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# ASSET ALLOCATION AND ASSET LOCATION DECISIONS: EVIDENCE FROM THE SURVEY OF CONSUMER FINANCES

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March 2001
Revised March 2002

ABSTRACT

The rapid growth of assets in self-directed tax-deferred retirement accounts has generated a new set of financial decisions for many households. In addition to deciding which assets to hold, households with substantial assets in both taxable and tax-deferred accounts must decide where to hold their various assets. This paper uses data from the 1989-1998 Surveys of Consumer Finances to assess how many households have enough assets in both taxable and tax-deferred accounts to face significant choices regarding asset location. As of 1998, 45 percent of households had at least some assets in a tax-deferred account, and more than ten million households had at least $25,000 in their taxable as well as their tax-deferred accounts. Many households hold equities in their tax-deferred accounts, but not in their taxable accounts, while also holding taxable bonds in their taxable accounts. This contradicts the general wisdom that one should locate heavily taxed assets in the tax-deferred account. Asset allocation within tax deferred accounts is quite similar to asset allocation in taxable accounts.

We are grateful to Brad Barber, Joel Dickson, and John Shoven for helpful conversations and to the Hoover Institution, the National Institute of Aging, and the National Science Foundation for research support.

Households have always confronted the asset allocation problem, the question of which assets to purchase and how much to invest in each of them. But with the recent growth of self-directed retirement plan assets, many households now also face an asset location problem. This concerns the choice of how much of a given asset to hold in a taxable account, and how much of it to hold in a tax-deferred account. Assets in participant-directed tax-deferred accounts totaled more than five billion dollars at the end of 2000, with $2.7 billion in Individual Retirement Accounts, and $2.5 billion in 401(k)-type private and government-sponsored plans.

Black (1980) and Tepper (1981) were the first to call attention to the asset location issue. They showed that for firms that did not view bankruptcy as a likely possibility, and which were therefore not concerned about maximizing the value of the pension insurance offered by the Pension Benefit Guarantee Corporation, defined benefit corporate pension fund assets should be invested entirely in fixed-income assets. This is because fixed-income investments held outside the pension account are more highly taxed than equity investments, and holding highly-taxed assets within the pension fund maximizes the value of the implicit government subsidy from tax-deferral. Holding debt in the pension account need not affect the firm's capital structure provided the fund can make offsetting adjustments in other components of its balance sheet.

The recent growth of IRAs, 401(k)'s, and other self-directed tax-deferred retirement vehicles, along with the decline of defined-benefit pension plans, has shifted the tax-deferred investment allocation problem from firms to households. Asset location has begun to attract substantial attention from researchers in public finance and financial economics, and it is a frequent topic of discussion among financial planners. Shoven (1998) outlined the structure of the asset location problem facing many households and pointed out that for individuals holding bonds and stocks through financial intermediaries such as mutual funds, the standard recommendation to allocate bonds to the tax-deferred account and stocks to the taxable account might not apply. Subsequent work by Dammon, Spatt, and Zhang (2000), Shoven and Sialm (1998, 2000), Huang (2000), Poterba, Shoven, and Sialm (2000), and others has

provided further insight on the optimal asset location strategy for households facing particular tax environments and investment options.

The general result that runs through these studies is that relatively heavily taxed assets should be held in the tax-deferred account. This is not always imply that taxable bonds should be held in this account. For example, Shoven and Sialm (2000) consider the case in which investors have access to tax-exempt bond investments and the available set of equity investments is relatively tax inefficient, as it may be if it includes only high-turnover actively-managed mutual funds. They show that optimal asset allocation may involve holding mutual funds in the tax-deferred account, with tax-exempt bonds in the taxable account.

Despite the recent interest in how households should locate assets to maximize their after-tax wealth at a given terminal date, there has been relatively little research on the actual behavior of taxable investors. Three notable exceptions are Bodie and Crane's (1997) study of the asset location decisions of TIAA-CREF investors, Barber and Odean's (2001) analysis of asset location patterns of clients of a large retail brokerage firm, and Amromin's (2001) study how prospective liquidity needs affect household decisions with respect to asset location.

In this paper, we use data from four waves of the Survey of Consumer Finances (SCF), conducted in 1989, 1992, 1995, and 1998, to investigate asset location patterns. Amromin (2001) also relies on the SCF data. The SCF data are useful for studying the asset location question because they provide complete and disaggregate data on the portfolios held by a large sample of households. While they do not provide as much detail on the individual securities that households own as the brokerage records studied by Barber and Odean (2001), they have the important advantage of including information on all of the assets the household owns, not just those at a particular financial institution.

The paper is divided into four sections. The first presents information on the number of households that face substantively important asset location decisions. We identify such households by the presence of substantial asset holdings in both taxable and tax-deferred accounts (TDAs). Section two explores how households allocate their assets in both taxable and tax-deferred accounts. It shows that, in

the aggregate, equity investments make up more than two-thirds of tax-deferred financial assets and a similar proportion of taxable financial assets. Section three focuses more precisely on the asset location question by studying whether households with both taxable and tax-deferred accounts display differences in the share of their taxable and tax-deferred accounts held in equities and in debt. The results suggest that if anything, equity is held disproportionately in the tax-deferred account. A brief conclusion suggests directions for future research.

## 1. How Many Households Face Asset Location Choices?

The last two decades have witnessed rapid expansion in the total value of assets in tax deferred accounts (TDAs). These accounts include: Individual Retirement Accounts (IRAs), which are available to all taxpayers with earned income, 401(k) plans, which are employer-provided defined contribution plans available at some firms, 403(b) plans, which are similar to 401(k) plans but are available to employees at nonprofit institutions, and a number of other smaller programs. Table 1 shows the total value of assets held in tax-deferred accounts as a fraction of total financial assets for selected years during the last two decades. The TDA share was 16.2 percent at the end of 1998, more than double the share in 1985. The stock of tax-deferred assets in 1998 was roughly equally divided between IRA and defined contribution pension plan accounts.

The aggregate data do not provide insight on the number of households with substantial balances both in TDAs and in conventional, taxable accounts that face substantively important asset location problems. To investigate how many households fall in this group, we use data from the 1989 through 1998 Surveys of Consumer Finances (SCFs). The SCF is the best available source of data on household wealth and its components. The survey asks a relatively comprehensive set of questions, has a large sample size, and oversamples the high net worth households that hold the bulk of financial assets.

The 1998 SCF, which is described by Kennickell, Starr-McCluer, and Surette (2000), sampled 4309 households, with 2813 in the random sample and 1496 in the stratified random sample that over-weighted those with high incomes or net worth. Four households are excluded from the public use dataset due to

disclosure concerns, leaving a sample with 4305 observations. One fourth of the households in the survey have net worth of over a million dollars. All of our tabulations weight the various observations in the survey by their sampling weights so that our reported statistics should be representative of the U.S. population.

Data from the SCF allow us to estimate the equity share of assets in tax deferred accounts (TDAs) as well as the equity share for non-TDA assets. For assets outside of tax-deferred accounts, the survey asks respondents to separately report the dollar values of direct stock holdings, equity mutual fund shares, and mixed equity-fixed income mutual fund shares. Aggregating these reported asset holdings provides a measure of equity held in taxable accounts. Our equity variable does not include equity in privately-held companies, since such assets may be illiquid and difficult to transfer from the taxable to the tax-deferred account. The SCF also provides considerable detail on fixed-income assets held outside of tax-deferred accounts. Our measure of fixed-income assets includes certificates of deposit, savings bonds, and other taxable bonds held directly and through mutual funds. We do not include the value of checking accounts or money market accounts, on the grounds that holdings of these accounts are driven by liquidity concerns rather than asset allocation or tax issues.

Tax-exempt bonds, which are held in taxable accounts, raise special problems for our analysis. While their risk attributes are similar to other fixed income securities, their tax attributes are similar to corporate equity, since their returns are not taxed at the ordinary income tax rate. In some of our calculations, we therefore combine tax-exempt bonds with equity to describe household asset allocations between heavily-taxed and lightly-taxed assets. Approximately 6.5 percent of households own tax-exempt bonds in each of the surveys. Virtually all of the households that hold tax-exempt bonds also hold taxable fixed-income instruments.

We measure the total value of the assets held in tax-deferred accounts as the sum of assets held in 401(k), 403(b), and supplemental retirement accounts (SRAs). Since some defined contribution plans that are not included in these categories allow participants little or no control over their asset allocation decisions, we probably understate the value of tax-deferred assets that are directly controlled by individual investors.

The SCF asks whether each tax-deferred account is invested ‘mostly or all in stock’, ‘split between stock and interest earning assets’, or "mostly or all in interest-bearing accounts," or in "real estate," "insurance," or "other." Hardly any TDA assets are held in real estate, insurance, or "other." We allocate all of the assets in accounts identified as ‘mostly or all in stock’ to equity, half of the value of ‘split’ accounts, and none of the value of other accounts to equity. We then sum these equity holdings, as well as the total value of all accounts. The SCF does not permit us to distinguish taxable and tax-exempt bonds in the TDA. Barber and Odean (2001) find very few households with tax-exempt assets in their TDA; we assume that there are no such holdings.

Table 2 presents summary information on the percentage of households in the 1989, 1992, 1995, and 1998 Survey of Consumer Finances with tax-deferred accounts. The total number of households in the U.S. economy rises from 93 million to 102.6 million over the period spanned by these surveys. The first column in Table 6 shows the percentage with Individual Retirement Accounts, 401(k) plans, 403(b) plans, or other self-directed retirement saving plans. This percentage rises from 29.1 percent in 1989 to 45 percent in 1998. The next column of Table 2 shows the percentage of households with financial assets, excluding transaction accounts such as checking accounts, outside their TDA. Approximately 45 percent of the households in each of the four Surveys of Consumer Finances report ownership of these assets. The last column of Table 2 shows the percentage of households with either taxable or tax-deferred assets. This group accounts for 54 percent of households in 1989 and 63 percent in 1998.

Table 3 presents more detailed information on the set of households that may face asset location problems. The table shows the number of households with more than certain threshold levels of assets in both taxable and tax-deferred accounts in 1989 and 1998. Asset thresholds are measured in constant 1998 dollars. The table shows that in 1998, 30.0 million households had positive amounts of both taxable and tax-deferred assets. Over half of these households had significant amounts in both accounts; 15.3 million households had more than $10,000 in both taxable and tax deferred assets. The number of households with more than a higher threshold asset level in both accounts is also substantial: 10.2 million had more than $25,000 in both settings and 6.1 million had more than $50,000. A smaller but still substantial group, 3.2

million households, had more than $100,000 in both types of accounts. This group, which accounts for just over 3 percent of all households, held almost 42 percent of financial assets as defined above.

The comparison between the entries in Table 3 for 1989 and 1998 demonstrates the growing importance of asset location issues. In 1989, 8.6 million households had more than $10,000, and 2.6 million had more than $50,000, in both taxable and tax-deferred accounts. The table also shows that the number of households with tax-deferred assets above various thresholds grew much more rapidly than the number of households with taxable assets above various thresholds over this period. This is a direct reflection of the expansion of eligibility for self-directed retirement accounts over this period. Poterba, Venti, and Wise (2001) provide more detail on this development.

The three tables described above suggest that many households have substantial amounts in tax-deferred accounts, but they do not indicate the share of household financial assets that these households hold in these accounts. Table 4 addresses this issue by showing, for 1998, the distribution of the ratio of TDA assets to total financial assets. The ratio of tax-deferred to total financial assets can be important for understanding the welfare effects of asset location choices. For a household with a portfolio almost entirely in the taxable account, the asset mix within the 401(k) may be of little consequence, since the value of the 401(k) at retirement may represent a small fraction of total wealth. For a household with almost all of their assets in the TDA, the asset location decision is also of little consequence -- there are too few assets outside the TDA to allow much flexibility. The households for whom the asset location decision is most significant are those with TDA balances that represent a nontrivial share of their financial assets.

Table 4 shows that in 1998, the median household among those with both tax-deferred and taxable financial assets had 55.6 percent of their financial assets in tax deferred assets. At the 25th percentile this value was 26.7 percent, while at the 75th percentile it was 85.4 percent. For higher net worth households, the distribution of tax-deferred assets relative to all financial assets shifts toward the left. The median value of this ratio for households with at least $250,000 in net worth, for example, is 46.4 percent, compared with 55.6 percent for all households. The net worth measure includes non-financial assets, and if we limit our sample to households with financial assets of more than $250,000, we find that the median household has only 41

percent of their financial assets in a TDA. Table 4 suggests that for a substantial group of households with both TDA and non-TDA financial assets, perhaps half, the amounts held inside and outside the TDA are of the same order of magnitude.

To provide some insight on the characteristics of the households with substantial holdings of both taxable and tax-deferred assets, Table 5 presents means and medians for several household attributes. The median net worth of households with more than $25,000 in both taxable and tax-deferred accounts is $520,000, while the median for those with more than $100,000 in both settings is $1.18 million. In both cases, mean net worth is substantially greater than median ($1.32 million for those with more than $25,000 in both settings, and $2.58 million for those with more than $100,000). Households with larger balances are older than those with smaller balances. The median household with more than $25,000 in both taxable and tax-deferred settings is headed by someone who is 54, while for those with $100,000 in both the TDA and the taxable account, the median age is 56. Median household income rises from $82,300 for those with more than $25,000 in both the TDA and the taxable account, to $124,900 for those with more than $100,000 in each setting. The percentage of college graduates is higher (74 percent) among the group with more than $100,000 in each setting than among those with at least $25,000 in each type of account (58 percent college graduates).

## 2. Asset Allocation Patterns

We now consider asset allocation as well as asset location patterns in the Survey of Consumer Finances. We begin by studying the share of equity in household financial assets, as well as the fraction of households who hold various types of financial assets. Table 6 presents this information from each of the SCFs between 1989 and 1998. The first panel of Table 6 shows that for all households, equity rose from 40.4 percent of financial assets in 1989 to 69.7 percent of financial assets in 1998. This increase reflected both high returns and broadening participation in equity markets. The share of individuals holding equity in either taxable or tax-deferred accounts rose from 27.3 percent to 45.8 percent, while the share of investors holding fixed-income assets remained steady at around 50 percent. The share of households with any equity

or fixed-income assets rose from 54 to 63 percent over this time period, while the share holding tax-exempt bonds was steady at between four and five percent.

The lower panels of Table 6 stratify households according to the configuration of their taxable and tax-deferred accounts. These panels again show the number of households with various types of assets in their portfolios. The number of households with financial assets both in their tax deferred account, and outside this account, rose from 19.3 million to 30 million between 1989 and 1998. The share of corporate equities in the financial assets of households with both TDAs and non-TDA assets rose from 44 percent in 1989 to 72 percent in 1998. The fraction of these households holding some equity rose from 74 to 91 percent over this time period.

The rise in equity exposure is most striking for households that have financial assets in their TDA but not outside the TDA. For this group, which consisted of 8 million households in 1989 and 16 million in 1998, the percentage with TDA equity rose from 39 to 74 percent. Total equity as a share of household financial assets for this group doubled from 29 to 59 percent. All financial assets for this group are held in tax-deferred accounts. The share of equity in total financial assets also increased for households that held no TDA assets, but that did have financial assets outside the TDA. These results are shown in the last panel of Table 6. The equity share in the portfolios held by these households rose from 36 to 61 percent between 1989 and 1998.

Table 7 presents summary statistics on asset allocation in TDAs and taxable accounts. In 1989, the equity share of assets held in TDAs (34 percent) was below the equity share in taxable accounts (43 percent). This was still true in 1998, but the equity share in the two types of accounts converged. By 1998, 68 percent of TDA assets and 71 percent of non-TDA assets were held in equities. The similar mix of stocks and bonds in taxable and tax-deferred accounts raises questions about the extent to which investors are pursuing sophisticated asset location strategies that suggest assets should be located inside or outside the TDA based on their tax characteristics.

The upper panel of Table 7 chronicles the substantial increase between 1989 and 1998 in the fraction of households owning corporate stock. In 1989, 27.3 percent of investors held any equity, with 20.0 percent

holding equity in a taxable account and 13.3 percent holding equity through a TDA. Six percent of all households held equity in both their TDA and in a taxable account. By 1998, 45.8 percent of all households held equity, with 34.5 percent holding equity in a tax-deferred account and 27.6 percent holding equity in taxable accounts.

The data in Table 7 do not permit an analysis of the tax burden on corporate equity holdings, since they do not distinguish direct holdings of corporate shares from indirect holdings through equity mutual funds. Investors who hold equity indirectly cede some control over their tax burdens to mutual fund managers' capital gain realization decisions. They lose the opportunity to employ investment strategies that exercise valuable tax-timing options.

Table 8 disaggregates various ways of holding corporate stock. The first row shows that in 1989, of the 27.3 percent of households that owned stock, 7.3 percent held equity only through their TDA, 6 percent held equity both inside and outside the TDA, and 14 percent held equity only outside their TDA. Of the 20 percent of households holding equity in taxable accounts, 14 percent (10.2 + 3.8) had only direct equity holdings, while 6 percent (1.1+1.1+1.8+2.0) held at least some equity through a mutual fund. By 1998, 12.4 percent held taxable equity, with all of their stock owned directly, while 15.3 percent held some taxable equity through a mutual fund (15.3 = 4.7+4.8+2.1+3.7). This shift toward greater holdings of equity investments through indirect methods, with potentially higher tax burdens than direct holdings, suggests that tax burden differences between fixed-income assets and equity investments may be decreasing over time.

Table 9 presents information on the ownership of fixed-income assets that is similar to the equity ownership information in Table 8. In addition to splitting fixed-income investments by TDA and non-TDA location, within taxable accounts Table 8 distinguishes taxable fixed-income investments from investments in tax-exempt bonds. In 1998, we estimate that 48.8 percent of households owned fixed income assets. This is almost identical to the percentage that held fixed income assets in 1989. Roughly one quarter of this group held fixed-income assets inside their TDA but not outside, while nearly half held fixed income assets outside the TDA but not inside. Most households holding fixed-income assets, whether these assets are held both

inside and outside the TDA or only outside the TDA, are not investing in tax-exempt bonds. For the bulk of SCF households, tax-exempt fixed-income investments do not represent a substantial share of their portfolio.

### 3. Asset Location Decisions

To investigate how households solve the asset location problem, we must jointly consider household equity and fixed income investments inside as well as outside tax-deferred accounts. Because there are many possible permutations of asset holdings, it can be challenging to summarize information on asset location in a parsimonious way.

Table 10 represents our first attempt to summarize the various asset holding patterns in the 1998 Survey of Consumer Finances. The columns of this table indicate whether households have tax-deferred accounts, and if they do, what assets (only equity, only bonds, and some combination) they hold in the TDA. The rows describe the assets that the households hold in their taxable accounts. We include tax-exempt bonds with equities held in taxable accounts, since they are less heavily taxed than ordinary fixed income investments.

Table 10 shows that there are a total of 46.2 million households with assets in tax-deferred accounts. Of this group, 10.8 million (23.4 percent) hold only fixed-income assets in their TDAs. This is a group that might be allocating their highly-taxed assets to their tax-deferred account, as standard models of asset location would suggest. Of this group, however, only 4.1 million (38 percent) hold any equity outside the TDA. This group, which looks like "bonds in the TDA, stocks outside the TDA" investors, represents less than one tenth of the households with tax-deferred accounts. The 2.5 million households with only bonds in the TDA, and only bonds outside the TDA, may also be following a tax-minimizing asset location strategy, as may be the 4.9 million households with only equity in their TDA and in their taxable account. For a household with risk tolerance that points toward holding only stocks or holding only bonds in both sets of accounts, their is no effective asset location decision. One additional group, those with bonds and stocks in the TDA, and stocks in the taxable account, could also be following this rule; this group consists of 2.3 million households. Adding all of these groups together, there are 13.8 million households, or 29.9 percent of all households with

TDA assets, who may be following the traditional advice regarding asset location. The question that these results raise is why more households do not follow an asset location strategy that comports with the standard advice of financial planners.

Table 10 also shows that there are a substantial group of households that hold both fixed-income and equity investments, with the equities in the TDA rather than the taxable account. There are 6.5 million households, 14 percent of the group with TDAs, that hold only fixed-income securities outside their TDA, while holding either all equities or a mix of bonds and stocks in the TDA. These households appear to be following just the reverse of the "bonds in the TDA" strategy. A total of 8.8 million households (19 percent) hold only equity in the TDA, while holding both bonds and equities, or only bonds, outside the TDA. There is another substantial group, representing 9.7 million households, that reports only equity in the TDA or both equity and fixed-income securities in the TDA, and holdings of both equity and fixed-income assets outside the TDA. These households, like those who hold bonds outside the TDA and stocks in the TDA, could probably reduce their taxes by reallocating their wealth so that they held more of their fixed-income investments in their tax-deferred account.

The lower panel of Table 10 presents information comparable to that in the upper panel, but for a sample limited to households with net worth of at least $250,000. We use this stratification to identify households for whom issues related to financial planning may be more salient than for lower-wealth households. The data show that of 21.6 million households that satisfy this net worth criterion, 16.4 million (75 percent) have some TDA assets. Of this group, 1.6 million (9.8 percent) exhibit asset allocation patterns that are consistent with the "bonds in the TDA first, stocks outside the TDA" prediction. This percentage is substantially greater than the percentage for all households with TDAs. While this suggests greater compliance with the standard wisdom for asset location, we also find a higher percentage of better-off households following asset allocation strategies that appear grossly inconsistent with this asset location rule. There are 4.1 million households, or 25 percent of the total with net worth greater than $250,000, with equities in the TDA, but only bonds or some combination of bonds and equities outside the TDA. The comparable statistic for households with net worth below $250,000 is 16 percent.

Theoretical studies of asset location that suggest that households should place highly-taxed assets preferentially in their tax-deferred accounts suggest that investors will locate at ‘corners’ in their portfolio allocation decisions. Huang (2001), an exception to this general statement, shows that liquidity needs and borrowing constraints may lead to an interior allocation in each account for some investors. In light of the literature, the cells of Table 10, based on 100, 0-100, and 0 percent equity allocations, are starkly drawn as well. Table 11 is similar to Table 10 except that the cutoffs are drawn at 20 and 80 percent equity allocations rather than at 0 and 100. These cutoffs provide information about households that are near an allocation edge or corner, but not precisely there.

The results generally reinforce the findings in Table 10. Of the 46.2 million households with TDA assets, 3.8 million have more than 80 percent of their TDA in equity, and less than 20 percent of their taxable account in equity. This compares with 3.2 million households, in Table 10, with all of their TDA in equity, and all of their non-TDA assets in fixed income. The assignment rules in Table 11 reduce the number of households that are categorized as "both equity and taxable fixed income" because it replaces this category with "between 20 percent and 80 percent equity". The other categories, that were starker (100 percent equity, for example) in Table 10, correspondingly become larger. The basic findings of Table 10 are confirmed by the data in Table 11.

Tables 10 and 11 suggest that relatively few households follow a strict "bonds in the TDA first" asset location strategy. Yet neither table indicates the magnitude of the deviation between the observed asset location and the asset location that would be prescribed by this simple asset location rule. To explore that issue, we calculated the change in each household's portfolio that would be needed to place all taxable fixed income assets in the tax-deferred account before any such assets were held in the taxable account. Recall that we are not considering assets in checking accounts or money market funds as part of our taxable fixed income category.

Table 12 presents our findings on the necessary reallocations to achieve the simple tax-efficient allocation. The table shows that for all households with both taxable and TDA financial assets, a total reallocation of $251 billion would move households to the tax-minimizing point. This re-allocation amounts

to just under one tenth of the $2640 billion in TDA assets. The required reallocation, as a percentage of TDA assets, is smallest for small account balances. For households with more than $250,000 in both their TDA and non-TDA financial assets, for example, the required reallocation is 11.4 percent of their total TDA assets. For households with less than $25,000 in both accounts, the required reallocation ($33.9 billion) is actually smaller -- 4.3 percent of total TDA assets. This reflects the smaller size of TDA relative to non-TDA assets for this group, as well as a greater tendency to hold taxable fixed income assets in the TDA among small account holders.

Table 12 also shows the aggregate portfolio reallocation that would be needed to move households to equal equity/fixed-income allocations both within and outside of tax-deferred accounts. The required changes are slightly larger than the ones that are needed to get to the tax-minimizing asset location. This comparison suggests that households are slightly closer to the tax-minimizing outcome than to a default strategy that would allocate the same fraction of both the taxable and the tax-deferred account to equities.

The third column of Table 12 shows the required reallocation to move households to a "fixed income in the TDA first" strategy, with one modification. This is to allow each household to hold $25,000 in fixed-income financial assets are held outside of the TDA. We think of this as a financial buffer stock outside the TDA. Such a buffer stock might be attractive if, as in Huang's (2001) analysis, households face random shocks to their expenditure needs and they can make early withdrawals from tax-deferred accounts only at substantial cost. The required reallocation when we allow for a buffer stock of non-TDA fixed income saving is only slightly smaller than that when we do not consider such a buffer. The aggregate reallocation is $246.9 billion, compared with $250.8 billion when we do not impose this constraint.

While the present paper does not try to test alternative models of what determines asset location, we do explore the relationship between various household attributes and the composition of household portfolios. Table 13 reports estimates of linear regression models in which the dependent variable is the equity share of either taxable or tax-deferred assets. The explanatory variables are a set of indicator variables for net worth falling in a variety of categories, or for age in a variety of categories. The sample is the set of 1709 SCF households in 1998 who hold both taxable and tax-deferred assets.

The results in Table 13 suggest several conclusions. First, there is a weak tendency for the share of the tax-deferred account allocated to equity to rise with household net worth. For households with less than $100,000 in net worth, the estimated coefficients in the equity share regressions center around 0.60, while for those with more than $1,000,000 in net worth, the coefficients are closer to 0.70. The differences across wealth categories are somewhat more pronounced, with the $1 million plus category rising to nearly 0.80, when we control for age as well as net worth.

Second, there is a stronger relationship between net worth and equity share for assets held in taxable accounts than for equity in TDAs. The difference between the coefficients for households with net worth of less than $100,000, and the coefficients for those with more than $1 million, is roughly 0.30 when we do not control for age, and 0.40 when we do. Thus the derivative of asset allocation percentage with respect to net worth is more than twice as large in taxable as opposed to tax-deferred accounts. These two results, taken together, suggest that households in the lower part of the net worth spectrum are more likely to allocate tax-deferred assets, than taxable assets, to equities.

The third pattern that emerges from Table 12 concerns the relationship between age and asset allocation in both taxable and tax-deferred accounts. Older households, those with heads 55-64 or over the age of 65, hold a smaller share of their taxable account in equities than their younger counterparts. The same age pattern emerges with respect to taxable assets, but the age-related differences are larger in the tax-deferred account than in the taxable account. There are larger age-related differences in the TDA than in the taxable account.

Table 14 presents results that are similar to those in Table 13, but that use income rather than net worth to stratify households. Higher income households, like higher net worth households, allocate a larger share of their tax-deferred assets to equities than their lower income counterparts. The pattern also emerges with respect to taxable assets, but unlike the results in Table 13, we do not find pronounced differences between the income-related increases in equity exposure in taxable and tax-deferred accounts. We continue to find age-related differences in the asset allocation fraction for both taxable and tax-deferred accounts, with older households holding a smaller share of their tax-deferred assets in stocks.

## 4. Conclusions

This paper presents evidence on asset allocation decisions, and asset location decisions, for households with substantial balances in both their taxable and tax-deferred accounts. It shows that asset location is an important financial issue for a substantial group of U.S. households. More than eleven million households in 1998 had at least $25,000 in both taxable and tax-deferred accounts, and at least 3.4 million had more than $100,000 invested in each type of account. With respect to asset allocation decisions, the share allocated to equity assets is roughly equal both inside and outside of tax-deferred investment vehicles. With respect to asset location, we find clear evidence of a substantial group of households holding equity in the tax-deferred account while at the same time holding fixed-income assets outside of TDAs. Whether this reflects lower transactions costs to holding equity through this channel, or greater exposure to information about equity investment through worker education programs associated with 401(k)s and related issues, is not clear.

Our results suggest several directions for further investigation. One is to provide a clearer description of characteristics of households with only equity in their tax-deferred accounts, and no equity outside the TDA. These households are pursuing asset location strategies that are precisely the reverse of the conventional wisdom, and it would be helpful to understand what motivates this decision. Some research along these lines can be carried out using the Survey of Consumer Finances, but the lack of precise information on the way equities are held, mutual funds versus directly, is a limitation. Ideally, one would combine data on detailed holdings in tax-deferred accounts, such as the data studied by Agnew, Balduzzi, and Sunden (2000) or Barber and Odean (2001), with detailed holdings outside these accounts.

A second dimension for further investigation is the interplay between taxable and tax-exempt bonds in household asset location decisions. In each of the SCF data sets that we analyze, slightly more than six percent of all households report owning tax-exempt bonds. Only four percent of households in 1998 held more than $10,000 in such bonds, and ownership of these bonds is highly concentrated among those with very high net worth. This suggests that the use of tax-exempt debt as a fixed income investment, outside the

tax-deferred account, is not very common. Yet studies of the asset location problem, such as Shoven and Sialm (1999) and Poterba, Shoven, and Sialm (2000), suggest that holding tax-exempt debt can be an important element of long-term return maximization. Further exploration of the role of tax-exempt debt in household portfolios is therefore warranted.

Finally, there is a need to link research on the structure of household portfolios with other information on household attributes. Developing measures of household risk tolerance, of the probability of facing liquidity constraints, and of other related factors that might affect asset allocation and asset location choices is a central part of this research agenda. Amromin's (2001) attempt to test models of liquidity constraints represents an important step in this direction. Future work needs to continue in this vein by developing empircally tractable models that permit various determinants of portfolio choice to affect asset location behavior.

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Table 1: Self-Directed Tax-Deferred Assets as a Percent of Total Financial Assets

| Year | IRA | DC pension | Total |
|---|---|---|---|
| 1985 | 2.9 | 5.4 | 8.3 |
| 1990 | 5.2 | 6.0 | 11.2 |
| 1995 | 6.8 | 7.8 | 14.6 |
| 1998 | 7.7% | 8.5% | 16.2% |

Source: Flow of Funds, Z.1 release, Tables L.10 and L.119.c. Total financial assets were $8.0 trillion in 1985, $12.3 trillion in 1990, $18.8 trillion in 1995, and $27.2 trillion in 1998.

Table 2: Percentage of Households with Tax-Deferred Accounts or Financial Assets Outside Tax-Deferred Accounts, 1989-1998

| Year | Tax Deferred Assets | Taxable Financial Assets Outside TDA | Either Taxable or Tax Deferred Assets |
|---|---|---|---|
| 1989 | 29.1 | 45.6 | 54.0 |
| 1992 | 32.4 | 44.5 | 54.5 |
| 1995 | 38.2 | 43.1 | 56.7 |
| 1998 | 45.0% | 46.8% | 62.5% |

Source: Tabulations from Surveys of Consumer Finances. Financial assets outside the tax-deferred account include stocks, equity mutual funds, certificates of deposit, savings bonds, and other taxable bonds. Tax-exempt bonds are not included in the set of financial assets outside the TDA. In 1989, 6.5 percent of households reported some holdings of tax-exempt bonds; this fraction was stable across surveys, rising to 6.6 percent in 1998. Virtually all households owning tax-exempt bonds also held taxable bonds. The number of households in the four Surveys of Consumer Finances are 93 million (1989), 95.9 million (1992), 99 million (1995), and 102.6 million (1998).

Table 3: Households with Significant Holdings of Both Taxable and Tax-Deferred Financial Assets

| Value of Tax-Deferred Account | Financial Assets in Taxable Account | | | | |
|---|---|---|---|---|---|
| | > 0 | ≥ 10K | ≥ 25K | ≥ 50K | ≥ 100K |
| 1989 | | | | | |
| >0 | 19.3 | 11.0 | 7.9 | 5.8 | 3.6 |
| ≥ 10K | 12.7 | 8.6 | 6.7 | 5.1 | 3.2 |
| ≥ 25K | 7.7 | 5.8 | 4.8 | 3.8 | 2.4 |
| ≥ 50K | 4.1 | 3.5 | 2.9 | 2.6 | 1.8 |
| ≥ 100K | 1.8 | 1.5 | 1.3 | 1.2 | 0.9 |
| 1998 | | | | | |
| >0 | 30.0 | 18.5 | 14.0 | 10.9 | 6.6 |
| ≥ 10K | 22.4 | 15.3 | 12.1 | 9.5 | 5.9 |
| ≥ 25K | 16.9 | 12.5 | 10.2 | 8.1 | 5.3 |
| ≥ 50K | 11.6 | 8.9 | 7.4 | 6.1 | 4.3 |
| ≥ 100K | 6.7 | 5.5 | 4.9 | 4.0 | 3.2 |

Notes: Each entry shows the total number of households (in millions) with the specified mix of assets in tax-deferred and taxable accounts. Asset cutoffs in both 1989 and 1998 are measured in 1998 dollars.

Table 4: Share of Financial Assets Held in Tax Deferred Accounts, 1998

| Net Worth or Financial Asset Criterion | Households (millions) with TDA & Non-TDA Assets | TDA Assets as a Percentage of Total Financial Assets For Households with Both TDA and Non-TDA Assets | | | | | |
|---|---|---|---|---|---|---|---|
| | | Percentile | | | | | Mean |
| | | 10th | 25th | Median | 75th | 90th | |
| All Households | 30.0 | 10.3% | 26.7% | 55.6% | 85.4% | 97.2% | 55.2% |
| Net Worth ≥ $100K | 22.3 | 8.4 | 23.4 | 53.1 | 83.3 | 96.3 | 53.2 |
| Net Worth ≥ $250K | 14.2 | 6.5 | 18.4 | 46.4 | 76.9 | 94.2 | 48.3 |
| Net Worth ≥ $1M | 3.4 | 3.7 | 13.3 | 33.5 | 67.7 | 88.2 | 40.3 |
| Financial Assets ≥ $100K | 15.1 | 7.2 | 19.7 | 47.7 | 78.9 | 94.6 | 49.1 |
| Financial Assets ≥ $250K | 7.4 | 5.4 | 14.3 | 41.0 | 68.9 | 92.4 | 43.7 |
| Financial Assets ≥ $1M | 1.6 | 2.8 | 7.6 | 22.3 | 50.3 | 85.1 | 32.8 |

Source: Authors' tabulations using 1998 Survey of Consumer Finances. See text for further details.

Table 5: Characteristics of Households with Substantial TDA and Non-TDA Assets, 1998

| Household Characteristic | All | Value of TDA and Value of Non-TDA Assets ≥ $25K | Value of TDA and Value of Non-TDA Assets ≥ $100K |
|---|---|---|---|
| Number of Households (millions) | 102.5 | 10.2 | 3.2 |
| Mean net worth ($M) | $0.28 | $1.32 | $2.58 |
| Median net worth ($M) | $0.07 | $0.52 | $1.18 |
| Mean household income (thousands) | $53.1 | $156.1 | $265.1 |
| Median household income (thousands) | $33.5 | $82.3 | $124.9 |
| Mean age of household head | 48.7 | 55.0 | 56.7 |
| Median age of household head | 46 | 54 | 56 |
| Percent College Graduates | 28.0 | 57.5 | 74.0 |
| Percent Willing to Take "Above Average Risk for Above Average Rewards" | 22.8 | 40.0 | 41.6 |

Source: Authors' tabulations from the 1998 Survey of Consumer Finances.

Table 6: Aggregate Household Portfolio Allocation, 1989 – 1998

| Year | Millions of Households | Equity Share of Total Financial Assets | Percent of Households Holding: | | | |
|---|---|---|---|---|---|---|
| | | | Any Equity or Fixed-Income Assets | Any Equity | Any Fixed-Income Assets | Tax-exempt bonds |
| All Households | | | | | | |
| 1989 | 93.0 | 40.4 | 54.0 | 27.3 | 49.2 | 4.6 |
| 1992 | 95.9 | 47.8 | 54.5 | 32.4 | 48.6 | 4.4 |
| 1995 | 99.0 | 55.5 | 56.8 | 36.6 | 48.4 | 4.4 |
| 1998 | 102.6 | 69.7 | 62.6 | 45.8 | 50.5 | 4.8 |
| Households with Both TDA and Non-TDA Financial Assets | | | | | | |
| 1989 | 19.3 | 43.5 | 100.0 | 73.8 | 97.9 | 16.3 |
| 1992 | 21.5 | 51.4 | 100.0 | 81.4 | 95.3 | 14.3 |
| 1995 | 24.4 | 57.3 | 100.0 | 84.6 | 95.7 | 13.4 |
| 1998 | 30.0 | 72.4 | 100.0 | 90.5 | 90.9 | 11.9 |
| Households with TDA Financial Assets and No Non-TDA Assets | | | | | | |
| 1989 | 7.8 | 29.1 | 100.0 | 39.2 | 83.0 | 0.0 |
| 1992 | 9.5 | 37.5 | 100.0 | 61.7 | 80.1 | 0.0 |
| 1995 | 13.5 | 43.4 | 100.0 | 60.8 | 68.2 | 0.0 |
| 1998 | 16.2 | 58.8 | 100.0 | 74.2 | 64.9 | 0.0 |
| Households with Financial Assets Outside the TDA and No TDA Assets | | | | | | |
| 1989 | 23.2 | 35.5 | 100.0 | 34.9 | 88.1 | 4.9 |
| 1992 | 21.2 | 38.5 | 100.0 | 36.3 | 87.1 | 5.5 |
| 1995 | 18.4 | 52.8 | 100.0 | 40.7 | 84.0 | 5.7 |
| 1998 | 18.0 | 60.9 | 100.0 | 43.3 | 78.0 | 7.8 |

Source: Tabulations from Surveys of Consumer Finances.

Table 7: Asset Allocation in Taxable and Tax-Deferred Accounts, 1989-1998

| | 1989 | 1992 | 1995 | 1998 |
|---|---|---|---|---|
| All Financial Assets | | | | |
| Equity as Percentage of Total Financial Assets | 40.4% | 47.8% | 55.5% | 69.7% |
| Tax Exempt Bonds as Percentage of Total Financial Assets | 13.5 | 12.0 | 9.6 | 6.2 |
| Percent of Households with Equity or Fixed-Income Assets | 54.0 | 54.5 | 56.7 | 62.6 |
| Percent of Households with Any Equity | 27.3 | 32.4 | 36.6 | 45.8 |
| Percent of Households with Any Fixed-Income Assets | 49.2 | 48.6 | 48.4 | 50.5 |
| Financial Assets Held in TDA | | | | |
| Equity as Percentage of TDA Financial Assets | 33.6 | 46.8 | 54.4 | 67.7 |
| Percent of Households with Equity or Fixed-Income Assets | 29.1 | 32.2 | 38.3 | 45.0 |
| Percent of Households with Any Equity | 13.3 | 19.9 | 24.7 | 34.5 |
| Percent of Households with Any Fixed-Income Assets | 23.2 | 24.3 | 25.0 | 26.1 |
| Financial Assets Held in Outside TDA | | | | |
| Equity as Percentage of Financial Assets in Taxable Account | 42.5 | 48.2 | 56.0 | 70.8 |
| Tax Exempt Bonds as Percentage of Total Financial Assets | 17.7 | 17.6 | 14.1 | 9.4 |
| Percent of Households with Equity or Fixed-Income Assets | 45.7 | 44.5 | 43.2 | 46.8 |
| Percent of Households with Any Equity | 20.0 | 21.0 | 22.3 | 27.6 |
| Percent of Households with Any Fixed-Income Assets | 39.9 | 38.6 | 35.7 | 35.7 |

Source: Authors' tabulations based on Survey of Consumer Finances. Holdings of tax-exempt debt are classified as fixed income assets.

Table 8: Percentage of Households Holding Equity, 1989 – 1998

| Year | Any Equity Holdings | Equity Held Both Inside and Outside TDA | | | | Equity Only Held in TDA | Equity Only Held Outside TDA | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Direct and Indirect | Only Indirect | Only Direct | | Total | Direct and Indirect | Only Indirect | Only Direct |
| 1989 | 27.3 | 6.0 | 1.1 | 1.1 | 3.8 | 7.3 | 14.0 | 1.8 | 2.0 | 10.2 |
| 1992 | 32.4 | 8.6 | 2.5 | 1.4 | 4.7 | 11.4 | 12.5 | 1.8 | 2.7 | 8.1 |
| 1995 | 36.6 | 10.3 | 2.6 | 3.3 | 4.5 | 14.4 | 12.0 | 1.7 | 3.8 | 6.5 |
| 1998 | 45.8% | 16.4% | 4.7% | 4.8% | 6.9% | 18.1% | 11.3% | 2.1% | 3.7% | 5.5% |

Source: Tabulations from Surveys of Consumer Finances.

Table 9: Percentage of Households Holding Fixed-Income Assets, 1989-1998

| Year | Any Fixed-Income Holdings | Fixed Income both Inside and Outside TDA | | | | Fixed-Income Only in the TDA | Fixed Income Only Held Outside TDA | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Both Taxable and Tax-Exempt Bonds | Only Taxable Bonds | Only Tax-Exempt Bonds | | Total | Both Taxable and Tax-Exempt Bonds | Only Taxable Bonds | Only Tax-Exempt Bonds |
| 1989 | 48.8 | 14.3 | 2.3 | 11.8 | 0.3 | 8.8 | 25.6 | 1.7 | 23.6 | 0.3 |
| 1992 | 48.4 | 14.5 | 1.8 | 12.4 | 0.3 | 9.8 | 24.1 | 1.9 | 21.8 | 0.5 |
| 1995 | 47.6 | 13.2 | 1.6 | 11.3 | 0.3 | 11.9 | 22.6 | 2.0 | 20.0 | 0.6 |
| 1998 | 48.8% | 13.0% | 1.5% | 11.1% | 0.5% | 13.1% | 22.7% | 2.2% | 19.8% | 0.7% |

Source: Tabulations from Surveys of Consumer Finances.

Table 10: SCF Households (millions) with Various Asset Combinations, 1998

| | | Households with No Assets in TDA | Households with Only Equity in their TDA | Households with Both Equity and Taxable Fixed Income in TDA | Households with Only Taxable Fixed Income in TDA | Total Number of Households |
|---|---|---|---|---|---|---|
| All Households | | | | | | |
| Households With No Taxable Assets Outside the TDA | | 38.4 | 5.7 | 6.3 | 4.2 | 54.6 |
| | Only Equity Outside TDA | 4.5 | 4.9 | 2.3 | 1.3 | 13.1 |
| | Equity and Fixed-Income Outside TDA | 3.8 | 5.6 | 4.1 | 2.8 | 16.3 |
| | Only Fixed-Income Outside TDA | 9.7 | 3.2 | 3.3 | 2.5 | 18.7 |
| Total | | 56.4 | 19.4 | 16.0 | 10.8 | 102.6 |
| Households with ≥ 250K in Net Worth (21.9 million households) | | | | | | |
| Households With No Taxable Assets Outside the TDA | | 1.4 | 1.0 | 0.7 | 0.6 | 3.7 |
| | Only Equity Outside TDA | 1.0 | 2.5 | 1.0 | 0.6 | 5.1 |
| | Equity and Fixed-income Outside TDA | 1.8 | 3.3 | 2.7 | 1.8 | 9.6 |
| | Only Taxable Fixed-income Outside TDA | 1.2 | 0.8 | 0.8 | 0.6 | 3.4 |
| Total | | 5.4 | 7.6 | 5.2 | 3.6 | 21.9 |

Notes: Tax-exempt bonds are included with equity, since these bonds are lightly taxed. The results are virtually unchanged if tax-exempt bonds are aggregated with taxable fixed income securities.

Table 11: Asset Allocation Patterns, 1998 Survey of Consumer Finances

| | Households With No TDA Assets | Households with TDA Assets > 0 | | | Total |
|---|---|---|---|---|---|
| | | > = 80% of TDA Invested in Equity | 20 - 80% of TDA Invested in Equity | < = 20% of TDA Invested in Equity | |
| All Households | | | | | |
| No Taxable Financial Assets | 38.4 | 6.1 | 5.5 | 4.7 | 54.6 |
| >= 80% Taxable Financial Assets in Equity | 5.9 | 8.5 | 3.9 | 2.5 | 20.8 |
| 20-80% Taxable Financial Assets in Equity | 1.9 | 2.4 | 1.2 | 1.4 | 6.9 |
| <= 20% Taxable Financial Assets in Equity | 10.2 | 3.8 | 3.1 | 3.2 | 20.2 |
| Total | 56.4 | 20.8 | 13.7 | 11.7 | 102.6 |
| Households with ≥ 250K in Net Worth | | | | | |
| No Taxable Financial Assets | 1.4 | 1.1 | 0.6 | 0.6 | 3.7 |
| >= 80% Taxable Financial Assets in Equity | 1.8 | 4.8 | 1.9 | 1.4 | 9.9 |
| 20-80% Taxable Financial Assets in Equity | 0.8 | 1.5 | 0.8 | 0.9 | 4.1 |
| <= 20% Taxable Financial Assets in Equity | 1.4 | 1.1 | 0.8 | 0.9 | 4.2 |
| Total | 5.4 | 8.4 | 4.2 | 3.9 | 21.9 |

Source: Authors' tabulations based on 1998 Survey of Consumer Finances. Tax-exempt bonds are included with equity, since these bonds are lightly taxed. The results are virtually unchanged if tax-exempt bonds are aggregated with taxable fixed income securities.

Table 12: Proximity of Actual Portfolios to Tax-Minimizing Asset Location, 1998 SCF ($1998 B)

| | Reallocation Needed to Achieve Equal Allocation in each account | Reallocation Needed to Move to Tax Minimizing Allocation | Reallocation Need to Move to Tax Minimizing Allocation (Except for $25,000 of Fixed Income Outside TDA) | Amount of TDA Assets | Total Financial Assets |
|---|---|---|---|---|---|
| TDA and Non-TDA > 0 | $266.4 | $250.8 | $246.9 | $2639.9 | $6845.8 |
| TDA and Non-TDA > $25 K | 228.2 | 216.9 | 208.9 | 1847.4 | 5500.1 |
| TDA and Non-TDA > $50 K | 198.3 | 190.2 | 174.5 | 1535.8 | 4631.1 |
| TDA and Non-TDA > $250K | 95.7 | 82.8 | 77.6 | 726.4 | 2168.7 |
| Net Worth > $0 | 266.2 | 250.5 | 246.9 | 3216.3 | 8754.1 |
| Net Worth > $100K | 259.0 | 243.1 | 239.5 | 3003.7 | 8422.5 |
| Net Worth > $200K | 244.0 | 229.5 | 223.5 | 2683.2 | 7860.0 |
| Net Worth > $250K | 238.1 | 225.8 | 215.5 | 2539.6 | 7589.0 |
| Net Worth > $1M | 136.3 | 135.9 | 128.0 | 1339.9 | 5072.6 |

Table 13: Wealth-Related Variation in Equity Share of Tax-Deferred Assets and Taxable Financial Assets

| | Tax-Exempt Bonds Excluded | | | | Tax-Exempt Bonds Included in Equity | |
|---|---|---|---|---|---|---|
| Wealth or Age | Equity Share in TDA | | Equity Share Outside TDA | | Equity Share in non-TDA Assets | |
| Net Worth < 0 | 0.657 (0.068) | 0.661 (0.067) | 0.361 (0.072) | 0.391 (0.072) | 0.382 (0.071) | 0.412 (0.072) |
| 0-25K | 0.592 (0.044) | 0.618 (0.044) | 0.290 (0.046) | 0.336 (0.047) | 0.297 (0.045) | 0.338 (0.047) |
| 25-100K | 0.667 (0.023) | 0.691 (0.029) | 0.499 (0.024) | 0.558 (0.031) | 0.513 (0.024) | 0.568 (0.031) |
| 100-250K | 0.573 (0.019) | 0.658 (0.031) | 0.474 (0.020) | 0.583 (0.034) | 0.505 (0.020) | 0.600 (0.034) |
| 250K-1M | 0.616 (0.016) | 0.722 (0.032) | 0.613 (0.017) | 0.736 (0.034) | 0.658 (0.017) | 0.762 (0.034) |
| 1-2.5M | 0.681 (0.037) | 0.802 (0.045) | 0.679 (0.017) | 0.810 (0.048) | 0.757 (0.038) | 0.867 (0.048) |
| >2.5M | 0.726 (0.048) | 0.843 (0.054) | 0.717 (0.050) | 0.846 (0.058) | 0.809 (0.050) | 0.919 (0.058) |
| 35-44 | | -0.013 (0.031) | | -0.090 (0.034) | | -0.087 (0.034) |
| 45-54 | | -0.006 (0.034) | | -0.046 (0.036) | | -0.050 (0.036) |
| 55-64 | | -0.139 (0.037) | | -0.153 (0.040) | | -0.137 (0.040) |
| > 65 | | -0.297 (0.036) | | -0.239 (0.039) | | -0.179 (0.039) |
| R2 | 0.703 | 0.724 | 0.629 | 0.641 | 0.665 | 0.670 |

Notes: The correlation between the error terms for the equations in columns 1 and 3 is 0.224, while that for the error terms in the equations in columns 2 and 4 is 0.209. The correlation between the error terms for the equations in columns 1 and 5 is 0.183, while that for the error terms in the equations in columns 2 and 6 is 0.176. The sample size for all equations is 1709 observations.

Table 14: Income-Related Variation in Equity Share of Tax-Deferred Assets and Taxable Financial Assets, 1998

| | Tax-Exempt Bonds Excluded | | | | Tax-Exempt Bonds Included in Equity | |
|---|---|---|---|---|---|---|
| Income or Age | Equity Share in TDA | | Equity Share in non-TDA Assets | | Equity Share in non-TDA Assets | |
| Income < 25K | 0.417 (0.029) | 0.550 (0.037) | 0.398 (0.031) | 0.434 (0.040) | 0.498 (0.031) | 0.498 (0.040) |
| 25-50K | 0.551 (0.019) | 0.630 (0.027) | 0.449 (0.020) | 0.473 (0.030) | 0.472 (0.020) | 0.474 (0.030) |
| 50-100K | 0.662 (0.015) | 0.717 (0.026) | 0.543 (0.016) | 0.560 (0.028) | 0.570 (0.016) | 0.571 (0.028) |
| 100-250K | 0.728 (0.024) | 0.780 (0.033) | 0.732 (0.025) | 0.744 (0.036) | 0.768 (0.025) | 0.764 (0.036) |
| 250-500K | 0.744 (0.053) | 0.815 (0.057) | 0.721 (0.056) | 0.736 (0.062) | 0.771 (0.057) | 0.766 (0.062) |
| 500K-1M | 0.753 (0.104) | 0.809 (0.105) | 0.668 (0.111) | 0.690 (0.114) | 0.737 (0.111) | 0.742 (0.115) |
| > 1M | 0.741 (0.114) | 0.820 (0.114) | 0.762 (0.121) | 0.788 (0.124) | 0.856 (0.121) | 0.862 (0.125) |
| 35-44 | | -0.026 (0.030) | | -0.042 (0.032) | | -0.033 (0.033) |
| 45-54 | | -0.011 (0.031) | | 0.034 (0.034) | | 0.041 (0.034) |
| 55-64 | | -0.114 (0.034) | | -0.034 (0.037) | | -0.009 (0.037) |
| > 65 | | -0.231 (0.032) | | -0.061 (0.035) | | 0.004 (0.035) |
| R2 | 0.702 | 0.729 | 0.633 | 0.636 | 0.660 | 0.661 |

Note: The correlation between the error terms for the equations in columns 1 and 3 is 0.202, while that for the error terms in the equations in columns 2 and 4 is 0.195. The correlation between the error terms for the equations in columns 1 and 5 is 0.159, while that for the error terms in the equations in columns 2 and 6 is 0.163. The sample size for all equations is 1709 observations.