BROAD-BASED EQUITY COMPENSATION, EMPLOYEE TURNOVER, AND UNIT

PERFORMANCE

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To Jennie, for everything.

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ABSTRACT

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This study, which consists of two essays, examines the performance effects of a deferred equity plan on both individual employee and business unit outcomes. The first essay investigates the effects of deferred compensation plan characteristics on voluntary turnover decisions, using detailed data on store-level employees of a large retail firm. Overall, I find that employees who are eligible to receive deferred profit-sharing payments have significantly lower voluntary turnover. However, the relation between eligibility and turnover varies depending upon the specific plan eligibility requirement (i.e., age, tenure, hours worked per year), with stronger retention effects when plan contributions are larger. Vesting restrictions are associated with lower turnover rates, but only among non-managerial store employees. Finally, the retention benefits from unvested plan holdings are driven primarily by deferred compensation that is invested in the company's stock rather than in diversified mutual funds. These findings suggest that employees may respond to the retention incentives provided by a deferred compensation plan, but that specific plan characteristics play a key role in determining the plan's retention benefits. The second essay examines the effects of equity compensation on unit performance at the same retail firm. Prior studies have argued that providing non-

managerial employees "a piece of the pie" through equity compensation is a means to improve firm performance, while critics contend that the free-rider problem will negate the performance effects of broad-based employee ownership. I find that equity compensation is positively associated with unit profitability. While I find that reduced employee turnover mediates the relationship between equity compensation and performance, the evidence suggests that effort incentives are the primary source of performance effects.

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1. Introduction

Over one-third of all workers employed by for-profit corporations in the U.S. receive equity compensation, and much of this compensation is deferred through vesting provisions (NCEO, 2013). Notwithstanding the widespread popularity of these compensation plans, two important questions have not been resolved in the prior literature. First, prior research has produced limited and mixed findings for the performance effects associated with broad-based equity plans. Second, while previous research suggests the deferred aspects of these compensation plans can reduce employee turnover, the importance of specific compensation plan characteristics (e.g., eligibility and vesting provisions, grant sizes, and investment choices) is not well understood.

This dissertation is organized into two essays. In the first essay I examine the retention impact of specific characteristics of a deferred compensation plan. I find that employees who are eligible to receive plan contributions have significantly lower turnover rates than employees who do not meet eligibility requirements. The effect of eligibility is stronger for higher levels of plan contributions, and varies with employee characteristics. I also find that unvested plan holdings are associated with reduced employee turnover, but the retention effects are concentrated in holdings invested in company stock as opposed to diversified mutual funds.

In the second essay I investigate the effect of equity compensation on unit-level performance. On the one hand, practitioners and academics have long argued that giving employees "a piece of the pie" through equity ownership can improve effort incentives, and therefore improve company performance. On the other hand, economic theory

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suggests that firm-level incentives are too diffuse to have a meaningful impact on employee behavior, and therefore other motivations, such as employee retention, have been proposed. I find that equity compensation is positively associated with unit performance. Moreover, I find that employee turnover is one channel through which equity compensation can impact performance. However, the association between equity compensation and unit performance remains positive and significant even after controlling for employee turnover, suggesting that turnover does not fully mediate the relationship between broad-based equity and unit performance, as recent studies have suggested.

Prior empirical evidence for the performance effects of broad-based equity and deferred compensation has been limited in part due to a lack of detailed compensation data available below the executive level. Two primary issues have limited the ability of prior research to make inferences about the performance consequences of broad-based equity plans. First, the endogenous choice to adopt a broad-based equity plan makes it difficult to compare adopting firms to non-adopters, yet the majority of prior research has taken this approach. Second, prior research has typically used broad, cross-sectional samples, with only high-level information on the extent to which firms grant equity below the executive ranks. This approach treats broad-based equity plans across firms as homogenous, even though the plans may differ in important ways, such as the extent of employee eligibility or the level of equity compensation.

I utilize a unique dataset comprising records and unit performance data for a large retail firm that uses an Employee Share Ownership Plan (ESOP). Detailed data within a single firm reduces the endogeneity problem because all units in the firm participate in

the same plan, and the choice to participate in the plan is relatively exogenous from the employees' perspective, conditional on choosing to work for the firm. Moreover, the detailed data allows me to investigate the importance of specific characteristics associated with the plan's design.

Collectively, these two essays show that deferred equity compensation can impact employee behavior and unit performance, but achieving desired effects depends on plan design. This research has implications for practitioners seeking to implement new equity or deferred compensation plans, or to justify and get the most out of an existing plan. Moreover, by documenting performance effects of a broad-based equity compensation plan, these essays are useful to academics seeking to understand the popularity of these compensation arrangements in practice.

2. Deferred Compensation Plan Characteristics and Voluntary Employee Turnover

2.1. Introduction

Considerable research has examined the influence of compensation characteristics on employee behavior and firm outcomes. This research has primarily focused on the use of compensation for incentive purposes (e.g., Prendergast, 1999; Merchant et al., 2003). However, firms use compensation plans to achieve a number of other objectives, with employee retention among the most important.[1] Many compensation professionals and academic researchers contend that firms can increase retention (i.e., reduce voluntary employee turnover) through the use of deferred pensions, profit-sharing plans, 401(k) matching, and equity grants (e.g., Lazear, 1990; Oyer and Schaefer, 2005). These compensation mechanisms defer payouts by making them explicitly contingent on the employee staying with the firm for some specified amount of time, typically through the use of tenure-based eligibility and vesting restrictions.[2]

A key issue in the design of deferred compensation plans is the influence of specific plan characteristics (e.g., eligibility requirements, vesting schedules, size of deferred grants, investment vehicle) on employee turnover decisions. Labor economists such as Lazear (1990, p. 263) argue that "turnover rates are fundamentally influenced by

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[1] For example, surveys by the compensation consulting firm PayScale found that retaining and attracting good talent were the two chief compensation objectives for both 2010 and 2011.
(http://www.werc.org/assets/1/Publications/924a%201_13905_PayScales_Compensation_Practices_Survey [1].pdf, accessed November 22, 2011)

[2] Throughout this chapter, I use the phrase "deferred compensation" to mean compensation that is explicitly contingent on tenure requirements. In other contexts, deferred compensation can refer more narrowly to the practice of executives voluntarily deferring a portion of current pay to achieve tax objectives (e.g., Anantharaman et al., 2011), or the practice of delaying the determination of contingent pay due to uncertainty with respect to performance measurement (e.g., Jackson and Lazear, 1991).

the structure of deferred compensation." Yet most empirical studies to date have ignored this issue, instead focusing on the cross-sectional association between the presence of deferred compensation plans and employee turnover rates (e.g., Allen et al., 1993; Evan and Macpherson, 1996; Azfar and Danninger, 2001), and largely ignoring whether specific plan characteristics have differential effects on employee retention.[3]

This chapter addresses this limitation using ten years of detailed data on individual, store-level employees of a large retail firm. The firm's deferred profit-sharing plan covers all store-level employees from entry-level customer service representatives to store managers, with lower turnover one of the plan's primary objectives.[4] Although any single-firm study faces generalizability concerns, this sample offers a number of significant advantages for investigating the retention benefits from different plan characteristics. First, the plan's eligibility cutoffs and vesting schedules are based on age, tenure, and the number of hours worked during each year, allowing me to identify and test for discontinuities in individual employees' retention incentives that arise from the plan cutoffs and vesting schedules. Second, some of the plan's provisions, including the minimum age for eligibility, the percentage of firm profits contributed to the plan, the length of the vesting schedule, and the investment of plan assets (company stock or diversified mutual fund) changed during the sample period, providing natural experiments to test the effects of these characteristics on employee retention. Finally, the detailed, employee-level data allow an examination of claims regarding the importance of

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[3] Exceptions include Kole (1997) and Cadman et al. (2011), which examine vesting terms for executive stock options as a function of proxies for retention importance.
[4] Similar deferred profit-sharing plans are used by more than eleven thousand U.S. firms to cover more than thirteen million employees, an increase of more than 333% over the last thirty years (NCEO, 2011).

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employee characteristics in deferred compensation design (e.g., Salop and Salop, 1976; Rosenbloom, 2005).

Using hazard analysis, I find that employees who are eligible to receive contributions under the deferred compensation plan have significantly lower turnover rates than employees who do not meet the eligibility requirements. Plan eligibility is associated with a 15–35% reduction in turnover rates, which corresponds to an expected employment length increase of 17 –54% for the average employee. The effect of eligibility on turnover is stronger for larger values of deferred compensation grants.

Turnover is not significantly different between employees just below the age or tenure cutoffs and those just above the cutoffs. However, employees who receive deferred compensation by working just over the annual hour cutoff exhibit lower turnover rates than do employees who work just under the required number of hours. The plan eligibility retention effects are stronger for females than for males, and for older workers than for younger workers. To the extent that these characteristics proxy for employees' discount rates, these results are consistent with prior evidence that women have lower discount rates than men (thereby increasing the expected value of deferred compensation), and that discount rates decrease with age (e.g., Warner and Pleeter, 2001).

Because unvested deferred compensation is forfeited if the employee leaves the firm, unvested plan holdings may have a greater influence on voluntary turnover decisions than vested holdings (e.g., Core and Guay, 2001; Kedia and Rajgopal, 2009). Consistent with this argument, I find a negative and significant association between the value of unvested plan holdings and voluntary turnover, but only for employees at the

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lowest organizational level. For these employees, an additional $1,000 of unvested holdings is associated with a 26% turnover rate reduction. This reduced turnover rate corresponds to a 35% longer expected employment duration. I also find that the retention effects of unvested holdings are primarily driven by deferred compensation invested in the company's stock, and not by investments in diversified stock holdings. In contrast to non-managerial employees, unvested holdings are not statistically associated with reduced turnover rates for store managers, suggesting that unvested holdings do not provide strong retention incentives to these employees, who tend to have higher current pay and greater investments in firm-specific human capital.

This chapter contributes to the literature on compensation design and employee turnover in three ways. First, I extend prior research by examining whether *specific characteristics* of a deferred compensation plan are associated with employee turnover rates. Beyond the decision of whether to adopt a deferred compensation plan, employers face a number of different choices in designing a plan to meet their retention objectives. The evidence in this chapter suggests that some plan characteristics are associated with reduced turnover while others appear to have no effect, thus highlighting the importance of examining specific plan characteristics when investigating deferred compensation plan outcomes.

Second, I am better able to overcome the endogeneity problem that has limited prior research on the retention benefits from deferred compensation. Although I do not directly examine whether the existence of a deferred compensation plan affects voluntary turnover, my findings that certain characteristics influence employee turnover are consistent with the plan having retention effects. Prior studies have attempted to

investigate the broad question of whether deferred compensation plans reduce employee turnover, with mixed results (e.g., Allen et al., 1993; Gustman and Steinmeir, 1993; Azfar and Danninger, 2001). One empirical difficulty in these cross-sectional studies is overcoming the endogenous decision to adopt such a plan in order to establish a causal relationship. My analysis of employee-level decisions in a single firm reduces this problem because the deferred compensation plan is relatively exogenous from the employees' perspective.

Third, although many studies have examined the determinants and consequences of compensation design for executives, relatively little is known about how design choices impact employees below the executive level. Research on the use of compensation design to mitigate employee turnover has generally focused on executives (e.g., Chen, 2004; Balsam and Miharjo, 2007; Sundaram and Yermack, 2007). In contrast, the setting for this chapter includes customer-facing store employees. For non-executive employees, a number of factors may attenuate the retention effects related to plan characteristics. For example, non-executive employees often fail to understand the provisions of deferred compensation plans in which they are eligible to participate (e.g., Mitchell, 1988; Luchak and Gunderson, 2000; Budd, 2008). In addition, deferred compensation for non-executive employees is commonly implemented as part of a qualified retirement plan to take advantage of tax savings. Regulatory requirements for these tax-qualified plans restrict the range of flexibility in designing eligibility criteria and vesting requirements, potentially diminishing the effect of various plan provisions on voluntary turnover. By examining the retention effects of deferred compensation plan characteristics in a setting made up of non-executive workers, this chapter responds to

calls for research on compensation for employees at lower organizational levels (e.g., Indjejikian, 1999).

The remainder of this chapter is organized as follows: In the next section, I provide an overview of theoretical predictions related to the link between deferred compensation and turnover, discuss the research setting, and develop hypotheses related to the retention effects of the research site's specific deferred compensation plan characteristics and institutional setting. Section 2.3 discusses the sample and measures used for the empirical analysis. In Section 2.4, I present my results. Conclusions are provided in section 2.5.

2.2. Theory, Research Setting, and Hypotheses

2.2.1 Deferred compensation characteristics and employee turnover

Although prior research posits a number of motivations for the use of deferred compensation, such as taking advantage of tax benefits (Black, 1980; Tepper, 1981), providing effort incentives (Lazear, 1979; Lazear, 1981) and attracting high-quality employees (Salop and Salop, 1976), practitioners and academics alike cite reduced voluntary turnover as one of the most direct benefits of deferred compensation. Recent surveys, for example, show that employers list retention as a primary reason for offering defined benefit and defined contribution pension plans to workers, and employers believe such plans directly impact employee turnover (Diversified Investment Advisors, 2006; Grant Thornton, 2010). Similarly, economic theories argue that deferred compensation in general can be an effective tool for reducing employee turnover (e.g., Lazear, 1990). Other researchers contend that retention is a prime motivation for several specific forms of deferred compensation, including deferred profit-sharing plans and Employee Share

Ownership Plans (ESOPs) (Kruse, 1996; Azfar and Danninger, 2001; Rosenbloom, 2005), pensions (Ippolito, 1991), and broad-based equity plans with vesting restrictions (Core and Guay, 2001; Ittner et al., 2003; Oyer and Schaefer, 2005).[5]

The argument for using deferred compensation to reduce voluntary turnover is straightforward. Because new compensation grants and/or vesting of previous grants are explicitly linked to tenure requirements, employees face increased implicit costs of quitting before tenure requirements are reached. However, the retention benefits from deferred compensation are likely to be driven not merely by the existence of such a plan, but also by the specific plan characteristics.

Eligibility rules, for example, can affect retention incentives by stipulating which employees participate in the plan. Holding current pay fixed, eligibility to receive deferred compensation increases future payouts, conditional on remaining with the firm (e.g., Lazear, 1979). The higher the present value of total compensation (i.e., current plus deferred), the less likely an outside offer will exceed the pay at the incumbent job, and therefore the less likely an employee will be to leave the firm.

The amount of money contributed to the plan is also likely to affect voluntary turnover because contribution size determines the difference in retention incentives between employees who are eligible and those who are ineligible for plan grants. Along these lines, Blasi et al. (2008) provide survey evidence that the size of profit-sharing

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[5] Several studies use firm-level data to examine whether the use of deferred compensation is related to retention-oriented compensation objectives. Using survey data on stated compensation objectives, Ryterband (1991) finds that reducing employee turnover is a primary objective among ESOP adopters, while Gerakos et al. (2011) find a negative relationship between retention objectives and the use of broad-based stock options. Core and Guay (2001) and Oyer and Schaefer (2005) use proxies for the relative importance of retention and find that these retention proxies are significant determinants of broad-based stock option grants.

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contributions as a percentage of total pay is negatively associated with self-reported intention to seek a new job.

Vesting terms can provide retention incentives by extending the time horizon of payouts (Kole, 1997; Cadman et al., 2011). Prior research specifically cites *unvested* holdings as being especially effective in discouraging employees from quitting, because any outside opportunity must compensate the employee for unvested holdings that would be forfeited on departure (e.g., Core and Guay, 2001; Kedia and Rajgopal, 2009). Consistent with this intuition, Balsam and Miharjo (2007) find that the value of unvested equity holdings is negatively associated with voluntary turnover for their sample of executives.

Finally, the retention effects of unvested holdings depend on the value of the holdings *to the employee,* because the subjective value represents the perceived cost of forfeiture. Employees' valuation of unvested holdings, and thus the associated retention effects, may depend on whether plan assets are invested in company stock or diversified investment vehicles. Prior research indicates that employees exhibit a preference for investments in employer stock (e.g., Huberman, 2001; Cohen, 2009), notwithstanding portfolio theory's clear prescriptions for diversification. Survey evidence indicates that employees actually consider company stock to be a *less* risky investment than a diversified equity portfolio (John Hancock Financial Services, 2002). Other studies suggest that owning company stock *per se* can increase employees' identification with the firm, and consequently improve loyalty and reduce voluntary turnover (e.g., Pierce et al., 1991; Kruse and Blasi, 1997; Blasi et al., 2008). All of these arguments imply that investing deferred contributions in company stock will yield stronger retention

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incentives. In contrast, recent studies highlight the cost of under-diversification associated with employees' investments in their companies' stock (e.g., Meulbroek, 2005; Poterba, 2003; Cohen, 2009). If employees recognize the costs of under-diversification, they may steeply discount investments in company stock, reducing the retention effects of company stock relative to diversified investments.

Although a number of studies have examined whether the *existence* of a deferred compensation plan is associated with reduced voluntary turnover,[6] relatively little evidence exists on the influence of specific plan characteristics on employee retention, despite their theoretical importance to plan outcomes. Given this limitation, I extend prior deferred compensation studies by examining the association between eligibility rules, plan contributions, vesting schedules, and plan investment vehicles on voluntary turnover rates.

2.2.2 Research setting

I conduct my analyses using records for store-level employees of a large U.S. retail firm. This setting is well-suited for studying retention incentives because the firm experiences high employee turnover and reducing turnover is an important organizational objective. Although the sample firm's voluntary turnover rate is generally lower than those of its industry peers, it is still very high compared to rates for other industries. Over

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[6]Most research in this area uses data from broad employment and compensation surveys to compare employee turnover rates at firms using and not using deferred compensation (e.g., Azfar and Danninger, 2001; Ippolito, 1987; 1991; Allen et al., 1993; Evan and Macpherson, 1996). These studies generally find that firms with deferred compensation plans have lower turnover. However, Gustman and Steinmeier (1993) find that, after controlling for appropriate job-and firm-level characteristics, the link between deferred compensation and turnover is not significant. Allen et al. (1993) and Evan and Macpherson (1996) also find limited evidence that deferred compensation reduces voluntary turnover, as opposed to layoffs or other forms of non-voluntary employee departure.

the sample period, voluntary turnover averaged nearly 75 percent annually and reached nearly 100 percent annually among employees at the lowest organizational level.

The firm's strategy involves generating repeat customer business by offering excellent customer service and fostering a sense of community in its stores. A key component of this strategy is a focus on customer-employee interactions, which depend not only on employee "friendliness," but also on familiarity between customers and employees.[7]

The firm operates a deferred profit-sharing plan, with senior managers citing reduced employee turnover as one of the plan's objectives.[8] However, management acknowledged that they do not have any direct evidence that the profit-sharing plan actually reduces turnover. Under the plan, eligible employees receive an annual contribution from the company to an individual retirement account that is managed by a third party. The plan is structured as a qualified retirement plan for Federal income tax purposes, and current employees are restricted from accessing their funds until after retirement.[9] However, employees can receive distributions from their *vested* plan

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[7] Interviews with store managers and other employees provided a number of explanations for a link between employee turnover and store-level operating performance. First, turnover can lead to lower customer satisfaction. Repeat customers become familiar with particular employees and expect to see them when they come in. Employee turnover can also harm a store's ability to maintain high operating standards because employee inexperience leads to slower service and longer lines. Longer-tenured employees are more likely to have mastered the basic routines in the store and thus are able to "focus on the details" to improve store presentation and meet customers' needs. Finally, managers cited the drain on their own time and attention associated with interviewing, hiring, and training new employees. This time-consuming process directs managers' efforts away from higher-value activities.

[8] In addition to providing retention incentives, management mentioned increasing employee effort as another goal of the plan. The performance consequences of equity compensation under this plan, whether from improved retention or employee effort, are the focus of Chapter 3.

[9] The primary tax benefits for structuring the deferred compensation program as a retirement plan are that contributions invested in the plan are not taxed to the employee until ultimately distributed, and investment returns on plan holdings can grow tax free

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holdings before retirement age if they separate from the company for any reason.[10] Structuring deferred compensation as a retirement plan impacts the timing of ultimate distributions and the administrative details of the plan, but does not otherwise substantively affect the deferred elements of the plan. The plan is quite general in that it entails making grants to employees in the current period that will not be fully earned until later, similar to other common forms of deferred compensation (e.g., restricted stock, stock options, and pensions). Even so, structuring deferred compensation as a tax-qualified plan requires that plan provisions conform to guidelines for tax-qualified plans outlined by the Employee Retirement Income Security Act (ERISA).

2.2.3 Hypotheses

In this section, I develop my hypotheses in the context of the specific characteristics of the research site's deferred profit-sharing plan and the firm's institutional setting.

2.2.3.1 Eligibility

Plan eligibility provisions impact retention incentives by determining which employees receive deferred compensation. Holding current pay fixed, eligible employees effectively earn a higher wage than ineligible employees, and therefore are less likely to find an outside offer that exceeds the incumbent total compensation (current and deferred). At the research site, eligibility to receive contributions under the deferred compensation plan is based on tenure, annual hours worked, and age. The firm has

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[10] For example, after leaving the company, an employee can elect to receive all of his or her vested holdings as a cash distribution, or can roll the vested holdings into another retirement account such as an Individual Retirement Account (IRA). Any cash distribution received before age 59 ½ is subject to an additional 10% penalty tax by the Internal Revenue Service (IRS). If an employee continues to work at the company beyond the normal retirement age (i.e., age 62), he or she can begin receiving distributions from plan holdings after age 70 ½ while still working at the firm.

flexibility under ERISA to choose cutoffs for each of these criteria within an acceptable range. In particular, ERISA requires tenure cutoffs between zero and twelve months, annual hours worked cutoffs between zero and 1,000 hours, and age cutoffs that do not exceed 21 years. For each of these criteria, the firm has used the flexibility within the ERISA guidelines to adopt the most stringent eligibility requirements allowable for tax-qualified plans. Therefore, to be eligible to receive a contribution, a worker must have been with the firm for at least twelve months, must have worked at least 1,000 hours during the plan year, and must be at least 21 years old.[11]

Despite the positive expected value of deferred compensation, the store-level employees in the sample may not consider the deferred component of compensation when evaluating potential outside employment opportunities.[12] Because the retail environment is characterized by high turnover rates for entry-level employees, these employees may consider their employment status to be tenuous, leading them to steeply discount future payouts that require them to stay with the firm for an extended period of time.

The uncertain relation between plan eligibility and retention in this setting leads me to test the prediction that employees consider the deferred component of their total pay when making stay or quit decisions. If so, eligible employees have stronger incentives to remain with the firm than ineligible employees, and consequently have lower turnover rates. Thus, my first hypothesis:

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[11]The age-21 requirement was imposed beginning with the 2002 plan year due to a change in ERISA rules. To receive a plan contribution after this date, an employee needs to be age 21 or older, even if they had received a grant in a previous year.

[12]In interviews, managers expressed the belief that store employees disproportionately weight current hourly pay when evaluating outside employment opportunities.

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H1: Eligibility to receive deferred compensation is negatively associated with voluntary turnover rates.

2.2.3.2 Level of contributions

Plan eligibility increases retention incentives by increasing the present value of future wages, but the size of this effect is likely to vary according to the level of contributions made to the plan. Contribution size at the research site is based on firm performance, but ultimately is at the discretion of the board of directors. Although there is no guarantee that the board will decide to make a grant, the company made a grant every year during the sample period. Annually, the board reviews the performance of the company and decides on the level of contribution to the plan as a percentage of company profits. From 2007 – 2009, annual plan contributions were 15% of profits. Prior to that, grants were 10% of annual profits.

Each employee's grant is determined mechanically based on a multiplier of his or her total eligible earnings for the year.[13] The multiplier is derived by dividing the total aggregate contribution to the plan by the aggregate eligible earnings. For example, if total plan contribution was $100 in a given year (15% of firm profits), and total eligible employee earnings was $1,000, the "contribution factor" for that year would be 100/1,000 = 10%, meaning that each employee would receive a contribution equal to 10% of his or her eligible earnings during that year. Although the contribution as a percentage of firm profits was fairly constant over the sample period (with the exception of the increase for years 2007-2009), the contribution to each employee as a percentage of eligible earnings varied from year to year, ranging from roughly 4.9% to 11.4%.

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[13] Eligible earnings include all wages earned after initial plan eligibility is achieved.

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Because employees who are eligible to receive grants under the plan accrue deferred compensation throughout the year, the effective hourly wage for eligible employees increases depending upon the size of the annual contribution factor. This accrued deferred compensation is then contributed to the employees' accounts at the time of the annual grant, and is subject to vesting provisions. If employees are aware of the computation that determines annual deferred compensation grants and are able to form reasonable expectations of the various inputs (e.g., annual profits and wages earned), then higher levels of contributions should increase retention incentives for eligible employees. Therefore, my second hypothesis:

> *H2: The association between eligibility and voluntary turnover rates is increasing in the level of plan contributions.*

2.2.3.3 Vesting

Tenure-based vesting provisions can provide retention incentives by explicitly linking employees' payouts to the length of time they remain with the firm. As a result, tenure-based vesting schedules are one of the most straightforward means to defer compensation. As with the company's other plan provisions, vesting schedules must conform to ERISA guidelines to maintain the plan's tax-favored status. Although ERISA permits either cliff or gradual vesting, the company has chosen to use a gradual vesting schedule. The maximum length of a permissible vesting schedule changed during the sample period as a result of a change in legislation governing ERISA. Prior to 2007, employees under a gradual vesting schedule had to be fully vested after a maximum of

seven years.[14] For 2007 and later, full vesting must be achieved after a maximum of six years.[15] As with its eligibility requirements, the company used the flexibility allowed within ERISA guidelines to choose the most restrictive vesting requirements available. For grants made prior to 2007, the vested percentage of plan holdings was 0% for fewer than three years of service, and 20% per year for three to seven years of service. Employees were 100% vested in their plan balances after accruing seven years of service. For grants made in 2007 and later, 20% vesting is achieved with each year of service from two to six, and employees are 100% vested in these grants after six years of service.[16] Table 2.1 presents the vesting schedule. Other than the pre-/post-2007 distinction, these vesting percentages are applied to the account balances themselves, and not to specific grants *per se*. For example, an employee with four years of service who receives a grant in 2005 is immediately 40% vested in that grant, as well as 40% vested in any grant received in previous years.

With respect to the choice to use the longest vesting term allowed under ERISA, company management pointed out that "vesting was structured to promote long-term commitment to the organization," consistent with the theory that longer vesting schedules increase the retention incentives provided by a deferred compensation plan (e.g., Kole, 1997; Cadman et al., 2011). Prior research argues that it is the value of *unvested* holdings that has the strongest incentive effects (e.g., Core and Guay, 2001; Kedia and Rajgopal, 2009). Unvested holdings represent compensation that is forfeited if an employee leaves,

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[14] Vesting is based on the number of years of service an employee has accumulated with the company. Under the research site's plan, a "year of service" (YOS) is accrued for every year in which an employee works at least 1000 hours.

[15] Under ERISA, full vesting must be achieved after 3 year if cliff vesting is used.

[16] Regardless of years of service, employees achieve 100% vesting when they reach age 62.

and therefore greater values of unvested grants should increase the employee's cost of leaving the firm, leading to my third hypothesis:

> *H3: The value of unvested holdings is negatively associated with voluntary turnover rates.*

2.2.3.4 Investment of plan assets

The relationship between unvested holdings and voluntary turnover may depend upon whether plan assets are invested in company stock or in diversified investments by altering employees' subjective valuations of their holdings. During the sample period, plan contributions were invested either in company stock as part of an employee share ownership plan (ESOP) or in diversified mutual funds. For the years 1999-2002 and 2004-2006, the investment of plan assets was split equally between company stock and mutual funds. For the years 2003 and 2007-2009, contributions were invested exclusively in company stock. Whether plan contributions were invested in mutual funds or company stock did not have any impact on eligibility, contribution factors, vesting, or distribution of plan holdings, and therefore the ESOP and mutual fund arms of the deferred profit-sharing program were the same in all respects other than how the contributions were invested.

As discussed earlier, psychological factors may cause employees to prefer company stock, despite portfolio theory's clear prescription for diversification. In addition, several studies have shown that employees "excessively extrapolate" company stock returns into the future (e.g., Bernartzi, 2001; Choi et al., 2003; Huberman and Sengmueller, 2004). This may be particularly important in this research setting. Over the

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sample period, the firm's stock significantly outperformed the market. [17] If employees extrapolated the superior company returns into the future, their valuation of investments in company stock would be higher than those in diversified funds, increasing the retention effects of ESOP investments vis-à-vis mutual fund holdings. This leads to my fourth hypothesis:

> *H4: The association between unvested holdings and voluntary turnover rates is stronger for company stock holdings than for mutual fund holdings.*

2.2.3.5 Employee characteristics

Although deferred compensation plan characteristics may affect turnover decisions on average, the extent to which *individual* employees respond to the retention incentives in deferred compensation is likely to differ with a number of employee characteristics (e.g., Salop and Salop, 1976). Rosenbloom (2005) emphasizes the importance of considering employee demographics in designing a deferred compensation plan because employees of different age and gender may find different plan features more or less attractive. For example, risk preferences, discount rates, and labor market participation are all likely to vary with age and gender (Eckel et al., 1998; Holt and Laury, 2002; Warner and Pleeter, 2001; Kirby and Markovic, 1996). These differences could impact an employee's personal valuation of deferred compensation, and therefore moderate the extent to which plan characteristics impact the decision to stay with the firm.

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[17] For ESOP purposes, the firm's stock is valued annually by a third party.

Position in the firm is also likely to matter. For example, promotions within a firm may reflect the extent to which an employee has accumulated firm-specific human capital. The more human capital an employee has within the firm, the more likely the employee's marginal product within the firm exceeds what it would be in a different firm, and therefore the wage offered by the current firm is more likely to exceed what could be obtained through an outside offer (e.g., Becker, 1962; Parsons, 1972; Nagypal, 2007). For this reason, as employees are promoted current pay may provide sufficiently strong retention incentives so that there is less scope for the deferred compensation plan or its provisions to impact turnover decisions. Alternatively, employees in higher positions may better understand plan provisions (e.g., Mitchell, 1988; Luchak and Gunderson, 2000; Budd, 2008), making it more likely that they will take plan characteristics into account when deciding whether to leave.

Based on the results in related studies, I predict the retention effects of deferred compensation characteristics to vary according to employee gender, age, and position in the firm. Therefore, my fifth hypothesis is as follows:

> *H5: Employee gender, age, and position moderate the relationship between deferred compensation characteristics and voluntary turnover rates.*

2.3. Sample and Measures

2.3.1 Data collection

I test these hypotheses using records for all store-level employees hired between 1998 and 2008. The data include employee hire date, termination date and type

(voluntary or involuntary), age, gender, wage, and position, as well as the size of grants to the employee under the company's deferred profit-sharing plan for plan years 1999-2008. The sample includes 145,961 unique employees hired between 1998 and 2008, working a total of 1,773,263 months. I observe 175,558 instances of employee turnover, of which 127,012 (72.35%) are classified as voluntary.[18] To better understand the deferred compensation plan and institutional setting, I examined official plan documentation, interviewed corporate employees responsible for administering the plan, and met with store employees across different organizational levels.

2.3.1.1 Dependent variable

The outcome of interest in this chapter is monthly voluntary turnover for each employee. The dependent variable *vol_turnover* equals one in the month a given employee voluntarily leaves the firm, and zero otherwise. Although there were no layoffs during the sample period, involuntary turnover occurred due to employees being terminated.[19] [20] [21]

2.3.1.2 Independent variables

As discussed above, eligibility to participate in the deferred profit-sharing plan is based on cutoffs with respect to age, tenure, and annual hours worked. After satisfying

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[18] Note that some employees that separate from the firm are re-hired, and may separate again.

[19] Following prior research on voluntary turnover (e.g., Trevor, 2001), I include in the analyses employees who are involuntarily separated, and the survival analysis treats these observations as being right censored (i.e., although these employees exit the sample, they do so before voluntary turnover, the event of interest, is observed). The model accounts for the fact that there was no voluntary turnover during these censored employees' tenure.

[20] As noted above, some employees leave the firm, are rehired, and then may leave again. In unreported analyses, I repeat the analyses without allowing these "repeated failures," removing employees from the sample after their first separation. Inferences remain unchanged.

[21] While there were no layoffs, there were instances of store closings during the sample period, which may lead to employees with strong geographic preferences to quit (i.e., some employees may be unwilling to transfer to another store). In unreported tests, I exclude all stores that closed during the sample period, and results are similar.

the age and tenure requirements, employees are technically eligible to receive a grant after passing a 1,000-hours-worked threshold. However, I consider employees eligible if they are *on pace* to achieve 1,000 hours in a given year, which corresponds to working an average of 20 hours per week. I do this to avoid coding all employees as non-eligible at the start of every year, even though they can fully expect to receive a grant at year-end if they remain with the firm. Specifically, *eligible* is an indicator variable equal to one if an employee is at least 21 years old (for years 2002 and later), has been with the firm for at least 12 months, and worked an average of at least 20 hours per week during the given year. In addition, I employ indicator variables for the individual eligibility criteria in additional tests.

Unvested holdings measures the dollar value (in year-2000 terms) of previously granted holdings that are yet to vest. Employees achieve vesting based on accumulated "years of service," defined as the number of years in which an employee worked at least 1,000 hours. I therefore determine when an employee reaches a vesting cutoff by estimating the month an employee reaches the 1,000-work-hour mark in each year.[22]

To examine whether the effect of plan characteristics varies with employee characteristics, I use measures of age, gender, and position in the firm. *Age* is the employee's age in years. *Female* is an indicator equal to one if the employee is female

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[22] The data for hours worked were provided on an annual basis, so I use the following procedure to estimate the month of vesting. First, I count the total number of weeks worked during the year, and divide the total hours worked by the number of weeks to obtain the hours worked per week. Next, I divide 1,000 by hours per week multiplied by 4.3 (i.e., monthly hours worked). For example, an employee who worked 1,500 hours and was employed for the entire year (52 weeks) would be estimated to vest during September, as follows: 1,500/52 = 28.85 hours per week. 1,000/(4.3*28.85) = 8.06.

and zero otherwise. Positions in the firm include Customer Service Representatives (CSRs), hourly managers, assistant store managers, and store managers.[23]

I include a number of control variables drawn from prior literature on employee turnover (e.g., Griffeth et al., 2000; Trevor, 2001; Benson et al., 2004). *Tenure* is the total number of months an employee has worked at the firm. I measure *Hourly wage* in real year-2000 dollars to account for the effect of inflation across my sample period. *Hours per week* is the total hours worked in a given year divided by the total number of weeks an individual was employed during the year. In addition to these employee-level variables, I obtain monthly unemployment rates at the county level from the U.S. Bureau of Labor Statistics to control for outside employment opportunities in the local labor market.[24] I include year fixed effects to control for changes in macroeconomic factors (other than unemployment) and company policies across years that affected all employees equally, and monthly fixed effects to control for seasonal differences in employee turnover.[25]

2.3.2 Descriptive statistics

Table 2.2 highlights the differences in employee characteristics across organizational levels. CSRs are considerably younger, and have shorter tenure than employees in managerial positions, and earn lower wages working fewer hours per week.

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[23] Organizational hierarchy at the store level consists of a store manager and an assistant store manager, both of whom are full-time, salaried employees. Below them are a number of lower-level managers with responsibility over specific store functions. These positions are paid hourly, but are also full-time. Below these hourly managers are the Customer Service Representatives, who are paid hourly and may be either part time or full time.

[24] In (unreported) alternative specifications, to control for outside labor opportunities I include the number of retail stores within the same zip code, scaled by the population within the zip code. Inferences remain unchanged.

[25] To account for the possibility that unobserved, time-invariant store-level are associated with both deferred compensation and employee turnover decisions, in unreported analyses I include store fixed effects, and find similar results.

These differences may result in differential deferred compensation effects across employee categories. For example, the average CSR tenure (ranging from approximately 15 to 32 months across the sample period) implies that full (100%) vesting is still several years away for most CSRs. In contrast, managers are much more likely to be in the latter stages of the vesting schedule. Wages rise sharply with promotions (e.g., store managers' salaries in 2008 were almost three times higher than those for CSRs). This wage structure may reflect firm-specific human capital investments and hence wages at these levels more likely exceed what could be obtained from outside employment opportunities (e.g., Ippolito, 1991). Therefore, current pay following promotions may provide sufficiently powerful retention incentives so that the incremental retention effects from deferred compensation are small for managers. CSRs tend to work less than a standard "full-time" work week (mean hours per week ranges from approximately 24 to 29), while all other employee categories average more than 40 hours per week.

The average values for *age*, *tenure*, and *weekly hours* (Panels B through D) suggest that nearly all employees above the CSR level are eligible to receive contributions under the deferred profit-sharing plan. In contrast, there is substantial variation in CSR eligibility. The total proportion of eligible CSRs has generally increased over the sample period, with almost 40 percent of CSRs eligible to receive contributions by 2008. In terms of eligibility requirements, the proportions of employees meeting the age, tenure, and hours-worked cutoffs all increased over time.[26]

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[26] Note that prior to 2002 there was no age eligibility requirement. As a result, the mean and median values of *age requirement* for 2000 are both 1.

Table 2.3 indicates that the correlations among the *age*, *tenure,* and *weekly hours* cutoffs are all significantly positive. However, the three eligibility cutoffs do not necessarily collapse into a single eligibility dimension. In unreported analysis, I find that among CSRs who are *not* eligible, the most common reason for ineligibility is failure to meet the tenure requirement. In particular, approximately 20 percent of ineligible CSRs meet the other two requirements while falling short on tenure, compared to roughly 10 to 15 percent who would be eligible if not for either the age or hours requirement.

2.4. Results

2.4.1 The effect of plan characteristics on voluntary turnover

The primary question for this chapter is the influence of different deferred compensation plan characteristics on employees' voluntary turnover decisions.[27] Participation in the plan depends on age, tenure, and hours worked, all of which are observed covariates. In addition, employee wages determine individual grant size, and hence plan holdings. Prior literature on employee turnover (e.g., Trevor, 2001; Hom and Kinicki, 2001) suggests that these covariates can have a direct impact on employee separation decisions, even in the absence of a deferred compensation plan. Thus, the empirical challenge is to identify the effect of the deferred compensation separately from the effect of the covariates that determine plan eligibility and grant size. The empirical strategy I rely on to overcome this challenge is a regression discontinuity (RD) research

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[27] One of the primary assumptions underlying the research site's deferred compensation plan is the (untested) belief that lower voluntary turnover leads to higher store financial performance. If this assumption is not true, then any relation between plan characteristics and lower turnover will have no impact on economic performance. I assess the validity of managements' assumption that lower voluntary turnover is associated with higher store-level operating performance in section 4.3 of Chapter 2 of this dissertation.

design, which has been widely used for program evaluation in the economics literature (e.g., Thistlewaite and Campbell, 1960; Trochim, 1984; Van Der Klaauw, 2002; DiNardo and Lee, 2004; Card et al., 2004). Regression discontinuity is appropriate when the "treatment" of interest (deferred compensation in this case) is determined by whether an observable covariate (known as a "forcing variable") is on either side of a threshold. Even if the covariate determining the treatment is itself associated with the outcome of interest, the effect of the treatment is still identified under the assumption that the relation between the forcing variable and the outcome of interest is not discontinuous exactly around the administrative cutoff.

Following prior literature on organizational turnover (e.g., Trevor, 2001; Hom and Kinicki, 2001; Benson et al., 2004), I primarily rely on Cox proportional hazard models to estimate the relationship between deferred compensation and voluntary turnover. Hazard analysis permits estimating the rate of voluntary turnover over time (i.e., the "hazard rate"), as opposed to estimating the odds of turnover occurring during some window of time, as is the case with logistic regression analysis. Rather than treating employee turnover as a dichotomous decision, hazard analysis implicitly accounts for the timing of the quit decision, so that an employee who leaves after one month conveys different information than an employee who separates after one year. Cox hazard models estimate the hazard rate as a "baseline hazard" (i.e., the hazard rate faced by everyone) shifted multiplicatively by observed covariates. The general Cox hazard model specification I use is

$$h(t|x) = h_0(t)\exp(\beta_1 x_{plan \text{ variable}} + \beta_2 x_{controls}) \tag{1}$$

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where $h(t|x)$ is the hazard rate conditional on having lasted until time t, $h_0(t)$ is the baseline hazard, *plan variable* represents either plan eligibility or plan holdings, and *controls* is a vector of the control variables discussed above. Within the hazard analysis framework, Cox models are commonly used in part because they are non-parametric, in the sense that no parametrization is assumed for the baseline hazard function and it is left unestimated.[28][29]

2.4.2 The effect of eligibility on voluntary turnover

My first hypothesis predicts that plan eligibility is negatively associated with voluntary turnover. To test this, I restrict the sample to include only CSRs, since this is the only group with meaningful variation in eligibility. Table 2.4 presents the Cox hazard model results. These and subsequent hazard analysis results are presented with exponentiated coefficients, which can be interpreted as hazard ratios (i.e., the ratio of hazard rates) so that values above one indicate an increased rate of voluntary turnover, and values below one represent a reduced rate of turnover. For example, the coefficient of .63 for *eligible* in column 1 indicates that the turnover rate for eligible employees is 37% (= 1 - .63) lower than the rate for non-eligible employees. An exponentiated coefficient equal to one represents no turnover effect, and is analogous to a coefficient of zero in an OLS regression.

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[28] When a specific parametrization of the baseline hazard can be reasonably assumed, a parametric hazard model can produce more efficient estimates than the semiparametric Cox model. However, if the assumed parametrization is not correct, the parametric model can produce biased coefficient estimates.
[29] An important assumption required to use the Cox model is proportionality, i.e., the hazard rate for an individual with one set of values for the covariates is a fixed proportion of the hazard rate for an individual with a different set of values. This assumptions implies that for covariates that are fixed (e.g., gender), the coefficient does not vary across time. However, this assumption is not required for covariates that change with time (Van den Poel and Lariviere, 2003; Allison, 1995), as the majority of covariates in my specifications do. For the remaining covariates, I test the proportionality assumption using STATA's STPHTEST command.

Column 1 includes an indicator for whether an employee is eligible, along with a number of control variables. Since this model does not include hours worked or tenure, *eligible* likely captures not only the effect of the deferred compensation plan, but also the underlying covariates that determine eligibility. The identification strategy for RD designs is to exploit the discontinuity in eligibility that is distinct from the effect of the continuous forcing variables. To this end, columns 2 and 3 include linear and higher order functions of the forcing variables *tenure* and *hours per week.* By controlling for the continuous variation in the forcing variables, the *eligible* indicator can be interpreted as the effect of plan eligibility *per se*.[30] Columns 2 and 3 indicate that the effect of eligibility is to reduce the hazard rate by 18.5% and 15%, respectively. While these effects are smaller than those reported in column 1, they are still statistically significant, suggesting that at the margins of eligibility requirements, eligibility has a turnover effect beyond the direct effects of tenure and hours per week. Based on untabulated analyses, the estimated hazard rate (i.e., voluntary turnover rate) for a non-eligible employee with 12 months tenure and average values for the other covariates is approximately 7% per month. Given this turnover rate, the estimated effect of eligibility for an average CSR is to increase the expected employment duration by roughly 2.5 months.[31] For comparison, the estimated

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[30] The necessary assumption for this interpretation is that hours worked and tenure do not have a discontinuous effect on turnover precisely at the levels required for eligibility (1,000 hours and 12 months, respectively). This assumption seems reasonable given that the firm chose the most restrictive eligibility requirements allowable under ERISA. Given that these values represent the boundary of permissible requirements, they can be thought of as relatively exogenously determined rather than being based on economically meaningful values with respect to employee behavior.

[31] Based on a 7% turnover rate, the expected number of months until turnover would be 14.28 (= 1/.07). A hazard ratio of .85 suggests a turnover rate of 5.95%, which corresponds to an expectation of 16.8 months until turnover (= 1/.0595). Note that this comparison involves an abstraction, because in actuality the hazard rate is expected to change over time. Therefore, while the hazard rate of eligible employees is expected to stay proportional to ineligible employees, the comparison rate may not stay at 7%.

hazard ratio for *hourly_wage* in column 3 is .893, suggesting that an additional dollar of hourly wage is associated with a reduction in the voluntary turnover rate of almost 11%.

The results reported in columns 1 - 3 represent the average effect of eligibility across gender and age categories. However, it is likely that employees of different age and gender face different employment horizons and discount rates, and thus are likely to respond to the retention incentives implicit in a deferred compensation plan differently. To investigate whether the effect of eligibility varies with gender, I include an interaction term between *female* and *eligible* in Column 4. The coefficient for the interaction term is significantly less than one, indicating that the retention effect of eligibility is greater for females than for males, consistent with women applying a lower discount rate when valuing deferred compensation than men. The hazard ratio for men is .926, whereas for women it is .806.[32]

In Column 5, I interact eligibility with an indicator for employees older than 30 (i.e., roughly the sample mean). The hazard ratio for the eligibility main effect is not significantly different from one, suggesting that, at the eligibility margins, eligibility is not associated with reduced turnover for younger employees. However, the eligibility effect for older employees is significant with a hazard ratio of .805 (i.e., the effect of eligibility is to reduce the turnover rate for older employees by nearly 20%). This is consistent with older employees using a lower discount rate to value deferred compensation than younger employees. Overall, the results presented in Table 2.4

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[32] The interpretation of the coefficient on an interaction term (using hazard ratios) in Cox models is as the ratio of hazard ratios. For example, dividing .806 by .926 yields .871, which is the coefficient on the interaction term. In column 4, the hazard ratio for the interaction is based on the sum of the main effect and the interaction.

support Hypothesis 1's prediction that plan eligibility is associated with lower voluntary turnover rates. However, the effect of eligibility depends upon employee characteristics.

2.4.2.1 Age eligibility requirement

I next test the turnover effects of the three individual eligibility criteria (age, tenure, and hours worked). First, I examine whether voluntary turnover rates changed for 18- to 20-year old employees before and after the age-21 restriction was put in place in 2002. I restrict the sample to include only employees in this age group, and I only include the years 1999-2004. In addition, I include only employees who had been with the firm for more than 12 months and had worked over 20 hours per week. In effect, all employees in this sample were eligible to receive deferred compensation before 2002, and none were eligible from 2002 onwards. The primary variable of interest for this test is *pre_02*, an indicator variable equal to one for the years 1999-2001, and zero otherwise. If restricting eligibility among this age group weakened retention incentives, the hazard ratio for *pre_02* should be significantly less than one. Because turnover rates among 18- to 20-year olds may have changed across these years for reasons other than the change in eligibility rules, I control for the average monthly turnover rate for all 21-year-old employees at the firm. 21-year-olds represent an appropriate control group because they are very close in age to the employees in the sample, but they were not impacted by the change in eligibility requirements.

The results are presented in Table 2.5. As shown in Column 1, the hazard ratio for *pre_02* is not significantly different from 1, indicating that plan eligibility does not affect turnover behavior of employees under age 21. The contribution factor (i.e., the percentage by which an individual's earnings are multiplied to determine the annual

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contribution) during this period ranged from approximately five percent to almost six-and-a-half percent (see Table 2.2), which represents an implicit "raise" in the form of deferred compensation for eligible employees. Yet, it appears employees in this age category either do not consider the deferred component of pay when making stay or quit decisions, or else apply a sufficiently large discount to deferred compensation so as to mute the retention effects of this additional pay. As reported in Column 2, neither males nor females in the under-21 age group are affected by eligibility, as indicated by the insignificant hazard ratio on the interaction between *pre_02* and *female*. These results are consistent with those in Table 2.4 showing that eligibility has no association with turnover of young employees.

2.4.2.2 Tenure eligibility requirement

I examine whether the tenure cutoff for eligibility influences turnover by testing whether there is a discontinuity in turnover rates after reaching the 12-month employment requirement.[33] As before, the empirical difficulty is estimating the effect of the eligibility rule apart from the effect of tenure, which itself is expected to be associated with reduced turnover. To address this issue, I use a difference-in-difference design to compare the difference in turnover rates before and after 12 months of tenure for employees who are otherwise eligible (i.e., are over 21 and work at least 20 hours per week) and employees who are not. That is, the control group for this test is employees who are not otherwise eligible, and thus are not affected by the tenure eligibility requirement. The interaction term *over_12xeligible* is the difference-in-difference estimator, and a retention effect

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[33] Once an employee becomes eligible he or she receives written communication from the firm about the deferred compensation plan, and therefore additional retention effects may arise due to increased visibility and awareness of the plan.

associated with this eligibility rule would be reflected by a hazard ratio significantly less than 1.

As reported in Column 1 of Table 2.6, the estimated hazard ratio is less than one but is not significant, suggesting that eligibility among employees around the tenure cutoff does not influence turnover decisions. Turnover rates are particularly high among employees with low tenure, and these employees may not expect to be with the firm long enough to become vested in any contributions they received, thus muting any potential retention effect. Alternatively, notwithstanding efforts to provide materials about the plan, these employees simply may not be aware of their eligibility status either before or after reaching the 12 month requirement. To further examine whether the retention effect varies with employee characteristics, Columns 2 and 3 report hazard ratios for 3-way interactions of *over_12xeligible* and indicators for older than 30 and female, respectively. Although the effect of the 12 month eligibility requirement does not differ across young and old workers, Column 3 provides weak evidence that turnover rates among female employees after the 12 month cutoff are lower for eligible employees than for non-eligible employees.

2.4.2.3 Annual hours worked eligibility requirement

The third eligibility criterion is working 1,000 hours within each plan year. I test the effect of this requirement by examining voluntary turnover rates for employees who either received a grant in the prior year or did not, based on being just above or below the 1,000-hour cutoff.[34] In using this design, I assume that receiving a grant increases an

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[34] Note that this is a somewhat different test than for Tables 5–7. Tables 5–7 estimate the effect of eligibility in the current year on turnover rates, whereas the tests for Table 8 estimate the effect of

employee's awareness of the plan, and increases the employee's expectation of receiving a grant in the future. For this test, I focus on the subsample of employees who met the age and tenure requirements as of the end of the previous year, so that whether an employee received a grant is only a function of hours worked relative to the cutoff. In addition, to focus on the discontinuity, the analyses use only employees whose prior-year hours worked is within a window around the 1,000-hour cutoff (Imbens and Lemieux, 2008). The assumption motivating these tests is that, after controlling for the number of hours worked within a given window, employees above the cutoff are substantively similar to those below the cutoff.[35] While this assumption is more likely to hold the smaller the window size, there is a tradeoff of comparability between "treatment" and "control" subjects and sample size as the window gets larger. Following Imbens and Lemieux's (2008) suggestion for RD analyses, I report results for different window sizes.

The estimated results from this RD analysis are reported in Table 2.7. The variable of interest is *above_1000*$_{t-1}$, an indicator equal to one if the employee was above the hours cutoff in the prior year (and therefore received a grant), and zero otherwise. In addition to including control variables for other determinants of voluntary turnover, I include squared and cubed prior-year hours worked to control for the continuous variation in this forcing variable as flexibly as possible. Although the estimated effect for the lagged 1,000-hour indicator is negative across window sizes, the relationship is

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eligibility in the prior year (i.e., whether or not an employee received a grant). While both age and tenure (which primarily determine eligibility in the previous two tables) can easily be measured at the monthly level, hours worked is only measured annually. Therefore, to cleanly define eligible vs. ineligible employees with respect to the hours worked cutoff, I require hours worked data for the *completed year*, which is why for this test I examine the effect of prior-year eligibility on voluntary turnover.

[35] In interviews, managers indicated that whether an employee worked 1,200 hours or 800 hours (i.e., my largest window size) did not represent a meaningful distinction, as both levels were well below the full-time threshold.

significant only for window size of +/- 150 hours (p < .1) and +/- 200 hours (p < .05).[36][37]

The estimated hazard ratios using the +/- 200 hours window suggest that eligibility to receive a grant in the prior year reduces the rate of turnover by nearly 35% for employees near the eligibility cutoff. For a benchmark hazard rate of 7% monthly, these hazard ratios suggest an increase in expected employment duration of nearly eight months, representing a roughly 54% increase in expected employment duration. As in Table 2.4, this estimated effect is large compared to the effect of an additional dollar of hourly wage. In sum, the results in Tables 2.4–2.7 provide support for Hypothesis 1's prediction that eligibility is associated with reduced voluntary turnover. This effect is stronger for women and for older workers. Moreover, plan eligibility appears to be most important for employees at the margin of the 1,000-hour cutoff.

2.4.3 Effect of contribution amounts on voluntary employee turnover

I next examine the moderating effect of contribution amounts on the relationship between eligibility and turnover. The amount of money contributed to the profit-sharing plan varied from year to year, and the contribution size rose dramatically starting in 2007 due to an increase in the percentage of profits used to compute contributions. Total contributions were 10% of profits prior to 2007, and 15% from 2007 onwards. This

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[36] Restricting these tests to only include employees within a relatively small window of hours worked significantly reduces the sample size for these tests. That the hazard ratio for *above_1000_{t-1}* is similar across windows and is increasing in significance as the sample increases suggests that the tests relying on the smaller windows may suffer from a lack of statistical power.

[37] To address concerns that these results are driven by the size of the window (i.e., comparing employees who are not comparable due to the difference in hours worked) and not the eligibility distinction, in unreported analyses I perform "placebo" tests using a window size of +/- 200 around cutoffs of 800 and 1200 hours, respectively. In both these cases the window does not include the true eligibility cutoff. I do not find that being above these artificial cutoffs has a statistically significant effect on turnover after controlling for hours worked, with a p-value of .71 and .35 for the 800-and 1200-hour cutoffs, respectively. Therefore, I conclude that the results reported in Table 2.7 are driven by the eligibility cutoff at 1000 hours, and not unobservable differences due to the size of the window.

change resulted in a substantial increase in total contributions, and therefore in the contribution factor determining individual grants as well. Since the total amount contributed to the plan is a function of firm profits, the effect of eligibility on turnover is likely to vary with employees' expectations of the portion of profits that will be allocated to the plan. Employees are given detailed quarterly reports of firm performance, including profits, so it is likely employees can form reasonable expectations of annual profits throughout the year. I proxy for employees' expectations of annual contributions using actual dollar contributions to the plan, scaled by contributions in 1999.[38] The scaling produces an index that captures plan contributions relative to 1999 contributions (the first year with available data). In addition to the change in percentage of profits contributed to the plan, in 2007 the firm shortened the vesting schedule by one year due to a change in ERISA requirements for tax-qualified retirement plans, and also began investing new contributions exclusively in the ESOP plan.

To control for changes in turnover rates over time that are due to factors other than changes in the deferred compensation plan, I use a difference-in-difference research design to compare the change in turnover rates before and after 2007 for both eligible and non-eligible employees. If changes in plan characteristics influence turnover rates, I expect the effects to exist only for eligible employees. Table 2.8 reports results from hazard analyses designed to test the effect of contribution size, as well as the effect of other changes in plan characteristics on employee turnover. I first examine the average effect of the combined 2007 changes (i.e., the increase in contribution size, the shorter vesting schedule, and the exclusive focus on the ESOP) by estimating voluntary turnover

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[38]I also use actual current and prior year plan contribution percentages and find similar results.

rates as a function of an indicator variable equal to one for the years 2007 and later, and zero otherwise. As reported in Column 1, the coefficient on the interaction term *eligiblex2007* is significantly less than 1, indicating that the combined changes in plan characteristics increased the association between eligibility and reduced voluntary turnover. Whereas eligibility in the pre-2007 period is associated with a turnover rate reduction of almost 12%, for 2007 and later eligibility is associated with a turnover reduction of approximately 24%. To disentangle the effects of contribution size from the other changes, I include an additional interaction variable *contributionxeligible* in Column 2 to investigate whether the eligibility effects vary with contribution size. When I include both interactions, it is apparent that the entire turnover reduction associated with plan changes is due to increased contribution levels, with no significant effect from the other changes. The estimates in Column 2 imply that doubling contribution size compared to the baseline level in 1999 increases the effect of eligibility on turnover rates by an additional 4.6%.

Because a change in the vesting period in particular may have different effects depending on where the employee stands in relation to the vesting schedule, I estimate the model separately for employees with tenure between 12–36 months and employees with tenure between 36–84 months. The results in Columns 3 and 4 suggest that a shorter vesting schedule does not impact the relationship between eligibility and turnover decisions regardless of tenure. Taken together, the evidence in Table 2.8 supports Hypothesis 2's prediction that contribution levels moderate the effect of eligibility on voluntary turnover.

2.4.4 The association between unvested holdings and voluntary turnover

I test Hypothesis 3 by estimating Cox hazard models of voluntary turnover rates as a function of the value of unvested holdings.[39] I again control for underlying variables that determine grant size and are likely to be correlated with turnover rates. Grant size in a given year is a function of whether the employee is eligible for a grant and the wages earned during the year. Although I can rely on the discontinuities associated with eligibility to provide variation in the value of unvested holdings, variation also results from differences in contribution rates and differences in the return on plan assets across time. In addition, the value of unvested holdings varies across time for a given employee as the portion of holdings that are vested changes and as the vesting requirements are achieved.

I estimate separate hazard models for each position to investigate whether the effects of unvested holdings varies across organizational levels. In addition, I eliminate employees who are already fully vested (i.e., employees over age 62 and employees with tenure over 7 years). Columns 1 through 4 of Table 2.9 report hazard ratios for CSRs, hourly managers, assistant store managers, and store managers, respectively. Column 1 shows that an additional $1,000 of unvested holdings reduces the rate of voluntary turnover by almost 26% for CSRs. Control variable results are also generally consistent with expectations and previous tests. However, as seen in Columns 2 through 4, there is no significant relationship between the value of unvested holdings and voluntary turnover for managerial employees. As discussed earlier, employees in hourly manager and higher

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[39] Alternatively, it may be the case that the impact of unvested holdings on turnover behavior depends on the size of the holdings relative to the employee's non-deferred wages (i.e., $1 of unvested holdings may mean more to an employee earning $10/hour as opposed to $15. To address this possibility, in unreported tests I scale the value of unvested holdings by *weekly_wage*, and inferences remain unchanged.

positions differ substantially from their CSR counterparts in terms of age, tenure, wage, and hours worked. These differences may create other, more powerful retention incentives that crowd out the effect of unvested holdings. For example, the higher wages associated with promotions may exceed what employees with these skills can obtain elsewhere. If current pay provides sufficiently powerful incentives for managerial employees to stay, unvested holdings may provide little incremental retention incentive.[40] Alternatively, the quality of outside opportunities available to employees above the CSR level may be substantially greater, increasing the likelihood that a job change more than compensates managerial employees for forfeited holdings. Another possibility is that after accumulating sufficient tenure to be promoted, employees in higher positions recognize a superior fit with the firm, and therefore are reluctant to leave (e.g., Jovanovic, 1979; Mitchell et al., 2001). Consistent with the latter explanation, voluntary turnover rates are dramatically lower for employees above the CSR level. Thus, for employees above the CSR level, there may simply be less scope for deferred compensation to influence turnover decisions to begin with.

Because vested holdings are highly correlated with unvested holdings and potentially provide countervailing incentives to separate from the firm (i.e., an employee cannot cash out of his or her vested holdings until after leaving the firm), I include vested holdings as an additional control in models 5 through 8. As before, unvested holdings are

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[40] Another potential explanation is that while the overall effect of unvested holdings is not significant, there is a significant effect for employees whose holdings are above some threshold. For example, while low levels of unvested holdings may not provide enough incentive to influence turnover decisions, at higher levels the effect begins to manifest. I explore this possibility in two unreported analyses. First, I replace *unvested_1000* with indicator variables for terciles within each position group, to test whether a "high" level of holdings has a retention effect. Second, I include separate variables for *unvested_1000* for each tercile of holdings within each position group to explore whether the effect depends on the level of unvested holdings. In both sets of analyses, I fail to find significant effects of unvested holdings.

associated with lower CSR turnover rates, but have no significant association with reduced turnover of managerial employees.[41] In addition, I find no significant relationship between vested holdings and voluntary turnover, suggesting that employees do not tend to leave the firm in order to access vested plan holdings. These results provide mixed support for Hypothesis 3. While unvested holdings are significantly associated with reduced voluntary turnover among CSRs, there is no association for managerial employees.

2.4.4.1 Investment of plan holdings

Table 2.10 investigates whether retention effects differ depending upon whether plan contributions are invested in company stock or diversified mutual funds. I conduct tests similar to those in Table 2.9, but replace total unvested holdings with separate variables for holdings invested in the firm's ESOP and holdings invested in diversified funds. For CSRs, $1,000 of unvested ESOP holdings is significantly associated with a turnover rate reduction of nearly 32%. In contrast, the hazard ratio for unvested mutual fund holdings is closer to one (indicating a 12% reduction in turnover rate) and is not significant at conventional levels (p = .10). This evidence suggests that among CSRs, the retention effects of unvested holdings are driven primarily by the holdings invested in employer stock. However, consistent with the total holdings results in Table 2.9, I do not find a significant relationship for either unvested ESOP or mutual fund holdings when examining employees above the CSR level. In Columns 5 through 8, I control for the

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[41] Contrary to expectations, Column 8 of Table 10 reports that unvested holdings are associated with *increases* in turnover rates among store managers. Due to the relatively small sample size for this test and the high correlation between vested and unvested holdings, it is possible that this represents a spurious result due to multicollinearity. When either unvested or vested holdings are included in the model separately, there is no significant association with turnover for store managers.

value of total vested holdings and find similar results.[42] In particular, although the hazard ratio for unvested diversified holdings is less than one (p < .10), the effect of unvested ESOP is larger and the difference in these hazard ratios is highly significant (p < .01 level). The results in Table 2.10 suggest that deferred compensation that is invested in company stock is particularly effective for reducing employee turnover. This finding is consistent with Hypothesis 4 and supports claims that broad-based equity plans are especially beneficial for achieving retention objectives (e.g., Oyer and Schaefer, 2005).

2.5. Conclusion

This chapter utilizes detailed records from a large retail firm to examine the retention effects of deferred compensation plan characteristics. I rely on eligibility cutoffs for plan participation to identify discontinuities in employees' retention incentives related to the plan. I find that plan eligibility is associated with a statistically significant decrease in the rate of voluntary turnover of non-managerial employees. Among these employees, plan eligibility is associated with a decrease in voluntary turnover of between 15–35%. However, the eligibility effect depends upon the specific eligibility requirement, the size of contributions, and employee characteristics. In additional tests, I find that the value of unvested plan holdings is associated with reduced turnover rates among low-level employees, and this effect is stronger when unvested plan assets are invested in company stock. In contrast, I do not find a significant, negative relationship between unvested

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[42] In Table 11 Columns 5-8 I control for total vested holdings rather than controlling separately for vested ESOP and mutual funds due to concerns with multicollinearity. The correlation between vested ESOP and mutual funds is particularly high, and VIFs for the separate vested components are both over five. When vested ESOP and mutual fund holdings enter the model individually, both components of unvested holdings are significantly negatively associated with voluntary turnover. In addition, vested ESOP holdings are not significantly associated with turnover, while vested mutual fund holdings are significantly positively associated with voluntary turnover. Because the focus of Table 11 is on the effect of investment allocation for *unvested* holdings, I do not conduct further analysis of the components of vested holdings.

holdings and voluntary turnover for employees in management positions. Collectively, my results suggest that employees may respond to the retention incentives implicit in deferred compensation plan characteristics, but that the strength of these incentives is determined both by specific plan characteristics (e.g., eligibility criteria, level of contributions, and investment allocation of plan assets) and employee characteristics (i.e., discount rates and position in the organizational hierarchy).

An important limitation of my study is the use of data from a single large firm, and therefore generalizing these results to other firms in different settings should be done with caution. Nevertheless, focusing on a single firm allows me to capture employee data and plan characteristics at a level of detail unavailable in any broad-sample dataset. Using detailed, employee-level data, as well as having access to plan documentation to identify discontinuities in retention incentives, allows me to construct powerful tests of the effects of plan characteristics on voluntary turnover.

This research has implications for academics studying the retention effects of deferred compensation. Prior research has generally examined whether the *existence* of a deferred compensation plan is associated with reduced turnover, but my results suggest that the *characteristics* of a plan determine retention incentives at the employee level. In addition, the findings of this chapter should interest practitioners designing deferred compensation plans, as I document that employee characteristics moderate the relationship between deferred compensation and voluntary turnover. This suggests that a "one size fits all" approach to designing deferred compensation plans may not result in the desired retention effects among all employee groups.

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3. The Impact of Broad-Based Equity Compensation on Business Unit Performance

3.1. Introduction

Despite the widespread practice of rewarding individual, non-executive employees based on firm-level outcomes, there is ongoing debate in the literature about the rationale underlying its popularity (e.g., Oyer and Schaefer, 2005; Hall and Murphy, 2003). At the center of this debate is a lack of consensus about the performance consequences of these common pay practices. A key point in this debate is whether this form of "pay for performance" can provide effort incentives for non-executive employees. Critics of the incentive view argue that freeriding will crowd out incentive effects (e.g., Alchian and Demsetz, 1972), and therefore there should be no positive performance effects from broad-based equity plans. This argument is particularly relevant for employees at lower levels of the organization, whose *individual* effort is unlikely to have any discernible influence on firm-level performance.

On the other side of the debate, academics and practitioners have argued that equity compensation can provide incentives, and thus improved firm performance, by giving employees a "piece of the pie" (Freeman et al., 2010). In addition to the typical pay-for-performance arguments for inducing increased employee effort, proponents argue that equity compensation can also improve cooperation and innovation by helping employees "think like owners" (e.g., Klein et al., 1987). More broadly, recent studies argue that equity compensation can lead employees to psychologically identify with the firm, thus aligning incentives and creating employee loyalty (Stiglitz, 2000; Kruse et al., 2008; Pierce et al., 2001). Beyond the possibility of inducing employees to work harder,

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academics have also proposed alternative explanations for these compensation practices, such as retention and sorting benefits (Oyer, 2004; Lazear, 2004; Hales et al. 2012). However, empirical evidence of the performance effects of broad-based equity compensation, whether due to improved effort, reduced turnover, or employee sorting, is limited. This chapter seeks to address this gap in the literature by examining monthly unit performance in a large retail firm that uses an ESOP plan.

Prior research on the performance effects of equity compensation has relied on broad samples to study variation across firms, but the endogenous choice to offer equity compensation has made it difficult to draw inferences (Hochberg and Lindsay, 2010; Sesil and Lin, 2011). In contrast, I study the performance effects of employee ownership within a single firm, and therefore participation in the plan is relatively exogenous at the unit level. In addition, whereas prior research has used company-level summary measures of performance, I examine the effects at the business unit level. By removing layers of performance aggregation implicit in a broad, cross-sectional research design, I am potentially able to construct more powerful tests of the effects of equity compensation on ownership.

I find that equity compensation, in the form of an ESOP, is associated with store-level performance. Specifically, at the store level, a one standard deviation increase in the dollar value of stock grants to entry-level employees is associated with an increase in monthly profits of 2.3%, after accounting for the cost of the grants. A one-standard deviation increase in grants to store managers is associated with an increase in profits of 5.8%. In addition, I take advantage of the detailed personnel data to test whether reduced employee turnover is a channel through which performance effects manifest. I find that

equity compensation is associated with reduced employee turnover, and reduced turnover is associated with better profitability.

This paper makes several contributions to the literature. First, in showing that participation in an employee share ownership plan is positively associated with unit performance, I add support for the contention that firm-level incentives can impact individual behavior. Prevailing theories in the economics and related literatures do not predict observed levels of broad-based equity compensation, and so equity compensation provides a particularly stark contrast between observed practice and academic theory (Hall and Murphy, 2003).

Anecdotal evidence collected from my field setting provides insight into the equity compensation puzzle. To this point, explanations in the economics literature for why effort incentives from equity compensation may not be undone by freeriding are based on mutual monitoring and sanctioning (Kandel and Lazear, 1992). However, in interviews with store-level employees, the dominant belief was that, contrary to economic theory, *individual* performance does have an impact on firm performance. Therefore, in addition to cooperative behavior, I propose an explanation based on employee beliefs.[43] To the extent that these "behavioral" factors have not been adequately modeled in the prior economics literature, this study provides a potential explanation for the inability of economic theory to predict observed compensation practices.

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[43]In a similar vein, Bergmann and Jenter (2007) argue that broad-based options plans may be motivated by employee optimism, causing employees to "overpay" (in terms of forgone cash compensation) for equity compensation.

Second, by documenting an association between ownership and turnover, I add support to recent theoretical arguments suggesting that retention concerns are important motivations for equity compensation plans (e.g., Oyer and Schaefer, 2005). These findings contribute to the literature on the relative importance of different compensation objectives as motivating the use of equity compensation (e.g., Gerakos et al., 2012; Core and Guay, 2001; Oyer, 2004; Oyer and Schaefer, 2005).

Finally, an important contribution of this study is that I document performance effects of equity compensation for employees below the executive level. To this point, the majority of research in this area has focused on CEOs and other "top 5" executives (e.g., Hanlon et al., 2003), even though the large majority of equity compensation is granted below the executive level.[44] Prior studies that do look below the executive level have either focused on industries characterized by knowledge workers (e.g., Ittner et al., 2003), or else do not differentiate among employee types across broad cross sections of industries. In this paper, I focus exclusively on ownership among retail store employees. At lower levels of an organization, *individual* effort is likely to have minimal impact on stock price, and thus incentives provided by equity compensation to these employees are expected to be particularly weak. By showing that employee ownership can improve performance even among non-managerial employees, I potentially provide a lower bound for the performance effects of equity compensation.

The remainder of this chapter is organized as follows: In the next section, I provide an overview of theoretical predictions about the performance effects of equity

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[44] Hall and Murphy (2003) document that in their sample, non-executive equity grants accounted for over 90% of total grants.

compensation. Section 3.3 discusses the sample and measures used for the empirical analysis. In Section 3.4, I present my results. Conclusions are provided in section 3.5.

3.2. Background and Hypotheses

Equity compensation for non-executive employees is increasingly common. As of 2010, approximately 28 million private-sector employees in the U.S. hold stock or options through broad-based option and restricted stock plans, ESOPs, or stock-based employer contributions to individual 401(k) accounts (NCEO, 2013). This makes up over a third of all workers employed by for-profit corporations. As equity represents an increasingly important component in compensation contracts, academics are interested in understanding the motivation behind this practice, and its effects. The primary rationale offered in the academic and practitioner literature is that equity compensation aligns employees' interests with outside shareholders' (e.g., Kruse et al., 2008; Stack, 2003; Rosen et al., 2007). For example, Mitchell and Utkus (2003) discuss the perceived benefits driving the popularity of equity compensation and note, "The goal of employee ownership of the firm's shares…is to increase efficiency, worker productivity, employee morale, and, ultimately, the firm's value" (p. 23). Proponents of equity compensation argue that tying employees' payoffs to firm-level outcomes provides incentives to increase effort, cooperation, and innovation, because employees share in the corresponding profit increases.

However, many economists have questioned the incentive-based explanations for equity compensation. Broad-based equity plans distribute ownership among lower levels of the employee hierarchy, where individual actions are expected to have negligible impact on firm performance. Moreover, because rewards for an individual's efforts are

shared so diffusely among shareholders, the pay-for-performance link is particularly weak, and incentives to freeride likely dominate rewards for higher effort (Alchian and Demsetz, 1972). Providing equity compensation to these employees is therefore commonly assumed to have no incentive effects (Oyer, 2004). The popularity of broad-based equity compensation is viewed as inconsistent with economic theory, and academics have thus turned to alternative (i.e., non-incentive-based) motivations for these compensation practices: retention (Oyer and Schaefer, 2005; Oyer, 2004; Core and Guay, 2001), attraction (Oyer and Schaefer, 2005), cash constraints (Core and Guay, 2001), accounting expensing rules (Hall and Murphy, 2003), employee optimism (Bergman and Jenter, 2007), and favorable tax treatment (Mitchell and Utkus, 2003). While some of these motivations imply direct performance effects of broad-based equity plans, others do not. As Ittner et al. (2003) observe, the question of whether equity compensation is associated with firm performance is thus "crucially important for understanding observed compensation contract designs" (p. 96).

Empirical evidence for an association between broad-based equity compensation and firm performance is limited, with mixed findings in the prior research. Several early studies examine the performance effects of broad-based ownership using both cross-sectional (i.e., comparing adopters to non-adopters) and longitudinal (i.e., comparing pre- and post-adoption performance) research designs. In their review, Kruse and Blasi (1997) note that while these studies generally find positive performance effects (in terms of firm-level productivity and profitability), only 3 of 21 studies report significant results at conventional levels. However, using meta-analytic tests, they conclude that the body of

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these early studies suggests positive and significant performance effects from broad-based ownership.

Two more recent studies examine the use of broad-based equity compensation in "new economy" firms, and both find mixed overall evidence for performance effects. Ittner et al. (2003), in exploratory analyses, find that lower than expected option holdings for non-executive employees are associated with lower subsequent accounting and stock price performance, but also find that lower than expected overall equity holdings are associated with *increased* stock returns. Moreover, the authors conclude that their tests provide little evidence that equity grants to lower-level employees are associated with performance effects. In a related study, Sesil et al. (2002) find that while firms with broad-based option plans have higher Tobin's Q, pre- and post-adoption comparisons do not yield significant differences.

Recent studies using large, broad samples of public firms also report mixed and conflicting evidence. Hochberg and Lindsay (2010) find that both the existence of a broad-based plan and the level of implied incentives for non-executive employees are associated with increased accounting performance. However, Aboody et al. (2010) conclude that the incentive effects of option grants to non-executive employees are negligible and do not manifest in firm profitability. Sesil and Lin (2011) find that broad-based equity plan adoption is associated with a short-term improvement in performance, but the improvement does not persist beyond the first year after adoption.

Given the conflicting theoretical predictions for the effects of broad-based equity compensation, as well as the limited and mixed findings in the prior literature, I

investigate the performance impact of equity compensation in my sample firm. My first hypothesis (in alternative form) is as follows:

H1: Equity compensation is positively associated with store performance

Several recent studies have discussed the importance of testing the effects of equity incentives for executives (typically the CEO or "top 5" employees) apart from the effects for non-executive employees (e.g., Oyer and Schaefer, 2005; Hochberg and Lindsey, 2010; Sesil and Lin, 2011). However, below the executive level, employees are typically treated as homogenous (see Ittner et al. (2003) for an exception). Employees at different levels within the organization may respond differently to equity incentives (Ittner et al., 2003; Landsman et al., 2007). For example, if entry-level employees have lower expectations of the marginal impact of their effort, the pay-for-performance link may be perceived as weaker and thus equity will have lower incentive value than managerial employees. In addition, to the extent that employees at higher levels are more likely to view their current employment as part of a long-term career relationship, these employees are more likely to experience increased organizational identification and commitment as a result of having an ownership stake, and therefore respond with a greater increase in effort. Another reason for differential performance effects is that even if equity compensation has the same motivational impact, entry-level employees may collectively have less ability to impact store performance. To allow for differences in the effects of equity compensation across organizational levels, I test for performance effects for each level within the store hierarchy separately.

As discussed above, several recent studies have argued that employee retention, and not effort incentives, is the primary motivation for the use of broad-based equity

plans, and some studies have documented retention effects from various types of equity compensation plans (e.g., Russell, 2006; Wilson and Peel, 1991).[45] However, prior literature has not tested for the performance impact of retention benefits from equity plans, or examined the relative importance of employee retention apart from other potential mechanisms (e.g., effort incentives). The following set of hypotheses (in alternative form) addresses these two issues:

H2a: Equity compensation is positively associated with store performance through an association with reduced employee turnover.

H2b: Equity compensation is positively associated with store performance after controlling for its impact on employee turnover.

3.3. Data and Measures

Data for this chapter includes all units of a large retail firm located in the U.S. for the years 2007-2009. Stores that do not have data over the entire period (due, for example, to a store opening or closing during the sample period) are excluded from the analyses. Monthly unit performance data were obtained from the company's accounting system, which combined with the firm's employee records make up the primary data source for this chapter.

The sample firm operates an ESOP, which has been in place for several years prior to the sample period. Under the plan, eligible employees receive an annual stock contribution from the company to an individual retirement account that is managed by a

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[45] Research on the determinants of broad-based equity plans provides indirect evidence for retention benefits from these plans (e.g., Core and Guay, 2001; Oyer and Schaefer, 2005, Gerakos et al., 2012).

third party.[46,47] The plan is structured as a qualified retirement plan for Federal income tax purposes, which requires that plan provisions (e.g., eligibility cutoffs and vesting schedules) conform to guidelines for tax-qualified plans outlined by the Employee Retirement Income Security Act (ERISA). Structuring deferred compensation as a retirement plan impacts the timing of ultimate payouts and the administrative details of the plan, but otherwise the plan is very general in that it gives employees an ownership stake in the company, and therefore ties individual employees' payoffs to the performance of the company (i.e., similar to restricted stock and stock option plans).[48]

Store performance. Following prior literature examining unit performance within retail firms (e.g., Ton and Huckman, 2008; Glebeek and Bax, 2006), I measure unit performance using store profitability. Profitability is defined as gross profit less shrinkage and spoilage, and less wage expense, and is calculated monthly. This measure of profitability is used by the firm to evaluate store financial performance. Because my interest is in measuring the total impact of the firm's equity compensation plan on unit performance, including both the benefits as well as the costs, I construct a *net* profitability measure by adjusting for the dollar amount of grants made to employees for the current year.[49] Since equity compensation is only granted annually, I estimate the

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[46]Current employees are restricted from accessing their funds until after retirement. However, employees can receive distributions from their *vested* plan holdings before retirement age if they separate from the company for any reason.

[47] For details on eligibility criteria and contribution rates, see section 2.2.2 of this dissertation.

[48] Distributing shares to employees through retirement plans such as ESOPs or 401(k) plans is a common means of promoting employee ownership (Mitchell and Utkus, 2003). The National Center of Employee Ownership estimates that there are approximately 12 million such plans in the U.S. (NCEO, 2013). Prominent examples of firms in the retail industry using these types of plans include Walmart and McDonalds (Brightscope.com).

[49] Adjusting for the cost of grants in this way is similar to the procedure used by Hochberg and Lindsay (2010), although they make their adjustment for slightly different reasons. Hochberg and Lindsay (2010)

monthly cost of grants for each employee category by dividing the total annual grants to those employees (within each store) by 12.

Equity compensation. In general, measurement of equity compensation for non-executive employees in the prior literature is limited by data availability, and requires numerous assumptions. Moreover, differences in measurement techniques potentially contributes to the mixed findings in the literature (e.g., Core and Guay, 2001; Oyer and Schaefer, 2005). In contrast, I use detailed employee records to construct measures of equity incentives more directly and with fewer required assumptions than has been possible in prior studies. In broad terms, prior research has used three approaches to measure equity incentives for non-executive employees. First, several studies measure equity compensation in terms of the percentage of employees covered by the plan. For example, Hochberg and Lindsay (2010), Oyer and Schaefer (2005), and Sesil et al. (2002) use indicator variables for firms that have "broad-based" plans, defined as equity plans that cover at least 50% of employees. An advantage of this approach is that it does not make assumptions about how employees value their equity compensation or their conceptions about the link between firm performance and individual payoffs. Moreover, theoretical arguments in the management literature suggest that an important mechanism through which equity compensation influences employee behavior is its impact on employees' identification with the firm (e.g., Simon, 1991). It may be that the symbolic impact of ownership *per se*, and not the dollar value of equity holdings, is the important factor driving employee identification.

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subtracted the Black-Scholes cost of option compensation to avoid a mechanical association with performance through lower reported compensation expense.

Second, recent studies measure equity compensation in terms of employees' implied incentives from holding equity. For example, Core and Guay (2001) and Hochberg and Lindsay (2010) estimate combined portfolio deltas (i.e., the dollar change in wealth for a 1% change in stock price) for employees below the top-5 executives. An appealing feature of this method is that it directly accounts for the fact that compensation plans differ in the amount of equity granted, and the resulting differences in economic incentives provided to employees.

Third, a related method is to estimate the value of recent equity grants to non-executive employees, rather than the entire stock of cumulative holdings (Ittner et al., 2003; Kedia and Mozumdar, 2002). To the extent that current equity grants are more salient to employees than grants made in the past, measuring incentives based on recent grants may be appropriate.[50]

Because each of these approaches has its advantages, I calculate separate measures of equity compensation that are conceptually similar to each approach. First, I calculate the percentage of employees within each store that received an ESOP grant for the prior year. As discussed in Chapter 2, eligibility to receive an ESOP grant depends on reaching tenure, annual hours worked, and age cutoffs. Of the four hierarchical levels, only employees at the lowest level exhibit meaningful variation with respect to these cutoffs (and hence variation in the percentage receiving grants), and therefore I calculate

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[50] Hochberg and Lindsay (2010) find that roughly 50% of the portfolio delta in their sample is due to current grants compared to previous grants.

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this measure for CSR employees only.[51] Second, I measure the average dollar value of ESOP holdings within each store by dividing cumulative ESOP holdings by the number of active employees. I calculate this measure for each level within the store hierarchy separately. Third, I measure the average dollar value of the most recent ESOP grant within each store, again separately for each employee level.

As discussed above, prior studies examining the relationship between equity incentives and performance have either relied on variation in equity plans across firms or compared pre- and post-plan adoption performance within firms. In contrast, my sample firm had the same plan in place for all stores during my sample period. Therefore, to test my hypotheses I rely on variation from three sources. First, for the CSR level, employees vary in terms of eligibility to participate in the ESOP plan. Each of the three variables determining eligibility (age, hours worked, and tenure) are potentially associated with store performance, regardless of equity compensation. Therefore, I include controls for the percentage of CSR employees achieving each individual cutoff. After controlling for the individual determinants of eligibility, I interpret the coefficients on the equity compensation measures as the effect of equity compensation apart from the effects of employee tenure, age, and workload.[52,53]

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[51] Over 75% of employees above the CSR level are eligible to receive a grant in a given year (compared to roughly 28% for CSR employees), and the remaining variation is almost completely determined by employee tenure.

[52] In additional analyses, I repeat regressions with and without each of the underlying eligibility factors. Inferences remain unchanged, suggesting that results are not driven by collinearity with the underlying eligibility criteria.

[53] A potential concern is whether, after I have controlled for the underlying eligibility variables, there is meaningful variation in the equity compensation variables. To address this, in unreported analysis, I regress *%received_grant* on the three eligibility variables. While each of the eligibility variables is highly significant, the R-squared of the model is .54, suggesting that at the store level, these variables explain only

Second, while the fundamental structure of the ESOP plan was constant over my sample period, the relative size of equity grants varied across years. Therefore, employees hired at different times have different levels of equity incentives.[54] Third, in a given year the size of each employee's equity grant is proportional to her total earnings, so employees with different past wage rates and workloads have different levels of equity holdings. I assume that after controlling for *current* wage rates and workloads (i.e., the determinants of current earnings) past wage rates and workloads are not associated with current store performance, except through their association with past equity compensation.

Employee Turnover. I follow the convention established in recent studies on the performance effects of employee turnover (e.g., Ton and Huckman, 2008; Siebert and Zubov, 2009; Shaw et al., 2005) by measuring turnover as the total number of employee separations in a period divided by the average number of employees active during the same period. In order to allow sufficient time for the effects of employee turnover to manifest in store performance, I calculate the average turnover rate over the prior three months (Ton and Huckman, 2008). Turnover is measured for each employee level separately.

Control Variables. In addition to the above variables, I control for other determinants of store performance used in prior studies. I include *store age*, calculated as the natural log of the number of months since the store opened. I also include *store size*, measured in

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about half of the variation in *%received grant*. This is because employees can reach eligibility requirements on one dimension (e.g., tenure) while failing to reach on another dimension (e.g., hours worked).

[54]As discussed, I control for employee tenure to account for differences in employee skills and knowledge due to different lengths of experience with the firm.

thousands of square feet. The participating company operates stores with two different business formats, which differ with respect to the breadth of products offered. I include an indicator variable, *format*, equal to one for stores with the larger product offering, and zero otherwise. I include the median household income and population density, measured at the county level from the 2010 U.S. census to control for differences in potential customer bases. To control for differences across stores in potential labor supply, I control for the local unemployment rate, calculated at the county level. I also include month and year effects, to control for seasonality and time trends in the data, respectively.

3.4. Results
3.4.1 Descriptive statistics.

As shown in Table 3.1, employee characteristics vary widely across hierarchical levels, with *tenure*, *workload*, *age*, and *wage* all increasing at higher levels within the store. As discussed above, these differences potentially result in variation in employees' perceived ability to impact store performance and relative importance (both economical and psychological) of equity compensation, and therefore support the need to examine the effect of equity compensation separately for each hierarchical level. Not surprisingly, there is also wide variation across positions in the average level of equity incentives. For example, CSR employees on average hold $981 of company stock through the ESOP plan (*equity holdings*), and that increases to $5093, $6534, and $19302 for hourly managers, assistant store managers, and store managers, respectively. Also note that there is substantial variation in the level of aggregate *equity holdings* across stores in the

sample, particularly at the CSR level. For example, for CSR employees, going from the first to the third quartile in *equity holdings* represents an almost 300% increase.

3.4.2 Analysis of the effects of equity compensation on store performance

Table 3.2 presents regressions of store performance on several different measures of equity incentives, as well as controls for the employee characteristics underlying eligibility, along with store characteristics. Panel A includes the analysis for CSR employees, for whom I calculate all three of the primary equity measures discussed above. Because of the time-series nature of the data (i.e., I observe the same stores across many months), I report standard errors (in parentheses) clustered at the store level in these and subsequent analyses. As shown in Columns 1-3, each measure of equity compensation is significant and positively associated with store profitability, with significance ranging from the .01 to the .10 levels. The estimated coefficient in Column 1 suggests that an increase in the average grant to CSR employees of one dollar is associated with an increase in store profitability (adjusted for the cost of grants) of roughly \$8.5.[55] Note that since the average store employs approximately 22 CSR employees, the company would have to grant in total an additional \$22 to realize the associated \$8.5 increase in profits implied by the coefficient. As a way to gauge the economic magnitude of this effect, a one-standard-deviation change in *equity grant*

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[55] As discussed above, equity compensation is strongly correlated with the underlying eligibility criteria (age, tenure, and hours worked), which are themselves likely to be associated with store performance. To check whether my results are significantly impacted by multicollinearity, I examine variance inflation factors (VIF) scores. The VIF scores are generally below 3, and therefore do not indicate serious problems with multicollinearity. In addition, in untabulated analyses, I estimate separate regressions excluding each of the eligibility criteria and equity compensation measure in turn, and inferences remain unchanged. As an additional precaution, to control more flexibly for the continuous variation in the eligibility criteria, I include up to 4th degree polynomials of each of the eligibility criteria as controls, and again inferences remain unchanged.

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($260) is associated with an increase in store profitability of $2175. Similarly, a one-standard deviation increase in the percentage of CSR employees who received an equity grant in the prior year (14.2%) is associated with an increase in profitability of $2032, while a one-standard-deviation increase in the average equity holdings ($809) is associated with an increase in profitability of $4738. Collectively, these results provide consistent evidence for a positive association between equity compensation and unit-level performance, supporting Hypothesis One. In terms of the other control variables included in the regression, results are generally of the expected sign. Employee tenure is positively associated with store performance, consistent with employees gaining ability and building customer rapport with experience. While the negative association with the percentage of full-time employees is not intuitive, it is consistent with the findings in Ton and Huckman (2008). Larger and more established stores are more profitable, as well as stores in wealthier and more densely populated areas. In addition, when unemployment rates are higher, perhaps proxying for the availability of qualified labor, profits are higher.

Panel B of Table 3.2 presents estimates for the effects of equity compensation to hourly managers, assistant store managers, and store managers. As discussed above, for each of these employee levels I examine only the average ESOP holdings and the average prior-year ESOP grant, and exclude the percentage receiving a grant due to a lack of variation in the data. However, for these remaining measures, there is a potential concern that the lack of variation in eligibility induces multicollinearity among the equity measures and the employee characteristics. *Equity holdings* for employees above the CSR level has a particularly strong correlation with *tenure*, making it difficult to reliably

estimate the unique effect of *equity holdings* apart from the effect of employee tenure. Examination of VIF scores for *equity holdings* and *tenure* are between seven and nine for each of the regressions using *equity holdings*, and the sign and/or significance of the *equity holdings* and *tenure* coefficients change depending on whether the other variable is included or not (in each case, omitting the control for *tenure* results in a significantly positive estimate for *equity holdings)*. While *equity grant* is also significantly correlated with *tenure,* the correlation is much smaller. VIF scores for models using *equity grant* are generally below two, suggesting that multicollinearity is much less a problem with this measure of equity compensation. In other words, while the *stock* of equity compensation is substantially determined by employee tenure, the *flow* of equity compensation is less so. Therefore, the results reported in Table 3.2 and subsequent analysis focus on the dollar value of equity grants. Turning to the results in Column 3 of Panel B, I find that the dollar value of recent equity grants to store managers is significantly and positively associated with store profits.[56] Specifically, I find that an additional $1 granted to a store manager is associated with an average increase in profits of $2.54. I am unable to find similar evidence for an effect of grants to either assistant store managers or hourly managers, as the coefficients on *equity grant* in both regressions are not significant. However, omitting the control for tenure in either regression does result in significant and positive estimates. Therefore, while I fail to document a unique effect of equity

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[56] As mentioned, VIF scores following this regressing are generally less than two. In untabulated analyses, I re-run the regression omitting either *tenure* or *equity grant*. While size and significance of *tenure* increases with the omission of *equity grant*, the coefficient for *equity grant* remains relatively unchanged with the exclusion of *tenure,* suggesting that the positive and significant estimate for *equity grant* is not due to multicollinarity.

compensation for these employees, this is possibly due to limitations in the data (i.e., multicollinearity).

3.4.3 Analyses of employee turnover as a mediating variable

As discussed above, recent studies have argued that employee retention, and not the provision of incentives, is the primary motivation for the use of broad-based equity plans (Oyer, 2004; Oyer and Schaefer, 2005). In this section I investigate whether employee turnover mediates the effect of equity compensation on performance, and in particular, whether the performance effects documented in the previous section derive primarily from retention benefits. In the parlance of mediational analysis, equity compensation in this case represents the "causal" variable, and store performance is the "outcome" variable. To the extent that equity compensation impacts store performance through its effect on employee turnover, employee turnover is referred to as a "mediator" or "intervening" variable. The tests in the preceding section do not distinguish among different potential mechanisms (or paths) through which equity compensation can impact performance (e.g., retention vs. effort incentives), and therefore the coefficients are interpreted as a "total effect." In contrast, mediation analysis represents an attempt to decompose the total effect into a direct and indirect effect. Following Baron and Kenny (1986), I conduct the mediation analysis in four steps. The first step is to show that there is an effect that may be mediated, in this case, to show that equity compensation is correlated with unit performance. This step is documented in the previous section. The second step is to show that the causal variable is correlated with the proposed mediator variable (i.e., equity compensation is associated with reduced turnover), and the third step is to show that the mediator variable is associated with the outcome variable (i.e., reduced

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employee turnover is associated with improved unit performance). The final step is to investigate whether the causal variable remains significantly associated with the outcome variable after controlling for the mediator. Steps two and three, in combination, establish whether a mediating relationship exists; if the association between the causal and the outcome variables is no longer significant in step four, the relationship is said to be "fully mediated" by the intervening variable.

In light of the insignificant results for hourly managers and assistant store managers in the preceding section (step one), in this section I focus my tests on CSRs and store managers. In Table 3.3 I regress voluntary turnover on different measures of equity compensation (step two). To avoid a mechanical relationship between turnover and equity compensation, I measure equity compensation as of the end of the prior month. Because the dependent variable for the CSR analysis (Panel A) is a percentage with a large number of observations at zero, I estimate a Tobit regression with censoring at zero (Trevor et al., 2008). For the store manager analysis (Panel B), I estimate logistic regressions, where the dependent variable is an indicator set equal to 1 if the store manager quit during the month. As shown in Panel A of Table 3.3, each of the three measures of equity compensation is significantly associated with reduced voluntary turnover. In terms of economic significance, a one-standard-deviation increase in the percentage receiving grants or the average equity holdings is associated with a reduction in the turnover rate of approximately .4 percent. Since the average monthly voluntary turnover rate among CSR employees is roughly 5 percent, a .4 percent reduction represents an improvement of between 8 – 9%. For the dollar value of the prior-year equity grant measure, a one-standard-deviation increase is associated with a reduction in

turnover of approximately .99%, or a roughly 20% improvement in monthly turnover. Panel B shows that the dollar value of the equity grant for the prior year is significantly associated with store manager voluntary turnover. However, the economic magnitude of this effect is relatively small, as the odds ratio for *equity grant* is very close to one.

Table 3.4 reports the results of regressing store profits on employee turnover. For CSR employees (Column 1), the association between employee turnover and unit performance is significantly negative, consistent with prior research in retail firms (e.g., Ton and Huckman, 2008; Shaw et al., 2005). A one-standard-deviation decrease in voluntary turnover over the prior 3 months is associated with an increase in store profits of approximately $1,500. For store managers (Column 2), while the estimated coefficient for store manager turnover over the prior 3 months is negative, it is not statistically significant at conventional levels.

Table 3.5 presents results from regressions similar to those reported in Table 3.2, but with voluntary turnover included as an additional control variable. The idea behind these tests is to control for the "indirect path" between equity compensation and unit performance via reduced employee turnover, so that the estimated coefficients for the equity compensation variables can be interpreted as the "direct" effect (e.g., through improved effort incentives). Comparing the results in Table 3.5 to those in Table 3.2, both sets of specifications yield very similar coefficients for both CSR and store manager employees. While the estimated effect of the percentage of CSR employees receiving a grant is somewhat lower and of weaker significance, it is still positive and significant. Combined, the results from Tables 3.3 – 3.5 suggest that employee turnover *partially* mediates the relationship between equity compensation and unit performance for entry-

level employees, but not for store managers.[57] These tests provide modest support for the arguments in prior literature that retention concerns are an important motivation for the use of equity compensation plans. However, in contrast to recent arguments that retention is the primary mechanism through which equity compensation impacts performance (e.g., Oyer, 2005), I find that the performance effects of equity compensation persist even after controlling for voluntary turnover.[58]

3.4.4 Vested vs. Unvested holdings

In the previous section I examine the importance of retention effects as a mechanism through which equity compensation impacts store performance. I now turn to a complementary analysis by examining the relative performance effects of vested and unvested holdings. Economic theory argues that the unvested portion of equity compensation is what drives retention benefits, because the unvested portion represents the value an employee forfeits by separating from the firm (Kole, 1997; Core and Guay, 2001). If, as Oyer and Schaefer (2005) suggest, retention benefits are the primary mechanism through which equity compensation to non-executive employees impact firm performance, I expect the performance effects to be concentrated in the unvested, rather than the vested, portion of equity holdings. On the other hand, if incentive provision is the primary means by which equity compensation is associated with performance, then I expect the performance effects to be concentrated in the vested portion of holdings.

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[57] In this setting, voluntary turnover among store managers is very low—less than 1% per month on average. Therefore, it is not surprising that I do not find strong evidence of a mediating effect of employee turnover among store managers.

[58] As noted in prior literature, the uncertain timing of employee turnover's effect on performance can make it difficult to estimate the full effect of turnover empirically (Ton and Huckman, 2008). Moreover, it is possible that the tests in Table 5 do not fully account for the true lead-lag relationships among equity compensation, turnover, and unit performance. As such, any assessment of the relative impact of the direct vs. indirect effects of equity compensation should be made with caution.

Therefore, to test the relative importance of incentives vs. retention, I regress profitability on both vested and unvested equity holdings. Results from this analysis are presented in Table 3.6. In Column 1 I include the average vested ESOP holdings (among CSR employees) only, and in Column 2 I include only unvested holdings.[59] In Column 3 I include both unvested and vested holdings in the same regression. The results across the three columns are consistent with the performance impact of equity compensation being concentrated in vested, not unvested, holdings. Consistent with the results from the mediation analysis in the previous section, these results suggest that increased effort, not retention, is the primary source of performance effects from equity compensation.

3.4.5 Economic vs. behavioral incentives from equity compensation

The preceding section provides evidence that equity compensation in the sample firm impacts store performance primarily through increased employee effort rather than through improved retention. However, as discussed previously, economic theory argues that free-riding among employees (i.e., the "1/n problem") is likely to diminish any incentive impact from equity compensation. In contrast, behavioral theories suggest that effort incentives from equity compensation stem from ownership *per se*, and not necessarily from an explicit pay-for-performance relationship implied by the equity.[60] In other words, the symbolic gesture of sharing profits with employees through equity compensation engenders identification with the firm, and therefore employees are motivated to act in the best interest of the firm. In this section, I examine whether the

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[59] I focus this analysis on CSR employees only, because as shown in Section 3.4.2, the other employee levels do not exhibit enough variation in ESOP holdings to uniquely estimate the effect of holdings on performance.

[60] For example, in a keynote address as Chief Economist of the World Bank, Joseph Stiglitz commented that "Profit sharing, which in terms of standard incentive theories may be fairly ineffective, may still be effective because of its effects in facilitating identification" (Stiglitz, 2000).

performance effects documented above likely derive from economic incentives or from increased identification with the firm.

Under the economics-based theory of equity incentives, the externalities between individual effort and group payoffs will potentially give rise to increased mutual monitoring among employees (Kandel and Lazear, 1992). Because an employee's reduced effort not only reduces her own potential payout under the equity plan, but also those of her coworkers, coworkers have incentives to use peer pressure or sanctioning to enforce acceptable effort levels. However, the incentives to employ mutual monitoring likely vary with the cost of monitoring. To the extent that mutual monitoring is less costly in stores with a high concentration of employees per square foot (Chen and Sandino, 2012), the economic incentive argument would predict that the performance effects of equity compensation are greater in stores with higher employees per square foot. I explore this prediction in tests reported in Table 3.7. I first calculate the ratio of employees per square foot for each store, and create an indicator variable equal to one for stores that are above the sample median.[61] Columns 1-3 of Table 3.7 report regressions which include interactions between this indicator and the different measures of equity compensation. Across the three models, I fail to find a significant interaction between equity compensation and my proxy for the cost of mutual monitoring (while none of the interaction coefficients are significant, two of the coefficients are negative, in contrast to the predicted positive sign). While failing to reject the null hypothesis does not represent conclusive evidence against the economic incentive theory, it is suggestive that for the

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[61] This approach is similar to that used by Hochberg and Lindsay, 2010). However, in their tests the authors focus on the benefits of mutual monitoring (i.e., the proportion of employees covered by the equity plan), whereas my tests focus on the costs of mutual monitoring.

sample firm, employee effort motivation from equity compensation is more likely due to increased identification with the firm.

As an additional test of the economic vs. behavioral explanations of equity incentives, I examine the association between equity compensation and monthly merchandise shrinkage. Chen and Sandino (2012) find that generous compensation practices can influence employee theft, both directly and indirectly through social norms. In this section, I conduct tests in a similar vein. In particular, I argue that under the economics-based incentive argument, employees may be inclined to increase total effort, but these incentives do not imply increased employee honesty manifested in lower shrinkage. In contrast, if incentives stem from increased identification with the firm, then I expect to observe reduced theft in addition to the effects on profit documented above. Table 3.8 presents results from regressing measures of equity compensation on monthly shrinkage. Columns 1-2 show that both ESOP grants and ESOP holdings are significantly (at the .05 .10 levels, respectively) negatively related to shrinkage. In Column 3, while the coefficient on *% received grant* is negative, it is significant only at the .15 level. Overall, these tests provide evidence consistent with equity compensation providing effort incentives through increased identification (Simon, 1991).[62]

3.5. Conclusion

The popularity of equity compensation for non-executive employees is a puzzle for economists, and in particular the performance impact of broad-based equity plans is

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[62] An alternative, but related explanation is that the equity compensation represents a form of efficiency wages (Shapiro and Stiglitz, 1984). With the equity compensation, employees receive higher total compensation than could be achieved outside the firm. Employees therefore value their job more highly and do not steal for fear of being fired.

unresolved in the prior literature. In this chapter, I shed light on this issue by studying the association between equity compensation and accounting performance using unit-level data within a single firm. I find a significant positive association between equity compensation and store-level performance. I add support for arguments by academics and practitioners that equity incentives, which reward individual employees for firm-level outcomes, can influence individual behavior. However, I provide evidence that employees' response to equity compensation is not necessarily driven strictly by economic incentives, which economists have commonly predicted would be undone by freeriding concerns. Rather, I provide support for increased effort due to behavioral factors such as employee identification with the firm. These findings are important for understanding the popularity of equity compensation for nonexecutive employees.

In addition to providing evidence for the overall performance effects of equity compensation, the unique dataset allows me to provide novel evidence for the specific mechanisms through which equity compensation impacts performance. While economists have generally been dismissive of equity compensation inducing increased employee effort, retention benefits have received support as the primary motivation for this form of compensation. While I find that equity compensation can impact unit performance through an effect on turnover, retention does not represent the primary channel. Instead, this evidence suggests that increased employee effort is the primary source of performance effects.

It is important to note that the findings in this chapter are based on data from a single firm, and therefore extrapolation of results should be done with caution. For example, while company culture and various forms of high-performance human resource

management practices may be important to achieve desired outcomes from equity compensation (e.g., Blasi et al., 2008), these factors are held constant in this setting and therefore this chapter cannot provide insight into these moderating variables. A potential limitation of this research setting is that the firm generally outperformed the stock market during the sample period, which potentially contributed to employees' enthusiasm for holding company stock. Further research is needed to explore whether similar performance benefits result from equity compensation when a firm's stock underperforms the market.

Table 2.1:
Vesting schedule
This table presents the vesting schedule applicable to plan holdings. Vesting percentages are applied to an employee's entire account, rather than to a specific grant. Starting in 2007, the permissible vesting schedule was shifted up one year due to a change in the Pension Protection Act; this change applies to plan holdings received in 2007 and later. Vesting percentages are based on the accumulation of "years of Service" which is defined as the number of calendar years in which an employee works at least 1,000 hours.

Years of service	Vesting % for grants prior to 2007	Vesting % for grants 2007 and later
Less than 2 years	0%	0%
2 years	0%	20%
3 years	20%	40%
4 years	40%	60%
5 years	60%	80%
6 years	80%	100%
7 years or more	100%	100%

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Table 2.2:
Descriptive statistics
This table presents mean (Median) values of select variables for even sample years. *Tenure* is number of months since employee was hired. *Wage* is measured in year 2000 dollars, and is scaled by the median value for Customer Service Representatives (CSR) in 2000. *Eligible* is an indicator for whether the employee meets requirements to receive a contribution under the deferred profit-sharing plan. *Age requirement*, *Tenure requirement*, and *hours requirement* represent indicator variables for whether age, tenure, and hours-worked eligibility requirements are met, respectively. *Contribution %* is the factor by which eligible earnings are multiplied to determine annual contributions under the deferred profit-sharing plan.

Panel A: CSRs					
Year	2000	2002	2004	2006	2008
#Employees	9,545	11,049	12,284	13,099	13,674
Female	0.65 (1)	0.62 (1)	0.6 (1)	0.61 (1)	0.6 (1)
Age	30.25 (23)	30.04 (23)	29.76 (22)	30.43 (23)	32.13 (25)
Tenure	14.93 (10)	17.48 (9)	19.34 (9)	21.9 (10)	32.05 (19)
Wage	1 (1)	.97 (.96)	.93 (.91)	.96 (.94)	1.01 (.99)
Eligible	.31 (0)	.22 (0)	.24 (0)	.26 (0)	.39 (0)
Age requirement	1 (1)	.59 (1)	.58 (1)	.60 (1)	.68 (1)
Tenure Requirement	.47 (0)	.45 (0)	.45 (0)	.48 (0)	.66 (1)
Hours Requirement	.61 (1)	.60 (1)	.68 (1)	.68 (1)	.73 (1)
Contribution %	5.82	4.88	6.49	6.79	10.7
Panel B: Hourly Managers					
Year	2000	2002	2004	2006	2008
#Employees	2,104	2,791	3,056	3,193	1,569
Female	0.71 (1)	0.68 (1)	0.65 (1)	0.63 (1)	0.62 (1)
Age	35.93 (35)	36.59 (36)	36.84 (36)	37.37 (37)	36.9 (36)
Tenure	26.31 (34)	36.76 (38)	46.72 (43)	54.86 (50)	57.34 (48)
Wage	1.27 (1.27)	1.31 (1.31)	1.31 (1.28)	1.35 (1.31)	1.46 (1.47)
Contribution %	5.82	4.88	6.49	6.79	10.7
Panel C: Assistant Store Managers					
Year	2000	2002	2004	2006	2008
#Employees	188	162	132	161	587
Female	0.4 (0)	0.39 (0)	0.39 (0)	0.37 (0)	0.44 (0)
Age	36.12 (36)	37.19 (37)	37.49 (38)	37.42 (37)	37.63 (36)
Tenure	22.53 (24)	34.10 (32)	35.03 (28)	39.14 (29)	57.20 (45)
Wage	1.99 (2.01)	2.06 (2.08)	2.05 (2.12)	2.12 (2.15)	2.09 (2.08)
Contribution %	5.82	4.88	6.49	6.79	10.7
Panel D: Store Managers					
Year	2000	2002	2004	2006	2008
#Employees	515	558	553	583	576
Female	0.52 (1)	0.5 (1)	0.47 (0)	0.45 (0)	0.41 (0)
Age	39.31 (38)	40.09 (39)	40.47 (40)	40.71 (41)	41.06 (42)
Tenure	34.85 (36)	53.82 (60)	70.91 (84)	84.12 (100)	93.55 (102)
Wage	2.34 (2.5)	2.39 (2.39)	2.42 (2.35)	2.84 (2.87)	2.83 (2.87)
Contribution %	5.82	4.88	6.49	6.79	10.7

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Table 2.3:
Correlation tables
This table presents correlations among variables used in the empirical analyses. Variables are defined in Table 2. Pearson correlations are presented above, and Spearman correlations below the diagonal. All correlations are significant at the .01 level or below.

	Female	*Age*	*Hourly wage*	*Weekly hours*	*Tenure*	*Vested holdings*	*Unvested holdings*
Female		0.13	-0.02	0.03	0.11	0.03	0.01
Age	0.16		0.15	0.21	0.38	0.23	0.15
Hourly wage	0.05	0.46		0.30	0.29	0.35	0.18
Weekly hours	0.04	0.31	0.54		0.31	0.29	0.30
Tenure	0.10	0.34	0.63	0.37		0.57	0.17
Vested holdings	0.09	0.38	0.56	0.42	0.58		0.09
Unvested holdings	0.06	0.23	0.35	0.32	0.40	0.58	

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Table 2.4:
Effect of plan eligibility on voluntary turnover
This table presents results of estimating Cox proportional hazard models of the rate of voluntary monthly turnover. All coefficients are exponentiated to represent hazard ratios. Values below one represent a reduced rate of turnover, and values above one indicate an increased rate of turnover. A value of one indicates no effect on turnover. *Eligible* is an indicator equal to 1 if an employee is over 21 years old (for years after 2002), has tenure >= 12 months, and works at least 20 hours/week, and equal to 0 otherwise. *Unemployment* is the county-level unemployment rate, measured monthly. *Older* is an indicator variable equal to one if an employee is over 30 years old. Standard errors are calculated by clustering at the employee level. Robust z-statistics are in parentheses.

VARIABLES	(1)	(2)	(3)	(4)	(5)
Eligible	**0.630***	**0.815***	**0.846***	**0.926***	**0.987**
	(-43.154)	**(-18.679)**	**(-15.215)**	**(-4.831)**	**(-1.040)**
Female	0.970***	0.983**	1.003	1.026***	1.006
	(-4.308)	(-2.518)	(0.502)	(3.690)	(0.970)
hourly_wage	0.709***	0.870***	0.893***	0.892***	0.888***
	(-35.917)	(-15.780)	(-13.032)	(-13.172)	(-13.710)
Age	0.998***	0.998***	0.997***	0.997***	1.002***
	(-6.151)	(-5.859)	(-9.955)	(-10.004)	(4.398)
Tenure		0.965***			
		(-58.225)			
unemployment	0.963***	0.968***	0.972***	0.972***	0.972***
	(-12.533)	(-11.366)	(-9.853)	(-9.901)	(-9.992)
eligiblexfemale				**0.871***	
				(-7.748)	
Older					0.917***
					(-5.371)
eligiblexolder					**0.648***
					(-23.515)
Higher order tenure and hours controls	No	No	Yes	Yes	Yes
Year and month fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	139,639	137,850	137,850	137,850	137,850

*** p<0.01, ** p<0.05, * p<0.1

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Table 2.5:
Effect of age-21 requirement on voluntary turnover

This table presents results of estimating Cox proportional hazard models of the rate of voluntary monthly turnover. The sample for this test includes only employees ages 18-20 for the years 1999-2004. All coefficients are exponentiated to represent hazard ratios. Values below one represent a reduced rate of turnover, and values above one indicate an increased rate of turnover. A value of one indicates no effect on turnover. *Pre_02* is an indicator variable equal to one if the year is less than 2002. *Turnover_21* is the average turnover rate for 21-year-old employees and is measured monthly. Standard errors are calculated by clustering at the employee level. Robust z-statistics are in parentheses.

VARIABLES	(1)	(2)
pre_02	**1.017**	**1.073**
	(0.314)	**(1.004)**
Female	0.939	0.960
	(-1.621)	(-0.926)
pre_02xfemale		**0.910**
		(-1.147)
turnover_21	1.030***	1.030***
	(2.587)	(2.579)
hours_per_week	0.984***	0.984***
	(-5.177)	(-5.165)
hourly_wage	0.668***	0.666***
	(-6.636)	(-6.739)
Age	0.907**	0.907**
	(-2.492)	(-2.485)
unemployment	0.911***	0.911***
	(-5.422)	(-5.419)
Month fixed effects	Yes	Yes
Observations	52,469	52,469

*** p<0.01, ** p<0.05, * p<0.1

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Table 2.6:
Effect of tenure-based eligibility requirement on voluntary turnover

This table presents results of estimating Cox proportional hazard models of the rate of voluntary monthly turnover. The sample for this test includes only observations in the 12-month period around the 12-month tenure cutoff for eligibility (i.e., +/- six months). All coefficients are exponentiated to represent hazard ratios. Values below one represent a reduced rate of turnover, and values above one indicate an increased rate of turnover. A value of one indicates no effect on turnover. *Over_12* is an indicator for whether tenure is greater than 12 months. *Eligible_12* is an indicator for whether, in the absence of a tenure requirement, an employee would be eligible to receive deferred compensation. Standard errors are calculated by clustering at the employee level. Robust z-statistics are in parentheses.

VARIABLES	(1)	(2)	(3)
over_12	0.774***	0.792***	0.657***
	(-4.020)	(-2.995)	(-4.392)
eligible_12	0.899***	0.892**	0.891**
	(-3.101)	(-2.484)	(-1.972)
over_12xeligible	**0.973**	1.018	1.151
	(-0.400)	(0.176)	(1.167)
over_12xover_30		0.940	
		(-0.679)	
eligiblexover_30		1.015	
		(0.272)	
over_12xeligiblexover_30		**0.918**	
		(-0.656)	
over_12xfemale			1.280**
			(2.411)
eligiblexfemale			1.015
			(0.201)
over_12xeligiblexfemale			**0.778***
			(-1.721)
Female	0.946*	0.947*	0.912*
	(-1.684)	(-1.668)	(-1.792)
hourly_wage	0.754***	0.754***	0.754***
	(-5.941)	(-5.935)	(-5.931)
Age	0.978***	0.979***	0.978***
	(-18.298)	(-14.118)	(-18.302)
unemployment	0.988	0.988	0.988
	(-0.917)	(-0.922)	(-0.913)
Year and month fixed effects	Yes	Yes	Yes
Observations	48,530	48,530	48,530

*** p<0.01, ** p<0.05, * p<0.1

Table 2.7:
Effect of hours worked eligibility requirement on voluntary turnover
This table presents results of estimating Cox proportional hazard models of the rate of voluntary monthly turnover. The sample includes only employees on either side of the 1000 hour cutoff in the prior year. Window sizes range from +/- 50 to +/- 200 hours. All coefficients are exponentiated to represent hazard ratios. Values below one represent a reduced rate of turnover, and values above one indicate an increased rate of turnover. A value of one indicates no effect on turnover. *Above 1000$_{t-1}$* is an indicator for whether the employee worked more than 1,000 hours in the prior year and thus received a deferred compensation grant. Standard errors are calculated by clustering at the employee level. Robust z-statistics are in parentheses.

	(1)	(2)	(3)	(4)
VARIABLES	+/-50 hours	+/-100 hours	+/-150 hours	+/-200 hours
Above 1000$_{t-1}$	**0.847**	**0.694**	**0.673***	**0.656****
	(-0.525)	**(-1.377)**	**(-1.863)**	**(-2.285)**
Male	0.950	1.022	1.015	0.968
	(-0.292)	(0.175)	(0.143)	(-0.363)
Hourly wage	0.796	0.782***	0.745***	0.771***
	(-1.621)	(-3.426)	(-4.622)	(-5.569)
Hours per week	0.947***	0.951***	0.950***	0.948***
	(-4.037)	(-5.417)	(-6.611)	(-8.105)
Age	0.987***	0.988***	0.989***	0.988***
	(-2.576)	(-3.363)	(-3.852)	(-4.566)
Tenure	0.995	0.997	0.997	0.996
	(-0.820)	(-0.824)	(-1.020)	(-1.624)
Unemployment	1.067	0.982	0.992	0.979
	(0.985)	(-0.392)	(-0.212)	(-0.680)
Higher order lagged hours controls	Yes	Yes	Yes	Yes
Year and month fixed effects	Yes	Yes	Yes	Yes
Observations	686	1,243	1,698	2,161

*** p<0.01, ** p<0.05, * p<0.1

Table 2.8:
Effect of plan changes on voluntary turnover
This table presents results of estimating Cox proportional hazard models of the rate of voluntary monthly turnover. All coefficients are exponentiated to represent hazard ratios. Values below one represent a reduced rate of turnover, and values above one indicate an increased rate of turnover. A value of one indicates no effect on turnover. *Year_2007* is an indicator for observations in year 2007 (the year of the plan changes) and later. *Contribution* is the size of annual contributions in dollars, scaled by the value at the beginning of the sample period. Standard errors are calculated by clustering at the employee level. Robust z-statistics are in parentheses.

VARIABLES	(1)	(2)	(3) Tenure between 24 and 36	(4) Tenure between 36 and 84
Eligible	0.884***	0.960	1.091	1.329***
	(-9.527)	(-1.240)	(1.576)	(2.792)
year_2007	0.691***	0.949**	0.892**	0.735***
	(-37.215)	(-2.562)	(-2.369)	(-2.962)
contribution		0.876***	0.906***	1.017
		(-17.889)	(-5.463)	(0.453)
eligiblex2007	**0.861*****	**1.003**	**1.090**	**1.103**
	(-7.491)	**(0.060)**	**(1.101)**	**(0.707)**
contributionxeligible		**0.950*****	**0.932*****	**0.879*****
		(-3.187)	**(-2.680)**	**(-2.814)**
Male	1.015*	1.018**	1.051***	0.976
	(1.870)	(2.223)	(3.099)	(-0.706)
hourly_wage	0.764***	0.742***	0.719***	0.763***
	(-30.039)	(-30.483)	(-16.134)	(-11.303)
hours_per_week	0.979***	0.979***	0.973***	0.965***
	(-49.638)	(-47.348)	(-28.171)	(-16.790)
Age	0.995***	0.997***	0.984***	0.981***
	(-14.637)	(-7.252)	(-24.567)	(-18.665)
unemployment	0.940***	0.944***	0.932***	0.941***
	(-21.494)	(-19.319)	(-11.779)	(-5.271)
industry_turnover	1.034***	1.001	1.028**	1.059**
	(5.516)	(0.194)	(2.053)	(2.209)
Higher order tenure and hours controls	Yes	Yes	Yes	Yes
Month fixed effects	Yes	Yes	Yes	Yes
Observations	122,784	120,700	32,702	10,904

*** p<0.01, ** p<0.05, * p<0.1

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Table 2.9:
Effect of unvested holdings on voluntary turnover

This table presents results of estimating Cox proportional hazard models of the rate of voluntary monthly turnover. The sample includes only employees who are not yet fully vested (i.e., employees under age 62 with less than 7 years of service). All coefficients are exponentiated to represent hazard ratios. Values below one represent a reduced rate of turnover, and values above one indicate an increased rate of turnover. A value of one indicates no effect on turnover. *Unvested* and *vested holdings* represent the dollar value of total vested and unvested plan holdings (in thousands), respectively. Standard errors are calculated by clustering at the employee level. Robust z-statistics are in parentheses.

VARIABLES	(1) CSR	(2) hourly manager	(3) assistant manager	(4) Store manager	(5) CSR	(6) store manager	(7) assistant manager	(8) store manager
Unvested holdings	**0.739***	**0.999**	**0.983**	**1.188**	**0.731***	**1.007**	**0.980**	**1.193***
	(-12.565)	**(-0.029)**	**(-0.201)**	**(1.611)**	**(-11.632)**	**(0.228)**	**(-0.227)**	**(1.682)**
Vested holdings					1.023	0.983	1.011	1.049
					(0.992)	(-0.768)	(0.185)	(1.085)
Female	1.002	0.932**	0.758**	0.701	1.002	0.931**	0.758**	0.730
	(0.328)	(-2.466)	(-2.274)	(-1.279)	(0.328)	(-2.468)	(-2.274)	(-1.127)
hourly_wage	0.895***	0.934***	0.904***	0.906***	0.895***	0.935***	0.904***	0.900***
	(-12.559)	(-5.587)	(-3.493)	(-2.600)	(-12.601)	(-5.556)	(-3.500)	(-2.827)
Age	0.998***	0.994***	1.014**	0.979	0.998***	0.994***	1.014**	0.975*
	(-5.606)	(-4.527)	(2.439)	(-1.530)	(-5.584)	(-4.472)	(2.383)	(-1.668)
Unemployment	0.970***	0.955***	0.928*	1.100	0.970***	0.955***	0.928*	1.114
	(-10.370)	(-3.630)	(-1.829)	(0.860)	(-10.382)	(-3.640)	(-1.824)	(0.997)
Higher order tenure and hours controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	135,651	10,979	1,738	624	135,651	10,979	1,738	624

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 2.10:

Effect of investment allocation on voluntary turnover

This table presents results of estimating Cox proportional hazard models of the rate of voluntary monthly turnover. The sample includes only employees who are not yet fully vested (i.e., employees under age 62 with less than 7 years of service). All coefficients are exponentiated to represent hazard ratios. Values below one represent a reduced rate of turnover, and values above one indicate an increased rate of turnover. A value of one indicates no effect on turnover. *Unvested esop* and *unvested_diversified* represent the dollar value of total unvested holdings (in thousands) invested in company stock and diversified mutual funds, respectively. *Vested_holdings* represent the dollar value (in thousands) of total vested holdings (the sum of company stock and diversified mutual funds). Standard errors are calculated by clustering at the employee level. Robust z-statistics are in parentheses.

VARIABLES	(1) CSR	(2) hourly manager	(3) assistant manager	(4) store manager	(5) CSR	(6) hourly manager	(7) assistant manager	(8) store manager
unvested_esop	0.679***	0.975	1.005	1.216	0.667***	0.985	1.002	1.217
	(-9.891)	(-0.453)	(0.050)	(1.441)	(-9.551)	(-0.268)	(0.021)	(1.466)
unvested_deversified	0.884	1.045	0.914	1.128	0.880*	1.047	0.916	1.141
	(-1.643)	(0.475)	(-0.417)	(0.568)	(-1.700)	(0.501)	(-0.409)	(0.631)
vested_holdings					1.028	0.984	1.008	1.049
					(1.218)	(-0.735)	(0.123)	(1.085)
Female	1.002	0.932**	0.759**	0.702	1.002	0.932**	0.759**	0.731
	(0.321)	(-2.458)	(-2.256)	(-1.275)	(0.321)	(-2.461)	(-2.256)	(-1.124)
hourly_wage	0.895***	0.934***	0.904***	0.905***	0.895***	0.935***	0.904***	0.900***
	(-12.488)	(-5.580)	(-3.497)	(-2.600)	(-12.538)	(-5.552)	(-3.502)	(-2.824)
Age	0.998***	0.994***	1.014**	0.978	0.998***	0.994***	1.014**	0.975*
	(-5.589)	(-4.520)	(2.436)	(-1.538)	(-5.562)	(-4.467)	(2.384)	(-1.659)
Unemployment	0.970***	0.955***	0.928*	1.103	0.970***	0.955***	0.928*	1.117
	(-10.372)	(-3.635)	(-1.811)	(0.887)	(-10.386)	(-3.644)	(-1.808)	(1.016)
Higher order tenure and hours controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	135,651	10,979	1,738	624	135,651	10,979	1,738	624

*** p<0.01, ** p<0.05, * p<0.1

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Table 3.1: Descriptive statistics

This table presents summary statistics for the sample, separated out by employee level. All variables are measured as of the end of the current month. For CSR and HM employees, variables represent the average values for each variable within each store. For assistant store managers and store managers, values are for the manager employed in each store as of the end of the current month. Under the sample firm's equity plan, employees must work at least 1000 hours during the plan year, have been with the firm at least 12 months, and be at least 21 years of age. % full time, % tenure12, and % age21 represent the percentage of employees who meet each of these eligibility requirements. Tenure is the number of months worked at the firm. Equity holdings is the dollar value of equity held through the plan. Equity grant is the average dollar value of the equity grant received for the prior year. Number of employees is the number of employees in each category employed as of the end of the current month. Turnover is the number of employee separations during the month, divided by the number of employees still employed as of the end of the month.

Panel A: CSRs					
Variables	Q1	Mean	Median	Q3	Std Dev
% full time	0.64	0.73	0.73	0.82	0.13
tenure	21.28	30.63	29.07	38.69	12.45
% tenure12	0.50	0.61	0.62	0.73	0.17
% received grant	0.17	0.28	0.27	0.37	0.14
equity holdings	359.81	981.05	784.32	1406.05	808.85
equity grant	306.98	500.12	465.19	657.16	260.34
age	29.35	32.34	32.10	35.00	4.40
% age21	0.61	0.70	0.71	0.80	0.14
number of employees	15.00	21.70	19.00	25.00	8.96
turnover	0.00	0.07	0.06	0.11	0.08

Panel B: Hourly Managers					
Variables	Q1	Mean	Median	Q3	Std Dev
% full time	1.00	0.98	1.00	1.00	0.07
tenure	42.00	58.80	57.25	73.75	23.87
% tenure12	0.80	0.89	1.00	1.00	0.18
% received grant	0.60	0.74	0.75	1.00	0.25
equity holdings	2658.81	5092.78	4454.74	6872.75	3408.23
equity grant	1735.56	2319.37	2249.22	2908.99	854.99
age	33.00	37.88	37.60	42.50	6.98
% age21	1.00	0.98	1.00	1.00	0.07
number of employees	3.00	4.13	4.00	5.00	1.89
turnover	0.00	0.02	0.00	0.00	0.08

Table 3.1 (continued)

Panel C: Assistant Managers					
Variables	Q1	Mean	Median	Q3	Std Dev
% full time	1.00	1.00	1.00	1.00	0.03
tenure	21.00	57.78	49.67	90.00	41.52
% tenure12	1.00	0.83	1.00	1.00	0.36
% received grant	0.33	0.72	1.00	1.00	0.43
equity holdings	223.97	6533.87	4746.40	10597.55	6599.32
equity grant	1976.22	2974.72	3641.14	4101.06	1554.58
age	29.00	37.78	37.00	46.00	10.07
% age21	1.00	1.00	1.00	1.00	0.00
number of employees	1.00	1.14	1.00	1.00	0.37
turnover	0.00	0.02	0.00	0.00	0.19

Panel D: Store Managers					
Variables	Q1	Mean	Median	Q3	Std Dev
% full time	1.00	0.99	1.00	1.00	0.06
tenure	66.00	92.33	102.00	121.00	35.41
% tenure12	1.00	0.99	1.00	1.00	0.11
% received grant	1.00	0.96	1.00	1.00	0.17
equity holdings	10277.26	19302.35	18799.92	27274.30	11448.01
equity grant	5242.30	6087.04	6123.81	7356.22	2074.26
age	35.00	41.35	42.00	48.00	8.96
% age21	1.00	1.00	1.00	1.00	0.00
number of employees	1.00	1.03	1.00	1.00	0.18
turnover	0.00	0.01	0.00	0.00	0.13

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Table 3.2:
Effect of equity incentives on store performance
This table presents results of regressing adjusted operating profit on various measures of equity compensation. Operating profit is defined as gross profit less shrinkage/spoilage and wage expenses. Adjusted operating profit is operating profit adjusted for the average monthly equity grant to employees in each category. Store age is defined as the natural log of the number of months since the store opened. The sample firm operates stores with two varieties of formats, which differ with respect to the breadth of product mix. Store format is an indicator variable equal to one for stores that offer an expanded product mix, and zero otherwise. Household income is average household income, in thousands of dollars. Population density is the number of people per square mile. Local competition is the number of businesses that operate in the same retail category as the sample firm. Household income, population density, and local competition are all measured at the zip code level, as of 2010. Unemployment rate is the county-level unemployment rate, measured monthly. All other variables are as defined in Table 3.1. Standard errors are calculated by clustering at the store level.

Panel A: CSRs

Variables	(1) Adjusted Profit	(2) Adjusted Profit	(3) Adjusted Profit
equity grant	8.476*		
	(1.793)		
equity holdings		5.864***	
		(4.061)	
% received grant			14,495.810**
			(2.105)
%age21	-23,506.583***	-24,412.659***	-23,794.273***
	(-3.155)	(-3.264)	(-3.123)
%tenure12	9,179.632*	7,257.733	8,300.672
	(1.665)	(1.473)	(1.594)
% full time	-15,468.634**	-13,554.885**	-14,173.149**
	(-2.460)	(-2.235)	(-2.318)
wage	-97.336	-152.966	-76.322
	(-0.932)	(-1.450)	(-0.757)
store age	3,952.028*	4,034.024*	3,781.086
	(1.688)	(1.750)	(1.612)
square footage	12.826***	13.021***	12.810***
	(7.732)	(7.819)	(7.702)
store format	14,390.259***	16,055.382***	14,263.076***
	(2.977)	(3.430)	(2.957)
household income	0.493***	0.517***	0.498***
	(3.702)	(3.930)	(3.745)
population density	2.248***	2.260***	2.227***
	(6.765)	(6.757)	(6.691)
local competition	-593.251***	-575.939***	-595.642***
	(-2.894)	(-2.860)	(-2.907)
unemployment rate	1,506.792*	1,284.124	1,502.769*
	(1.735)	(1.510)	(1.735)
month and year fixed effects	YES	YES	YES
Observations	16,992	16,992	16,992
R-squared	0.404	0.411	0.404

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3.2 (continued)

Panel B: Hourly Managers, Assistant Store Managers, and Store Managers

Employee level	(1) Hourly manager	(2) Assistant store manager	(3) Store manager
Variables	Adjusted Profit	Adjusted Profit	Adjusted Profit
equity grant	-0.897	0.665	2.545***
	(-1.117)	(1.310)	(7.740)
tenure	165.475***	21.057	28.452
	(4.425)	(0.923)	(1.437)
wage	100.546***	-74.369***	139.949***
	(3.881)	(-2.612)	(9.083)
age	-376.741***	-147.368**	27.571
	(-3.332)	(-2.093)	(0.361)
workload	280.913	83.326	-188.707
	(1.538)	(0.500)	(-1.167)
store age	4,054.470*	4,864.067*	7,171.604***
	(1.751)	(1.804)	(3.169)
square footage	12.356***	13.104***	7.666***
	(7.557)	(7.337)	(5.836)
store format	16,015.011***	18,254.424***	12,162.238***
	(3.358)	(3.383)	(2.950)
household income	0.537***	0.709***	0.344***
	(4.059)	(5.052)	(2.810)
population density	2.150***	2.504***	1.549***
	(6.376)	(6.271)	(4.797)
local competition	-707.614***	-772.850***	-539.167***
	(-3.420)	(-3.234)	(-3.078)
unemployment rate	1,425.232	2,605.197***	831.010
	(1.587)	(2.887)	(0.922)
Year and Month Fixed effects	YES	YES	YES
Observations	16,967	10,965	16,585
R-squared	0.411	0.420	0.514

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3.3:

Mediation analysis—effect of equity compensation on employee turnover

Panel A of this table presents Tobit regressions of voluntary turnover on equity compensation, with voluntary turnover censored at zero. Voluntary turnover is measured as the number of CSR employees who quit in the current month, divided by the number of CSR employees working as of the end of the month. Panel B presents a logistic regression of Voluntary Turnover. For the logistic regression, voluntary turnover is an indicator variable set equal to one if the store manager quit in the current month, and zero otherwise. For Panel A and B, all equity compensation variables are measured as of the end of the prior month. All variables are as defined in previous tables. Standard errors are calculated by clustering at the store level.

Panel A: CSR employees			
	(1)	(2)	(3)
Variables	Voluntary turnover	Voluntary Turnover	Voluntary Turnover
equity grant	-0.004***		
	(-5.809)		
equity holdings		-3.165***	
		(-3.177)	
% received grant			-0.001***
			(-2.702)
%tenure12	-0.005	-0.644	-0.939
	(-0.006)	(-0.761)	(-1.118)
%age21	-6.626***	-7.497***	-8.085***
	(-8.709)	(-9.805)	(-10.690)
% full time	-3.218***	-4.518***	-5.049***
	(-3.807)	(-5.554)	(-6.198)
wage	-0.021*	-0.032***	-0.027**
	(-1.899)	(-3.001)	(-2.498)
household income	-0.000	-0.000	-0.000
	(-0.145)	(-0.251)	(-0.235)
population density	-0.000**	-0.000**	-0.000**
	(-2.389)	(-2.267)	(-2.258)
local competition	-0.014	-0.012	-0.015
	(-0.724)	(-0.598)	(-0.781)
unemployment rate	0.021	0.013	0.035
	(0.285)	(0.179)	(0.461)
Month and Year Fixed Effects	YES	YES	YES
Observations	16,520	16,520	16,520

Robust t-statistics in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3.3 (continued)

Panel B: Store managers

Variables	(1) Voluntary Turnover
equity grant	-0.001***
	(-22.490)
age	0.019*
	(1.863)
tenure	0.014***
	(6.119)
workload	0.060***
	(2.741)
wage	0.000
	(0.159)
household income	0.000
	(0.244)
population density	0.000
	(0.394)
local competition	0.008
	(0.426)
unemployment rate	-0.065
	(-0.879)
Month and Year Fixed Effects	YES
Observations	16,128

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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Table 3.4:

Mediation analysis—effect of employee turnover on store performance

This table presents the results of regressing adjusted profits on employee turnover. Turnover3 represents the number of employees who quit over the prior three months, divided by the average number of active employees during the same period. Columns 1 and 2 report results for CSR and store manager-level employees, respectively. All variables are as defined previously. Standard errors are calculated by clustering at the store level.

	(1)	(2)
Employee level	CSR	Store manager
Variables	Store Profits	Store Profits
turnover 3	-11,077.997***	-2,089.537
	(-2.754)	(-0.949)
wage	-105.092	167.253***
	(-1.193)	(11.186)
store age	4,765.631*	7,175.328***
	(1.963)	(3.146)
square footage	12.919***	8.054***
	(7.661)	(5.923)
store format	15,582.080***	16,023.466***
	(3.196)	(3.817)
household income	0.556***	0.366***
	(4.163)	(2.882)
population density	2.227***	1.640***
	(6.730)	(4.964)
local competition	-704.459***	-579.358***
	(-3.349)	(-3.151)
unemployment rate	1,952.245**	1,131.402
	(2.173)	(1.240)
Month and Year fixed effects	YES	YES
Observations	16,520	16,744
R-squared	0.400	0.500

Robust t-statistics in parentheses
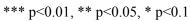
*** p<0.01, ** p<0.05, * p<0.1

Table 3.5:

Mediation analysis—effect of equity compensation, controlling for effect of turnover

This table presents the results of regressing adjusted profit on equity compensation while controlling for employee turnover. Columns 1—3 are for CSR employees, and Column 4 presents results for store managers. All variables are as defined previously. Standard errors are calculated by clustering at the store level.

	(1) CSR	(2) CSR	(3) CSR	(4) Store manager
Employee level				
Variables	Adjusted Profit	Adjusted Profit	Adjusted Profit	Adjusted Profit
equity grant	8.493*			2.545***
	(1.780)			(7.749)
equity holdings		5.732***		
		(3.952)		
% received grant			13,304.968*	
			(1.925)	
turnover3	-8,879.997**	-8,587.398**	-8,616.195**	-630.702
	(-2.265)	(-2.227)	(-2.213)	(-0.288)
tenure	6,853.498	5,097.777	6,505.100	28.339
	(1.224)	(1.017)	(1.226)	(1.427)
age	-23,457.581***	-24,286.433***	-23,466.370***	27.457
	(-3.132)	(-3.238)	(-3.066)	(0.360)
workload	-15,397.666**	-13,409.236**	-13,771.338**	-188.122
	(-2.422)	(-2.196)	(-2.232)	(-1.161)
wage	-100.113	-153.014	-76.910	139.969***
	(-0.951)	(-1.442)	(-0.759)	(9.083)
Store and Location controls	YES	YES	YES	YES
Month and Year Fixed Effects	YES	YES	YES	YES
Observations	16,520	16,520	16,520	16,585
R-squared	0.409	0.416	0.409	0.514

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3.6:

Effect of vested vs. unvested equity holdings on store performance

This table presents the results of regressing adjusted performance on vested and unvested equity holdings, both separately (Columns 1 and 2) and together (Column 3). All variables are as defined previously. Standard errors are calculated by clustering at the store level.

Variables	(1) Adjusted Profit	(2) Adjusted Profit	(3) Adjusted Profit
vested equity holdings	5.845***		5.899***
	(3.995)		(4.040)
unvested equity holdings		0.002	3.257
		(0.000)	(0.508)
%tenure12	8,504.566*	14,087.343**	7,770.605
	(1.706)	(2.583)	(1.565)
%age21	-23,630.080***	-20,453.411***	-24,088.320***
	(-3.168)	(-2.763)	(-3.240)
% full time	-12,739.419**	-10,588.865*	-13,208.297**
	(-2.094)	(-1.713)	(-2.209)
wage	-149.588	-63.102	-152.107
	(-1.422)	(-0.631)	(-1.442)
store age	4,084.903*	3,938.185*	4,057.736*
	(1.768)	(1.670)	(1.753)
square footage	13.008***	12.782***	13.016***
	(7.784)	(7.645)	(7.806)
store format	16,160.344***	14,227.801***	16,116.412***
	(3.445)	(2.921)	(3.431)
household income	0.520***	0.494***	0.518***
	(3.955)	(3.696)	(3.940)
population density	2.259***	2.238***	2.259***
	(6.732)	(6.689)	(6.746)
local competition	-572.174***	-595.584***	-574.091***
	(-2.837)	(-2.890)	(-2.845)
unemployment rate	1,290.135	1,539.428*	1,284.944
	(1.519)	(1.775)	(1.512)
Month and year fixed effects	YES	YES	YES
Observations	16,992	16,992	16,992
R-squared	0.411	0.402	0.411

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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Table 3.7:
Moderating effect of mutual monitoring
This table presents results of regressing adjusted profits on the interaction between equity compensation and employee concentration. Employee concentration is an indicator variable equal to one if the number of employees per square foot is above the sample mean, and zero otherwise. All other variables are as defined previously. Standard errors are calculated by clustering at the store level.

Variables	(1) Adjusted Profit	(2) Adjusted Profit	(3) Adjusted Profit
employee concentration	26,884.369***	24,701.593***	26,521.187***
	(8.745)	(8.713)	(10.330)
% received grant	19,114.026***		
	(2.830)		
employee concentrationx%received grant	-8,742.843		
	(-1.090)		
equity grant		12.224***	
		(3.025)	
employee concentrationxequity grant		-0.191	
		(-0.046)	
equity holdings			5.903***
			(4.086)
employee concentrationxequity holdings			-2.351
			(-1.598)
%tenure12	7,835.626*	7,193.498	8,209.644*
	(1.767)	(1.523)	(1.928)
%age21	-17,325.614**	-18,241.222***	-16,886.716**
	(-2.550)	(-2.745)	(-2.527)
% full time	14,817.834**	11,651.921**	15,791.307***
	(2.585)	(1.997)	(2.763)
wage	-50.929	-87.389	-109.818
	(-0.559)	(-0.927)	(-1.160)
Store and location controls	YES	YES	YES
Month and Year Fixed Effects	YES	YES	YES
Observations	16,992	16,992	16,992
R-squared	0.503	0.504	0.508

Robust t-statistics in parentheses

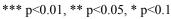*** p<0.01, ** p<0.05, * p<0.1

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Table 3.8:

Effect of equity compensation on merchandise shrinkage

This table presents results of regressions of merchandise shrinkage on equity compensation. Shrink % is defined as merchandise shrinkage divided by total revenues, multiplied by 100. All other variables are as defined previously. The coefficients on equity grant and equity holdings have been multiplied by 1000 for ease of exposition. Standard errors are calculated by clustering at the store level.

	(1)	(2)	(3)
Variables	Shrink %	Shrink %	Shrink %
equity grant	-0.183**		
	(-2.181)		
equity holdings		-.0367*	
		(-1.883)	
% received grant			-0.144
			(-1.447)
employee concentration	2.925	4.655	3.922
	(0.265)	(0.424)	(0.356)
%tenure12	-0.317***	-0.353***	-0.340***
	(-3.995)	(-4.666)	(-4.213)
%age21	0.227**	0.204**	0.211**
	(2.388)	(2.186)	(2.202)
% full time	0.110	0.057	0.071
	(1.153)	(0.607)	(0.745)
wage	0.001	0.001	0.000
	(0.581)	(0.566)	(0.229)
Store and location controls	YES	YES	YES
Month and Year Fixed Effects	YES	YES	YES
Observations	15,673	15,673	15,673
R-squared	0.122	0.122	0.121

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

BIBLIOGRAPHY

Aboody, D., N. B. Johnson, and R. Kasznik. 2010. Employee stock options and future firm performance: Evidence from option repricings. *Journal of Accounting and Economics* 50: 74-92.

Alchian, A. A., and H. Demsetz. 1972. Production, Information Costs, and Economic Organization. *AmericanEconomic Review* 62:777–95.

Allen, S. G., R. L. Clark, and A. A. McDermed. 1993. Pensions, bonding, and lifetime jobs. *The Journal of Human Resources* 28: 463-481.

Azfar, O., and S. Danninger. 2001. Profit-sharing, employment stability, and wage growth. *Industrial and Labor Relations Review* 54: 619-630.

Balsam, S., and S. Miharjo. 2007. The effect of equity compensation on voluntary executive turnover. *Journal of Accounting and Economics* 43: 95-119.

Becker, G. S., 1962. Investment in human capital: A theoretical analysis. *Journal of Political Economy* 70: 9-49.

Benson, G. S., D. Finegold, and S. A. Mohrman. 2004. You paid for the skills, now keep them: Tuition reimbursement and voluntary turnover. *The Academy of Management Journal* 47: 315-331.

Bergman, N. K., and D. Jenter. 2007. Employee sentiment and stock option compensation. *Journal of Financial Economics* 84(3): 667–712.

Bernartzi, S. 2001. Excessive extrapolation and the allocation of 401(k) accounts to company stock. *The Journal of Finance* 56: 1747-1764.

Black, F. 1980. The tax consequences of long-run pension policy. *Financial Analysts Journal* 36: 21-28.

Blasi, J. R., R. B. Freeman, C. Mackin, and D. L. Kruse. 2008. Creating a bigger pie? The effects of employee ownership, profit-sharing, and stock options on workplace performance. NBER Working Paper 14230.

BrightScope. Retirement Plan Search. http://www.brightscope.com. Accessed June 2013.

Budd, J. W. 2008. Does employee ignorance undermine shared capitalism? NBER Working Paper 14236.

Cadman, B., T. Rusticus, and J. Sunder. 2011. Stock option grant vesting terms: Economic and financial reporting determinants. Working paper, Northwestern University.

Card, D., C. Dobkin, and N. Maestas. 2004. The impact of nearly universal insurance coverage on health care utilization and health: evidence from Medicare. NBER Working Paper, 10365.

Chen, C. X., and T. Sandino. 2012. Can wages buy honesty? The relationship between relative wages and employee theft. *Journal of Accounting Research* 50(4): 967-1000.

Chen, M. A. 2004. Executive Option Repricing, Incentives, and Retention. *The Journal of Finance* 59: 1167-1200.

Choi, J. J., D. Laibson, B. Madrian, and A. Metrick. 2003. Employees' investment decisions about company stock. NBER Working Paper, 10228.

Cohen, L. 2009. Loyalty-based portfolio choice. *The Review of Financial Studies* 22: 1213-1245.

Core, J., and W. Guay. 2001. Stock option plans for non-executive employees. *Journal of Financial Economics* 61: 253–287.

DiNardo, J., and D. S. Lee. 2004. Economic impacts of new unionization on private sector employers: 1984–2001. *Quarterly Journal of Economics* 119: 1383–1441

Eckel, C., P. Grossman, N. Lutz, and V. Padmanabhan. 1998. Playing it safe: Gender differences in risk aversion. Working paper, Virginia Tech.

Even, W. E., and D. A. Macpherson. 1996. Employer size and labor turnover: The role of pensions. *Industrial and Labor Relations Review* 49: 707-728.

Freeman, R.B., J.R. Blasi, and D.L. Kruse. 2010. Shared Capitalism at work. University of Chicago Press.

Gerakos, J. J., C. D. Ittner, and F. Moers. 2012. Compensation Objectives and Business Unit Pay Strategy. Working Paper, University of Chicago.

Glebbeek, A. C., and E. H. Bax. 2004. Is high employee turnover harmful? An empirical test using company records. *The Academy of Management Journal* 47: 277-286.

Grant Thornton LLP, 2010. Use of employer matching contributions in 401(k) plans – Follow-up survey. http://www.grantthornton.com/staticfiles/GTCom/Tax/CBC%20files/401kMatchingFollowupSurvey.pdf, accessed November 2011.

Griffeth, R. W. P. W. Hom, and S. Gaertner. 2000. A meta-analysis of antecedents and correlates of employee turnover: Update, moderator tests, and research implications of the next millennium. *Journal of Management* 26: 463-488.

Gustman, A. L., and T. L. Steinmeier. 1993. Pension portability and labor mobility: Evidence from the survey of income and program preparation. *Journal of Public Economics* 50: 299-323.

Hales, J, L. Wang, and M.G. Williamson. 2012. Selection Benefits of Stock-Based Compensation for the Rank-and-File. Working Paper, University of Texas.

Hall, B. J. and K. J. Murphy. 2003. The Trouble with Stock Options. *Journal of Economic Perspectives* 17: 49-70.

Hanlon, M., S. Rajgopal, and T. Shevlin. 2003. Are executive stock options associated with future earnings? *Journal of Accounting and Economics* 36(1): 3-43.

Hausknecht, J. P., C. O. Trevor, and M. J. Howard. 2009. Unit-level voluntary turnover rates and customer service quality: Implication of group cohesiveness, newcomer concentration, and size. *Journal of Applied Psychology* 94: 1068-1075.

Hochberg, Y.V., and L. Lindsey. 2010. Incentives, targeting, and firm performance: an analysis of non-executive stock options. *Review of Financial Studies* 23: 4148-86.

Holt, C. A., and S. K. Laury. 2002. Risk aversion and incentive effects. *American Economic Review* 92: 1644-1655.

Hom, P. W., and A. J. Kinicki. 2001. Toward a greater understanding of how dissatisfaction drives employee turnover. *The Academy of Management Journal* 44: 975-987.

Huberman, G. 2001. Familiarity breeds investment. *Review of Financial Studies* 14: 659–80.

Huberman, G., and P. Sengmueller. 2004. Performance and employer stock in 401(k) plans. *Review of Finance* 8: 403–43.

Imbens, G. W., and T. Lemieux. 2008. Regression discontinuity design: A guide to practice. *Journal of Econometrics* 142: 615-635.

Indjejikian, R. J.. 1999. Performance evaluation and compensation research: An agency perspective. *Accounting Horizons* 13: 147-157.

Ippolito, R. A. 1987. Why federal workers don't quit. *The Journal of Human Resources* 22: 281-299.

Ippolito, R. A. 1991. Encouraging long-term tenure: Wage tilt or pensions? *Industrial and Labor Relations Review* 44: 520-535.

Ittner, C. D., R. A. Lambert, and D. F. Larcker. 2003. The structure and performance consequences of equity grants to employees of new economy firms. *Journal of Accounting and Economics* 34: 89-127.

John Hancock Financial Services, 2002. Eighth defined contribution plan survey: Insight into participant investment knowledge & behavior. Boston: John Hancock Financial Services.

Jovanovic, B. 1979. Firm-specific capital turnover. *Journal of Political Economy* 87: 1246-1260.

Kacmar, M. K., M. C. Andrews, D. L. Van Rooy, R. C. Steilberg, and S. Cerrone. 2006. Sure everyone can be replaced…but at what cost? Turnover as a predictor of unit-level performance. *Academy of Management Journal* 49: 133-144.

Kandel, E., and E. P. Lazear. 1992. Peer Pressure in Partnerships. *Journal of Political Economy* 100:801–17.

Kedia, S., and A. Mozumdar. 2002. Performance Effect of Employee Stock Options. Working Paper, Rutgers.

Kedia, S., and S. Rajgopal. 2009. Neighborhood matters: The impact of location on broad based stock option plans. *Journal of Financial Economics* 92: 109-127.

Kirby, K. N., and N. N. Marakovic. 1996. Delay-discounting probabilistic rewards: Rates decrease as amounts increase. *Psychonomic Bulletin and Review* 3: 100-104.

Klein, K.J. 1987. Employee stock ownership and employee attitudes: A test of three models. *Journal of Applied Psychology* 72*:* 319–32.

Kole, S. R. 1997. The complexity of compensation contracts. *The Journal of Financial Economics* 43: 79-104.

Kruse, D. L. 1996. Why do firms adopt profit-sharing and employee ownership plans? *British Journal of Industrial Relations* 4: 515-538.

Kruse, D. L., and J. R. Blasi. 1997. Employee ownership, employee attitudes, and firm performance: A review of the evidence, in the human resources management handbook, Part 1. D. Lewin, D. Mitchell, & M.A. Zaidi (Eds.).Greenwich, CT: JAI Press.

Kruse, D. L., J. R. Blasi, and R. Park. 2008. Shared capitalism in the US economy: Prevalence, characteristics, and employee views of financial participation in enterprises. NBER Working Paper, 14225.

Landsman, W., M. Lang and S. Yeh. 2007. Governance and the Split of Options between Executive and Nonexecutive Employees. *Journal of Accounting, Auditing & Finance* 22(2):109-38.

Lazear, E. P. 1979. Why is there mandatory retirement? *The Journal of Political Economy* 87: 1261-1284.

Lazear, E. P. 1981. Agency, earnings profiles, productivity, and hours restrictions. *The American Economic Review* 71: 606-620.

Lazear, E. P. 1990. Pensions and deferred benefits as strategic compensation. *Industrial Relations* 29: 263-285.

Lazear, E. P. 2005. Output-based pay: Incentives, retention or sorting? In S. Polachek (ed.), *Research in Labor Economics* 23: 1–25.

Luchak, A. A., and M. Gunderson. 2000. What do employees know about their pension plan? *Industrial Relations* 39: 646-670.

Merchant, K. A., W. Van der Stede, and L. Zheng. 2003. Disciplinary constraints on the advancement of knowledge: the case of organizational incentive systems. *Accounting, Organizations and Society* 28: 251-286.

Meulbroek, L. 2005. Company stock in pension plans: How costly is it? *Journal of Law and Economics* 48: 443-474.

Mitchell, O. S. 1988. Worker knowledge of pension provisions. *Journal of Labor Economics* 6: 21-39.

Mitchell, O. S., and S. Utkus. 2002. Company stock and retirement plan diversification. Pension Research Council Working Paper 2002-4.

Mitchell, T. R., B. C. Holtom, T. W. Lee, C. J. Sablynski, and M. Erez. 2001. Why people stay: Using job embeddedness to predict voluntary turnover. *The Academy of Management Journal* 44: 1102-1121.

Nagypál, E. 2007. Learning by doing vs. learning about match quality: Can we tell them apart? *Review of Economic Studies* 74: 537-566.

NCEO, 2012. National Center for Employee Ownership, a statistical profile of employee ownership. http://www.nceo.org/articles/statistical-profile-employee-ownership, accessed June 2013.

Oyer, P. 2004. Why do firms use incentives that have no incentive effects? *The Journal of Finance* 59(4): 1619-1650.

Oyer, P., and S. Schaefer. 2005. Why do some firms give stock options to all employees?: An empirical examination of alternative theories. *Journal of Financial Economics* 76: 99-133.

Parsons, D. O. 1972. Specific human capital: An application to quit rates and layoff rates. *Journal of Political Economy* 80: 1120-1143.

Pierce, J. L., S. A. Rubenfield, and S. Morgan. 1991. Employee ownership: A conceptual model of process and effects. *The Academy of Management Review* 16: 121-144.

Pierce, J. L., T. Kostova, and K. Dirks. 2001. Toward a theory of psychological ownership in organizations. *The Academy of Management Review* 16(1): 121-45.

Poterba, J. M. 2003. Lessons from Enron: Employer stock and 401(k) plans. *The American Economic Review* 93: 398-404.

Prendergast, C. 1999. The provision of incentives in firms. *Journal of Economic Literature* 37: 7-63.

Rosen, C., J. Case, M. Staubus. 2005. Equity: Why Employee Ownership Is Good for America. Harvard Business School Press.

Rosenbloom, J. S. 2005. The handbook of employee benefits: Design, funding, and administration. New York: McGraw-Hill.

Russell, K. D. 2006. Deferred compensation and employee retention. Working paper, Stanford University.

Ryterband, D.J., 1991. The decision to implement an ESOP: Strategies and economic considerations. *Employee Benefits Journal*.

Salop, J., and S. Salop. 1976. Self-selection and turnover in the labor market. *The Quarterly Journal of Economics* 90: 619-627.

Sesil, J. C., and Y. P. Lin. 2011. The impact of employee stock option adoption and incidence on productivity: Evidence from US panel data. *Industrial Relations: A Journal of Economy and Society 50*(3): 514-534.

Sesil, J., M. Kroumova, Blasi, J. R., and D. L. Kruse. 2002. Broad-based employee stock options in US 'New Economy' firms. *British Journal of Industrial Relations* 40: 273–94.

Shapiro, C., J. Stiglitz. 1984. Equilibrium unemployment as a worker discipline device. *American Economic Review* 74: 433–444.

Shaw, J. D., N. Gupta, and J. E. Delery. 2005. Alternative conceptualizations of the relationship between voluntary turnover and organizational performance. *The Academy of Management Journal* 48: 50-68.

Siebert, W. S., and N. Zubanov. 2009. Searching for the optimal level of employee turnover: a study of a large UK retail organization. *Academy of Management Journal 52*(2): 294-313.

Simon, H. 1991. Organizations and Markets. *Journal of Economic Perspectives*. 5 (Spring): 25-44.

Stack, J., and B. Burlingham. 2003. A Stake in the Outcome: Building a Culture of Ownership for the Long-Term Success of Your Business. Crown Business.

Stiglitz, J. 2000. Democratic Development as the Fruits of Labor. *Perspectives on Work*, 4(1): 31-38. Also Chapter 9 in *The Rebel Within*, H. Chang (ed.), London: Wimbledon Publishing Company. 2001. 279-315. (Originally Keynote Address at the Industrial Relations Research Association, Boston, January 2000.)

Sundaram, R. and D. Yermack. 2007. Pay me later: inside debt and its role in managerial compensation. *Journal of Finance* 67: 1551–88.

Tepper, I. 1981. Taxation and corporate pension policy. *Journal of Finance* 36: 1-13.

Thistlethwaite, D. L., and D. T. Campbell. 1960. Regression-discontinuity analysis: an alternative to the ex post facto experiment. *Journal of Educational Psychology* 51: 309-317.

Ton, Z., and R. S. Huckman. 2008. Managing the impact of employee turnover on performance: The role of process conformance. *Organization Science* 19: 56-68.

Trevor, C. O. 2001. Interactions among actual ease-of-movement determinants and job satisfaction in the prediction of voluntary turnover. *The Academy of Management Journal* 44: 621-638.

Trochim, W. M. 1984. Research design for program evaluation: The regression-discontinuity design. Beverly Hills, CA: Sage Publications.

Van der Klaauw, W. 2002. Estimating the effect of financial aid offers on college enrollment: A regression-discontinuity approach. *International Economic Review* 43: 1249-1287.

Warner, J. T., and S. Pleeter. 2001. The personal discount rate: Evidence from military downsizing programs. *The American Economic Review* 91: 33-53.

Wilson, N., and M. Peel. 1991. The impact on absenteeism and quits of profit-sharing and other forms of employee participation. *Industrial and Labor relations Review* 44(3): 454-68.