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ESSAYS ON RETIREMENT EDUCATION AND PRIVATE PENSIONS

By

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Economics

2000

ABSTRACT

ESSAYS ON RETIREMENT EDUCATION AND PRIVATE PENSIONS

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This dissertation examines the effects of taking a retirement class on two choices employees must make within their defined contribution (DC) pension plans: whether to save their DC balance upon separation from their employer and how to allocate their assets within their pension plan. As DC plans are increasingly becoming the primary pension plan offered by employers, the choices employees make will affect their retirement security. With the future of Social Security uncertain, employer-sponsored pension plans will be playing an increasing role in providing retirement income for the future elderly.

The first chapter, *Retirement Education and Pension Preservation: Does Retirement Education Teach Individuals to Save Pension Distributions?* examines whether taking a retirement class affects an individual's decision to save or spend his pension distribution. Most DC plans allow the participant to take his pension balance with him upon job separation. Spending these distributions can have negative effects on retirement saving, and educating workers about the importance of saving their pension distributions may be one way of retaining some or all of these funds for retirement. This paper provides econometric evidence of the effect of retirement education on the use of pension distributions for DC participants. I find that retirement education substantially

increases the probability of saving a distribution for participants age 40 and under, while decreasing the probability of saving a distribution for college graduates and females. These important differentials are concealed by estimating the effect of retirement education on participants generally.

I examine the effect of retirement education on asset allocation within a DC plan in Chapter 2, *Investment Choice in Private Pensions: The Effects of Retirement Education on Asset Allocation*. Increasing numbers of DC plans are being set up as self-directed plans, which allow participants to choose how their pension assets are invested. The portfolio one chooses can have substantial effects on the amount of pension income available during retirement. Recently, both pension plan sponsors and policy makers alike have become concerned as to whether participants have the financial knowledge to make such important decisions. This paper provides econometric evidence of the effect of retirement education on asset allocation in self-directed DC plans. I find that those with an extreme degree of risk aversion do not re-allocate their portfolios after taking a retirement class, whereas those with a slightly lower degree of risk aversion invest a larger percentage of their assets in equities after attending a class. Participants generally do not alter their behavior after attending a class. It is possible that this result is due to the heterogeneity in financial instruction or the inability of the model to detect small changes in asset allocation.

ACKNOWLEDGMENTS

I would like to thank many individuals for their advice, support, and guidance, for without them this dissertation could not have been completed.

I would like to first thank my advisor, Leslie Papke, for taking an interest in my work and sharing her knowledge of pension economics with me. She answered my questions in a thorough and thoughtful manner, and provided me with a rich base of knowledge from which to further my studies.

I would also like to thank David Neumark for his suggestions and help through these years. He always made time for me in his busy schedule, and for this I will always be grateful.

I also appreciate the input of Jeff Wooldridge in the writing of this paper. His knowledge of econometrics has given me a better understanding of econometric analysis and its various applications to policy, which will prove to be most valuable to me in my future work.

A thanks goes to those professors and fellow graduate students who took the time to add valuable suggestions to the writing of this paper. Scott Adams, Christine Amsler, Heather Bednarek, Hailong Qian and Daiji Kawaguchi have been much help to me. A special thanks goes to Kathleen Beegle, who fielded questions long-distance when I was in a bind.

Finally, I would not be where I am today without the support of my husband, Chris, and my parents. Both have provided me with emotional and financial support that I will never be able to repay.

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INTRODUCTION

The private pension environment in America is rapidly changing. Whereas twenty years ago most employees could plan on retirement income from a defined benefit (DB) pension plan from their employer, this is often no longer the case. Defined contribution (DC) plans, the most common being the 401(k) salary reduction plan, are quickly becoming the primary retirement plan offered by companies. Unlike the DB plan, where the employer periodically sets aside money for the employee to be paid out in an annuity at retirement, DC plans allow the responsibility of retirement security to be shared by both the employer and the employee. Employees must decide whether to participate in the DC plan, and if they participate, how much money they would like to contribute. In addition, employees can decide what to do with their money if they separate from their employer, and in many cases how to invest their pension contributions.

In the early to late 1980s, when companies increasingly began to offer 401(k) plans to their workers, most employees did not have to make the choices they do today.¹ Information about the plan was limited, and often restricted to a lengthy plan description that most employees were unable to understand. Valuations (calculations of the current value of the DC account) were available once or twice a year. Employees often had to file with the plan sponsor at least a month in advance to change their contribution rate or re-allocate their assets, often using information over 2 months old to make these decisions. For those who could choose their investments (these plans are often called 'self-directed' plans), choices were often limited to one or two types of assets, either

company stock, Guaranteed Investment Contracts (GICs), or some other type of fixed-income asset.

Today employees have more freedom when making decisions about DC plans. Participants enjoy more flexibility in changing contribution rates and many are able to access the value of their account on a daily basis. The number of investments the employee has to choose from is also greater. A 1995 RogersCasy study found that 74 percent of surveyed companies offer six or more investment options (Shultz, 1996). In addition, many plans are now offering loans (56 percent in 1998) (VanDerhei et al., 2000), and DC plans allow the employee to take his balance with him upon job separation.

But with greater freedom comes greater responsibility. In the new age of DC plans, not all employees are making decisions that will offer them retirement security. For instance, in 1993 only 65 percent of employees whose employer sponsored a DC plan participated in the plan (Employee Benefit Research Institute (EBRI), 1995). In addition, sponsors of self-directed plans are concerned about the investment choices participants are making. A 1994 survey of the largest DC plans in the country by Phoenix-Hecht found that only 8 percent of plan sponsors feel that participants are well qualified to make sound investment decisions (Phoenix-Hecht, 1994a). Furthermore, in 1996, 21 percent of DC plan dollars were not reinvested in a tax-deferred account when the participant separated from his job (Dickemper and Yakoboski, 1997).

It has been suggested that individuals are not making sophisticated choices because they lack the financial knowledge to do so. Traditional life cycle models of saving require that an individual understand many financial concepts, including the real

¹ The information in the following two paragraphs follows Hurt (1998).

rate of interest, inflation, and the benefits of compounding. More specific models of portfolio choice also require an understanding of risk/return trade-offs and saving time horizons.

Currently, both employers and policy makers are emphasizing retirement education as one way to increase financial knowledge and awareness about retirement saving. In the early 1990s many firms initiated retirement education programs, and by 1994 over 88 percent of large employers reported offering some form of retirement education (Pensions and Investments, 1995). In addition, the government initiated a public saving and pension campaign through the Department of Labor (DOL) in 1995 aimed at increasing public awareness on the need to save for retirement.

Retirement education programs promote sophisticated saving choices in several ways. Foremost, they provide financial knowledge the participant may be lacking. They also may enhance individual investment skills through providing financial planning training and guidance. In addition, the mere fact that the individual is exposed to information on retirement saving may cause him to realize the importance of securing his retirement and initiate a savings plan.

In this paper I will examine evidence that shows that many Americans may benefit from some form of retirement education. In the next section I will outline survey results that show the state of financial knowledge in the United States. In Section 3, I will show that many individuals do not realize they are not preparing adequately for retirement (or they are not making use of all available information). In Section 4, I examine the manner in which individuals appear to be making saving choices, and evaluate some of these methods. I offer concluding remarks in Section 5.

2. ECONOMIC AND FINANCIAL KNOWLEDGE

The economic and financial illiteracy of Americans ranges from the inability to handle the most elementary calculations to lack of knowledge in solving more complex retirement saving problems. For example, existing studies show that only 20 percent of adults can determine the correct change using prices from a menu (Bernheim, 1998). Given that many people lack simple skills needed to perform everyday tasks, it is doubtful that they possess the ability and knowledge needed to make optimal saving decisions.

Bernheim (1998) uses a 1993 survey conducted by Merrill Lynch to test the financial and macroeconomic knowledge of individuals ages 29 to 47. The survey contains eleven questions that cover such topics as the current rate of inflation, average returns between different types of investments, and the effects of compounding interest. Overall, individuals performed quite poorly, with more than 80 percent of the sample answering at least five of the eleven questions incorrectly.

As I noted in the previous section, most DC plan sponsors do not feel their employees have the knowledge to make sound investment decisions. Looking at the Merrill Lynch results, their hesitation is not surprising. Nearly two-thirds of the sample would not even guess as to the current level of the Dow Jones average, and 42 percent of respondents could not choose the correct reason as to why returns might differ between mutual funds and federally insured Certificates of Deposits. Additionally, nearly one-third of individuals answered that \$1,000 left in the bank for 30 years at 8 percent interest would earn less than \$5,000. The inability to appreciate the benefits of compound

interest not only affects asset allocation decisions, but may also increase the chance that DC participants who change jobs may spend their balances prematurely.

The results of a study done by EBRI (1996) using the 1995 Retirement Confidence Survey (RCS)² reinforces the inadequacy of knowledge demonstrated in the Merrill Lynch sample. The RCS included five questions (four true and false, one multiple choice) covering subjects related to investment returns, goals for retirement security, and average length of retirement. Although most of the individuals (80 percent) knew what percentage of current income one would need to retire and maintain the same standard of living, a significant amount of individuals could not correctly answer questions on asset returns. Only 55 percent knew that over the past 20 years government bonds provided a lower rate of return than the domestic stock market. Additionally, only 38 percent knew that company stock is not typically a less volatile option than investment in a diversified portfolio of stocks.

In addition to general retirement knowledge, a number of individuals admit they do not understand many concepts related to retirement (tax-deferred) accounts. In the 1997 RCS, 35 percent of those participating in a DC plan did not know the maximum they are allowed to contribute (Dickemper and Yakoboski, 1997). Of those currently eligible to make a contribution to an IRA, only 50 percent report they have a very clear or somewhat clear understanding of the eligibility rules for making an IRA contribution (Dickemper and Yakoboski, 1997). Relaying this type of straightforward information via retirement education materials may increase the number of individuals who take advantage of the tax-deferred nature of these accounts.

3. MYOPIA IN RETIREMENT PLANNING

In the 1998 RCS, 36 percent of respondents say they have not started to save for retirement. Of these individuals, 21 percent report their reason for not saving as "just have not thought about retirement", while 20 percent report they believe retirement will "work itself out." If workers cannot realize their financial vulnerabilities, financial knowledge alone will have little success in changing their behavior.

It is possible that the mere presence of retirement education - via employer-sponsored classes or pamphlets, or just through public advertising - may incite some of these individuals to start thinking about retirement. It is through this recognition effect that retirement education may affect saving choices.³ I will outline two studies - one by Bernheim (1998) and one done by EBRI using the 1999 RCS - that exemplify this overly-optimistic attitude of many Americans regarding retirement and saving preparedness.

Bernheim (1998) uses a 1993 Merrill Lynch survey to examine the relationship between self-rated financial preparedness for retirement and actual financial status. He measures self-rated preparedness in three ways: whether the respondent feels his finances are secure, whether he feels prepared for retirement, and whether he feels he will have a greater standard of living in retirement. Bernheim measures actual financial status by segmenting the respondents into wealth-to-earnings quartiles and adjusting each group for financial vulnerability (including factors such as age, marital status and education). He then compares the individual's own rating of preparedness with the actual ratios.

² The RCS is an annual survey covering 1,000 randomly-selected individuals ages 25 and over.

³ Cagan (1965) and Katona (1965) were the first to put forth the idea of a recognition effect. They hypothesized that those with pensions save more because the mere existence of the pension led them to think about saving for retirement.

There is some evidence that individuals correctly assess their vulnerabilities, as the fraction of individuals who describe themselves as very or somewhat well prepared for retirement rises with the adjusted-wealth quartiles. However, patterns of overly optimistic behavior also exist. Among those with the lowest actual preparedness, 54 percent regard their personal finances as secure or fairly secure. Forty-five percent of this group believes they are very or somewhat well prepared for retirement, while only 37 percent expect to achieve a lower standard of living in retirement.

The 1999 RCS also measures self-assessed and actual retirement preparedness. EBRI (1999) uses responses on actual finances and readiness from the survey and constructs a retirement readiness scale⁴ with which to compare self-assessed retirement confidence. Of those reporting being very confident in their preparedness, only 25 percent are rated as being very well prepared for retirement, and 26 percent are rated as being very poor to adequately prepared. Additionally, of those reporting being somewhat confident, 50 percent are rated as actually being very poor to adequately prepared.

It is encouraging to note, however, that retirement education may increase actual preparedness. The 1998 RCS reports that of individuals who say they have set aside retirement savings, 33 percent list having a retirement plan or educational material at work as a reason they started saving. Eighteen percent list a financial advisor, and 17 percent credit print media articles or television as providing incentive to save. Additionally, 33 percent of workers in an EBRI/Greenwald study said using employer-provided educational material led them to increase the amount of their contributions to their DC plan, and 44 percent said it led them to change their pension portfolio allocation

(EBRI, 1995). Although examination of correlations in the raw data does not imply causation, the use of retirement education appears to be a promising way of affecting saving behavior.

4. INDIVIDUAL RULES FOR SAVING BEHAVIOR

If individuals are not acting in financially sophisticated ways, then how are they making their saving decisions? Not all advice is good advice - be it from a financial planner, a retirement class, or the media. Determining an amount to save and how to invest this money is a complex matter, one that may differ depending on the characteristics and life circumstances of the individual. If an individual lacks the economic and financial knowledge to make sound decisions, he is likely to follow "rules" of behavior that reflect his financial illiteracy.

Several patterns of unsophisticated saving behavior can be observed in the literature. Bernheim (1994a) uses data from a 1993 survey for The Equitable to examine whether individuals act in a sophisticated manner by considering both current and future earnings when making financial decisions. The data provides information on current income, whether the individual expects future income growth, and saving targets. The standard life cycle theory predicts that when future income potential is higher, current saving should be lower, as there is not as much need to save today for the future. However, Bernheim finds just the opposite in the data: a higher percentage of those with more potential future income growth are attempting to save (85 and 78 percent,

⁴ The scale is computed from responses on actual saving amounts for retirement, if the individual has estimated his needs for retirement, if he has established an investing or saving program for retirement, and responses to various aspects of retirement preparedness.

respectively). In addition, mean and median saving rate targets are uncorrelated with expected income growth.

Feenberg and Skinner (1989) present evidence that shows how financial information can still result in unsophisticated behavior if individuals do not interpret the information correctly. They present data on individual IRA limits and actual IRA contributions from the early 1980s, after the liberalization of IRAs. Banks and other financial institutions put out massive advertising campaigns to get people to take advantage of the tax-deferred status of these accounts, often using concrete examples to promote the tax savings. Most of these ads used the \$2,000 contribution limit in their examples. The result was as financial institutions had hoped: increased IRA contributions. However, out of the 14 million families that contributed in 1984, 5.5 million contributed exactly \$2,000 when they actually faced either a \$2,500 or \$4,000 contribution limit. It is not known for certain that these families did not intentionally contribute below their limit, but it is highly unlikely that they would all choose to contribute exactly \$2,000.

Sometimes it is not so easy to determine whether a given behavior is unsophisticated, because economic and financial professionals cannot agree themselves on a model that best describes optimal behavior. Most financial professionals advise individuals to follow a “rule of thumb” to determine the optimal amount of equity in their portfolios, based on their age. They propose that an individual invest a proportion of stocks equal to 100 minus his current age. So if a worker is 55 years old, he should invest 45 percent of his portfolio in equities.

Bodie (1995) is one financial economist who disagrees with the conventional advice. He argues that the riskiness of holding equities actually *increases* the longer the holding period when compared to a risk-less asset (such as default-free zero coupon bonds). Theories that suggest that stocks are less risky in the long run base their claim only on the *probability* of a shortfall (the difference between the value of the stock and the bond at maturity), but do not factor in the *magnitude* of the shortfall. Using an option-pricing model to evaluate the cost of insuring against a shortfall, Bodie finds that holding stocks is more risky compared to the risk-less asset as the holding period lengthens.

Examination of age/equity patterns in the literature does not show one specific pattern relating equity holdings with age. While Papke (1998) and Goodfellow and Schieber (1997) find evidence of decreasing equity holdings with age, Muller (Dissertation, Chapter 2) and Poterba and Wise (1998) find no discernable relationship.

5. CONCLUSION

Evidence suggests that many individuals not only do not possess adequate financial knowledge to make sophisticated decisions, but also do not realize their financial vulnerabilities. Advice on retirement saving may still result in unsophisticated behavior if individuals are unable to use the information and apply it to their own situations. Furthermore, the situation is complicated if financial professionals offer rule of thumb advice or do not agree on what choices are optimal.

Much has been done in the area of retirement education in the past few years to address some of these issues. Along with the savings campaign initiated by the federal

government, in 1992 the DOL finalized section 404(c) of ERISA. Section 404(c) limits plan sponsor liability with regard to advice given in retirement education seminars, given sponsors follow certain guidelines. These guidelines list specific requirements pertaining to asset allocation and require plan sponsors to provide certain types of retirement education. Compliance is not mandatory, but as a 1998 KPMG Peat Marwick survey shows, most sponsors (those with 94 percent of plans) intend to comply with the guidelines. With the fear of legal liability greatly diminished, more companies may offer retirement education. Additionally, the requirements for education put forth in the guidelines should streamline information given in employer-sponsored retirement education across firms.

REFERENCES

Bernheim, B. Douglas, "Financial Illiteracy, Education, and Retirement Saving," in Living with Defined Contribution Pensions: Remaking Responsibility for Retirement, edited by Olivia S. Mitchell and Sylvester J. Schieber, 38-68. Philadelphia, Pennsylvania: Pension Research Council, the Wharton School of the University of Pennsylvania, and the University of Pennsylvania Press, 1998.

Bernheim, B. Douglas, "Personal Saving, Information, and Economic Literacy: New Directions for Public Policy," in Tax Policy for Economic Growth in the 1990s, Washington, D.C.: American Council for Capital Formation, 1994a, pp. 53-78.

Bodie, Zvi, "On the Risk of Stocks in the Long Run," Financial Analysts Journal, 51: May/June 1995, pp. 18-22.

Cagan, Phillip, "The Effect of Pension Plans on Aggregate Saving: Evidence from a Sample Survey," Occasional Paper 95, New York: Columbia University Press, 1965.

Dickemper, Jennifer, and Paul Yakoboski, "Increased Saving but Little Planning: Results of the 1997 Retirement Confidence Survey," Employee Benefit Issue Brief no. 191, November 1997.

Employee Benefit Research Institute, The 1999 Retirement Confidence Survey (RCS) Summary of Findings [Online] Available http://www.ebri.org/rcs/1999/1999_results.html, June 20, 2000.

Employee Benefit Research Institute, The 1998 Retirement Confidence Survey (RCS) Summary of Findings [Online] Available http://www.ebri.org/rcs/1998_results.html, June 20, 2000.

Employee Benefit Research Institute, The 1997 Retirement Confidence Survey (RCS) Summary of Findings [Online] Available http://www.ebri.org/rcs/1997/1997_results.html, June 20, 2000.

Employee Benefit Research Institute, "Can We Save Enough to Retire? Participant Education in Defined Contribution Plans," Employee Benefit Research Institute Issue Brief no. 160, April 1995.

Employee Benefit Research Institute, "Participant Education: Actions and Outcomes," Employee Benefit Research Institute Brief no. 169, January 1996.

Feenberg, Daniel, and Jonathan Skinner, "Sources of IRA Saving," Tax Policy and the Economy, 1989, pp. 25-46.

REFERENCES (continued)

Goodfellow, G.P., and S.J. Schieber, "Investments of Assets in Self-Directed Retirement Plans," in Positioning Pensions for the Twenty-first Century, edited by M.S. Gordon, O.S., Mitchell, and M.M. Twinney, 67-90. University of Pennsylvania Press, 1997.

Hurt, Ronald D., "The Changing Paradigm of 401(k) Plan Servicing," in Living with Defined Contribution Pensions: Remaking Responsibility for Retirement, edited by Olivia S. Mitchell and Sylvester J. Schieber, 193-207. Philadelphia, Pennsylvania: Pension Research Council, the Wharton School of the University of Pennsylvania, and the University of Pennsylvania Press, 1998.

Katona, George, Private Pensions and Individual Saving, Ann Arbor: University of Michigan Institute for Social Research, 1965.

KPMG Peat Marwick, Retirement Benefits in the 1990s: 1998 Survey Data. Washington, D.C., KPMG Marwick, 1998.

Papke, Leslie E., "How Are Participants Investing Their Accounts in Participant-Directed Individual Account Pension Plans?" Michigan State University Working Paper, 1998.

Pensions and Investments. "Employees Getting More: Investment Education, Planning Help on the Increase," January 23, 1995, p. 74.

Phoenix-Hecht, Plan Sponsor Survey: Large Defined Contribution Plans Respondent Report. Research Triangle Park, N.C.: Phoenix-Hecht, 1994a.

Poterba, James M., and David A. Wise, "Individual Financial Decisions in Retirement Saving Plans and the Provision of Resources for Retirement, " in Privatizing Social Security, edited by Martin Feldstein, 85-105. Chicago: University of Chicago Press, 1998.

Schultz, Ellen E., "Executives See Trouble in Employee's Nest Eggs," Wall Street Journal, March 27, 1996, C1.

VanDerhei, Jack, Holden, Sarah and Carol Quick, "401(k) Plan Asset Allocation, Account Balances, and Loan Activity in 1998," Employee Benefit Research Institute Issue Brief no. 218, February 2000.

Chapter 1: RETIREMENT EDUCATION AND PENSION PRESERVATION: DOES RETIREMENT EDUCATION TEACH INDIVIDUALS TO SAVE PENSION DISTRIBUTIONS?

INTRODUCTION

As defined contribution (DC) plans have become increasingly common over the past two decades, lump sum distributions from these pension plans have also become more common. DC plans give employees the flexibility to take the balance of their account with them upon job separation. For those who elect this option, they can choose to maintain these funds in accounts designated for retirement, invest them in other savings vehicles, or spend them. If spent pension savings are not replaced by other saving, retirement wealth for the future elderly is more likely to be insufficient to maintain a desired standard of living in old age.⁵ As people live longer, pension retirement savings will play an increasingly important role in financing retirement.

Most previous research on the preservation of pension funds has focused on the demographic and financial characteristics of those individuals who spend their distributions upon job separation (Andrews, 1991; Atkins, 1986; Bassett, Fleming and Rodrigues, 1998, henceforth BFR; Poterba, Venti and Wise, 1998, henceforth PVW). While identifying the characteristics of these individuals is important, it is also necessary to look at what can be done to halt this leakage out of the private pension system. Two pieces of tax legislation in 1986 and 1992 include penalties for pension withdrawals before the age of 55. Although tax penalties are somewhat successful in lowering the

⁵Engelhardt (1999) estimates that spent distributions result in a decrease in retirement consumption by approximately 6-8 percent, given that Social Security and pensions account for three-quarters of retirement income.

number of employees spending their pensions before retirement, statistics show many individuals still do not save their balances. Using data from the 1996 Retirement Confidence Survey (RCS), Yakoboski (1997) reports that 10 percent of workers said they had the opportunity to take their pension balances with them upon job separation in the last three years. Of those who elected to take the distribution, 50 percent reported spending some or all of the money on consumption. This results in approximately 5 percent of employee pension distributions being used for consumption.

Traditional economic models of saving assume that individuals have the knowledge to make utility maximizing saving decisions, or at least they act as though they do. These models predict that the consumption/saving choice individuals make – although it may be to consume a pension distribution rather than save it – is the utility-maximizing choice for that individual. However, if choices are based upon limited information and financial knowledge, these decisions may not actually be the best ones for individuals and their retirement security.

Educating workers about the necessity to save for retirement is one way of increasing pension preservation upon job separation. This education can come in the form of private financial planners, employer-sponsored materials, or retirement classes offered at institutions such as community colleges. Bernheim and Garrett (1996) find that employer-sponsored education increases general saving rates by approximately 2 percent and increases retirement wealth by \$2,176. Thus, educating individuals about their future income security may be a valuable way to reach employees who currently spend their pensions before retirement.

In this paper I examine the relationship between retirement education -

specifically retirement meetings - and the saving of pensions upon separation from a job. I include both employer-sponsored meetings and those offered by public and private institutions in my study. I analyze this relationship using two definitions of saving - a definition that includes only re-investment in tax-deferred saving vehicles (Individual Retirement Accounts (IRAs), new employer pension plans, etc.) and a broader definition that includes tax-deferred vehicles, general saving vehicles (stocks, bonds, saving accounts, etc.) and paying off debt. Because different types of individuals may not react in the same way to attending a retirement class, I also evaluate the effects of retirement education for specific types of individuals especially important to policy makers. Previous research on pension distributions identifies younger individuals, females, and those without college degrees as less financially secure in retirement, making the effects of retirement education on these groups particularly relevant.

I use a cross-section of 938 individuals from the 1992 Health and Retirement Study (HRS) who participated in a DC plan in a previous job. This is the first study to test the relationship between retirement education and pension preservation, while controlling for characteristics at the time of the pension distribution such as reason for job separation and income and marital status at the time of separation from employment. In addition, this data set is unique in that it provides a rich source from which to construct proxy variables to control for unobservable saving tastes.

The next section provides background information on pension distributions, their tax treatment, and an overview of retirement education and why it may be effective in slowing the flow of money out of the pension system. In Section 3, I summarize the literature on pension distributions and retirement education. I provide an overview of the

data in Section 4. Section 5 provides econometric evidence of the effect of retirement education on pension preservation. I first estimate the effect of retirement education on the use of pension distributions with and without additional control variables. I then add interaction terms to account for differences in the effects of retirement education on pension preservation for sub groups who may be at risk of financial insecurity at retirement. I also discuss possible selection bias in the model and present two ways to address this bias. I offer concluding remarks in Section 6.

2. BACKGROUND

Pension Preservation

Pensions can be categorized into two broad types: defined benefit (DB) and DC plans. The amount of benefit in a DB plan is usually determined by a formula that includes years of service and average annual salary. Benefits are paid in a stream of annuities beginning at a specified age. Portfolio managers decide how the assets in the pension fund are invested. DB plans were by far the most common type of plan until the 1980s.

The typical DB plan does not allow for pre-retirement distributions upon job separation. In 1988, only 10 percent of employers allowed their pre-retirement employees the option to take their pension balance with them upon separation (Fernandez, 1992).⁶ Pension law does allow employers the option, however, to unilaterally cash out employees with balances of less than \$5,000, regardless of the

⁶ Technically, employees with traditional DB plans do not carry balances, since each employee does not have an individual account. The balance referred to here is calculated using a formula that reflects the amount of service completed upon separation.

employee's preference to remain in the plan.⁷

The design of DC plans is quite different. The 401(k) Plan, Employee Stock Ownership Plans (ESOPs), and Simplified Employee Pension Plans (SEPs) are a few of the common types of DC plans. DC plans establish an individual account for every employee into which the employee, the employer, or both may make contributions. Contributions and interest income are tax-deferred until withdrawal. In addition, many DC plans allow the employee to make his own investment choices. The implementation of 401(k) plans in 1981 and their subsequent growth has accounted for most of the increased use of DC plans in recent years.

Most DC plan sponsors allow employees to take the balance of the account with them upon separation, regardless of the reason for separation. Employees may choose to keep the funds in a former employer's pension plan, transfer the funds to the new employer's plan, roll the money directly into a tax-deferred account such as an IRA, or take the distribution as a lump sum.⁸ Those who take the lump sum distribution can then spend the money, invest it in a general saving vehicle, or put it into an IRA. Leaving pension funds with the previous employer, transferring it to a new employer's account, or transferring it directly into another tax-deferred vehicle is called a direct rollover or fiduciary-to-fiduciary transfer. Taking a lump sum distribution and then putting it into an IRA is called an indirect rollover. In the remainder of this paper, I will use the term *pension distribution* to refer to all pension balances that are available upon job separation, whether the money is spent or saved. I will use the term *lump sum distribution* or

⁷ The Employee Retirement Income Security Act (ERISA), passed in 1974, originally set the maximum unilateral cashout at \$1,750. This limit was raised to \$3,500 by the Retirement Act of 1984. Effective January 1, 1998, the limit was raised to \$5,000.

⁸ Chang (1996) notes that, as of 1988, most pension plans did not allow rollovers from other pension plans.

cashout to refer specifically to those distributions for which the employee actually withdraws the pension funds, and then decides whether to spend them or put them into a general or tax-deferred savings vehicle.⁹

In the current economic environment where workers are increasingly mobile, the popularity of the DC plan is likely to continue. In 1975, 13 percent of workers were covered by a primary DC plan; by 1987 that number rose to 30 percent (Beller, 1992). With this increase in DC plans the availability of distributions has also increased. The number of workers reporting the availability of a distribution from any retirement plan was 47.8 percent in 1983. By 1993, 71.5 percent reported having this option (Scott and Shoven, 1996).

As the option to cash out pension balances upon job separation has become more widespread, the percentage of all workers electing to maintain their balances in a tax-deferred plan has also grown in recent years, albeit modestly. In 1983, 45 percent of individuals reported saving their balances in tax-deferred accounts. In 1993, that number rose to 50 percent (Scott and Shoven, 1996). Paul Yakoboski (1997) reports similar trends using Hewitt Associates data from 1993 and 1996. In 1993, 35 percent of individuals rolled over their pension funds into a tax-deferred account. By 1996, that number had risen to 40 percent.

Specific groups of individuals are more likely to spend their distributions. Lower-income or less-educated individuals, as well as those with smaller distributions, are less likely to save their pension distributions in either a retirement or general saving vehicle

⁹ If a worker separates from his job and has the option to do whatever he wishes with his money, he is choosing what to do with his pension distribution. If that worker chooses to actually take a check from the employer for his pension and then decides what to do with the money, he takes a lump sum distribution. A lump sum distribution is a particular form of a pension distribution.

(Atkins, 1986; BFR, 1998; PVW, 1998). Females are less likely than males to save their distributions in a tax-deferred vehicle (Hurd, Lillard and Panis, 1998, henceforth HLP). Chang (1996) concludes that although a 10 percent penalty on consumption of distributions increased the probability of rollovers for high-income groups (those with annual incomes exceeding \$39,999), there was no effect for low-income groups.

Groups that are more likely to spend their pension distributions are among those most vulnerable to inadequate retirement security. Low wage earners tend to also have less formal education, which means decreased potential for future wage growth and subsequent lower retirement wealth. The probability of spending a distribution decreases with age (Atkins, 1986; PVW, 1998) and younger recipients tend to have lower account balances at the time of job separation (Piacentini, 1990). A younger worker who receives a distribution will most likely change jobs more often in his lifetime than an older worker, allowing him more opportunities to spend his distribution. Spending a small pension distribution from one job may not appear to affect retirement security by much, but repeated distributions that are not saved result in significantly smaller retirement wealth.¹⁰ Females are also at greater risk for inadequate retirement security. Divorced and widowed households headed by women in their 50s and 60s have approximately two-thirds the median net worth¹¹ of similar households headed by men (Smith, 1995).¹² Increasing numbers of individuals with inadequate personal retirement wealth increases pressure on Social Security and may translate into higher future outlays for government programs such as Medicaid and Supplemental Security Income.

¹⁰ See Piacentini (1990) for calculations of retirement income loss due to spending of pension distributions.

¹¹ Net worth includes IRA and Keogh accounts, but does not include Social Security or private pension wealth.

¹² This difference in net worth is found only for white males and females.

I must emphasize that in some cases spending the pension distribution may be the *individually* optimal thing to do. However, from a public policy perspective, inadequate personal retirement security for future generations is an issue that must be addressed.

Tax Legislation

Government policies aimed at preserving pension distributions have been predominately in the form of tax penalties. The Tax Reform Act of 1986 (TRA86) contains the first changes in the tax code to address pension distributions. TRA86 imposes a 10 percent penalty for those under age 55¹³ on the distribution amount if the distribution is not re-invested in a tax-deferred retirement vehicle within 60 days of receipt. For example, a 45 year-old with a pension balance of \$50,000 would have to pay \$5,000 in penalty tax if he spent or invested his distribution in a non-tax-deferred savings instrument, or put it into a tax-deferred instrument later than 60 days after receipt.

Congress added a withholding tax to pension distributions not directly rolled over into another tax-deferred account in 1992. The Unemployment Compensation Amendments Act imposes a 20 percent withholding tax for those under age 55 on the amount of the pension not transferred directly into another tax-deferred retirement account. This law allows the federal government to withhold 20 percent of a distribution whenever a qualified recipient takes a lump sum distribution.¹⁴

¹³ Withdrawals made after job separation are subject to the penalty if the individual is under age 55 at time of withdrawal. Exemptions to the penalty exist. See: U.S. Congress, Joint Committee on Taxation, 1987.

¹⁴ The 20 percent withholding tax is structured differently than the 10 percent penalty tax. The 10 percent tax is an excise tax. The 20 percent tax is a federal income withholding tax. Twenty percent is taken out of the distribution and if the individual then puts the pension money back into a tax-deferred account, he is credited for this amount in that year's federal income tax. However, in order to not incur the 10 percent penalty on the 20 percent withheld, the individual must come up with the additional 20 percent and invest this in the retirement account as well. If he does not, 10 percent of the 20 percent withheld is taken in penalty tax.

Has tax legislation affected the consumption of funds meant for retirement?

Because the portability of pensions is a relatively recent phenomenon, very few studies have been done on the effects of tax legislation. Chang's (1996) study on the effects of the 10 percent tax penalty on the saving of pensions is the only econometric evidence to date. Her estimates suggest that the penalty increases the probability of rolling over a pension distribution by 4 percent for high-income groups. The penalty has no statistically significant effect on low-income groups, particularly those who are under 55 years of age. Scott and Shoven's (1996) tabulations also document differences in rollovers across income groups. For individuals who earn more than \$30,000 annually, the propensity to cash out declined from 1983 to 1988, and continued on a downward trend from 1988 to 1993. But for those with incomes below \$30,000, the cashout propensity declined from 1983 to 1988 and then rose from 1988 to 1993. Although the tax penalty may affect the behavior of certain types of individuals, other types of workers still fail to roll over their distributions.

To date, a similar study has not been done for the 1992 legislation. However, Fronstin et al. (1997) tabulate the use of lump sum distributions from the 1993 EBS and compare them with similar tabulations from the 1996 RCS. The number of lump sum distributions invested in retirement accounts before and after the 1992 legislation is remarkably similar: 45.5 percent for distributions received from 1987 to 1993 (EBS) and 46 percent for distributions received from 1993 to 1996 (RCS). The numbers suggest that the withholding tax has not had much effect; however, it is premature to conclude this without further econometric evidence.

Retirement Education

The availability of retirement education, like that of pension distributions, has grown remarkably in the past 20 years. Although private financial planners have been available for many years, the availability of retirement education at community colleges and in the workplace has just grown substantially throughout the 1980s and 1990s. In 1994, 88 percent of large employers offered financial education, with two-thirds of these programs added after 1990 (Pensions and Investments, 1995).

Retirement education takes many different forms. Some firms use only written materials such as brochures and pamphlets, while others offer workshops and seminars, or one-on-one financial advising. Most recently some sponsors have added Internet sites and interactive software specifically designed to inform individuals about retirement saving. In 1993, approximately 65 percent of pension plan sponsors provided newsletters, and 44 percent offered seminars to all workers (Bayer, Bernheim, and Scholz, 1996, henceforth BBS).

Retirement education includes a variety of topics, from the basics of investing and definitions of financial terms, to subjects such as asset allocation, the effects of compounding and inflation, and retirement income projections. In 1995 nearly 100 percent of employer-sponsored programs covered asset allocation and 95 percent explained risk and risk tolerance. Eighty-eight percent discussed basic investment terminology and explained the characteristics of the pension plan, while 73 percent showed employees how to calculate income for retirement. But only 39 percent specifically addressed the impact of spending pension distributions before retirement (Employee Benefit Research Institute (EBRI), 1995).

The growth of retirement education has lagged behind the growth of DC plans. In the past, employers have expressed concern for the legal liability that may result from providing financial education. Because most DC plans offer participants the ability to choose how to invest their pension balances (commonly referred to as self-directed plans), employees often look to employers to advise them on how best to allocate their assets.¹⁵ Advising employees is risky - employers who offer anything that resembles advice may be held liable for losses incurred by the employee, even if the employee ultimately is the one who makes the investment decision.

In addition, not until recently has the government provided clear guidelines for employers to follow when organizing a retirement education program. In 1992 the Department of Labor finalized section 404(c) regulations of ERISA that outlines ways for employers to minimize their legal risk. Although following these guidelines does not completely protect a firm from legal liability, it does provide a defense against allegations of misdirected advice. These guidelines have allowed firms that otherwise would not have offered retirement education to implement programs at the workplace.

Why Should Retirement Education Affect Pension Preservation?

Americans demonstrate a clear need for financial guidance. Only 33 percent of surveyed adults understand the basics of compounding interest, while 42 percent can not identify why federally-insured certificates of deposit have a lower rate of return than privately held mutual funds (Bernheim, 1998). Individuals are also uninformed about

¹⁵ A Bureau of Labor Statistics survey published in 1990 reported that 90 percent of participants in particular types of DC plans had self-directed plans. For further information see: United States Department of Labor, Bureau of Labor Statistics, "Employee Benefits in Medium and Large Firms, 1989," Bulletin 2363, June 1990.

retirement planning. Results from the 1997 RCS show that only 36 percent of workers in the United States have any idea of how much they will need to save for retirement, and of these individuals, 24 percent cannot provide an actual figure. Furthermore, of those who participate in a 401(k) plan, 35 percent do not know their contribution limit (Dickemper and Yakoboski, 1997).

With little knowledge about financial matters and retirement, workers may be making different spending and saving decisions than they would had they more information. An informed decision about the use of pension distributions involves knowledge about the employee's pension plan, how much income is needed for retirement, and the advantages of compound interest, for example. But does educating individuals change behavior?

Evidence suggests that exposure to financial information and advice does affect saving behavior. It is likely that formal education (i.e., high school, college) increases general economic literacy and helps to develop the skills needed to process financial information. Bernheim and Scholz (1992) find that those with more formal education are more likely to show evidence of sophisticated financial planning. When comparing the average person with and without a college degree, those with college degrees save more adequately for retirement – that is, they make decisions that are more consistent with the life cycle model.

Evidence also shows that retirement education - employer-sponsored classes in particular - affects savings behavior. Bernheim and Garrett (1996) find that individuals who make use of retirement education offered by their employer have a general saving rate 2.2 percent higher than those who do not use educational material. A 1996 EBRI

analysis reports that 39 percent of workers in pension plans said that using employer-provided materials or attending seminars led them to increase their contribution rate to the plan. In addition, 53 percent of workers reported that additional advice on financial planning by their employers would lead them to save more for retirement. Thus it is reasonable to suggest that retirement education may have an effect on general saving behavior, and specifically, the choice to save a pension distribution.

3. PREVIOUS RESEARCH

Who Saves and Who Spends their Pension Distributions?

While there are no studies that address the impact of retirement education on pension preservation, previous work on pension distributions has examined the characteristics of those individuals who spend their pensions and those who save them. BFR (1998) and PVW (1998) both use the EBS in cross-section analyses. BFR include distributions from DB and DC plans and find that those with a college degree are 11 percent more likely than those without a degree to roll over their distributions into a tax-deferred account. They also find that as family income increases, so does the probability of rollover. For each additional \$1,000 in family income, the rollover probability increases by 3 percentage points.

PVW (1998) also examine the factors affecting the decision to save a pension. They use the 1993 EBS as their primary data set, and support these findings with data from the 1992 HRS. They find that older individuals, workers with a college degree and those with higher current labor income are more likely to save their pensions. Workers with higher pension balances at time of receipt are also more likely to save their

distributions: the probability of rolling over a distribution of more than \$25,000 is 25 percentage points higher than that of a distribution worth less than \$1,000.

Chang (1996) uses the 1988 EBS to study the effect of the TRA86 10 percent penalty on increasing pension preservation. She uses both traditional probit estimation and a difference-in-difference approach in her analysis. Results from the probit specifications show that a one percent increase in the tax price of spending the distribution raises the probability of rollover among high-income groups by 0.4 percent.¹⁶ A one percent increase in the tax price for low-income groups raises the probability by only 0.2 percent. Using the difference-in-difference approach, a one percent increase raises the probability of rollover by 1.3 percent for high-income individuals, but has no statistically significant effect on the use of the distribution for low-income individuals.

The finding that low-income individuals do not respond to tax penalties for spending pension distributions is important, considering low-income workers are more likely to spend their distributions in the first place. The tax penalty does not affect the behavior of those who most need to preserve their pensions, resulting in increased economic vulnerability in old age and perhaps more impoverished elderly in the future.

Does Retirement Education Affect Saving? Evidence in the Literature

There are no known econometric studies on retirement education outside of the workplace. However, there are two studies that address the relationship between employer-sponsored retirement education and savings behavior. The first, by Bernheim and Garrett (1996), uses a sample of 2,055 individuals, ages 30 through 48 in 1994. The

¹⁶ Workers who do not roll over their pensions must pay income tax on the amount of the distribution in the year received. Because TRA86 also lowered income tax rates for most levels of income, the tax price of a non-rollover must also incorporate these lower marginal income tax rates.

survey is sponsored by Merrill Lynch and includes information on both the availability and use of employer-sponsored education. The type of retirement education offered (written materials or seminars) is not specified, so the analysis estimates the effects of the typical retirement education program in the workplace.

Bernheim and Garrett use median values of the dependent variable to estimate the effects of employers offering and employees participating in retirement education on the household saving rate, retirement saving rate, total wealth, and retirement wealth. The results suggest a relatively small, positive relationship between the presence of retirement education and the household saving rate and retirement education and retirement wealth. Workers whose employers *offer* retirement education save 1.7 percent more than those not offered education, and have \$2,488 more in retirement wealth. Employees who *use* retirement education materials save 2.2 percent more than those who do not, while accumulating \$2,176 more in retirement wealth. Coefficient estimates on both the offering and usage of retirement education in specifications using total wealth and the retirement saving rate are statistically insignificant. The fact that the general savings rate increases more than the retirement saving rate suggests that perhaps retirement education not only affects saving for retirement, but has a spillover affect on saving in general. Alternatively, individuals could be using general saving vehicles to save for retirement.

Bernheim and Garrett also test the hypothesis that attending a retirement meeting is correlated with unobserved saving tastes. They conclude that those with lower propensities to save are more likely to be offered retirement education and to use it in the workplace.

BBS (1996) use a 1993-1994 longitudinal survey of 1,100 employers selected by

KPMG Peat Marwick to study the effects of employers offering retirement education on participation and contribution rates in 401(k) plans. Their data allows them to examine the effects of both seminars and written material, as well as the frequency in which education is offered. When estimating these effects for both highly compensated (HC) and non-highly compensated (NHC) employees¹⁷, they find that participation rates are 11.5 percent higher for NHC employees and 10.5 percent higher for HC employees when retirement education is offered, given that the seminars are offered frequently.¹⁸

4. DOES RETIREMENT EDUCATION PROMOTE SAVING OF DISTRIBUTIONS? EVIDENCE FROM THE 1992 HRS

The 1992 HRS is the first wave of an ongoing survey of 12,057 men and women, most between the ages of 51-61 in 1992.¹⁹ Besides including standard demographic and financial information, the survey also includes questions specifically relating to retirement. Detailed pension information and expectations about the retirement years make for a rich source of data for analyzing retirement issues. As I am interested in how retirement education affects DC participants who received a pension distribution, my sample consists of the 938 individuals who participated in a DC plan in their previous job.

Although the HRS is a longitudinal study, I only use the 1992 wave. The questions addressing retirement education are only asked during the 1992 survey, and

¹⁷ Highly compensated employees are defined as having annual earnings of \$100,000 or more, owning more than 5 percent of the company, or having annual earnings of \$65,000 or more if this amount is in the top quintile of the firm's salary distribution.

¹⁸ The offering of retirement education has no effect if the education is in the form of written materials, or if seminars are offered occasionally.

¹⁹ Because spouses of respondents of this age group are also asked the same questions, only 9,673 individuals fit into this age category. Since my analysis looks at a past event, a pension distribution, the age range at which these distributions occurred is larger than the age range of the respondents at the time of the interview.

although using information from subsequent waves may add new lump sum distribution recipients to the sample, information on attendance in retirement classes after 1992 is not available. Given the acceleration of retirement education in the 1990s, there is a high probability of undocumented participation for those who attended a meeting between 1992 and 1996.

Table 1.1 reports summary statistics for the sample of individuals for whom I am able to classify their response in the two savings categories and who also answered the question on attending a meeting. Out of 640 individuals²⁰, 19 percent report having attended a meeting. Of those who attended a meeting, 72 percent (14 percent of the sample) took this meeting from either their employer or their spouse's employer. Forty-nine percent of the sample is female and 25 percent of the respondents earned at least a college degree. The mean age when the distribution was received is 49 years of age. The average labor income of both spouses at the time of the distribution is \$50,247, while the mean pension balance at the time of the distribution is \$33,797.²¹

Pension Preservation in the HRS

All respondents were asked if they had a previous job for which they worked at least five years. If they did, they were asked if they had an employer-sponsored pension plan at that job and if the plan was characteristic of a DB plan, a DC plan, or had characteristics of both. Because only a small percentage of DB plan participants historically have had the choice on whether to take a distribution, only those with DC

²⁰ Tables 1-4 include only individuals in the sample who answered the retirement meeting question and whose pension distribution can be classified as either general savings, retirement savings, or paying off debt. Because many individuals did not answer one or both of these questions, the sample size for the regressions drops from 938 to 640.

plans are included in the analysis.²²

The HRS then asks each respondent what he did with his pension upon job separation. Options include rolling it over into a new employer's pension plan, leaving it with the former employer to accumulate, rolling it directly into an IRA, converting it to an annuity, or receiving a distribution.²³ For those who elected to receive a distribution, the use of the distribution is recorded.²⁴ Choices include spending it, saving/investing it in general saving vehicles or paying off debt, or investing it in an IRA. Only one use for each respondent is recorded.

I analyze the effect of retirement education on saving a distribution, using two definitions of saving. The broad definition includes saving the distribution in either a tax-deferred (or retirement) or a non-tax-deferred (or general) savings vehicle. Included in this definition are direct rollovers into new employer accounts, IRAs, or annuities, leaving the distribution with a former employer, taking a lump sum distribution and investing it in an IRA or general saving vehicle, or paying off debt.²⁵ A general saving vehicle is any investment vehicle that is not tax-deferred, including but not limited to, stocks, bonds, certificates of deposit, and bank saving accounts. Henceforth, this definition of saving will be referred to as *all types of saving*. The narrower definition includes types of saving included in the broad definition except for saving in general vehicles and paying off debt. Henceforth, this definition of saving will be referred to as

²¹ All dollar variables are in 1993 dollars.

²² Individuals whose pension plans had characteristics of both DB and DC plans are omitted from the analysis, given that it is not possible to sort out those plans that typically allowed distributions (DC types) from those that did not (DB types).

²³ Other options include losing the benefits, having benefits in litigation and waiving pensions benefits in exchange for other benefits. Respondents who chose these options are omitted from the sample.

²⁴ Whether the individual was eligible to receive a distribution is not given. Because DC plans have historically had a high rate of portability, the omission of data on eligibility is not an issue here.

retirement saving.

Employing two different definitions of saving - one including not only tax-deferred accounts but also general savings accounts - is important to this analysis. One characteristic of tax-deferred accounts is their lack of liquidity. Withdrawal of funds from a tax-deferred account such as an IRA before age 59-1/2 brings with it a substantial tax penalty. For this reason, individuals, especially younger ones, may keep funds they have mentally designated for retirement in non tax-deferred instruments. Individuals who invest their pension in general saving vehicles should not be classified with those who simply spend their distributions on consumption.

Table 1.2 reports the uses for pension balances for the sample. The top two rows report the percentage of respondents who saved their distribution in either all types of saving vehicles or retirement vehicles only. Sixty-nine percent of respondents saved their pensions in all types of savings vehicles, while 60 percent saved their pensions in a tax-deferred account. Subtracting these two figures shows that 9 percent of DC participants saved their distributions in a general saving vehicle or paid off debt. The remaining rows report the specific use of the distribution. Thirty-one percent spent their distributions on consumption (using the broad definition of saving). Of those who did not spend their distributions, the most frequent uses include leaving the money in a previous employer's account (30 percent) and rolling over the funds into an IRA (22 percent).

At least a third of DC participants report spending their distributions - 31 percent if saving is defined broadly, 40 percent if saving is defined as only retirement saving. These figures appear low when compared to a study done by Yakoboski (1997), who

²⁵ I include paying off debt as saving because, all else equal, it increases net wealth, and therefore, future income.

reports a rate of 54 percent for 50-59 year olds using 1993 Hewitt data. HLP (1998) also report a rate of 54 percent when using the 1992, 1994, and 1996 waves of the HRS.

These figures, however, include only those individuals who take a lump sum distribution - employees who leave their funds with old employers or transfer them to new employers are not included in the sample. If I eliminate these people from my sample, the resulting percentage of individuals who do not save their pensions in a retirement vehicle increases to 64 percent, slightly higher than the figures provided by Yakoboski and HLP. The timing of the receipt of the distribution in my sample may account for the greater percentage of respondents spending their distributions. While the other studies cover predominately distributions received in the 1990s, the mean year of recipiency in my sample is 1984. Andrews (1991) finds that the more recent the distribution, the higher the probability of it being saved in a retirement vehicle. The 1981 legislation lifting the restriction on the opening of IRAs to those covered by employer pension plans may have affected the disposition of cashouts by making it easier to keep pension funds in the retirement system.

Information on Retirement Education in the HRS

The HRS is the only public data source that contains data on both retirement education and pension distributions. All respondents are asked two questions about retirement education: have they ever attended any meetings on retirement or retirement planning? Of those who answered yes, they are then asked if that meeting was organized by the respondent's or spouse's employer.

Table 1.3, column (1) reports the percentage of DC participants who took a

retirement class, by age, education, and gender. The percentage of each group that saves their pensions is then reported in columns (2) and (3). Observing all three columns shows a general trend among groups - those who are less likely to attend meetings are also in those groups that have fewer individuals saving their pensions. The most striking differences appear within the age and educational categories. While half as many non-college graduates as graduates attended a meeting (15 versus 30 percent), only 66 percent of non-graduates saved their pensions in all types of saving vehicles, while 80 percent of graduates saved their distributions. Looking at age, 14 percent of those age 40 and under attended a meeting, while 20 percent of those over age 40 attended a class. The percentage of younger workers saving their distributions in all types of saving is 58 percent, compared to 71 percent of older workers.²⁶

Table 1.4 reports the proportion of distributions saved and spent, depending on whether the respondent attended a meeting or not. (Expressing proportions as percentages), columns (1a) and (1b) report the percentage of workers who saved their distribution in all types of saving vehicles, depending on retirement meeting attendance. Columns (2a) and (2b) do the same for investment in retirement vehicles only. Columns (1c) and (2c) report the percentage point difference in saving a distribution between those who attended a meeting and those who did not. Column (2) is subtracted from column (1) in order to determine the percentage of individuals who invested in general saving vehicles only or paid off debt. I first report percentages for all DC participants, and then proportions by age, gender, and receipt of college degree.

Tabulations show that for the full sample, 73 percent of DC participants who

²⁶ The difference in class attendance for college graduates and non-graduates is the only difference that is statistically significant (at the five percent level, not shown on the table).

attended a class invested their pensions in any type of saving vehicle versus 68 percent of those who did not attend a meeting. Sixty-four percent of individuals who attended a meeting saved in retirement vehicles, versus 59 percent of those who did not participate in a class.

The differences in pension preservation between those who attended a meeting and those who did not become more apparent when focusing on sub groups of individuals. Seventy-eight percent of those age 40 and under saved their distributions in all types of saving vehicles if they attended a class, versus 54 percent of those who did not attend a class, with the difference being statistically significant at the 10 percent level. No difference is found when comparing investment in retirement saving vehicles: 36 percent of those age 40 and under saved in tax-deferred vehicles regardless of class attendance. The differences between all types of saving and retirement saving show that much of the investing of this group is done in general saving vehicles: 42 percent of those age 40 and under who attended classes saved in general vehicles only, versus 18 percent of those who did not attend a class. Small, statistically insignificant differences are found for those over age 40, regardless of the definition of saving used.

Females and males also show different patterns of saving their distributions depending on whether they attended a class. While the percentages of females saving their distributions in either type of savings vehicle differs only slightly between those who attend a meeting and those who do not (2 percentage point decrease for all types of saving, 3 percentage point decrease for retirement saving), the difference for males is more striking. Ten percent more males save their distributions if they attended a class, regardless of the definition of saving used. Both differences are statistically significant at

the 10 percent level. It is apparent, however, that the difference for all types of saving is being driven by the difference in retirement saving, with 6 percent of males saving in general saving vehicles or paying off debt regardless of class attendance.

The effects of retirement education also appear to differ between college and non-college graduates. A greater percentage of non-college graduates saved their distributions if they attended a meeting, with 7 percent more saving their distributions in all types of saving and 4 percent more re-investing their pension balances in retirement vehicles. On the other hand, a smaller percentage of college graduates saved their distributions if they attended a meeting, regardless of the definition of saving used. Seven percent fewer graduates saved their pensions in all types of saving vehicles, with 4 percent fewer saving in retirement vehicles only. Neither of these differences is statistically significant, however.

The differing effects of retirement education depending on educational level are reported in two studies by EBRI (1995, 1996). A 1993 EBRI/Matthew Greenwald and Associates study found that of those workers who read educational material or attended seminars, 41 percent of those without a college degree report that the seminars led them to increase the amount of their contributions to their pension plan, compared to 30 percent of college graduates (EBRI, 1995). The 1995 RCS reports similar findings. Forty-three percent of those with a high school degree or less who used educational material increased the amount of contributions to their plan, versus 38 percent of those with more education (EBRI, 1996).

5. ECONOMETRIC RESULTS ON THE EFFECTS OF RETIREMENT EDUCATION ON PENSION PRESERVATION

In this section I describe the model I use in the econometric analysis and report the results. I use a linear probability model and estimate it using OLS.²⁷ The model is as follows (omitting individual subscripts):

$$S_j = X\beta_j + \alpha_j R + \omega_{1j} (R*y) + \omega_{2j} (R*c) + \omega_{3j} (R*f) + P + \varepsilon_j, \quad (1)$$

where S_j is a dichotomous variable equal to one if the respondent saved his distribution and equal to zero otherwise, with $j=1,2$, depending on the definition of saving used. The independent variable of interest, R , is a dummy variable equal to one if the respondent attended a retirement meeting, and zero otherwise. X contains the observed variables that are thought to affect the saving decision. The variables $(R*y)$, $(R*c)$, and $(R*f)$ are interaction terms of the retirement meeting variables with the binary variables age 40 and under, college degree and female, respectively.²⁸ The variables for age 40 and under, college degree and female are included in X . P is a vector of proxy variables to control for unobserved individual saving tastes.

One set of variables included in X merits explanation. I include five dummy variables that indicate the reason the individual separated from his job, including quitting,

²⁷ I also estimate the model using probit analysis, with similar qualitative results (results not reported in tables).

²⁸ As is noted previously, individuals with low income and small pension account balances are more likely to spend their pension distributions, hence workers with these characteristics could also be interesting candidates with which to interact the retirement meeting variable. However, specifications using the three interactions in the model plus an income interaction term show no differing effects of retirement meetings between low and high income participants. The same result holds when substituting four dummy variables for the amount in the account in X and including four additional interaction terms. Hence I do not include these interactions in the model.

being fired, or leaving because of disability, retirement, or family issues.²⁹ Individuals could give more than one reason for separation. To simplify the interpretation of the coefficient estimates for these variables, I assign only one response per individual.³⁰ The reason for job separation has not been included in previous models observed in the pension distribution literature. However, it is relevant because it coincides with the decision on whether to save the pension and aids in describing the worker's financial situation at the time of the saving choice.

I first estimate equation (1) without interaction terms or proxy variables. The results are presented in Tables 1.5 and 1.6. Column (1) reports the simple relationship between meetings and pension distributions without any control variables. For all types of saving, attending a retirement meeting leads to a 5 percent greater likelihood of saving a distribution, and a 4 percent greater probability when estimating re-investment in retirement vehicles only. Both estimates are not statistically significant, however.

The results from adding the controls in X are reported in column (2).³¹ Attending a retirement meeting now has a small, negative coefficient estimate for both definitions of saving, however both estimates remain statistically insignificant at conventional levels.³²

The other coefficient estimates in column (2) are qualitatively similar to those in

²⁹ I construct the family issues variable from a variety of responses, the most common being divorce, child care, and care of a family member.

³⁰ Those who gave retirement as the reason for leaving were classified as such no matter what other choices they checked, as the use of pension money is specific to retirement income. Being disabled took precedence over merely quitting or family issues, as it describes more specific circumstances. Being fired is chosen when any of the others were also checked (except for retiring). Being fired is also very specific and may come with subsequent economic hardship. I choose those who gave family issues as a reason only when the worker also quit his job.

³¹ Tables 1.5 and 1.6 include year dummies for when the distribution was received, as well as a dummy flagging respondents whose spousal income was set to zero due to refusal to interview or to answer the income question.

The year dummies are statistically significant, with an F statistic of 13.68 using all types of saving and 22.36 for retirement saving. The larger F statistic for specifications using retirement saving may be due to the effect different pension and tax legislation had specifically on tax-deferred accounts.

previous pension distribution research. Those with larger distributions have a higher probability of saving their distributions, at a rate of about 1/2 of one percent per \$10,000 in the pension account, regardless of the definition of saving used. Those with college degrees save their distributions 14 percent more often than non-college graduates in all types of saving vehicles, and 19 percent more often in retirement vehicles. Whether the individual was age 40 or under matters only for retirement saving (estimated at just under 90 percent confidence), with a 15 percent lower probability of saving in retirement vehicles than older participants. Those with household labor income of greater than \$35,000 at the time of the distribution save their distributions more often than those with lower income; 15 percent for all types of saving and 18 percent for retirement saving only.

One interesting result lies in the estimates on the reason for job separation. Estimation using all types of saving shows that those who left their job because of disability have an 18 percent lower likelihood of saving their distributions (significant at the five percent level) than those who quit their job. Those who left because of family issues are also less likely to save their distributions. This estimate is not statistically significant at conventional levels, although the t statistic is well above 1.0. Estimates using retirement saving, on the other hand, are much smaller in magnitude for the disability and family issues variables, and none of the other reasons for job separation affect the choice to save a distribution.

Leaving a job because of disability and family issues are life situations over which the individual has little control. They are also situations in which the immediate need for finances - be it health care costs for disability or increased living costs for taking

³² I refer to conventional levels as statistical significance of no more than at the 10 percent level.

care of a family member - may override the need to save for retirement, be it in general or retirement vehicles. To test whether all four of the dummies belong in equation (1), I test their joint significance and obtain an F statistic of 1.82 with a p-value of 0.12. Although the estimate is not statistically significant at conventional levels, the relatively low p-value provides moderate evidence that circumstances at the time of distribution receipt do have an effect on the use of pension distributions.

Given that the estimates thus far show that retirement education has no effect on pension preservation, I must address an issue in the data that may affect this result. The HRS does not give the year the individual attended the retirement meeting, but it does give the year he separated from his job. As a result, some workers could have taken the class *after* making the choice on how to use their distribution. If this is the case, then the coefficient estimate on the retirement meeting variable does not measure what is intended in this analysis - the effect of retirement classes on pension preservation. The estimates may show no effect of retirement education on pension preservation, when in fact an effect does exist in the relevant population.

In order to investigate the possibility of the sequence of events affecting the results, I estimate equation (1) using a sub sample of 299 individuals from my sample of 938, all of whom were not employed at the time of the interview. The HRS differentiates between two types of individuals in the data: respondents that are currently working (CW) and those who are currently not working (CNW).³³ Both types state the year they left their last job (and hence made their choice regarding the use of their pension distribution). Approximately one-third of the sample is CNW. Of those CNW, 80 percent of those who attended a retirement meeting attended it at an employer. Since

these CNW do not have a current job, but attended the meeting at an employer, they must have taken the class before they received their distribution upon separation from this previous employer.³⁴ This fact in mind, I re-estimate equation (1), only this time using only those CNW who took their class from their employer. I then compare the results to those for the full sample.

Tables 1.7 and 1.8 report the results for both definitions of saving. Estimates using the whole sample are also included for comparison. I report estimates without control variables added to the model in columns (1) and (3). As is reported in Table 1.5, all respondents have a 5 percent increased probability of saving their distributions in all types of saving if they took a class, compared to 3 percent for the CNW. When looking at only retirement vehicles, all respondents have a 4 percent increased probability of saving their pension if they attended a meeting, while the CNW experience a 3 percent increased probability. Both estimates from the sub sample, like the full sample, are not statistically significant. Columns (2) and (4) report the results when adding controls. As is shown for the full sample, the estimates for the CNW become negative and remain small and statistically insignificant. While the full sample estimates are -0.04 for all types of saving and -0.07 for retirement saving, the CNW estimates are -0.07 and -0.05, respectively. The similarity of estimates from the two samples leads me to conclude that the lack of information regarding the sequence of events is not driving the results in Tables 1.5 and 1.6.

³³ They are currently not working for various reasons such as retirement, disability, unemployment, etc.

³⁴ Since I am only using the most recent distribution in the analysis, the possibility of the CNW respondent taking an employer-sponsored class from an employer previous to the one from which he received the distribution is not a concern.

Selection

The decision to attend a retirement meeting may be motivated by the same unobserved saving tastes that affect the decision to save a pension distribution. In fact, Bernheim and Garrett (1996) find that the decision to use employer-sponsored retirement education is negatively correlated with unobserved saving tastes. If this is in fact the case, then the coefficient on R in equation (1) is underestimated, and all parameter estimates are biased and inconsistent.

To address the possibility that DC participants select into retirement meetings based upon omitted saving characteristics, I include a set of proxy variables to control for unobserved tastes. The vector, P , in equation (1) contains these proxies. The HRS is a rich source from which to choose proxy variables. I construct variables from measures that control for bequest intent, mortality risk, planning horizon, uncertainty about the future and liquidity constraints, and risk aversion. These variables control for a wide variety of personal characteristics that affect saving behavior in general. However, since it is not possible to be certain if additional unobservables exist after I add the proxy variables to the model, I must assume that no further omitted factors are incorporated in the error term that are correlated with either the observables or the proxy variables in order to obtain consistent estimates.

I base my choice of variables to include in P on two factors. First, a good proxy variable must be correlated with innate saving characteristics of the individual, rather than characteristics that are the result of taking a retirement class. One way to reduce the probability of reverse causality is to use stock, rather than flow, variables. Stock measures such as current net wealth take a relatively long time to accumulate. Yearly

saving measures, on the other hand, are accumulated in short time periods and can change significantly from year to year. These measures are more likely to represent temporary saving, which would be more likely than net wealth to reflect tastes for saving that result from taking a class.

I also look at the theoretical framework put forth by HLP (1998) to decide which proxy variables to include in P. By augmenting an extended version of a life cycle model developed by Hurd (1989a, 1990b, 1997)³⁵ to pension distributions specifically, HLP identify specific saving characteristics that affect the pension preservation choice. They then construct an empirical model testing the relationship of these characteristics to pension preservation using data from the 1992, 1994 and 1996 waves of the HRS. The following paragraphs include descriptions of the proxy variables I use in my estimation, many of which are also used by HLP in their empirical model.

Bequest intent is measured using a binary variable that equals one if the respondent said he intends to leave a large bequest, zero otherwise. I quantify expectations about mortality in a binary variable constructed from the respondent rating the likelihood that he will live until age 85. This variable represents the respondent's own estimation of his mortality risk, and equals one if he feels there is at least a 50 percent chance he will live to be age 85. The fact that this question asks for the

³⁵ HLP augment a version of the life cycle that includes bequest motive (Hurd 1989a, 1990b), uncertain health and medical expenditures for both members of a couple (Lillard and Weiss 1997), as well as using a couple-level utility function in addition to an individual utility function (Hurd 1997). Following Yaari (1965), they use a time-separable utility function, separable in consumption and bequests, where the only uncertainty is the date of death. Couples and individuals have initial bequeathable wealth with a non-negativity constraint, rights to pensions, and access to annuity streams such as Social Security. The model does not include a choice whether to work or not, hence, it is applicable to respondents only after they reach retirement or become disabled.

A life cycle model estimating the amount one would be willing to pay to annuitize bequeathable wealth is also incorporated into the analysis. Together these two models lend support to an empirical model with a trinomial choice dependent variable: annuitize the distribution, save it, or consume it. However, because

respondent's *own* assessment of longevity (versus estimates based on standard longevity scales) is important: how long the individual himself expects to live affects his rate of future discount. Expecting a shorter life - and hence - a shorter retirement (if one at all) could mean a shorter time horizon for planning and subsequent low amount of saving, and a lower probability of saving a pension distribution.³⁶

I construct two sets of dummy variables to control for individual planning horizon. The first set includes three binary variables that represent the financial planning period most important to the respondent. I incorporate the responses into three different time periods: a few months to a year, a few years to ten years, and more than ten years. The second set includes four dummy variables that I construct from responses to a question asking how much the individual thinks about retirement. The answers given by the respondents are classified into thinks much, some, little, or not at all about retirement.

I control for uncertainty about the future and liquidity constraints by including a continuous variable for total net worth, measured in 1993 dollars. Those with lower net worth have fewer private resources for retirement and may be more uncertain of future financial security. In addition, lower net worth may mean more debt, resulting in a lower likelihood of securing future credit.

To control for risk aversion, I construct a binary variable that equals one if the individual is risk averse, and equals zero otherwise.³⁷ Risk averse individuals may have a greater taste for precautionary saving, thus being more likely to save their distributions to

the number of respondents in the data choosing to annuitize is so small, annuitization is incorporated into the choice described as saving the distribution, and the model becomes a binomial choice model.

³⁶ Unless, of course, the individual is planning on using the pension to cover medical costs. I attempt to control for this in the variable indicating leaving the job because of disability.

³⁷ This measure is constructed from a question regarding an income gamble. The individual is asked whether he would take a new job that had a fifty percent chance of doubling his income and a fifty percent chance of cutting it in half. I label him as risk averse if he chooses not to take the job.

insure themselves against uncertain events, particularly those in old age.

I report the estimates on the retirement meeting variable after adding the proxy variables in Tables 1.5 and 1.6, column (3). Table 1.5 shows that the coefficient estimate remains negative and decreases by a small amount - about 1 percentage point to -0.05 - but continues to be statistically insignificant when looking at all types of saving. When using the narrow definition of saving in Table 1.6, the estimate is also negative and decreases by a slightly greater amount (2 percentage points) to -0.09. The estimate is still statistically insignificant at conventional levels, but with a t statistic of 1.48.

The increase in magnitude (in absolute value) of the estimates with the addition of the proxy variables suggests downward bias in the initial estimates on the retirement meeting variable. However, with such small changes in estimates that are statistically equal to zero, it is difficult to determine with any amount of certainty whether selection bias is in fact affecting the estimates.

The Effect of Retirement Meetings on Different Subgroups

If it is true that all DC participants react similarly to retirement education (and there is no selection bias), then the estimates in column (2) of Tables 1.5 and 1.6 represent the effect of retirement education on pension preservation for the population of individuals who had a DC plan in a previous job. Because it is possible that these estimates are being driven by the different effects retirement classes have on select groups (as is suggested from the tabulations in Table 1.4), I estimate equation (1) and include the interaction terms ($R*c$), ($R*y$) and ($R*f$). I estimate the model with and without proxy variables.

Table 1.9 reports the effect of retirement meetings on saving a distribution by age, education and gender. I report the estimates for all types of saving in column (1) and for retirement saving only in column (3). Workers age 40 and under have a 28 percent higher³⁸ probability of saving their distribution in all types of savings if they attended a meeting (estimated with 90 percent confidence), but there is no effect on investment in retirement vehicles only. These results are not surprising considering the stage in the life cycle of these workers. Younger individuals, many who are not yet planning seriously for retirement, attend a retirement class and realize the importance of saving for retirement. But because of the decreased liquidity that is characteristic of tax-deferred vehicles, they are more likely to choose to save their distributions in all types of saving vehicles than in retirement accounts only.³⁹ Estimates show no effect of retirement classes on the saving of distributions for individuals over age 40.

College graduates who attend meetings have a lower probability of saving their distributions than college graduates who do not attend a meeting, regardless of the definition of saving used. Those with a college degree have a 16 percent smaller likelihood of saving their distribution in all types of savings vehicles, and an 18 percent smaller probability of re-investing the money in a retirement account. Both estimates are statistically significant at conventional levels. There is no effect of retirement education on the use of a pension distribution for non-college graduates.

³⁸ I calculate the effect of retirement education for those age 40 and under by evaluating the linear combination: $\alpha_j + \omega_{1j} + (c)\omega_{2j} + (f)\omega_{3j}$, where c and f are the sample means for college graduates and females, respectively. I calculate the effects for the other five groups in a similar manner.

³⁹ In order to see if the preference for general saving vehicles is driving the strong effect of the estimates using the broad definition of saving, I define a new dependent variable measuring re-investment in general saving vehicles only, which is equal to the difference between the variables for all types of saving and retirement saving only. The same specification is estimated, only using this new dependent variable. The estimate on the retirement meeting variable is 0.35, with a robust standard error of 0.17 (not reported in tables).

The negative coefficient estimates for college graduates appear on the surface to be unintuitive, especially considering existing evidence suggests that retirement education has a positive, albeit relatively small, effect on flow savings and net wealth measures.⁴⁰ A smaller effect of retirement education on saving distributions for college graduates would follow from the evidence that college graduates possess more financial knowledge, hence gaining less from a retirement class. However, the fact that the effect of retirement education is negative means that college educated individuals are actually more likely *to spend* their distributions after taking a class.

Perhaps the explanation for the results for college graduates lies within the difference between deciding to save a *pension distribution* and to save *in general*. As was shown in the first section of the paper, the most widely offered topics in retirement education are description of the pension plan (88 percent) and estimation of income needed for retirement (73 percent). Impact of pre-retirement withdrawals on retirement income is the least covered topic, with only 39 percent of firms including this topic in their retirement education agenda (EBRI, 1995). Because consumption of pension distributions has become a concern to private as well as government organizations only recently, an even smaller percentage of firms most likely covered the importance of pension preservation in their educational material if the individual took the retirement class in the 1980s or early 1990s.

A 1996 EBRI Issue Brief shows how workers may react to knowledge gained from retirement education. Employees whose retirement education included estimating the amount needed for retirement had the highest average equity allocation (42 percent), in comparison with any other topics covered. This is attributed to the surprise many

⁴⁰ See Bernheim and Garrett (1996).

employees feel when they realize how much they actually need to save for retirement.

This realization may result in either increased pension contributions or a reallocation of the pension portfolio to more risky assets in hopes of increasing long-run rates of return.

The EBRI report also notes that two of the lowest average equity holdings are for retirement education that covers explanation of the company pension plan (40 percent) and the impact of pre-retirement withdrawals (38 percent). In the report the authors propose that upon learning that distributions are available before retirement, employees treat their funds more as a short-run investment and decrease the aggressiveness of their holdings (EBRI, 1996). And if employees learn through retirement education classes that they have access to their pensions before retirement, they may also decide to spend them upon job separation.

This may explain why an individual may choose to spend his pension after taking a class, but it does not explain why college graduates in particular are more vulnerable. EBRI (1996) reports that the more financially knowledgeable the individual, the more likely he is to have retirement savings outside of Social Security and employer pensions set aside for retirement.⁴¹ As is noted in Section 2, evidence shows that those with college degrees are more financially knowledgeable than non-college graduates. Hence, college graduates should have more private savings set aside than non-college graduates. With calculating retirement income and a description of the pension plan being two of the most common educational topics covered, the college graduate may find he has overestimated his income needs and does not need to save his pension distribution. With additional private savings set aside, he may feel he can afford it more so than the less

wealthy, non-college graduate.

Table 1.9 shows that females are estimated to have a 15 percent lower probability of saving their distribution in retirement vehicles if they attend a meeting, with no effect on all types of saving. Males do not use their distributions differently if they attend a meeting, regardless of the definition of saving used. A negative effect for females than for males would be logical, given that many females, especially those of the age bracket studied in the HRS, are often the secondary earners in the household. Females may consider preservation of their pension of secondary importance, and learning that they can spend the money may result in an increased incidence of non-preservation.

Columns (2) and (4) report the estimates after adding proxy variables to the specifications. Adding the proxy variables decreases the estimates for college educated individuals by 2 percentage points, to -0.18 using the broad definition of saving. When looking at saving distributions in retirement vehicles only, the estimate also decreases, from -0.18 to -0.21. Both estimates remain statistically significant. Workers age 40 and under who take a retirement class save their distribution in all types of saving 24 percent more often, down from 28 percent when the proxies are omitted. This 4 percentage point drop results in the estimate for younger individuals to no longer be statistically significant at conventional levels. The rate at which retirement education effects female saving in retirement accounts does not change with the addition of the proxy variables - the estimate remains at -0.15.

The changes in the estimates for the college educated and younger individuals move in different directions with the addition of proxy variables. For college educated

⁴¹ It is possible that those who are more financially knowledgeable got that way because they (for some other reason) chose to start saving for retirement. Bernheim (1998) rejects this line of causation by

individuals, the increase (in absolute value) of the estimates suggests the original estimates are underestimated, while the decrease in the estimates for workers age 40 and under suggests the original estimates are overestimated.

In addition to reporting the effects of retirement education separately by age, education and gender, I look at the effects for groups each possessing different combinations of these three characteristics. Table 1.10, columns (1) and (3) report OLS estimates for eight different types of DC participants, each group with specific age, education, and gender characteristics.

Three types of individuals show statistically significant effects on pension preservation from attending retirement meetings. Males age 40 and under without college degrees save their distributions in all types of savings 41 percent more often when they take a retirement class (significant at the 5 percent level). There is no effect using the more narrow definition of saving. The absence of any effect of retirement meetings for this specification is not surprising, given the tendency for younger participants to save their distributions in general saving vehicles. In fact, when looking at the OLS estimates for the other three groups with individuals age 40 and under, in two of the three the pattern is similar: positive estimates for saving in all types of saving vehicles, and negative estimates for saving in retirement vehicles only, although some of the coefficients are not statistically significant at conventional levels.⁴²

Females who have a college degree save their distributions less often when they attend a retirement meeting, regardless of age. The older group has a lower probability of

estimating a model using macroeconomic knowledge as an instrument for financial knowledge.

⁴² Because the dependent variable for retirement saving is equal to 0 if an individual spends his pension or saves it in a general account, the estimate using retirement saving can be negative and the individual can still save the pension in a general savings account.

saving their distribution if they attended a meeting (29 percent for all types of saving, 27 percent for retirement saving), with both estimates statistically significant at the 5 percent level. Those age 40 and under save their pensions 31 percent less often in retirement vehicles and 34 percent less often when I include proxies in the specification, however the estimate is statistically significant only in the specification including the proxies. Meetings have no effect for this younger group when using the broad definition of saving.

Estimation with Instrumental Variables

The addition of proxy variables in equation (1) is one method of addressing possible selection into retirement education classes. Another method is to use instrumental variable (IV) estimation. For IV estimation to provide consistent estimates, the instruments must be correlated with the retirement meeting variable, R , but be uncorrelated with the error term.

The preferred instrument for the choice to attend a meeting is whether the individual was *offered* a retirement class by their employer⁴³, since existing evidence suggests that the offering of employer-sponsored classes is motivated by employer choice rather than employee demand.⁴⁴ Unfortunately this measure is not available in the HRS. Data on occupation and industry is available for the individual's previous job, which may be correlated with the employer's decision to offer a meeting.⁴⁵ Industry is uncorrelated

⁴³ Although individuals who took retirement meetings not sponsored by their employer are included in the sample, 70 percent of respondents did take their meeting at an employer. Both the OLS and IV estimates using the variables for attending a meeting (any type) and attending an employer-sponsored meeting are qualitatively similar.

⁴⁴ See BBS (1996).

⁴⁵ BBS (1996) found that employers offer education more often with low participation and contribution

with attending a meeting (p-value of 0.7), and so is not a good IV candidate. Occupation, however, is highly correlated with attending a meeting (p-value of 0.006, F statistic of 2.75) and so could be used to instrument for the retirement meeting variable. IV estimation requires the addition of a reduced-form equation for attending a meeting:

$$R = X\beta + Z\phi + v, \quad (2)$$

where Z contains 10 binary variables indicating occupation at a previous job to be used as instruments for attending a meeting.⁴⁶

Whether or not occupation is correlated with the error term is questionable. If choice of occupation is motivated by unobservables that also affect the decision to save a distribution, then the IV estimates are inconsistent. It is possible that motivating factors in choosing a job include attitude toward risk, planning horizon, or uncertainty about the future. For example, those who prefer risk may choose employment as an investment banker or an entrepreneur, while those who are more risk averse may prefer a more stable occupation. Because of this possibility, I estimate the model first by omitting the proxy variables and then by including the proxies in the specification.

I report the IV estimates for the effects of attending a meeting, with and without proxy variables, in Table 1.11. In the first row, I report the estimates for the effects of a

rates in their DC plans from low-compensated workers - in other words, as a remedial measure. Blue collar and service workers tend to have lower income than white collar workers, so they may be more likely to be offered a meeting. One problem with this line of reasoning exists, however. Since the makeup of white collar, blue collar and service workers at each respondent's former employer is not known, I can not be certain that just because an individual is a blue collar worker that the workforce at that employer is also made up of mostly blue collar and service employees.

⁴⁶ The HRS records occupation using the Census Bureau Master Codes, but condenses them into 17 different groups for data reporting purposes. The 17 codes could be described in terms of three types of occupations: white collar (i.e., managerial and professional occupations), blue collar (i.e., mechanical, transport, and construction occupations), and service (i.e., public and food service occupations). Because some of the codes contained under 20 observations, I condensed the 17 codes into 10 dummy variables according to magnitude and sign of correlation with the retirement meeting variable. The resulting F statistic testing joint significance of the occupation variables is higher when using the 10 occupation

retirement class without accounting for variation among different groups. For all types of saving, the IV estimate is ten times as large in magnitude as the estimate using OLS at -0.40, with a robust standard error approximately 7 times as large as the OLS estimate. The increase in the estimate and standard error is also large when estimating the model using retirement saving vehicles only. IV estimates in column (3) show that DC participants who attend meetings save their distributions 41 percent less often than those who do not attend a meeting. Estimates using either definition of saving are statistically equal to zero.

Adding the proxy variables results in the estimates becoming substantially less negative. Attending a retirement class decreases the probability of saving a distribution in all types of savings by 11 percent, while reducing the likelihood of saving in retirement vehicles by 15 percent. Standard errors remain extremely large in both specifications, and neither estimate is significant. Regardless of the inclusion of proxy variables, the conclusion using IV estimation is the same: there is no effect of retirement education on pension preservation.

The IV estimates measuring the effect of retirement classes by age, education, and gender are imprecise, whether or not the proxy variables are included in the model. The estimate for workers age 40 and under increases from 0.28 using OLS (with no proxies) to 0.86 using IV estimation, with the standard error increasing from 0.16 to 0.55. Similar patterns emerge when looking at college educated individuals and females. Estimates rise in absolute value substantially, with an increase in standard error equal to or larger than the increase in the estimate. Estimates that are significantly different from zero

variables ($F=2.8$ without proxies in the specification, 2.2 with proxies) than when using all 17 ($F=1.6$ without proxies, 1.4 without).

using OLS are no longer statistically significant using IV estimation, whether proxy variables are included or not. In addition, groups whose estimates show no effect of retirement education using OLS - specifically those over age 40 and males - show large, statistically significant effects using IV estimation.

The huge IV estimates and standard errors, as well as the large difference between the OLS and IV estimates, leads me to believe that IV estimation is not necessary. In order to lend evidence to this conclusion, I perform Hausman tests, one using the IV estimates without proxy variables in the specification and one including the proxy variables, for both definitions of saving. I do the test using the specification without the interaction terms.

P-values ranging from 0.35 to 0.72 indicate that I am unable to reject the null hypothesis that the retirement variable is uncorrelated with the unobservables.⁴⁷ With these results, and the large differences between the OLS and IV estimates, the preferred estimates are those using OLS.

6. CONCLUSION

This paper is the first analysis to evaluate an additional means aside from tax legislation in affecting the consumption of pension distributions. I find that retirement education substantially increases the probability of saving a distribution for participants age 40 and under, while decreasing the probability of saving a distribution for college graduates and females. These important differentials are concealed by estimating the effect of retirement education on participants generally.

⁴⁷ P-values are as follows: all types of saving, no proxies, 0.34; with proxies, 0.71; retirement saving, no proxies, 0.37; with proxies, 0.72.

These results do not necessarily contradict the findings of Bernheim and Garrett (1996), who estimate that retirement education has a positive effect on saving behavior. I have proposed that one result of attending a retirement meeting may be to merely inform the participant that he has the option to spend his distribution upon job separation. This information in turn could increase the likelihood that certain groups of participants will spend their distributions. Given the relatively small percentage of retirement education that covers the topic of pension distributions in depth, it is likely that this information was not accompanied by further explanations of the effects on retirement security of spending distributions prematurely. More detailed data is needed to examine both the initial knowledge of participants regarding pensions distributions, as well as the extent to which retirement education programs are informing pension participants of the consequences of spending their distributions.

REFERENCES

Andrews, Emily S., "Retirement Savings and Lump Sum Distributions," Benefits Quarterly, 2: 1991, pp. 47-58.

Atkins, G. L., "Spend it or Save it? Pension Lump Sum Distributions and Tax Reform," Washington, D.C.: Employee Benefit Research Institute, 1986.

Bassett, William F., Michael J. Fleming, and Anthony P. Rodrigues, "How Workers Use 401(k) Plans: The Participation, Contribution, and Withdrawal Decisions," National Tax Journal, 51(2): June 1998, pp. 263-89.

Bayer, Patrick, B. Douglas Bernheim, and John Karl Scholz, "The Effects of Financial Education in the Workplace: Evidence from a Survey of Employers," National Bureau of Economic Research Working Paper no. 5655, July 1996.

Beller, Daniel J., "Introduction and Summary of Major Findings," in Trends in Pensions, 1992, edited by John A. Turner and Daniel J. Beller, 285-317. Washington, D.C.: Government Printing Office, 1992.

Bernheim, B. Douglas, "Comments and Discussion," Brookings Papers on Economic Activity, (1): 1994b, pp. 152-166.

Bernheim, B. Douglas, "Financial Illiteracy, Education, and Retirement Saving," in Living with Defined Contribution Pensions: Remaking Responsibility for Retirement, edited by Olivia S. Mitchell and Sylvester J. Schieber, 38-68. Philadelphia, Pennsylvania: Pension Research Council, the Wharton School of the University of Pennsylvania, and the University of Pennsylvania Press, 1998.

Bernheim, B. Douglas, "Personal Saving, Information, and Economic Literacy: New Directions for Public Policy," in Tax Policy for Economic Growth in the 1990s, Washington, D.C.: American Council for Capital Formation, 1994a, pp. 53-78.

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

Bernheim, B. Douglas, and John Karl Scholz, "Private Saving and Public Policy," National Bureau of Economic Research Working Paper no. 4215, 1992.

Burman, Leonard E., Coe, Norma B., and William G. Gale, "Lump Sum Distributions from Pension Plans: Recent Evidence and Issues for Policy and Research," National Tax Association Spring Symposium Meetings, May 1999.

REFERENCES (continued)

Chang, Angela E., "Tax Policy, Lump-Sum Pension Distributions, and Household Saving," National Tax Journal 49(2): June 1996, pp. 235-52.

Dickemper, Jennifer, and Paul Yakoboski, "Increased Saving but Little Planning: Results of the 1997 Retirement Confidence Survey," Employee Benefit Research Institute Issue Brief no. 191, November 1997.

Employee Benefit Research Institute, "Can We Save Enough to Retire? Participant Education in Defined Contribution Plans," Employee Benefit Research Institute Issue Brief no. 160, April 1995.

Employee Benefit Research Institute, "Participant Education: Actions and Outcomes," Employee Benefit Research Institute Issue Brief no. 169, January 1996.

Engelhardt, Gary V., "Pre-retirement Lump Sum Distributions and Retirement Income Security: Evidence from the Health and Retirement Survey," Dartmouth College, Mimeo, 1999.

Fernandez, Phyllis A., "Preretirement Lump-Sum Distributions," in Trends in Pensions 1992, edited by John A. Turner and Daniel J. Beller, 285-317. Washington, D.C.: Government Printing Office, 1992.

Fronstin, Paul et al., "Lump-Sum Distributions and Rollovers," Employee Benefit Research Institute Databook on Employee Benefits, eds. Deborah Holmes et al., Washington, D.C.: Employee Benefit Research Institute, 1997.

Hurd, Michael D., "The Joint Retirement Decision of Husbands and Wives," in Issues in the Economics of Aging, edited by David Wise, 231-254. Chicago, Illinois: University of Chicago Press, 1990b.

Hurd, Michael D., "Mortality Risks and Bequests," Econometrica, 1989a, pp. 779-813.

Hurd, Michael D., "Mortality Risk and Consumption by Couples," RAND Working Paper 2061-NIA, 1999.

Hurd, Michael D., Lee Lillard, and Constantijn Panis, "An Analysis of the Choice to Cash Out Pension Rights at Job Change or Retirement," RAND Working Paper 1979-DOL, October 1998.

Lillard, Lee, and Yoran Weiss, "Uncertain Health and Survival: Effects on End of Life Consumption," Special Issue: Dynamic Structural Models, Journal of Business and Economic Statistics, 15(2): 1997, pp. 254-268.

REFERENCES (continued)

Pensions and Investments. "Employees Getting More: Investment Education, Planning Help on the Increase," January 23, 1995, p. 74.

Piacentini, Joseph S., "An Analysis of Pension Participation at Current and Prior Jobs, Receipt and Use of Preretirement Lump-Sum Distributions, and Tenure at Current Job," Washington D.C.: Employee Benefit Research Institute, 1990.

Poterba, James M., Steven F. Venti, and David A. Wise, "Lump-Sum Distributions From Retirement Saving Plans: Receipt and Utilization," in Inquiries in the Economics of Aging, edited by David A. Wise, 85-105. Washington, D.C.: National Bureau of Economic Research, 1998.

Scott, Jason S., and John B. Shoven, "Lump-Sum Distributions: Fulfilling the Portability Promise or Eroding Retirement Security?" Employee Benefit Research Institute Issue Brief no. 178, October 1996.

Smith, James P, "Marriage, Assets, and Savings," RAND Working Paper 1055-NIA, March 1995.

United States Congress, Joint Committee on Taxation, "General Explanation of the Tax Reform Act of 1986," Washington, D.C.: Government Printing Office, 1987.

Yaari, M., "Uncertain Lifetime, Life Insurance, and the Theory of the Consumer," Review of Economic Studies, 32: 1965, pp. 137-150.

Yakoboski, Paul, "Large Plan Lump-Sums: Rollovers and Cashouts," Employee Benefit Research Institute Issue Brief no. 188, August 1997.

Yakoboski, Paul, "Preservation and Annuitization in Retirement Saving Accounts," Employee Benefit Research Institute Notes 19(1), January 1998, pp. 1-3.

TABLE 1.1
Summary Statistics

	<u>Mean</u>	<u>Standard Deviation</u>
Attended a retirement class	19 %	39 %
Retirement class was sponsored by employer	72	45
Female	49	50
Black/other	22	41
College degree is highest degree obtained	25	43
Married	75	44
Age 40 and under	15	36
Total household labor income >\$35,000	59	49
Left job - family problems	12	32
Left job - unemployed	29	45
Left job - disabled	13	34
Left job - retired	17	38
Left job - quit	28	45
At least a 50 percent chance of living until age 85	35	48
Expects to leave large inheritance	47	50
Thinks much about retirement	29	46
Thinks some about retirement	24	43
Thinks little about retirement	17	37
Does not think at all about retirement	30	46
Short saving horizon (few months-year)	25	44
Medium saving horizon (few years-5 to 10 years)	64	48
Long saving time horizon (over 10 years)	11	31
Risk averse	71	43
Age at time of distribution	49	8.5
Family labor income at time of distribution	\$50,247	\$53,047
Amount of distribution in 1993 dollars	\$33,797	\$81,147
Number of dependents in household in 1993	1.5	1.1
Total net worth in 1993	\$295,039	\$687,818

Total number of observations equals 640. Individuals who did not answer the retirement meeting question or whose use of pension balances could not be classified in the savings dependent variable are not included in the tabulations. Responses that could not be classified include other uses (1 percent of total sample), lost pension (4 percent), or use of distribution not available (12 percent).

Tabulations for retirement class sponsored by employer are conditional on taking a class, and are calculated from 121 observations. Variables for age, married, labor income, and amount of distribution refer to the time period in which the respondent separated from his job. Labor income and amount of distribution were initially recorded in nominal dollars for the year of separation, and are expressed here in 1993 dollars.

TABLE 1.2
Uses of Pension Distribution Upon Job Separation
Expressed in Percentages

<u>Use of Pension</u>	<u>Percent of Full Sample</u>
Saved in all types of savings vehicles	69 %
Saved in a retirement vehicle	60
Spent	31
Saved in non-retirement account	6
Paid down debt	3
Left in old employers account	30
Transferred to new employer	3
Rolled into an annuity	5
Rolled into/invested in an IRA	22

Total number of observations equals 640. Rows 1 and 2 report the percentages of respondents who saved their distributions, using each definition of saving. Rows 3 through 9 report the percentage of respondents who used their distribution in each specific way, and adds up to 100 percent.

TABLE 1.3
Percentage of Individuals who Attended a Retirement Meeting
and Saved their Pension Distributions, by Group

<u>Group</u>	<u>Attended a Meeting</u>	<u>Saved in All Types of Vehicles</u>	<u>Saved in Retirement Vehicles Only</u>
	(1)	(2)	(3)
Age received distribution			
< = age 40	14 %	58 %	36 %
> age 40	20	71	64
At least a college degree	30	80	74
No college degree	15	66	56
Female	18	63	51
Male	20	75	69

Total number of observations equals 640. Column (1) reports the percentage of the sample that attended a retirement class. Columns (2) and (3) report the percentage of individuals that saved their pension distributions, depending on the definition of saving used.

TABLE 1.4
Disposition of Pension Distributions by Retirement Meeting Attendance
Expressed in Proportions

Group	Attended A Class (1a)	All Types of Saving		Attended A Class (2a)	Retirement Saving		Number of Observations
		Did Not Attend a Class (1b)	Difference (1c)		Did Not Attend a Class (2b)	Difference (2c)	
All respondents	.73	.68	.05	.64	.59	.05	640
Age 40 and under	.78	.54	.24*	.36	.36	0	97
Over age 40	.72	.71	.01	.67	.64	.03	540
Female	.61	.63	-.02	.49	.52	-.03	312
Male	.83	.73	.10*	.77	.67	.10*	328
No college degree	.71	.64	.07	.59	.55	.04	481
College degree	.75	.82	-.07	.71	.75	-.04	159

Column (1), All Types of Saving, includes paying down debt or saving in a general savings account only. Column (2), Retirement Saving, includes leaving money with former employer, transferring balance to new employer, investing in an annuity, or rolling balance over directly or indirectly into an IRA. The number of those age 40 and under and over 40 does not add to 640 because missing data for the year the distribution was received does not allow me to calculate their age at time of job separation.

** significant at 5 percent level

* significant at 10 percent level

TABLE 1.5
Effects of Retirement Education on Pension Preservation
Saving defined as ALL TYPES OF SAVING

Dependent Variable: All Types of Saving	(1)	(2)	(3)	(4)	(5)
Attended a retirement class	0.05 (0.05)	-0.04 (0.06)	-0.05 (0.06)	0.07 (0.10)	0.06 (0.10)
Female		-0.05 (0.05)	-0.07 (0.05)	-0.03 (0.05)	-0.04 (0.05)
Black/other		-0.10 (0.06)	-0.12* (0.07)	-0.10 (0.06)	-0.12* (0.07)
College degree		0.14** (0.05)	0.14** (0.05)	0.20** (0.06)	0.20** (0.06)
Married		-0.03 (0.06)	-0.04 (0.06)	-0.04 (0.06)	-0.05 (0.06)
Amount of distribution		0.005** (0.002)	0.005** (0.002)	0.005** (0.002)	0.005** (0.002)
Age 40 and under		-0.03 (0.10)	-0.04 (0.10)	-0.09 (0.10)	-0.10 (0.11)
Household annual labor income is > \$35,000		0.15** (0.05)	0.12** (0.06)	0.16** (0.05)	0.13** (0.06)
Number of dependents		-0.01 (0.02)	-0.01 (0.02)	-0.02 (0.02)	-0.02 (0.02)
Left job - fired/laid off		-0.02 (0.06)	-0.02 (0.06)	-0.02 (0.06)	-0.02 (0.06)
Left job - disabled		-0.18** (0.08)	-0.14* (0.08)	-0.18** (0.08)	-0.14* (0.08)
Left job - retired		-0.04 (0.07)	-0.06 (0.08)	-0.03 (0.08)	-0.05 (0.08)
Left job - family issues		-0.13 (0.09)	-0.14 (0.09)	-0.12 (0.08)	-0.13 (0.09)
Retirement meeting *college degree				-0.20* (0.11)	-0.22* (0.12)
Retirement meeting*age 40 and under				0.35** (0.18)	0.31* (0.18)
Retirement meeting *female				-0.16 (0.11)	-0.15 (0.11)
Total net worth			0.00007 (0.0003)		0.00006 (0.0003)
Plan to leave large inheritance			0.03 (0.05)		0.03 (0.05)
At least 50 percent chance of living until age 85			0.09* (0.05)		0.08* (0.05)

TABLE 1.5 (continued)

Thinks much about retirement			0.03 (0.06)		0.02 (0.06)
Thinks some about retirement			0.03 (0.07)		0.02 (0.06)
Thinks little about retirement			-0.01 (0.08)		-0.03 (0.08)
Saving horizon 1-10 years			0.10* (0.06)		0.09 (0.06)
Saving horizon over 10 years			0.01 (0.08)		0.02 (0.09)
Risk averse			0.01 (0.05)		0.005 (0.05)
Constant	0.68** (0.02)	1.14** (0.16)	1.13** (0.18)	1.23** (0.12)	1.14** (0.16)
R ²	0.002	0.18	0.20	0.20	0.22
Observations	640	461	449	461	449

Dependent variable is whether the respondent saved his pension upon changing jobs. Saving is defined as putting the money in a retirement vehicle (old employer's account, IRA, annuity, new employer's account), general saving vehicle, or paying off debt. Variables for net worth and amount of distribution are in ten-thousand 1993 dollars. Base cases are quit job, does not think at all about retirement, and saving horizon less than a year. Year dummy variables for the year of the distribution are included in columns (2)-(5).

Columns: (1) mean; (2) add control variables; (3) add proxy variables; (4) add interaction terms to (2); (5) add proxy variables to (4).

Robust standard errors are in parentheses.

** significant at 5 percent level

* significant at 10 percent level

TABLE 1.6
Effects of Retirement Education on Pension Preservation
Saving Defined as RETIREMENT SAVING

Dependent Variable: Retirement Saving	(1)	(2)	(3)	(4)	(5)
Attended a retirement class	0.04 (0.05)	-0.07 (0.05)	-0.09 (0.06)	0.09 (0.09)	0.06 (0.09)
Female		-0.09** (0.05)	-0.11** (0.05)	-0.06 (0.05)	-0.08 (0.05)
Black/other		-0.13** (0.06)	-0.15** (0.07)	-0.13** (0.06)	-0.16** (0.07)
College degree		0.19** (0.05)	0.18** (0.06)	0.24** (0.06)	0.23** (0.06)
Married		-0.01 (0.06)	-0.01 (0.06)	-0.02 (0.06)	-0.02 (0.06)
Amount of distribution		0.006** (0.002)	0.005** (0.002)	0.005** (0.002)	0.005** (0.002)
Age 40 and under		-0.15 (0.10)	-0.16* (0.10)	-0.16 (0.10)	-0.17 (0.10)
Household annual labor income > \$35,000		0.18** (0.05)	0.15** (0.05)	0.18** (0.05)	0.16** (0.05)
Number of dependents		-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.04* (0.02)
Left job - fired/laid off		0.002 (0.06)	0.01 (0.06)	0.001 (0.06)	0.009 (0.06)
Left job - disabled		-0.04 (0.08)	0.01 (0.08)	-0.03 (0.08)	0.02 (0.08)
Left job - retired		0.009 (0.07)	0.02 (0.08)	0.01 (0.08)	0.02 (0.08)
Left job - family issues		-0.08 (0.08)	-0.07 (0.08)	-0.08 (0.08)	-0.07 (0.08)
Retirement meeting *college degree				-0.17* (0.11)	-0.19* (0.11)
Retirement meeting*age 40 and under				-0.03 (0.20)	-0.06 (0.21)
Retirement meeting *female				-0.19* (0.11)	-0.15 (0.11)
Total net worth			-0.00006 (0.0003)		-0.00008 (0.0003)
Plan to leave large inheritance			0.05 (0.05)		0.05 (0.05)
At least 50% chance of living until age 85			0.07 (0.05)		0.07 (0.05)

TABLE 1.6 (continued)

	(1)	(2)	(3)	(4)	(5)
Thinks much about retirement			0.12* (0.06)		0.12* (0.06)
Thinks some about retirement			0.10 (0.06)		0.10 (0.06)
Thinks little about retirement			0.02 (0.07)		0.01 (0.07)
Saving horizon 1-10 years			0.04 (0.06)		0.03 (0.06)
Saving horizon over 10 years			0.02 (0.08)		0.02 (0.08)
Risk averse			0.09** (0.05)		0.08* (0.05)
Constant	0.59** (0.02)	1.23** (0.16)	1.06** (0.16)	1.36** (0.12)	1.18** (0.15)
R ²	0.001	0.27	0.30	0.28	0.31
Observations	640	461	449	461	449

Dependent variable is whether the respondent saved his pension upon changing jobs. Saving is defined as putting the money in a retirement vehicle only. See Table 1.5 for additional notes.

Robust standard errors are in parentheses.

* * significant at 5 percent level

* significant at 10 percent level

TABLE 1.7
Effects of Retirement Education on Pension Preservation
Full Sample Versus Currently Not Working (CNW)
Saving defined as ALL TYPES OF SAVING

	Full Sample		Currently Not Working (CNW)	
Dependent Variable:	(1)	(2)	(3)	(4)
All Types of Saving	Mean	Add Controls	Mean	Add Controls
Attended a retirement class	0.05 (0.05)	-0.04 (0.06)	0.03 (0.09)	-0.07 (0.10)
Female		-0.05 (0.05)		-0.13 (0.08)
Black/other		-0.10 (0.06)		-0.10 (0.10)
College degree		0.14** (0.05)		0.20* (0.11)
Married		-0.03 (0.06)		-0.007 (0.09)
Amount of distribution		0.005** (0.002)		0.009** (0.004)
Age 40 and under		-0.03 (0.10)		0.38 (0.48)
Household annual labor income > \$35,000		0.15** (0.05)		0.16* (0.09)
Number of dependents		-0.01 (0.02)		-0.02 (0.04)
Left job - fired/laid off		-0.02 (0.06)		0.09 (0.17)
Left job - disabled		-0.18** (0.08)		0.13 (0.18)
Left job - retired		-0.04 (0.07)		0.20 (0.17)
Left job - family issues		-0.13 (0.09)		-0.22 (0.18)
Constant	0.68** (0.02)	1.14** (0.16)	0.58** (0.03)	-0.004 (0.19)

TABLE 1.7 (continued)

	(1)	(2)	(3)	(4)
R ²	0.002	0.18	0.0005	0.31
Observations	640	461	251	165

Dependent variable is whether the respondent saved his pension upon changing jobs. Saving is defined as putting the money in a retirement vehicle (old employer's account, IRA, annuity, new employer's account), general savings vehicle, or paying off debt. Amount of distribution is in ten-thousand 1993 dollars. Labor income is in 1993 dollars. Base case for job separation dummies is quit job. Year dummy variables for the year of the distribution are included in columns (2) and (4).

Robust standard errors are in parentheses.

** significant at the 5 percent level

* significant at the 10 percent level

TABLE 1.8
Effects of Retirement Education on Pension Preservation
Full Sample Versus Currently Not Working (CNW)
Saving defined as RETIREMENT SAVING

	Full Sample		Currently Not Working (CNW)	
Dependent Variable:	(1)	(2)	(3)	(4)
Retirement Saving	Mean	Add Controls	Mean	Add Controls
Attended a retirement class	0.04 (0.05)	-0.07 (0.05)	0.03 (0.09)	-0.05 (0.10)
Female		-0.09** (0.05)		-0.13 (0.08)
Black/other		-0.13** (0.06)		-0.07 (0.10)
College degree		0.19** (0.05)		0.21** (0.11)
Married		-0.01 (0.06)		0.03 (0.10)
Amount of distribution		0.006** (0.002)		0.009** (0.004)
Age 40 and under		-0.15 (0.10)		0.38 (0.47)
Household annual labor income > \$35,000		0.18** (0.05)		0.17* (0.09)
Number of dependents		-0.03 (0.02)		-0.02 (0.04)
Left job - fired/laid off		0.002 (0.06)		0.10 (0.17)
Left job - disabled		-0.04 (0.08)		0.16 (0.18)
Left job - retired		0.009 (0.07)		0.20 (0.17)
Left job - family issues		-0.08 (0.08)		-0.20 (0.18)
Constant	0.59** (0.02)	1.23** (0.16)	0.57** (0.03)	-0.03 (0.19)

TABLE 1.8 (continued)				
	(1)	(2)	(3)	(4)
R ²	0.001	0.27	0.0002	0.32
Observations	640	461	251	165

Dependent variable is whether the respondent saved his pension upon changing jobs. Saving is defined as putting the money in a retirement vehicle only. See Table 1.7 for additional notes.

Robust standard errors are in parentheses.

** significant at the 5 percent level

* significant at the 10 percent level

TABLE 1.9
OLS Estimates of the Effect of Retirement Education on Pension Preservation
by Age, Education, and Gender

<u>Group</u>	<u>All Types of Saving</u>		<u>Retirement Saving</u>	
	<u>OLS</u>	<u>OLS With Proxies</u>	<u>OLS</u>	<u>OLS With Proxies</u>
	(1)	(2)	(3)	(4)
All respondents	-0.04 (0.06)	-0.05 (0.06)	-0.07 (0.05)	-0.09 (0.06)
Age 40 and under	0.28* (0.16)	0.24 (0.16)	-0.08 (0.19)	-0.13 (0.20)
Over age 40	-0.06 (0.06)	-0.07 (0.06)	-0.05 (0.06)	-0.06 (0.06)
College degree	-0.16* (0.09)	-0.18* (0.09)	-0.18** (0.08)	-0.21** (0.09)
No college degree	0.04 (0.07)	0.04 (0.07)	-0.008 (0.09)	-0.02 (0.07)
Female	-0.09 (0.08)	-0.09 (0.08)	-0.15** (0.08)	-0.15** (0.08)
Male	0.07 (0.08)	0.05 (0.08)	0.04 (0.08)	0.0006 (0.09)
Number of observations: 461				

Robust standard errors are in parentheses

** significant at the 5 percent level

* significant at the 10 percent level

TABLE 1.10
OLS Estimates of the Effect of Retirement Education on Pension Preservation
for those with Combinations of Age, Education, and Gender Characteristics

<u>Group</u>	<u>All Types of Saving</u>		<u>Retirement Saving</u>	
	<u>OLS</u>	<u>OLS</u> <u>With Proxies</u>	<u>OLS</u>	<u>OLS</u> <u>With Proxies</u>
	(1)	(2)	(3)	(4)
No college, >40, male	0.07 (0.10)	0.06 (0.10)	0.09 (0.09)	0.06 (0.09)
No college, >40, female	-0.09 (0.09)	-0.08 (0.10)	-0.10 (0.09)	-0.09 (0.09)
No college, <=40, male	0.41* (0.18)	0.37* (0.18)	0.06 (0.22)	-0.007 (0.23)
No college, <=40, female	0.25 (0.17)	0.22 (0.17)	-0.14 (0.19)	-0.16 (0.20)
College, >40, male	-0.13 (0.09)	-0.15 (0.10)	-0.08 (0.09)	-0.12 (0.10)
College, >40, female	-0.29* (0.11)	-0.30* (0.12)	-0.27* (0.11)	-0.27* (0.11)
College, <=40, female	0.05 (0.20)	0.01 (0.20)	-0.31 (0.19)	-0.34* (0.20)
College, <=40, male	0.21 (0.20)	0.16 (0.20)	-0.11 (0.21)	-0.19 (0.23)

Number of observations: 461

Robust standard errors are in parentheses

** significant at the 5 percent level

* significant at the 10 percent level

TABLE 1.11
IV Estimates of the Effects of Retirement Education on Pension Preservation
by Age, Education, and Gender

<u>Group</u>	<u>All Types of Saving</u>		<u>Retirement Saving</u>	
	<u>IV</u>	<u>IV</u> <u>With Proxies</u>	<u>IV</u>	<u>IV</u> <u>With Proxies</u>
	(1)	(2)	(3)	(4)
All respondents	-0.40 (0.43)	-0.11 (0.41)	-0.41 (0.42)	-0.15 (0.40)
Age 40 and under	0.86 (0.55)	0.87 (0.55)	0.35 (0.53)	0.36 (0.53)
Over age 40	-0.65* (0.33)	-0.52 (0.42)	-0.57* (0.32)	-0.28 (0.41)
College degree	-0.62 (0.54)	-0.50 (0.53)	-0.62 (0.48)	-0.45 (0.47)
No college degree	-0.33 (0.34)	-0.23 (0.34)	-0.36 (0.34)	-0.28 (0.33)
Female	-0.07 (0.41)	0.02 (0.41)	-0.21 (0.40)	-0.02 (0.39)
Male	-0.75** (0.37)	-0.62* (0.37)	-0.65* (0.36)	-0.62* (0.35)

Number of observations: 461

Robust standard errors are in parentheses

** significant at the 5 percent level

* significant at the 10 percent level

Chapter 2: INVESTMENT CHOICE IN PRIVATE PENSIONS: THE EFFECTS OF RETIREMENT EDUCATION ON ASSET ALLOCATION

INTRODUCTION

As 401(k) pension plans become more common in the workplace of many Americans, so does the worker's choice on how to invest his pension assets. In 1993, 91 percent of participants in thrift and saving plans in medium and large firms could choose how to invest their DC plan assets (Department of Labor (DOL), 1993). Plans that allow participant choice are often called *self-directed* plans, because the worker is given a range of options from which he can choose how to allocate the assets. The proportion of self-directed plans is likely to continue to rise, as 62 percent of those who contribute their own salaries to plans report they prefer to make their own investment decisions (Employee Benefit Research Institute (EBRI), January 1996).

Most previous research on self-directed plans has focused on the demographic and financial characteristics of participants and how these relate to their portfolio decisions (Poterba and Wise, 1998; Goodfellow and Schieber, 1997). Identifying the asset allocation choice for different groups of individuals is certainly important when evaluating the investment decisions of workers, given that the choice of how to allocate assets and the level of saving both affect the balance available at retirement. Returns on a portfolio with mostly low-risk assets will differ considerably from a diversified portfolio or one with predominately risky assets, resulting in different levels of pension income for a given amount of contribution.

It is essentially this difference in returns - and ultimate retirement payouts - that has recently concerned plan sponsors and policy makers. The Institute of Management and Administration (1995) reports that in one recent survey two-thirds of employers were concerned about the asset allocation decisions their employees were making. Although some employers feel that workers are choosing overly risky portfolios, most are concerned that participants are investing too conservatively. By comparing aggregate defined benefit (DB) portfolio allocations with those of defined contribution (DC) plans (predominately 401(k) plans), DB plan portfolios hold substantially more of their assets in equities than do 401(k) plans (Wyatt Company, 1994; Smith, 1993). Additionally, when asked how they would choose pension investments knowing that their pension benefits would go down with investment losses and up with investment gains, 69 percent of workers said they would prefer low-risk investments, even if the returns were also lower (EBRI, 1993).

Whether participants are making the portfolio choices that are best for their retirement security is difficult to determine. Observable characteristics such as age and income contribute to this decision and are observed to vary with asset allocation (Goodfellow and Schieber, 1997). However, economic theory suggests that an individual's degree of risk aversion also affects his portfolio choice, and this characteristic is often difficult to measure. Thus empirical analysis of the determinants of asset allocation has not been able to determine if – and to what extent – individual risk-taking behavior affects a worker's portfolio choice.

Choosing the optimal portfolio also requires substantial financial knowledge. How average returns differ between asset types, the trade off between risk and return, and

how returns are affected by inflation are just a few of the concepts involved in understanding how to allocate assets optimally. Evidence suggests that many individuals do not have the financial knowledge to make sophisticated choices. The 1995 Retirement Confidence Survey (RCS) reports that many individuals do not know how historical rates of return differ for various classes of investments. EBRI reports that only half of those surveyed know that over the past 20 years government bonds have yielded a lower rate of return than the U.S. stock market (EBRI, January 1996). Other examples of financially unsophisticated behavior include ignoring changes in expected future earnings when choosing saving targets (Bernheim, 1994a) and the number of individuals that lose money in financial scams (Alliance Against Fraud in Telemarketing, 1992).

If individuals do not have the financial knowledge needed to determine an optimal portfolio allocation, education may increase their knowledge, leading to more efficient asset allocation decisions. An EBRI/Greenwald survey shows that of those reading written material or attending retirement classes in the workplace, 44 percent said it led them to change the allocation of their money within their 401(k) account (EBRI, 1995). Employees also appear interested in financial education: of those who participated in some form of employer-sponsored retirement education program, 92 percent reported reading the material (EBRI, 1995).

In this paper I examine the effects of retirement education - specifically retirement classes - on asset allocation within a self-directed 401(k) pension plan. This is the first analysis to examine whether retirement education affects DC asset allocation decisions. I include both employer-sponsored meetings and those offered by public and private institutions in my analysis. Because individual characteristics may affect the way in

which participants respond to retirement education, I also analyze the effects of retirement education for different types of individuals.

I use a sample of 1,236 workers- with 1,322 self-directed plans (each worker can have more than one self-directed plan) - from the 1992 Health and Retirement Study (HRS). The HRS is unique in that it also contains questions specifically designed to pick up unobservable characteristics related to saving and risk-taking behavior often missing from other data sets. The inclusion of variables such as degree of risk aversion and expected longevity add additional insight into what influences individual portfolio choices in private pensions.

The next section provides background information on self-directed plans, individual portfolio choice, and retirement education. In Section 3, I summarize the literature on asset allocation within pension plans and retirement education. I provide an overview of the data in Section 4. Section 5 provides econometric evidence of the effect of retirement education on 401(k) asset allocation. I use OLS regressions to estimate the effects of retirement education on the percentage of equity in the pension portfolio, and compare these values with ordered logit estimates. I then estimate these effects for different types of individuals. I also address the possibility of selection bias in the model and examine methods to address this issue. I offer concluding remarks in Section 6.

2. BACKGROUND

Pension plans can be categorized into two types: defined benefit and defined contribution plans. DB plans typically determine the amount of the benefit using a formula that includes years of service and/or salary. DB plans are established and funded

by the employer for the employee, and asset plan managers typically manage one account for all employees.

The design of DC plans is quite different. Salary-reduction plans such as 401(k) plans, Employee Stock Option Plans (ESOPs), and Simplified Employee Pension Plans (SEPs) are all types of DC plans. Each employee has his own account into which he, and often his employer, makes contributions. Currently, most plan sponsors allow DC participants to make their own portfolio choices. According to a Bureau of Labor Statistics survey, 91 percent of participants in thrift and savings plans in medium and large firms could choose how their contribution was to be invested, and 62 percent could direct the investment of the employer contribution (DOL, 1993).

Participants choose their mix of assets from a range of investments as determined by the plan sponsor. According to a 1993 Hewitt Associates survey of employers who offered 401(k) plans, employers offer on average 4.5 investment options for employee contributions. The percent of employers offering only 1 to 2 options is quite small, at 7 percent, while 22 percent offer 6 or more options. Employees usually have the choice of at least one equity fund (either growth and income equity, growth equity, or equity index), one balanced fund (preset allocations of bonds and stocks) and one fixed-income fund (assets with low risk, such as Guaranteed Investment Contracts (GICs)⁴⁸ or government treasury bills) (Yakoboski, 1995). There is evidence that the number and characteristics of the options available affects the asset allocation mix (Galer et al., 1999). Goodfellow and Schieber (1997) examine the allocations of participants by specific DC plan. After taking into consideration such variables as the average age of the participant

⁴⁸ GICs are contracts offered by insurance companies and guarantee a certain rate of return and payment of principal and interest at a specific time.

and the age of the plan, significant similarities remain in investment behavior between those in the same plan.

If the employee is able to choose how the employer's contribution is invested, the options are often more limited. The 1993 Hewitt data show that on average only 3.5 options are offered for the employer contribution, with 29 percent of employers offering only 1 choice (Yakoboski, 1995). Often this choice is limited to employer stock, particularly if the plan is organized as a profit sharing or stock bonus plan (e.g., ESOP). Although an extensive data base prepared by EBRI and the Investment Company Institute (ICI) shows that less than one percent of plans mandate the employer contribution be made in employer stock, most of these plans are large, resulting in 15 percent of participant accounts and 25 percent of assets with the employer contribution predetermined (Galer et al., 1999).

The introduction of the self-direction of 401(k) plans lagged behind the introduction of the 401(k) plans themselves, at least initially. Allowing employees to choose their own investments can have legal implications, as plan sponsors can be held liable for losses incurred by participants, even if these losses are the result of the participant's own decisions. In 1992 the DOL finalized section 404(c) regulations of ERISA,⁴⁹ which outlines characteristics of self-directed plans that may limit the possibility of liability for plan sponsors.

Section 404(c) compliance is not mandatory. However, establishing a compliant plan should provide a defense against charges that the participant's ability to choose

⁴⁹ The effective date of the final regulations was January 1, 1994.

resulted in a fiduciary breach.⁵⁰ Generally, compliance requires that participants be allowed to “exercise independent control” over their accounts and be given at least three investment alternatives with different risk/return characteristics (employer stock cannot be one of the three). Sponsors are allowed to restrict how often employees can change their portfolios, however, they must offer enough flexibility for employees to respond to expected market changes in their investments.⁵¹ Sponsors are also required to provide education about the plan and the investments available. Sponsors may include information on risk versus return and other investment topics, but they must inform the participants that they are responsible for the outcome of the investments they choose and of any additional transaction fees that could be incurred for certain assets types.

Why Be Concerned About Individual Investment Choice in Pension Plans?

As DC plans become more common, more workers will be making decisions that will affect their retirement security. In 1988, 26 percent of workers reported DC plans as their primary plan type. By 1993, this percentage nearly doubled to 50 percent (EBRI, 1995). Increasingly, workers are depending upon their own contributions to an employer retirement plan to support them in retirement. The 1999 RCS reports that while only 8 percent of current retirees depend on own-funded employer retirement plans, 32 percent of current workers list these plans as their primary source of retirement income (Galer et

⁵⁰ For example, a participant who chooses his own investments and incurs losses may allege a breach has occurred because the sponsor did not override his investment decisions.

⁵¹ Access Research (1995) reports that beginning in the late 1980's, plan sponsors (particularly those specializing in mutual funds) allowed daily valuations and trading for plan participants. Since that time over 30 percent of 401(k) plans allow daily valuations and trading, and over 50 percent of firms with over 1,000 employees include this feature.

al., 1999). How assets are allocated within the pension account can have significant effects on the pension funds available for retirement.⁵²

Recently concerns have arisen in both private and government circles regarding the increasing numbers of DC participants who are able to choose how their money is invested. The primary concern is that workers are choosing overly conservative portfolios that will not provide adequate returns for retirement security. Reports of lower aggregate holdings of equities in DC plans than in DB plans have prompted much of this concern. 1991 DOL tabulations of the assets held in private pension plans with more than 100 participants show that DB plans held nearly twice as much equity⁵³ as DC plans (43 percent versus 27 percent) (DOL, 1995).⁵⁴

Whether this comparison is informative is debatable. Portfolio managers make their asset allocation decisions with different goals in mind than the individual investor. Managers and individuals have different investment time horizons, which may cause their willingness to accept risk to differ. An individual investor can have a fairly long time horizon if he is just starting his career, or a short one if he is approaching retirement. The DB manager, on the other hand, maximizes the return for an infinitely lived agent, the plan sponsor. DB plan accounts also hold all assets in one account, allowing the presence of funds for employees of different ages to decrease risk. Additionally, the government

⁵² Kritzman (1994) illustrates the difference in returns by comparing two alternatives for a \$100,000 investment. An investor puts it all in either a risk-less asset with an annual rate of return of 3 percent or a riskier asset with an annual rate of return of 10 percent with a 15 percent standard deviation. After 20 years, the risk-less asset is worth \$180,611, while the riskier asset will be worth between \$180,651 and \$2,565,345.

⁵³ The term equity usually refers to both own-company stock and outside stock. The figures reported by the DOL define equity as outside stock only.

⁵⁴ 1989 Form 5500 filings show that DB plans hold two-thirds more assets in equities than DC plans do (Wyatt Company, 1994). Greenwich Associates estimates that DC participants invest 39 percent of their assets in equities, while DB plans invest more than half of their assets in equities (Smith, 1993).

insures DB assets through the Pension Benefit Guaranty Corporation (PBGC); DC assets are not insured.⁵⁵

It can be misleading to draw conclusions about DC investments from the aggregate data. Both Goodfellow and Schieber (1997) and Papke (1998) analyze individual data and the choices participants make in self-directed plans. Papke estimates that DC participants who are able to choose their investments actually allocate 15 percent *more* of their balance to equities than do participants of DC plans without choice.⁵⁶ Goodfellow and Schieber use a database of 36,000 participants in 24 DC plans and examine the percentage of assets in equities according to characteristics such as age and wage income. The aggregate numbers show a pattern of a relatively small percentage of equities (28 percent) in DC plans. However, when they stratify the data by age they find that overall, investment in equities falls with age, an investment strategy most financial professionals advocate. Since older workers tend to have larger balances in their DC accounts than younger workers, it follows that a smaller percentage of total DC assets will be invested in equities.

Goodfellow and Schieber do offer some evidence, however, that certain groups of participants are investing either too conservatively or too risky than financial planners would advocate for their stage in the life cycle. By examining percentages of each asset type for potential investors of that asset in different age groups, they find that 23-34 percent of participants age 30 and under hold 80 percent or more of their assets in fixed-

⁵⁵ One could propose that the existence of insurance for DB assets may provide incentive for DB sponsors to invest in overly risky assets. The incentive for firms to take such risks is probably not very strong. Warshawsky (1997) reports that up until the early 1990s the PBGC was financially volatile, causing Congress to raise premiums paid by employers of DB plans in 1987 and again in 1989. Additionally, penalties are imposed on the firm if the value of the assets in the plan fall below a minimum funding requirement set by the PBGC.

income funds - a very conservative portfolio for this age group.⁵⁷ Some groups of participants also appear to expose themselves to excessive risk. Fourteen percent of those ages 61 and older hold over 80 percent of their assets in domestic equity funds⁵⁸, and 5 percent of this age group holds over 80 percent of their balances in company stock. Additionally, 13-31 percent of those under 30 and nearly 10 percent of those 30 to 40 years of age hold 80 percent or more of their assets in company stock. Holding all or most of a DC portfolio in company stock alone is an overly risky investment - even for younger participants - as the collapse of the company would not only mean loss of income for the participant, but loss of retirement security as well.

Will allowing individuals to choose their own investments result in lower retirement wealth than if the investments are made by an investment manager? It is not possible to answer this question until those who will depend on funds in self-directed accounts enter retirement. Examination of the available evidence suggests that in general individuals are not investing as conservatively as the aggregate data show. However, there are groups of participants that are not making what financial advisors would term "sophisticated financial decisions."

Retirement Education

Retirement education broadly consists of two types: education offered within the workplace, and education offered privately by such institutions as community colleges and private financial planners. Retirement education in the workplace has risen

⁵⁶ This estimate is assuming the plan is not a profit sharing type, since profit sharing plans often mandate (or provide incentives for) investment in company stock.

⁵⁷ If these participants have non-pension stock holdings designated for retirement, the overall portfolio may not be that conservative. The data, however, does not provide information on outside stock holdings.

dramatically throughout the 1990s: a 1994 survey by EBRI and Matthew Greenwald and Associates reports that 73 percent of workers participating in a 401(k) plan said their employer offered retirement education, versus 45 percent of employers of employees reporting being retired in 1994 (EBRI, 1995).

Retirement education can come in many forms. Both private entities and employers often use pamphlets, seminars, or individual financial counseling as a means to communicate their message. More recently interactive phone response systems and software and Internet sites have been added to assist clients. Buck Consultants (1994) reports that in the early 1990s, the most common modes of communication for education in the workplace were the summary plan description or other written material (53 to 68 percent of plans) and seminars or individual meetings (32 to 47 percent).

The frequency with which retirement education is offered in the workplace differs depending on the plan sponsor. A 1993 survey of 401(k) plan sponsors shows that 25 percent of sponsors provide retirement education quarterly, 11 percent provide it annually, and 20 percent provide it upon participant enrollment (EBRI, 1995). Whether education is being offered frequently enough to have adequate impact upon asset allocation is debatable. Financial planners report that short, frequent sessions on appropriate asset allocation is the best way for employer education to make a difference (Yakoboski, 1995). Because learning about such complex issues as risk tolerance and purchasing power are difficult to grasp - and recall - the frequency with which the message is communicated is very important.

In order to increase the probability that participants will understand and implement sophisticated asset allocation in their plans, the topics covered must also be

⁵⁸ This may not be considered too risky if the relevant time horizon extends substantially past retirement.

relevant to the asset allocation question. A 1994 EBRI survey of self-directed 401(k) sponsors shows that the most common topic covered is asset allocation, with 93 to 99 percent of plans (ranging from under 100 employees to over 10,000) providing this information. Understanding risk and risk tolerance is covered by 84 to 99 percent of plans, and estimating income needed for retirement is included in material for 94 to 99 percent of plans (EBRI, 1996). Estimating income needed for retirement is particularly relevant to the asset allocation decision, as rate of return, amount of risk willing to be assumed, and contribution rate must be determined simultaneously to pinpoint a desired level of retirement security.

Employers may be more likely to offer retirement education with the 1992 finalization of section 404(c) regulations. As I described in the previous section, compliant sponsors of self-directed plans must offer information about the plan that will aide employees in choosing investment wisely. 404(c) guidelines offer certain legal protections that may now provide incentive for employers to introduce self-direction, and hence education, into the workplace. In fact, Buck Consultants (1994) reports that 50 percent of sponsors cited the release of 404(c) regulations as a factor in offering education to their participants.

Why Might Retirement Education Affect Asset Allocation?

Determining if individuals would choose an optimal portfolio allocation without the aid of retirement education is difficult, as there is not agreement on one economic theory that describes how participants should choose their investments within their plan. A number of theories have been proposed that follow a life cycle model and emphasize

choosing investments depending on the length of the saving time horizon. Bodie, Merton and Samuelson (1992) propose that households should reduce equity holdings as they age, suggesting that as the relevant saving time horizon decreases, equity and other risky asset holdings should also decrease. Bodie (1995), on the other hand, uses a model of option pricing and concludes that risk does not diminish the longer the stock is held. Samuelson (1989, 1990) proposes that the increasing longevity of retirees means investment in equities remains an option near and after retirement. The time horizon for retirement saving should not stop at retirement, since individuals are living well past current retirement age.

Kritzman (1994) uses a standard model of declining marginal utility and increasing wealth to argue that risk aversion is so strong for some investors that the stage in the life cycle does not matter. For these individuals, low-risk or risk-less assets will be chosen regardless of time horizon. For this short-term risk aversion to carry over to the long term, three conditions must be met: first, risk aversion must be invariant to changes in wealth; second, investors must believe that returns on risky assets are random; and finally, the investor's future wealth must depend only on investment income.

Regardless of the theory (or theories) that best describes investment behavior, if individuals do not possess enough financial and economic knowledge they will not make optimal choices. While it is necessary for participants to be able to estimate how much income they will need at retirement in order to determine what asset mix is optimal for their needs, most Americans have never made this calculation. The 1997 RCS reports that only 36 percent of workers in the United States have any idea of how much they will need for retirement, and of these individuals, 24 percent cannot provide an actual figure

(Dickemper and Yakoboski, 1997). Workers are also ill informed regarding risk and return tradeoffs. Just over half of all workers surveyed (56 percent) know that historically, the probability of losing money from a diversified portfolio of stocks has not risen the longer the investment is held (EBRI, 1996).

Participants admit they are not prepared to make such complex decisions. Although 64 percent of participants in a DC plan would like to make their own investment decisions (EBRI/Gallup Organization, 1994), only 26 percent of participants in a Phoenix-Hecht study believe they are well qualified to make their own investment decisions and only 8 percent of sponsors believe so (Phoenix-Hecht, 1994a). With the array of knowledge that is needed to determine asset allocation, it is no surprise that most workers do not feel they alone have the ability to make sound decisions.

Perhaps the reports of plan sponsors and employees themselves are the best indicator of whether individuals are making optimal asset allocation decisions in the absence of retirement education. Since most professional advisors advocate increasing proportions of equity with age, plan sponsors use this advice as a benchmark with which to compare employee investment choice. An EBRI survey of plan sponsors shows that 49 percent of sponsors feel that educational materials have a substantial effect on younger participants investing less conservatively, while 35 percent feel there is a moderate effect (EBRI, 1996). In a 1994 EBRI/Greenwald survey, 44 percent of employees said retirement education materials led them to change the allocation of their money (EBRI, 1995). Likewise, in two separate studies of Continental Bank and Rite Aid Corporation, a large proportion of employees reallocated their assets after using educational material. Sixty-five percent of employees at Continental Bank who used an interactive software

package to estimate retirement needs and asset allocation mixes reported they plan to change their investment allocation. Rite Aid Corporation targeted female clerks under the age of 40 with a video educational campaign. When the campaign was initiated in 1991, 54 percent of these employees allocated their assets to the fixed-income fund. Figures reported shortly after 1994 show this percentage down to 37 percent (EBRI, 1995). If participants change their behavior after using retirement educational materials, they must believe their original choices were not optimal.⁵⁹

3. PREVIOUS RESEARCH

What Factors Affect DC Plan Asset Allocation?

Much of the previous work on asset allocation within DC plans examines how characteristics such as age, income, gender and risk aversion affect participant investment decisions. Bajtelsmit and VanDerhei (1997) examine the correlation between employee characteristics and the likelihood of allocation to different asset types for participants in a self-directed DC plan. They use a 1993 sample of 20,000 management employees from a large United States employer.

Looking at the specification measuring DC balances (they also include specifications using current DC contributions), their estimates show that women are more likely than men to invest in fixed-income assets, but less likely to invest in employer stock. Age also affects investment in fixed-income assets - but in a non-linear fashion. As participants age their allocation to fixed-income investments decreases initially, but at a specific age they begin to increase their allocations to these assets. Bajtelsmit and VanDerhei also offer evidence of decreasing relative risk aversion with respect to total

⁵⁹ This is true, of course, only if sound advice is given.

401(k) wealth. The likelihood of investing in equities and employer stock increases with DC wealth, but at a decreasing rate. The fact that participants treat investment in employer stock similarly to non-employer equity funds lends evidence to the hypothesis that participants see employer stock as a risky investment.⁶⁰

Poterba and Wise (1998) examine participant-level data for DC participants in self-directed plans provided by the financial service institution TIAA-CREF. TIAA accounts typically are invested in fixed-income assets; CREF accounts in equity. In 1993, 44 percent of assets were in TIAA accounts. Investment in these fixed-income funds increases with age, with 37 percent of assets of those under age 35 and 49 percent of those ages 55 to 64 invested in TIAA. Percentage of assets in TIAA also falls with income, with 53 percent of assets of those who earn \$25,000 annually and 40 percent of assets for those with incomes over \$100,000 in TIAA.

Econometric analysis of the data shows that participants with income greater than \$100,000 and those with net worth over \$250,000 allocate a smaller percentage of their assets to TIAA. Females invest 4 percent more in TIAA accounts, while those with less than 12 years of formal education invest 10 percent more of their assets in TIAA. Higher-income and higher-wealth participants also invest less in TIAA - 5 to 7 percent fewer DC assets for those with incomes over \$100,000 are invested in the fixed-income fund, as are 4 percent fewer assets for those with higher net wealth.

The characteristics of DC plans may make a difference in the composition of assets in the plan. While the aforementioned research examines only participants with self-directed plans, Papke (1998) uses participants with and without choice to examine

⁶⁰ There is some evidence that individuals may perceive company stock as low-risk and substitute it for fixed-income assets. See Galer et al. (1999).

whether there is a difference in pension portfolio allocation if a participant is able to choose his own investments. She uses the 1992 National Longitudinal Survey (NLS) of Mature Women to estimate the effect that being in a self-directed plan has on the percentage of equities invested in the plan.⁶¹ She finds that those who are able to choose their investments allocate 15 percentage points more to equities, given the plan is not a profit sharing plan. She finds that women in plans with choice choose to invest 5 percentage points less in equities than do men, however, this difference is not statistically significant. Investments in stock also decline with age, with a 2-percentage point decrease in stock investment for each additional year of age. Papke's results seem to lend evidence that DC participants actually invest *less* conservatively when they are able to make their own portfolio decisions.

The majority of the existing literature on pension asset allocation decisions describes how portfolio choice differs by characteristics of the participant. My analysis adds to the literature by including controls, such as mortality risk and saving time horizon, which are not included in previous studies. But more specifically, I test one way in which participants may alter their portfolio allocation - via retirement education - that provides evidence as to whether policies aimed at increasing individual financial knowledge in the United States are useful.

Does Retirement Education Affect Portfolio Choice? Evidence in the Literature

There is no previous research on retirement education outside of the workplace, and more specifically, no analyses of how retirement education affects DC asset allocation. However, there are two studies that address the relationship between

⁶¹ The 1992 NLS for Mature Women includes women and their spouses, ages 55-69 in 1992.

employer-sponsored retirement education and savings behavior, both inside and outside the pension plan.

Bernheim and Garrett (1996) use a sample of 2,055 individuals, ages 30 through 48 in 1994. The survey is sponsored by Merrill Lynch and includes information on both the availability and use of employer-sponsored education. The type of retirement education offered (written materials or seminars) is not specified, so the analysis estimates the effects of the typical retirement education program in the workplace.

Bernheim and Garrett estimate separately the effects of employers offering and employees participating in retirement education on the household saving rate, retirement saving rate, total wealth, retirement wealth, 401(k) participation rate, and 401(k) balances. Workers whose employers *offer* retirement education save 1.7 percent more than those not offered education, and have \$2,488 more in retirement wealth. Employees who *use* retirement education materials save 2.2 percent more than those who do not, while accumulating \$2,176 more in retirement wealth. Additionally, those who use retirement education are 19 percent more likely to participate in a 401(k) plan (conditional on eligibility) and have accumulated \$2,826 more in the 401(k) account. All estimates are statistically significant (at the 10 percent level or lower).

Bernheim and Garrett also test the hypothesis that attending a retirement meeting is correlated with unobserved saving tastes. They conclude that those with lower propensities to save are more likely to be offered and use retirement education.

Bayer, Bernheim and Scholz (1996) use a 1993-1994 longitudinal survey of 1,100 employers selected by KPMG Peat Marwick to study the effects of employers offering retirement education on participation and contribution rates in 401(k) plans. The data

allows them to examine the effects of both seminars and written material, as well as the frequency in which education is offered. When estimating these effects for both highly compensated (HC) and non-highly compensated (NHC) employees⁶², they find that participation rates are 11.5 percent higher for NHC employees and 10.5 percent higher for HC employees when retirement education is offered, given that the seminars are offered frequently.⁶³

The studies done by Bernheim and Garrett (1996) and BBS (1996) provide valuable information on the effects of retirement education on various forms of saving. While how much is saved is a large factor in determining the final retirement payout, the choice of asset allocation is also a major factor in determining the ultimate worth of a pension plan. Given that many Americans do not have the financial knowledge with which to make such a sophisticated decision, it is worthwhile to examine the effect of retirement education on asset allocation choice within DC plans.

4. RETIREMENT EDUCATION AND ASSET ALLOCATION IN THE 1992 HRS

The 1992 HRS is the first wave of an ongoing survey of 12,057 men and women, most between the ages of 51-61 in 1992.⁶⁴ Along with standard demographic and financial information, the survey also includes questions specific to retirement. Detailed pension information and expectations about the retirement years make for a rich source of data for analyzing retirement issues. My sample consists of the 1,236 DC participants

⁶² Highly compensated employees are defined as having annual earnings of \$100,000 or more, owning more than 5 percent of the company, or having annual earnings of \$65,000 or more if this amount is in the top quintile of the firm's salary distribution.

⁶³ The offering of retirement education has no effect if the education is in the form of written materials, or if seminars are offered occasionally.

⁶⁴ Because spouses of respondents of this age group are also asked the same questions, only 9,673 individuals fit into this age category.

who describe their current pension plan as self-directed. Because each individual can have more than one plan, I analyze a total of 1,322 plans, with 1,155 participants having only 1 plan, 76 having 2 plans, and 5 having 3 plans.

Along with the fact that each individual can have more than one plan, each family can also have more than one plan. In the HRS, married respondents and their spouses are both asked each question. Thus, if the spouse also has at least one self-directed plan, there can be more than one plan per family. Of the 1,236 DC participants, 106 individuals (53 couples) have one or more plans, resulting in 1,030 family identifiers. For 617 (60 percent) of these families, at least one of their self-directed plans is their primary plan.

Although the HRS is a longitudinal study, I only use the 1992 wave. The questions addressing retirement education are only asked during the 1992 survey. Although using asset allocation information from subsequent waves would allow me to exploit the benefits of longitudinal analysis, information on attendance in retirement classes after 1992 is not available. Given the acceleration of retirement education in the 1990s, there is a high probability of undocumented participation for those who attended a meeting after 1992.

I report summary statistics for the sample in Table 2.1. Twenty-nine percent of DC participants attended a retirement class, with 79 percent of these seminars taken at the workplace. The percentage of individuals with self-directed plans who attended a meeting is significantly higher than the full sample of the HRS, the sample of those with DC plans, and those with DC plans without participant choice. Only 17 percent of the full sample attended a meeting, with a larger percentage of all DC participants- 24

percent - attending. Only 17 percent of those with DC plans without self-direction attended a meeting (not reported in tables).

The average age in the sample is 54 years. Forty-five percent of women have self-directed plans, and 92 percent of participants have at least a high school degree. The average expected time until retirement is 8.5 years.⁶⁵ Seventy-one percent of individuals have another employer-sponsored pension plan: either a DB plan in their current or past job, another self-directed DC plan, a non self-directed DC plan, or a plan having characteristics of both a DC and a DB plan.

Fourteen percent of the plans are defined as either profit sharing, stock option, or ESOP plans. Because these types of plans are more likely to offer company stock and/or mandate employer contributions be in company stock, I group these types of plans together under the general heading *profit sharing* plans. Identification of these plans is crucial to the analysis, as they may contain a larger percentage of equity that is not the direct result of choice by the employee.⁶⁶

Asset Allocation in the HRS

All individuals are asked if they have a pension plan with their current employer, and if they do, whether the plan has characteristics of a DC plan, a DB plan, or both. Thirty-five percent of those currently working are covered by an employer-sponsored pension plan; 53 percent of these plans are described as having characteristics of a DC

⁶⁵ The HRS asks participants in what year they expect to retire. Seven percent of participants said they will never retire. Because I am unable to determine a retirement saving time horizon for these individuals in terms of years, these responses are set to missing.

⁶⁶ 50 percent of profit sharing plans in the sample are invested in mostly equities, compared to 26 percent of plans not described as profit sharing (not reported in tables).

plan.⁶⁷ Fifty-six percent of DC plans (1,314 plans) are self-directed.

The HRS records how the participant chooses to allocate his DC assets by assigning him one of three categories. These options include investing the balance mostly or all in interest earning assets (hereafter, also called *bonds*), mostly or all in equities (hereafter, also called *stock*), or split between the two (a diversified portfolio). In Table 2.2, row 1, I show the percentage of participants in each of these three categories. In order to avoid double-counting individual characteristics, I restrict those individuals who have more than one self-directed plan to their primary self-directed plan. Out of 1,108 participants where the respondent also answered the retirement education question, 28 percent report investing their DC assets in mostly stocks, 27 percent choose mostly bonds, and 45 percent hold a mixed portfolio. This distribution of assets is similar to those reported by Papke (1998), whose sample from the NLS also reports asset allocation in these same three categories and consists of participants of roughly the same age group.⁶⁸

Several participant characteristics affect DC asset allocation. As I discussed in Section 2, stage in the life cycle, willingness to take risks, and even gender have been proposed to affect an individual's investment choice. The HRS not only contains standard demographic and financial measures that allow econometric testing of these theories, but also includes measures often omitted from other surveys that capture retirement saving horizon and degree of risk aversion. Beginning in row 2 of Table 2.2, I show participant allocation by characteristics that have been highlighted in the pension

⁶⁷ This percentage does not include those individuals who describe their pension as having characteristics of both a DB and DC plan.

⁶⁸ When making comparisons with Papke (1998), it must be kept in mind that while my study includes only self-directed plans, Papke's study includes both plans that are self-directed and those that are not.

allocation literature as being correlated with DC asset allocation.

Conventional wisdom in the professional financial community states that the longer the time horizon for investing, the larger proportion in equities one should hold. This means that as one ages, the proportion of stock in the portfolio should decrease. The tabulations in Table 2.2 do not show a pattern consistent with this belief. While 26-28 percent of participants in their pre-retirement years (under age 60) hold mostly equities, 29 percent of participants in or very close to their retirement years also hold mostly or all assets in equities. A higher proportion of older individuals do hold all or mostly bonds, however, but the pattern is not linear. While only 24-25 percent of those under age 55 hold mostly low-risk portfolios, 33 percent of those ages 55 to 60 and 28 percent of those age 60 and over choose to do so. Although the HRS restricts the sample of participants to those in the later stages of the life cycle, other studies using individuals of all ages report similar patterns. Poterba and Wise (1998) use regression analysis to examine pension asset allocation with participants of all ages and also find that age is not an accurate predictor of pension portfolio choice.

There is evidence that women invest more conservatively than men by investing less often in equities (Jianakoplos and Bernasek (1994), Hinz et al. (1997)). This pattern is also evident in the HRS data. Thirty-one percent of males report they invest in mostly equities, while only 23 percent of women do. This difference is statistically significant, with a p-value of 0.003. The gender difference remains when dividing the groups further by marital status. Lower percentages of both married and unmarried women invest in equities (25 and 19 percent, respectively) than do married and unmarried males (32 and 26 percent, respectively) (not reported in table). A larger percentage of females than

males choose portfolios that include both stocks and bonds, however, with 47 percent of women and 41 percent of men choosing to diversify their portfolios (statistically significant with a p-value of 0.07).

Both participants without high school degrees and individuals with lower incomes show patterns of more conservative investing. While 28 percent of participants with high school degrees invest mostly in equities, 25 percent without a degree choose mostly stocks, but this difference is not statistically significant. The difference between the percentage of participants who invest in mostly bonds is quite striking: 39 percent of those without a degree choose mostly bonds, while only 26 percent of those with a degree make this choice. The difference in this allocation type is statistically significant at the five percent level (p-value equal to 0.02).

Asset allocation also varies by family income. While 21 percent of participants who earn less than \$25,000 annually invest their DC assets in mostly stocks, 33 percent of individuals whose family income is greater than \$100,000 per year invest in this manner. This difference is statistically significant with a p-value of 0.05. Poterba and Wise (1998) use econometric analysis and conclude that lower-income, less-educated workers allocate smaller portions of their DC assets to equities.

In Table 2.2, I also examine DC asset allocation according to how many years the respondent expects until he retires. This measure is valuable for capturing retirement saving horizon and may represent stage in the life cycle more appropriately than does age, since workers may choose to retire at different ages and save accordingly.⁶⁹ In accordance with traditional financial advice, the HRS data shows a general pattern

⁶⁹ If workers save for retirement by looking past the retirement date to post-retirement years, then this measure may not be as accurate.

toward more conservative investing as years until retirement decreases. Twenty-two percent of participants who have 11 or more years until retirement invest in mostly bonds, while 33 percent of those with less than 5 years until retirement choose mostly or all low-risk assets (estimated with a p-value of 0.002). The pattern in investment in mostly equities fluctuates very little, however, as one gets closer to retirement. Twenty seven percent of those with 5 to 8 years until retirement invest in mostly stocks, and this proportion only rises 2 percentage points to 29 percent for those with 8 to 11 years until retirement. Twenty-nine percent of participants with either less than 5 years until retirement or with 11 or more years invest in mostly equities.

As the choice of which assets to invest in involves risk and return tradeoffs, the willingness to take risks - particularly financial risks - affects asset allocation. One way to measure risk aversion is to examine individual choice given different risks and returns. The HRS includes a question designed to capture degree of risk aversion. The respondent is asked to consider a scenario in which he can take an equally good job with a 50 percent probability of doubling his income and differing probabilities of decreasing his income by half. I quantify degree of risk aversion for each participant based upon the probability of loss of income he is willing to accept.

The last rows of Table 2.2 stratify DC asset allocation by degree of risk aversion. Twenty-nine percent of participants who are the least willing to accept risk (or who are extremely risk averse) are invested mostly in equities, compared to 33 percent of participants who have the highest tolerance for risk (or those with low risk aversion). The relationship between risk aversion and percent in equities is not linear. While those participants at the two extremes of risk aversion appear to conform to the expected

pattern of trading risk for return, a smaller percentage of individuals who have high amounts of risk aversion (26 percent) invest in mostly equities than do those with an extreme degree of aversion (29 percent). The differences between each level of risk aversion and extreme and low degrees of risk aversion are not statistically significant.

Retirement Education in the HRS

The HRS is the only public data source that contains data on both retirement education and asset allocation within pension plans. All respondents were asked two questions about retirement education: Have they ever attended any meetings on retirement or retirement planning? Of those who answered yes, they are then asked if that meeting was organized by the respondent's or his spouse's employer.

In Table 2.3, column (1), I report the proportion of participants who attended a retirement class, by individual characteristics. In columns (2)-(4), I report the proportion of individuals who choose each type of asset allocation (taken from Table 2.2). Notice that participants without a high school degree and also those with lower income not only have lower participation rates in retirement meetings, but also tend to invest more conservatively in their pension portfolios. The difference in retirement meeting attendance is more apparent when looking at income levels: while 21 percent of participants with incomes under \$25,000 attend meetings, 32 percent of individuals with incomes over \$100,000 attend meetings.⁷⁰ This difference is statistically significant, with a p-value of 0.10.

When comparing retirement meeting attendance and asset allocation in Table 2.3

it must be emphasized that there is no reason to believe that taking a retirement class will increase holdings of equity in the portfolio. Nor is there evidence that more conservative investing necessarily is sub optimal for the participant, or necessarily results in lower retirement wealth. I merely suggest that if those with lower education levels or income are investing more conservatively because they lack financial knowledge, and their decisions are in fact not optimal, then increasing attendance in retirement classes may increase their well-being.

I have presented tabulations in Tables 2.2 and 2.3 that show patterns of asset allocation and retirement meeting attendance by specific characteristics of DC participants in self-directed plans. In the following section I use econometric techniques to examine whether retirement education affects the asset allocation decision, for participants generally as well as for those individuals with varying time horizons and degrees of risk aversion.

5. ECONOMETRIC RESULTS ON THE EFFECTS OF TAKING A RETIREMENT CLASS ON DC ASSET ALLOCATION

In this section I describe the model I use in the econometric analysis and report the results. I estimate the model using OLS and ordered logit. The model is as follows (omitting individual subscripts):

$$A = X\beta + \alpha R + (R^*T)\omega + (R^*V)\phi + P\psi + \varepsilon, \quad (1)$$

where A is a trinomial variable equal to 100 if the plan is invested mostly or all in

⁷⁰ Increased attendance could of course be the result of more of an interest in saving, which has been shown to be positively correlated with education and income. This selection issue will be addressed further in the next section.

equities, equal to 50 if investment is mixed between equities and bonds, and equal to zero if investment is mostly or all in bonds. The independent variable of interest, R , is a dummy variable equal to one if the respondent attended a retirement meeting, and zero otherwise. X contains the observed variables that are thought to affect the asset allocation decision. The vectors $(R \cdot T)$ and $(R \cdot V)$ contain interactions of the retirement meeting variables with the dummy variables for years until retirement and degree of risk aversion, respectively. The variables for years until retirement and degree of risk aversion are included in X . P is a vector of proxy variables to control for unobserved individual saving tastes.

Since the HRS responses on pension asset allocation are not reported as continuous percentages, it is necessary to express the dependent variable, A , as a trinomial choice variable. Simply choosing numbers for this variable and estimating the model using ordered logit is one possible estimation technique. However, using logit will only give estimates of the probability of each response occurring, and because the estimates are not expressed as partial effects, simple interpretation of the estimates is limited to examination of sign and statistical significance.

By using a linear model I am able to interpret the estimates as percentage change in equity. I follow Papke (1998) by assigning each asset allocation response 100 (mostly or all equities), 50 (a mix of equities and bonds), or 0 (all bonds). I choose these values to simplify the interpretation of the coefficient estimates as percent change in equities. Assigning extreme portfolio allocations will likely result in some mismeasurement of the true asset mix, particularly if the proportion of different assets varies widely within each category. This possibility of bias due to mismeasurement must be kept in mind when

interpreting the results. For a complete discussion of structuring the dependent variable in this manner, see Papke (1998).

I estimate equation (1) using both OLS and ordered logit, without interaction terms or proxy variables. The OLS results are presented in Table 2.4 and the ordered logit estimates in Table 2.5. The logit estimates are not partial effects, and so magnitudes in columns (1) through (5) cannot be compared to the corresponding columns of OLS estimates. However, the direction and statistical significance of the logit estimates are similar to those using OLS.

The OLS standard errors in Table 2.4 are robust to heteroskedasticity, and because each participant and family can have more than one self-directed plan, standard errors are also corrected for individual and family-level correlation. I report the simple relationship between meetings and asset allocation without any control variables in column (1). DC participants choose to invest 1.79 additional percentage points in stock if they attended a retirement meeting. This effect is not statistically significant, however.

I add demographic, income and net worth variables to the specification and report these results in column (2). In column (3), I add additional financial variables as well as variables that describe the pension plan. The estimate on attending a meeting drops slightly to 1.28 in column (2) and then rises to 3.16 (with a t-statistic of 1.1) in column (3), but is not statistically significant in either specification.

Many of the estimates for other explanatory variables are consistent with previous asset allocation research. In column (2), the estimate on age shows that participants invest almost one-half a percentage point less in stock for each additional year (with a p-value of 0.8), although the effect becomes very small and statistically insignificant in

column (3).⁷¹ Whether participants actually alter their investments in stocks and bonds as they age is not clear from the existing literature. While Goodfellow and Schieber (1997) and Papke (1998) find decreasing equity investment with age, Hinz et al (1997) do not find age to be a factor in portfolio choice. It should be noted that the estimate for age in this model does not generalize to the total population of DC participants in self-directed plans, as the HRS restricts its sample to those in the pre-retirement years.

Income and net worth also affect DC asset allocation. As seen in column (2), those with incomes over \$100,000 invest 10.41 percentage points more in stock than do those with incomes under \$25,000, although this effect decreases significantly with the additional controls in column (3). Net worth affects DC investment choice in both specifications. As shown in column (3), those with \$100,000 to \$250,000 in net worth invest 9.66 percentage points more in stock than those with less than \$50,000 in net worth, while participants with net worth between \$250,000 and \$500,000 choose 12.8 percentage points more in stock (p-values of 0.025 and 0.13, respectively). Net worth variables are estimated jointly with a p-value of 0.04.

Gender affects asset allocation decisions. As is seen in column (3), females invest more conservatively than males, allocating 6.45 percentage points less to stocks. This effect holds even after controlling for income and degree of risk aversion.

Existing evidence of a gender effect on DC asset allocation is mixed. Hinz et al. (1997) find that females invest less of their assets in equities after controlling for demographic and financial variables. Jianakoplos and Bernasek (1994), on the other

⁷¹ Not surprisingly, the addition of the variable measuring years until retirement in column (3) contributes significantly to the change in the estimate on age. Estimating the specification in column (3) without the years until retirement variables produces an estimate of -0.35 on age, with a p-value of 0.23 (not shown in table).

hand, do not find a gender difference after controlling for demographic and wealth characteristics.

Because the HRS is particularly concerned with retirement issues, it provides detailed data on all pension plans and expectations about retirement. Specifically, it provides details about the respondent's self-directed plan as well as other DC and DB plans, both from current and past employers. I include a binary variable in the specification in column (3) that controls for the existence of either a DB plan from a current or past employer, another self-directed plan, a DC plan that does not offer choice, or a plan with characteristics of both DB and DC plans. Individuals with other pension plans may be more willing to invest in riskier assets if they have additional pension security. Although I find that participants with another plan invest 3.3 percentage points more in equity, the estimate is not statistically significant.

One characteristic of the self-directed plan that affects pension allocation is whether the plan is of the profit sharing type. Participants with plans of this type (recall I group all ESOP, stock option, and profit sharing plans under this heading) have a significantly higher percentage in stock than those with other types of DC plans. These plans hold 18.02 percentage points more stock than other types of plans, estimated with a p-value of 0.0. This result is not surprising given the fact that profit sharing plans often consist of mandated employer matching contributions in company stock.

Including a variable in the model for non-pension equity holdings may be controlling for one of two things. Either the participant has a taste for stocks or he diversifies across his pension, non-pension and wealth holdings. If this equity variable is positively correlated with the percentage of equity in a DC plan, then it is most likely

controlling for a taste for stock. If a negative relationship is observed, however, then individuals may be choosing their investments within the pension plan by diversifying across *all* their asset holdings. Recent work by Bodie and Crane (1997) and Weisbenner (1999) finds no evidence of diversification across pension and non-pension portfolios.

Papke (1998), likewise, finds no evidence of diversification. She finds a positive relationship between outside stock holdings and the percentage of equity in the pension plan. She reports that for every \$1,000 in outside stock holdings, the participant holds about one-third of a percentage point more in stocks. I find positive, although smaller, effects. For every \$1,000 held in outside equity, the participant invests 0.02 of a percentage point more in stocks in his DC plan (one-fifth of a percentage point for every \$10,000 in outside stock).⁷²

One of the quantitatively largest effects on percent invested in equities is the presence of an employer match to the employee contribution. If the employer provides a match, the participant invests 15.16 percentage points more in stock than if there is no match, estimated with a p-value of 0.0. The reason for this effect is not immediately apparent, as this relationship has not been observed in other DC asset allocation literature.

Participants with employer matches may invest more in stock if the employer match is mandated to be in company stock. Galer et al. (1999) report that employees in

⁷² It can be argued that those who take a class may use knowledge they learn in class and change their outside stock holdings. If this is the case then the outside stock variable is not picking up a taste for stocks.

It is doubtful that the estimate on the outside stock variable is representing any other effect besides the correlation between outside and pension stock allocations. First of all, the outside stock variable is the total amount of equity accumulated in all accounts, not a flow of investments in stock for only the current year. In addition, taking out the outside stock variable from the regression in column (3) has only a minimal effect on the retirement education variable. When I include the outside stock variable in the specification, as I have done in column (3), the estimate on the retirement meeting variable is 3.16, with a standard error

plans with mandated employer contributions put a higher proportion of their own contributions in company stock than do employees in companies without the mandate. Unfortunately, I do not have information on whether the match is mandated to be in company stock. I do know, however, whether a plan is of the profit sharing type. Profit sharing type plans have a greater likelihood than other types of plans of requiring company stock matching contributions. In order to test the null hypothesis that participants with mandated employer matches do not increase their DC equity holdings more than those without mandated matches, I interact the profit sharing term with the employer match variable and include the resulting interaction in the specification in column (3). The coefficient estimate on this interaction term is statistically insignificant (with a p-value of 0.50) (not reported in table), leading me to conclude that mandated employer matching is likely not the reason for employer matches increasing the percentage of equity in the DC plan.

An alternative explanation may have to do with how the participant perceives his investments when his employer contributes funds. Employees make sophisticated asset allocation decisions if they treat both their contributions and those from their employer equally, since employer contributions are part of in-kind compensation. However, employees may perceive the employer contribution as a windfall, and invest in higher-risk assets as a result. By treating the employer match as one might treat another person's money, the participant is willing to hold more high-risk equities in his portfolio.

of 3.02. Eliminating the stock variable increases the retirement meeting variable by 0.12 of a percentage point to 3.28, with the same standard error.

Selection

An individual may choose to attend a retirement class for several reasons. He may feel the need to begin preparing for retirement, leading him to seek out either a financial advisor or a class at work. Alternatively, he may realize he does not have the necessary knowledge to make educated financial decisions and solicit the advice of someone more knowledgeable. Or his employer may simply require that he attend a class.⁷³ It is thus reasonable to assume that the choice to attend a class may be motivated by unobserved factors that also affect the asset allocation decision. If so, then the coefficient estimate on R in equation (1) and all other estimates are biased and inconsistent.

To address the possibility of selection bias, I include a set of proxy variables to control for unobserved tastes. The vector, P , in equation (1) contains these proxies. The HRS is a rich source from which to choose proxy variables. Along with measures of risk aversion, retirement planning horizon, and future liquidity constraints (the net wealth variables) that I include as basic controls in the model, I also construct variables that control for mortality risk and general saving time horizon. In order to obtain consistent estimates, I must assume that no other omitted factors in the error term are correlated with either the observables or the proxy variables.

One's own assessment of mortality risk can affect one's investment choice. Expectations of a shorter life - and hence a brief retirement (if one at all) - shortens the retirement saving horizon. The HRS asks the respondent to rate the chance he or she will live to be to age 85. I quantify the responses by constructing a binary variable equal to one if the individual feels there is at least a 50 percent chance he will live to be age 85. If

participants follow the traditional financial advice of increasing investment in risky assets the longer the time horizon, then the probability of a longer life should increase the percentage allocated to equity.

In addition to measuring the retirement saving horizon with the years until retirement variable, I construct three dummy variables that describe general saving horizon. The respondent is asked which time horizon is most relevant to his and his family's saving plans: the next few months, next year, next few years, next 5-10 years, or longer than 10 years. I incorporate the responses into three different time periods: a few months to a few years, five to ten years, and more than ten years. The effect of general time horizon on pension equity allocation depends upon whether the individual general and retirement saving horizons coincide, as well as whether the participant sees his DC plan as a vehicle for other types of saving besides retirement saving.

The presence of a safety net, such as Social Security, may also affect the asset allocation choice. Respondents in the HRS are asked to rate the probability that Social Security benefits will decrease in the next ten years. Since the majority of individuals in the survey are between the ages of 51 and 61, the next 10 years coincides with their retirement years. The HRS groups the responses on a scale from 0 to 10, with 0 being absolutely no probability of decreased benefits. I group the responses into three categories: those reporting a zero to 40 percent probability of decreased benefits, those believing there is a 40 to 70 percent chance, and those who are 70 to 100 percent sure benefits will decrease. The 1995 RCS reports that those who believe Social Security will provide little, if any, benefits for their retirement also expect to rely more on employer-sponsored retirement plans (EBRI, January 1996). There could be two effects on pension

⁷³ Unfortunately the HRS does not report whether the class was voluntary or mandatory.

asset allocation for individuals: they could feel the need to increase future balances within their pensions and invest more in equities. Alternatively, they could invest more in less risky fixed-income instruments for fear of losing all or most of their retirement security. Theoretically, the direction of the effect of lowering Social Security benefits on pension asset allocation is ambiguous.

It is also important to identify one other important factor that may affect both the decision to attend a meeting and the portfolio choice: financial knowledge.

Unfortunately, I am unable to directly measure the financial knowledge of each individual. Note, however, that two measures already included in X in equation (1) may serve as proxies for this measure: formal education and amount of outside stock holdings. Bernheim and Scholz (1992) find that those with more formal education are more likely to show evidence of sophisticated financial planning. Likewise, individuals who have non-pension stock holdings may have acquired financial knowledge through making decisions regarding these holdings, or they could have possessed knowledge initially that led them to seek out and invest in equities.⁷⁴

Table 2.4, column (4) reports the estimates for the specification including the proxy variables. Each proxy variable estimate is statistically insignificant, and an F test of the joint significance of all proxy variables produces a small F statistic of 0.32, with a p-value of 0.90. The addition of the proxy variables leads to an increase from 3.16 to 3.87 in the retirement education variable, with a p-value of 0.20 and a t-statistic of 1.3.

Whether retirement education is exogenous in the model is unclear, even after the addition of the proxy variables. The addition of the proxies increases the estimate on

retirement education, suggesting downward selection bias in the original model.

However, the proxies themselves are statistically insignificant, and the relative magnitude of the change in the retirement education variable is not very large.

Employer and Non-Employer Sponsored Retirement Classes

Performing instrumental variable (IV) estimation would be the next logical step in addressing the potential endogeneity of the retirement education variable. However, an instrumental variable that satisfies the necessary conditions for consistent estimation does not present itself. As an alternative, I examine whether attending an *employer-sponsored* class is motivated by saving tastes. I specify a model in which the retirement meeting variable, R , is replaced by two different variables, depending on whether the individual took the class from his employer or not:

$$A = X\beta + \delta E + \sigma N + P\psi + \mu. \quad (2)$$

A , X , and P contain the same variables as in equation (1). E is equal to 1 if the individual took an employer-sponsored class, 0 otherwise. N is equal to 1 if the individual took a non-employer-sponsored (henceforth known as *outside*) class, 0 otherwise.

Existing literature on retirement education focuses on employer-sponsored programs. There are several reasons for this. These programs are more homogenous in content and structure than the array of available private financial planners and community college classes. In addition, private retirement education usually requires payment and

⁷⁴ Whether the individual has any non-pension stock or not is perhaps a better proxy than amount of stock. I evaluate the model replacing only the amount of stock with a binary variable expressing whether the individual has outside stock holdings and find no statistical difference in the estimates.

time outside of work, which are in smaller supply to low-income workers. Employers educating their employees about saving and retirement may be a way for financial education to reach those who need to save for retirement the most.

I can reasonably assert that attending an outside retirement class has a greater likelihood of being motivated by individual saving tastes than do employer-sponsored classes, because the individual must be motivated by some force to seek out the class in the first place.⁷⁵ Employers, on the other hand, often require these classes in conjunction with entering a DC plan or offer them conveniently to employees during work hours.

Starting with the assumption that attending an outside meeting is not exogenous, I use equation (2) to test if effects of employer-sponsored meetings on DC asset allocation are statistically equal to the effects of outside meetings. I report the retirement education coefficient estimates in the first and second rows of Table 2.6, and the difference between the two in the third row. Each column uses the same variables as in columns (1)-(4) of Table 2.4. The difference is not statistically significant in any of the specifications, including the model with the proxy variables. Therefore, I cannot reject the null hypothesis that the estimates are statistically the same.

I cannot conclude from this comparison that the retirement meeting variable in equation (1) is not endogenous, as I am simply comparing two broad types of retirement education. However, this result does lend evidence to the conclusion by Bernheim and Garrett (1996) that using employer-sponsored education may be motivated by unobservable individual characteristics that also affect saving behavior. As more

⁷⁵ It could be argued that those with particular tastes for saving demand education from their employers. Bayer, Bernheim and Scholz (1996) examine the motivation behind employers offering retirement education and conclude that it is low participation by lower-paid workers - not employee demand for classes - that is the prime motivator.

employers decide to offer retirement education, its effectiveness in changing behavior is likely to be an ongoing topic of study - one in which employee motivations for attendance must be taken into consideration.

The Effect of Retirement Education by Individual Characteristics

Participants may react to retirement education differently depending on individual characteristics. Individuals with different time horizons may follow traditional advice and allocate their assets depending upon their stage in the life cycle. Likewise, participants with different degrees of risk aversion may take financial advice and tailor their investments to the amount of risk and return they are willing to accept.⁷⁶ In order to test these differences econometrically, I estimate model (1) and include the interaction terms $R*T$ and $R*V$. I estimate the model with and without proxy variables.

In Table 2.7, I report OLS estimates of the effect of retirement meetings on percent invested in equities, by years until retirement and degree of risk aversion. I report the estimates using OLS without proxy variables in column (1), and with proxy variables in column (2).⁷⁷ Those with a high degree of risk aversion allocate 20 to 21 percentage points more to equity if they attend a retirement class, with p-values of 0.006 and 0.004 for OLS with and without proxies, respectively. The estimates on the other measures of risk aversion and years until retirement do not appear to follow any particular pattern, and all are statistically insignificant.

⁷⁶ Participants could also respond differently to retirement education based upon characteristics such as gender, education, and income. I estimate many different specifications using different interaction terms, and do not find adding any other interactions to be of additional explanatory value (not reported in tables).

⁷⁷ The effect of retirement education for the variable *less than 5 years until retirement* is calculated by evaluating the linear combination: $\alpha + \omega_1 + (N_1)\phi_1 + (N_2)\phi_2 + (N_3)\phi_3$, where N_j is the sample mean of the corresponding degree of risk aversion variable. I calculate the effects for the other 7 groups in a similar

In addition to reporting the effects of retirement education separately by years until retirement and degree of risk aversion, I look at the effects for groups, each possessing different combinations of these characteristics. In Table 2.8, column (1), I report OLS estimates for eight different types of DC participants, each group having a different combination of time horizon and risk aversion characteristics. Because I will discuss only the results for those with extreme and high degrees of risk aversion, and because the estimates for the eight groups that each have either a moderate or low aversion to risk are all statistically insignificant, I omit these groups from the table.

All 4 groups in Table 2.8 that have high degrees of risk aversion increase their holdings of stock if they took a retirement class. All coefficients are estimated with a p-value of at the most 10 percent, with the majority of the estimates statistically significant at less than the 5 percent level. A general pattern of stock investment consistent with life cycle predictions is evident if the individual has a high degree of risk aversion, although the effect is not linear. As is seen in column (1), those expecting to retire in 8 or more years invest from 20 to 28 percentage points more in equity if they attend a meeting, while those with up to 8 years until retirement invest approximately 16 to 18 percent more in equity.

These effects are quite large for those with less than 8 years until retirement. It is possible that individuals are looking past the actual time of retirement in their saving horizons. Also, employers are only recently realizing that retirement age is becoming more variable, as some employees are choosing to retire early while others choose to work into their late 60s and 70s. Terneoy (1995) reports that in the past, specific

manner, only using the mean value of each years until retirement variable when evaluating the effect of degree of risk aversion.

retirement counseling at employers was done at the age of 55 or older, but more recently many employers are starting retirement counseling around age 50.

Why are only those with high levels of risk aversion - and not those with extreme levels - responding to retirement education? One explanation may be related to the curvature of each group's utility function. In Section 3, I discuss Kritzman's (1994) theory on why certain individuals will not invest in a risky asset, no matter how long their time horizon. The theory proposes that for certain individuals with extremely concave utility functions, the potential disutility associated with losing even a little wealth is greater than the potential gains that could be had from more risk and larger returns.

It may be the individuals with extreme levels of risk aversion that display behavior similar to that described in Kritzman's model. Regardless of any knowledge pertaining to holding period and risk learned at a retirement class, the participant does not want to hold risky assets. On the other hand, those with relatively less aversion to risk - or those labeled as having high levels of risk aversion - respond to information at a class concerning holding risky assets and choose to hold more equities.

6. CONCLUSION

This paper is the first study to evaluate the effects of taking a retirement class on asset allocation within a self-directed DC plan. I find that retirement education substantially increases the percentage invested in equities for those with a high level of risk aversion, regardless of the individual retirement time horizon. I find no effect of retirement education on participant equity choice generally. Because the HRS only surveys individuals ages 51 to 61, these results do not generalize to all DC participants with choice in their pension plans.

It is pertinent to point out certain factors that may affect the results and implications of this analysis. First of all, the HRS does not report the year in which the participant took the class. Hurt (1998) reports that classes began to consist of more detailed investment information beginning only in the late 1980s. The preliminary release in 1987 and final release in 1992 of section 404(c) guidelines also may have affected the content of classes over time. Before guidelines were specified to restrict legal liability for employers, asset allocation information may have been minimized to avoid being interpreted as investment advice.

Characteristics of the organization offering the class, or even of the instructor, can also vary significantly. Although asset allocation and risk/return issues are among the topics most often covered in an employer-sponsored class (EBRI, 1995), Goodfellow and Schieber (1997) find significant variation in asset allocation for participants with similar characteristics among different plans. This suggests that perhaps there are other characteristics of classes besides content, such as the method by which the information is transmitted, that may differ across classes.

Bias in the estimates due to selection is another possible - although not probable - factor. Although my estimates on the retirement education variable do increase with the addition of the proxy variables, the increase is small and the estimate is statistically insignificant in each specification. The proxy variables are also largely jointly insignificant, suggesting they do not explain much (if any) variation in pension portfolios. Hence the existing evidence suggests that selection bias is not affecting the retirement education estimates. However, without further means to investigate the possibility of bias (such as IV estimation), I can only come to this conclusion with a moderate amount

of certainty.

Lastly, the content of the HRS data and the structure of the questions regarding both retirement education and DC asset allocation may affect the results. The HRS does not report the number of investment choices the participant has to choose from, or what those choices are. VanDerhei et al. (2000) report that the options offered to the employee affect the allocation he chooses. The HRS also does not identify whether the employer match is mandated in company stock. I am able to identify those plans that have a greater probability of containing this mandate (by flagging those plans of the profit sharing type), but not all plans of this type have this feature.

Perhaps the most likely reason for the lack of effect of retirement classes on asset allocation is the manner in which the HRS presents the question regarding pension asset allocation to its survey participants. If individuals decide to rearrange their portfolios after taking a class, small shifts, rather than large movements, of assets are more likely. Thus the appearance of no shift in assets for those who attended a meeting may be a function of the inability of the model to pick up small changes in investment patterns. The fact that the model may not be able to pick up these small changes does not mean the results tell us nothing about retirement education and asset allocation, however. Rather, the fact that there is no effect in this model speaks to what retirement education does not do for the average participant - and that is cause *large* shifts in equity within the pension account.

REFERENCES

Access Research, Inc., "Participant Attitudes and Behavior," Report prepared for members of the Society of Professional Administrators and Recordkeepers. Windsor: Access Research, 1995.

Alliance Against Fraud in Telemarketing, Top Emerging Scams of 1992. Washington, D.C.: Alliance Against Fraud in Telemarketing, Winter 1992.

Bayer, Patrick, B. Douglas Bernheim, and John Karl Scholz, "The Effects of Financial Education in the Workplace: Evidence from a Survey of Employers," National Bureau of Economic Research Working Paper no. 5655, July 1996.

Bernheim, B. Douglas, "Personal Saving, Information, and Economic Literacy: New Directions for Public Policy," in Tax Policy for Economic Growth in the 1990s, Washington, D.C.: American Council for Capital Formation, 1994a, pp. 53-78.

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

Bernheim, B. Douglas, and John Karl Scholz, "Private Saving and Public Policy," National Bureau of Economic Research Working Paper no. 4215, 1992.

Bodie, Zvi, "On the Risk of Stocks in the Long Run," Financial Analysts Journal, 51: May/June 1995, pp. 18-22.

Bodie, Zvi, and Dwight B. Crane, "Personal Investing: Advice, Theory, and Evidence," Financial Analysts Journal, November/December 1997, pp. 13-23.

Bodie, Zvi, Merton, R.C., and W.F. Samuelson, "Labor Supply Flexibility and Portfolio Choice in a Life Cycle Model," Journal of Economic Dynamics and Control, 16(3-4): July-October 1992, pp. 427-49.

Buck Consultants, 401(k) Plans, Employer Practices and Policies, A Survey Report - September 1994. New York: Buck Consultants, Inc., 1994.

Dickemper, Jennifer, and Paul Yakoboski, "Increased Saving but Little Planning: Results of the 1997 Retirement Confidence Survey," Employee Benefit Issue Brief no.191, November 1997.

Employee Benefit Research Institute, The 1999 Retirement Confidence Survey (RCS) Summary of Findings. Washington, D.C.: Employee Benefit Research Institute, 1999.

REFERENCES (continued)

Employee Benefit Research Institute, "Can We Save Enough to Retire? Participant Education in Defined Contribution Plans," Employee Benefit Research Institute Issue Brief no. 160, April 1995.

Employee Benefit Research Institute, "Participant Education: Actions and Outcomes," Employee Benefit Research Institute Brief no. 169, January 1996.

Employee Benefit Research Institute, Public Attitudes on Investment Preferences . Washington D.C.: Employee Benefit Research Institute, 1993.

Employee Benefit Research Institute, "Worker Investment Decisions: An Analysis of Large 401(k) Plan Data," Employee Benefit Research Institute Issue Brief no. 176, August, 1996.

Employee Benefit Research Institute/Gallup Organization Inc., "Public Attitudes on Investment Preferences," Employee Benefit Research Institute Report no. G-61, November 1994.

Galer, R., Quick, C., Rea, J. and Jack VanDerhei, "401(k) Plan Asset Allocation, Account Balances, and Loan Activity," Employee Benefit Research Institute Issue Brief no. 205, January 1999.

Goodfellow, G.P., and S.J. Schieber, "Investments of Assets in Self-Directed Retirement Plans," in Positioning Pensions for the Twenty-first Century, edited by M.S. Gordon, O.S., Mitchell, and M.M. Twinney, 67-90. University of Pennsylvania Press, 1997.

Hinz, Richard P., McCarthy, David D. and John A. Turner, "Are Women More Conservative Investors? Gender Differences in Participant-Directed Pension Investments," in Positioning Pensions for the Twenty-first Century, edited by M.S. Gordon, O.S., Mitchell, and M.M. Twinney, 67-90. University of Pennsylvania Press, 1997.

Hurt, Ronald D., "The Changing Paradigm of 401(k) Plan Servicing," in Living with Defined Contribution Pensions: Remaking Responsibility for Retirement, edited by Olivia S. Mitchell and Sylvester J. Schieber, 193-207. Philadelphia, Pennsylvania: Pension Research Council, the Wharton School of the University of Pennsylvania, and the University of Pennsylvania Press, 1998.

Institute of Management and Administration, Defined Contribution Plan Investing. Washington, D.C., April 25, 1995.

Jianakopulos, Nancy and Alexandra Bernasek, "Are Women More Risk Averse?" Paper presented at the Western Economics Association annual meeting, San Diego, California, June 1994.

REFERENCES (continued)

Kritzman, Mark, "What Practitioners Need to Know About Time Diversification," Financial Analysts Journal, January/February 1994, p. 15.

Oppenheimer Funds, Restoring the Dream of a Comfortable Retirement. New York: Oppenheimer Funds Distributor, 1994.

Papke, Leslie E., "How Are Participants Investing Their Accounts in Participant-Directed Individual Account Pension Plans?" Michigan State University Working Paper, 1998.

Phoenix-Hecht, Plan Sponsor Survey: Large Defined Contribution Plans Respondent Report. Research Triangle Park, N.C.: Phoenix-Hecht, 1994a.

Poterba, James M., and David A. Wise, "Individual Financial Decisions in Retirement Saving Plans and the Provision of Resources for Retirement," in Privatizing Social Security, edited by Martin Feldstein, 85-105. Chicago: University of Chicago Press, 1998.

Samuelson, Paul A., "Asset Allocation Could Be Dangerous to Your Health," Journal of Portfolio Management, 16: Spring 1990, pp. 5-8.

Samuelson, Paul A., "The Judgment of Economic Science on Rational Portfolio Management: Indexing Timing and Long-Horizon Effects," Journal of Portfolio Management, 16(1): Fall 1989, pp. 4-12.

Smith, Roger, "DC Plans Accepted, Assets Growing...What's the Problem?" Pension World, February 1993, pp. 28-30.

United States Department of Labor, Pension and Welfare Benefits Administration, Abstract of 1991 Form 5500 Annual Reports. Private Pension Plan Bulletin No. 4, Washington, D.C.: United States Government Printing Office, Winter 1995.

United States Department of Labor, Bureau of Labor Statistics, "Employee Benefits in Medium and Large Firms," Washington, D.C.: United States Government Printing Office, 1993.

VanDerhei, Jack, Holden, Sarah and Carol Quick, "401(k) Plan Asset Allocation, Account Balances, and Loan Activity in 1998," Employee Benefit Research Institute Issue Brief No. 218, February 2000.

Warshawsky, Mark J., "Funding of Defined Benefit Plans," in Positioning Pensions for the Twenty-first Century, edited by M.S. Gordon, O.S., Mitchell, and M.M. Twinney, 107-138. University of Pennsylvania Press, 1997.

REFERENCES (continued)

Weisbenner, Scott, "Do Pension Plans with Participant Investment Choice Teach Households to Equitize?" Dissertation. Massachusetts Institute of Technology, 1999.

Wyatt Company, Wyatt Insider. October 1994, p. 8.

Yakoboski, Paul, "Participant-Directed Retirement Plans Today and Critical Issues for Tomorrow," in When Workers Call the Shots: Can They Achieve Retirement Security? edited by Dallas L. Salisbury, 9-22. Washington, D.C.: Employee Benefit Research Institute, 1995.

TABLE 2.1
Summary Statistics

<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Plans/ Participants</u>
Percent stock in pension plan	0.51	0.38	1187
Attended a retirement meeting	0.29	0.45	1108
Attended an employer-sponsored meeting	0.79	0.41	319
Attended a non employer-sponsored meeting	0.21	0.41	319
Female	0.46	0.50	1108
Black/other	0.16	0.36	1107
Married	0.82	0.38	1108
Age	54	4.9	1108
High school degree	0.92	0.27	1108
Income < \$25K	0.06	0.24	1108
Income between \$25 and \$50K	0.29	0.45	1108
Income between \$50 and \$100K	0.46	0.50	1108
Income over \$100K	0.19	0.39	1108
Net worth less than \$50K	0.15	0.36	1108
Net worth between \$50 and \$100K	0.18	0.38	1108
Net worth between \$100 and \$250K	0.38	0.48	1108
Net worth between \$250 and \$500K	0.19	0.40	1108
Net worth over \$500K	0.10	0.29	1108
Has profit sharing plan	0.14	0.35	1160
Amount of non-pension equity	\$29,356	\$106,522	1108
Amount in plan	\$52,335	\$111,755	924
Has other DC or DB pension	0.71	0.45	1108
Years expected until retirement	8.5	5.3	1039
Years in plan	7.7	6.5	1174
Employer matches a percentage of contribution	0.68	0.46	1041
Extreme degree of risk aversion	0.64	0.48	1098
High degree of risk aversion	0.14	0.35	1098
Moderate degree of risk aversion	0.11	0.31	1098
Low degree of risk aversion	0.11	0.31	1098
Has at least 50 percent chance of living until age 85	0.35	0.48	1099
Financial planning period a few months-few years	0.50	0.50	1093
Financial planning period 5-10 years	0.39	0.49	1093
Financial planning period greater than 10 years	0.11	0.31	1093
High expectation that Social Security benefits will decline in next 10 years	0.55	0.50	1101

TABLE 2.1 (continued)

<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Plans/ Participants</u>
Low expectation that Social Security benefits will decline in next 10 years	0.18	0.38	1101

Total number of plans in the sample is 1,322, with 1,236 participants in 1,130 families. Variables describing each plan (percent stock, profit sharing plan, amount in plan, years in plan, employer matches) are calculated using the total number of plans. All other variables describe the participant and are calculated from the number of participants. In both cases, observations are restricted to those individuals that reported how DC assets are allocated and if they attended a retirement meeting.

Statistics for type of meeting are conditional on having attended a meeting. The variable has other DB or DC plan describes those participants who have at least one DB plan from current or past employment, other self-directed DC plans, non-self-directed DC plans or plans that have both DC and DB characteristics.

TABLE 2.2
Proportion of Participants with Each Type
of Asset Allocation, by Individual Characteristics

	<u>Stocks</u>	<u>Mixed</u>	<u>Bonds</u>	<u>Number of Plans</u>
<u>Group</u>	(1)	(2)	(3)	(4)
All plans	.28	.45	.27	1108
Age				
<50 years	.26	.50	.24	167
50-55 years	.28	.47	.25	523
55-60 years	.27	.40	.33	327
>=60 years	.29	.43	.28	91
Female	.23**	.48*	.29	505
Male	.31**	.42*	.27	603
At least a high school degree	.28	.46	.26**	1020
No high school degree	.25	.36	.39**	88
Income				
<\$25K	.21**	.42	.37	70
\$25-50K	.25	.44	.31	315
\$50-100K	.28	.46	.26	514
>=\$100K	.33**	.45	.22	209
Years until retirement				
<5 years	.28	.39**	.33**	260
5-8 years	.27	.45	.28	233
8-11 years	.29	.43	.28	219
>=11 years	.28	.50**	.22**	327
Risk aversion				
Extreme degree	.27	.44	.29	704
High degree	.24	.50	.26	155
Moderate degree	.30	.49	.21	121
Low degree	.32	.42	.26	118

Participants not indicating how their assets are allocated or those not answering the retirement education question are excluded. Columns (1)-(3) report the proportion of participants who invested in mostly stocks, mixed, or mostly bonds. For the 7 percent of participants with more than one self-directed plan, I use only the allocation for the primary self-directed plan.

Statistical significance for income refers to the difference between less than \$25K and equal to or more than \$100K, and for years until retirement it is the difference between less than 5 years and 11 years and over.

** significant at the 5 percent level

* significant at the 10 percent level

Table 2.3
Proportion of Participants Who Attended a Retirement Meeting
and Respective Asset Allocation, by Individual Characteristics

<u>Group</u>	<u>Attended a Meeting</u>	<u>Stocks</u>	<u>Mixed</u>	<u>Bonds</u>	<u>Number of Plans</u>
	(1)	(2)	(3)	(4)	(5)
All participants	.29	.28	.45	.27	1108
Age					
<50 years	.23**	.26	.50	.24	167
50-55 years	.27	.28	.47	.25	523
55-60 years	.33	.27	.40	.33	327
>=60 years	.40**	.29	.43	.28	91
Female	.27	.23	.48	.29	505
Male	.31	.31	.42	.27	603
At least a high school degree	.30	.28	.46	.26	1020
No high school degree	.23	.25	.36	.39	88
Income					
<\$25K	.21*	.21	.42	.37	70
\$25-50K	.27	.25	.44	.31	315
\$50-100K	.31	.28	.46	.26	514
>=\$100K	.31*	.33	.45	.22	209
Years until retirement					
<5 years	.41**	.28	.39	.33	260
5-8 years	.31	.27	.45	.28	233
8-11 years	.23	.29	.43	.28	219
>=11 years	.23**	.28	.50	.22	327
Risk aversion					
Extreme degree	.29	.27	.44	.29	704
High degree	.26	.24	.50	.26	155
Moderate degree	.27	.30	.49	.21	121
Low degree	.35	.32	.42	.26	118

Participants not indicating how their assets are allocated or those not answering the retirement education question are excluded. I report the proportion of the sample that attended a retirement class in Column (1). Columns (2)-(4) report the proportion of participants who invested in mostly stocks, mixed, or mostly bonds. For the 7 percent of participants with more than one self-directed plan, I include the allocation for the primary self-directed plan.

Statistical significance for income refers to the difference between less than \$25K and equal to or more than \$100K, for years until retirement it is the difference between less than 5 years and 11 years and over, and for age it refers to the difference between less than 50 years old and equal to or greater than 60 years old.

** significant at the 5 percent level

* significant at the 10 percent level

TABLE 2.4
Percentage Point Increase in Stock if Attended a Retirement Class, by Plan
OLS Estimates

<u>Dependent Variable: Stocks, Bonds, Mix</u>	(1)	(2)	(3)	(4)	(5)
Attended a retirement meeting	1.79 (2.43)	1.28 (2.46)	3.16 (3.16)	3.87 (3.03)	2.70 (9.42)
Female		-5.93** (2.37)	-6.45** (2.89)	-6.47** (2.94)	-6.28** (2.87)
Black/other		1.21 (2.98)	5.18 (3.70)	5.26 (3.70)	4.45 (3.64)
Married		-0.72 (3.19)	-3.56 (3.78)	-3.91 (3.81)	-3.82 (3.81)
Age		-0.43* (0.24)	-0.06 (0.37)	-0.08 (0.37)	-0.009 (0.37)
High school degree		5.00 (4.6)	8.72 (5.48)	8.48 (5.49)	8.59 (5.50)
Income between \$25 and \$50K		3.56 (5.22)	2.48 (7.44)	2.06 (7.50)	3.16 (7.38)
Income between \$50 and \$100K		5.72 (5.39)	7.43 (7.53)	7.45 (7.57)	7.93 (7.45)
Income over \$100K		10.41* (5.94)	5.60 (8.28)	6.25 (8.31)	5.96 (8.18)
Net worth between \$50 and \$100K		6.72* (3.88)	7.38 (4.76)	7.48 (4.81)	7.20 (4.74)
Net worth between \$100 and \$250K		5.40* (3.55)	9.66** (4.31)	9.77** (4.35)	10.04** (4.33)
Net worth between \$250 and \$500K		7.67* (4.14)	12.80** (5.13)	13.20** (5.20)	12.72** (5.19)
Net worth over \$500K		2.23 (5.12)	0.16 (6.92)	0.14 (7.03)	0.88 (7.08)
Has profit sharing plan			18.02** (4.08)	18.39** (4.09)	18.26** (4.11)
Amount of non-pension stock holdings			0.19 (0.12)	0.21* (0.12)	0.20 (0.12)
Balance in account			0.21 (0.15)	0.20 (0.14)	0.23 (0.14)
Has DB or other DC plan			3.30 (3.30)	3.05 (3.35)	4.02 (3.33)
Years until retirement < 5			-4.54 (4.54)	-5.16 (4.64)	-3.40 (5.41)

TABLE 2.4 (continued)

	(1)	(2)	(3)	(4)	(5)
Years until retirement between 5 and 8			-4.51 (4.31)	-4.51 (4.31)	-3.50 (5.06)
Years until retirement between 8 and 11			-0.15 (3.86)	0.81 (3.89)	-1.48 (4.46)
Years in plan			-0.31 (0.22)	-0.36 (0.23)	-0.33 (0.23)
Employer offers match			15.16** (3.01)	14.41** (3.04)	15.32** (3.00)
Extreme degree of risk aversion			-5.17 (5.48)	-6.19 (4.74)	-6.20 (5.94)
High degree of risk aversion			-6.26 (4.68)	-4.22 (5.52)	-10.32 (6.75)
Moderate degree of risk aversion			2.78 (5.80)	3.13 (5.84)	5.04 (7.03)
Has at least 50 percent chance of living until age 85				1.52 (2.81)	-----
70-100 percent chance Social Security benefits will decrease in next 10 years				-2.80 (3.64)	-----
40-70 percent chance Social Security benefits will decrease in next 10 years				-1.39 (4.03)	-----
Financial planning period 5-10 years				-2.19 (3.01)	-----
Financial planning period greater than 10 years				-1.75 (4.85)	-----
Retirement meeting*years until retirement <5					-2.68 (7.71)
Retirement meeting*years until retirement between 5 and 8					-4.07 (7.98)
Retirement meeting*years until retirement between 8 and 11					7.53 (8.69)
Retirement meeting*extreme degree of risk aversion					-1.38 (9.40)
Retirement meeting*high degree of risk aversion					17.70 (11.42)
Retirement meeting*moderate degree of risk aversion					-10.62 (12.62)

TABLE 2.4 (continued)

	(1)	(2)	(3)	(4)	(5)
Constant	50.66** (1.34)	61.18** (15.20)	30.13 (22.70)	34.5 (23.02)	27.18 (22.95)
R ²	0.0005	0.02	0.113	0.115	0.123
Number of plans	1187	1186	763	757	763
Number of participants	1108	1107	727	722	727

(1) mean regression; (2) add demographic and financial variables; (3) add other control variables; (4) add proxy variables; (5) add interaction terms to (3). Amount of non-pension stock holdings and balance in account are expressed in \$10,000 1993 dollars.

P-values for F tests of joint significance: column (3): income, 0.50; net worth, 0.04; risk aversion, 0.13; years until retirement, 0.58; column (4): all proxies, 0.90; column (5): interaction terms for degree of risk aversion, 0.07; interaction terms for years until retirement, 0.59

Robust standard errors are corrected for family and individual-level correlation.

** significant at the 5 percent level

* significant at the 10 percent level

TABLE 2.5
Percentage Point Increase in Stock if Attended a Retirement Class, by Plan.
Ordered Logit Estimates

Dependent Variable: Stocks, Bonds, Mix	(1)	(2)	(3)	(4)	(5)
Attended a retirement meeting	0.09 (0.12)	0.07 (0.12)	0.14 (0.16)	0.18 (0.16)	0.08 (0.51)
Female		-0.30** (0.12)	-0.33** (0.16)	-0.33** (0.16)	-0.33** (0.16)
Black/other		0.05 (0.15)	0.24 (0.20)	0.25 (0.20)	0.21 (0.20)
Married		-0.04 (0.16)	-0.16 (0.21)	-0.18 (0.22)	-0.18 (0.21)
Age		-0.02* (0.01)	-0.004 (0.02)	-0.005 (0.02)	-0.001 (0.02)
High school degree		0.27 (0.22)	0.47 (0.30)	0.46 (0.30)	0.46 (0.30)
Income between \$25 and \$50K		0.19 (0.26)	0.08 (0.38)	0.05 (0.39)	0.11 (0.38)
Income between \$50 and \$100K		0.30 (0.26)	0.35 (0.39)	0.34 (0.39)	0.38 (0.39)
Income over \$100K		0.53* (0.30)	0.27 (0.43)	0.30 (0.43)	0.29 (0.43)
Net worth between \$50 and \$100K		0.33* (0.19)	0.34 (0.26)	0.35 (0.26)	0.34 (0.26)
Net worth between \$100 and \$250K		0.32* (0.18)	0.45* (0.23)	0.46* (0.24)	0.48** (0.24)
Net worth between \$250 and \$500K		0.38* (0.21)	0.58** (0.27)	0.61** (0.27)	0.58** (0.28)
Net worth over \$500K		0.10 (0.25)	-0.19 (0.37)	-0.20 (0.38)	-0.16 (0.38)
Has profit sharing plan			0.99** (0.23)	1.02** (0.23)	1.02** (0.23)
Amount of non-pension stock holdings			0.0016* (0.0009)	0.002* (0.0009)	0.002* (0.0009)
Balance in account			0.0011 (0.0008)	0.0011 (0.0008)	0.0012 (0.0008)
Has DB or other DC plan			0.18 (0.17)	0.16 (0.18)	0.22 (0.18)
Years until retirement < 5			-0.20 (0.24)	-0.23 (0.24)	-0.13 (0.28)

TABLE 2.5 (continued)

	(1)	(2)	(3)	(4)	(5)
Years until retirement between 5 and 8			-0.19 (0.22)	-0.19 (0.22)	-0.16 (0.26)
Years until retirement between 8 and 11			0.01 (0.21)	0.07 (0.21)	-0.07 (0.24)
Years in plan			-0.02 (0.01)	-0.02 (0.01)	-0.02 (0.01)
Employer offers match			0.81** (0.16)	0.78** (0.16)	0.82** (0.16)
Extreme degree of risk aversion			-0.29 (0.28)	-0.34 (0.24)	-0.36 (0.29)
High degree of risk aversion			-0.34 (0.24)	-0.24 (0.28)	-0.58* (0.34)
Moderate degree of risk aversion			0.16 (0.30)	0.17 (0.30)	0.28 (0.37)
Has at least 50 percent chance of living until age 85				0.07 (0.15)	-----
70-100 percent chance Social Security benefits will decrease in next 10 years				-0.17 (0.20)	-----
40-70 percent chance Social Security benefits will decrease in next 10 years				-0.09 (0.22)	-----
Financial planning period 5-10 years				-0.11 (0.16)	-----
Financial planning period greater than 10 years				-0.06 (0.24)	-----
Retirement meeting*years until retirement <5					-0.17 (0.41)
Retirement meeting*years until retirement between 5 and 8					-0.18 (0.43)
Retirement meeting*years until retirement between 8 and 11					0.42 (0.46)
Retirement meeting*extreme degree of risk aversion					-0.02 (0.50)
Retirement meeting*high degree of risk aversion					0.99 (0.61)

TABLE 2.5 (continued)

	(1)	(2)	(3)	(4)	(5)
Retirement meeting*moderate degree of risk aversion					-0.55 (0.66)
Number of plans	1187	1186	763	757	763
Number of participants	1108	1107	727	722	727

(1) mean regression; (2) add demographic and financial variables; (3) add other control variables; (4) add proxy variables; (5) add interaction terms to (3).

Standard errors in parentheses.

** significant at the 5 percent level

* significant at the 10 percent level

TABLE 2.6
Effects of Attending an Employer-Sponsored Class or
an Outside Retirement Class on Asset Allocation, by Plan

<u>Type of Meeting</u>	(1)	(2)	(3)	(4)	<u>Number of Plans</u>
Employer-sponsored	1.19 (2.72)	1.12 (2.75)	3.20 (3.23)	3.80 (3.24)	271
Non employer-sponsored	4.14 (4.46)	2.40 (4.50)	5.41 (5.93)	6.83 (6.0)	73
Difference	2.95 (4.89)	1.27 (4.91)	2.21 (6.32)	3.04 (6.36)	-----

Specifications in columns (1)-(4) correspond to the same columns in Table 2.4, except for the replacement of the more general retirement education variable with employer and non employer-sponsored education variables.

(1) mean regression; (2) add demographic and financial variables; (3) add other control variables; (4) add proxy variables.

Robust standard errors in parenthesis. Standard errors are corrected for family and individual-level correlation.

** significant at the 5 percent level

* significant at the 10 percent level

TABLE 2.7
Percentage Point Increase in Stock if Attended a Retirement Class
by Years until Retirement and Degree of Risk Aversion, separately

<u>Group</u>	<u>OLS</u>	<u>OLS with</u> <u>Proxies</u>	<u>Number</u> <u>of Plans</u>
	(1)	(2)	(3)
Years until retirement < 5	0.64 (5.61)	1.80 (5.64)	278
Years until retirement 5 to 8	-0.74 (5.95)	-0.59 (6.00)	258
Years until retirement 8 to 11	10.86 (6.83)	10.41 (6.93)	236
Years until retirement > 11	3.32 (5.32)	3.95 (5.41)	349
Extreme degree of risk aversion	1.32 (3.73)	1.60 (3.80)	751
High degree of risk aversion	20.40** (7.44)	21.62** (7.49)	170
Moderate degree of risk aversion	-7.92 (8.92)	-6.68 (8.98)	130
Low degree of risk aversion	2.70 (8.69)	2.11 (8.17)	123

Robust standard errors in parenthesis. Standard errors are corrected for family and individual-level correlation.

** significant at the 5 percent level

* significant at the 10 percent level

TABLE 2.8
Percentage Point Increase in Stock if Attended a Retirement Class
by Years until Retirement and Degree of Risk Aversion, together

<u>Group</u>	<u>OLS</u>	<u>OLS with</u> <u>Proxies</u>	<u>Plans</u>
	(1)	(2)	(3)
Extreme degree of risk aversion / less than 5 years until retirement	-1.36 (5.99)	-0.35 (6.04)	188
Extreme degree of risk aversion / 5 to 8 years until retirement	-2.75 (6.23)	-2.75 (6.30)	178
Extreme degree of risk aversion / 8 to 11 years until retirement	8.80 (7.08)	8.26 (7.18)	146
Extreme degree of risk aversion / greater than 11 years until retirement	1.32 (6.03)	1.79 (6.13)	194
High degree of risk aversion / less than 5 years until retirement	17.71** (8.95)	19.68** (8.99)	39
High degree of risk aversion / 5 to 8 years until retirement	16.33* (9.04)	17.28* (9.07)	31
High degree of risk aversion / 8 to 11 years until retirement	27.93** (9.94)	28.28** (10.03)	33
High degree of risk aversion / greater than 11 years until retirement	20.39** (8.37)	21.82** (8.45)	57

Robust standard errors in parenthesis. Standard errors are corrected for family and individual-level correlation.

** significant at the 5 percent level

* significant at the 10 percent level

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