

**CHANGES IN FIRM PENSION POLICY: TRENDS AWAY FROM TRADITIONAL
DEFINED BENEFIT PLANS**

by

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Abstract

In light of the recent concerns regarding the solvency of Social Security's Old-Age, Survivors and Disability Insurance (OASDI), private pensions may play an increasingly important role in retirement welfare of US retirees. However, the private pension landscape has evolved in ways that may result in lower private pension wealth for retirees. One recent such phenomenon involves the conversion of traditional defined benefit pension plans to cash balance plans, which resulted in lower pension benefits for many workers. In this study, I investigate how characteristics of the firm's workforce influenced whether the firm converted their traditional pension plan to a cash balance plan and how these characteristics related to the firm's pension plan policy more generally. Using the Longitudinal Employer-Household Data and pension plan data from the Department of Labor/Internal Revenue Service and the Pension Benefit Guaranty Corporation, I found little evidence of workforce age distribution effects on the likelihood of DB plan conversion to a cash balance plan in the 1990s. More generally, I consistently find positive associations between firms with older and more female workforces and defined contribution plans during the same time.

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The relative share of aggregate income for U.S. retirees from private pensions has increased from about 10 percent in 1962 to about 20 percent in 2004 (SSA 2006). Although Social Security constituted the largest share of aggregate income over the same time period (from 32 percent in 1962 to 37 percent in 2004), the role of private pensions for retirees will play a larger role in the future as the fraction of retirement income from Social Security will decrease (McGill et al.; 2005; Leimer 2007). There is also evidence that the fraction of workers covered by employer provided pensions is decreasing: Copeland (2007) reports that the fraction of full-time wage and salary workers ages 21-64 employed by a firm sponsoring a private pension has decreased from 67 percent in 1987 to 61 percent in 2006. Additionally, firms may be reducing coverage and benefits in other ways by changing the type of plan(s) they offer or freezing their current plans (Mitchell and Schieber 1998; Papke 1999; Aaronson and Coronado 2005; Munnell et al. 2006). This decline in firm provision of such benefits exacerbates the increasing need for private pension benefits to offset the decreasing share of public pension benefits.

In this study, I examined a recent phenomenon whereby firms converted their traditional defined benefit (DB) plans to hybrid cash balance pension plans.² Cash balance plans result in a retirement benefit accrual pattern that looks similar to accruals in defined contribution (DC) plans, though they are technically DB plans. In the 1990s, many firms were converting their traditional pension plans to cash balance plans. The conversion tended to reduce the amount of private pension wealth particularly for older and longer tenured workers. Using data from the Department of Labor matched to unique firm-employee matched Census data, the Longitudinal Employer Household Data, I investigated which types of firms chose to convert their pension plans. In particular, I focused on characteristics of the firm's workforce- the age and gender distribution of employees

²Most of these conversions occurred in the 1990s. The IRS issued a moratorium on cash balance conversions in 1999. The 2006 Pension Protection Act remedied many of the perceived problems with these conversions and the moratorium was lifted in December 2006 (Pension Protection Act, 2006).

working at the firm. I also conducted a more general exploratory analysis on how the workforce characteristics related to the firm's plan type(s). Understanding why some firms chose to convert to cash balance plans will shed light on how firms choose pension plan type more generally. Using linked employer employee data, this study aimed to improve our understanding of how firms decide to supply pension plans as a component of their compensation.

Previous Literature & Background

Cash Balance Plans

Previous studies of cash balance plan conversions tested two main explanations for such conversions, though there are other hypotheses regarding the general trend away from DB plans (e.g. Mitchell and Schieber 1998). The "tax avoidance hypothesis" suggests that firms with over-funded DB plans converted to cash balance plans in order to access excess plan assets (Coronado and Copeland 2004; D'Souza, Jacob, and Lougee 2006; Niehaus and Yu 2005). When plan assets exceed plan liabilities, the firm can terminate its traditional DB plan to access the surplus funds. However, the cost of termination includes immediate vesting of all plan participants in addition to an excise tax (of up to 50 percent) on the surplus amount (Zelinsky 2000). Alternatively, if the firm instead converts its DB plan to a cash balance plan, it avoids these costs though it still cannot access the surplus funds. The firm rolls over excess assets to the new plan in the event of over-funding (McGill et al. 2005) and hence does not have to contribute as much to the plan at that time. Because cash balance plans are technically DB plans, the firm needs only to file a plan modification with the Department of Labor (DOL) and Internal Revenue Service (IRS). The empirical support for this hypothesis is mixed, though most of the work suggests an insignificant or negative effect of plan funding on the likelihood of conversion (Coronado and Copeland 2004; D'Souza et al. 2006;

Niehaus and Yu 2005; Kapinos 2009).³ In the most recent work on this, Kapinos (2009) found that the plan funding status had no significant effect on the likelihood of conversion using a large sample (including terminated plans) than in previous studies.

The second theoretical framework draws on the implicit contract theory (Lazear 1979; Ippolito 1985), arguing that conversions were the result of firms' decisions to renege on the promises of a particular retirement plan and expected benefits. In the case of cash balance pension plan conversions, the value of some employees' expected deferred compensation was reduced, resulting in a breach of the implicit contract by the firm for those workers. For these firms, it must be the case that the value of the implicit contract was worth less to the firm than the benefit of converting to these plans. Which types of firms would want to breach the implicit contract? In general, there is increasing evidence that firms prefer the implicit contract and lifetime employment arrangements less now than in previous decades (Cappelli 1999; Ippolito 2001; Friedberg and Owyang 2002; Balan 2003; Aaronson and Coronado 2005). Researchers have suggested specific employee characteristics and scenarios under which the firm would have an incentive to breach the contract: firms with less mobile employees on average, firms with older employees on average, and in certain rapidly changing industries or environments where the value of general human capital exceeds the value of firm specific human capital. Previous researchers have endeavored to test this hypothesis by examining the effect of the age and tenure distribution of workers at the firm, worker mobility, and firm industry on the likelihood of plan conversion (Coronado and Copeland 2004; D'Souza, Jacob, and Lougee 2006; Niehaus and Yu 2005; Kapinos 2009). The findings from these studies have provided little support for this hypothesis, with mostly insignificant estimated effects.

³ The exception is Niehaus and Yu's work (2005). Niehaus and Yu (2005) examined all DB plans that either were converted to a cash balance plan or were terminated and subsequently replaced by a defined contribution (DC) plan. They found that in this sample, firms with excess assets were more likely to convert during the 1990s.

Measurement error is a pervasive problem in all of these studies as researchers often measure workforce age, mobility and tenure as the average for the industry of the firm.

General Trend towards DC Plans

Researchers have examined both explanations for the trend away from DB plans and the consequences of this trend. DC plans tend to cost less for firms to administer (Hustead, 1998; D'Souza et al. 2006) and offer greater flexibility and portability to employees (Mitchell and Schieber, 1998; Aaronson and Coronado, 2005). Employees tend to have greater control over the DC retirement accounts and can take accrued benefits upon separation more easily (portability). Employers also began favoring DC plans as changes in industry composition and technology rendered long-term employment contracts less optimal, including the DB plans as components of those contracts (Andrews, 1992; Gustman and Steinmeier, 1992; Ippolito, 1995, 2001; Friedberg and Owyang, 2004; Balan, 2003; Aaronson and Coronado, 2005). Firms in rapidly changing industries/environments began to value more general human capital over firm-specific skills, implying that long-term labor contracts, long tenured and older employees with large stocks of firm specific human capital were less desirable.

There are also clear consequences of the changes in the pension landscape, namely from the movement from traditional DB plans to the DC-like plans. Changes in the private pension plan environment, including the cash balance conversions, affect measurements of the financial adequacy of the OASDI trust fund. The trend away from DB pension plans affects labor force participation and retirement rates. For example, Lumsdaine, Stock, and Wise (1994) found that the cumulative retirement rate at age 65 decreased from 86 to 80 percent for a simulated change from a defined benefit to a defined contribution plan. Purcell (2000) reported an increase in labor force participation of both men and women ages 65 and older from 1995 to 2000 using the Current Population Survey data, which may be partly attributable to changes in firms' pension policies.

Additionally, changes in firm pension policy may affect retiree well-being. Previous research suggests that pension wealth tends to be less generous for retirees in DC plans than in DB plans (Gustman and Steinmeier, 1989). Plan conversion from a traditional DB plan to a cash balance plan results in lower pension wealth for older and longer tenured employees, though the effect can be positive for younger and more mobile workers.

Hypotheses - Firm or Employee Driven?

The hypotheses that the age and tenure distribution at the firm would positively affect the likelihood of plan conversion or a change in firm pension plan policy towards DC plans are based on the assumption that these conversions were firm driven. Researchers examining the trend away from DB plans have found that some changes in the labor force affected this trend (Aaronson and Coronado 2005). Therefore, I discuss my main hypotheses from both the firm's point of view and the employee's point of view, which in some cases yields contradictory hypotheses.

Defined benefit plans result in large accruals of retirement wealth just prior to retirement age; whereas cash balance plans (and DC plans) result in more even accumulation of retirement benefits over one's career. This results in a larger reduction in the value of retirement benefits for older and longer tenured workers upon conversion. Therefore, older employees would have preferred to maintain their traditional retirement accounts as opposed to converting to a cash balance plan, which resulted in account reductions. Workers with higher labor mobility would have preferred a cash balance plan over a traditional DB due to the cash balance plan's portability and more even benefit accrual. Munnell, Haverstick, and Sanzenbacher (2006) suggest that gender may also play a role in worker demand for certain pension plan types. Women tend to have lower years of tenure and more gaps in labor force participation on average than men making portable plans more attractive than traditional DB plans (Munnell & Soto 2007).

The firms' preferences are less clear. Depending upon the age distribution of workers at the firm and how much the firm valued firm specific human capital, the firm's stance would have varied. Firms with a relatively older workforce may have been more willing to convert to a cash balance plan, particularly if the firm did not value the stock of firm specific human capital of those workers. Despite the potential for increased pension costs for younger workers under the cash balance plan, firms may have generated savings by lower pension costs for the older workers. Assuming that these firms were trying to maximize profits, they may have expected that the benefit in having these younger and more skilled or educated employees would have exceeded the projected cost of renegeing and paying higher labor and pension costs. Therefore, the firm's likelihood of converting depends on both the age and tenure distribution of workers at the firm and the value of firm specific human capital relative to more general human capital. In this study, I investigate the role of a workforce's age and gender in explaining firm pension plan offerings.

Previous attempts to understand firm conversions to these plans have used some combination of the above-mentioned sources for data and linked these plans to Compustat to obtain firm level control variables. Additionally, researchers have linked these data to other datasets (such as the CPS aggregated to industry level) to obtain proxies for average age, mobility, and tenure at the firm (Coronado and Copeland, 2004; D'Souza, Jacob, and Lougee, 2004; Niehaus and Yu, 2005; Kapinos, 2009). These data do not allow for appropriate modeling of this phenomenon because variables are measured at inappropriate levels of aggregation (i.e., conversion is measured at the plan level and average age is measured at the industry level). Indeed, previous researchers have found little support that firms with older employees—as measured by the mean age in the plan's industry—were more likely to convert to cash balance pension plans (Coronado and Copeland, 2004; D'Souza, Jacob, and Lougee, 2004; Kapinos, 2009). In this study, I analyzed data

where I measured key variables at the firm or establishment level, still imperfect, but an improvement over industry level measures.

Determining whether these changes were firm or employee driven is not straightforward. The employee characteristics that plausibly influence the firm's pension plan policy may also be influenced by the firm's policy. That is, while firms with older employees may prefer a particular plan type (for cost or other reasons), it may also be the case that employees select into firms at least partially on the basis of firm pension plan policies. In other words, estimates of the effect of the workforce age and gender distribution may be endogenous to firm pension plan type. While I do not have an ideal exclusion restriction in the data I analyze to estimate an instrumental variables model to deal with this (as solution to this problem), I can estimate the firm's pension plan policy using lagged measures of the firm's workforce. This may yield more plausibly causal estimates, but is imperfect because the age and gender distribution at the firm is likely correlated from one year to the next. In fact, the results I present below (using non-lagged covariates) are qualitatively consistent with models using lagged measures.⁴

Data and Empirical Strategy

In this analysis, I used Form 5500 data from Department of Labor and Internal Revenue Service data from 1992⁵ to 1999 linked to the Census Bureau Longitudinal Employer-Household Dynamics (LEHD) data and the Pension Benefit Guaranty Corporation (PBGC) data on plan terminations. I included plans at firms in states for which LEHD data is available from 1996 at the latest.⁶ Most firms in the US are required by law to submit the 5500 forms annually detailing their pension plans (among other employee benefit plans). The Form 5500 pension characteristics are

⁴ Results available upon request.

⁵The DOL reports that 5500 data prior to 1991 is unavailable due to data corruption. Though the first conversion was in 1985, most conversions occurred in the 1990s.

⁶ This restricts the analysis to firms located in the following states: California, Colorado, Florida, Idaho, Illinois, Maryland, Maine, Montana, North Carolina, New Jersey, New Mexico, Oregon, Texas, Virginia, Washington, and Wisconsin.

reported at the plan level. The link to the Census Bureau LEHD data, specifically the Quarterly Workforce Indicator (QWI) data, provided establishment level characteristics about the workforce, including the total compensation and number of employees working at the firm in various age and gender groups. The LEHD data are particularly useful in that they are drawn from state unemployment insurance records and supplemented with other data at the Census Bureau (see Abowd et al., 2005). In this analysis, I linked plan level details from the DOL/IRS records to establishment level details on the workforce as reported in the fourth quarter. For firms with multiple establishments, I used the mean across all establishments within the same state. I use the term “firm” in the rest of the paper to encompass both single-establishment firms and multi-establishment firms. Some details on cash balance plans are missing from the IRS/DOL data, especially in the earlier years. For that reason, I supplemented this data with specific dates of conversion obtained from previous researchers and consulting firms (Niehaus and Yu, 2005), court cases, and firm financial statements. My final sample of DB plans consists of 9,862 plan-years and my final sample of DB and DC plans consists of 65,162 plan-years from 1992 to 1999. In Table 1, I report descriptive statistics for the sample of DB plans only and for the larger DB and DC plan sample in panels A and B, respectively. The main differences in these two samples are the age and unionization make-ups: adding in the DC plans seems to add younger individuals and more non-union plans.

For my first set of analyses, I focused on defined benefit plans only and estimated a hazard model to investigate how worker characteristics affected the likelihood of plan conversion each year. This model deals with censoring and allows for time varying covariates, whereas much of the previous analysis uses multiple year means of the covariates. More specifically, I estimated:

$$\lambda(t) = \lambda_0(t) \exp(X\beta + Z\gamma)$$

where X includes the main variables of interest: the fraction of employees at the firm older than 44 years of age⁷ and the fraction of female employees at the firm; Z is a vector of control variables: these include total payroll at the firm, number of DB and DC plans at the firm, number of active and retired participants in the plan, whether the plan covers unionized employees, plan funding status, administrative expenses (logged), and firm contributions to the plan (logged); $\lambda(t)$ is the hazard rate that a DB plan would convert to a cash balance plan at time t and $\lambda_0(t)$ is the baseline hazard rate. I included industry fixed effects and adjusted for firm clustering in all models.

Next, I attempted to incorporate the competing risks—a firm could convert a DB plan to a cash balance plan, terminate its DB plan and establish a new DC plan (though there are high costs associated with doing this) or establish a new DC plan and leave its DB plan intact, but encourage participation only in the former. There has been little empirical evidence that actual replacement of a DB plan with a DC plan (i.e. terminating the DB plan and having employees switch to a DC plan) occurred very often (Kruse, 1995; Papke et al. 1996; Ippolito and Thompson, 2000). Thus, I again focused on DB plans only and compared those that converted or terminated with those that did not change during my sample period. I estimated a multinomial logit with three categories: the DB plan a) converted to a cash balance plan, b) terminated or c) did not convert or terminate. I included the same control variables as described in the hazard model estimation discussion.

Next, I extended the sample to include DC plans to get a broader sense of how the workforces at firms with various plan types look. I investigated this in several ways. First, I estimated the likelihood of a plan being a DC plan as a function of the same covariates as described above using a probit model. Second, I estimated a multinomial logit with four plan categories (by year): a) traditional DB plan, b) cash balance plan c) defined contribution plan, or d) terminated plan. Third, I estimated a multinomial logit by categorizing the overall pension plan policy at the

⁷ As a robustness check, I also use the fraction of employees who are older than 54 years of age in all of the analysis. The results are consistent with those presented here.

firm in the following mutually exclusive manner: a) firm has only one DB plan, b) firm has two or more DB plans, c) firm has only one DC plan, d) firm has two or more DC plans or e) firm has both types of plans. In each of these specifications, I controlled for the total payroll at the firm, whether the plan covered unionized employees, the funding status of the plan, the annual firm contributions to the plan, the administrative expenses (logged), and industry fixed effects.

Results

In Table 2, I reported the hazard model results. In all specifications, I included the total payroll for each age group of employees at the firm and whether the plan covered unionized employees⁸ and I clustered at the firm level because some firms have more than one plan in my sample. In columns 1 and 2, I reported results from models with and without industry fixed effects, respectively. I found that plans at firms with a larger fraction of employees in the aged 44 or greater were about 55 percent less likely to convert to a cash balance plan over the 1992-1999 period than to remain a traditional DB plan. I found that plans at firms with more female employees were more likely to convert to cash balance plan than to remain a traditional DB plan, although this effect diminished when I controlled for industry fixed effects. I also consistently found that plans with more active participants were significantly more likely to convert to cash balance plans.

Next, I estimated the multinomial logit to allow for the possibility of plan termination (Table 3). Interestingly, once I allowed for plan termination as an option, I found no evidence that having a larger fraction of older employees at the firm correlated with a greater likelihood of conversion to a cash balance plan relative to not changing. In addition, perhaps not surprisingly, plans covering unionized employees were more likely not to change as opposed to converting to a cash balance plan or terminating. The results reported in Table 3 are qualitatively similar if I use lagged

⁸ In some tables, I am unable to report results on the plan union status due to disclosure rules.

measures of the covariates, however, I did lose a substantial number of observations using lagged measures.

Next, I conducted exploratory analysis to investigate more generally how the characteristics of the workforce explain firm pension policy. Controlling for the total payroll at the firm (by age categories), whether the plan covered unionized employees, the fraction of female employees at the firm, plan funding status, plan administrative expenses and contributions, I estimated how the age distribution predicted the likelihood that a given plan in a given year was a defined contribution plan. Again, given the theoretical discussion regarding reasons for firm shifts to defined contribution plans, I am interested in whether plans at firms with more older employees were, in fact, less likely to have DC plans. I first presented results from a simple probit estimation predicting the probability that a plan in a given year is a DC plan (see Table 4). These results suggest that plans at firms with more older employees or female employees were less likely to be DC plans instead of DB plans.

In Table 5, I presented results from a multinomial logit model with four categories for each plan-year: DB plan, cash balance plan, DC plan (omitted category), and terminated plan. Plans at firms with a larger fraction of older employees were more likely to be DB plans (traditional or cash balance). Note that the relative risk of conversion to a cash balance plan relative to being a traditional DB plan is insignificant (3.77/3.26), but the relative risk of conversion relative to termination is significant (3.77/1.32). In other words, plans at firms with older workers were more likely to have cash balance plans relative to terminating the plan (consistent with results in Table 3). Plans at firms with a larger share of female employees were significantly more likely to be cash balance plans relative to the other plan types. Finally, consistent with earlier tables, plans that covered unionized employees were significantly more likely to be traditional DB plans relative to other plan types.

Finally, in Table 6, I presented results with a more general categorization of the firm's pension plan policy. Again, firms with older workforces were more likely to have DB plans only (single or multiple) relative to DC only or both plan types. Similarly, firms with an older workforce were less likely to have DC plans only relative to DB only or both plan types. Firms with plans that covered unionized employees were more likely to have DB plans relative to DC plans only or both plan types. These results are consistent with those presented earlier.

Discussion and Conclusion

The finding that firms with larger fractions of employees near retirement age were not more likely to convert to cash balance plans weakens the notion that converting firms were engaging in age discrimination. Although I actually found a negative effect of having an older workforce on the likelihood of plan conversion to a cash balance plan, this effect became insignificant once I accounted more properly for the possibility of plan termination. The notion that female employees would prefer cash balance plans (or DC plans) over traditional DB plans stems from the fact that they tend to have employment spells of shorter duration and more gaps in their labor force participation than men (Blau and Kahn, 2006). Given that both cash balance and DC plans are more conducive to such a labor force participation pattern, I hypothesized that if employees were driving these conversions, firms with more female workers (relative to male workers) would be more likely to convert. I did find some evidence of this; however, my results became insignificant in models with industry fixed effects. This may be due to large differences in the fraction of female employees in firms across industry (i.e. manufacturing versus service). In other words, the correlation between the industry dummies and the fraction of female employees at the firm may have washed out the female effect.

I presented preliminary evidence that DC plans were more likely to be present at firms with younger workforces. This is not surprising, as previous research has documented that the decline in

the prevalence of DB plans has yielded a pension landscape where most DB plans are at large, industrial, unionized firms (Andrews, 1992; Gustman and Steinmeier, 1992; and Ippolito, 1995). However, this analysis likely suffers from the problem of endogeneity. For example, was it the case that firms with younger workforces started offering cash balance or DC plans to accommodate worker demand and preferences for such plans, or did firms' offering of such plans attract younger employees (Munnell, Haverstick, and Sanzenbacher, 2006)? I found that models with lagged measures yield similar results, although this does not completely deal with this potential bias because the composition of workers at time $t-1$ is likely correlated with the composition at time t . In other words, these lagged measures of the age distribution are likely correlated with the error term in the similar way that the non-lagged measures are.

In my analysis investigating more generally the correlates of firm pension plan policy, I consistently found that firms with older workforces were less likely to have DC or DC-like plans relative to DB plans. Similarly, I found that firms with more female and unionized employees were more likely to have DB plans than DC plans.

This paper presented exploratory and preliminary findings about the determinants of firms' movement away from traditional DB plans; firstly, in the trend towards conversion to cash balance plans and secondly in the more general trend towards DC plans.

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Table 1. Descriptive Statistics, Means by Plan-Year Type

<u>Panel A: DB Plans Only</u>	<u>N</u>	<u>mean</u>	<u>std. dev.</u>
% of Employees > 44	9862	0.40	0.22
% of Employees > 54	9862	0.16	0.18
% of Employees - Female	9862	0.40	0.28
Number of DC plans at firm	9862	0.09	0.36
Number of DB plans at firm	9862	1.15	0.79
Number of Active Plan Participants (000s)	9862	0.62	2.63
Number of Retired Plan Participants (000s)	9862	0.17	1.01
Plan Covers Unionized Employees (0/1)	9862	0.26	0.44

<u>Panel B: DB & DC Plans</u>	<u>n</u>	<u>Mean</u>	<u>std. dev.</u>
% of Employees > 44	65,162	0.33	0.20
% of Employees > 54	65,162	0.13	0.15
% of Employees – Female	65,162	0.40	0.26
Number of DC plans at firm	65,162	0.91	0.46
Number of DB plans at firm	65,162	0.21	0.58
Number of Active Plan Participants (000s)	65,162	0.41	1.88
Number of Retired Plan Participants (000s)	65,162	0.03	0.42
Plan Covers Unionized Employees (0/1)	65,162	0.06	0.24

Notes: Table 1 is based on LEHD-DOL linked data from 1992-1999. The unit of observation in these calculations is plan-year. All measures in dollars are in millions of 1999\$.

Table 2. Cox Proportional Hazard Results; Sample: All DB plans from 1992-1999
Hazard Ratios Reported

	Column 1	Column 2
% of Employees > 44 years of age	0.46* (0.21)	0.45* (0.20)
% of Employees who are Female	2.28** (0.78)	1.03 0.40
Number of DC plans at Firm	1.99 (0.92)	1.83 (0.89)
Number of DB plans at Firm	1.12 (0.17)	1.15 (0.19)
Number of Active Plan Participants (000s)	1.02 (0.01)	1.02** (0.01)
Number of Retired Plan Participants (000s)	0.98 (0.05)	0.99 (0.04)
Industry Fixed Effects?	No	Yes
Observations	9,862	9,862
log likelihood (pseudo)	-989.74	-977.36
Number of Failures	135	135

Notes: All specifications include the firm's total payroll for each age category and whether the plan covers unionized employees (results are suppressed for disclosure reasons), plan funding ratio, annual administrative expenses, and firm contributions to the plan. Robust standard errors are in parentheses (clustered at the firm level).

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

Table 3. Multinomial Logit Results: Traditional DB, Cash Balance, and Terminated DB Plans. Relative Risk Ratios Reported (Omitted Category is no change to DB plan)

	Cash Balance	Terminated DB
% of Employees > 44 years of age	0.73 (0.32)	0.38** (0.14)
% of Employees who are Female	1.35 (0.56)	0.63 (0.16)
Plan Covers Unionized Employees	0.43** (0.15)	0.59** (0.13)
Industry fixed effects?	Yes	
Observations	9,862	
log likelihood	-1,315.49	
Pseudo R2	0.16	

Notes: All specifications include the firm's total payroll for each age category, # of DB/DC plans at the firm, total # of active and retired participants in the plan, plan funding status, administrative expenses, and contributions. Robust standard errors are in parentheses (clustered at the firm level).

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

Table 4. Probit Results of the Likelihood that a Plan is a DC Plan, Marginal Effects reported

% of Employees > 44 years of age	-0.13*** (0.01)
% of Employees who are Female	-0.08*** (0.01)
Plan Covers Unionized Employees	-0.41*** (0.01)
Industry fixed effects?	Yes
Observations	65,162
Pseudo R2	0.25

Notes: All specifications include the firm's total payroll for each age category, plan funding ratio, annual administrative expenses, and firm contributions to the plan. Robust standard errors are in parentheses (clustered at the firm level).

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

Table 5. Multinomial Logit Results: Traditional DB, Cash Balance Plan, DC Plan, and Terminated DB Plan. *Relative Risk Ratios Reported (Omitted Category is DC plan)*

	Traditional DB plan	Cash Balance Plan	Terminated Plan
% of Employees > 44 years of age	3.77*** (0.23)	3.26*** (1.49)	1.32 (0.38)
% of Employees who are Female	2.08*** (0.11)	3.64*** (1.49)	1.55* (0.38)
Plan Covers Unionized Employees	10.57*** (0.46)	3.16*** (1.08)	3.95** (0.72)
Industry fixed effects?		Yes	
Observations		65, 162	
log likelihood		-24,156.80	
Pseudo R2		0.19	

Notes: All specifications include the firm's total payroll for each age category, # of DB/DC plans at the firm, total # of active and retired participants in the plan, plan funding status, administrative expenses, and contributions. Robust standard errors are in parentheses (clustered at the firm level).

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

Table 6. Multinomial Logit Results. Firm Pension Plan Policy: Single DB plan, 2+ DB plans, Single DC plan, 2+ DC plans, or Both Plan Types.

Relative Risk Ratios Reported (Omitted Category is Both Plan Types)

	Single DB plan	Multiple DB plans	Single DC plan	Multiple DC plans
% of Employees > 44 years of age	1.82*** (0.22)	2.32*** (0.56)	0.42*** (0.05)	0.40*** (0.07)
% of Employees who are Female	2.00*** (0.23)	1.19 (0.34)	0.87 (0.10)	0.82 (0.13)
Plan Covers Unionized Employees	1.40*** (0.11)	4.23*** (0.62)	0.11*** (0.01)	0.42*** (0.06)
Industry fixed effects?			Yes	
Observations			65,162	
log likelihood			-42,150.40	
Pseudo R2			0.14	

Notes: All specifications include the firm's total payroll for each age category, # of DB/DC plans at the firm, total # of active and retired participants in the plan, plan funding status, administrative expenses, and contributions. Robust standard errors are in parentheses (clustered at the firm level). *** p < 0.01, ** p < 0.05, * p < 0.01