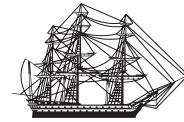


401(k) Plan Design: Match, Loan, and Investment Menu Effects

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Executive summary. An in-depth analysis of more than 500 retirement savings plans indicates that matching contributions have a modest incentive effect on plan participation rates, while loans and investment menu design can also influence employee savings behavior.

Overview of retirement programs. The vast majority of the 401(k) and 403(b) plans in our study offer a matching contribution. Matches range from 0.5% to more than 6% of pay, with the typical match equivalent to 3% of pay. The majority of plans combine a 401(k) feature with another employer-funded plan or contribution source.

Match effect. Depending on the match design, participation rates of nonhighly compensated employees (NHCEs) increase by 5 to 15 percentage points as the result of a match, a meaningful though modest incentive effect. In the typical plan, about 60% of NHCEs would join their retirement savings plan regardless of the match; 10% would participate due to the match; and nearly 30% of NHCEs fail to join regardless of the match, despite the fact that the match offers a return premium on their contributions.

Loan and investment menu effects. Loans appear to raise contribution rates by 10%,

from 6.1% to 6.7% on average. The number of investment funds appears to raise plan participation as well. But a higher proportion of equity funds in the menu discourages participation.

Employer match costs and forfeited compensation. Although the typical plan promises a match value equivalent to 3% of pay, in practice the employer pays less than 2% of pay in match costs because of the failure by some employees to participate or to save at the full match rate.

Implications. Sponsors have a meaningful but limited ability to influence the savings behavior of NHCEs through match design. To broaden retirement savings, they should consider other plan design strategies such as non-elective contributions or autopilot 401(k) designs. Loans appear to encourage contributions but not participation. When designing investment menus, employers must balance the appeal of greater choice against the complexity of offerings.

Author

Stephen P. Utkus

This report is an excerpt from "Turning Workers into Savers? Incentives, Liquidity, and Choice Effects in 401(k) Pension Design," by Olivia S. Mitchell and Tongxuan (Stella) Yang, Wharton School, University of Pennsylvania, and Stephen P. Utkus, Vanguard Center for Retirement Research. See "References" for more information.

Background

In this report, we analyze the impact of 401(k) plan design on employee savings behavior—in particular, how such features as the match, loans, and the investment menu affect plan participation and contribution rates.¹ This research will be useful to plan sponsors and consultants as they estimate the impact of plan design changes on employee savings behavior. It will also help policymakers understand the variety of plan designs found among U.S. private-sector employers and the impact plan design has on the retirement preparedness of U.S. workers.

The principal goal of this research is to explore how plan design influences the savings behavior of NHCEs. Our interest is motivated by the need for plan sponsors to maintain or increase NHCE savings rates under federal nondiscrimination testing rules. It also arises from the finding, discussed below, that highly compensated employees (HCEs) are largely immune to match incentives, as most of them would save for retirement regardless of the match provided. Thus, most of the behavioral change resulting from plan design occurs in the NHCE population.

Our research is made possible by a data set drawn from Vanguard® recordkeeping systems for 2001. This data set, covering more than 500 plans and nearly 740,000 eligible employees, includes details on plan design, employee demographics, and plan sponsor characteristics. While the data set is from 2001, our experience is that plan designs change slowly, and thus the economic effects we present are still valuable in evaluating current plan design issues.

This document begins by reviewing the characteristics of the plans and employees in our data set, the design of matching contributions, and the role of the 401(k) plan in the overall retirement benefits program. In turn, we consider how the match influences employee participation and contribution rates. We also summarize the important effects of loans and investment menu design. Finally, we compare the promised match design with the actual match costs incurred by employers, and we estimate how much compensation employees typically forfeit when they fail to avail themselves of the maximum match offered.

This paper is drawn from a broader research effort conducted jointly with Olivia S. Mitchell and Tongxuan (Stella) Yang at the Wharton School of the University of Pennsylvania.²

401(k) plan design

We reviewed 2001 data drawn from Vanguard's recordkeeping systems for a subset of employer plans. The data elements include:

- 401(k) plan design features, including detailed formulas for matching contributions, the presence of loans and after-tax contributions, and characteristics of the plan investment menu.
- Employee demographics, such as age, income, job tenure, and gender, as well as plan participant behavior, such as plan participation and contribution rates, equity contribution allocations, and account balances.
- Employer characteristics, such as firm size, industrial sector, and overall retirement benefits design.

¹ For simplicity's sake, we use the term "401(k)" to refer to both 401(k) and 403(b) savings plans.

² See Mitchell, Utkus, and Yang, 2005, in the References.

More than 80% of the savings plans in our sample offer matching contributions, which range from 0.50% to in excess of 6% of pay (Figure 1). The typical (median) match is equivalent to 3% of pay: It is the well-known match formula of \$0.50 on the first dollar up to 6% of pay. The median plan, in other words, promises a contribution equivalent to 3% of pay for those employees willing to contribute 6% of pay to the plan. This 3% match costs the typical employer only 1.9% of total wages because some employees fail to join the plan, while others fail to save at the full match rate. (More detail on 401(k) match design is provided later in this report and in the Appendix.)

The dominant liquidity element in retirement savings plans is a loan feature, with 85% of our plans permitting one or more outstanding loans. Nearly one-quarter of plans also permit after-tax contributions. Many plans allow employees to withdraw after-tax contributions as a method of providing liquidity for retirement savings.

In this 2001 data set, the average savings plan offered 12.6 investment options to participants, and 65% of the investment menu consisted of equity funds. About one-fifth of plans offered company stock.

The average plan in our data set had 1,460 eligible employees, with plan sizes (as measured by number of eligible employees) ranging from 50 employees to nearly 65,000. Only 5% of our plans had eligible employees of 5,000 or more, but this small group of plans accounted for 58% of all eligible employees. (As discussed below, we make certain adjustments to account for the variation in plan size.) Our sample is drawn heavily from the manufacturing, services, finance, and utilities sectors.

Figure 1. Savings Plan Characteristics, 2001

For 507 401(k) and 403(b) savings plans

Match design

Percent offering match	82%
Median match rate	\$0.50 on \$1
Median match threshold	6%
Median value of promised match	3%
Median employer match cost	1.9%

Liquidity features

Percent offering loan	85%
Percent offering after-tax contributions	24%

Investment menu design

Average number of funds	12.6
Percent of menu in equity funds	65%
Percent offering company stock	19%

Plan size

Average number of eligibles	1,460
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Plan size breakdown

Eligible employees	Percentage of plans	Percentage of eligibles
5,000+	5%	58%
1,000–4,999	18%	28%
<1,000	77%	14%

Sectors

Manufacturing	43%
Services	22%
Wholesale and retail trade	5%
Agriculture, mining, and construction	6%
Finance	11%
Utilities	11%
Other	2%

Source: Vanguard, 2005.

Figure 2. Participant Characteristics, 2001

Plan-average statistics for 507 plans (739,975 eligible employees)

	All	NHCEs*	HCEs*
Demographics			
Age	42.7	41.9	47.4
Income	\$63,900	\$42,000	\$157,400
Job tenure	8.7	8.2	12.3
Sex (% male)	64%	58%	85%
Participant savings behavior			
Participation rate	77%	74%	91%
Contribution rate	6.8%	6.9%	6.8%
Account balance	\$54,400	\$35,500	\$153,800
Plan assets owned	100%	59%	41%
Participant investment behavior			
Contribution to equities	74%	73%	79%
Number of funds used	3.5	3.4	3.8
Contribution to company stock	14%	14%	14%
Participant account characteristics			
Loan outstanding	15%	15%	11%
Web registered	26%	23%	42%
Tax limits			
HCE participants	19%	—	—
Participants at 402(g) limit	11%	—	—
Plans "capping" HCEs	10%	—	—

*Non-highly and highly compensated employees, respectively.

Source: Vanguard, 2005.

Participant characteristics

Because our analysis focuses on plan design, we summarize participant statistics as plan-level averages.

Within the typical plan, the average age of participants is just over 42; average income is nearly \$64,000 on an individual (not household) basis; participants have an average of 8.7 years on the job; and 64% of eligible workers are male (Figure 2).

Based on the 2001 definition of HCEs, we have calculated separate plan-level averages for HCEs (earning more than \$85,000 in 2001) and NHCEs (earning \$85,000 or less in 2001). HCEs were more likely to participate in the plan than NHCEs (91% versus 74%); they had higher balances (\$153,800 versus \$35,500); they were somewhat more likely to hold equities (79% versus 73%); and they were significantly more likely to be registered to use the Internet to manage their plan account (42% versus 23%).

Figure 3. Retirement Program Design, 2001

	Plans	Employees	Average plan size
<i>n</i> =	507	739,975	1,460
DC-only designs			
401(k) only	39%	25%	936
401(k) plus DC	27%	11%	595
Subtotal	66%	36%	796
DB/DC designs			
401(k) plus DB/DC	14%	40%	4,170
401(k) plus DB	20%	24%	1,751
Subtotal	34%	64%	2,747
Total	100%	100%	

Source: Vanguard, 2005.

On an array of other measures, including contribution rates, number of funds, and contributions to company stock, we find that HCE and NHCE participants appear very similar. HCE and NHCE contribution rates are no doubt similar because HCEs are more likely to be constrained by the maximum 402(g) limit—which was \$10,500 in 2001. Effective plan contribution rates decline dramatically as income increases. In 2001 an individual earning \$100,000

would have a maximum plan contribution rate of 11% (\$10,500 divided by \$100,000), whereas an individual earning \$200,000 would have a maximum plan contribution rate of 5.25%.

In 2001 the average plan had 11% of all participants contributing at the 402(g) limit of \$10,500; 19% of plan participants were classified as HCEs (controlling 41% of plan assets); and 10% of plans “capped” HCEs to comply with nondiscrimination testing.

Total retirement design

One feature of our data set is the information available on the total retirement program offered

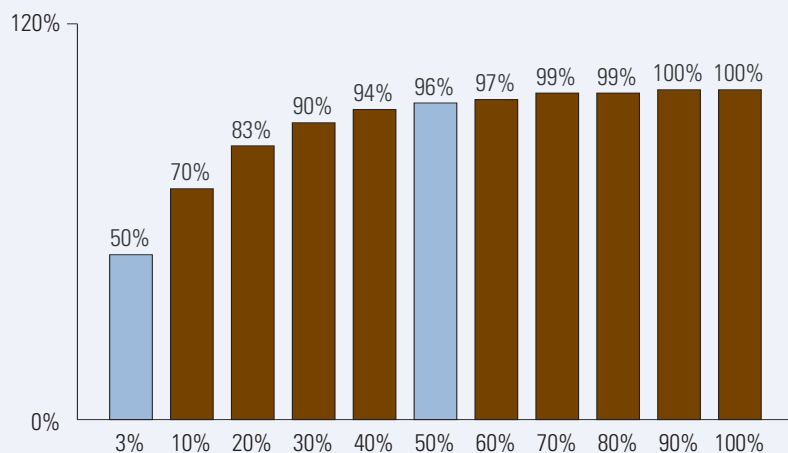
by the employer. These programs vary considerably in terms of the types of plans offered and types of employer and employee contributions.

About 4-in-10 retirement programs are standalone 401(k) plans. The employer offers a single plan funded by employee elective deferrals and employer matching contributions (Figure 3, top panel).

Compared with NHCEs, HCEs were more likely to participate, had higher balances, and were more likely to be web-registered.

Figure 4. Plans Versus Eligible Employees

*Percent of eligible employees in a given percent of plans
n=507 plans and 739,975 employees*



Source: Vanguard, 2005.

What is clear from this data set is that retirement plan design is very heterogeneous. It's common to describe the historic trend in private retirement plan design as a shift from DB plans to 401(k) plans. Our data suggests that actual plan design patterns are more varied and complex.

Plan versus employee analysis

Across the universe of 401(k) plans, the overwhelming majority of eligible participants are found in the largest of plans. In our sample, half of all eligible employees are in the top 3% of plans, or 15 out of 507 plans (Figure 4). Well over 80% of eligible employees can be found in the top 20% of plans.

And 96% of eligible employees are in the top half of plans, while only 4% of eligible employees are in the bottom half. In other words, the "average participant" can be found among a handful of the very largest plans, whereas the "average plan" is actually representative of a much smaller company, accounting for a very small proportion of 401(k) eligible employees.

A good illustration of this phenomenon is the reported participation rate of 77% (Figure 2). This is an average of the participation rates for each of the 507 plans in our sample. In this calculation, all plans are weighted equally, with the participation rate for a small plan with 50 eligible employees averaged with, among others, the participation rate for a plan with nearly 65,000 eligible employees.

In contrast, 6-in-10 of the retirement programs combine a 401(k) feature with another DB or DC arrangement:

- More than one-quarter (27%) of programs combine a 401(k) feature with another employer-contributory DC plan or source of funds—for example, a stand-alone profit-sharing plan, money purchase plan, or employee stock ownership plan (ESOP), or a profit-sharing or ESOP contribution to a 401(k) plan.
- One-fifth of programs combine a 401(k) plan with a DB plan.
- Almost a sixth (14%) of programs combine a 401(k) plan with a DB/DC program. In some cases, these are large legacy plan designs that combine a 401(k) plan, a DB plan, and an ESOP. In other cases, these are organizations that offer a DB/401(k) design to older employees and a DC/401(k) design to new employees.

Figure 5. Match Design, 2001

		Plans	Employees
<i>n</i> =		507	739,975
Type	Example		
Single-tier formula	\$0.50 per dollar on 4% of pay	71%	72%
Multi-tier formula	\$1.00 per dollar on 2% of pay; \$0.50 per dollar on next 2% of pay	11%	14%
Subtotal—plans with matches		82%	86%
No match		18%	14%
Total		100%	100%

Source: Vanguard, 2005.

By comparison, if all the plans in our universe are treated as a single plan, the participation rate is only 66%. Why this discrepancy? As noted above, large plans represent the overwhelming majority of participants. They often find it more difficult to maintain high rates of plan participation, in part because they offer other retirement benefits besides the 401(k) plan and because employee populations are dispersed across many worksites. As a result, even though employees at large firms are generally better paid and have longer job tenure than employees at smaller firms, a higher proportion are still less likely to participate in the 401(k) plan. Conversely, participation rates are generally higher among small plans where the 401(k) program is often the only retirement benefit.

As a result, a plan-weighted participation rate of 77% reflects the strong showing of small plans, while a participant-weighted participation rate of 66% reflects the experience of large companies.

Although the largest impact of plan size occurs in participation rates, we attempt to adjust our calculations for this issue and comment on other major discrepancies between the plan and the employee perspective in the remainder of this report.

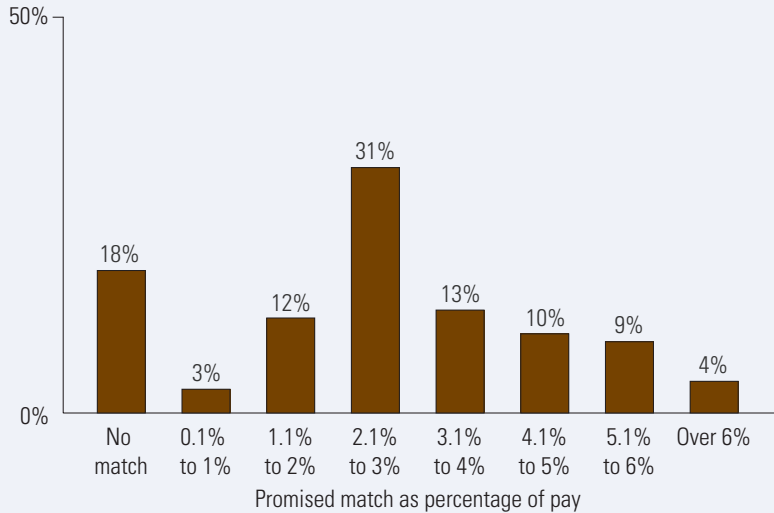
Design of the 401(k) match

As noted earlier, some 82% of 401(k) plans in our sample offer a match (Figure 5). In 71% of cases, the match is a *single-tier* match formula, such as \$0.50 on the dollar on the first 4% of pay. In another 11% of cases, the match is a *multi-tier* formula, such as \$1.00 per dollar on the first 2% of pay, and \$0.50 per dollar on the next 2% of pay. Technically, about one-fifth of plans in our sample offer no matching contribution—although, again, some of these offer a companion profit-sharing or ESOP contribution, which they communicate to employees as a type of match, while others may provide an employer contribution to a DB or other DC plan.³

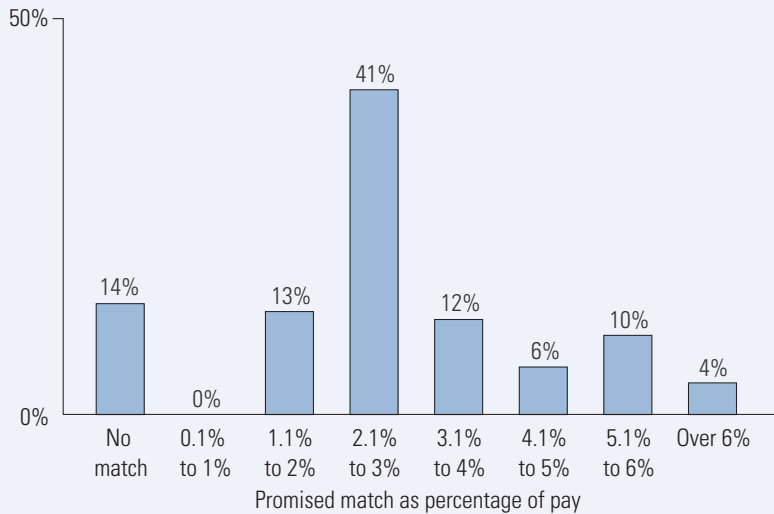
³ Our analysis sample omits union plans, where matches are less common and are typically subject to collective bargaining. We also omit a handful of highly complex match formulas (e.g., where match rates vary by job tenure or hours worked), because they represent a negligible percentage of overall plans and the matches were, in our judgment, too complex to be easily modeled or understood by participants.

Figure 6. Promised Value of the Employer Match, 2001

Percentage of plans (n=507)



Percentage of eligible employees (n=739,975)

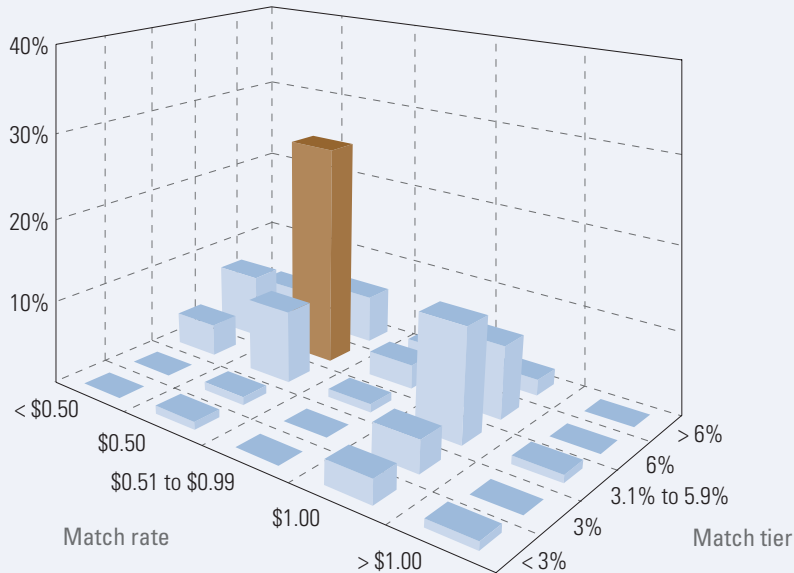


Source: Vanguard, 2005.

The promised value of the match varies substantially from plan to plan. Both the average and median promised match is equivalent to 3.0% of pay (Figure 6). Nearly one-third of plans (31%) offer a match from 2.1% to 3.0% of pay. Most of these plans offer a match exactly equivalent to 3.0% of pay using two common formulas, either the well-known \$0.50 on the \$1.00 up to 6.0% of pay, or \$1.00 per dollar on 3.0% pay. When measured in terms of eligible employees, 41% receive a match in the 2.1% to 3.0% range, reflecting the tendency of larger firms to offer match formulas that are equivalent to 3.0% of pay.

Figure 7. Single-Tier Match Formulas by Rate and Tier, 2001

For 360 single-tier match plans



Note: See also the Appendix, which provides detail underlying this chart, both at the plan and participant level.

Source: Vanguard, 2005.

The Appendix provides more information on the 360 single-tier formulas. One observation to note in the Appendix is the difference between plan- versus eligible-employee-weighted formulas. For example, while 27% of single-tier plans offer the well-known formula of \$0.50 on the dollar up to 6% of pay, these plans are typically at large companies and so account for 38% of all eligible employees in our data set.

Methodology

As noted earlier, our main research question is to analyze how NHCE and HCE participation and contribution behavior varies in light of these differences in match design. That said, any analysis of savings behavior must control for differences in employee demographics and company features. For example, employees at one firm may

Single-tier matches

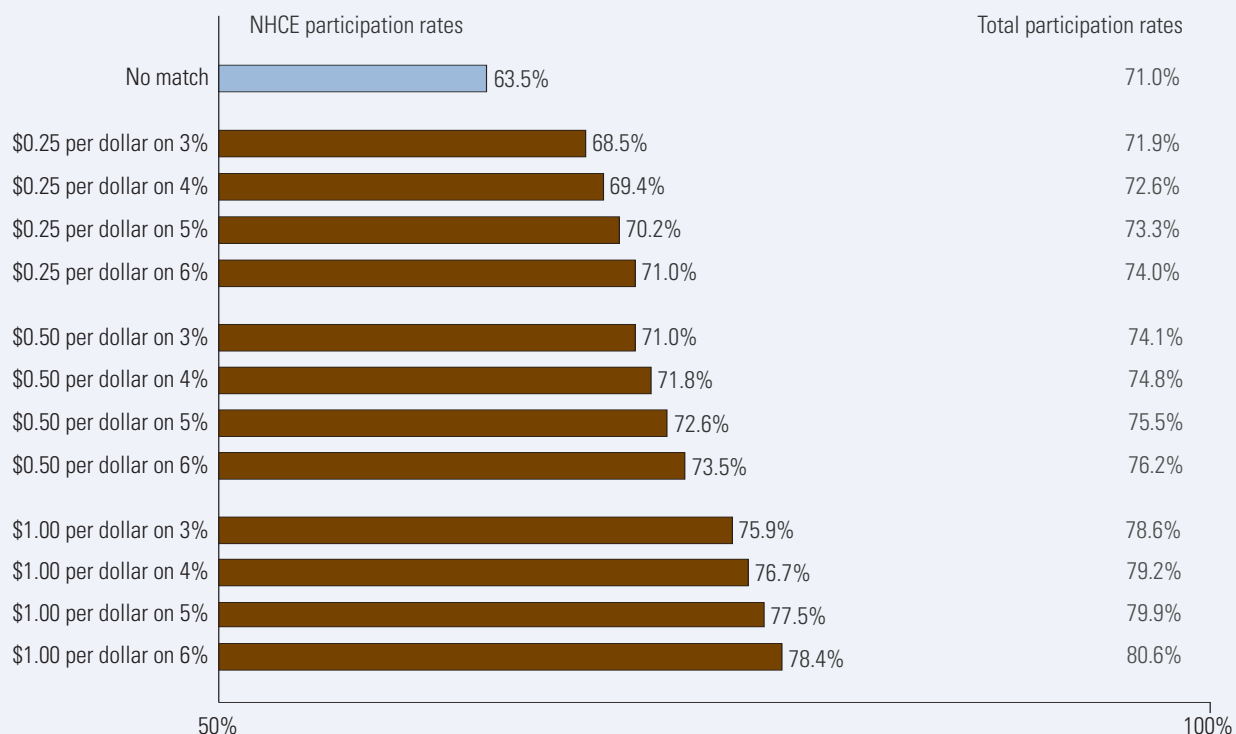
As noted earlier, 71% of the match formulas in our sample (360 plans in all) are single-tier formulas. These consist of one match rate, such as \$0.33 on the dollar, applied to a single tier or threshold of compensation, such as 3% of pay.

Plans offer a wide variety of match rates and tiers; however, many choose well-known match formulas (Figure 7). The most common match, accounting for 27% of single-tier plans, is \$0.50 on the dollar up to 6% of pay. The second most common set of matches, accounting for 14% of single-tier plans, is dollar for dollar on either 4% or 5% of pay.

contribute at a higher level because they are older and better paid, or because they work in a specific industry sector, such as finance, where financial knowledge is higher. Similarly, employees at another firm may not contribute at a higher level because their company offers other generous retirement benefits or because they work for a large company where it is more difficult to promote retirement savings, regardless of the match.

Figure 8. Match and Plan Participation, 2001

Predicted participation rates



Source: Vanguard, 2005.

To capture all of these effects, we conducted a multivariate statistical analysis that examined NHCE and HCE participation and contribution rates as a function of 401(k) plan-design features, employee demographics, and company-specific characteristics.⁴ After estimating these regression equations, we summarized the results by predicting participation and savings behavior for a range of common match designs. We discuss these predicted values on page 11.

Impact on plan participation

For nondiscrimination testing purposes, the critical variable that plan sponsors seek to influence is the participation rate of NHCEs. From our analysis, only a small portion of the NHCE population actually responds to the match incentive. In general, if a plan offered no match, we would expect 64% of NHCEs to participate in their employer's 401(k) plan (**Figure 8**). We believe these eligible employees are responding to the retirement savings and tax benefits of the plan, as well as the plan's education program, independent of any employer match.⁵

⁴ See Mitchell, Utkus, and Yang, 2005, for details on our statistical approach.

⁵ All of the plans in our sample provide enrollment information to all eligible participants. This information includes basic retirement savings and investment concepts, as well as a description of the plan features and the available investment choices. Participants also receive a quarterly newsletter and quarterly statements, and can obtain 401(k) savings and investment information via the Internet if they register for account access.

Introducing a very modest match (\$0.25 on the dollar on 3% of pay) leads to a large jump in NHCE participation of 5 percentage points. Introducing a very generous match, \$1.00 per dollar on 6% of pay, raises it by 15 points. The most common match formula, \$0.50 on the dollar on 6% of pay, raises NHCE participation by about 10 percentage points.

Also shown are predicted “total participation rates” for the combined NHCE and HCE populations. The total plan participation rate is less responsive to the match design because most HCEs will join their employer’s plan regardless of the match formula. HCEs are more likely to derive large current tax benefits from plan participation, and they are likely to have higher levels of financial literacy.

Also notable is what is not shown. In our calculations, loans appear to have no impact on plan participation; their sole effect is on plan contributions among those who already participate.⁶

Implicit return premia

One way to interpret an employer match is as an additional premium in terms of investment returns. For example, in describing a match formula of \$0.50 on the dollar on 6% of pay, participant communications sometimes present the match as providing an immediate 50% return on the participant’s initial plan contributions (up to 6% of pay).

To evaluate how beneficial employer contributions may be over long periods, we have calculated the “return premium” implicit in a range of employer match formulas. In effect, the return premium captures how much more a participant with no match would have to earn in order to achieve similar results to a participant earning a given match.

In our calculations, we first estimated the retirement savings of a typical NHCE with no match who earned a 4% real market rate on his 401(k) investments.⁷ In 2001 the typical NHCE was 42 years old, earned \$42,000 a year, was contributing 6% assuming no match and no loan, and could be reasonably expected to retire in 20 years. We then estimated how much more that same NHCE would have if the plan included various employer-matching formulas. The implicit return premium is the return that equates the no-match participant to the match participant earning a 4% real return on his account.

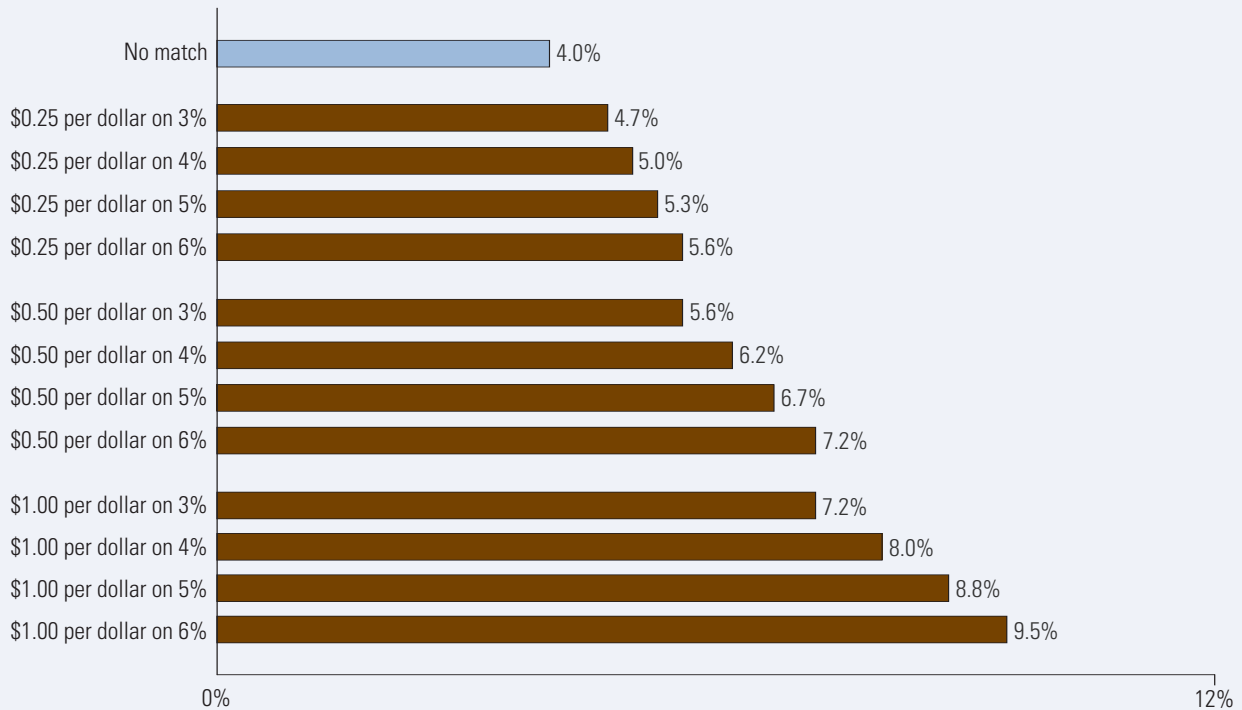
The return premium captures how much more a participant with no match would have to earn in order to achieve similar results to a participant earning a given match.

6 Some studies report similar results for loans, while others report an impact on plan participation. For example, in Vanguard (2005), we find that loans boost plan participation rates among newly eligible participants.

7 401(k) investors generally hold 60% to 70% of assets in equities and the remainder in fixed income investments. Historically, such a portfolio would have generated a return above inflation of 5% to 6% depending on the period measured. We use a 4% real return as a reasonable estimate of post-expense returns on 401(k) assets.

Figure 9. Implicit Real Return Premia in Match Formulas

Match formula



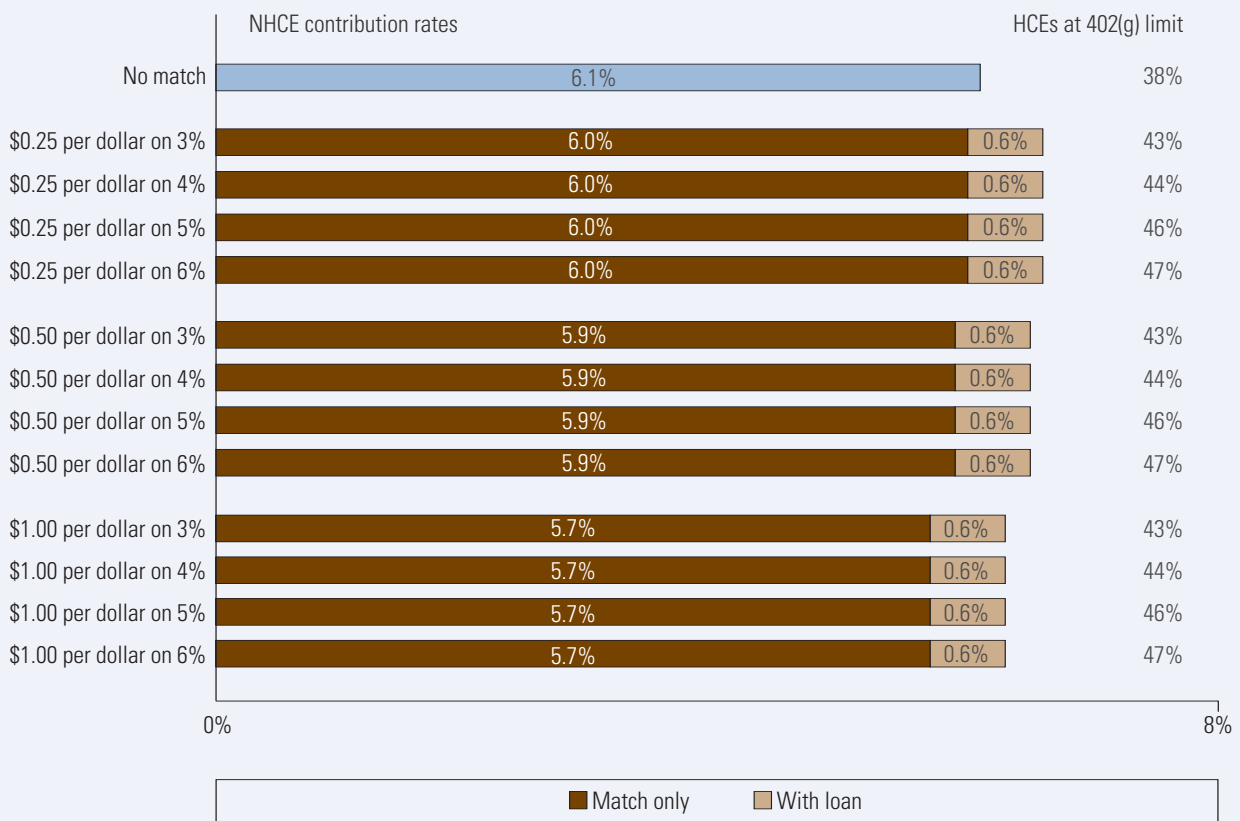
Source: Vanguard, 2005.

This implicit return premium is quite large (Figure 9). For example, eligible employees who fail to contribute to a plan offering a \$0.50 on the dollar match on 6.0% of pay are, in effect, bypassing 401(k) investments with a real annual return of 7.2%. That is a premium of more than three percentage points on top of our long-term assumed real return on 401(k) investments of 4%. In some ways, it is the equivalent of investing in a balanced portfolio

that is expected to earn 4% per year after inflation in the long run, but earning the equivalent of the real return on equities due to the employer match. Depending on the generosity of the match, nonparticipants forfeit an implicit return premium offered by the employer match of nearly 1% to 6%. Viewed in this way, nonparticipants are passing up a substantial and basically no-risk premium on their investments when they choose not to join the plan and forfeit employer matching contributions.⁸

⁸ Technically, the employer contributions are risky in that the employer can change or terminate the matching contribution at any time. But it seems unlikely that the volatility of employer matching contributions would come close to the capital markets volatility needed to generate similar returns to those derived from matching contributions.

Figure 10. Predicted Contribution Rates



Source: Vanguard, 2005.

Impact on plan contributions

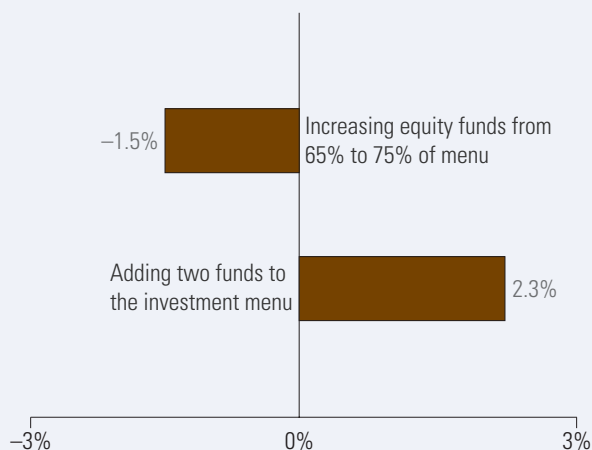
While match formulas have a meaningful effect on participation rates, they have little impact on plan contribution rates (Figure 10). Indeed NHCE plan contribution rates fall slightly, from 6.0% to 5.7%, as match formulas become more generous. It is as if NHCEs think in terms of target savings rates: If the match is more generous, the participant saves somewhat less.

What is notable is the impact of a loan feature. In general, the presence of a loan (which had no effect on participation rates) increases plan contributions by about 10.0% among NHCEs, raising contribution rates by about 0.6% on a base of around 6.0%.

HCEs are more likely to be subject to the 402(g) limit, and so the higher their income the lower their plan contribution rate. We did, however, estimate the percentage of HCEs at the 402(g) limit as a function of match design. As shown, a more generous match tends to encourage a modest increase in the percentage of HCEs contributing at the maximum rate. With no match, 38% of HCEs saved at the 402(g) limit in 2001; with a very generous match, 47% did.

Figure 11. Investment Menu Effects

Impact on NHCE participation rate



Source: Vanguard, 2005.

Investment menu effects

We also analyzed the relationship between investment-menu design and employee savings behavior. Previous research has pointed to the problem of “choice overload”—namely, the greater the number of fund options, the more likely it is that some eligible employees will fail to join their employer’s savings plan.⁹ Unlike that research, we attempted to disentangle two distinct effects of choice overload: the number of funds versus the percentage of equity funds in the investment menu. Over time, as plan sponsors have added investment options, there is some evidence that they have tended to add more equity investment choices. We suggest that it is the addition of more complex equity options, rather than the number of options *per se*, that contributes to choice overload.

These results confirm that there are, in fact, two offsetting effects of choice overload (Figure 11). Adding more fund options appears to stimulate participant interest. For example, we estimate that adding two funds to the average plan menu (of 12.6 options in 2001) would encourage another 2% of eligible NHCEs to join their employer’s savings plan. However, adding more equity fund options tends to discourage plan participation. Increasing the percentage of equity options in the plan from 65% of options to 75%, for example, decreases plan participation by about 2%.

These results again underscore a broader observation that employee savings behavior is not solely a function of match incentives, participant education, or other account features such as loans. Investment menu design also plays a vital role.¹⁰

Employer match costs and forfeited compensation

A final measure of the impact of plan design on employee savings behavior is the employer’s actual costs. As noted above, the average employer promises a match equivalent up to 3% of pay. But the cost of that 3% promise is less due to the failure of some eligible participants to join the plan and/or contribute up to the match threshold. As with our savings analysis, we estimated actual employer-matching costs based on a multivariate regression. In essence, our calculations illustrate how employer match costs vary assuming that *every* employer is the average company with the average workforce.

⁹ See Vanguard, 2003, and Iyengar, Huberman, and Jiang, 2004, for additional details.

¹⁰ For example, adding life-cycle funds to an investment menu appears to raise plan participation among newly eligible employees. See Vanguard, 2005.

Figure 12. Actual Employer Matching Contributions

Predicted costs as a function of match design

Match formulas	Promised match	Actual cost	As percentage of promised match	
			Employer actual cost	Employee forfeited compensation
\$0.25 per dollar on 3%	0.75%	0.25%	34%	66%
\$0.25 per dollar on 4%	1.00%	0.44%	44%	56%
\$0.25 per dollar on 5%	1.25%	0.62%	50%	50%
\$0.25 per dollar on 6%	1.50%	0.81%	54%	46%
\$0.50 per dollar on 3%	1.50%	0.63%	42%	58%
\$0.50 per dollar on 4%	2.00%	0.99%	49%	51%
\$0.50 per dollar on 5%	2.50%	1.35%	54%	46%
\$0.50 per dollar on 6%	3.00%	1.71%	57%	43%
\$1.00 per dollar on 3%	3.00%	1.38%	46%	54%
\$1.00 per dollar on 4%	4.00%	2.09%	52%	48%
\$1.00 per dollar on 5%	5.00%	2.80%	56%	44%
\$1.00 per dollar on 6%	6.00%	3.51%	58%	42%

Source: Vanguard, 2005.

Actual employer costs for the match do vary considerably depending on the match formula. In the least generous match that we modeled, \$0.25 per dollar on 3% of pay, the employer match is equivalent to 0.75% of pay, but the actual cost is only 0.25% due to nonparticipation and low contributions rates (Figure 12). For the small number of plans with such matches, employer costs are only about one-third of the promised match. At the other extreme, with a generous match of \$1.00 per dollar on 6% of pay, the predicted employer costs are about 3.5% of pay, about 60% of the promised match.

By and large, the more generous the match, the higher the percentage the employer will pay in the form of actual costs. This stands to reason, as a more generous match formula induces more eligible employees to participate, and thus raises employer costs.

Implications

Plan sponsors typically seek to alter employee retirement savings behavior in order to improve compliance with federal nondiscrimination testing rules or to enhance retirement preparedness. Our research findings suggest that employer matching contributions have a meaningful but limited role in influencing savings decisions, particularly among NHCEs. Matching contributions appear to work by broadening plan participation, but they appear to have a negligible—if even slightly negative—impact on plan contribution rates.

Specifically, a typical match only induces about 10% of eligible employees to join their employer's retirement savings plan. More than 60% of eligible employees would join their employer's plan regardless of the match, as they are drawn to the savings, tax, and investment features of the program. Another 30% fail to join their employer's plan despite the presence of a match—and despite the large return premium a typical match offers.

In the end, sponsors can improve at the margin testing results or retirement readiness by enhancing their matching contribution. But the effect due to the match increase is likely to be small. These findings suggest that sponsors need to combine strategies such as expanded education programs (above and beyond the basic education programs already offered by plans), on top of any change to match design, to enhance retirement results.

Other plan-design features also can influence savings behavior, though the effects are generally small. Loans appear to have little impact on plan participation generally, but they do appear to raise plan contributions. By and large, to encourage higher retirement savings, sponsors should offer a loan feature if administratively possible.

Our results also point to the important role that investment menu design can play in shaping savings decisions. In a variation of the choice overload hypothesis, there appears to be a tension between greater fund choice and menu complexity, and sponsors should consider this carefully before adding new options to their savings program.

Beyond these changes, sponsors have two broader options to weigh. One is to consider the greater use of nonelective contributions, such as profit-sharing or money purchase contributions. A meaningful number of plans in our research study already offer these, and still others offer a DB plan to serve in a similar role. By making such contributions, the employer is supplanting the employee's judgment with the employer's own preferences for retirement saving, and ensuring some minimum savings for retirement regardless of the employee's own decision regarding elective deferrals.

A second, increasingly popular strategy is automatic enrollment or its improved variant, the autopilot 401(k). In such programs (including Vanguard's OneStep® program), eligible employees are automatically enrolled in their employer's savings plan, and plan contribution rates are increased automatically over time, with the right to opt out of enrollment and savings increase decisions. These programs raise plan participation and savings rates by fundamentally changing default decisions in favor of plan saving.

Our findings suggest that strategies like these will be necessary to reach the reluctant savers who fail to join their employer's savings plan, despite the substantial return premia that matching contributions offer.

Appendix

Appendix Table. Single-Tier Match Formulas, 2001

Percent of plans (n=360)

Cap	Match rates									Total
	\$0.10 to \$0.24	\$0.25	\$0.26 to \$0.49	\$0.50	\$0.51 to \$0.74	\$0.75	\$0.76 to \$0.99	\$1.00	Over \$1.00	
Less than 2%								1%		1%
2 to 2.99%		0%		1%				1%	1%	3%
3%				1%				4%	0%	6%
3.1 to 3.99%						0%		1%		1%
4.0 to 4.99%		2%		5%	0%	0%		6%	0%	14%
5.0 to 5.99%		1%	1%	4%	1%	0%		7%	0%	14%
6.00%	1%	5%	2%	27%	1%	2%		9%	0%	47%
Over 6%	1%	2%	1%	6%	1%	1%	0%	2%	0%	15%
Total	1%	11%	4%	44%	3%	4%	0%	31%	2%	100%

Percent of employees (n=535,078)

Cap	Match rates									Total
	\$0.10 to \$0.24	\$0.25	\$0.26 to \$0.49	\$0.50	\$0.51 to \$0.74	\$0.75	\$0.76 to \$0.99	\$1.00	Over \$1.00	
Less than 2%								0%		1%
2 to 2.99%		0%		0%				0%	4%	3%
3%				0%				4%	0%	6%
3.1 to 3.99%						0%		0%		1%
4.0 to 4.99%		1%		1%	0%	0%		4%	0%	14%
5.0 to 5.99%		0%	1%	4%	0%	0%		3%	0%	14%
6.00%	0%	15%	1%	38%	1%	2%		11%	0%	47%
Over 6%	0%	1%	5%	1%	0%	0%	0%	0%	0%	15%
Total	0%	16%	8%	44%	2%	3%	0%	23%	4%	100%

Maximum value of promised match as percentage of pay: Under 3% Exactly 3% Over 3%

Source: Vanguard, 2005.

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