Gender Differences in the Allocation of Assets in Retirement Savings Plans

Annika E. Sundén and Brian J. Surette*

In 1995, 40 percent of working men and 32 percent of working women were covered by a defined contribution (DC) plan. A distinguishing characteristic of these plans is that workers can generally choose how their assets are invested. Using data from the 1992 and 1995 Surveys of Consumer Finances (SCF), this paper examines if workers differ systematically by gender in the allocation of assets in DC plans. Previous researchers have reported that many workers tend to invest their retirement assets too conservatively, and in particular that women are less likely than men to invest in risky assets such as stocks. In the presence of an equity premium, a lower propensity by women to invest in stocks could translate into large differences in the accumulation of financial wealth for retirement. We establish that gender differences in investment decisions exist, though they are more complicated than previous studies have suggested. We show that these differences are not completely explained by differences in individual or household characteristics.

A few studies have examined gender differences in investment decisions (Vickie L. Bajtelsmit and Jack L. VanDerhei, 1997; Richard P. Hinz, David D. McCarthy and John A. Turner, 1997) These studies use administrative data and report that women tend to invest their retirement funds in less risky vehicles than men. Michael Haliassos and Carol C. Bertaut (1995) use the 1983 SCF to

examine why such a large fraction of households do not own any stock. They report that gender does not have a significant effect on the probability of owning stock, though gender differences are not the focus of their paper.

What these data sources lack (Haliassos and Bertaut being the exception) is a rich set of demographic and other variables on households that theory predicts should affect investment behavior. This paper adds to the literature by examining gender differences in investment decisions conditioning on such variables. The results highlight the importance of including marital status, risk aversion measures and the portfolio of assets held outside DC plans when examining gender differences in investment decisions in these plans.

I. Data

The data used in this paper come from the 1992 and 1995 Surveys of Consumer Finances, a triennial survey sponsored by the Federal Reserve Board in cooperation with Statistics of Income. The SCF collects detailed information on households' assets, liabilities, and demographic characteristics as well as on pension coverage, pension plan characteristics and the allocation of assets in DC plans.[1] The survey sample size was 3,906 households in 1992 and 4,299 households in 1995. Descriptive statistics on pension coverage are presented in table 1.

These data enable us to undertake a detailed analysis of investment choices in DC plans and relate it to individual and household characteristics. Most information is collected at the

household level. However, data on pension coverage, employment and other demographic characteristics are available for both the household head and the spouse/partner. We use person-specific information to split married households into two observations. Variables collected at the household level, such as financial wealth, are attributed to both of these person records while person-specific information is attributed to the individuals separately.[2] We believe this is reasonable since married couples can draw on shared finances. The sample consists of individuals currently working, covered by a DC plan and under the age of 75.[3]

II. Model

The investment choices reported in the SCF for defined contribution plans are categorical: (i) invest mostly in stocks; (ii) invest mostly in interest earning assets (hereafter 'bonds'); and (iii) investments split between stocks and interest earnings assets (hereafter 'diversified'). The SCF does not collect information on the specific allocation of plan assets and we cannot derive portfolio shares. Since no clear ordering exists among the alternatives, a multinomial logit model is used to analyze investment behavior.

To estimate the model we pool data from the 1992 and 1995 SCFs.[4] The first column of table 2 contains descriptive statistics for the pooled sample. We assume that each individual ultimately decides how their retirement assets are invested. To account for the possibility that married individuals may coordinate their investment decisions, and that the effects of

gender may differ by marital status, we include indicator variables for gender and marital status, as well as an interaction variable of the two.

Other research has argued that financial knowledge is an important determinant of investment decisions (B. Douglas Bernheim and Daniel M. Garrett, 1996). To proxy for financial knowledge we include indicator variables for levels of schooling.

The allocation of assets within and outside retirement plans is likely to be correlated with the willingness of households to trade risk for return. We control for attitudes toward risk by including self-reported measures of each household's willingness to exchange risk for return.[5]

Savings in defined contribution plans are only one part of households' portfolios. The overall level of financial risk and return facing a household depends on the mix of all its financial assets. Decisions about how to invest defined contribution savings should, therefore, depend on the financial assets held outside DC accounts. To address such factors, we include variables to control for the share of each household's other savings that are held in stocks, bonds, and in other financial assets. These shares also include assets held in Individual Retirement Accounts (IRAs).[6]

Several of the variables included in the model are likely to be endogenous or simultaneously determined with DC investment decisions. These econometric issues are very difficult to address. The analysis below does not account for these

complications. Thus, we caution the reader that the results are descriptive rather than causal.

III. Results

The results of our analysis are presented in table 2. We chose the 'diversified' category as the base category for the multinomial logit. Therefore, the effects of each variable described below refer to its effect on the probability of choosing 'mostly stocks' or 'mostly bonds' relative to the probability of choosing the 'diversified' category. To simplify the exposition, we discuss the results without reference to this normalization.

The results demonstrate that it is not gender alone that determines investment choice. Rather investment decisions seem to be driven more by a combination of gender and marital status. According to the estimates in column 2, single women and married men are less likely than single men (the comparison group) to choose 'mostly stocks'. Though the interaction of marital status and gender is statistically significant, a joint test of all three gender-marital coefficients indicates that married women do not differ significantly from other groups in their probability of choosing 'mostly stocks'. The estimates in column 3 indicate that, though women and men do not differ, married women are more likely than single women to choose mostly bonds.

These results demonstrate that the effects of gender on investment decisions are more complicated than previous research has suggested. In fact, ignoring the possibility that the

effects of gender differ by marital status would lead to very different conclusions. Estimates from models that omit the gender-marital interaction term (not reported) suggest that marital status has no effect on investment decisions, and that women have a higher probability of choosing 'mostly bonds'. The results in table 2 show clearly that marital status matters and that it interacts in important ways with gender. Surprisingly, neither education nor age seems to affect allocation decisions.

The risk preference measures have the expected effects on portfolio choices. A willingness to take above average risk for above average return increases the probability of choosing the 'mostly stocks' category and reduces the probability of choosing the 'mostly bonds' category. Workers willing to take average risk in exchange for average returns are also less likely to choose 'mostly bonds'.

To account for portfolio effects, we include a kinked, linear spline function of the percentages of financial assets held in stocks and bonds.[7] Column 2 shows that individuals with less than 33 percent of their financial assets in bonds are less likely to choose 'mostly stocks'. The estimates in column 3 show that the probability of holding 'mostly bonds' declines as the percentage of financial assets held in stocks rises from 20 percent to 80 percent. This effect reverses dramatically once individuals reach stock allocations of 80 percent.

These portfolio effects are largely consistent with our expectations. However, there is also evidence of an unexpectedly

persistent preference for bonds: Individuals with large allocations of financial assets to bonds are more likely to invest their DC assets in 'mostly bonds'. Given the large number of covariates included in these regressions to explain life-cycle factors and risk preference, this result suggests that some individuals are highly averse to investing more than a small percentage of their financial assets in stocks. It is telling that individuals who choose mostly bonds are much more likely to state that they are unwilling to take any financial risk, even though investing exclusively in bonds exposes the household to considerably more real interest rate risk.

The gender and marital differences in investment behavior described above may partially be driven by self-selection into jobs with DC plans. It is not clear how a model addressing this econometric problem would be identified. For this reason, we did not control for selection in the allocation model. However, we think it is important to discuss participation in DC plans.

The data show that women are less likely than men to have DC plans (table 1), and that married women are least likely to have such plans (not shown). If these differences persist, women may end up accumulating less wealth for retirement regardless of how they invest their DC assets. To test whether gender and marital differences in DC participation remain in a multivariate framework, we estimate a probit of DC participation on the pooled 1992-1995 SCF sample. The results are reported in column 4 of table 2. The results indicate that single women are more likely

than single men to have a DC plan. Married women, however, are much less likely than men (or single women) to have a DC plan.

The salient characteristics of jobs that offer DC plans are difficult to identify precisely. We include occupation and full-time dummies in the participation probit to proxy for job characteristics that might explain gender and marital differences in coverage. Although not reported in the table, both measures significantly affect DC participation. Professional and 'skilled white-collar' workers are about 5 percent more likely than 'unskilled blue-collar' workers to have a DC plan while service workers are about 11 percent less likely than 'unskilled blue-collar' workers to be covered. Full-time workers are about 26 percent more likely than part-time workers to have a DC plan. We hypothesize that measurement difficulties coupled with gender and marital differences in occupational choice and full-time status may partially explain why women's DC participation has increased at a slower rate than men's and why gender and marital differences in participation persist in a multivariate framework.

IV. Conclusions

We conclude that gender and marital status significantly affect how individuals choose to allocate assets in defined contribution plans. We control for a wide range of demographic, financial, and attitudinal characteristics that previous researchers have argued could explain such differences. Our results indicate that such controls are important but do not explain away gender and marital effects. Because these controls

are imperfect, however, and because unobserved differences may affect investment behavior, we interpret the remaining gender and marital differences with caution. We view them as descriptive, rather than causal.

The trend toward defined contribution plans makes individual investment decisions particularly important in determining how much wealth is accumulated for retirement. In the presence of an equity premium, the failure of some groups—such as single women—to invest sufficient assets in stocks may lead to lower retirement wealth. Moreover, some of the proposed reforms of the Social Security system will allow workers to choose how their Social Security contributions are invested. Our results, therefore, shed some light on how public and private retirement wealth may be distributed in the future.

References

Bajtelsmit, Vickie L. and VanDerhei, Jack L. "Risk Aversion and Pension Investment Choices," in Michael S. Gordon, Olivia S. Mitchell and Marc M. Twinney, eds., Positioning Pensions for the Twenty-First Century. Philadelphia, PA: University of Pennsylvania Press, 1997, pp. 45-66.

Bernheim, B. Douglas and Garrett, Daniel M. "The Determinants and Consequences of Financial Education in the Workplace: Evidence from a Survey of Households." National Bureau of Economic Research (Cambridge, MA) Working Paper No. 5667, July 1996.

Haliassos, Michael and Bertaut, Carol C. "Why Do So Few Hold Stocks?" The Economic Journal, September 1995, 105(432), pp. 1110-1129.

Hinz, Richard P.; McCarthy, David D. and Turner, John A. "Are Women Conservative Investors? Gender Differences in Participant Directed Pension Investments," in Michael S. Gordon, Olivia S. Mitchell and Marc M. Twinney, eds., Positioning Pensions for the Twenty-First Century. Philadelphia, PA: University of Pennsylvania Press, 1997, pp. 91-103.

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

* Board of Governors of the Federal Reserve System, 20th/C Street, NW Stop 153, Washington, DC 20551. The authors thank Raphael Bostic, Bruce Fallick, Arthur Kennickell and Martha Starr-McCluer for helpful comments. The views presented are those of the authors alone and do not necessarily reflect the official position of the Board of Governors.

1. Arthur B. Kennickell, Martha Starr-McCluer and Annika E. Sundén (1997) describe the SCF in detail.

2. This data strategy may result in non-independent observations and may cause regression estimates to be inefficient.

3. The SCF first collected data on self-direction of DC assets in 1995. These data show that those who can and cannot direct their investments do not differ in their allocation decisions. We therefore use all DC participants in 1992 and 1995.

4. The results are qualitatively similar (though less precise) when the model is estimated for the two years separately.

5. This question is asked only for the household as a whole; we think it likely that members of the same household have similar risk-return preferences.

6. Only the household's overall allocation of IRA's is collected.

7. The kink points were selected to minimize trends in predicted probability 'residual' plots for small groupings of observations sorted by percent allocations to stocks or bonds. The qualitative results are not overly sensitive to the selection of kink points.

Table 1: Pension Coverage in 1992 and 1995

	1992		1995	
	Men	**Women**	**Men**	**Women**
Percent with pension	56.8	50.2	56.5	48.0
Percent with DB plan	34.9	29.4	24.8	21.8
Percent with DC plan	31.9	28.0	40.1	32.2
Percent with DC plan that can direct investment	n.a	n.a	71.4	69.8
Investment in DC plan				
Mostly Stock	32.2	28.6	40.2	39.1
Mostly Bond	27.9	29.5	16.1	21.2
Diversified	40.0	41.9	43.7	39.8
Median Amount in DC account ($1995, Thousands)	10.8	5.4	10.4	5.5
Number of observations	1,443	1,380	1,705	1,669

Sample: Working men and women, age less than 75, Survey of Consumer Finances 1992 and 1995.

Table 2: Descriptive Statistics, Multinomial Logit, and Probit Results (standard errors in parentheses)

		Mostly	Mostly	Have
Demographics	Mean	Stocks[1]	Bonds[1]	A DC[2]
Female	0.433	−0.567 **	−0.369	0.148 *
		(.251)	(.322)	(.083)
Married	0.817	−0.491 **	−0.291	0.095
		(.227)	(.283)	(.073)
Female*Married	0.322	0.740 **	0.791 **	−0.349 **
		(.278)	(.381)	(.091)
Age	42.28	−0.002	−0.003	0.069 **
		(.040)	(.050)	(.011)
No HS Degree	0.043	0.177	0.568 *	−0.223 **
		(.311)	(.337)	(.080)
Some College	0.231	−0.103	−0.039	0.047
		(.167)	(.195)	(.050)
College Graduate	0.485	0.130	0.096	0.145 **
		(.155)	(.183)	(.054)
Risk/Return Preferences				
Above average	0.283	0.407 **	−0.547 **	.
		(.175)	(.213)	.
Average	0.487	0.077	−0.418 **	.
		(.156)	.164)	.
Portfolio Share of Non-Retirement Assets[3]				
Bond Holdings				
0-33 percent	0.844	−0.994 *	−0.417	.
		(.577)	(.691)	.
33-67 percent	0.108	1.752 *	−0.465	.
		(.995)	(1.36)	.
67-100 percent	0.048	1.291	4.273	.
		(2.06)	(2.70)	.
Stock Holdings				
0-20 percent	0.648	1.185	−0.930	.
		(0.99)	(1.25)	.
20-80 percent	0.288	−0.043	−1.362 **	.
		(.483)	(.650)	.
80-100 percent	0.063	2.331	6.424 *	.
		(2.53)	(3.31)	.
No. Observations	2,098	2,098	2,098	6,197

[1]Also includes age squared, tenure, income, financial, nonfinancial, and IRA assets, total debt, no. of children under 12, percent invested in 'other' assets, and dummies for having no financial assets, year, race, homeownership, and whether household has rights to a DB plan.
[2]Also includes the variables listed in footnote 1, occupation, and fulltime status dummies.
[3]Instead of means, we report the percentage of individuals in each portfolio share category.