those who had already been doing the task well for non-reward based reasons.

We empirically test our theory by studying an attendance award program implemented in an industrial laundry plant in the Midwestern United States. In March 2011, the managers at one of the company's five plants independently—but systematically and carefully—implemented a monthly attendance award program that recognized all employees with perfect attendance, and awarded one such employee, randomly selected from all those with perfect attendance in that month, a $75 gift card. Perfect attendance was defined to cover both punctuality and a lack of unexcused absences. The independent implementation of the award at only one plant allows us to

investigate its effect in a quasi-experimental way, using employees at the other four plants as a quasi-control group for the single "treated" plant.

In line with both our theory and the previous literature, we find that the award improved the attendance of employees with previously poor attendance. However, consistent with multitasking theory, there is clear evidence that employees took actions to stay eligible for the award, even if those actions ran contrary to the spirit of the award. For example, employees were far more likely to take unplanned "single absences" by calling in sick, likely on days when they anticipated arriving late for work. Before the award was introduced, these employees were likely to simply arrive late, but the award appears to have caused them to call in sick so as not to lose their eligibility for the award. Furthermore, once an employee became disqualified for the award in a given month, she immediately reverted to her pre-award level of attendance and punctuality, suggesting that the award did not increase baseline motivation for good attendance.

We also find significant evidence that employees who were already highly motivated for attendance before the award program suffered from crowding out once it was introduced. Employees with perfect attendance and punctuality in the pre-award period were 5.5 times more likely than similar employees in the control group to have a *second* attendance issue in a given month once an initial event had disqualified them from the award. This is consistent with crowding out theory, which argues that the introduction and then removal of an extrinsic motivator will reduce an employee's intrinsic motivation for the task.

Most strikingly, we find evidence for negative motivational spillovers from the award. Employees with perfect pre-award attendance and punctuality reduced their average laundry task productivity by 8% after the introduction of the award. In contrast to the direct crowding out of motivation for attendance, which occurred only after an employee was disqualified for the award

in a given month, this indirect crowding out of work productivity occurs from the start of the month, when the employee is still eligible for the award. Notably, attendance and punctuality do not affect the company's measure of productivity, so this result cannot be from traditional multitasking based on effort allocation decisions.

Overall, this chapter builds and tests a theory of negative motivational spillovers that bridges the multitasking notion of reduced performance on an uncompensated task and the crowding out idea that extrinsic rewards can reduce intrinsic motivation. By considering heterogeneity across task, employee type, and eligibility for the award, we build and test a nuanced theory of the impact of awards on employee and corporate performance.

3.2 Theoretical Development

3.2.1 A Taxonomy on Motivation from Awards

Figure 3.1 presents the theoretical framework developed in this section, which is based on three dimensions that are critical to predicting the effects of awards: employee motivational type, task type, and eligibility. In our framework, employees are defined as either "internally-motivated" (performing highly on the awarded task absent the award) or "reward-motivated" (only performing highly with the extrinsic award program). Tasks are divided between those that are awarded and those that are not. At any given time, employees are either still eligible to win the award or are no longer eligible, depending on their performance on the awarded task and the rules of the award program.

Our paper's theoretical design begins with the one combination presented in existing literature—the performance of eligible, reward-motivated employees on the awarded task. We term this the "direct effect" of an award, and argue that there are two direct effects. First, as existing empirical studies demonstrate, reward-motivated employees improve performance on

the task while eligible under the program rules. Second, as implied by multitasking theory but not shown in prior work, reward-motivated employees strategically game program rules to improve chances of winning, even when this undermines the spirit of the program.

We then extend existing award theory by arguing that award programs have "indirect effects" on motivation and productivity based on the three incomplete assumptions in prior studies on direct effects: 1) that all employees lack full motivation for the awarded task absent the award; 2) that the award only affects motivation and performance on the awarded task; and 3) that the award's impact is constant once introduced, regardless of a given employee's eligibility based on the program's rules. This chapter's unique theoretical contribution is to explain and empirically show that these indirect effects of award programs from employee heterogeneity, motivational spillovers to other tasks, and eligibility produce substantial economic costs.

Like most of the empirical literature on motivation, throughout the chapter we use task performance absent formal rewards as a proxy for internal motivation. Therefore, in our setting, we classify those employees with high task performance without formal rewards as "internally motivated" towards that task, compared to those with low task performance absent formal rewards who we earlier designated as "reward-motivated" towards that task. As we note in the chapter's empirical section, an important component of our empirical setting is the absence of long-term career-based rewards such as promotion, which might extrinsically motivate high performance even without short-term formal rewards.

3.2.2 Direct Effects of Awards on Motivation

Direct effects on effort: Although monetary rewards remain important for extrinsic motivation, scholars have long been interested in the effect of nonmonetary rewards on effort, motivation, and job performance. Large bodies of theoretical literature in sociology, economics, and

psychology explain why nonmonetary extrinsic rewards motivate employees through desire for status and social recognition among peers and employers (Blau 1964; Greenberg 1988; Grant and Gino 2010) and for social approval (Akerlof 1980; Benabou and Tirole 2006; Andreoni and Bernheim 2009). Sociologists (Olson 1965; Sewell et al. 1969) and, more recently, economists (Frank 1985; Frey 2006; Ariely et al. 2009; Ederer and Patacconi 2010) have also noted that individuals are motivated by the prospect of prestige, rank, and respect.

Award programs, perhaps the most prominent example of formal, nonmonetary extrinsic motivation policies in firms, have been understudied by academic researchers despite their widespread use (Frey and Neckermann 2008). Although no standard definition exists for "award," scholars note that corporate awards contain four fundamental traits: they involve a formal program set up by managers; they involve public recognition for performance; they involve the award of something valuable, such as money, a certificate or trophy; and they involve scarcity or competition, since not everyone can win (Frey and Neckermann 2008).

An emerging body of empirical research on awards is almost universally positive about their effects on employee performance. Kosfeld and Neckermann (2011), for example, show a short-term motivational effect in experiments with students, while Neckermann et al. (2014) found that unannounced symbolic awards in a call center increased performance on nonawarded tasks for both award recipients and nonrecipients. Notably, Neckermann et al. (2014) is the only paper, to our knowledge, that has considered the possibility of spillovers across tasks and it only examines positive spillovers. Other studies have found award programs to improve motivation for critical but typically uncompensated employee behaviors such as attendance (Scott and Markham 1982; Markham et al. 2002).

Although most research does not cleanly identify the precise mechanism behind the

motivational increase from award programs, the empirical settings almost all involve significant peer recognition for the award. Interestingly, for awards involving a small financial reward (ranging from $5 to $100), the size of the reward does not affect the size of the improvement in employee response (Frey and Neckermann 2008), suggesting that the primary motivational benefit from the award is often not financial. A small number of laboratory (Huberman et al. 2004) and field (Larkin 2010) studies even suggest that some employees are willing to pay for the peer recognition that stems from winning an award. Recognition and status amongst peers appears to be the largest source of motivation from corporate awards, an argument previously advanced in behavioral economics (Frey 2006).

The implication of this literature is that employees who lack motivation in the absence of formal rewards, and thus exhibit low performance absent an extrinsic reward, will have the greatest increase in motivation and productivity due to the extrinsic motivation of an award. The literature on awards almost always makes a critical and usually unstated assumption that employees are capable of improving their performance on the awarded task. This, in turn, implicitly assumes that employees whose performance improves due the award had previously lacked the motivation—rather than the ability—to perform that well, since the introduction of an award does not change employee skill. We therefore hypothesize:

> Hypothesis 1a: *The introduction of an award program for a previously unrewarded task improves performance on that task for employees who had previously performed poorly on it (that is, reward-motivated employees).*

Direct effects on gaming: The existing literature has almost exclusively focused on the direct effect of awards presented in Hypothesis 1a—task-specific motivation for reward-motivated employees. Yet a second and under-studied direct effect is that employees will strategically

respond to corporate reward systems by carefully following the formal rules to maximize their reward, even when these actions are costly to the employer. Gaming of award program rules stems directly from multitasking theory in economics (Holmstrom and Milgrom, 1991). In multitasking theory, the use of extrinsic rewards for a task inherently draws away effort and attention from other, nonrewarded tasks, creating negative performance spillovers on the second task (Prendergast 1999). It is in practice highly difficult to design reward programs that perfectly align employee action to the interests of the firm, and firms therefore use reward systems that are prone to distortive, manipulative behavior by workers (Kerr 1975). Empirical research demonstrates that such gaming behavior is rampant in many commonly-used monetary reward systems, and that this behavior is highly costly to employers (Oyer 1998; Obloj and Sengul 2012; Larkin 2014).

In empirical work, multitasking and gaming have been almost exclusively applied to the use of monetary rewards. However, the predictions from the multitasking literature naturally extend to any type of formal extrinsic reward system used in corporations. Indeed, formal economic models of nonmonetary rewards effectively treat these rewards as equivalent to monetary rewards in terms of the mechanisms by which they affect motivation (Benabou and Tirole 2006).

Although the existing literature has not examined multitasking and gaming in an awards setting, we believe that the predictions from the multitasking literature apply directly to the use of awards. As noted above, awards represent a strong motivational tool for reward-focused agents not otherwise motivated for the task at hand. It is natural to expect awards to lead to dysfunctional multitasking behavior where agents focus on the rules rather than the spirit of the award program. If employees at least partially respond to awards rationally and strategically, as

predicted by multitasking theory, we should expect them to manipulate rules to improve their probability of winning.

> Hypothesis 1b: *Reward-motivated employees who respond to an award with increased performance will on average achieve some of this increase by manipulating the rules of the system.*

In terms of our taxonomy, both Hypotheses 1a and 1b represent direct effects of the award program, since they focus on the effect of the award on the awarded task for reward-motivated employees. Hypothesis 1a serves as a concise summary of the empirically-supported hypotheses in the vast majority of existing work on awards, and provides a useful summary of the existing theory in the taxonomy of our theory. We would therefore expect our empirical findings to corroborate this well-known result. Hypothesis 1b, while new to the awards literature, follows directly from the vast literature on multitasking and gaming.

3.2.3 The Indirect Effect of Awards

We next present the effect of award introduction when at least one of the criteria classifying the direct effect does not hold; that is, when employees are internally-motivated, when they are no longer eligible for the award, and/or when they work on non-awarded tasks.

Motivation reversion after lost eligibility: Multitasking theory holds that employees pay careful attention to the rules of a reward program. In an award setting, one of the most important sets of rules involves exactly how the award winners are determined. Although not always the case, awards are commonly based on ex-ante criteria specifying the process by which the award winners will be selected, and these criteria usually imply that, at some point, employees who lack sufficient performance on the award criteria become ineligible for the award, even before the

winners are determined (Garr, 2012).

Multitasking theory predicts that agents care *only* about the rules governing the reward program, not its spirit. If employees respond to awards by gaming the rules to increase their chance of winning, they logically will respond to the loss of eligibility by ceasing to be motivated by the award program. It is notable that much of the research on nonmonetary extrinsic motivators posits that these rewards can provide a subtle habituation of desired behavior through mechanisms such as increased organizational loyalty or the learning of positive habits (Frey and Neckermann 2008; Acland and Levy 2012; Allcott and Rogers 2014). Our theory predicts the opposite – that the loss of award eligibility will cause a *motivation reversion* such that reward-motivation employees return to their pre-award level of motivation. Formally:

> Hypothesis 2: *Reward-motivated employees who respond to an award with increased performance will revert to their lower pre-award performance once ineligible for the award.*

Crowding out internal motivation: Social psychologists and management scholars have long recognized that some employees may have strong task-specific motivation that stems from sources other than external rewards. Intrinsic motivation, the value a worker receives simply from enjoying the task itself (Amabile et al. 1994), is the most widely studied alternative to motivation based on extrinsic rewards. Psychologists have demonstrated that it can generate learning, creativity, enjoyment, and effort (Deci 1971, 1975; Deci and Ryan 1985; Ryan and Deci 2000) and ultimately lead to improved productivity (Shamir 1991; Grant 2008). Workers who receive no formal extrinsic rewards for particular tasks may also be motivated through extrinsic social mechanisms such as prosocial motivation, peer image, and social pressure and through psychological mechanisms such as gratitude (Deci 1971; Hackman and Oldham 1975;

Benabou and Tirole 2006; Grant 2007; Mas and Moretti 2009; Grant and Gino 2010; Wrzesniewski et al. 2014). Although separating these motivational mechanisms is difficult, we note that our theory is not dependent on a high level of internal motivation stemming from purely intrinsic factors.

It is critical to note that the research on intrinsic and other internal motivations has found them to be person-task traits, not person-specific traits that apply to all tasks (Fehr and Falk 2002; Grant 2007; Grant and Berry 2011). Employees with internal motivation toward one task may require extrinsic rewards to perform highly on another.

Many social psychologists and an increasing number of economists argue that the introduction of extrinsic rewards can substitute for—or crowd out—intrinsic motivation through a number of mechanisms (Deci and Ryan 1985; Frey and Oberholzer-Gee 1997). Desire for competence on the job, for example, is one of the leading mechanisms for intrinsic motivation in self-determination theory (Deci and Ryan 2002), and can be "crowded out" as an external reward shifts the lens through which an employee views a behavior. Prior to the introduction of an extrinsic reward, the employee may pursue a behavior because she perceives it as what a competent employee does, but once a reward has been introduced, she may instead perceive that behavior as something that gets her a reward (Gneezy and Rustichini 2000a). Later research has focused on the role of image in crowding out (Benabou and Tirole 2006; Grant and Mayer 2009; Lacetera and Macis 2010), a critical mechanism because of the importance of image in motivating prosocial behavior. Although the lens by which peers view and judge one's actions is an extrinsic factor, intrinsically motivated actors can become demotivated if they feel others will view their actions as opportunistic or extrinsically motivated (Ariely et al. 2009). This might occur, for instance, if the external perception of the motives behind a given worker's prosocial

behavior shifts from "a desire to be a 'good' employee" to "a desire to win an award and receive social recognition."

Laboratory and field evidence on crowding out abounds. However, as Prendergast (1999) notes, only a few papers provide any empirical evidence on crowding out in firms (Holmas et al. 2010; Bareket-Bojmel et al. 2014; Hossain and Li 2014). In some ways, this is unsurprising: firms more often track performance data for tasks that they reward than for nonrewarded tasks. Also, previous research has not examined the introduction of a reward for an unrewarded activity and the subsequent removal of it. Even if crowding out exists, the effect of the reward introduction on overall motivation is ambiguous because it depends on the relative magnitudes of the gain in extrinsic motivation and the drop in intrinsic motivation. The net effect of introducing an extrinsic reward therefore crucially depends on its size (Gneezy and Rustichini 2000b). Our theory, therefore, does not yield a prediction about the direct effect of an award on the awarded task for internally motivated employees. While the award is in place, these employees will have increased extrinsic but decreased intrinsic motivation, yielding an ambiguous overall effect on performance.

However, adding the award eligibility dimension provides a clear prediction of the effect of an award on internally-motivated employees. Specifically, crowding out theory unambiguously predicts reduced motivation and performance once a reward is introduced and then removed (Deci et al. 1999). The reward's removal eliminates the extrinsic motivation but the intrinsic motivation does not return. Our earlier hypotheses suggest that the increased extrinsic motivation brings increased focus on the award program rules, including those around eligibility. If the award introduction increases the extrinsic motivation of an internally-motivated employee but reduces her internal motivation, then by the same logic underlying Hypothesis 2,

the employee's loss of eligibility will lead to reduced extrinsic motivation. The net effect on motivation for internally-motivated employees from ineligibility following award introduction is therefore unambiguously negative, compared to the period before the award was introduced. This is because the introduction of the extrinsic reward reduced internal motivation, but the loss of eligibility eliminates any increase in extrinsic motivation from the award. Formally:

> Hypothesis 3: *Performance on the now-awarded task by internally-motivated employees will be lower than pre-award performance after the employee loses eligibility.*

Negative motivational spillovers on nonawarded tasks: Although the introduction of an award should most directly affect the awarded task, it may also impact other tasks. Multitasking theory predicts that extrinsic rewards should only reduce effort and performance on other tasks if there is a direct tradeoff in effort required; otherwise, it predicts that a reward for one task should have no impact on another. Most studies in economics and social psychology on employee performance have little to say on such possible interactions in the absence of effort constraints, instead focusing on the performance of individual tasks. Crucially, we focus on why tasks without a tradeoff in effort allocation might still incur negative motivational spillovers from the introduction of an award on one task but not the other. This part of the theory therefore combines elements of multitasking from economics and crowding out from social psychology.

Why might the motivations for two tasks be related? The theory of psychological contracts holds that employees form an implicit exchange agreement with employers that governs their overall relationship and influences their individual day-to-day actions (Levinson et al. 1962; Rousseau 1989; Rousseau and Greller 1994). Notably, some employee actions are governed by transactional considerations such as the exchange of compensation for productive

effort. Transactional considerations can play a crucial supporting role in sustaining the deeper, longer-lived relational contract between employee and employer (MacNeil 1985). However, most employee actions are relational and are governed not by explicit rewards, but by a more complex implicit contract involving shared values (MacNeil 1985). The implication of this is that if an award or other nonmonetary extrinsic reward for one relational task undermines the employee-employer relationship, then this, in turn, is likely to affect the performance of other relational tasks.

The introduction of a reward might change the implicit contract between employees and employer because it might affect perceptions of fairness and equity, which are critical for maintaining psychological contracts (Robinson and Rousseau 1994). In equity theory (Adams 1965), individuals compare the ratio of their rewards to their contributions with those of others, the comparisons tending to be unfavorable due to individuals overestimating their own contributions (Festinger 1954). Perceptions of inequity are known to both decrease effort and productivity as well as increase counterproductive behaviors such as cheating and dishonesty (e.g., Greenberg 1990; Gino and Pierce 2009; John et al. 2014; Edelman and Larkin 2014).

Introducing an award for a task which an internally-motivated employee previously considered part of the relational contract with the employer could engender feelings of unfairness. This occurs because employees who previously were not motivated to perform well on the task are able to gain peer recognition by changing their behavior and winning the award. Since internally-motivated employees had previously exhibited the now-awarded behavior without receiving any reward or special recognition, the implementation of an award program creates feelings of inequity in their minds by failing to recognize (reward) these prior contributions. Furthermore, the award introduction would reclassify high performance as

transactional rather than relational (Feldheim 1999) by introducing formal recognition for strong performance, causing internally-motivated employees to feel that their psychological contract with the employer had been violated.

Because an employee's relational contract with the employer is complex and governs all nontransactional noncompensated portions of her work (Rousseau and Parks 1993), the literature on breach of psychological contract focuses on reductions in aggregate measures such as loyalty, commitment, and overall job motivation (Cullinane and Dundon 2006). However, we hypothesize that a violation of a psychological contract by transactionalizing a task with an award will reduce an employee's nonreward motivation for nontransactional tasks governed by the relational contract. The impact of this breach on internal motivation—and thereby on task performance—will occur only for internally motivated employees who were highly motivated for the now-awarded task. This idea, which we term *negative motivational spillovers*, is formalized by the following hypothesis:

> Hypothesis 4: *Introducing an award for a task will cause employees who are internally motivated for that task to perform other tasks less well than they did in the pre-award period.*

Crucially, the negative motivational spillovers from an award introduction are not dependent on award ineligibility. According to our theory, the mere introduction of the reward will reduce motivation and performance on the non-awarded task for internally-motivated employees, even when an employee is eligible for the award on the awarded task. Empirically, of course, we must distinguish this reduced performance from the more standard multitasking argument; in the next section, we discuss how the two tasks in our study do not involve an effort tradeoff, which is the theoretical mechanism behind multitasking in economics.

We also note that Hypothesis 4 will hold for any nonawarded task for which the employee who is internally motivated for the awarded task also has some motivation outside the formal rewards system. The nonawarded task may be formally rewarded by the firm, but our hypothesis is contingent on the employee also having some nonreward motivation for it.

In contrast to negative motivational spillovers for internally-motivated employees, our theory does not predict negative spillovers for employees who are reward-motivated for the awarded task. This is because the relational contract between these employees and the firm is not violated by the introduction of a reward on a task for which they do not have pre-existing motivation.

3.2.4 Summary of Theory and Hypotheses

Figure 3.1 outlines the three dimensions by which our theory extends the existing literature on the impact of awards on employee motivation and performance: employee-task motivation, task, and eligibility. Notably, our theory incorporates existing empirical findings (Hypothesis 1a) and theoretical implications (Hypothesis 1b) on the direct effect of awards for reward-motivated employees. More novelly, it builds three new hypotheses on the indirect effect of corporate awards that combine multitasking theory from economics (Hypothesis 2), crowding out theory from the literature on motivation (Hypothesis 3), and equity theory from social psychology (Hypothesis 4).

3.3 Empirical Setting

Our setting is an industrial laundry cleaning company in the Midwestern United States, which we will refer to as *LaundryCo*. *LaundryCo* is a leading regional provider of work uniforms, professional work apparel, and commercial laundry cleaning services. Their services primarily include the selling, cleaning, and repairing of work uniforms and small workplace items such as

mats, towels, and mop heads. Nearly all of the cleaning services occur at five plants, which are similar in layout, machinery, staffing positions, and products.

The production process at *LaundryCo* is complex. Each day, route-service representatives drop off soiled uniforms, which go through a complex process with many interdependent tasks before they are returned to customers. The process involves sorting garments by type and soil level, washing with a specific temperature and chemical mix, drying and pressing, inspecting to ensure that garments with missing buttons or other problems are fixed, and sorting for the quick loading of clean garments to return to customers. Non-uniform items undergo a similar process, but extra steps are often involved, such as rolling laundered floor mats or folding and bundling hand towels. Workers are cross-trained on many tasks, but tend to specialize in a few, amongst which they alternate throughout each day. As with most labor-intensive service operations, *LaundryCo* is highly dependent on worker efficiency. Inefficiency results both from mistakes, such as incorrect sorting, and when the productivity of upstream workers lags, leaving downstream workers idle.

Each plant is supervised by two managers who focus on efficiency and worker productivity. These managers enjoy substantial autonomy in the policies they implement to increase efficiency. Each plant has about 35 employees. To facilitate the transfer of garments though each stage of the cleaning process, *LaundryCo* attempts to give each plant an open and uncluttered layout. One consequence of this layout is that employees can clearly observe each other's behavior. They can see, for example, who is late or absent, and they interact frequently as they switch between tasks. In addition to formal work interactions, *LaundryCo* also puts significant effort into building a "friendly" workplace through programs such as birthday recognition, company barbeques, fundraisers, and "alumni" reunions.

LaundryCo tracks individual productivity, measuring how many garments a worker processes for each task each day. The company then uses the task's time-studied rate, determined by corporate headquarters, to calculate the employee's productivity on that task. Scores are normalized such that a score of 100 reflects performance that meets expectations. For example, the time-studied rate for pressing dress shirts is 50.4 seconds, meaning an employee would have to press over 71 shirts in an hour to earn a score of 100. For each worker, the system computes overall daily productivity, equal to the weighted average (by time spent) of the worker's productivity scores on each task that day. For example, a worker who spent two hours pressing dress shirts with an efficiency score of 80, two hours rolling mats with a score of 140, and four hours sorting cleaned clothes with a score of 160 would have a final daily productivity of 135.

LaundryCo workers are paid using a piece-rate bonus system, with a guaranteed base hourly rate and hourly wage bonuses for daily productivity above the expected 100, up to a maximum bonus at 140. The bonus system differs slightly across plants, although the productivity cutoffs are the same across all plants. The study's treatment plant uses a linear increase in hourly pay as productivity increases from 100 to 140. The four other plants give employees discrete wage increases at 120 and 140. Interviews with management suggest that because workers do not know their precise productivity while working, the two compensation systems are similar in their incentive effects. Daily efficiency is normally distributed around a mean of 115, with high performers in the 130-150 range, and low performers between 80 and 100 (see Appendix 2).

Given the externalities generated by the plant's upstream-downstream nature, arriving consistently and on time is essential to operational efficiency. Tardiness and unexpected absence both contribute to inefficiency, since one section of the plant may be understaffed. Even if the

plant manager finds a substitute for that section, that substitute must abandon another task and will likely not be as efficient in the job as the missing worker, which can lead to downstream idling time. *LaundryCo* therefore has relatively detailed policies concerning tardiness and attendance. Repeated tardiness first precipitates a written warning from the plant manager. The third warning in a year results in suspension from work and the fourth results in termination. However, *LaundryCo* leaves the administration of this policy to individual plant managers, who are usually lenient towards slight or occasional tardiness. The difficulty and cost of finding and training replacement workers discourages managers from terminating such employees.

Attendance policies allow workers to take excused absences for sickness or vacation. To be counted as excused, an absence must be scheduled with the company. Sickness is considered excused if the employee notifies the manager even a few minutes before the start of the shift. Each employee is given a fixed number of paid time-off (PTO) days each year that can be used for any absence, excused or unexcused. Although the nature of the absence does not affect the use of PTO days, *LaundryCo* does track unexcused absences and plant managers may issue formal warnings and eventually terminate an employee with too many. Interviews with management revealed that employees often call in right before their shift to excuse an absence.

3.3.1 Attendance Award Program

In an effort to encourage fewer unexcused absences and less tardiness, the general and plant managers at one *LaundryCo* plant (hereafter referred to as "Plant 1" or "the treatment plant") implemented an award program that recognized the employees who had perfect attendance in a given month and awarded one of them, randomly selected, a $75 gift card to a local restaurant or store. Perfect attendance was defined as having no unexcused absences and no "tardies." An unexcused absence was defined as an absence of which the employee did not notify the plant

management in advance, while a "tardy" was defined as being more than five minutes late for a shift. The names of all award-eligible employees in a given month—those with perfect attendance according to the rules—were announced at a monthly plant-wide meeting early in the following month. The previous winner randomly selected the new winner by drawing a name out of a hat.

The plant manager announced the program in mid-February 2011 and it began on March 1. It lasted 10 months and was terminated by corporate headquarters, with the last award given for December 2011. In an average month 20 employees were eligible, meaning that the expected value of the award was less than $4, the equivalent of about 20 minutes of work. The expected monetary value of the award is therefore negligible.

In the course of our research, we carried out a series of interviews with *LaundryCo* managers about their experience with the attendance award program.[20] The managers at the treatment plant stated that they decided to introduce the award because certain employees' punctuality and attendance problems were affecting plant productivity and because they "hadn't really tried out awards as incentives too much." Crucially, the managers stated that they did not feel that their plant's punctuality, attendance, or performance problems differed from those of the other plants. Interviews with managers from other plants corroborate that the treatment plant did not differ on attendance and punctuality.

Managers of the treatment plant did not discuss their plan with the executive team at *LaundryCo* or with managers of other plants. They believed the award would be a cost-effective way to improve attendance and punctuality. The managers also believed that the close-knit plant culture and the fact that many employees had worked together for so many years would make the

[20] The appendix (Appendix 2) contains more details from our interviews and managers' interpretation of our study's results.

competition and the chance for any employee with perfect attendance to win motivational. In short, the managers felt that even if the plan failed, $75 in gift cards per month was a small investment and the maximum expected cost of the program (apart from the minimal managerial time needed to run the program).

Senior executives at *LaundryCo* informed us that, while they believe in the motivational benefits of incentives and awards, they do not believe that "employees should be rewarded for something they are supposed to be doing anyways [coming on time to work each day]." They therefore terminated the award program after hearing about it in a company human resource meeting in early December 2011. The treatment plant managers were disappointed when the award was shut down. While they understood top management's objections, they also felt that a large number of employees liked the program and that it had improved attendance and punctuality. They did state that while they had heard some "grumblings" from employees about the fairness of the award program, they hadn't considered the impact this might have on motivation or productivity, apart from better punctuality and attendance by employees with a checkered history and the potential downstream benefits on productivity.

3.4 Methods

3.4.1 Empirical Strategy

The introduction of the award at one plant and the existence of several similar plants without awards represent a type of quasi-experiment that is frequently used to estimate policy effects (Gertler et al. 2011). We use a difference-in-differences (DiD) design to assess the impact of the attendance award on the punctuality, attendance, and productivity of Plant 1's workers. The DiD design treats *LaundryCo*'s other four plants as a quasi-control group. The DiD strategy "differences out" fixed differences between Plant 1 and the control group plants and uses post-

treatment changes at the control group plants as a counterfactual for what would have happened at Plant 1 had it not introduced the award.

3.4.2. Data

We use a 21-month panel of daily worker-level data that spans two periods: the period before Plant 1 introduced the award, which we call the "pre-award" period (12 months), and the period when Plant 1 had the award program in place, which we call the "award period" (9 months). These data include punctuality and attendance measures, as well as measures of daily worker productivity for 218 workers in five plants between March 1st, 2010 and November 30th, 2011. The typical observation details an individual worker's daily record, including clock-in and clock-out times, information on items worked on, productivity ratings for each item, overall daily productivity output, whether the employee was absent or not, and demographic variables such as tenure, age, gender, and marital status.

Employees generally had set shift times, but these sometimes shifted slightly due to seasonal demand. We did not have access to *LaundryCo*'s employee schedules and therefore inferred a worker's shift from her observed clock-in and clock-out times and the list of actual shift times. We shared our coding with the plant manager at Plant 1, and he agreed that our manual coding was both appropriate and accurate for normal weekday shifts. Since our manual coding was less accurate on days when the worker arranged to come in late, switched shifts with other workers, or worked extra hours, we restricted our analysis to weekdays, dropped observations in which an employee worked less than 7.5 hours of an 8.5 hour shift, and dropped observations that indicated a worker was more than an hour early or late for a shift. This affected less than 1% of the weekday observations, and our results are qualitatively similar to including these observations.

3.4.3 Dependent Variables

We use five main dependent variables. The first three (*tardy, minutes late, absent)* are performance metrics that the plant managers hoped to improve through the attendance award program. *Tardy* is a dummy variable indicating that a given worker showed up more than five minutes late on a given day and is one metric for disqualification in the award program; the other disqualifying event is an unexcused absence. *Minutes late* is a continuous measure of the minutes and seconds late an employee showed up to work; it has a negative value if the employee clocked in early. *Absent* is a dummy variable indicating that the worker was absent from work for reasons other than public holidays, workers compensation days, suspensions, family medical leave, and funerals. However, we do not observe whether an absence was excused or unexcused. S*ingle absence* is a dummy variable similar to *absent,* but it only takes the value of 1 if an employee was absent on a given day but not absent the previous or following workday. The last dependent variable, *daily worker efficiency,* is the worker's productivity efficiency number for a given day. We winsorized this variable to two standard deviations from the mean because managers suggested that severe outliers were likely errors. Using the nonwinsorized data does not significantly change our results.

3.4.4 Validity of Difference-in-Differences Approach

DiD strategies do not require that treatment and control groups be the same, and are explicitly designed to allow comparison of treatment and control groups that are different in observable ways (Gertler et al. 2011). Any difference in the two groups that does not change contemporaneously with the treatment event does not affect the statistical estimates of treatment. In our case, however, the treatment and control plants are very similar on most dimensions. All five plants work on the same range of tasks, use the same production technology, and share a

common floor layout. Also, two of the control group plants are geographically proximate to Plant 1 (32 and 34 miles), and therefore help control for local shocks, such as weather, that might affect tardiness. All five plants had the same attendance policies and enforcement procedures.

The biggest difference between Plant 1 and the control group plants is that Plant 1 is unionized. This leads to some clear differences between the treatment and control groups, as seen in Table 3.1 (see Appendix 2 for employee-level statistics). Although employees in both groups are similar in age, those at Plant 1 have higher tenure and wages, and include more males. However, employees at Plant 1 had levels of tardiness and attendance similar to those of control plant employees. Also, there is no evidence of differential time trends in employee tenure, wages, or other key variables. Since DiD studies "difference out" fixed differences between treatment and control group units, only differences which change across time can bias the results (Gertler et al. 2011). In our case, the differences in the makeup of the treatment and control plants appear stable and therefore do not affect our statistical estimates.

3.4.5 Empirical Specification

We use a standard DiD specification to estimate the impact of the award on the dependent variables:

$$Y_{it} = \alpha_i + \beta_1 * TREAT\_GRP_i + \beta_2 * POSTTREAT_t + \beta_3 * TREAT\_GRP_i * POSTTREAT_t + \Upsilon_t + \varepsilon_{it}$$

where Y_{it} is the dependent variable, *TREAT_GRP* is a dummy variable equal to 1 if the worker is in the treatment group and 0 otherwise, *POSTTREAT* is a dummy variable equal to 1 for dates after the award program went into effect and 0 otherwise, and *TREAT_GRP*POSTTREAT* is the interaction of the two previous variables. The coefficient on this interaction (β_3) estimates the treatment effect; to conserve space, we simply label this variable as *treatment* in the results tables. Our specification takes advantage of the panel nature of the data by introducing a full set

of fixed effects, including worker fixed effects (α_i), which account for unobserved worker heterogeneity, and time fixed effects (Υ_t), which account for time trends across months, days in the month, and days of the week. In specifications with worker fixed effects, the variable *TREAT_GRP* is absorbed. Similarly, *POSTTREAT* is absorbed by the time fixed effects.

All the regressions reported in the chapter were estimated using ordinary least squares (OLS). Three of the five dependent variables are binary, but logit or probit models perform poorly when predicting rare events such as the ones in this study (King and Zeng 2001). In contrast, OLS specifications result in unbiased coefficient estimates (Stewart 2009) but incorrect standard errors. However, DiD models typically underestimate standard errors regardless of the specification (Bertrand et al. 2004), so we bootstrap standard errors for all regressions in the study. Therefore, OLS is appropriate for coefficient estimation for all five of our dependent variables. In contrast to other approaches, such as the rare events logistic model, OLS is also convenient in terms of time required to bootstrap and in ease of coefficient interpretation.

3.5 Results

3.5.1 Basic Treatment Effects

Table 3.2 shows the regression results of the average treatment effect for the five dependent variables that represent performance in the study. The award caused substantial improvement on two of the three performance metrics that the managers attempted to influence (*tardy*, *minutes late*, and *absent*). There was a 1.5-percentage-point reduction in tardiness at Plant 1, or a 45% reduction from the pre-award baseline of 3.3%. In addition, the average worker clocked in nearly a minute earlier, a reduction in minutes late of about 39% from the pre-award baseline of -2.03. We do not observe a statistically significant treatment effect on absences, although the use of *single absences* increased by nearly 40% from a baseline of 1.5%, a result we discuss later.

Finally, the award did not lead to overall changes in laundry task efficiency.

DiD models are known to produce false positives due to serial correlation issues (Bertrand et al. 2004). Random assignment of treatment groups and dates can lead to significant effects some 45% of the time. While bootstrapping standard errors helps alleviate this problem, we present placebo tests on our main results in the appendix (Figure A2.3 and Table A2.1) that demonstrate our results are unlikely to be spurious.

Two other typical confounds in DiD models are that an unobserved contemporaneous change led to the identified effects and that the results stem from simple mean reversion. Although it is impossible in field studies to definitively disprove these confounds, plotting the effect over time can help alleviate the concern (Gertler et al. 2011). If the identified effect happens exactly upon treatment, then it is less likely that the effect is due to an unobserved change or to mean reversion. Figure 3.2 shows treatment effects from a regression using individual treatment-month dummies. As seen in the figure, the treatment effect is largest and most statistically significant in the month just after the award is introduced. Figure 3.2 therefore lends evidence to the argument that the award introduction causally leads to the identified effects. In fact, Figure 3.2 also suggests that the effect of the award may dampen over time, a finding we discuss in the final section of the chapter.

3.5.2 Heterogeneous Employee Response: The Direct Effect of Awards

While the award program appears to have led to at least some of the behavior desired by the managers who implemented it, our hypotheses all involve heterogeneous responses by employees based on their motivation towards attendance and punctuality. To examine worker heterogeneity in pre-existing motivation for the awarded task, for both treatment and control plants we split workers into groups based on their propensity for tardiness before the award was

put in place. Nearly 32% of workers had no tardies during the twelve-month period before the award was implemented, while nearly 20% of workers were tardy once a month or more. Between these extremes, just over 10% of workers were tardy once every six months or less, 12% of workers were tardy once every four to six months, and 26% of workers were tardy every month to three months.

In the results shown below, we split the sample into "low tardy" and "high tardy" groups at the median level of pre-award tardiness, or one tardy every four months. This yields 116 workers in the "low tardy" group, and 102 in the "high tardy" group. The "low tardy" group corresponds to the internally motivated employee group in our framework, since they exhibited high performance on punctuality without any formal reward for this task. The "high tardy" group corresponds to the reward-motivated group in our theory, and exhibited frequent tardiness in the pre-award period. We note that some of the "high tardy" group workers may also demonstrate some internal motivation towards attendance. We also repeated our models using alternative group definitions. The results are robust to any definition of "low tardy" up to one tardy every four months, including only using employees with no pre-award tardies in the "low tardy" group. Our results are also robust to splitting the sample into "no tardy," "low tardy," and "high tardy" workers.

There are two common methods for comparing heterogeneous treatment effects that are equivalent when implemented properly (Fink et al. 2012): interaction effects and subsample analysis. Because the treatment effect in DiD models is already an interaction term, we report subsample analyses to avoid difficulty in interpretation from triple interactions (Gelman and Pardoe 2007). It is important to note that these subsample analyses, like all the statistical tests in this chapter, are done relative to the relevant control group of employees. A subsample analysis

focusing on, for example, the effect of the award on employees with perfect attendance before the award program compares the behavior of employees with perfect pre-award attendance at the treatment plant with employees with perfect pre-award attendance at control group plants.

The effect of the award on *tardy* and *minutes late* is shown in Table 3.3. The "high tardy" group decreases its rate of *tardiness* by 2 percentage points, or about 36% from a baseline of 5.6%, although they do not decrease *minutes late* significantly. This is initial evidence for Hypothesis 1b – that reward-motivated employees game the award eligibility rules by clocking in no later than five minutes late, rather than by truly improving punctuality on the average day. This effect can be seen more clearly in Figure 3.3, which shows the percentage change for "high tardy" workers in the treatment and control plants for employees clocking in at various intervals on the *minutes late* scale. In the treatment plant there was a large reduction in employees clocking in seven or more minutes late, but nearly all of the change goes into the mass of employees clocking in between four and five minutes late. Employees in the treatment plant are over 50% more likely to clock-in just before this five minute cutoff compared to the control group after award introduction. There are no other improvements in *minutes late* when comparing to the control group, except for this shift.

Table 3.4, which shows the treatment effect on the *absence* and *single absence* variables, contains further evidence on gaming of the award system. The positive and significant results on *single absence* for "high tardy" employees suggests they were significantly more likely to take a single day off in a given week. Our interviews suggest this result was caused by "high tardy" employees calling in sick on days they otherwise would have arrived late. It is inconceivable that the award caused employees to become sick more often, but is consistent with our hypotheses that the award would cause an employee to call in sick in order to maintain award eligibility. By

strategically taking a sick day, these employees were able to maintain eligibility for the award.

It is telling, and consistent with our theory, that we find corresponding evidence of manipulation by the "low tardy" workers, as our theory suggests they might also experience increases in reward motivation. While the overall performance for the "low tardy" group on *tardy* and *minutes late* did not change, the award appears to have caused previously internally-motivated employees to view perfect attendance through a reward-oriented lens, since they apparently began gaming the eligibility system in ways similar to reward-motivated employees.

Overall, the subsample analysis strongly supports our theory on the direct effect of awards. Hypothesis 1a, which states that employees not motivated prior to the award will perform better on the awarded task, is directly supported by the large reduction in *tardiness.* Hypothesis 1b, which states that some of the better performance will come via rule manipulation, is supported by the lack of an effect on *minutes late*, and the results on *single absences*. Our results therefore corroborate the existing literature as to the direct effect of awards, and suggest that awards cause both positive improvements and gaming behavior.

3.5.3 Motivation Reversion after Loss of Eligibility

The above results suggest a conscious response to the award by reward-motivated employees—those with low performance on the awarded task before the award program began. Hypothesis 2 predicted that the loss of eligibility for the award would cause reward-motivated employees to revert to their previous poor performance. We test this hypothesis by splitting the *treatment* dummy variable into two separate dummy variables. A *pre-fail* dummy indicates that, as of the start of the day in question, an employee has not yet had a disqualifying event in the month in question. A *post-fail* dummy indicates that, as of the start of the day in question, the employee has already been disqualified for the current month's award due to a tardy or an unplanned

absence. For each treatment day, one or the other of these variables equals 1.

The results for the *tardy* dependent variable are shown in Table 3.5. The "high tardy" group reduces its level of tardiness while eligible for the award (as shown by the negative and significant coefficient on the *pre-fail* dummy). However, their degree of tardiness is no different than it was in the pre-award period once they are no longer eligible for the award in a given month (as shown by the insignificant coefficients on the *post-fail* dummy). Similarly, Table A2.3 in the appendix shows that the average employee arrives nearly a minute earlier while still eligible for the award, but after she loses eligibility, her *minutes late* is not different from pre-award levels. Hypothesis 2b, stating that the behavior of reward-motivated employees will revert to pre-award behavior once they lose eligibility for the award, is supported.

3.5.4 Crowding Out Internal Motivation

Table 3.5 also has direct evidence for Hypothesis 3, which states that nonreward motivation for the awarded task will be crowded out for the subgroup of employees with high pre-award task motivation. This can be seen in the positive and significant coefficient on the *post-fail* dummy for the "low tardy" group. Once a "low tardy" employee has become disqualified for the award in a given month, she is 5.5 times more likely than "low tardy" employees in the control group to have a second failure in attendance or punctuality. The award caused employees who had previously had good punctuality to have significantly worse punctuality once the extrinsic reward was removed, which clearly suggests crowding out. Again, the lack of an effect in the pre-fail period is also consistent with our theory, which argues that the presence of the extrinsic reward leads to an ambiguous overall effect on an internally motivated employee's performance as long as she is still eligible for the award.

3.5.5 Negative Motivational Spillovers on Nonawarded Tasks

We next examine the effect of the award on employee performance on a separate task domain. *LaundryCo* employees are assigned one or more laundry tasks over a workday. Since the efficiency measure is based on actual working hours, their performance on the laundry task is not affected by their punctuality or attendance. This is because making a greater or lesser effort to be punctual does not make their assigned laundry tasks easier or more difficult. This is especially true because punctuality on a given day generally does not affect take-home pay, because employees clocking in seven or less minutes late are paid as if they started on time. In only 1.8% of observations do employees clock in eight or more minutes late. Our results are not affected by using only the 98.2% of observations in which an employee is no more than seven minutes late. Therefore, any change in laundry task performance is not resulting from effort towards punctuality.

We first analyze the direct effect of the award on employees' productivity on their assigned laundry tasks. The results are shown in columns 1 and 2 of Table 3.6. As predicted by Hypothesis 4, internally motivated "low tardy" employees suffer a drop in productivity of over 9 points, a reduction of over 8%. The productivity of "high tardy" employees does not change due to the award, which is consistent with our supposition that reward-motivated employees would not feel that the award violated their psychological contract. Columns 3 and 4 of Table 3.7 show the same results broken down by award eligibility. As predicted, the productivity reduction appears larger while the "low tardy" employee is still eligible for the award; the result on the *post-fail* dummy is also positive, but with a p-value of only 0.17, likely because there are few employee-days for the "low tardy" group in the *post-fail* cell. The coefficients for the *pre-* and *-post-fail* dummies are nearly identical. Consistent with our theory, the reduced laundry task productivity from the award occurs immediately and is not due to loss of eligibility for the

award.

3.6 Discussion and Conclusion

This study builds a more sophisticated and realistic theory of the effect of corporate awards on employee motivation and subsequent performance. We hypothesized that the almost universally positive nature of the empirical literature on awards is due to its focus on a single case—employees who had previously lacked the motivation for high performance. By integrating theory from economics and social psychology—most notably the theories of multitasking, motivational crowding out, and psychological contracts between employers and employees—we hypothesized that the introduction of a corporate award would have heterogeneous effects on employee-task pairs, depending on an employee's pre-award level of motivation towards the awarded task.

Our empirical results are corroboratory of both existing studies and the extensions presented in our theory. Indeed, at face value, the award used in the study was effective at motivating the average employee on the awarded task, in that it reduced average tardiness and encouraged workers to show up earlier for their shifts. This direct result of the award is highly consistent with the existing awards literature. However, these gains were driven entirely by the subset of reward-motivated workers who lack the internal motivation for consistent attendance and punctuality. Furthermore, these employees appear to have improved at least partially by manipulating the rules of the award system. Finally, the performance improvement of reward-based employees disappears once an employee becomes ineligible for the award in a given month.

More worryingly, we find strong evidence of crowding out of motivation among internally-motivated employees. This was most clearly seen in the fact that employees who had

previously had perfect attendance became over five times more likely than their comparison group at other plants to have a second attendance problem after losing eligibility for the award. Most strikingly, we find evidence of *negative motivational spillovers* that affect performance on a completely separate task. The mechanisms underlying this result may appear to be subtle, but as we document below, the significant productivity decrease by the plant's previously punctual employees was by far the statistical effect with the largest economic consequence in the study. This finding of negative motivational spillovers is remarkable because it suggests that awards for one type of behavior might crowd out internally motivated behavior not only on the awarded task, but also on other tasks.

Our findings complement Neckermann et al.'s (2014) study, which shows positive spillovers after the introduction of a series of corporate awards. A comparison of the two studies may help explain why their results differ and why more nuanced theory on corporate awards is needed. The awards reported in Neckermann et al. (2014) were given for positive behavior identified by managers, with the criteria announced to workers only after the award was given. Thus, reward-motivated employees could not change their behavior in order to win. Also, the positive spillovers documented in that study may simply have been employees inferring what behaviors managers would choose to reward next. In our study, however, the criteria for winning were known in advance. As noted by Larkin (2010) and Garr (2012), both types of awards—those that recognize ex-post behavior on categories not known to employees and those that are governed by established ex-ante rules—are widely used.

Our results suggest that the award had a significant negative impact on net plant productivity. Aggregating the coefficient estimates allows a high-level estimation of the total effect on plant efficiency of introducing the award. Depending on the exact assumptions used,

the award introduction reduced overall plant efficiency by 1.4 to 3.1%. The small increase in the number of minutes worked raised overall productivity by 0.12%, but the various sources of productivity losses reduced productivity by 1.4 to 2.5%, depending on whether results with only marginal significance are included. In addition, the increased use of single absences reduced overall efficiency by another 0.6%, although we note that these absences may simply substitute away a future PTO day for the worker. Even if this is the case, however, interviews suggested that any absence given with short notice is costly. A reduction in overall plant efficiency of 1.0% is approximately equivalent to the loss of one-third of a worker, so the magnitude of the effect is quite large.

The plant managers anticipated that the award's direct cost of $75 per month would easily "pay for itself" as better attendance would mean fewer bottlenecks and thus higher productivity. At worst, if there were no improvement the cost would be a mere $75 a month, the cost of the gift card. However, our results suggest the monthly cost of the award program was at least $1,497, which is equal to 1.4% of the plant's total monthly labor cost (wages, retirement, insurance and payroll taxes), plus the $75 gift cards. The award was therefore approximately 20 times more costly than anticipated by Plant 1's managers. Using the higher end of our estimates, the total monthly cost of award introduction was $3,302. These results clearly indicate that awards can be far more costly than anticipated and can significantly and negatively impact overall firm performance.

3.6.1 Limitations

Like many studies of this type, ours has several limitations. First, worker assignment to treatment and control groups was not random and there were differences between the two groups, such as the non-union status of the four control plants. These fixed differences, along with any other pre-

existing differences between groups, are "differenced out" by the DiD methodology. However, this approach does assume common time trends across groups. We interviewed managers at the treatment and control plants and, apart from an annual health screening offered to control plant employees in April 2011,[21] managers reported no policy or management changes near the introduction of the award. We also note that the monthly treatment effect model (Figure 3.2) indicates that the largest effects occurred in the month after treatment. This suggests that neither the health intervention nor any other unobserved change not exactly correlated with treatment could explain our results.

It could also be that our results are simply due to poor planning or program administration and not a problem with the program itself. But our interviews suggest that the plant managers carefully considered and administered the program, and our interviews with corporate management reflected their high confidence in the competence of the Plant 1 managers. Even more informative is that the positive direct effects of the program were seen immediately upon implementation, suggesting that the program was working as the plant managers intended. Still, in studies like ours, it is impossible to completely separate the effect of the program design, which has large external validity, from the effect of the management or implementation.

Furthermore, we cannot definitively prove the mechanism by which the attendance award negatively affected some workers' productivity. The explanation that the award crowded out intrinsic motivation is theoretically appealing, especially given the strong laboratory evidence on crowding out. However, as in most field studies, this interpretation is speculative, since we cannot directly measure intrinsic motivation and do not know the mechanism that led some workers to perfect attendance and punctuality even when neither was required or compensated.

[21] See Gubler and Pierce (2014).

There are several alternative explanations besides intrinsic motivation, such as individual differences in responsiveness to social pressure or individual prosocial tendencies. Our results do show, however, that whatever the motivational mechanism was, the award reduced it for some employees.

Finally, our results consider a single type of award program while in practice, award programs vary widely across and even within organizations. They differ, for example, in whether or not employees know in advance which behaviors will help them win the award. The attendance award in our setting randomly rewarded only one of the many employees who qualified each month. Many awards are restricted to a limited number of employees, such as "Employee of the Month" or "circle of excellence," which recognizes the top 10% of employees—common for salespeople (Larkin 2010). Other awards are given to anyone who meets the criteria. As with monetary incentives, there are many ways in which award programs can vary, as can their costs and benefits. We therefore suggest caution in applying the study's empirical results to all types of award.

3.6.2 Theoretical Implications

Economists have only recently started to consider the psychological effects of incentive programs. On the other hand, social psychologists have traditionally been focused on the response of individual employees to different incentive programs, rather than on questions of firm-level effects or optimal incentive design (Nickerson and Zenger 2008; Larkin et al. 2012). This study provides further evidence that scholars need to incorporate the strengths of both approaches: the holistic, cost-benefit lens of economics and the realistic social psychology model of human behavior, incorporating biases and emotions.

Given the heterogeneity in the types of awards used in corporations, we hope one

contribution of our theory is to allow scholars and practitioners to design award programs more systematically. We believe that many corporate award programs are not designed to account for heterogeneity in employee motivation or for an employee's multiple daily tasks. Nor do they account for the possibility that formal recognition of improved performance on a given task may seem unfair to employees who don't need to improve that much because they were motivated all along to perform well. Our theory suggests that using awards to improve behavior should likely be limited to cases in which most employees lack internal motivation for the task in question; obviously, this conjecture requires further empirical validation.

Although our study does not directly show crowding out (Deci 1975; Deci and Ryan 1985), it does suggest that employees who previously behaved in ways that were not explicitly rewarded or compensated—namely, showing up early for their shift—cut back on this behavior due to the introduction of the reward. The notion of crowding out is usually applied to monetary rewards (e.g., Gneezy and Rustichini 2000b), with recent work suggesting that nonmonetary rewards do not, for example, reduce prosocial blood donations (Goette and Stutzer 2008; Lacetera et al. 2012). In contrast, our results suggest that crowding out may also apply to extrinsic but nonmonetary rewards such as corporate awards. In addition, crowding out is usually focused on reduction in motivation for actions that are compensated. Our results suggest that compensating one action can also lead to crowding out in a completely different realm, the first evidence of such negative motivational spillovers of which we are aware. Existing research further suggests that the long-term costs from demotivation, particularly following program termination, may be even greater than what this study's time-range of data can show (Gneezy and Rustichini 2000a; Meier 2007).

Our results also suggest that the direct effect of an award is more like a monetary

incentive than a subtle nudge toward positive behavior. While social psychologists and behavioral economists have long been interested in small interventions that can imperceptibly alter behavior, the fact that awards usually do not carry great monetary value does not mean they are only a subtle influence on worker behavior. A job award is, after all, a formal program designed by a manager and not simply a small difference in framing.

Finally, our study suggests that the antecedents of negative motivational spillovers require further research. Awards are commonly used for tasks deemed less important than the workers' primary tasks, which are more often rewarded with monetary compensation (Garr 2012). In our setting, the less-important awarded task was attendance and the more-important compensated task was productivity. Even if the two tasks are not linked in terms of employee effort, our theory and empirical results suggest that a reward introduced for a less important task may spill over to the more important task. It is important that future work unpack the mechanisms underlying negative motivational spillovers because, as our study demonstrates, the economic costs in the form of individual and organizational performance can be substantial.

3.7 References

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3.8 Figures and Tables

Table 3.1: Descriptive Statistics at Worker/Day Level

TREATMENT	*Pre-Award*					*Award Period*				
Variable	Obs	Mean	Sd	Min	Max	Obs	Mean	Sd	Min	Max
Tardy	7126	0.04	0.20	0.0	1.0	5742	0.03	0.16	0.0	1.0
Minutes late	7126	-1.73	5.37	-59.7	54.0	5737	-2.19	5.10	-49.0	58.2
Total absences	7846	0.04	0.19	0.0	1.0	6318	0.05	0.21	0.0	1.0
Single absences	7846	0.01	0.07	0.0	1.0	6318	0.01	0.11	0.0	1.0
Daily efficiency	6576	125.6	32.4	54.5	218.0	5669	124.7	36.2	54.5	218.0
Late	7126	0.15	0.35	0.0	1.0	5742	0.10	0.29	0.0	1.0
Monthly absences	7861	0.79	1.65	0.0	8.0	6339	1.03	1.80	0.0	10.0
Total hrs worked	7861	8.25	1.64	0.0	23.7	6339	8.17	1.69	0.0	13.1
Tenure	7861	3373	2681	176	9262	6339	3186	2708	176	9262
Age	7861	43.51	10.05	21.0	62.0	6339	43.63	9.84	21.0	62.0
Male	7861	0.43	0.50	0.0	1.0	6339	0.43	0.49	0.0	1.0
Base salary	7861	25695	845	19240	28600	6339	25495	1363	19240	28600

CONTROL	*Pre-Award*					*Award Period*				
Variable	Obs	Mean	Sd	Min	Max	Obs	Mean	Sd	Min	Max
Tardy	23600	0.03	0.17	0.0	1.0	14081	0.02	0.15	0.0	1.0
Minutes late	23600	-2.12	4.73	-59.4	59	14081	-1.88	5.07	-59	59
Total absences	27449	0.05	0.22	0.0	1.0	16300	0.05	0.22	0.0	1.0
Single absences	27449	0.02	0.13	0.0	1.0	16300	0.02	0.12	0.0	1.0
Daily efficiency	22320	120.3	34.7	54.5	218.0	14148	125.3	35.6	54.5	218.0
Late	23600	0.17	0.38	0.0	1.0	14081	0.14	0.34	0.0	1.0
Monthly absences	27684	1.06	1.76	0.0	15.0	16474	1.13	1.78	0.0	12.0
Total hrs worked	27684	8.01	1.38	0.0	44.0	16474	8.09	1.25	0.0	16.37
Tenure	27684	1720	1920	4	8566	16474	1754	1992	60	8566
Age	27684	39.36	12.88	18.0	69.0	16474	39.87	12.79	19.0	69.0
Male	27684	0.34	0.47	0.0	1.0	16474	0.32	0.47	0.0	1.0
Base salary	27522	19850	4899	8320	48526	16474	197334	5167	8320	48526

Table 3.2: Basic Treatment Effect

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	Tardy	Minutes Late	Absent	Single Absence	Efficiency
Treatment	-0.015***	-0.801**	0.007	0.006***	-1.992
	(0.006)	(0.343)	(0.006)	(0.002)	(3.193)
Constant	0.020***	-2.057***	0.051***	0.023***	117.353***
	(0.006)	(0.214)	(0.009)	(0.005)	(9.036)
Time Controls	Y	Y	Y	Y	Y
Worker FE	Y	Y	Y	Y	Y
R^2	0.004	0.006	0.004	0.003	0.008
# of employees	218	218	218	218	206
Observations	50,549	50,544	57,913	57,913	48,713

Note: Standard errors presented in parentheses are block bootstrapped with 400 repetitions. Significance levels: * p<0.10, ** p<0.05, *** p<0.01. The variable "Treatment" is the interaction of the treatment group and post award introduction dummies, and represents the estimated effect of the introduction of the award. The post award introduction dummy is coded as missing for observations after the award was removed.

Table 3.3: Sub-sample Analysis on "Tardy" and "Minutes Late"

	(1)	(2)	(3)	(4)
Dependent Variable:	Tardy	Tardy	Minutes Late	Minutes Late
Sample:	Low Tardy	High Tardy	Low Tardy	High Tardy
Treatment	0.001	-0.020***	-1.144	-0.319
	(0.004)	(0.008)	(0.730)	(0.341)
Constant	0.002	0.035***	-2.872***	-1.348***
	(0.004)	(0.010)	(0.301)	(0.261)
Time controls	Y	Y	Y	Y
Worker FE	Y	Y	Y	Y
R^2	0.004	0.007	0.015	0.007
# of employees	116	102	116	102
Observations	23,502	27,047	23,502	27,042

Note: Standard errors presented in parentheses are block bootstrapped with 400 repetitions. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 3.4: Sub-sample Analysis on "Absence" and "Single Absence"

	(1)	(2)	(3)	(4)
Dependent Variable:	Absence	Absence	Single Absence	Single Absence
Sample:	Low Tardy	High Tardy	Low Tardy	High Tardy
Treatment	0.021***	0.000	0.006**	0.006**
	(0.008)	(0.008)	(0.003)	(0.002)
Constant	0.050***	0.051***	0.026***	0.020***
	(0.013)	(0.012)	(0.007)	(0.006)
Time controls	Y	Y	Y	Y
Worker FE	Y	Y	Y	Y
R^2	0.007	0.005	0.004	0.004
# of employees	116	102	116	102
Observations	27,114	30,799	27,114	30,799

Note: Standard errors presented in parentheses are block bootstrapped with 400 repetitions. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table 3.5: Effect of Losing Award Eligibility on Tardiness

	(1)	(2)	(3)
Dependent Variable:	Tardy	Tardy	Tardy
Sample:	ALL	Low Tardy	High Tardy
Pre-fail treatment	-0.017***	-0.002	-0.021**
	(0.006)	(0.003)	(0.009)
Post-fail treatment	-0.010	0.045**	-0.016
	(0.009)	(0.021)	(0.010)
Constant	0.020***	0.002	0.035***
	(0.006)	(0.004)	(0.010)
Time controls	Y	Y	Y
Worker FE	Y	Y	Y
R^2	0.004	0.005	0.007
# of employees	218	116	102
Observations	50,549	23,502	27,047

Note: Standard errors presented in parentheses are block bootstrapped with 400 repetitions. Significance: * p<0.10, ** p<0.05, *** p<0.01.

Table 3.6: Treatment Effects on Efficiency by Employee Type

Dependent Variable:	(1) Efficiency	(2) Efficiency	(3) Efficiency	(4) Efficiency
Sample:	Low Tardy	High Tardy	Low Tardy	High Tardy
Treatment	-9.551***	2.052		
	(3.273)	(4.415)		
Pre-fail treatment			-9.815***	2.018
			(3.431)	(4.535)
Post-fail treatment			-9.327	3.152
			(6.735)	(4.011)
Constant	97.725***	125.307***	118.871***	127.393***
	(22.685)	(8.822)	(3.016)	(3.388)
Time controls	Y	Y	Y	Y
Worker FE	Y	Y	Y	Y
R^2	0.014	0.017	0.014	0.016
# of employees	109	97	109	97
Observations	22,450	26,263	21,303	24,822

Note: Standard errors presented in parentheses are block bootstrapped with 400 repetitions. Significance: * p<0.10, ** p<0.05, *** p<0.01

Figure 3.1: Study Taxonomy and Summary of Hypotheses

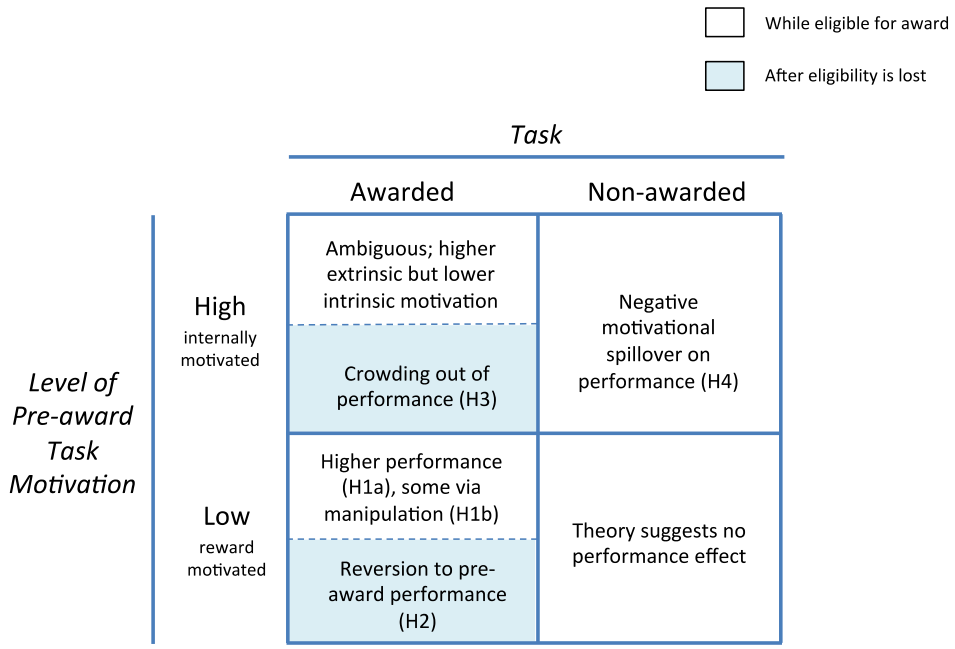


Figure 3.2: Monthly Treatment Effect on Minutes Late

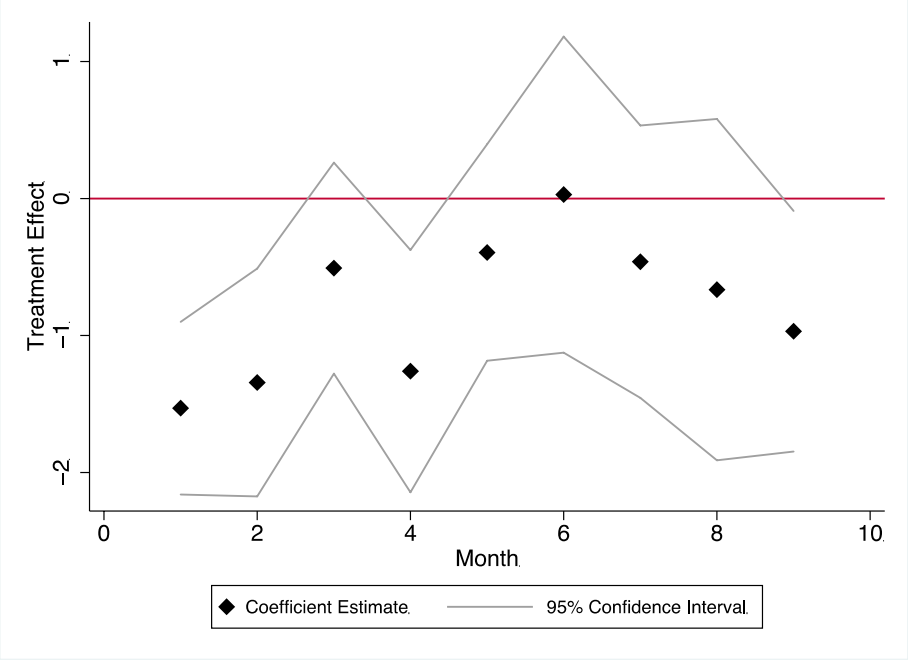
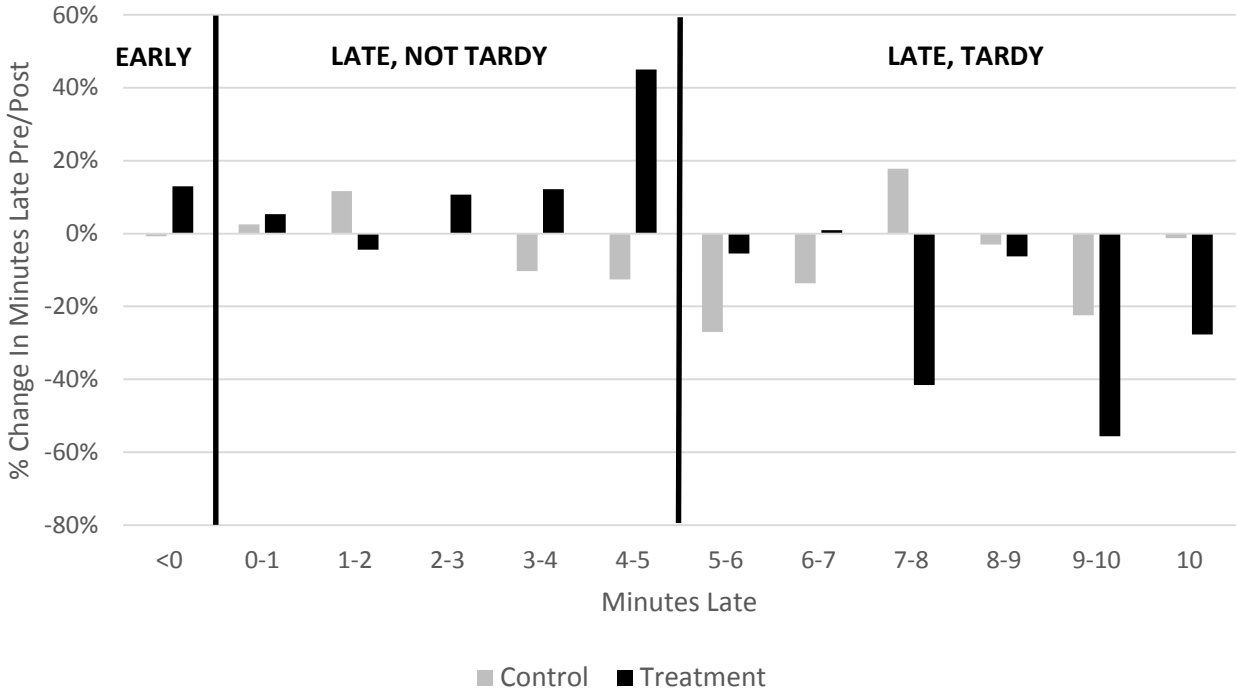


Figure 3.3: Change in Minutes Late After Award Implementation for "High Tardy" Group



Note: Percentage changes represent changes from the initial baseline clock-in frequency for each minute interval.

CONCLUSION

This dissertation has investigated the role of social structure and financial incentives in individual productivity and organizational performance. Drawing on unique data from two distinct service settings, it has explored how heterogeneity in social factors and motivations at the individual level influence individual productivity, choices, opportunities, and behaviors. Moreover, it has investigated how such effects scale up to influence organizational-level outcomes. The key takeaway from the three chapters is that social structures and factors, which vary at the individual-level, combine with financial concerns to significantly influence individual and organizational outcomes. Moreover, when properly managed, such factors can be leveraged to improve performance and generate advantages for firms.

The results of these chapters have important theoretical implications. First, they suggest the need for future work that explores micro-macro links in strategy. The key assumption underlying the microfoundations view is that individuals are heterogeneous. Thus, firm heterogeneity in performance outcomes is impacted by individual mobility, productivity, and value appropriation, and some firms may generate advantages relative to rivals because of their unique ability to attract, motivate, and retain key individuals. The results from these chapters support this view, and suggest that further work that investigates the interplay between individuals and firms is needed. Second, the results from this dissertation suggest a more nuanced view of social structure. In particular, these studies suggest that individual choice, as well as elements of the context, are important to understanding the impact of social structures on individuals and organizations. Finally, the results of this dissertation provide support for Simon's argument that we need a more comprehensive "model of man" (Simon 1957). Such a model must

include the response of individuals to social factors and financial incentives, as well as their interplay. Moreover, it must continue to explore how elements of the context or organization influence individual choice. Such an avenue moves beyond the current literatures in human capital or human resources, and provides a fruitful area for additional research.

The results of this dissertation similarly have important managerial implications. First, they suggest that individual heterogeneity in social structures and motivations are important to firm outcomes. This is a previously understudied yet important aspect of human capital. Firms can potentially improve employee and firm performance by understanding how to best manage this heterogeneity. Second, these results imply that hiring and staffing policies are critical to organizational outcomes. Moreover, understanding the complementarity between individuals and organizations is key to effectively creating and sustaining advantages from labor. Finally, these results suggest that it is critical for managers to craft policies that leverage social factors to improve performance of employees and the firm. Moreover, it is important for managers to take social and psychological factors into account when devising such policies.

There is much potential to build upon and extend this work. In each chapter I have concluded with thoughts for related future work. To conclude this dissertation, however, I provide some overarching thoughts about potential future directions. First, this dissertation suggests there is significant potential in investigating heterogeneity between organizations in their ability to leverage social factors to improve performance and generate sustainable advantages compared to competitors. This includes exploring how social structures can be leveraged strategically over time, as organizations are founded, grow, and compete with rivals. Second, I believe future research should continue to investigate the impact of micro-level factors on macro-level outcomes. While a significant amount of work has focused on the firm or

industry levels, significantly less work has explored the link between individual and organizational-level factors. Yet, as evidenced by these chapters, such factors can be critical to understanding organizational performance and success. Finally, I believe there is much potential in focusing on how strategy theories and findings apply to service industries, whose chief productive resource is labor. While such industries comprise a large percent of the US economy, surprisingly much of the research in strategic management has shied away from these industries. Future theoretical and empirical work should continue to investigate how service settings differ from more traditional strategy settings. Such an approach necessitates embracing individuals—their productivity, skills, motivations, abilities, and potential for mobility—as key resources of organizations.

INTRODUCTION AND CONCLUSION REFERENCES

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APPENDIX 1: Appendix to Chapter 1

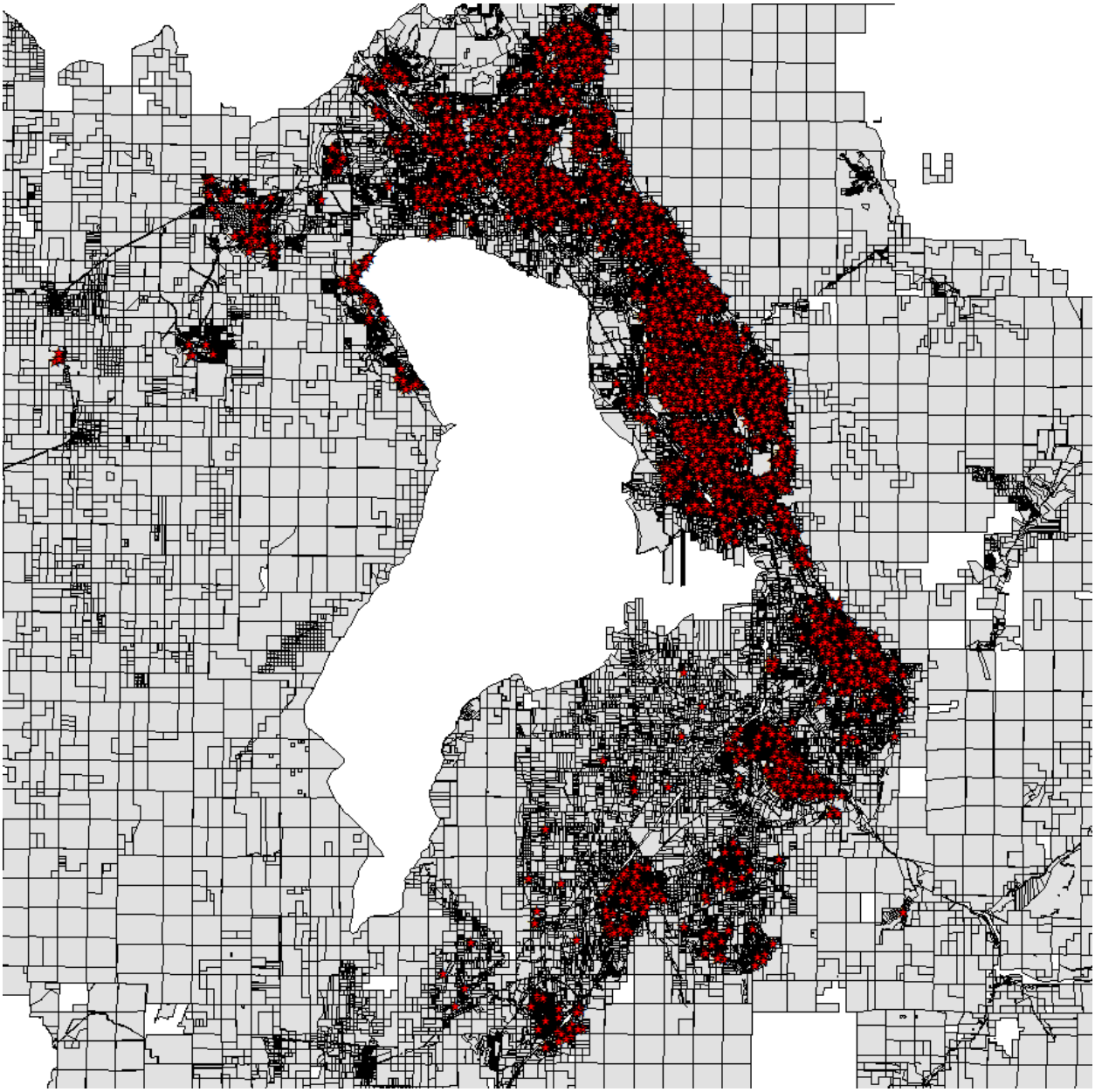
Table A1.1: House Description and Quality Indicator Dummies from Public Remarks

Quality Indicators	Mean	Std. Dev.	Quality Indicators	Mean	Std. Dev.
TLC	0.01	0.09	Custom	0.06	0.24
Needs Updating	0.002	0.04	Unique	0.01	0.08
Estate Sale	0.002	0.04	Maple	0.02	0.14
Foreclosure	0.002	0.05	Newer	0.06	0.23
Handyman	0.001	0.03	Hurry/Will Not Last	0.03	0.17
As-Is	0.01	0.11	Pride	0.002	0.05
Rehabber	0.0002	0.01	Clean	0.07	0.25
Bank-Owned	0.01	0.08	Quiet	0.08	0.27
Priced to Sell	0.02	0.14	Dream	0.01	0.09
Motivated	0.02	0.14	Block	0.02	0.13
Potential	0.01	0.12	Huge	0.09	0.28
Close	0.19	0.39	Deck	0.06	0.24
!	0.40	0.49	Mint	0.002	0.04
New	0.33	0.47	Hardwood	0.07	0.26
Spacious	0.07	0.25	Views	0.10	0.30
Elegance	0.01	0.08	New Roof/New Shingles	0.02	0.13
Beautiful	0.19	0.39	Upgraded/Updated	0.09	0.29
Remodeled/Renovated	0.05	0.22	Vaulted	0.11	0.31
Historic/Vintage	0.003	0.06	Floor plan	0.09	0.28
Maintained/Well-Cared	0.03	0.17	Award	0.001	0.04
Wonderful	0.05	0.22	Hot Tub	0.02	0.14
Fantastic	0.03	0.17	Tile	0.12	0.33
Charming	0.01	0.12	Cul-de-sac	0.05	0.21
Stunning	0.01	0.10	Jetted Tub	0.05	0.22
Amazing	0.02	0.15	Park	0.14	0.35
Granite	0.06	0.24	Brick	0.05	0.21
Immaculate	0.04	0.19	Value	0.03	0.16
Breathtaking	0.01	0.05	Windows	0.05	0.22
Neighborhood	0.14	0.34	Mother-in-law	0.02	0.15
Spectacular	0.01	0.10	Stainless	0.02	0.15
Landscaped	0.09	0.29	Theater	0.01	0.12
Stained Glass/Art Glass	0.001	0.02	Surround Sound	0.01	0.10
Built-in	0.03	0.17	Pickiest	0.01	0.07
Tasteful	0.003	0.05	Rare	0.01	0.08
Must See	0.07	0.26	Starter	0.04	0.20
Fabulous	0.01	0.12	Master	0.15	0.36
Leaded	0.001	0.04	Cute	0.02	0.16
Delightful	0.001	0.04	Warranty	0.03	0.16
Move-In	0.03	0.17	Temple	0.01	0.07
Gourmet	0.01	0.08	Fenced	0.10	0.30
Corian	0.01	0.07			

Note: These house characteristic and quality dummies take the value of 1 if they (or their common derivatives) are referenced in the public comments section of the listing, 0 otherwise.

Figure A1.1: Flow Chart of a Typical Real Estate Transaction for Listing Agents

Figure A1.2: Map of Utah County with Listing Agent Home Addresses



Note: This map of Utah County shows the approximate locations of home addresses for real estate agents living in Utah County that listed a home during my sample period. The red stars represent a single agent's home.

APPENDIX 2: Appendix to Chapter 3

Site interviews on empirical results

After analyzing the productivity and attendance data, we presented our results to the executive team at *Laundry Co* and to the managers of Plant 1. They found many of our results unsurprising, including the improvement in punctuality and attendance from the award program. They were not surprised at the use of single absences to retain eligibility. They told us they had suspicions that employees might be using absences strategically, as they seemed to notice many calls right before shift start times from employees during the period of the award. Neither were they surprised that it was primarily the workers with previous punctuality problems who drove the improvements in punctuality and attendance; that had been the point all along.

They were somewhat surprised by the disqualification results, but did note that they had observed some changes in employee behavior based on whether or not the employee was still eligible for the award. One manager observed: "There seemed to be this feeling among employees that once you are disqualified, 'what the heck, might as well revert back to what I was doing, and then I'll try again next time.'" They noted that the need for perfect punctuality and attendance was difficult for many employees, but that "quite a few employees were able to go six months or more without being disqualified."

What really surprised them was the decrease in productivity. While they had noticed fairness concerns about the award program, they hadn't linked it to decreased performance. One manager noted: "We did hear some grumbling. The ones that were showing up on time [before the award was introduced] were wondering why everyone was now being rewarded for something they were already doing… [These individuals were saying,] 'We have been doing this all along, but haven't got anything special.'" Another manager noted: "Employees were divided

about the program. It was about 50/50 on who seemed to like the program." The plant managers also noted that the "low tardy" employees expressed increased expectations of winning the drawings: "These were the people that usually came on time anyways, and so were always in the hunt [to win]." However, most of the winners were members of the "high tardy" group, which may have deepened feelings of unfairness among internally motivated "low tardy" workers. The senior corporate management took our results as a confirmation of their feeling that employees shouldn't be rewarded for things that they are expected to do anyways, as it creates fairness problems amongst workers.

Plant management did not allow us to interview production workers who had participated in the program, as they did not want to "bring back the topic [for discussion]."

Table A2.1: Descriptive Statistics at the Worker/Month Level

TREATMENT	*Pre-Award*					*Award Period*				
Variable	Obs	Mean	Sd	Min	Max	Obs	Mean	Sd	Min	Max
% time tardy per month	33	0.07	0.08	0.0	0.37	33	0.06	0.06	0.0	0.19
# minutes late per month	33	-2.64	3.17	-11.4	3.74	33	-3.63	2.91	-9.67	0.21
% time late per month	33	0.20	0.17	0.0	0.59	33	0.16	0.15	0.0	0.47
% time absent per month	33	0.02	0.02	0.0	0.08	33	0.06	0.03	0.02	0.11
% time single absent per month	33	0.01	0.01	0.0	0.03	33	0.03	0.02	0.0	0.11
Average efficiency	32	122.1	22.4	87.5	168.0	32	122.9	25.8	75.0	169.4

CONTROL	*Pre-Award*					*Award Period*				
Variable	Obs	Mean	Sd	Min	Max	Obs	Mean	Sd	Min	Max
% time tardy per month	185	0.04	0.06	0.0	0.33	106	0.05	0.11	0.0	1.0
# minutes late per month	185	-2.09	2.19	-13.33	5.4	106	-1.51	2.45	-10.5	8.31
% time late per month	185	0.20	0.22	0.0	0.95	106	0.24	0.20	0.0	1.0
% time absent per month	185	0.05	0.08	0.0	0.50	106	0.06	0.06	0.0	0.42
% time single absent per month	185	0.03	0.05	0	0.50	106	0.03	0.03	0	0.11
Average efficiency	174	110.0	30.3	54.5	217.8	99	122.3	29.5	66.9	218.0

Table A2.2: Placebo Tests

Variable	Random Treatment Group (50)			Random Treatment Group and Date (50)		
	Mean Coefficient	p < 0.1	p <0.05	Mean Coefficient	p < 0.1	p <0.05
Tardy	-0.0006	6%	4%	-0.0003	14%	6%
Minutes late	-0.1182	2%	2%	-0.0969	12%	4%
Single absence	0.0015	6%	4%	0.0025	12%	8%

Note: The average results of the placebo tests are shown above. For both types of placebos, the mean coefficient is both close to zero and significantly smaller than the corresponding coefficient from Table 3.3. Also, across the placebos the results are significant at close to the expected rate. We present the point estimate and 95% confidence intervals for each placebo regression of *minutes late* in Figure A2.1, which show that our point estimate has the smallest standard error of any of the individual placebos. Placebo regressions for our other models produced similar results. Overall, the placebo test results suggest that the treatment effects shown in Table 3.3 were actually a result of the treatment. The award program encouraged improved attendance behavior for workers in Plant 1, supporting Hypothesis 1. Standard errors in parentheses are clustered at the employee level. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table A2.3: Pre- and Post-Fail for Minutes Late

	(1)	(2)	(3)
Dependent Variable:	Minutes late	Minutes late	Minutes late
Sample:	ALL	Low Tardy	High Tardy
Pre-fail treatment	-0.883**	-1.165	-0.453
	(0.357)	(0.755)	(0.327)
Post-fail treatment	-0.469	-0.872	0.061
	(0.357)	(0.969)	(0.422)
Constant	-2.046***	-2.870***	-1.326***
	(0.215)	(0.303)	(0.262)
Time controls	Y	Y	Y
Worker FE	Y	Y	Y
R^2	0.006	0.015	0.007
# of employees	218	116	102
Observations	50,544	23,502	27,042

Note: Standard errors presented in parentheses are block bootstrapped with 400 repetitions. Significance: * p<0.10, ** p<0.05, *** p<0.01.

Figure A2.1: Plant Process Flow Chart

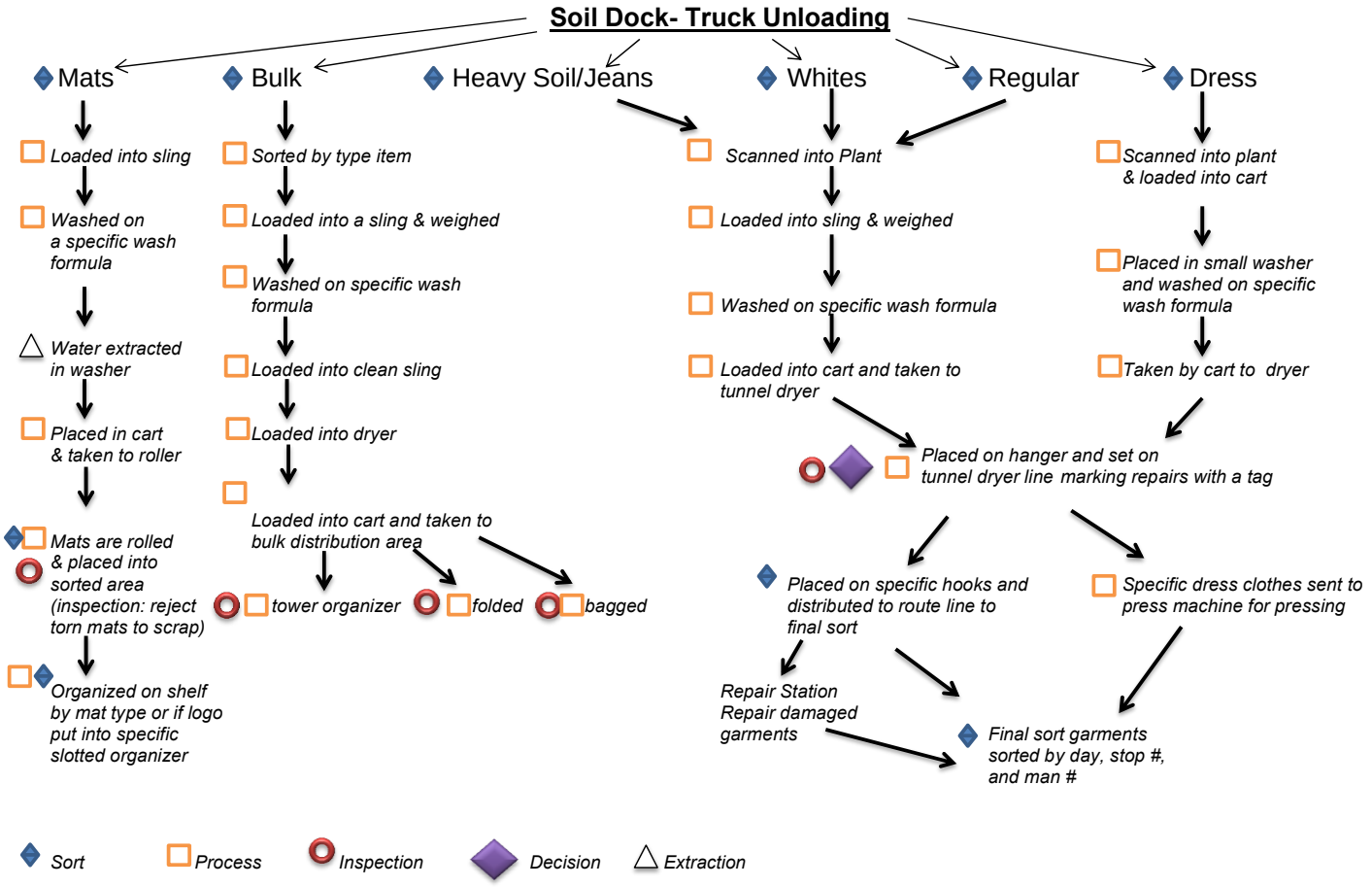


Figure A2.2: Histogram of Daily Efficiency for All Workers

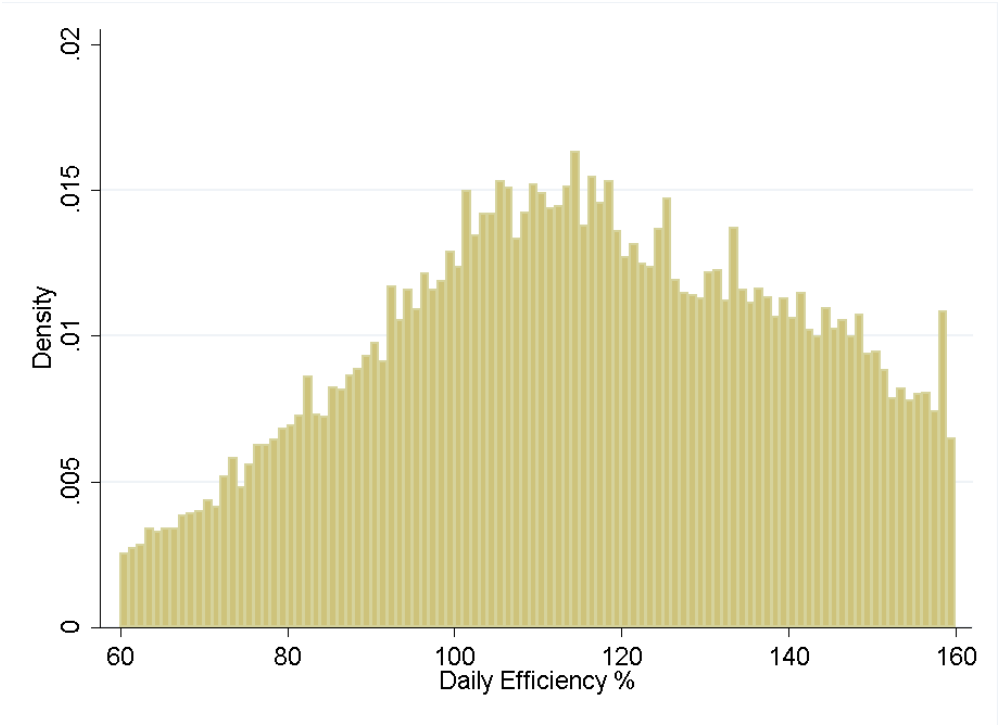


Figure A2.3: Eligible Months by Worker

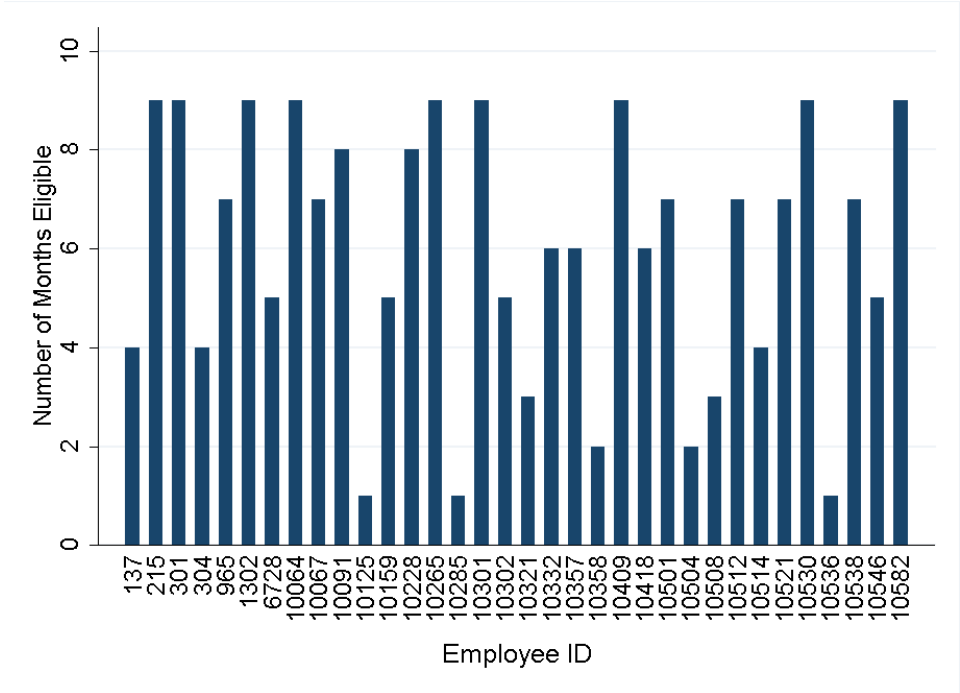


Figure A2.4: Placebo Regressions for Minutes Late

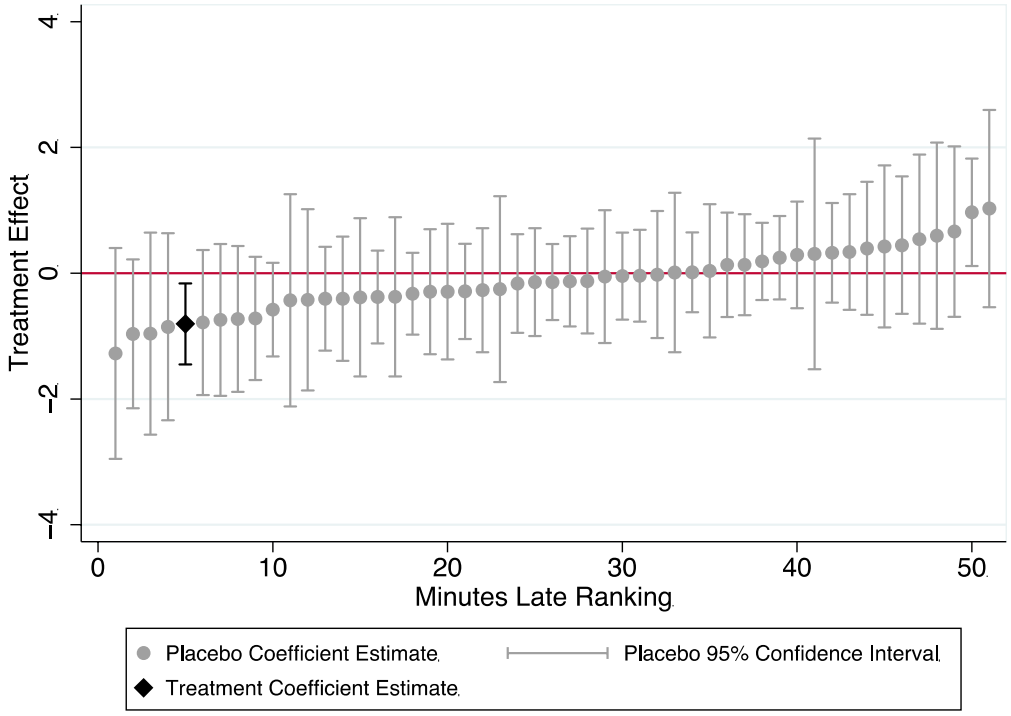
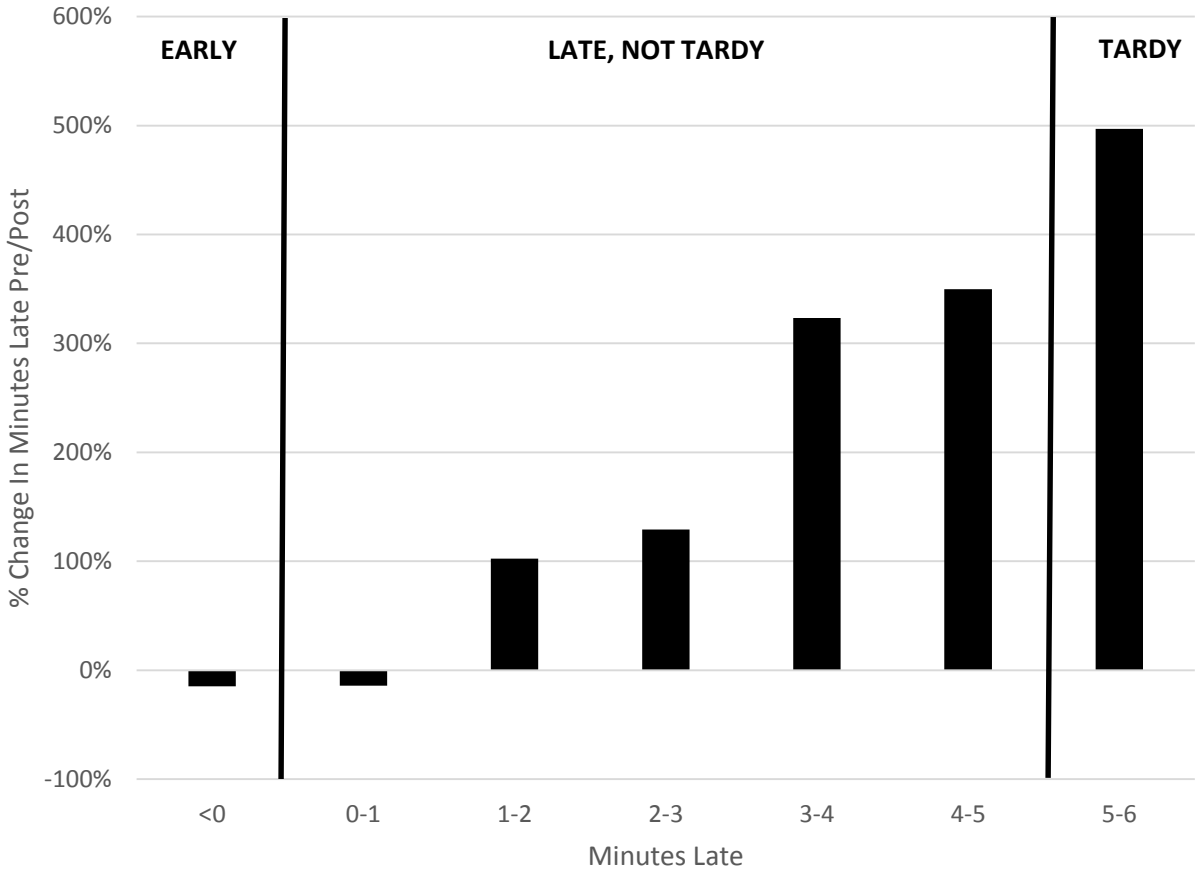


Figure A2.5: Change in Minutes Late After Award Disqualification



Note: Percentage changes represent changes from the initial baseline clock-in frequency for each minute interval. Values above bars indicate the baseline frequency for prefail clock-ins.