# The Effect of Providing Peer Information on Retirement Savings Decisions

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### Preliminary and incomplete

**Abstract:** We conducted a field experiment to evaluate the effect of receiving information about the retirement savings decisions of one's peers. Non-participants and low savers in one firm's 401(k) plan received letters offering them the opportunity to enroll or increase their plan contribution rates by returning a simple reply form. We randomly assigned employees to receive no peer information, information about the fraction of their coworker peers who were saving in the plan, or information about the fraction of their coworker peers who were contributing at least 6% of their salary to the plan. We find that peer information reduced plan enrollment rates among unionized non-participants. These results highlight the possibilities and limitations of peer information interventions designed to increase retirement savings.

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In models of informational cascades and social learning, the actions of peers reflect information that is relevant to the individual's payoffs. Therefore, after an individual observes her peers, her actions will mimic those of her peers (Banerjee, 1992; Bikhchandani, Hirshleifer, and Welch, 1992; Ellison and Fudenberg, 1993). Observations of peers may also inform individuals about social norms from which deviations are costly due to social sanction, identity considerations, or strategic complementarities (Akerlof, 1980; Bernheim, 1994; Akerlof and Kranton, 2000; Glaeser and Scheinkman, 2003).

Empirical work has confirmed that individuals imitate their peers in a variety of domains, including retirement savings, stock market participation, technology adoption, criminal activity, education, welfare usage, automobile purchases, contraception, and littering.<sup>1</sup> Peer influences are likely to be stronger when members of the peer group are more similar to the observer and when the decision task at hand is more difficult or ambiguous (Suls and Wheeler, 2000).

Given the power of peer effects, it seems intuitively plausible that policy interventions that disseminate information about peers' choices will move individuals' behavior towards the peer norm. Field experiments have shown that providing peer information has this effect on entree selections in a restaurant, music downloads, towel re-use in hotels, theft of petrified wood from a national park, and stated intentions to vote (Cai, Chen, and Fang, forthcoming; Salganik, Dodds, and Watts, 2006; Cialdini et al., 2006; Goldstein, Cialdini, and Griskevicius, 2008; Gerber and Rogers, 2009). Perhaps the largest-scale implementation of "social norms marketing" has been on U.S. colleges and universities, many of which publicize statistics about typical drinking behavior on campus in order to discourage student alcohol consumption. However, the evidence on these campaigns' efficacy is mixed, perhaps because existing studies are hampered by among other things—a lack of exogenous variation in campaign adoption and reliance on self-reported drinking behavior.<sup>2</sup>

<sup>&</sup>lt;sup>1</sup> See Asch (1951), Besley and Case (1994), Munshi (2004), Case and Katz (1991), Glaeser, Sacerdote, and Scheinkman (1996), Sacerdote (2001), Bertrand, Luttmer, and Mullainathan (1998), Munshi and Myaux (2006), Foster and Rosenweig (1995), Cialdini, Reno, and Kallgren (1990), Kallgren, Reno, and Cialdini (2000), Duflo and Saez (2002, 2003), Hong, Kubik and Stein (2004), and Grinblatt, Keloharju, and Ikäheimo (2008). Manski (2000) provides a general overview of issues in the broadly defined literature on social interaction.

<sup>&</sup>lt;sup>2</sup> See Wechsler et al. (2003) and Werch et al. (2000) for critiques of the literature.

In this paper, we investigate whether disseminating peer information can affect retirement savings behavior. In partnership with a large manufacturing firm and its retirement plan administrator, we mailed letters to employees who had low contribution rates in the company 401(k) plan. Employees who had never enrolled in the plan received Quick Enrollment (QE) letters, which allowed them to start contributing 6% of their pay to the plan at a pre-selected asset allocation by returning a simple reply form. Employees who had previously enrolled but now had low contribution rates received Easy Escalation (EE) letters, which gave them a nearly identical reply form which could be returned to increase their contribution rate to 6% of pay. Previous work has shown that these simplified enrollment and contribution escalation mechanisms significantly increase savings plan contributions (Choi, Laibson, and Madrian, forthcoming; Beshears et al., 2006).

Quick Enrollment and Easy Escalation recipients were randomly assigned to three groups. A third of employees were shown information about the savings behavior of coworkers in their five-year age group (e.g., all employees at the firm between the ages of 25 and 29). Another third of employees received similar information regarding coworkers in their ten-year age group (e.g., all employees at the firm between the ages of 20 and 29). The remaining employees served as a control group and received no such peer information. For QE recipients in the peer information treatments, our letters stated the fraction of employees in the relevant age group who were already enrolled in the savings plan. For EE recipients, the peer information number was the fraction of savings plan participants in the relevant age group who were contributing at least 6% of their pay to the plan. In all age groups, the QE and EE peer information numbers were greater than 70%.

We use plan administrative data to track contribution rate increases over the two months following our mailing. In the taxonomy of Harrison and List (2004), our study was a "natural field experiment," since subjects never learned that they were part of an experiment. We measure the effect of the *presence* of peer information by comparing the frequency with which employees in the peer information treatment groups increased their contribution rates against the corresponding frequency for the control group. To estimate the effect of the *magnitude* of the peer information number, we exploit two sources of

variation. First, two employees of the same age were exposed to different peer information numbers if one was randomly assigned to have coworkers in her five-year age range as her peer comparison group and the other was randomly assigned to the tenyear age range treatment. Second, if two employees were similar in age but on opposite sides of a boundary separating adjacent five-year or ten-year age ranges, those employees saw different peer information numbers because of the discontinuity at the boundary.

Employees in our study naturally fell into four subpopulations: (1) unionized nonparticipants, (2) non-unionized non-participants, (3) unionized plan participants with low contribution rates, and (4) non-unionized plan participants with low contribution rates. Unionized employees were distinct from non-unionized employees because of differences in their job tasks and because the relationship between a unionized employee and the firm is intermediated by a collective bargaining entity. Furthermore, nonunionized employees were automatically enrolled in the retirement savings plan at a 6% contribution rate unless they opted out, while unionized employees were not. Prior research has found that automatic enrollment has a large impact on 401(k) enrollment, contribution rates, and asset allocations because employees often passively accept the default options (Madrian and Shea, 2001; Choi et al., 2002 and 2004). Non-unionized employees at our partner firm who passively accepted the 6% contribution rate default did not receive QE or EE letters. Therefore, among the four subpopulations who received a letter, only unionized non-participants had never made an active 401(k) savings decision; the other three subpopulations had actively chosen their low savings rate.

We find that among non-unionized non-participants, the peer information intervention worked as expected. Receiving peer information increased the likelihood of subsequently enrolling in the plan from 0.7% to 3.4%. A one percentage point increase in the reported fraction of coworkers already enrolled in the plan increased the response rate by 0.9 percentage points.

However, for unionized non-participants, receiving peer information surprisingly *reduced* the likelihood of subsequently enrolling in the plan from 10.4% to 6.5%. Schultz et al. (2007) argue that social norms marketing can backfire if individuals learn that the promoted behavior is less common than they previously believed. This mechanism is not driving the unionized employees' response, since enrollment was also decreasing in the

magnitude of the peer information number communicated. A one percentage point increase in the reported fraction of coworkers already enrolled in the plan reduced the response rate by 1.8 percentage points.

We find no statistically significant effects in either unionized or non-unionized participants who received EE letters. The null effects may be due to the fact that, compared to non-participants, those who have chosen a positive contribution rate have stronger convictions about their optimal contribution rate and are thus less likely to be swayed by the provision of peer information.

These results highlight on the potential benefits and limitations of interventions based on peer information. The robust negative relationship between peer information and enrollment among unionized non-participants suggests that boomerang effects (Clee and Wicklund, 1980; Ringold, 2002) from even subtle social norms marketing campaigns such as the one we tested are not necessarily unusual.

The paper proceeds as follows. Section I provides background information on retirement benefits at the firm we study and describes our experimental design. Section II presents the empirical results. Section III discusses possible explanations for our findings and concludes.

### **II. Company Background and Experimental Design**

### A. Company Background

The company at which we ran the field experiment is a Fortune 500 manufacturing firm with approximately 15,000 U.S. employees, a quarter of whom are represented by one of five unions. In general, unionized workers are employed on the shop floor, although not all shop floor workers are unionized. The firm offers both defined benefit and defined contribution retirement plans. The details of the defined benefit plans vary according to an employee's exact union status, but a typical employee receives an annual credit of four to six percent of her salary in a cash balance plan, as well as interest credit on accumulated balances. Upon retirement, the employee receives an annuity stream based on the notional balance accrued in the plan.

The details of the defined contribution plans, which are the focus of our study, also depend on an employee's precise union status. In general, employees do not need to

meet a minimum service requirement before becoming eligible for the plan. Every pay cycle, participants can contribute up to 50% of their eligible pay to the plan on a beforetax basis, subject to IRS limits.<sup>3</sup> The firm makes additional contributions that are proportional to the employee's contributions up to a threshold, and these matching contributions vest immediately. Table 1 describes the six matching structures, which vary by union status. Match structure A, which offers a dollar-for-dollar match on the first 1% of pay contributions, applies to non-unionized employees. For all employees, plan balances can be allocated among 21 mutual funds, and eleven of these are target retirement date funds, which invest in mixes of asset classes that slowly adjust over time to create age-appropriate portfolios. The firm's stock is not an investment option.

On January 1, 2008, every non-unionized employee who was not participating in the 401(k) plan was automatically enrolled at a before-tax contribution rate of 6% of pay, unless the employee actively elected another outcome. The default investment for an automatically enrolled employee was the target retirement date fund most closely matched to her anticipated retirement date. Affected employees were informed of this program in advance through print and electronic channels, and those who did not wish to be part of the program had to make their wishes known to the benefits administrators in order to opt out. After January 1, 2008, newly hired non-unionized employees were also automatically enrolled at a 6% before-tax contribution rate directed to a target retirement date fund, with enrollment taking effect 90 days from the hire date. Again, employees could opt out by communicating their decision to the benefits administrators. Automatic enrollment was not implemented for unionized employees during 2008 because the collective bargaining negotiations necessary for such a change were not scheduled to take place until the fall of 2008 or later.

#### B. Experimental Design

Our field experiment targeted all non-participating and low-saving U.S. employees of the firm who were at least 20 years old and at most 69 years old on July 31,

<sup>&</sup>lt;sup>3</sup> In 2008, the IRS limit on annual contributions was \$15,500 for workers under 50 years of age and \$20,500 for workers over 50 years of age.

2008. Non-participants were defined as employees who were eligible for but had never enrolled in the 401(k) plan as of July 14, 2008.<sup>4</sup> Low savers were defined as all employees who were enrolled in the 401(k) plan but whose before-tax contribution rate was less than both the employer match threshold and 6% as of July 14, 2008, regardless of what their after-tax contribution rate was. The match threshold, which is the rate at which an employee must contribute in order to receive all available employer matching contributions, varies by union status and can be less than, equal to, or greater than 6% (see Table 1).

We employed a stratified randomization scheme to allocate employees to three equally sized treatment groups. We first sorted employees into bins based on several characteristics: age as of July 31, 2008, rounded down to the nearest integer year; plan participation status (enrolled or not enrolled); geographic location of workplace; employer match structure; and union membership. Within each of these bins, employees were randomly assigned to receive no peer information, information about the savings behavior of peers in their five-year age bucket, or information about the savings behavior of peers in their ten-year age bucket.

On July 30, 2008, we mailed Quick Enrollment and Easy Escalation letters to target employees, and we surmise that employees received these letters at some point between August 1 and August 4. Appendix B provides sample QE and EE letters.

Non-participants received Quick Enrollment letters, which described the benefits of enrollment in the 401(k) plan, especially the presence of employer matching contributions.<sup>5</sup> By checking a box on the form, signing it, and mailing it in a pre-addressed postage-paid envelope, employees could begin contributing to the plan at a 6% before-tax rate invested in an age-appropriate target retirement date fund. Employees were reminded that they could alternatively implement this outcome (or any other combination of contribution rate and asset allocation) by calling the benefits center or visiting the benefits website. Letters sent to employees in the peer information treatments prominently displayed the following text: "Join the *A*% of *B*-*C* year old employees at

<sup>&</sup>lt;sup>4</sup> Our sample excluded non-unionized employees who were within the first 90 days of their employment on July 14, 2008 and who had not yet opted out of automatic enrollment, since these employees were likely to be automatically enrolled soon after the start of our study.

<sup>&</sup>lt;sup>5</sup> Information on employer contributions varied according to the match structure facing the individual employee.

[company] who are already enrolled in the [plan]." Letters sent to employees in the nopeer-information treatment simply omitted this sentence. The number *A* was calculated using data on all eligible employees in the five-year or ten-year age range applicable to the letter recipient. These participation rates, reported in Table 2, ranged from 77% to 93%.

Low savers received Easy Escalation letters, which also emphasized that employees were foregoing employer matching contributions.<sup>6</sup> A low-saving employee could increase her before-tax contribution rate to 6%, invested according to her current asset allocation, by completing the form and returning it in the pre-addressed postagepaid envelope. Like the QE letters, the EE letters reminded recipients about the possibility of changing their contribution rates and asset allocations through the benefits call center or website. The EE peer information text, which did not appear for employees in the no-peer-information treatment, read as follows: "Join the *X*% of *Y-Z* year old [plan] participants at [company] who are already contributing at least 6% to the [plan]." Data on all plan participants in the relevant five-year or ten-year age range were used to calculate the number *X*, which ranged from 72% to 81% (see Table 2).

Both the Quick Enrollment and Easy Escalation letters stated a deadline of August 22, 2008 for returning the forms, but this deadline was not enforced. Our analysis considers the impact of the letters over the course of the two months following the mailing. Hewitt Associates, a large U.S. benefits administration and consulting firm, provided us with data on employees' plan participation status and contribution rates as of our sample definition date (July 14, 2008) and as of October 1, 2008. They also provided employee-level data on gender, birth date, hire date, salary, plan balances, and union status.

As mentioned previously, our analysis separately considers four different employee subpopulations: (1) unionized non-participants, (2) non-unionized nonparticipants, (3) unionized plan participants with low contribution rates, and (4) nonunionized plan participants with low contribution rates.

We draw the distinction between non-participants and low savers for the simple reason that QE letters and EE letters make different requests of recipients: initial

<sup>&</sup>lt;sup>6</sup> Again, information about employer contributions was personalized.

enrollment in the case of QE, and contribution rate increases in the case of EE. We separately analyze unionized and non-unionized employees because they generally have different job tasks and because the nature of the employment relationship with the firm differs between the two groups. In addition, all non-unionized employees faced employer match structure A, which has a match threshold of 6% (see Table 1). The match threshold for some unionized employees, in contrast, was different from 6%. Due to technological constraints in the processing of QE and EE forms, all QE and EE letters encouraged recipients to elect a 6% contribution rate. Thus, the QE and EE letters may have been more compelling for non-unionized employees than for unionized employees; nonunionized employees were all asked to choose the minimum contribution rate that qualified them to receive the entire employer match, while some unionized employees were asked to choose a contribution rate that was less focal given their match structure. Finally, the fact that automatic enrollment was instituted for non-unionized employees but not for unionized employees created differential selection into our target sample by union status. Unionized employees who passively accepted the default status of nonparticipation were included in our target sample, but non-unionized employees who passively accepted the 6% automatic enrollment contribution rate were not included in our target sample. Previous work has documented that employees frequently accept default options in retirement savings plans (Madrian and Shea, 2001; Choi et al., 2002 and 2004), so the extent of differential selection was likely to be large.

### III. Results

Table 3 presents summary statistics for our sample broken out by initial participation status, union status, and treatment group. The majority of our sample is male, although the fraction varies across the different subpopulations: approximately 65% for the unionized non-participants, 77% for the non-unionized non-participants, 55% for the unionized low savers, and 68% for the non-unionized low savers. The average age in our sample is about 40 years, and average tenure is high: 10 or 11 years for all groups but the non-unionized non-participants, who have an average tenure of 7 years. Mean annual salary is in the \$35,000 to \$45,000 range for all subpopulations except the non-unionized low savers, for whom mean annual salary is more than \$55,000. Among the

two groups of low savers, average initial before-tax contribution rates are about 2%, and average before-tax plan balances are roughly half of mean annual salaries.

We discuss our empirical results in two parts. First, we analyze the effect of the presence of peer information on enrollment and contribution escalation by comparing the peer information treatment groups to the control group, which received no peer information. Second, we restrict our attention to the peer information treatment groups and examine the effect of the magnitude of the peer information number.

### A. Effect of the Presence of Peer Information

Panel A of Table 4 lists the fraction of employees in each treatment group who responded positively by October 1, 2008, broken out by initial participation status and union status. A positive response for a non-participant (QE recipient) is enrollment in the plan, and a positive response for a low saver (EE recipient) is an increase in contribution rate. Response rates for the five-year age range and ten-year age range peer information treatments are similar, so we group them together for the purposes of statistically testing the effect of the presence of peer information.

Among unionized non-participants, 6.5% of employees who were exposed to peer information enrolled in the plan, while the response rate was 10.4% for employees who did not see peer information, a statistically significant difference. For non-unionized non-participants, however, the presence of peer information had a positive effect on response rates: 3.4% for the peer information treatments versus only 0.7% for the no peer information treatment. This difference is statistically significant at the 10% level. We do not detect differences in the Easy Escalation subpopulations. Indeed, the point estimates for the effect of the presence of peer information are almost exactly zero.

In Panel B of Table 4, we report the fraction of employees in each treatment group who initiated a positive response by mailing a Quick Enrollment or Easy Escalation reply form, again broken out by initial participation status and union status. The majority of positive responses in the QE subpopulations were initiated by returning a QE form, but less than half of positive responses in the EE subpopulations were implemented via EE reply form.

### B. Effect of the Peer Information Number's Magnitude

To examine how the magnitude of the peer information number affected responsiveness to our intervention, we limit our attention to the employees who were in one of the two peer information treatments. An important confound our analysis must address is the "reflection problem" (Manski, 1993). Because our experiment provided employees with peer information related to their five-year or ten-year age categories, the peer information number embeds not only information about the peer group but also information about the age-related characteristics of the QE or EE letter recipient. Throughout our analysis, we therefore study the relationship between responsiveness to our intervention and the magnitude of the peer information number while controlling for a flexible function of age. Our empirical strategy identifies the effect of the magnitude of the peer information using two sources of variation. First, two employees of the same age may see different peer information numbers if one is randomly assigned to receive information about her five-year age group and the other is randomly assigned to receive information about her ten-year age group. Second, two employees who are similar in age may see different peer information numbers if their ages are on opposite sides of a boundary separating two adjacent five-year or ten-year age ranges.

We perform a series of linear probability (ordinary least-squares) regressions where the dependent variable is a positive response indicator, taking a value of one if the employee initiates enrollment or increases her contribution rate and a value of zero otherwise.<sup>7</sup> Our baseline specification, presented in Table 5, controls for gender, a linear spline in age with knot points every five years starting at age 22½, tenure, salary, initial contribution rate (for the EE subpopulations), and plan balances (for the EE subpopulations). For the unionized non-participant subpopulation, a one percentage point increase in the reported fraction of coworkers participating in the plan resulted in a 1.8 percentage point decrease in the probability that the QE letter recipient enrolled in the

<sup>&</sup>lt;sup>7</sup> We employ linear probability regressions instead of probit or logit regressions because of problems with perfect predictability. Our flexible age controls sometimes perfectly predict failure, requiring us to drop observations from probit or logit regressions. Adjusting the sample for each different regression specification would make it difficult to compare results across specifications, and using a minimal sample for all specifications could potentially give a misleading picture of the results. Thus, this subsection reports the results of linear probability regressions, which allow us to maintain a consistent sample and include all observations. In Appendix A, however, we present probit regressions using our baseline set of controls, and the results are similar to the linear probability regression results.

plan. Among non-unionized non-participants, however, the same change in the peer information number resulted in a 0.9 percentage point increase in responsiveness to QE. These effects are large and statistically significant at the 5% level and the 10% level, respectively. The coefficients on the peer information number for the two EE subpopulations, while positive, are not significantly different from zero.

The magnitude of the peer information number does not significantly influence responsiveness to our intervention among plan participants with low contribution rates, so the rest of our analysis focuses on the two subpopulations of non-participants. Table 6 examines the importance of the two different sources of variation in the peer information number. In regressions (5) and (6), we expand our baseline set of controls to include dummy variables for the employee's five-year age range. These variables allow the function that controls for age to jump discontinuously at the boundaries of adjacent age ranges. In these regressions, the effect of the peer information number is no longer identified using discontinuous jumps in the peer information number across age range boundaries; identification comes from comparing employees in the five-year and ten-year age range peer information treatments. The coefficient on the peer information number remains negative and statistically significant for the unionized non-participants, and it is positive and marginally statistically significant for the non-unionized non-participants. Regressions (7) and (8) do not include five-year age range dummies as controls but instead allow the linear spline in age to be estimated separately for employees in the fiveyear and ten-year age range peer information treatments. Here, identification comes from comparing employees on opposite sides of an age range boundary at which the peer information number jumps discontinuously. The coefficients on the peer information number do not change sign, but they become smaller in magnitude and are no longer statistically significant, indicating that the effects estimated in the baseline regressions are largely driven by comparisons between the five-year and ten-year age range peer information treatments.

In Table 7, we investigate the robustness of our results to the inclusion of additional control variables. Regressions (9) and (10) modify the linear spline in age to have knot points every 2<sup>1</sup>/<sub>2</sub> years, starting at age 22<sup>1</sup>/<sub>2</sub>. The coefficients on the peer information number do not change meaningfully. In regressions (11) and (12), we include

dummy variables for the exact target retirement date fund offered to the employee, since this aspect of the QE letters varied systematically with employee age. Including these controls does not change the results either.

Finally, Table 8 addresses some issues regarding the interpretation of the coefficient on the peer information number. Variation in the peer information number generated by our two sources of identification is associated with variation in the employee's position relative to her peer comparison group. To be more precise, two employees who are randomly assigned to the five-year and ten-year age range peer information treatments differ not only in that they see different peer information numbers but also in that they see information about two different sets of peers, one more narrowly defined than the other. Similarly, two employees on opposite sides of a boundary separating adjacent five-year or ten-year age ranges are exposed to different peer information numbers but are also in different situations relative to their peer groups, with one older than most of her peer group and the other younger. To partially control for these factors, we introduce variables capturing an individual's position in relationship to her comparison group. Regressions (13) and (14) include linear and squared terms for the difference in years between the employee's age and the mean age in her peer group; regressions (15) and (16) include linear and squared terms for the employee's percentile rank in age within her peer group. The coefficients on the peer information number are qualitatively unchanged.

### **IV.** Conclusion

The results of our field experiment offer some insight into the possible benefits and drawbacks of savings interventions based on peer information. Consistent with theory and evidence arguing that exposure to information about the actions of peers often generates conformity, plan enrollment rates among non-unionized non-participants in our study were positively related to the presence and magnitude of the peer information number in our Quick Enrollment mailings. However, unionized non-participants reacted negatively to the presence and magnitude of the peer information number.

Because union non-participant enrollment was decreasing with exogenous increases in the size of the peer information number, their contrary reaction is unlikely to

be due to their learning that their coworkers were saving less in the 401(k) than they expected. Instead, we propose three hypotheses.

First, unionized non-participants may have perceived their optimal savings behavior to be negatively correlated with that of the coworkers used to construct the peer number. Because unionized workers constitute only one-quarter of the company's workforce, company-wide 401(k) participation rates will largely reflect non-unionized worker choices. If union employees identify themselves in opposition to non-union employees, they may prefer savings choices that are atypical by company standards. The difficulty with this hypothesis is that it does not parsimoniously explain why union participants did not exhibit similar contrary behavior. One must additionally assume that union participants' oppositional identity is weaker than union non-participants'.

Second, unionized non-participants may have believed, due to an antagonistic collective bargaining relationship, that savings messages sent to them by the company were likely to be counter to their own best interests. This hypothesis also suffers from the inability to parsimoniously explain unionized participant reactions. Furthermore, it is not clear why inclusion of the peer number would induce greater mistrust relative to the control letter, which also strongly encouraged 401(k) participation, and why mistrust is increasing in the magnitude of the peer number.

Finally, and perhaps most likely, unionized non-participants may have been discouraged and demotivated by the size of the gap between their savings behavior and their peers'. This single mechanism would lead to negative enrollment effects from both the presence and size of the peer number. The hypothesis's weakness is that it does not parsimoniously explain non-unionized workers' reactions. One must additionally assume that non-unionized workers are less susceptible to such discouragement, allowing the social learning effect to dominate within that population.

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# Table 1. Match Structures

This table describes the six employer matching contribution structures that exist at the firm. All non-unionized employees are subject to Match Structure A.

	Description
Match Structure A	Dollar for dollar on the first 1%, and 50 cents on the dollar on the next 5% of eligible pay.
Match Structure B	50 cents on the dollar on the first 2% up to \$325.
Match Structure C	Dollar for dollar on the first 2%, 50 cents on the dollar on the next 2%, and 25 cents on the dollar on the next 4% of eligible pay
Match Structure D	Dollar for dollar on the first 2%, 50 cents on the dollar on the next 2%, and 25 cents on the dollar on the next 2% of eligible pay
Match Structure E	50 cents on the dollar on the first 4% of eligible pay
Match Structure F	50 cents on the dollar on the first 6% of eligible pay

## Table 2. Peer Information

This table lists the information shown to employees in the peer information treatments. Non-participating employees were shown the participation rate of employees in their 5-year or 10-year age group. Participating employees with before-tax contribution rates below the minimum of their match threshold and 6% were shown the fraction of employees in their 5-year or 10-year age group with before-tax contribution rates of at least 6%.

	Plan participation rate	Percent of employees
5 waar aga groups		contributing at least 070
J-year age groups	77	70
20 - 24	//	/9
25 - 29	87	74
30 - 34	90	72
35 - 39	90	72
40 - 44	92	73
45 - 49	93	75
50 - 54	91	77
55 – 59	90	78
60 - 64	88	79
65 - 69	87	81
10-year age groups		
20 - 29	83	76
30 - 39	90	72
40 - 49	92	74
50 - 59	91	78
60 - 69	88	79

## **Table 3. Sample Characteristics**

This table summarizes the characteristics of employees who were not participating in the plan (Panel A) or who were participating in the plan at a before-tax contribution rate below the minimum of their match threshold and 6% (Panel B) as of the sample definition date, broken out by union status and treatment status. The Before Intervention samples were defined as of May 17, 2008. The Intervention samples were defined as of July 17, 2008.

Panel A: Non-participants							
			Union			Non-union	
Percent male		No peer information 68.4	Information about 5-yr. age group 65.1	Information about 10-yr. age group 60.8	No peer information 77.8	Information about 5-yr. age group 76.6	Information about 10-yr. age group 75.5
Age	Mean Std. dev.	41.2 13.5	40.9 13.5	41.3 13.5	40.0 11.5	40.9 11.6	40.6 12.2
Tenure at company (years)	Mean Std. dev.	9.8 12.1	9.8 12.3	9.4 12.3	6.6 9.0	7.0 9.1	7.1 8.1
Annual salary	Mean Std. dev.	36.9 18.0	36.3 16.4	37.2 20.2	43.1 21.0	44.1 22.1	41.6 20.3
Sample size		N = 326	N=332	N=332	N = 153	N = 145	N = 151

Panel B: Participants with low contribution rates								
			Union		Non-union			
Percent male		No peer information 60.9	Information about 5-yr. age group 52.0	Information about 10-yr. age group 52.0	No peer information 67.8	Information about 5-yr. age group 67.5	Information about 10-yr. age group 69.4	
Age	Mean	40.0	40.9	41.1	41.8	41.9	42.0	
	Std. dev.	11.7	11.8	11.9	10.6	10.7	10.5	
Tenure at	Mean	11.4	10.7	10.7	10.7	10.4	11.1	
company (years)	Std. dev.	10.1	9.9	10.6	10.2	9.6	9.9	
Annual salary (thousands of \$)	Mean	43.4	41.6	40.7	56.3	54.9	57.0	
	Std. dev.	16.4	13.7	14.7	30.6	25.1	28.4	
Before-tax cont.	Mean	2.5	2.5	2.5	1.9	1.8	1.8	
rate	Std. dev.	1.8	1.8	1.8	1.7	1.8	1.8	
Before-tax	Mean	19.0	18.2	18.7	34.2	30.0	32.4	
balance	Std. dev.	29.6	26.6	32.9	61.8	53.8	55.1	
Sample size		N = 235	N = 254	N = 254	N = 931	N = 917	N = 913	

**Table 4. Effect of Peer Information on Quick Enrollment/Easy Escalation Response** This table analyzes the responses of employees who received Quick Enrollment / Easy Escalation letters. Panel A gives the fraction of employees who responded positively, broken out by original participation status, union status, and treatment status. For nonparticipants, a positive response is defined as enrollment in the plan within 2.5 months; for participants with low contribution rates, a positive response is defined as a before-tax contribution rate increase within 2.5 months. Panel B gives the fraction of employees who responded positively by returning Quick Enrollment / Easy Escalation cards through the mail (other methods for initiating positive responses included website visits and telephone calls to a benefits center). Non-participating employees in the peer information treatments were shown the participation rate of employees in their 5-year or 10-year age group. Participating employees with low contribution rates in the peer information treatments were shown the fraction of employees in their 5-year or 10-year age group. Participating employees with low contribution rates in the peer information treatments were shown the fraction of employees in their 5-year or 10-year age group with before-tax contribution rates of at least 6%. In the treatment effect column, \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Positive responses					
		D : 0		a 1, 1	Combined
	N	Peer info	Peer info	Combined	peer info
	No peer	about 5-yr.	about 10-yr.	peer info	treatment
	information	age group	age group	treatments	effect
Non-participants,	10.4%***	6.3%***	6.6%***	6.5%***	-3.9%**
union	(1.7)	(1.3)	(1.4)	(1.0)	(1.8)
Non-participants,	0.7%	3.4%**	3.3%**	3.4%***	2.7%*
non-union	(0.7)	(1.5)	(1.5)	(1.1)	(1.5)
Participants with low	10.6%***	9.8%***	11.0%***	10.4%***	-0.2%
cont. rates, union	(2.0)	(1.9)	(2.0)	(1.4)	(2.4)
Participants with low	8.2%***	7.7%***	8.9%***	8.3%***	0.1%
cont. rates, non-union	(0.9)	(0.9)	(0.9)	(0.6)	(1.1)
Panel B: Positive res	sponses initiate	d by mailing (	Quick Enrollme	nt / Easy Escal	ation card
					Combined
		Peer info	Peer info	Combined	peer info
	No peer	about 5-yr.	about 10-yr.	peer info	treatment
	information	age group	age group	treatments	effect
Non-participants,	7.1%***	3.9%***	4.5%***	4.2%***	-2.9%*
union	(1.4)	(1.1)	(1.1)	(0.8)	(1.5)
Non-participants,	0.7%	2.8%**	0.7%	1.7%**	1.0%
non-union	(0.7)	(1.4)	(0.7)	(0.7)	(1.1)
Participants with low	3.4%***	2.0%**	3.1%***	2.6%***	-0.8%
cont. rates, union	(1.2)	(0.9)	(1.1)	(0.7)	(1.3)
Participants with low	3.2%***	3.6%***	3.4%***	3.5%***	0.3%
· .					

# Table 5. Effect of the Magnitude of Peer Information Numbers on Quick Enrollment / Easy Escalation Response

This table reports the results of linear probability (ordinary least-squares) regressions modeling the probability that an employee responds positively to Quick Enrollment / Easy Escalation letters that include peer information. For non-participants, a positive response is defined as enrollment in the plan within 2.5 months; for participants with low contribution rates, a positive response is defined as a before-tax contribution rate increase within 2.5 months. All employees in these samples were shown a peer information number. For non-participating employees, the peer information number was the participation rate of employees in their 5-year or 10-year age group. For participating employees with before-tax contribution rates below the minimum of their match threshold and 6%, the peer information number was the fraction of employees in their 5-year or 10-year age group with before-tax contribution rates of at least 6%. The linear spline in age has knot points at 22.5, 27.5, 32.5, ..., and 67.5. All regressions include a constant. Robust standard errors are in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Non-	Non-	Participants	Participants
	participants,	participants,	with low cont.	with low cont.
	union	non-union	rates, union	rates, non-union
	(1)	(2)	(3)	(4)
Peer info number	-1.80**	0.94*	2.20	0.68
	(0.76)	(0.49)	(1.94)	(0.80)
Male dummy	0.08***	-0.04	-0.04	-0.01
	(0.02)	(0.03)	(0.03)	(0.01)
Age spline	Yes	Yes	Yes	Yes
log(Tenure)	-0.02*	-0.02***	-0.01	-0.03***
	(0.01)	(0.01)	(0.02)	(0.01)
log(Salary)	0.02	0.08**	0.04	0.03**
	(0.02)	(0.04)	(0.05)	(0.02)
Cont. rate dummies	No	No	Yes	Yes
log(Before-tax			0.02	0.03***
balance)			(0.01)	(0.01)
$R^2$	0.0399	0.0739	0.0450	0.0318
Sample size	N = 658	N = 293	N = 508	N = 1,825

### Table 6. The Effect of the Magnitude of Peer Information Numbers on Responsiveness to Quick Enrollment: Sources of Identification

This table reports the results of linear probability (ordinary least-squares) regressions modeling the probability that an employee responds positively to a Quick Enrollment letter that includes peer information. The employees in these samples are non-participants, and a positive response is defined as enrollment in the plan within 2.5 months. All employees in these samples were shown a peer information number that was the participation rate of employees in their 5-year or 10-year age group. The linear spline in age has knot points at 22.5, 27.5, 32.5, ..., and 67.5. Additional controls for age are included as indicated. All regressions include a constant. Robust standard errors are in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Non-	Non-	Non-	Non-
	participants,	participants,	participants,	participants,
	union	non-union	union	non-union
	(5)	(6)	(7)	(8)
Peer info number	-2.05**	1.18*	-0.60	0.85
	(0.86)	(0.70)	(1.27)	(0.94)
Male dummy	0.00	-0.04	0.00	-0.05
-	(0.02)	(0.03)	(0.02)	(0.03)
5-yr. age bucket dummies	Yes	Yes	No	No
Age spline	Yes	Yes	Yes	Yes
Age spline × Info about 10-yr. age group dummy	No	No	Yes	Yes
Info about 10-vr.			1.40	-1.41
age group dummy			(2.34)	(1.28)
log(Tenure)	-0.02*	-0.02***	-0.02*	-0.02**
	(0.01)	(0.01)	(0.01)	(0.01)
log(Salary)	0.02	0.08**	0.02	0.08**
	(0.02)	(0.04)	(0.02)	(0.04)
$R^2$	0.0516	0.1100	0.0545	0.1088
Sample size	N = 658	N = 293	N = 658	N = 293

# Table 7. The Effect of the Magnitude of Peer Information Numbers onResponsiveness to Quick Enrollment: Robustness

This table reports the results of linear probability (ordinary least-squares) regressions modeling the probability that an employee responds positively to a Quick Enrollment letter that includes peer information. The employees in these samples are non-participants, and a positive response is defined as enrollment in the plan within 2.5 months. All employees in these samples were shown a peer information number that was the participation rate of employees in their 5-year or 10-year age group. The linear spline in age has knot points at 22.5, 27.5, 32.5, ..., and 67.5. The alternative linear spline in age has knot points at 22.5, 25, 27.5, ..., and 67.5. All regressions include a constant. Robust standard errors are in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Non-	Non-	Non-	Non-
	participants,	participants,	participants,	participants,
	union	non-union	union	non-union
	(9)	(10)	(11)	(12)
Peer info number	-1.79**	1.23**	-1.99***	0.87*
	(0.77)	(0.56)	(0.76)	(0.49)
Male dummy	0.00	-0.05	0.00	-0.04
	(0.02)	(0.03)	(0.02)	(0.03)
Age spline	No	No	Yes	Yes
Alternative age spline	Yes	Yes	No	No
log(Tenure)	-0.02*	-0.02***	-0.02*	-0.02**
,	(0.01)	(0.01)	(0.01)	(0.01)
log(Salary)	0.03	0.07**	0.02	0.08**
	(0.02)	(0.04)	(0.02)	(0.04)
Dummies for	No	No	Yes	Yes
retirement date				
funds offered				
$R^2$	0.0554	0.1109	0.0510	0.1004
Sample size	N = 658	N=293	N = 658	N=293

# Table 8. The Effect of the Magnitude of Peer Information Numbers onResponsiveness to Quick Enrollment: Further Robustness

This table reports the results of linear probability (ordinary least-squares) regressions modeling the probability that an employee responds positively to a Quick Enrollment letter that includes peer information. The employees in these samples are non-participants, and a positive response is defined as enrollment in the plan within 2.5 months. All employees in these samples were shown a peer information number that was the participation rate of employees in their 5-year or 10-year age group. The linear spline in age has knot points at 22.5, 27.5, 32.5, ..., and 67.5. The variable labeled "Years from Mean Age in Group" is equal to the individual employee's age minus the mean age in that employee's 5-year or 10-year age group. The variable labeled "Age Percentile in Group" is equal to the individual employee's percentile rank from 0 to 1 in the age distribution within that employee's 5-year or 10-year age group. All regressions include a constant. Robust standard errors are in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Non-	Non-	Non-	Non-
	participants,	participants,	participants,	participants,
	union	non-union	union	non-union
	(13)	(14)	(15)	(16)
Peer info number	-2.41***	0.83	-1.96**	1.07*
	(0.88)	(0.54)	(0.79)	(0.58)
Male dummy	0.00	-0.04	0.09	-0.04
	(0.02)	(0.03)	(0.02)	(0.03)
Age spline	Yes	Yes	Yes	Yes
Years from group	-0.01	-0.00		
age mean	(0.01)	(0.01)		
Years from group	0.00*	-0.00		
age mean squared	(0.00)	(0.00)		
Age percentile			-0.34**	-0.06
in group			(0.17)	(0.13)
Age percentile			0.33**	0.08
in group squared			(0.15)	(0.12)
log(Tenure)	-0.02*	-0.02***	-0.02*	-0.02***
	(0.01)	(0.01)	(0.01)	(0.01)
log(Salary)	0.02	0.08**	0.02	0.08**
	(0.02)	(0.04)	(0.02)	(0.04)
$R^2$	0.0489	0.0742	0.0485	0.0754
Sample Size	N = 658	N = 293	N = 658	N = 293

# **Appendix A. The Effect of the Magnitude of Peer Information Numbers on Responsiveness to Quick Enrollment / Easy Escalation: Probit Regressions**

This table reports the results of probit regressions modeling the probability that an employee responds positively to Quick Enrollment / Easy Escalation letters that include peer information. For non-participants, a positive response is defined as enrollment in the plan within 2.5 months; for participants with low contribution rates, a positive response is defined as a before-tax contribution rate increase within 2.5 months. All employees in these samples were shown a peer information number. For non-participating employees, the peer information number was the participation rate of employees in their 5-year or 10year age group. For participating employees with before-tax contribution rates below the minimum of their match threshold and 6%, the peer information number was the fraction of employees in their 5-year or 10-year age group with before-tax contribution rates of at least 6%. The table gives marginal effects holding all variables fixed at their means (in particular, age is fixed at its mean, as opposed to holding the variables that make up the linear spline in age each fixed at their individual means). In the case of binary variables, the marginal effects are reported for a change from zero to one. Because of the problem of perfect predictability, all four regressions drop employees over the age of 67.5. The same reasoning also forces us to drop employees under the age of 22.5 and between the ages of 52.5 and 62.5 from regression (A2). Thus, the linear spline in age has knot points at 22.5, 27.5, 32.5, ..., and 62.5 for regressions (A1), (A3), and (A4). The linear spline in age for regression (A2) has knot points at 27.5, 32.5, 37.5, 42.5, and 47.5, as well as an independent slope and intercept for the age range 62.5-67.5. These adjustments reduce the number of observations for regressions (A1), (A2), (A3), and (A4) by 3, 58, 2, and 1, respectively. All regressions include a constant. Robust standard errors are in parentheses. \*, \*\*, and \*\*\* indicate statistical significance of the underlying probit coefficient at the 10%, 5%, and 1% levels, respectively.

				Participants
	Non-	Non-	Participants	with low cont.
	participants,	participants,	with low cont.	rates, non-
	union	non-union	rates, union	union
	(A1)	(A2)	(A3)	(A4)
Peer info number	-1.94**	1.42*	1.29	0.38
	(1.20)	(1.31)	(1.65)	(0.69)
Male dummy	0.00	-0.05*	-0.03	-0.00
	(0.03)	(0.04)	(0.02)	(0.01)
Age spline	Yes	Yes	Yes	Yes
log(Tenure)	-0.03**	-0.02***	-0.01	-0.02***
	(0.02)	(0.02)	(0.01)	(0.02)
log(Salary)	0.03	0.04**	0.02	0.01*
	(0.03)	(0.04)	(0.04)	(0.02)
Cont. rate dummies	No	No	Yes	Yes
log(Before-tax			0.01	0.02***
balance)			(0.01)	(0.02)
Pseudo- $R^2$	0.0751	0.2798	0.0677	0.0580
Sample size	N = 655	N = 235	N = 506	N = 1,824

# Appendix B.1: Sample Quick Enrollment Letter with No Peer Information

Logo	Stop WaitingStart Saving!
	Participate in the <u>company retirement plan</u> to plan for your future and get company matching money. Simply check <b>Yes</b> on the attached response card, and return it by <b>August 22, 2008</b> to enroll in the <mark>plan</mark>
•••	By checking Yes, you will:
	<ul> <li>receive the <u>company</u> match, which is 50 cents on the dollar on the first 6% of your eligible pay you contribute on a before-tax basis.</li> <li>Invest in the <u>company</u> Target Retirement 2045 Fund. The asset mix of the <u>company</u> Target Retirement 2045 fund is designed for someone who may retire in 2045 and will become more conservative as you approach retirement.</li> </ul>
	Once you enroll in the <b>plan</b> you have the freedom to change your contribution rate and investment options at any time. Visit URL for call phone number for more information.
	Don't turn down the company match! Check <b>Yes</b> below and return the card in the enclosed postage-paid envelope to enroll today.

Tear at perforation

# Your response is needed by August 22, 2008!

## Yes! I want to receive the full company match! Enroll me in the plan today.

- By making this election, I will automatically begin contributing 6% of my eligible pay on a before-tax basis, which qualifies me for the full company match.\* My contribution will be invested in the company Target Retirement 2045 Fund, based on my age and estimated retirement date.\*

- I also know that I can change my elections at any time by visiting Your Benefits Resources™ at UR

RL	or	by c	alling	phone	number
----	----	------	--------	-------	--------

Signature	Date
*Subject to IRS limits. **By selecting Yes, your election of 6% in Company Target Retirement 2045 Fund will IRI or by calling the Dhone number	Il go into effect as soon as administratively possible unless you make another election by visiting

## Appendix B.2: Sample Quick Enrollment Letter with Peer Information

Logo	Stop WaitingStart Saving!
	Participate in the company retirement plan plan for your future and get company matching money. Simply check <b>Yes</b> on the attached response card, and return it by <b>August 22, 2008</b> to enroll in the plan
	Join the 87% of 25–29 year old employees at <u>company</u> who are already enrolled in the plan.
	By checking <b>Yes</b> , you will:
	Start contributing 6% of your eligible pay to the plan By doing so, you will receive the company match, which is 50 cents on the dollar on the first 6% of your eligible pay you contribute on a before-tax basis.
	Invest in the company Target Retirement 2045 Fund. The asset mix of the company Target Retirement 2045 fund is designed for someone who may retire in 2045 and will become more conservative as you approach retirement.
	Once you enroll in the plan you have the freedom to change your contribution rate and investment options at any time. Visit
	more information.
	Don't turn down the company match! Check <b>Yes</b> below and return the card in the enclosed postage-paid envelope to enroll today.

Tear at perforation

# Your response is needed by August 22, 2008!

#### Yes! I want to receive the full company match! Enroll me in the plan today.

- By making this election, I will automatically begin contributing 6% of my eligible pay on a before-tax basis, which qualifies me for the full company match.\* My contribution will be invested in the company Target Retirement 2045 Fund, based on my age and estimated retirement date.\*\*

 – I also know that I can change my elections at any time by visiting Your Benefits Resources<sup>™</sup> at URL or by calling phone number.

Signature	Date	
*Subject to IRS limits. **By selecting Yee, your election of 6% in Company URL	get Retirement 2045 Fund will go into effect as soon as administratively possible <b>unless</b> you make another election by visiting the phone number	

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# Appendix B.3: Sample Easy Escalation Letter with No Peer Information

Logo	Stop Missing Out!
	Because you're currently contributing below the full match level to the <u>company</u> retirement plan, <b>you're leaving money on the table.</b>
Every day you vait, you're	Simply check <b>Yes</b> on the attached response card, and return it by August 22, 2008 to increase your contribution rate and start receiving the maximum plan match available to you.
nissing out on the matching contributions available to you.	By checking <b>Yes</b> , you will:
	Start contributing 6% of your eligible pay to the plan on a before-tax basis.
That's money	Receive the full company match, which is 50 cents on the dollar on the first 6% of your eligible pay you contribute on a before-tax basis.
you can't	Your contributions will be invested according to your current investment elections.
	As always, you have the freedom to change your contribution rate and investment options at any time. Visit URL or call phone number for more information.
	Don't turn down free money! Check <b>Yes</b> below and return the card in the enclosed postage-paid envelope to start receiving the full plan match.

Tear at perforation

# Your response is needed by August 22, 2008!

### □ Yes! I want to receive the full company match. Increase my contribution rate today.

- By making this election, I will automatically begin contributing 6% of my eligible pay on a before-tax basis, which qualifies me for the full company match.\* My after-tax contribution (if any) will remain the same. My contributions will be invested according to my current investment election.\*\*
- I also know that I can change my elections at any time by visiting Your Benefits Resources™ at URL or by calling phone number

Signature	Date	
*Subject to IRS limits. "By selecting <b>Yes</b> , your election of 6% to plan go into effect as soon as administratively phone number	/ possible <b>unless</b> you make another election by visiting URL	or by calling

# Appendix B.4: Sample Easy Escalation Letter with Peer Information

Logo	Stop Missing Out!
	Because you're currently contributing below the full match level to the <u>company</u> retirement plan, <b>you're leaving money on the table.</b>
Every day you	Simply check <b>Yes</b> on the attached response card, and return it by August 22, 2008 to increase your contribution rate and start receiving the maximum plan match available to you.
wait, you're missing out on the matching contributions	Join the 76% of 20–29 year old plan participants at company who are already contributing at least 6% to the plan
available to you.	By checking Yes, you will:
	Start contributing 6% of your eligible pay to the plan on a before-tax basis.
That's money	Receive the full company match, which is 50 cents on the dollar on the first 6% of your eligible pay you contribute on a before-tax basis.
you can't	Your contributions will be invested according to your current investment elections.
ger back.	As always, you have the freedom to change your contribution rate and investment options at any time. Visit URL or call phone number for more information.
	Don't turn down free money! Check <b>Yes</b> below and return the card in the enclosed postage-paid envelope to start receiving the full <b>plan</b> match.

Tear at perforation

# Your response is needed by August 22, 2008!

# □ Yes! I want to receive the full company match. Increase my contribution rate today.

- By making this election, I will automatically begin contributing 6% of my eligible pay on a before-tax basis, which qualifies me for the	e
full company match.* My after-tax contribution (if any) will remain the same. My contributions will be invested according to my curre	nt
investment election.**	

- I also know that I can change my elections at any time by visiting Your Benefits Resources™ at UR

-	or	by	cal	ling	phone	number	

Signature	Date	_
*Subject to IRS limits. *By selecting <b>Yes</b> , your election of 6% <mark>to plan go phone number</mark>	o effect as soon as administratively possible <b>unless</b> you make another election by visiting URL , or by	calling