401(k) investment decisions and Social Security reform

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ABSTRACT

This paper uses the 1995 Survey of Consumer Finances to show that 401(k) participants with an underlying defined benefit plan are more likely to invest in equities than are participants whose 401(k) is their primary plan, suggesting that workers with a guaranteed source of retirement income are more likely to invest their other retirement assets more aggressively. Removing this guarantee might result in more conservative investment. Therefore, using current 401(k) asset allocation behavior to project income under a Social Security individual account system with reduced guaranteed benefits could overstate returns to these accounts, thus overstating their attractiveness relative to the current system.

401(k) Investment Decisions and Social Security Reform

Two relatively recent developments increase the importance of understanding how workers invest their 401(k) plan assets. First, the trend toward defined contribution (DC) plans places more of the asset allocation responsibility and investment risk directly on workers rather than employers. Some of the increase in DC coverage takes the form of supplemental coverage to a primary defined benefit (DB) plan; the proportion of pension plan participants with supplemental DC coverage more than doubled from 1975 to 1987, increasing from 19 percent to 39 percent (Beller and Lawrence 1992). Moreover, DC plans are increasingly becoming the primary plan for workers. Among active pension plan participants, the proportion whose primary plan is a DC plan increased from 13 percent in 1975 to nearly 45 percent in 1997 (Olsen and VanDerhei 1997). Participation in 401(k) plans in particular increased dramatically, from 19 percent of all active pension participants in 1984 to 52 percent in 1993 (EBRI 1997, table 13.1).

Adding to the importance of understanding 401(k) asset behavior is that many recent Social Security reform proposals include provisions that would divert a portion of payroll taxes toward the creation of either publicly- or privately-held individual accounts. Under these plans, individuals would be responsible for directing their own asset allocations. For instance, the Individual Account (IA) plan advocated by one group of the 1994-1996 Advisory Council on Social Security would create accounts in the amount of 1.6 percent of covered payroll. Benefits under the traditional Social Security system would be reduced gradually through increases in the normal retirement age and the reduction in the growth of future benefits for middle- and high-wage workers. The Personal Security Account (PSA) plan, advocated by another group of the Advisory Council, would make a more dramatic shift to private accounts. Five percentage points

of the payroll tax would be directed to personal accounts. The remainder of the payroll tax would be used to maintain a modified retirement program with flat dollar benefits. Several current Congressional Social Security reform proposals include these types of approaches.[1]

Estimating the impact on retirement income of the continuing shift from DB to DC plans and the potential advent of Social Security individual accounts requires assumptions regarding how individuals will allocate their assets in these accounts. If individuals invest conservatively, they might not accumulate enough money to provide adequately for their retirement needs, and could end up worse off under either DC plans or a Social Security individual account system than under DB plans or the current Social Security system. Alternatively, individuals who invest more aggressively and attain higher returns might do better under DCs or an individual account system.

Asset allocation patterns in the current 401(k) market provide a reasonable starting point for estimating investment decisions. Indeed, when the Office of the Actuary simulated the effects of the Advisory Council individual account plans, it assumed a distribution of assets between stocks and bonds by age group based on 401(k) experience. Using these assumptions, workers would, on average, do as well in the IA plan as in the current Social Security system, and would do better in the PSA plan than in the current system.

However, it might not be appropriate to assume that new 401(k) participants and individuals directing their Social Security individual account investments would allocate their accounts similarly to current 401(k) participants. For instance, individuals might invest more conservatively under a Social Security program that reduces its guarantee of retirement benefits,

1. For example, legislation introduced by Congressmen Kolbe and Stenholm (H.R. 1793) and by Senators Gregg and Breaux (S. 1383) would direct two percentage points of the payroll tax to mandatory individual accounts. Senator Grams introduced a bill that would direct 10 percentage points of payroll taxes into individual accounts (S. 1103).

in order to reduce their exposure to risk. In addition, investment allocation patterns in the current 401(k) environment presumably reflect the existence of a guaranteed Social Security annuity benefit. If the Social Security system shifts to a system of individual accounts, 401(k) asset allocations might themselves become more conservative. Similarly, 401(k) participants with an underlying DB plan might allocate their contributions more aggressively than workers whose 401(k) plan is their primary plan. As a result, 401(k) investment patterns may become more conservative as the shift toward primary DC plans continues.

To address these issues, I use data from the 1995 Survey of Consumer Finances to examine 401(k) investment allocation behavior.[2] In particular, I examine whether allocation behavior differs by whether the participant has an underlying DB plan. I find that 401(k) participants with an underlying DB plan are more likely to invest in equities than are participants whose 401(k) is their primary retirement plan. This suggests that workers who have a guaranteed source of retirement income are more likely to invest their other retirement assets more aggressively. The removal of this guarantee might result in more conservative investment. Therefore, using current overall 401(k) asset allocation behavior to project income under a Social Security individual account system that reduces guaranteed Social Security benefits could overstate returns to these accounts, thereby overstating their attractiveness relative to the current system.

Previous Research

Several studies use administrative data from one or more plans to examine how 401(k) asset allocation behavior varies across workers. Using plan administrative data has the

2. This paper is part of a larger project that examines how households allocate their entire asset portfolio.

advantage of being able to incorporate information about plan rules and investment options available to workers. In general, these studies find that investment allocation patterns vary by age and income. For instance, older workers invest more conservatively than younger workers (Clark et al. 1998, Goodfellow and Schieber 1997), presumably in accordance with their shorter time horizons. However, a significant minority of younger workers hold zero equities (Yakoboski and VanDerhei 1996), suggesting higher liquidity needs. Some younger workers may be using their 401(k) as short-term savings vehicles rather than retirement plans.

Workers with low incomes invest more conservatively than workers with higher incomes (Bajtelsmit and VanDerhei 1997, Goodfellow and Schieber 1997, Hinz et al 1997). Again, this suggests higher liquidity needs among workers with lower incomes. Alternatively, lower earners might be more risk averse or might not be receiving as much investment education as higher earners.

There is also evidence that women make different investment choices than men. Women in the federal Thrift Savings Plan invest their pension assets more conservatively than men (Hinz et al. 1997), as do women in a single large private U.S. employer (Bajtelsmit and VanDerhei 1997), even after controlling for age and earnings. And although Clark et al. (1998) find that women generally do not invest more conservatively than men, they do find that the range of available investment options has a differential effect on the patterns of investment allocation by gender.

An EBRI study focuses on more specific investment allocations and the effects of company stock as an option using the EBRI/ICI database of 6.6 million 401(k) participants (VanDerhei et al. 1999). They find that having the option of company stock reduces participant allocations to other equity funds, but increases overall investment in equities. Moreover,

participants whose employer contributions are mandated to be invested in company stock have higher self-directed investments in company stock. Among participants whose employer contributions are directed to company stock, investments in company stock account for one-third of participant-directed balances and over one-half of total balances. This may signal a lack of adequate diversification among participants with options to allocate balances to company stock.

Although plan administrative data can help gauge the effects of plan design and fund options on allocation choice, the information on participant characteristics is typically limited to age, earnings, tenure, and sometimes gender. Other characteristics that influence investment allocation choice, such as marital status, education level, and household-level information on income and wealth, are not available in administrative data. To compensate for this lack of information, Poterba and Wise (1996) combine 1988 TIAA-CREF administrative data with a participant survey containing information on marital status, education, and family income and wealth. They find that women, lower-income workers, and less educated workers allocate a smaller share of assets to equities.

Other researchers have turned to household-level surveys to examine 401(k) investment allocation. Analysis of the Survey of Consumer Finances (SCF) indicates that it is the interaction between gender and marital status, rather than gender alone, that determines investment choice (Sundén and Surette 1998). This analysis also suggests that risk-averse households invest more conservatively than households that are willing to exchange above-average risks for above-average returns.

In another analysis of the SCF, Hungerford (1999) finds that workers whose spouses have pension coverage are more likely to invest their 401(k) assets in equities. Presumably, workers with access to other retirement income can be more aggressive with their 401(k) assets.

However, he finds that workers with a non-401(k) plan (either a DB plan or a non-401(k) DC plan) or an IRA in addition to their 401(k) invest no differently than workers with only a 401(k) plan. He posits that this reflects that a spouse's pension plan is more generous and therefore has more of an effect than a worker's non-401(k) or IRA plan. His findings may result, however, from defining 401(k) coverage narrowly—he includes only those respondents who specifically report having a 401(k) or 403(b) plan. He excludes from his 401(k) definition any workers who report being in a thrift savings account, even though these plans can function identically to a 401(k) plan. As a result, his measure of "other pension coverage" likely includes workers with 401(k)-type plans, thereby potentially understating the effect of a participant's other coverage on 401(k) investment decisions.

Finally, an analysis of the National Longitudinal Survey of Mature Women (NLSMW) suggests that participants who can direct their own allocations invest more in equities (Papke 1998). Since the NLSMW cannot distinguish between investment in company stock and other equity investments, it is unclear how these findings relate to those based on the EBRI/ICI database.

In summary, several factors help explain why otherwise similar 401(k) participants invest differently. First, some participants may simply be more risk averse than others. A lack of financial education can also contribute to conservative investment. Participants might not be aware of the larger investment returns available from investing in equities, and thus may ignore the real interest rate risk inherent in investing too conservatively.[3] Some participants, especially workers nearing retirement, have shorter investment horizons, and therefore might wish to avoid the short-term volatility of equity rates of return. Similarly, other participants, especially

3. See Bernheim (1998).

younger workers, have higher liquidity needs and therefore prefer to invest more conservatively. Finally, 401(k) participants with access to other retirement income may be able to invest more aggressively than those whose 401(k) plan is their only source of retirement income.

In this paper, I examine these issues and focus in particular on whether 401(k) participants with an underlying DB plan invest differently than those without a DB plan. Although Hungerford (1999) examines whether participants with alternative retirement income sources (either through their own employment or through a spouse's) invest differently than those who do not, he does not distinguish between DB plans and non-401(k) DC plans. Therefore, it is unclear whether it is the presence of an alternative retirement income source in general or the guaranteed nature of DB benefits in particular that encourages more aggressive 401(k) investment behavior.

Data and Methods

For this analysis, I use data from the 1995 Survey of Consumer Finances, a triennial survey conducted by the Federal Reserve Board that obtains detailed information on household finances. The survey collects household-level asset and liability information as well as individual-level demographic, employment, and pension information for both the household head and the spouse.[4] I created an individual-level dataset by splitting each married household into two observations, one for the head and one for the spouse. Household-level asset and liability data are attributed to both spouses.

SCF respondents who report they have an account-based pension plan are asked about the specific type of plan. I define 401(k) participation broadly to include not only workers who

4. For a more detailed discussion of the SCF, see Kennickell, Starr-McCluer, and Sundén (1997).

specifically report being covered by a 401(k) or 403(b) plan, but also those who report being in a thrift savings plan. I also include workers who report a different type of defined contribution plan if they also report that they are allowed to borrow or withdraw from their account.[5] These other plans likely function very similarly to 401(k) plans, and in fact may be 401(k) plans, because some workers may not be well-informed about the specific type of their DC plan. The final analysis sample is limited to the 1,092 full-time non-self-employed 401(k) participants between the ages of 25 and 64.

To examine 401(k) investment behavior, I use the categorical responses for investment choice; 401(k) participants can report that they invest (i) mostly or entirely in stocks (including company stock), (ii) mostly or entirely in interest earning assets (referred to hereafter as bonds), or (iii) split between stock and bonds.[6] I regard these three categories as the relative levels of assets invested in stocks, with participants investing mostly in bonds having the least investment in stocks, and those investing mostly in stocks having the greatest investment in stocks. Therefore, I use an ordered probit model to estimate the 401(k) asset allocation decision.

Because on average stocks achieve higher rates of return than bonds, allocating a relatively small proportion of contributions to stock accounts can, over time, produce relatively large proportions of overall balances allocated to stock accounts unless the participant periodically rebalances the accounts. Therefore, it would be preferable to examine both the allocation of contributions and the allocation of balances. Unfortunately, it is unclear whether the SCF question regarding asset allocation intends to refer to the allocation of contributions or

5. In general, the plans not defined as 401(k) plans are profit sharing and stock option plans.

6. For participants with two or more 401(k) plans, I determine the proportion of the aggregate balance that is allocated to stocks. I categorize aggregate balances with less than 33 percent equities as mostly bonds; balances with more than 67 percent or more stocks as mostly stocks; and balances with between 33 and 67 percent equities as mixed.

the allocation of account balances. Respondents could be reporting either. Bajtelsmit and VanDerhei (1997) examine the relative impacts of various factors on both the allocation of contributions and the allocation of balances, and find similar results for each. Therefore, the ambiguity in the SCF should not affect the results here.

To examine whether the existence of other retirement savings vehicles influences 401(k) asset allocation, I include indicators for whether the worker also has a DB plan, whether the worker also has a non-401(k) DC plan, whether the worker's spouse has a DB plan, whether the worker's spouse has a DC plan (either 401(k) or non-401(k)), and whether either the worker or the spouse has an IRA. I also include an indicator for whether the participant has choices on where the money is invested. Note that since I define 401(k) coverage broadly, relatively few workers in the sample have non-401(k) DC plans in addition to their 401(k) coverage, most of which are profit sharing or employee stock option plans.

Households with short planning horizons and/or high liquidity needs likely exhibit different asset allocation preferences than other households. I include a series of variables to indicate financial planning horizons and a variable to indicate whether the household expects any major expenses within the next five to ten years. In addition, I include a variable to indicate whether the household's primary reason for saving is retirement. This variable reflects a household's overall savings attitudes, not those specific to their 401(k) accounts.

A household's entire portfolio allocation may influence 401(k) investment decisions. Therefore, the model includes variables for total household net worth, the proportion of non-retirement financial assets invested in stocks, and the proportion of non-retirement financial assets invested in bonds. Finally, the model controls for various other characteristics, including age, gender, marital status, race, education level (to proxy for financial literacy), and wage.

Results

Table 1 presents the investment allocation patterns for selected characteristics. (Appendix Table A-1 contains investment allocation patterns for additional characteristics.) Overall, 22 percent of 401(k) participants invest their assets mostly in bonds, 40 percent invest mostly in stocks, and the remaining 38 percent invest in a mix of stocks and bonds. Nearly one-quarter of 401(k) participants have an underlying DB plan, and these participants are somewhat more likely to invest mostly in stocks than are other participants. Participants with a non-401(k) DC plan in addition to their 401(k) plan are even more likely to invest in stocks. However, as noted above, these are workers with profit sharing and stock option plans, and are probably pre-disposed to investing in equities.

In contrast, 401(k) participants with spouses who have DB plans invest somewhat less aggressively than participants without spouses who have DB plans. Although 401(k) asset allocation is fairly similar regardless of whether a participant also has a spouse with a 401(k) plan, 401(k) asset allocation strategy correlates highly with the spouse's particular 401(k) asset allocation strategy. For instance, of participants with spouses who invest their 401(k) assets mostly in bonds, 43 percent invest their own 401(k) assets mostly in bonds. The correlation is even higher among participants whose spouses invest mostly in stocks; 58 percent of participants invest mostly in stocks when their spouses invest in stocks.

Participants with IRAs (under either their name or their spouse's) are more likely to invest 401(k) assets in stocks, as are less risk averse participants and those with longer planning horizons. Participants whose main reason for saving is retirement invest slightly more aggressively than those who save for other reasons. And those who expect a major expense in the next 5 to 10 years and therefore have higher liquidity needs invest slightly more

conservatively.

I estimate an ordered probit regression model to examine how 401(k) asset allocations vary by these and other characteristics, after controlling for age, income, education, and other demographic characteristics. I run three models with slightly different specifications. Table 2 presents the results for each of these models. Variables with positive coefficients can be interpreted as being associated with more investment in stocks, and variables with negative coefficients can be interpreted as being associated with less investment in stocks and more investment in bonds.

The first model includes variables for whether the participant has a DB plan, whether the participant has a non-401(k) DC plan, whether the participant has a spouse with a DB plan, whether the participant has a spouse with a DC plan (either 401(k) or non-401(k) DC plan), and whether the participant or spouse has an IRA. After controlling for savings preferences and other characteristics, 401(k) participants with DB plans are more likely to invest in stocks than those whose 401(k) plan is their sole plan. Presumably, having additional pension coverage allows 401(k) participants to invest more aggressively. However, having a spouse with either DB or DC pension coverage is not associated with either higher or lower investment in stocks. Similarly, 401(k) asset allocation does not vary by whether the worker has a non-401(k) DC plan or whether the household has an IRA.

The second model includes a risk aversion measure. Risk-averse workers are presumably more likely to invest in bonds, while those who are willing to trade above-average risks for above-average returns are probably more likely to invest in stocks. To control for attitudes about risk, I include an indicator for households that are less risk averse, based on a self-reported measure for willingness to exchange financial risk for returns. I define less risk averse

households as those willing to take above-average or substantial financial risks to achieve above-average or substantial returns. Although these measures are available on a household-level only, it is likely that couples share risk-return preferences.

The results of the second model confirm that less risk averse 401(k) participants are more likely to invest in stocks than are those who are more risk averse. However, even after controlling for a participant's risk aversion level, 401(k) participants who have an underlying DB plan are more likely to invest in stocks relative to those without a DB plan.

The third model parses out a spouse's DC coverage into 401(k) coverage and non-401(k) coverage; for those with 401(k) coverage, it differentiates between those whose spouses invest in bonds, those who invest in stocks, and those who invest in a mix of stocks and bonds. Participants with spouses who invest their 401(k) assets in stocks are much more likely to invest their own 401(k) assets in stocks relative to participants without spouses with 401(k) plans. In addition, 401(k) participants whose spouses invest their 401(k) assets in bonds are more likely to invest their own 401(k) assets in bonds. However, the coefficient, while relatively large, is not statistically significant. Although a spouse's 401(k) asset allocation is likely endogenous, the regression results confirm the high correlation between couples' 401(k) asset allocations shown in table 1 when viewed as descriptive and not causal. This finding suggests that households make their asset allocation decisions jointly. On the other hand, the result could be an artifact of the SCF survey design, in which one respondent answers the survey questions for both spouses. It is possible that a respondent who is less knowledgeable about his spouse's investment allocations may simply report his own asset allocation strategy for both himself and his wife.

Aside from the pension-related variables, the results of the three model specifications are nearly identical, except that some coefficients that are statistically significant in the first two

model specifications are not significant in the third. This likely occurs because many of the factors that are associated with a worker's investment decisions also influence the spouse's investment decisions.

Participants in households with longer financial planning horizons are more likely to invest in stocks. Presumably these households are investing for the long term and therefore can handle the short-term volatility of stock returns. After controlling for the financial planning horizon, there is no association between 401(k) asset allocations and whether a participant expects a large expense within the next 5 to 10 years nor whether the participant's main reason for saving is for retirement.

Investment patterns do not vary by net worth. However, the measure of net worth did not include defined benefit wealth. Therefore, the coefficient on the defined benefit coverage indicator could be capturing both the guaranteed nature of the pension coverage and the extra wealth associated with that coverage.

There is some evidence that workers invest their retirement assets similarly to how they invest their non-retirement financial assets. Participants in households with more than two-thirds of their non-retirement assets in the form of stocks are more likely to invest their 401(k) assets in stocks. However, there is not a similar finding for bonds, possibly due to the small proportion of households with very large proportions of bond investments.

Finally, 401(k) participants age 35 and older are less likely to invest in stocks relative to younger participants. After controlling for other factors, investment allocations do not vary by gender, marital status, race, education, or wages.

Discussion

Among 401(k) participants, those with underlying DB plans are more likely to invest their 401(k) assets more aggressively. The more guaranteed nature of DB plans appears to allow participants with supplemental 401(k) plans to invest their plan assets less conservatively. This finding has several possible implications.

First, if the implementation of a Social Security individual account system is offset by a reduction in the defined benefit nature of the program, participants might direct their account assets more conservatively than they do in the current 401(k) system. Using current patterns in overall 401(k) asset allocations as a gauge for how workers would invest their Social Security individual accounts might overstate the investment returns to these accounts. This is especially true given evidence that workers not currently in 401(k) plans would invest even more conservatively than current participants (Hungerford 1999).

Overly conservative investments may in turn lead to inadequate retirement income. To illustrate, let's assume that a worker makes the same contribution in real dollars to his individual account each year and that the annual real rates of return on bonds and equities are 3 percent and 7 percent, respectively. Over 30 years, the worker will have accumulated only half as much in his account if he invested entirely in bonds rather than stocks. Investing in a 50-50 mix of stocks and bonds will yield an account balance three-quarters that of an account invested entirely in stocks.

The findings also suggest that reducing guaranteed benefits in the Social Security system, with or without the introduction of individual accounts, might result in more conservative 401(k) investment allocation patterns. In addition, 401(k) investment patterns may become more conservative as the shift toward primary DC plans continues.

Somewhat offsetting these findings, however, is that the increasing prevalence of 401(k) plans may be accompanied by an increased consumer awareness of the merits of investing retirement assets in stocks. Over time, participants may become more comfortable investing in stocks, especially as financial education campaigns become more prevalent. Indeed, there is evidence that 401(k) investments in stocks have been increasing over time. The proportion of participants who invest mostly in stocks increased about 10 percentage points between 1989 and 1995 (Samwick and Skinner 1998). Therefore, the findings presented here might be more relevant in the short term rather than the long term.

References

1994-1996 Advisory Council on Social Security. *Report of the 1994-1996 Advisory Council on Social Security, Volume 1: Findings and Recommendations*. Washington, D.C., 1997.

Beller, Daniel J., and Helen H. Lawrence. 1992. "Trends in Private Pension Plan Coverage," in *Trends in Pensions 1992*, John A. Turner and Daniel J. Beller, eds.. Washington, D.C.: U.S. Department of Labor.

Bajtelsmit, Vickie L., and Jack L. VanDerhei. 1997. "Risk Aversion and Pension Investment Choices," in *Positioning Pensions for the Twenty-First Century*, Michael S. Gordon, Olivia S. Mitchell, and Marc M. Twinney, eds. Philadelphia: University of Pennsylvania Press.

Bernheim, B. Douglas. 1998. "Financial Illiteracy, Education, and Retirement Saving," in *Living with Defined Contribution Pensions*, Olivia S. Mitchell and Sylvester J. Schieber eds. Philadelphia: Pension Research Council.

Clark, Robert, Gordon P. Goodfellow, Sylvester J. Schieber, and Drew A. Warsick. 1998. "Making the Most of 401(k) Plans: Who's Choosing What and Why," presented at the 1998 Pension Research Council Symposium, April 27 and 28, 1998.

Employee Benefit Research Institute (EBRI). 1997. *EBRI Databook on Employee Benefits.* Washington, D.C.: EBRI.

Goodfellow, Gordon P. and Sylvester J. Schieber. 1997. "Investment of Assets in Self-Directed Retirement Plans," in *Positioning Pensions for the Twenty-First Century*, Michael S. Gordon, Olivia S. Mitchell, and Marc M. Twinney, eds. Philadelphia: University of Pennsylvania Press.

Hinz, Richard P., David D. McCarthy, and John A. Turner. 1997. "Are Women Conservative Investors? Gender Differences in Participant-Directed Pension Investments," in *Positioning Pensions for the Twenty-First Century*, Michael S. Gordon, Olivia S. Mitchell, and Marc M. Twinney, eds. Philadelphia: University of Pennsylvania Press.

Hungerford, Thomas L. 1999. "Workers' Investment Decisions for 401(k) Pension Assets," mimeo.

Kennickell, Arthur B., Martha Starr-McCluer, and Annika E. Sundén. 1997. "Family Finances in the U.S.: Recent Evidence From the Survey of Consumer Finances." *Federal Reserve Bulletin* 83(1): 1-24.

Olsen, Kelly, and Jack VanDerhei. 1997. "Defined Contribution Plan Dominance Grows Across Sectors and Employer Sizes, While Mega Defined Benefit Plans Remain Strong: Where We Are and Where We Are Going," EBRI Issue Brief No. 190.

Poterba, James M., and David A. Wise. 1996. "Individual Financial Decisions in Retirement Saving Plans and the Provision of Resources for Retirement." NBER Working Paper 5762.

Papke, Leslie E. 1998. "How Are Participants Investing Their Accounts in Participant-Directed Individual Account Pension Plans?" *American Economic Review* 88(2): 212-216.

Samwick, Andrew A., and Jonathan S. Skinner. 1998. "How Will Defined Contribution Pension Plans Affect Retirement Income?" NBER Working Paper No. 6645.

Sundén, Annika E., and Brian J. Surette. 1998. "Gender Differences in the Allocation of Assets in Retirement Savings Plans," *American Economic Review* 88(2): 207-211.

VanDerhei, Jack, Russell Galer, Carol Quick, and John Rea. 1999. "401(k) Plan Asset Allocation, Account Balances, and Loan Activity," EBRI Issue Brief No. 205.

Yakoboski, Paul, and Jack VanDerhei. 1996. "Worker Investment Decisions: An Analysis of Large 401(k) Plan Data," EBRI Issue Brief No. 176.

Table 1.
401(k) Investment Allocation, by Selected Characteristics:
Full-Time, Non-Self-Employed, 401(k) Participants Ages 25 to 64
N=1,092

		401k Investment Allocation		
Characteristic (% of sample)	All (%)	Mostly in Bond (%)	Mix (%)	Mostly in Stock (%)
All	100.00	22.17	38.34	39.49
Has DB plan				
No (76%)	100.0	23.6	38.5	37.9
Yes (24%)	100.0	17.7	37.8	44.6
Has Non-401(k) DC Plan				
No (95%)	100.0	22.8	38.1	39.1
Yes (5%)	100.0	8.9	43.6	47.5
Spouse Has DB Plan				
No (87%)	100.0	21.9	37.7	40.4
Yes (13%)	100.0	24.1	42.7	33.2
Spouse Has 401(k)				
No (72%)	100.0	23.4	37.7	38.9
Yes (28%)	100.0	19.0	39.9	41.1
Spouse has 401(k) invested in bonds (6%)	100.0	43.3	22.5	34.2
Spouse has 401(k) invested in mix (11%)	100.0	9.5	63.0	27.6
Spouse has 401(k) invested in stock (11%)	100.0	16.6	25.7	57.7
Household Has IRA				
No (65%)	100.0	23.8	39.8	36.5
Yes (35%)	100.0	19.2	35.6	45.3
Risk Preferences				
More risk averse (73%)	100.0	24.3	40.9	34.8
Less risk averse (27%)	100.0	16.4	31.3	52.4
Financial Planning Horizon				
Next few months to a year (25%)	100.0	23.9	41.5	34.7
Next few years (18%)	100.0	29.0	32.2	38.8
Next 5 years or longer (56%)	100.0	19.2	38.9	41.9
Main Reason for Saving is Retirement				
No (63%)	100.0	24.2	37.3	38.5
Yes (37%)	100.0	18.7	40.1	41.2
Expect Major Expenses in Next 5-10 Years				
No (55%)	100.0	21.8	37.4	40.8
Yes (45%)	100.0	22.7	39.5	37.9

Source: Author's tabulations of the 1995 Survey of Consumer Finances.
Note: Distributions are weighted to be nationally representative.

Table 2.
Ordered Probit Results of 401(k) Investment Allocations

		Regression 1		Regression 2		Regression 3	
	Mean	Coefficient	Std Err	Coefficient	Std Err	Coefficient	Std Err
				coeff	std err	coeff	std err
Has DB Plan	23.58	0.1781 *	0.1019	0.1807 *	0.1017	0.1749 *	0.1017
Has non-401(k) DC plan	4.58	0.1575	0.1726	0.1728	0.1726	0.1401	0.1729
Spouse has DB plan	12.82	-0.1048	0.1509	-0.0979	0.1504	-0.0722	0.1513
Spouse has DC plan	29.82	0.1076	0.0943	0.1106	0.0944	na	na
Spouse invests 401(k) in bonds	5.57	na	na	na	na	-0.2640	0.1816
Spouse invests 401(k) in bonds/stocks	11.23	na	na	na	na	-0.0080	0.1262
Spouse invests 401(k) in stocks	11.45	na	na	na	na	0.3163 **	0.1311
Spouse has non-401(k) DC plan	2.26	na	na	na	na	0.4571 *	0.2528
Household has IRA plan	34.58	0.1464	0.0939	0.1361	0.0940	0.1338	0.0932
Has allocation choice	75.37	0.1700 *	0.1016	0.1472	0.1011	0.1533	0.0999
Less risk averse	26.67	na	na	0.2454 ***	0.0827	0.2268 ***	0.0832
Financial Planning Horizon							
Next few months to a year	25.42	0.0368	0.1244	0.0244	0.1251	0.0130	0.1250
Next few years	18.37	...	...	...	...	...	...
Next 5 years or longer	56.21	0.2090 *	0.1095	0.1859 *	0.1104	0.1586	0.1114
Expect major expenses in next 5-10 years	45.07	-0.1282	0.0967	-0.1311	0.0971	-0.1242	0.0958
Main reason for saving is retirement	37.22	0.0443	0.0829	0.0328	0.0830	0.0514	0.0821
Household Net Worth							
Less than $50,000 (ref)	34.06	...	...	...	...	...	...
$50,000-$100,000	23.08	-0.1263	0.1419	-0.1162	0.1417	-0.1025	0.1393
$100,000-250,000	24.97	-0.0584	0.1198	-0.0645	0.1198	-0.0498	0.1221
250,000-499,999	10.19	-0.0274	0.1748	-0.0270	0.1727	-0.0205	0.1693
500,000+	7.70	-0.0893	0.1683	-0.1251	0.1692	-0.0947	0.1682
Bonds as a Share of Non-Retirement Financial Portfolio							
0-33 percent (ref)	96.87	...	...	...	...	...	...
33-67 percent	2.45	0.0369	0.2151	0.0561	0.2123	0.0375	0.2135
67-100 percent	0.68	-0.0099	0.3291	-0.0018	0.3324	-0.0007	0.3323
Stocks as a Share of Non-Retirement Financial Portfolio							
0-33 percent (ref)	81.99	...	...	...	...	...	...
33-67 percent	9.64	0.1844	0.1440	0.1673	0.1452	0.1509	0.1431
67-100 percent	8.37	0.2397 *	0.1293	0.2193 *	0.1302	0.1935	0.1277
Wages							
Less than $25,000 (ref)	24.25	...	...	...	...	...	...
$25,000-50,000	44.08	-0.1000	0.1029	-0.0991	0.1030	-0.0922	0.1039
$50,000-$100,000	41.11	-0.0199	0.1259	-0.0283	0.1263	-0.0084	0.1248
$100,000+	45.43	0.0115	0.1695	-0.0051	0.1693	-0.0037	0.1704
Age							
25-34 (ref)	30.43	...	...	...	...	...	...
35-44	34.30	-0.2318 **	0.1061	-0.2095 *	0.1081	-0.2192 **	0.1060
45-54	25.97	-0.2438 *	0.1289	-0.2134 *	0.1287	-0.2130 *	0.1258
55-64	9.29	-0.2854 *	0.1523	-0.2415	0.1523	-0.2407	0.1526
Female	43.12	-0.1352	0.1765	-0.1057	0.1761	-0.1141	0.1757
Married	78.36	-0.1230	0.1679	-0.0886	0.1682	-0.1006	0.1680
Female*Married	29.07	0.0719	0.1942	0.0458	0.1944	0.0559	0.1931
Spouse works	62.18	0.0258	0.1124	0.0127	0.1124	0.0120	0.1122
Education Level							
No high school degree	5.64	-0.0574	0.2035	-0.0576	0.2040	-0.0259	0.1982
High school graduate (ref)	27.34	...	...	...	...	...	...
Some college	26.84	0.1285	0.1141	0.1233	0.1151	0.1066	0.1145
College degree	40.18	0.1773	0.1175	0.1383	0.1197	0.1147	0.1194
Nonwhite	17.93	-0.0401	0.1022	-0.0406	0.1024	-0.0419	0.1034

*** significant at 1% level; ** significant at 5% level; * significant at 10% level
Means are weighted to be nationally representative. Standard errors are adjusted to account for imputation variance.
Positive coefficients indicate more investment in stocks and negative coefficients indicate more investment in bonds.
N=1,092

Appendix Table 1.
401(k) Investment Allocation, by Selected Characteristics:
Full-Time, Non-Self-Employed, 401(k) Participants Ages 25 to 64
N=1,092

		401k Investment Allocation		
Characteristic (% of sample)	All (%)	Mostly in Bond (%)	Mix (%)	Mostly in Stock (%)
All	100.0	22.17	38.34	39.49
Household Net Worth				
Less than $50,000 (34%)	100.0	24.1	35.2	40.7
$50,000-100,000 (23%)	100.0	23.2	42.3	34.5
$100,000-250,000 (25%)	100.0	21.6	36.9	41.5
250,000-499,999 (10%)	100.0	18.5	39.1	42.4
500,000+ (8%)	100.0	17.3	44.0	38.7
Bonds as a Share of Non-Retirement Financial Portfolio				
0-33 percent (97%)	100.0	22.1	38.3	39.7
33-67 percent (2%)	100.0	19.2	47.9	32.9
67-100 percent (1%)	100.0	44.3	14.8	41.0
Stocks as a Share of Non-Retirement Financial Portfolio				
0-33 percent (82%)	100.0	23.7	38.3	38.0
33-67 percent (10%)	100.0	16.1	36.9	47.1
67-100 percent (8%)	100.0	14.2	40.1	45.7
Wages				
Less than $25,000 (24%)	100.0	25.9	32.8	41.3
$25,000-50,000 (44%)	100.0	23.1	40.1	36.9
$50,000-100,000 (27%)	100.0	17.7	41.2	41.1
$100,000+ (4%)	100.0	20.7	33.9	45.4
Age				
25-34 (30%)	100.0	19.4	34.9	45.7
35-44 (34%)	100.0	23.5	40.5	36.0
45-54 (26%)	100.0	23.2	38.6	38.3
55-64 (9%)	100.0	23.6	41.1	35.3
Gender				
Male (57%)	100.0	20.9	38.7	40.4
Female (43%)	100.0	23.9	37.9	38.3
Married				
No (22%)	100.0	21.8	38.6	39.5
Yes (78%)	100.0	22.3	38.3	39.5
Race				
White	100.0	21.1	37.9	41.0
Nonwhite	100.0	26.9	40.4	32.8
Education Level				
No high school degree (6%)	100.0	35.1	33.3	31.6
High school graduate (27%)	100.0	27.5	36.8	35.7
Some college (27%)	100.0	19.8	41.1	39.2
College degree (40%)	100.0	18.3	38.3	43.4

Source: Author's tabulations of the 1995 Survey of Consumer Finances.
Note: Distributions are weighted to be nationally representative.