



1-1-2005

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Nyce, Steven A., "The Importance of Financial Communication for Participation Rates and Contribution Levels in 401(k) Plans" (2005). *Wharton Pension Research Council Working Papers*. 377.  
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## **Disciplines**

Economics

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Steven A. Nyce

**PRC WP 2005-3**

## **Pension Research Council Working Paper Pension Research Council**

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The author would like to thank Ruth Falck, Chris Falzini, Greg Frese, Trish Geyer, Lisa Korst, Rachel Lakofka, Amy Litten, Rich Luss, Brendan McFarland, Janemarie Mulvey, Brian Paulson, Nancy Pokorny, Denise Reynolds, Syl Schieber, Adam Swain and Mike Tyukodi of Watson Wyatt and Nancy Campbell of Docu-Mentor, Inc. The opinions and conclusions stated here are the author's and should not be construed to be those of Watson Wyatt Worldwide or any of its other associates.

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## **The Importance of Financial Communication for Participation Rates and Contribution Levels in 401(k) Plans**

Steven A. Nyce

Over the last 25 years, the private pension system in the United States has undergone an important transformation. Defined benefit plans have ceded significant ground to 401(k)-type plans, and, for many workers, 401(k) plans are now their primary vehicle for saving for retirement. Under a 401(k) scheme, employees must make a number of critical decisions, such as whether to participate, how much salary to give up for savings and how to invest the assets. These choices impose more responsibility on employees to provide for their own retirement.

Are American workers prepared to make good 401(k) decisions? Given persistently low rates of private savings and rising rates of household debt in recent decades, many experts worry that future retirees could experience deteriorating standards of living during their retirement years. Bernheim (1998) concludes that most Americans “are unaware of their financial vulnerabilities, and they lack the knowledge, sophistication, and /or authoritative guidance required to set them on the right track.”

Responding to the concerns about workers’ retirement prospects, many employers have taken it upon themselves to provide a financial education to their workers. Much of existing employer-sponsored communication is designed to encourage employees to participate in the 401(k) plan and to contribute more to their plans. But employer educational efforts have only recently become common. Plan sponsors used to be extremely averse to providing investment education to plan participants, fearing potential fiduciary liability. However, over the last decade, the U.S. Department of Labor (DOL)

has issued guidelines clarifying the requirements for plan sponsors to claim protection from participant claims due to investment losses and encouraging them to provide greater participant education in self-directed accounts.<sup>1</sup> In an effort to promote participant education, Congress has recently enacted economic incentives to encourage employers to offer qualified retirement planning advice outside the plan.<sup>2</sup>

Building upon previous research, this analysis examines the impact of firm-sponsored financial communication on employee 401(k) participation and contribution rates. In particular, the analysis updates and expands upon Clark and Schieber (1998) by using more recent plan administration records and more extensive plan communication information, which was collected directly from employer sponsors. The study results appear to confirm that enhanced financial communication has important beneficial effects on plan participants' financial decisions. In addition, the evidence suggests that employers with more sophisticated, web-based communication programs have higher participation and contribution rates.

As a concept, financial education is often loosely defined in the marketplace. Section 2 defines financial education by exploring the types of financial communication that employers offer today. Section 3 reviews the literature on financial education and its effects on individuals' savings. While not the focus of the paper, this section also explores the literature regarding the effects of demographic and plan characteristics on employee behavior. Section 4 describes the data set, discusses its limitations and explores the reliability of the estimates. Section 5 uses the data to test whether financial education has measurable effects on 401(k) plan participation and contribution rates. Section 6

concludes by summarizing the study results and their importance to employers and employees.

### **Financial Communication in the Workplace**

Retirement education programs in the workplace have evolved considerably over the last few decades. As described by Arnone (2004), many of today's financial education programs are an outgrowth of preretirement planning programs that were offered by large companies in the 1980s. These programs consisted primarily of planning seminars for employees approaching retirement.

But as the popularity of self-directed plans grew, it soon became apparent that employees had a much wider array of complex choices to manage. Critical decisions — such as whether to participate, how much to contribute and how to allocate the assets — require informed choices. In this new environment, employer-sponsored financial communication programs for late-career workers are not enough. Instead, an effective communication program is required to better equip employees to plan for retirement throughout their careers; waiting until the later part of one's career could be too late and have lifelong negative consequences.

In recent years, companies have made considerable efforts to educate their workers, giving them the resources and tools to meet their new responsibilities. EBRI (2004) reported that 34 percent of workers say their employer provided educational materials or seminars about retirement planning and saving in the past 12 months. But of those workers who participate in a retirement savings plan at work, 55 percent have received retirement education materials from their employer. More formal programs are much more prevalent at large companies. In fact, P&I (1995) reported that, as of 1994, 88

percent of large companies offered some sort of financial education program — and two-thirds of these programs were initiated after 1990.<sup>3</sup> Financial education for workers has also been a priority for the federal government. In 1995, the DOL introduced a national pension education program to raise employees' awareness that all workers are responsible for planning for their own retirement (Bernheim, 1998). In January 2004, the U.S. Treasury Department's Office of Financial Education released its inaugural issue of *The Treasury Financial Education Messenger*. The online quarterly newsletter emphasizes the importance of financial education and the need for all Americans, young and old, to acquire the practical knowledge and skills they need to make informed financial decisions throughout their lives.

Employer-sponsored financial information generally consists of written communication about the basic 401(k) plan, and brochures or newsletters highlighting general information about financial markets and the economy. Some employers provide financial education seminars in which employees can ask retirement experts questions. EBRI (2001) reported that, of plan sponsors that provide educational materials to employees, the most common material provided was employee benefit statements (89 percent) followed by brochures (85 percent) and newsletters/magazine (59 percent). Several employers also provide individual access to a financial planner (57 percent), investment advice (57 percent) and seminars (54 percent). In recent years, companies have become increasingly sophisticated. Some companies now offer elaborate websites that enable employees to project their retirement income under various economic scenarios based on their own detailed financial information. In fact, roughly 47 percent of companies that provide educational materials have Intranet, Internet or online services;

this is up from just 4 percent in 1998 (EBRI 2001). Additionally, 15 percent of these companies offer computer software.

When asked to rate the effectiveness of each type of communication, employees in the 2001 EBRI survey reported finding computer software (45 percent) and employee benefits statements (43 percent) most effective. Likewise, roughly 38 percent of respondents replied that online services were very effective. Respondents also found seminars (33 percent), financial planners (38 percent) and investment advice (32 percent) to be very useful forms of financial education.

### **Brief Overview of Previous Research**

Why do we think financial communication might affect employee savings behavior? The basic premise is that workers who are more knowledgeable and better prepared to make timely and informed decisions are more likely to contribute a higher percentage of their salary to the 401(k) plan than workers who are not.<sup>4</sup> Economic theory, however, suggests that *a priori* the effects of more knowledge on savings behavior are ambiguous.

Economists generally describe the tradeoff between consumption and saving behavior within the context of the life-cycle model. The basic concept is that people develop lifetime savings plans to ensure that they have enough income to approximate their preretirement standard of living after retirement. The decisions made by 401(k) plan participants, however, are based on their current understanding of financial markets and of how much they should save for retirement. After learning more about finance and retirement, people may realize they are not saving enough to support their desired standard of living in retirement. Subsequently, these folks may decide to save more.



However, it is also conceivable that increased financial awareness could have the opposite effect. Individuals may discover that their current savings rate overshoots their income needs in retirement, such that they are “over-saving.” Thus, there have been numerous empirical tests on the effects of greater financial communication on 401(k) savings behavior. In general, the results have consistently revealed a positive link. But due to the many shortcomings in the data employed, one must be cautious when interpreting the results from prior studies.

The existing studies on the impact of financial communication in the workplace have relied on two primary sources of information. The first source is case studies. This approach typically analyzes the effect of a financial education seminar at a single organization on employees’ savings decisions, financial goals and/or measures of financial well-being (Kratzer et al., 1998; McCarthy et al., 2000; Clark et al., 2003). The idea is that comparing individuals’ responses before and after the session can measure changes in attendees’ retirement savings decisions and/or financial goals.

Unfortunately, saving for retirement is one area in which individuals excel at delay (Choi et al., 2001). Thus, it is unclear whether participants actually follow through with their reported changes. Madrian and Shea (2001) used a case study approach by surveying employees at a mid-sized company before and after attending a one-hour retirement seminar. The notable difference in this study was that the seminar attendance was tracked to previous and subsequent plan administration data. They survey found that, more often than not, employees failed to make their reported changes. Of those not participating in the plan, nearly 100 percent indicated their intention to begin contributing to the 401(k) plan. The actual plan data showed that only 14 percent actually joined the

plan. Similarly, of those who were already contributing to the plan, 28 percent indicated their intention to increase their contributions, but only 8 percent actually did so. So while financial education seminars appear to significantly affect employees' savings decisions and retirement goals, previous case studies may have overstated the magnitude of their impact on actual savings. These programs may have a much greater effect on intentions than on behavior.

A second source of information utilized in several studies has been cross-sectional surveys covering a broad sample of organizations. The existing literature has utilized two basic types of surveys: those based on a broad sample of employee respondents<sup>5</sup> and those based on responses from multiple employers.<sup>6</sup> In general, these studies show that employees with greater financial knowledge and sophistication are significantly more likely to enroll in their 401(k) plan (McCarthy and Turner, 2000). Workers who have been exposed to financial education in the workplace display significant improvements in their knowledge of asset returns and understanding of their pension plan (Maki, 2001). Increases in the percentage of assets invested in equities also has been linked to financial education, particularly among workers who are moderately more risk-averse and have a longer time until retirement (Muller, 2003).

The type of educational information is also important. Personalized, individual financial communication appears to be more effective than more generic information (such as print media, newsletters and plan descriptions) in changing employees' savings behavior (Bayer, Bernheim and Scholz, 1996; Clark and Schieber, 1998). While it is important for employers to offer retirement education is important, employee utilization of that information is most critical in eliciting higher saving rates (Bernheim and Garrett,

2003). Evidence also suggests that early exposure to a financial curriculum in high school can have important effects on wealth accumulation in adulthood (Bernheim, Garrett and Maki, 1997).

However, there are a number of critical limitations to research studies based on survey response information. There are tradeoffs between using household data versus employer responses. While household surveys are the most comprehensive source of critical demographic data, such as age, earnings, household wealth and education, it is often difficult for respondents to accurately recall the details of their employer's financial education program and/or other plan design features. The survey results become less meaningful if the participants who most value the 401(k) plan also have the best understanding of the employer-sponsored financial education. The findings could then overstate the effect of financial education on employees' savings behavior.

On the other hand, with employer survey data, the employees' level of financial sophistication is unlikely to influence the reported participation and contribution rates. Employers generally provide more accurate information about the financial education program and other critical features about the 401(k) plan. However, employer survey data lack critical household demographic characteristics. This information is essential for making well-informed policy decisions.

The ideal data set would combine accurate plan information with actual employee and household records for a wide cross-section of firms. Very few studies have been able to acquire this sort of detailed employee and plan information.<sup>7</sup> To date, only Clark and Schieber (1998) have linked financial communication information and other plan features to employee administration records for a number of firms. Clark and Schieber used an

employer survey to collect information on each employer's financial communication practices and linked that data to actual employee participation and contribution records provided by plan sponsors. In this way, they were able to avoid several of the pitfalls described above. This analysis builds upon the work done by Clark and Schieber by linking detailed employee records to accurate plan information. The next section describes the data employed for this analysis, highlighting the enhanced financial communication information and noting the potential limitations.

### **About the Data**

Watson Wyatt collected the data for this analysis from a combination of personalized benefits statement records and average deferral percentage (ADP) testing files for the period between October 2000 and March 2001. The 401(k) plans in the data set are from 48 firms, ranging in size from 335 to over 41,000 employees. The data set includes 306,463 employees, roughly 30 percent of whom are employed in the manufacturing industry. While small samples of employers have been used in previous studies to investigate the effect of financial education on employee behavior (Clark and Schieber, 1998; Bernheim, 1998), it is natural to be concerned whether the sample is representative. However, there is no reason to believe that the companies, their plans and the employees eligible to participate exhibit characteristics that that will inherently bias the outcome of this analysis. In fact, average participation and contribution rates for this data set closely tracks rates reported from larger national samples.

Watson Wyatt collected information on the 401(k) communication programs via a paper survey that was completed by a human resource representative at each firm. Of the

48 plans for which detailed administration data was available, we collected responses on the communication survey for 26 firms.<sup>8</sup>

Previous studies focused heavily on the type of information (e.g., newsletters, seminars) circulated to employees (Bernheim and Garrett, 2003; Bayer, Bernheim and Scholz, 1996). The data used here, however, are somewhat limited by the fact that all employers in the sample provide personalized statements to employees. This is not at all surprising, given that 89 percent of employees offered financial communication received benefit statements from their employer (EBRI, 2001). Likewise, many of the companies in this study are medium-to-large and well-established organizations. These are the firms that are most likely to offer educational programs to their employees (P&I, 1995).<sup>9</sup>

To truly understand the depth of workers' financial knowledge, a well-designed measure of financial communication must capture the content matter and sophistication of the employer-sponsored materials. As such, this questionnaire focused on collecting widespread information about the various topics and subject matter provided to employees. For example, the questionnaire tried to answer questions such as: Do the communication materials mostly provide plan information, such as contribution amounts, account balances and investment returns? Or do they focus more on providing financial education? The questionnaire asks company representatives to indicate whether all employees receive the financial information and how often it is distributed. Finally, the survey attempted to assess the extent to which each company's 401(k) plan communications were integrated with the Internet (and/or a company-based Intranet).

We created four variables to serve as proxies for the various aspects of each firm's 401(k) communication program: plan information, educational materials,

projection information and the percentage of communication materials that are Internet/web-based. Each of the four proxies is based on a series of questions that captures the frequency and intensity of its usage within the communication program. Table 1 provides a breakout of the underlying questions for each of the four topic areas.

In constructing proxies for plan and educational materials, respondents were asked to indicate how often such information was provided. We arrived at a combined score by summing the responses across each question, with a high score indicating more frequent use of the plan and/or educational materials. For the proxy on projection information, a similar method was followed, but, in this case, respondents were asked to indicate the extent to which all employees received or could access retirement income projections. Finally, the web-based indicator was created by comparing two separate questions for the same subject matter. The first question asked respondents whether employees received various types of information through regular mailings, and the second asked whether employees could access the same information via the web. To create the web-based proxy, we divided the sum of the web-based responses by the total of the two groups. A score of 100 percent would indicate that a firm's 401(k) communications are completely web-based, while a score of zero would indicate that communications are entirely paper-based. A 50 percent score would indicate an equal mix between the two.<sup>10</sup>

*Table 1 here*

As shown in Table 1, firms provide plan, education and projection information to their employees in varied degrees. Plan information is offered most often. A large majority of employees receive personal plan information on a quarterly basis, while

information on specific investment funds is provided somewhat less frequently. Education materials are distributed less regularly. Very few companies send employees educational materials on a quarterly basis, and roughly 30 percent do not provide any at all. This is consistent with Bernheim and Garrett (2003). Employers do provide a large majority of their workers with retirement income projections. A broad group of employees has access to retirement modeling tools. The way the information is presented also may be critical to whether employees actually utilize this benefit. In recent years, employers have become increasingly web-based in their communications to their employees. These results show that the average employer provides roughly an equal mix of information via web- and paper-based materials when communicating about the company's 401(k) plan.

Aside from the particulars on financial communication, detailed records of each firm's match rate design were also available, so that 401(k) plan generosity can be accurately measured against employee participation and contribution rates. This study also accounts for the existence of a defined benefit pension plan, which in many previous studies has been an important factor in individuals' 401(k) saving decisions.

The time period of the data used is important, since it just precedes the significant downturn in the U.S. equity markets that occurred over much of 2001 and 2002. As a result, the data presented here does not capture individuals' reactions to the bursting of the stock market bubble. However, the purpose of this analysis is to examine how more central factors such as age, earnings, gender, etc. along with how various plan features such as match rates and communication programs influence individual's participation and savings behavior. There is no reason to believe that the short-term fluctuations over the

past few years should fundamentally change the relation between these factors and employee's participation and savings behavior within 401(k) plans, which are vehicles that have a long-run outlook in mind.<sup>11</sup>

### **Evidence on Participation in and Contributions to 401(k) Plans**

Using the data described above, this section presents the analysis of the factors that influence employees' 401(k) participation and contributions. We begin by examining simple cross-tabulations of the raw data to gain a better understanding of data and to provide benchmarks against previous studies with national samples. We then use multivariate regression models to estimate (1) the probability that an employee will participate in the plan, and (2) the factors that influence participants' saving rates. While the focus is on how employer financial communication affects these decisions, it is important to also examine how individual, firm and other plan design characteristics relate to participation and contributions.

#### ***Characteristics of 401(k) Plans***

To link financial communication to employees' participation and saving decisions, it is useful to summarize key patterns in the raw data. Table 2 shows average participation rates, contribution rates and dollar contributions, which are separated into two groups of low and high scores for each of the four financial communication factors. Firms that use educational materials more extensively report higher participation rates (80 percent) than those that use it less often (75 percent). Of companies that offer retirement projections to a wide array of employees, 81 percent of employees participate in 401(k) plans, while participation is 77 percent in companies that offer these materials to fewer employees or to none. Likewise, participation rates are higher in companies with



a higher concentration of web-based communication (80 percent) compared to firms with low Internet usage (74 percent). Participation rates are not listed for plan type communication, since these materials are not universal and are distributed only to plan participants.

In general, participant contribution rates follow similar patterns. Indeed, employees who are offered plan information most often contribute an average of 7.7 percent of pay (or \$4,467) per annum, while average contribution rates are 6.9 percent (or \$3,290) for those who receive this information less often. Similarly, employees who receive education materials more frequently make higher contributions (7.4 percent) than those who receive it less often (7.1 percent). Projections follow a very similar pattern. In companies that offer access to projection modelers and retirement income projections to a broad cross-section of employees, contribution rates are 7.4 percent versus 7.2 percent in companies with low access to projection information. However, there is very little difference in contribution rates between companies that score high on web-based communication (7.2 percent) and those that use web-based communications less often (7.3 percent). Yet the dollar value of contributions follows the expected trend. Employees exposed to frequent Internet-based communication contribute an average of \$3,900 to their 401(k) plans compared to \$3,611 for those who receive fewer web-based materials/tools.

*Table 2 here*

Previous studies have found that an employee's age, earnings and years of service are highly correlated with his or her decision to join the 401(k) plan. Table 3 reports participation rates of eligible employees by various earnings and age groups. In order for

a worker to be considered a participant, he or she must have contributed to the plan at some point over the plan year. The table clearly shows that participation rates rise significantly along with age and earnings. In the lowest earnings group, only half the workers participate in the plan. Rates rise rather steeply for each successive earnings group. Participation rates for those with annual earnings of over \$60K are nearly identical, with roughly 90 percent of workers participating in the plan. When looking across the various age groups for a given salary level, participation rates tend to rise as workers get older, especially for low-wage earners.

*Table 3 here*

As Table 4 shows, participant contribution rates also rise with age and earnings. Holding age constant, contribution rates rise with each earnings group — up to a point. At all ages, the average contribution rate drops from a peak of 8.7 percent for those earning \$60K to \$75K to 5.7 percent for those earning \$100K and more. The drop-off is largely due to limits imposed under the Internal Revenue Code (IRC). In 2000, IRC provision 402(g) limited tax-free contributions to \$10,500. IRC 415(c) also imposes limits on total contributions to a 401(k) account — from employers and employees — to the lesser of \$30,000 or 25 percent of total compensation.<sup>12</sup>

*Table 4 here*

The bottom two rows in Table 4 show the percentage of employees that contributed the statutory maximum. The second-to-last row shows that, on average, 8.3 percent of participants contributed to the 401(k) plan at the \$10,500 pre-tax limit. Due to the IRC 415(c) limits, however, only those making \$42K and more could feasibly reach the 415(c) limits. By restricting the sample to those earning more than \$42K, roughly 18

percent reached the statutory maximum. When looking across age groups, workers aged 60 to 64 were over twice as likely to be contributing at the 402(g) limits as workers aged 21 to 29. This is partly because older workers generally earn higher salaries. But it is also because older workers tend to save more — consistent with the life cycle theory.

Previous studies have also found a strong link between the employer match rate and employees' decisions about enrollment in the 401(k) plan. Table 5 provides participation and contribution rates by age for various ranges of the first-dollar match rate. There is a consistent pattern of increasing 401(k) plan participation at successively higher match rates. When a company offers no matching contributions, only about half the workers participate in the plan. But when match rates rise above a quarter per dollar of salary contributed, average participation rates rise to over 75 percent.

*Table 5 here*

On the contribution side, however, the relationship between contribution rates and match rates is much less consistent. Contribution rates appear to be highest among firms that do not offer matching contributions. In fact, contribution rates fall between 1.4 to 1.9 percentage points when a match rate is introduced. The apparent negative relation implies a strong income effect such that greater employer contributions enable participants to contribute less and still reach their savings target, or the match rate attracts savers who are willing to contribute only a very small percentage to the plan. Both participation and contribution rates rise within each matching group as workers get older. However, participation rates tend to attenuate for workers aged 60 and over, while contribution rates steadily rise throughout a worker's career.

## **Factors Affecting Participation**

The data above support the concept that financial communication has important effects on individuals' 401(k) participation and saving decisions. However, simple descriptive data may be misleading. Financial communication is likely correlated with other factors that may influence these decisions. For example, are the differences in participation and saving rates due to a worker's age, level of earnings, years of service or other personal characteristics, such as education, household wealth or marginal tax rate? Are these decisions influenced by certain plan design features, such as the employer's match rate, the availability of loans or having a separate employer-sponsored pension? To account for these possibilities, we employed a multivariate regression to estimate the effect of financial communication on the probability that an employee will participate in the plan.<sup>13</sup>

As indicated in previous research, both employee and plan characteristics are important determinants of employees' participation and contribution decisions. Prevailing evidence has shown that employee participation is strongly related to an employee's age, earnings and years of service. That has been true whether the study was based on household survey data, such as that used by Andrews (1992), Bassett et al. (1998), and Even and Macpherson (2003), or on employer administrative records, as used by Clark et al. (2000), Clark and Schieber (1998), and Holden and VanDerhei (2001). The existing evidence consistently confirms that employees who are older, who earn more and who have longer periods of service are more likely to participate in the 401(k) plan and generally contribute a higher percentage of their salary.

Along with the proxies for financial communication, the model includes several additional plan variables. Most notable are the features of the employer's matching contributions. One component of the match rate design is the percentage of the first dollar of an employee's pay that the employer matches, i.e., the *match rate*. Previous studies have focused nearly exclusively on the relationship between the match rate and employee participation and savings rates. The second component of the match rate design has often been overlooked, which entails the maximum percentage of an employee's pay (or dollar amount) up to which employers contribute, i.e., the *match threshold*. Both the first-dollar match rate and the match threshold are likely to exert a strong influence on employees' saving decisions. The model also includes a discrete identifier for firms with a defined benefit plan. Following previous studies, firm-specific controls of company size, measured by the number of employees, and industry affiliation are included.

The central finding is that financial communications — projections, education and web-intensity — have a statistically significant effect on employee participation. To provide a greater sense of its importance on employee participation, fitted probabilities are estimated for an average person in the sample at various levels of financial communication (see Figure 1).<sup>14</sup> For a firm that provides a very basic financial communication program, 62 percent of employees are anticipated to participate. By introducing an enhanced financial education program on a par with that offered by the average firm, participation rates increase by 5 percentage points to 67 percent, *ceteris paribus*. For firms offering retirement income projections similar to those offered at the average firm, participation rates rise by another 2 percentage points for a combined rate of 69 percent.

*Figure 1 here*

Using the Internet for financial communications has the greatest impact on participation. Companies that improve their financial communication program from a very modest level to providing roughly equal shares of paper and web-based financial information (similar to the average firm) can increase enrollment by another 6 percentage points. The combined use of financial education, retirement income projections and web-intensity similar to the level of usage of the average firm raises average participation to 74 percent — a gain of 12 percentage points. However, some companies offer much richer financial communication programs. For those companies that provide financial communication programs significantly above those offered by the average plan, participation rates for the average worker rise to 84 percent.

Participation rates are also significantly influenced by a higher match rate. Regression results indicate that, by raising the first dollar match rate from 25 to 50 percent, average participation increases by roughly 8 percentage points. Workers covered by a plan with a 75 percent match rate are 15 percent more likely to participate in the plan than those covered by a 25 percent match rate. Workers in plans with a 100 percent match are almost 20 percentage points more likely to contribute to the plan. The positive link between participation and match rates is consistent with previous studies. The magnitude of the effect is also roughly in line as well, although Clark and Schieber (1998) estimated a larger effect than reported here. The match threshold also has a significant positive effect on workers' enrollment decisions, but the estimated effect is quite small.

The presence of a defined benefit pension plan offsets the effects of a higher match rate. Estimates indicate that the average worker covered by a defined benefit pension plan is 10 percent less likely to contribute to the 401(k) plan than the average worker without a defined benefit plan. Previous studies have also reported a similar negative effect, indicating that workers in general are target savers.<sup>15</sup> Other firm effects include a negative relationship between company size and participation. However, the effect of firm size is rather small, such that average participation for a firm with 1,000 employees is only 2.5 percentage points higher than participation for a firm with 10,000 employees. In addition, manufacturing workers are roughly 2.5 percentage points more likely to enroll in the plan than are other workers. Finally, the average male is roughly 7 percent less likely to participate in the plan than a female of the same age and with the same salary and years of service.

It is very difficult to interpret from the estimates how participation rates change as workers get older, earn higher salaries or accumulate additional years of service. Figures 2 through 4 provide age and earnings profiles to better illustrate how changes in each affect the probability of participating in the 401(k) plan. At the same time, comparisons can be made highlighting the relative effects of various match rate designs and communication programs on 401(k) participation.

Figure 2 shows the changes in estimated participation rates as workers get older. The probability of a worker participating in the plan rises rather steeply up to about age 29. Between ages 30 to 57, participation rates remain moderately flat. As workers approach retirement, however, participation rates drop off considerably. In fact, participation rates for workers aged 21 to 29 roughly mirror those for workers aged 57 to

65. The figure highlights the impact of progressively higher financial communication on employee participation. Again, we see that increased financial communication is associated with an increased likelihood of enrollment in the 401(k) plan.

*Figure 2 here*

Figure 3 provides the participation profile by annual earnings. Fitted participation rates rise quickly for workers earning between \$10K and \$60K. For those offered the average level of financial communication, participation rates rise from 50 percent for those earning \$20K to over 85 percent for those making \$60K. Enrollment rates level off for those earning over \$70K and remain rather constant for all high-level earners. Again, financial information has important effects on participation. This is particularly true for lower-level earners. For individuals making \$35K, the likelihood of participating in the plan is 56 percent in companies with low levels of financial communication. However, participation rates rise to 80 percent for those provided with high levels of financial information. The effect of financial communication tapers off for high-wage earners.

*Figure 3 here*

The earnings profile in Figure 4 shows the blend of different match designs and financial communication programs. The lowest profile shows the estimated participation rate for a company that offers a 25 percent match rate with a 6 percent match threshold and a relatively meager financial communication program. What if this company raises its match rate to 100 percent at the same match threshold and under the same financial communication program? Alternatively, what if the company decides to completely overhaul its financial communication program while maintaining the same match rate? The upper two profiles indicate that these two separate policies would have nearly an



identical impact on estimated participation rates. Overall, participation rates for a worker earning \$40K would rise in both cases by over 25 percentage points, to 78 percent compared to the baseline scenario of 52 percent. However, the impact would be about half that for a worker with annual earnings of \$100K.

*Figure 4 here*

As these scenarios show, there are tradeoffs to be made in raising 401(k) plan participation. In recent years, many companies have grappled with rising health care costs and more competitive markets for the products or services they deliver. To reduce their financial burdens, a number of companies have eliminated or reduced their 401(k) match. The implications are that providing employees with enhanced financial information can mitigate the expected decline in participation from eliminating a company match. In fact, under several scenarios, a considerable increase in the company match would have the same effect on expected participation as a significant enhancement to the financial communication program. Financial communication is likely cheaper than raising the company match rate and so may be an attractive choice for many companies. This may be true especially for companies having difficulty in passing discrimination standards, since the effects of financial communication are particularly noticeable for lower-salary workers.

### **Factors Affecting Contributions**

After deciding to participate in the plan, workers next must decide how much to contribute to the plan. Here again we question whether financial communication significantly affects how much employees save. Similar to the effect on participation,

expectations are that greater financial knowledge raises workers' awareness about the need to put aside more money for retirement.

The regression results support the hypothesis that financial communication raises employee savings rates in 401(k) plans.<sup>16</sup> An additional communication proxy for how often plan information is distributed is included in the contribution regression model, which was not included in the previous participation model. As noted earlier, the plan materials provide information such as account balances, the performance of investment options and loan balances. This information is relevant only for plan participants.

Again, to better understand the influence of financial communication on participant contributions, Figure 5 provides fitted saving rates for a typical worker. For the average worker at a firm with a meager financial communication program, the estimated average 401(k) plan contribution is 5.5 percent of annual salary. Enhanced plan information has only a marginal effect on savings rates, all else remaining equal. A company that makes no changes other than to improve its plan communication up to an average level would boost savings rates by approximately 0.1 percentage points. Similar enhancements in financial education materials have only a small effect on savings — raising the savings rate of the average worker by a mere 0.1 percentage points.

*Figure 5 here*

Providing employees with projection tools and materials has a pronounced effect on contribution rates, and companies that provide retirement income projections to a much broader group of individuals than the average firm can increase savings rates by 0.4 percentage points. The largest effect on participant contribution rates comes from raising the concentration of materials offered via the web. Providing employees with the

advantage of immediate, concrete and hands-on access to financial materials and their own account information can boost savings rates by 0.8 percentage points. In total, a company that brings its meager financial communications up to the level at an average firm can boost 401(k) plan retirement savings from 5.5 to 6.9 percent. Further improving the financial communication program to above average would raise savings rates by another 1.35 percentage points to a lofty 8.2 percent.

The estimates for individual characteristics have a similar directional effect to those in the participation models. The results show that both age and wages have a positive and significant effect on 401(k) savings rates, and there is a non-linear relation. Female workers tend to contribute a higher percentage of their salary to the plan. Longer-service employees tend to save less; however, the magnitude of the effect of service length on contribution rates is rather small.

When including both the match rate and match threshold, previous studies showed that the match threshold tends to have an anchoring effect on employee contributions.<sup>17</sup> These results reveal a similar relationship. A rise in the match rate has a negative effect on contribution rates, while an increase in the match threshold is positive. As will be shown below, changes in both the match rate and match threshold largely offset each other, creating only moderate effects on contribution rates.

The presence of a defined benefit plan positively influences participant contributions, raising contribution rates by 1.1 percentage points. This is at odds with the target savings model but supports the idea that inherently high savers utilize both a defined benefit and 401(k) plan.<sup>18</sup> Employees working for large companies tend to contribute a greater share of their salary than their counterparts at small companies, all

else being equal. However, the magnitude of the difference is quite small. Employees working in the manufacturing sector are projected to contribute 0.7 percentage points less than do workers in the service sector. This may partly reflect the more generous defined benefit pension plans in the manufacturing industry, which is not specifically accounted for in the model.

To better illustrate the tradeoff between changes in the financial communication program and the match rate design, Figures 6 to 8 provide fitted estimates of contribution rates for age and earnings profiles. Figure 6 shows fitted contribution rates across the age profile for various levels of financial communication. Workers' contribution rates rise rather slowly at early ages — up to about 40 years old — and accelerate thereafter. The picture clearly illustrates that greater financial communication promotes higher 401(k) contribution rates. Due to the linear nature of the Ordinary Least Squares (OLS) model, there are no age-related effects.

Figure 7 shows the impact of greater financial communication on contribution rates across the earnings spectrum. The picture clearly shows the non-linear pattern between contribution rates and earnings. Workers' contribution rates steadily increase as earnings rise to approximately \$80,000, after which they decline precipitously for high-wage earners. The decline in saving rates for higher-wage earners is undoubtedly due to the IRS contribution limits. Some companies also impose contribution limits on high-wage workers because of ADP tests. As described earlier in Table 4, many workers in these plans already contributed the IRS maximum of \$10,500 in 2000. When offered greater financial communication, the predicted contribution rates for high-wage workers exceed the IRS limit. As shown by the solid black line, the average worker earning

\$120,000 or more at a company with the highest level of financial communication is estimated to contribute above the legal limit. Obviously, high-salary workers cannot defer their desired salary to the plan. As such, the full effect of enhancements in financial communication on increasing contribution rates can be seen mostly in lower-wage workers whose annual contributions are safely below the IRS limit.

*Figure 6 here*

*Figure 7 here*

When the communication program and match rate design are allowed to vary, Figure 8 illustrates that changes in the match rate and the match threshold have more modest effects on contribution rates than changes in the financial communication program. For example, consider an employee at a firm that offers a 401(k) plan with a 50 percent match on the first 3 percent of pay. Assume this worker is offered a below-average communication program. Under this scenario, the average worker earning an annual salary of \$40K would be expected to contribute roughly 5.2 percent of his or her annual salary to the 401(k) plan. As described earlier, an employer wishing to encourage higher 401(k) savings would want to raise its match threshold as opposed to its match rate. For example, raising the match threshold to 8 percent while holding the match rate at 50 percent would raise the contribution rate to 5.7 percent for an average worker earning \$40K. Alternatively, increasing the match rate to 100 percent on the first 3 percent of pay would likely cause this worker's contribution rate to decline to 4.7 percent. But enhancements in the financial communication program would have the greatest impact on employee contributions. In the scenario above, enhancing the financial communication program while offering the same match rate design would increase

expected average contribution rates by nearly 1.4 percentage points — from 5.2 to 6.5 percent. That is more than double the predicted effect of a 5 percent increase in the match threshold.

*Figure 8 here*

## **Conclusion**

The primary findings of this research further support the premise that an enhanced financial communication program can be an effective method of raising 401(k) participation and contribution rates. The largest impact on participation and contribution rates was for firms that highly utilized the Internet and web-based tools as an information and financial education medium. This result suggests that employers should consider providing greater flexibility and useful tools, so employees can access their account information, software, and other educational materials on their own time and at their own pace.<sup>19</sup> Regarding content, firms that provide retirement income projections and financial education materials can raise participation and contribution rates — although the magnitude of their impact is smaller.

These results also suggest that both the match rate and the match threshold are critical factors in influencing participation in and contributions to the 401(k) plan. A failure to account for the complete match rate design, which previous studies have often overlooked, will likely skew accounts of the relationship between match rates and employee saving behavior.

This analysis has important consequences for employers, especially those that need to raise participation and contribution rates to satisfy IRS regulations. Generally,

enhancing a financial communication program can boost employee enrollment as much as sweetening the company match rate. Improved financial communication may be more effective in encouraging employees to save than increasing the employer match. As a result, organizations should consider both alternatives when attempting to promote employee interest in their 401(k) plans. Enhancing the financial communication program may be both cheaper and more effective than making costly adjustments to the match rate design.

Future research should expand on the limited number of plans used in this study. More importantly, gaining access to multiple years of administrative records would provide the statistical power to control for unobserved variables that could not be included in the model specification in this analysis. Finally, gaining greater insight into not only the makeup of the financial communication programs but also the ways employees use these programs would provide even more accurate and thus more useful estimates.

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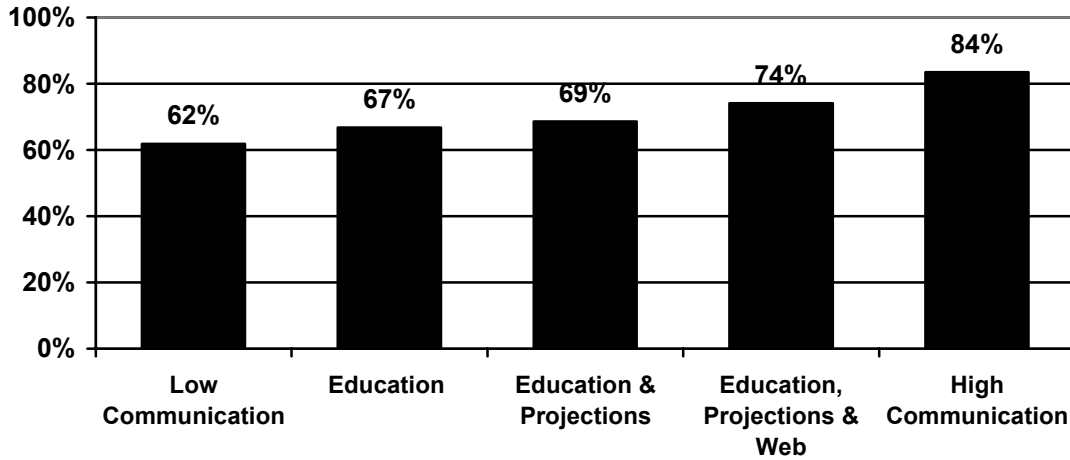
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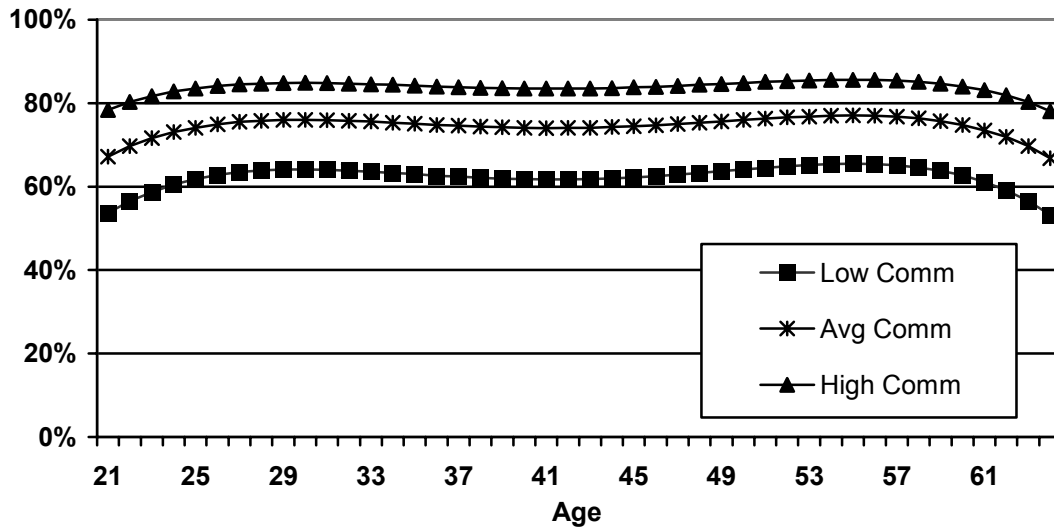
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**Figure 1: Impact of Financial Communication on 401(k) Participation Rates**



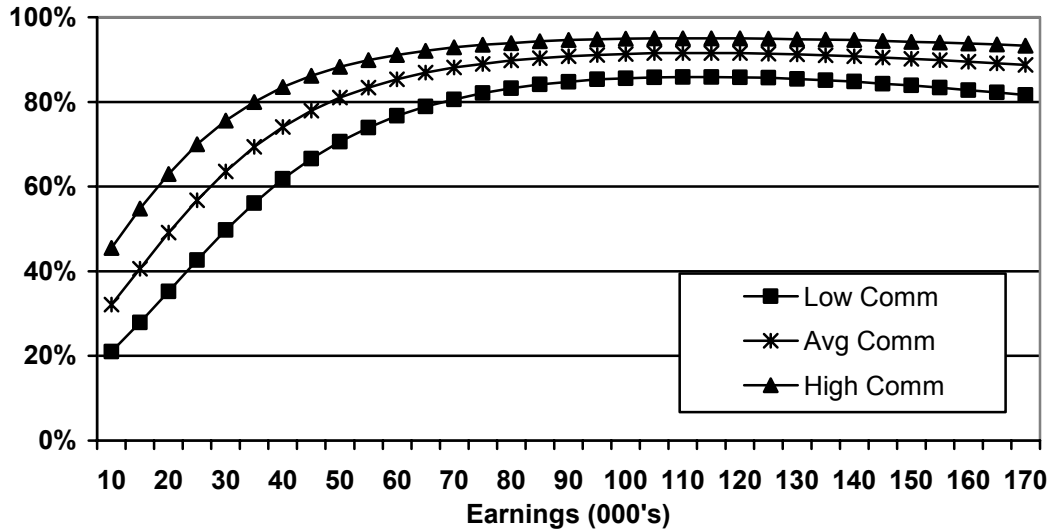
Notes: Fitted probability for a 40-year-old male earning \$40K a year who has five years of service and is covered by a defined benefit plan. He works for a non-manufacturing company with 10,000 employees that provides a company match rate of \$.50 on the first 6 percent of pay. “Low Communication” is a two standard deviation decrease from the average level of communication, which is represented by “Education, Projections & Web.” “High Communication” represents a two standard deviation increase from the average level of communication.

**Figure 2: Estimated Participation Rates for Alternative Communication Programs by Individual’s Age**



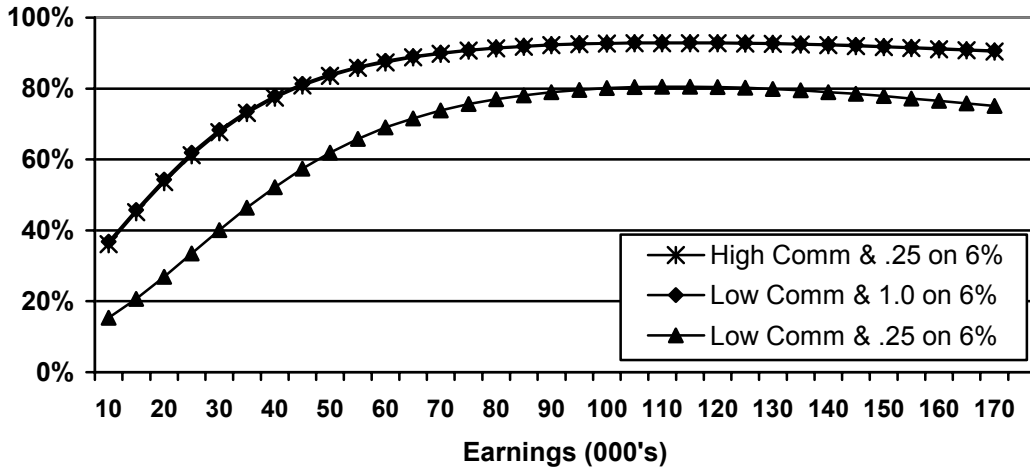
Notes: Fitted probability for a male worker earning \$40K a year who has five years of service and is covered by a defined benefit plan. He works for a non-manufacturing company with 10,000 employees that provides a company match rate of \$.50 on the first 6 percent of pay. Low communication is two standard deviations below the average level of communication. High communication represents two standard deviations above the average.

**Figure 3: Estimated Participation Rates for Alternative Communication Programs by Individual's Earnings**

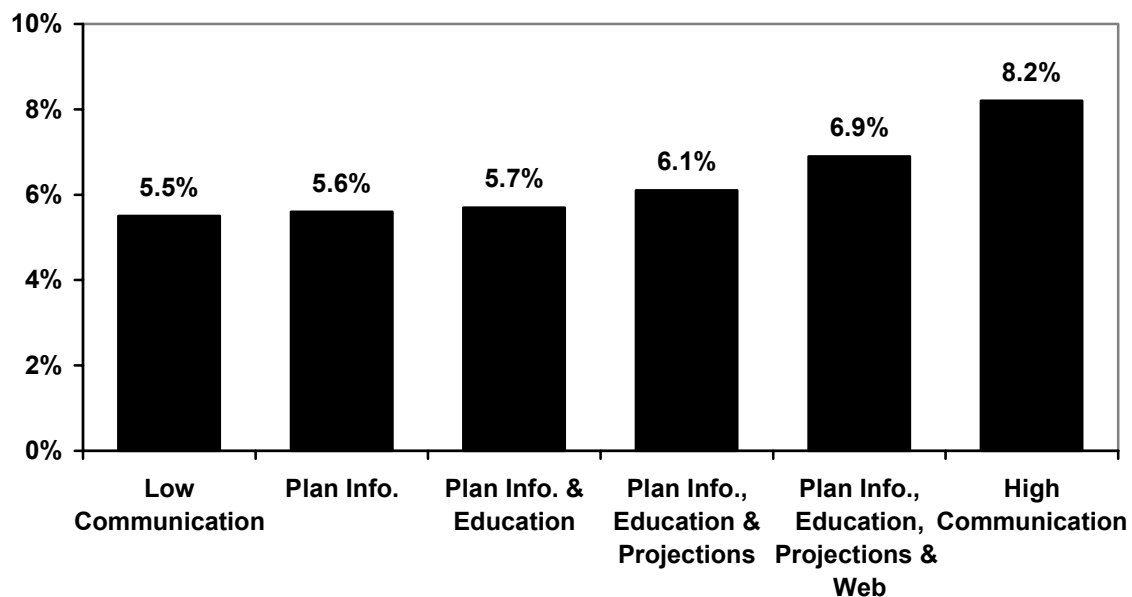


Notes: Fitted probability for a 40-year-old male worker who has five years of service and is covered by a defined benefit plan. He works for a non-manufacturing company with 10,000 employees that provides a company match rate of \$.50 on the first 6 percent of pay. Low communication is two standard deviations below the average level of communication. High communication represents two standard deviations above the average.

**Figure 4: Estimated Participation Rates for Alternative Communication Programs and Match Rate Design by Individual's Earnings**

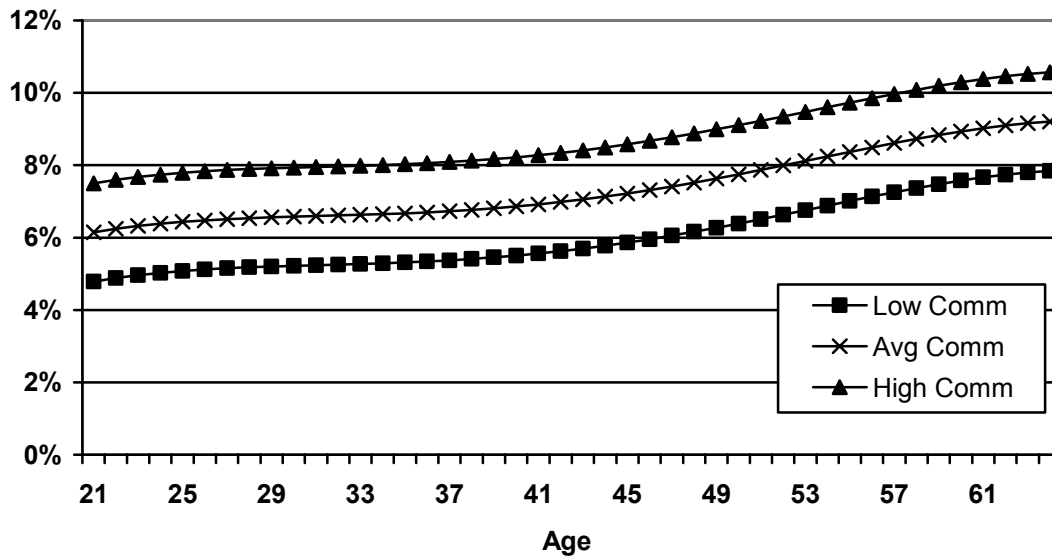


Notes: Fitted probability for a 40-year-old male worker who has five years of service and is covered by a defined benefit plan. He works for a non-manufacturing company with 10,000 employees. Low communication is two standard deviations below the average level of communication. High communication represents two standard deviations above the average.

**Figure 5: Impact of Financial Communication on Participant Contribution Rates**

Notes: Estimates are for a 40-year-old male earning \$40K a year who has five years of service and is covered by a defined benefit plan. He works for a non-manufacturing company with 10,000 employees that provides a company match rate of \$.50 on the first 6 percent of pay. “Low communication” is a two standard deviation decrease from the average level of communication, which is represented by “Plan Information, Education, Projections & Web.” “High Communication” represents a two standard deviation increase from the average level of communication.

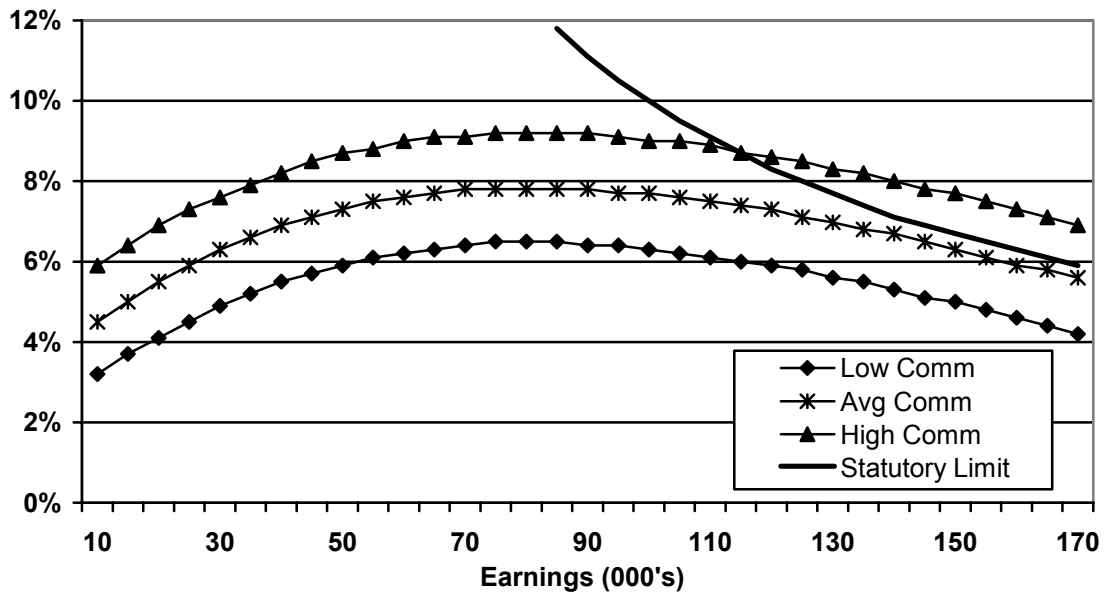
**Figure 6: Estimated Participant Contribution Rates for Alternative Communication Programs by Individual's Age**



Notes: Fitted estimates for a male worker earning \$40K a year who has five years of service and is covered by a defined benefit plan. He works for a non-manufacturing company with 10,000 employees that provides a company match rate of \$.50 on the first 6 percent of pay. Low communication is two standard deviations below the average level of communication. High communication represents two standard deviations above the average.

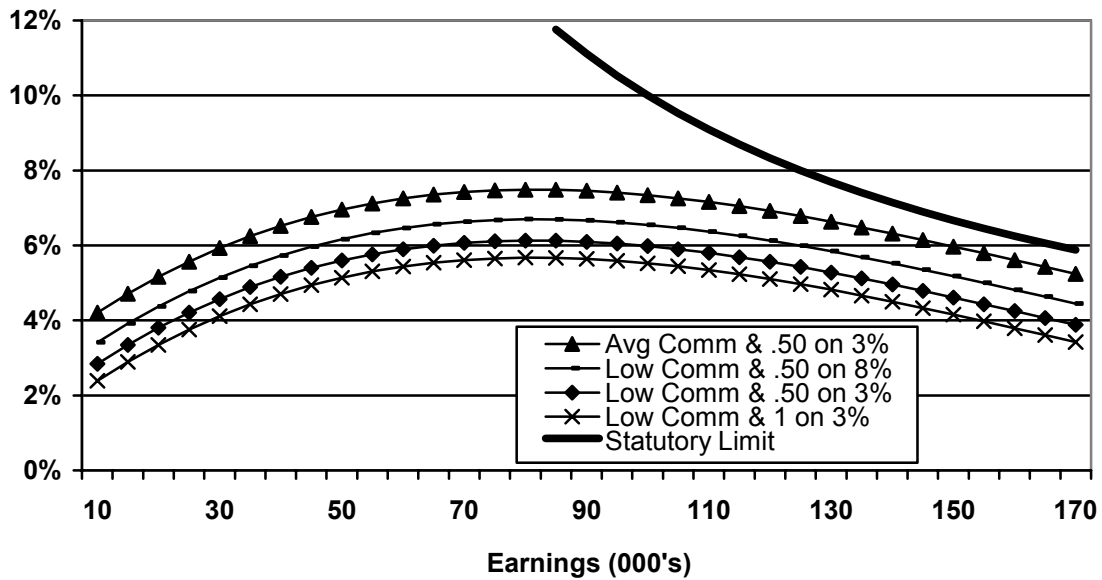


**Figure 7: Estimated Participant Contribution Rates for Alternative Communication Programs by Individual's Earnings**



Notes: Fitted estimates for a 40-year-old male worker who has five years of service and is covered by a defined benefit plan. He works for a non-manufacturing company with 10,000 employees that provides a company match rate of \$.50 on the first 6 percent of pay. Low communication is two standard deviations below the average level of communication. High communication represents two standard deviations above the average.

**Figure 8: Estimated Participant Contribution Rates for Alternative Communication Programs and Match Rate Designs by Individual's Earnings**



Notes: Fitted estimates for a 40-year-old male worker who has five years of service and is covered by a defined benefit plan. He works for a non-manufacturing company with 10,000 employees. Low communication is two standard deviations below the average level of communication. High communication represents two standard deviations above the average.

**Table 1: Summary of company's 401(k) communications**

	Percentage High <sup>3</sup>
Plan <sup>1</sup> :	
Personalized 401(k) contribution and loan information	92.3
401(k) account balances by fund	87.5
Historical performance of investment choices	87.0
Specific investment funds	52.2
Education <sup>1</sup> :	
Importance of participating in the plan	28.0
Income needs in retirement	13.0
Time value of money/compound interest	4.6
Strategies for investment (i.e. diversification)	30.0
Projections <sup>2</sup> :	
Total retirement income projections	65.2
Replacement income projections	45.5
Retirement modeling tools (i.e. account projections and optimal asset allocation tools)	74.0
Web-Intensity <sup>2</sup> :	
Web intensity factor based on each of the above questions (average)	49.0% (Low 28.6 to High 66.7)

Source: Author's calculations using Watson Wyatt's data.

Notes: (1) Based on 5-point Likert scale of Never, Annually or Less Frequently, Semi-Annually, Quarterly, or At least Once a Month; (2) Based on 5-point Likert scale of Not at All, Offered to Few Employees, Offered to Some Employees, Offered to Most Employees, Offered to All Employees; (3) High represents a response of either 4 or 5.

**Table 2: Participation and Contribution Rates for Various Types of Financial Communication**

Financial Communication	Participation Rate	Contribution Rate	Contribution Amount
<b>Plan</b>			
<i>Low</i>	-	6.9%	\$3290
<i>High</i>	-	7.7	4467
<b>Education</b>			
<i>Low</i>	74.9%	7.1	3281
<i>High</i>	79.5	7.4	4413
<b>Projections</b>			
<i>Low</i>	76.7	7.2	3713
<i>High</i>	80.6	7.4	4060
<b>Web</b>			
<i>Low</i>	73.9	7.3	3611
<i>High</i>	79.8	7.2	3900

Source: Author's calculations using Watson Wyatt's data.

**Table 3: Participation Rates in 401(k) Plans by Workers' Age and Pay**

	21 to 29	30 to 39	40 to 49	50 to 59	60 to 64	Total
<\$25K	42.9	51.4	54.0	59.3	58.7	51.1
\$25-\$34.9K	62.7	70.9	73.7	78.7	79.6	71.2
\$35-\$44.9K	77.2	81.5	82.8	84.5	82.3	81.6
\$45-\$59.9K	84.8	86.9	86.8	87.9	87.2	86.7
\$60-\$74.9K	86.0	89.9	89.7	90.2	87.6	89.5
\$75-\$99.9K	83.9	90.6	91.3	91.3	88.4	90.4
\$100K+	84.9	90.4	92.1	91.4	87.0	90.8
<b>Total</b>	<b>62.7</b>	<b>75.3</b>	<b>78.1</b>	<b>80.3</b>	<b>76.7</b>	<b>74.7</b>
# participants	54,831	95,101	88,193	50,461	7,765	296,351

Source: Author's calculations using Watson Wyatt's data.

Notes: Includes workers ages 21 to 64 with annual wages over \$10,000 and one or more years of service.

**Table 4: Contribution Rates in the 401(k) Plan by Workers' Age and Pay**

	21 to 29	30 to 39	40 to 49	50 to 59	60 to 64	Total
<\$25K	5.5	6.0	6.7	7.8	8.6	6.5
\$25-\$34.9K	5.8	6.1	6.6	7.9	8.8	6.6
\$35-\$44.9K	6.3	6.6	7.2	8.6	9.9	7.1
\$45-\$59.9K	7.6	7.6	7.9	9.2	9.9	8.0
\$60-\$74.9K	8.6	8.4	8.5	9.4	9.7	8.7
\$75-\$99.9K	8.6	8.2	8.1	8.5	8.8	8.3
\$100K+	5.9	5.8	5.6	5.7	5.4	5.7
<b>Total</b>	<b>6.3</b>	<b>6.7</b>	<b>7.2</b>	<b>8.1</b>	<b>8.8</b>	<b>7.1</b>
<hr/>						
Total \$ contributions	\$2,665	\$3,599	\$4,026	\$4,428	\$4,278	\$3,757
No. contributors	34,391	71,631	68,908	40,507	5,954	221,391
Pct at 402(g) limit – all (%)	3.4	7.8	9.6	11.1	10.1	8.3
Pct at 402(g) limit – employees earning at least \$42K (%) <sup>1</sup>	11.3	16.8	18.5	21.9	24.3	18.0

Source: Author's calculations using Watson Wyatt's data.

Notes: Includes only plan participants. Also, includes workers ages 21 to 64 with annual wages over \$10,000 and one or more years of service. (1) Contributions up to the 402(g) limit (\$10,500) would be restricted for those making less than \$42,000 under 415(c), which limits the employer and employee contributions to the lesser of \$30,000 or 25 percent of pay in 2000. EGTRRA raised the dollar limit for 415(c) to \$40,000 and the percentage to 100 percent beginning in 2002.

**Table 5: Average Participation and Contribution Rates by Age and First Dollar Match**

<b>Average Participation Rate</b>				
	<b>No Match</b>	<b>1-25</b>	<b>26-75</b>	<b>76+</b>
21 to 29	38.9	43.3	64.9	62.1
30 to 39	55.8	60.8	76.2	80.1
40 to 49	53.9	68.4	79.6	84.5
50 to 59	56.8	74.7	82.3	87.1
60 to 64	45.0	74.0	79.5	85.8
Total	53.4	64.0	75.9	79.6
<b>Average Contribution Rate</b>				
	<b>No Match</b>	<b>1-25</b>	<b>26-75</b>	<b>76+</b>
21 to 29	6.3	5.7	6.4	6.1
30 to 39	7.6	6.1	6.7	6.7
40 to 49	8.3	6.5	7.2	7.0
50 to 59	9.8	7.6	8.1	7.9
60 to 64	10.8	8.1	8.7	8.5
Total	8.5	6.6	7.1	7.0

Source: Author's calculations using Watson Wyatt's data.

Notes: Includes workers ages 21 to 64 with annual wages over \$10,000 and one or more years of service.

## **Endnotes**

<sup>1</sup> In 1992, the DOL issued guidelines under section 404(c) of ERISA, which clarified the “sufficient information” requirement under which plan sponsors are protected against participant claims due to investment losses (Arnone 2004). Furthermore, the DOL issued Interpretive Bulletin 96-1, which distinguished participant education from investment advice under ERISA. Prior to its passage, sponsors were reluctant to provide such information in fear of the fiduciary liability in offering investment advice.

<sup>2</sup> The Economic Growth and Tax Relief Reconciliation Act of 2001 allowed qualified retirement planning advice to be a nontaxable fringe benefit under IRC section 132, as long as the services are made available to all employees.

<sup>3</sup> As reported by Bernheim (1998).

<sup>4</sup> Maki (2001) argues that there are three possible mechanisms at work that could lead employees to alter their savings and investment decisions due to financial education by: (1) lowering an employee’s discount rates, (2) leading an individual to become less risk averse, and (3) changing a household’s knowledge of its choice set. Maki argues that it is unclear how the financial topics covered in many employer-sponsored programs change a household’s discount rate or the level of risk aversion. Maki argues that financial education must alter a household’s decisions by making it more knowledgeable about its choice set.

<sup>5</sup> See EBRI (1996); Bernheim and Garrett (2003); Bernheim, Garrett and Maki (1997); Bernheim (1998); Muller (2001); Maki, (2001); Muller (2003); Lusardi (2003).

<sup>6</sup> See Bayer, Bernheim and Scholz (1996); EBRI (1996); Clark and Schieber (1998).

<sup>7</sup> See Clark and Schieber (1998), Clark et al. (2000) and Holden and VanDerhei (2001) for studies that link administration records to detailed plan records for a cross-section of firms. McCarthy and Turner (2000), Kusko, Poterba, Wilcox (1998) and Choi et al (2001) used similar data but for only one or a limited number of organizations.

<sup>8</sup> A concern with the data used here pertains to when the information was collected. The administrative records are for the end of year 2000, while the survey data on employer communication programs was collected at the beginning of 2003. Previous studies linking financial communication to employee saving behavior have shown that financial communication is remedial (Bayer et al., 1996; Bernheim and Garrett, 2003). If employers respond to low employee interest by increasing financial communication around these plans, one would expect that cross-sectional estimates would be biased against the conclusion that financial communication raises employee participation and contributions to the 401(k) plan.

<sup>9</sup> This study and its implications may be viewed as somewhat limited for smaller organizations that do not already provide a baseline level of communication around their 401(k) plan.

<sup>10</sup> The web-based indicator combines the educational and transaction elements of a company's communication program. Prevailing evidence indicates that employees utilize the transaction features quite extensively while the Internet is utilized far less for educational materials. In fact, EBRI (2004) finds that only 21-24 percent use online retirement educational materials. Data limitations precluded the estimation of separate effects but this would be valuable to pursue in future research.



<sup>11</sup> Papke, Peterson and Poterba (1996) found persistence in 401(k) participation rates implying that employees make long-term commitments in these plans. Choi et. al. (2001) provide a similar conclusion.

<sup>12</sup> Furthermore, an employee's contributions may be limited due to Actual Deferral Percentage (ADP) nondiscrimination tests. In addition, some plan sponsors limit participant contributions by imposing maximum percentages of pay employees may contribute.

<sup>13</sup> A multivariate logit model was used to estimate the probability that an employee will participate in the plan. A complete list of the regression coefficients is available upon request.

<sup>14</sup> The fitted probability is based on a 40-year-old male who earns \$40K a year, has five years of service and is covered by a defined benefit plan. He works for a non-manufacturing company that has 10,000 employees and provides a company match rate of \$.50 on the first 6 percent of pay contributed to the plan.

<sup>15</sup> Andrews (1992), Papke (1996), and Bernheim and Garrett (2003) all found a negative relation between participation and the presence of another plan. Clark et al. (2000) and Clark and Schieber (1998) were able to include the replacement rate of the defined benefit plan and also found a negative relation to participation. Even and Macpherson (2003) found a positive link between 401(k) participation and the presence of another plan. They postulate that the presence of another plan could proxy for a taste for saving.

<sup>16</sup> An Ordinary Least Squares (OLS) model was estimated to predict participant contribution rates. A complete list of the regression coefficients is available upon request.

<sup>17</sup> See Kusko, Poterba and Wilcox (1998), Holden and VanDerhei (2001) and Choi et al. (2001).

<sup>18</sup> See Ippolito's (1997). Clark et al. (2000) found a similar positive link between contribution rates and a DB plan, while Clark and Schieber (1998) and Bayer, Bernheim and Scholz (1996) found no statistically significant relationship.

<sup>19</sup> EBRI (2004) reports that, of the individuals who used investment advice, the large majority only followed some of the suggestions (67 percent), while some did not implement any of the suggestions (24 percent). As shown in EBRI (2003), most people (53 percent) would prefer to have suggestions from a professional and then make their own decisions or to look into investments on their own and make their own decisions (21 percent).