

## Household Stock Investing:

### *Inside Versus Outside the Retirement Plan*

Vickie L. Bajtelsmit and Nancy A. Jianakoplos

Possible justification for stock investing is to diversify the household portfolio. Households tend to have a large proportion of their wealth in illiquid assets such as Social Security wealth, real estate and human capital.

Thus, investment in stocks provides a valuable source of diversification, while still providing a higher level of return than less risky alternatives. Some individuals may have innate preferences for riskier assets or they may place value on the entertainment that they get from investing.

A recent study by Barber and Odean (2000) shows that women achieve higher returns than men in their stock portfolios, largely because they do not trade as often, thus avoiding costly brokerage fees. Although the authors attribute the lower male returns to overconfidence, the male behavior may be rational if, in fact, they get satisfaction from the act of trading.

Lastly, households may hold stock because they receive employment compensation in the form of stocks and/or stock options on employer equity. Although these may eventually be liquidated, there are usually holding period limitations.

## Why Don't Households Invest in Stocks?

Standard financial theory suggests that households should hold portfolios diversified across all types of assets. Thus, according to financial theory, all households should own stocks. Yet, as reported earlier, more than half of the households in the United States in 1998 did not own any stocks. A number of previous studies, including those by Uhler and Cragg (1971) and King and Leape (1998), have noted the wide-spread tendency for households to hold incomplete portfolios. Explanations for incomplete portfolios generally fall into three broad categories: transaction costs, information costs and constraints on obtaining an optimal portfolio.

Transaction costs involved in buying and holding stocks could be sufficient for some households to offset any anticipated higher re-turn of stock ownership. In addition, Uhler and Cragg (1971) suggest there may exist "nuisance" costs associated with holding small quantities of an asset that are sufficient to limit households from owning a full array of assets. The restrictive impact of transaction costs is expected to diminish as household wealth in-creases, making stock ownership more likely for richer households.

The costs of obtaining and processing information about stocks could also deter many households from investing in equities. Based on a survey of U.S. households, King and Leape (1987) reported that when asked why they did not own stocks, about a third responded, "[I/We] don't know enough about it." King and Leape suggest that information about investing in-creases with age. Bertault (1998) modifies a consumption capital asset pricing model to include the information costs associated with stock investing. According to this model, stock investing should be related to the household's ability to obtain and process information, which is likely to be related to education and occupation. In addition, they find that barriers to stock ownership resulting from information costs decline with lower risk aversion and the presence of a bequest motive.

Finally, restrictions may prevent households from holding their optimal portfolio. Auerbach and King (1983) suggest that restrictions on short sales prevent (the optimal) negative holdings of particular types of assets for certain households. Other households may face liquidity constraints and the consequent inability to borrow to obtain an optimal portfolio.

## Inside vs. Outside

Should stocks be held inside a tax-deferred account or outside? There are arguments on both sides of this issue. The tax-deferred status of qualified pensions favors holding both growth and income securities inside a pension. Because dividend income would normally be taxed at the ordinary income tax rate, whereas long-term capital gains are subject to more favorable tax rates, the argument for holding stock inside the pension is stronger for income stocks. Upon retirement, withdrawals are taxed at the individual's ordinary income tax rate. However, basic principles of the time value of money favor paying taxes later rather than earlier, so it is still preferable to defer taxation, all else equal.

Households may also value the expertise offered by professional pension fund managers. Although individuals may choose to allocate their pensions to particular fund types, the stock selection within a DC plan is done by expert portfolio managers. Furthermore, the volume of dollars invested in any given plan makes it possible for the plan to invest in securities that might not be available to small investors, thus improving portfolio diversification.

Just as stock compensation plans may result in larger amounts of household wealth in stock outside the pension, employee stock ownership plans and profit-sharing plans may result in larger percentages of household wealth held inside the pension. This is perhaps the worst type of stock investing because it results in household portfolios that are less diversified, with both human capital and financial assets tied to the employer.

There are also some good reasons for holding stocks outside a pension. The illiquidity of retirement assets may be a major factor for households facing unknown future expenditures such as education and health care. In addition, households may have motives for saving other than retirement and bequests.

### **The Link Between Inside and Outside Stock Ownership:**

The hypothesis of this paper is that participation in DC retirement plans significantly reduces the information costs associated with stock investing so that retirement plan participants are more likely to also invest in stocks outside their retirement plan. Through retirement plans, participants gain both familiarity with-and information about-stock investing. Familiarity with stock investing is likely to occur because 401(k), 403(b) and other types of DC retirement plans are part of the benefits package accompanying their employment. Particularly in the presence of matching employer contributions, DC plan participants have great incentives to become familiar with stock investing.

The option to participate is generally offered to the employee, engaging those who would not actively initiate stock investing on their own. Some individuals may be more willing to consider stock investing that is sponsored by their employer, with whom they have an ongoing relationship, than in pursuing investment options with less well-known financial planners or brokers.

Employers also provide investing information. Bayer, Bernheim and Scholz (1996) using firm level data, find that plan summaries, newsletters and financial seminars were offered by roughly 70%, 65% and 44%, respectively, of all firms sponsoring either DC or defined benefit retirement plans.

Once participants have gained information about investing within the retirement plan, this information is readily transferable to investment outside the retirement plan.

A number of studies have investigated stock investing within retirement plans (Bajtelsmit and VanDerhei 1997, Bodie and Crane 1997, Waggle and Englis 2000). Many of these have found that households are more conservative in investment decisions, i.e., allocating a smaller share to stock, than professional investment managers. Still others have considered stock investing outside retirement plans (Barber and Odean 2000). Obviously, the allocation of assets within a retirement plan is part of an overall allocation strategy for the

entire port-folio. Bodie and Crane (1997) examine stock investment both inside and outside retirement plans, but the sample on which their study is based is limited to only households participating in a particular DC pension. Their nonrepresentative sample does not allow any robust conclusions to be drawn.

Weisbenner (1999) examined stockholding outside of DC pensions using only DC plan participants from the 1995 Survey of Consumer Finances. In contrast to these previous studies, the data used in this study represent both DC plan participants and nonparticipants and are drawn from a representative sample of households. Thus we are able to investigate how asset allocation within a retirement plan is part of the overall household portfolio allocation and to analyze the impact of participation in a DC retirement plan on stock investment outside the pension.

## **Description of the Data**

The Survey of Consumer Finances (SCF), a triennial survey sponsored by the Federal Reserve Board with the cooperation of the Department of the Treasury, is the most detailed source of information on household finances currently available.

The most recent wave of the survey (SCF98), conducted in 1998, is used for this study. The survey includes 4,305 households, of which 3,070 households have at least one person age 18-62 who is currently employed, and 1,337 households have at least one person with investments in a DC pension.

Because the purpose of this study is to compare stock investments inside and outside the pension, the subsample of working adults is used in this study. An important aspect of the SCF98 is that it oversamples wealthy households. These households are the ones for which wealth measurement is the most difficult. Furthermore, wealthy households have the potential to bias average estimates of wealth and allocations of wealth when included in raw form.

In order to be representative of the U.S. population of working adults, all results reported below are sample weighted. The multiple imputation technique is used to account for missing variables (Montalto and Sung 1996). For the purposes of this analysis, we consider household investment allocations of their financial assets only.

Investment in stocks includes stocks held directly or indirectly in mutual funds, annuities, trusts, IRA/Keogh accounts and DC pensions. Where the investment allocation information for indirect stock ownership is limited to "mostly stocks," "mostly bonds" or "mixed," we follow the convention used in other studies, such as Papke (1998), of assuming that "mostly stocks" means 100% stock and "mixed" means 50% stocks. This may result in an overstatement of the allocation to equities in household portfolios.

## **Stock Investing Inside and Outside the Retirement Plan**

Table I summarizes the stock ownership characteristics of the employed, working age subsample of households. While 58% of these households owned stock either inside or outside of DC plans, 89% of households with DC plans owned stock, compared to only 32% of households without DC plans. Focusing just on stock holdings outside of DC pensions, 51% of the households with DC plans own stock outside of their DC plan, compared to just 32% of households without DC plans. Based on this observed difference and without controlling for other differences, households with DC pensions are 59% more likely to own stock outside their DC pensions than households without DC plans are likely to own any stock. Not only are households with DC pensions more likely to own stocks, but the value of the stocks they own represents 49% of their financial wealth, on average, compared to just 18% for those households without DC plans. However, households with DC plans tend to have more income, wealth and education, and they are more likely to be married.

## DETERMINANTS OF OUTSIDE STOCK INVESTING

To determine the impact of DC pension plan participation on stock holdings outside the plan, holding other factors constant, we estimate a probit model according to the following reduced form specification:

OWNSTOCK is a dummy variable equal to one if the household owns stock outside the pension and zero otherwise. This decision is expected to be related to demographic, preference, information, transaction costs and constraint variables  $X_i$  to  $X_n$ . Demographic variables include a set of dummy variables indicating marital/gender status (with married couples as the omitted category), number of children currently in the household and race. Information variables include age (as hypothesized by King and Leape), years of education, managerial occupation, whether the household has a defined benefit plan and whether the household has a DC plan that allows investment choice. Each of these variables is associated with greater knowledge and/or ability to process information and is hypothesized to be positively related to stock ownership. Transaction costs of stock holding are expected to diminish as household income and wealth increase. To avoid endogeneity bias, variables measuring age, years of education and a dummy variable indicating the receipt of an inheritance serve as proxies for income and wealth and are expected to be positively related to stock ownership.

Preference variables include dummy variables indicating whether the household expresses a bequest motive, has a long-term (five years or more) investment time horizon, and if the respondent indicates an unwillingness to take financial risk. Because stock ownership is usually more appropriate for long-term investing, both a bequest motive and a long-term horizon are expected to be positively related to stock ownership. An unwillingness to take risk is expected to be inversely related to stock ownership because of the greater volatility of stock prices and the possibility of nominal losses. A dummy variable indicating whether the household pays off credit cards is used as a proxy for whether the household faces liquidity constraints and is expected to be positively related to stock ownership. Both single men and single women are estimated to be less likely to own stock outside a DC than married couples by 10% and 6%, respectively. In addition, holding other factors constant, white households are 6% more likely to own stock than nonwhite households.

Other variables used to capture the impact of information and transaction costs on stock investing exhibit the expected signs. Stock ownership is estimated to increase by 1.4% per year with age and 3% per additional year of education. Those employed in managerial occupations, presumed to have more access to information relevant for stock investing, are estimated to be almost 5% more likely to own stocks than those employed in other occupations. Those who inherited significant wealth are estimated to be almost 11% more likely to own stocks than those who did not.

Preference variables are estimated to have significantly and quantitatively large impacts on stock ownership. A bequest intent and a long-term horizon are estimated to increase the probability of stock ownership by 12% and 15%, respectively. In contrast, those who indicate an unwillingness to take financial risk are 25% less likely to hold stock outside the pension. Those households that do not face liquidity constraints, as proxied by their ability to pay off their credit cards, are more than 14% more likely to own stock outside a DC, compared to households that face liquidity constraints.

## CONCLUSIONS:

This study investigates the stock investing propensities of U.S. households using the most recent Survey of Consumer Finances data set. On average, those households with stock holdings are likely to be older, more educated and more affluent. Focusing on households with working adults ages 18-62, we compare the stock ownership of households with and without DC pensions. We find that households with DC pensions offering investment choice are 5% more likely to hold stock outside their pensions than households without DC pensions. Based on the economics and investments literature, this is consistent with the hypothesis that the

deterrents to stock investing are related to information costs and unfamiliarity. When DC plans offer investment choices, they are required to provide information to the participants to help them make decisions with respect to investment allocation. Once the participants become familiar with the concepts of risk and return, they are more likely to choose riskier investments outside their pensions.

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