Human Wealth And Financial Asset Ownership

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Investment decisions such as the choice to own risky assets should be related to a household's perception of total lifetime resources or wealth, which can be defined as the sum of net worth plus human wealth. This article uses data obtained from the 1998 Survey of Consumer Finances to provide an updated view of the total wealth of households in the U.S. This study shows that while financial assets are a relatively large component of the available resources for households age 65 and over, half of the total sample has less than 1% of total wealth composed of investment assets.

Key words: *Household portfolios, Investment, Risk tolerance, Survey of Consumer Finances, Wealth*

An article in the New York Times (Alger, December 3, 2000) suggests that the diversification of investment portfolios should be related to the perceived stability of future income from jobs. Additionally, the author suggests that investors should also consider the perceived correlation between their job/income and the return on the market when making investment choices. This is because while income (human wealth) can be perceived as a steady flow that can be used for current and future consumption, investments and financial assets can be seen as a means by which to smooth over changes in income. One example being when an individual goes from working full time to retiring. This implies that the household's total portfolio, or total wealth, is the sum of its net worth including both investments and human wealth. Therefore, when considering the allocation of resources to financial assets, one should consider not only what other types of assets are held but also the amount of total resources that the financial assets represent. This study describes how the proportion of household total wealth allocated to financial assets and to investment assets varies across households, and by the level of household human wealth. Human wealth is an important component of household total wealth and should be taken into consideration by practitioners and researchers when making portfolio recommendations.

The idea that one considers his or her income flows over time when making consumption and savings choices is consistent with a life-cycle model of consumption and savings behavior. Bodie, Merton and Samuelson (1992) discuss a life-cycle model and the relationship of human wealth and portfolio choice. One implication of this framework is that when an individual is younger and has greater human wealth, he or she may be able to take greater risks with his or her investments since the investments represent a smaller portion of the individual's total lifetime resources. As one ages however, these assets represent a larger portion of total wealth because investment assets would increase in value with time while human wealth would decrease with age. Therefore, as the proportion of total wealth held in investments increases, the investment assets should not be exposed to as much risk. Bodie et al (1992) also point out that at any point when income may be seen as risky, the amount of income allocated to risky assets should diminish.

Heaton and Lucas (1997) note that human wealth is uninsurable to a large extent and that this should be a motivation for household savings. They observe that in many cases human wealth can be seen as less risky than stocks and might be a substitute for other low risk investments such as bonds. Heaton and Lucas however, do not explain why many individuals still do not own stocks and why many individuals hold lower-risk bonds when their income may also be seen as having less risk than stocks.

The investment decision-making process can be represented using an expected utility framework. Hanna and Chen (1997) examine the relationship between portfolio choice and two objective measures of risk tolerance: the investment horizon and the proportion of wealth allocated to financial assets. They define total wealth as the sum of net worth and human wealth for the household, where human wealth is the present value of non-investment income. Hanna and Chen use a simulation to determine the expected utility of portfolios for different levels of relative risk aversion and different percentages of total wealth attributable to financial assets The results provide optimal portfolios for different levels of risk aversion and objective risk tolerance. They show that the lower the ratio of financial assets to total wealth, the higher the *objective* risk tolerance of the household, because any loss in the investment portfolio would represent a smaller loss when compared to the total wealth of the household. Households with a ratio of financial assets to total wealth less than 20% would be considered to have high objective

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risk tolerance, and should have 100% stock portfolios for investment horizons over five years. All households should hold some stocks, no matter what their level of subjective risk tolerance.

Several studies examine human wealth and portfolio choice. Friend and Blume (1975) discuss two empirical measures of the proportion of wealth invested in risky assets. The numerator for both ratios is the dollar value of risky assets. In the first measure, wealth is defined as net worth. In the second measure, wealth is the sum of net worth and human wealth. Friend and Blume (1975) estimate human wealth as the present value of labor income until retirement, and their empirical estimation is based on simplistic assumptions about the retirement age.

Lee and Hanna (1995) use data from the 1983 and 1986 Survey of Consumer Finances (SCF) to examine the ratio of financial assets to total wealth and the ratio of investment assets to total wealth. Their estimate of human wealth is more rigorous than that of Friend and Blume. Lee and Hanna (1995) estimate human wealth as the sum of several components. The first component is the average income for the household, representing human wealth during working years, which is determined using the second wave of the panel. This income measure includes pensions, government assistance, and income from businesses. Lee and Hanna (1995) also include an estimate from the SCF of the present value of future Social Security and pension benefits. They find that the average household has a small proportion of wealth allocated to investment assets and concluded that a large proportion of US households should hold risky assets like stocks in their portfolios.

This study makes several contributions to the literature. First, this study provides a careful estimate of human wealth. Second, this study not only updates the results of Lee and Hanna (1995), but it also compares the definition of investment assets used in their study to a more traditional definition based on asset type.

There are two main objectives for this study. First, it updates the results from Lee and Hanna (1995) using the 1998 SCF to provide a more recent picture of the Hanna and Chen (1997) objective risk tolerance measure for the US population. Second, this study breaks down the ratios by age, willingness to own risky assets, and whether or not the household owns risky assets. Hanna and Chen (1997) cite the Lee and Hanna study (1995) in suggesting that the majority of households should have most of their portfolios in stocks, based on the Lee and Hanna finding that a low proportion of U.S. households have portfolios representing over 20% of total wealth. Given the changes in stock ownership since the 1980s, it is important to update the earlier estimates of objective risk tolerance.

Methods

The dataset for this study is the 1998 SCF, which is sponsored by the Federal Reserve Board with cooperation from the Department of the Treasury. The SCF is an ideal choice because it is a large national data set that contains detailed information about household characteristics, assets, and liabilities, as well as some basic information about a household's preferences. There are three main concerns when using the SCF. These concerns relate to over-sampling of wealthy households, weighting, and multiple imputation of the data.

The SCF has one component that over samples high-income/wealthy households and another that is a multi-stage probability sample (Kennickell, 1998). The weight variable provided in the public use data set can be applied to adjust the non-representative sample to be representative of the US population in 1997 (Kennickell, McManus & Woodburn, 1996).

The SCF uses multiple imputation techniques to eliminate missing values, which allows the survey to be analyzed as a complete data set (Kennickell, 2000; Rubin, 1987). Montalto and Sung (1996) describe the application of Rubin's Repeated Imputation Inference (RII) technique for analyzing the SCF's multiply imputed data, which uses data from all five implicates and incorporates estimates of imputation error (Rubin, 1987). RII techniques will be used for estimating the descriptive statistics in this study.

This study analyzes households with a household head and spouse over the age of 30. Younger households are excluded since there would be more uncertainty in projecting their wages since their earnings may change drastically over time. For the purpose of this research, it is assumed that once a respondent is thirty or older, current earnings are a reasonable proxy for future earnings. Although human wealth for younger households may be underestimated, this is acceptable for two reasons. First, younger households have more years of income considered for the human wealth estimate, and second, younger households who expect real income growth have a greater number of years of growth considered than older households who expect real income growth.

Three ratios related to the Hanna and Chen (1997) measure of objective risk tolerance are examined in this study. The denominator for each of these ratios is the total wealth of the household. Total wealth is defined as the sum of net worth and human wealth. Household financial assets are defined as the sum of checking, savings, money market,

CDs, stocks, bonds, mutual funds, defined contribution plans, and IRAs. The numerator for the second ratio will make the same distinction between financial and investment assets used by Lee and Hanna (1995) to facilitate comparison. Lee and Hanna (1995) define investment assets as the value of financial assets exceeding 3 months income. The numerator for the third ratio is based on a more standard definition of investment assets. In this ratio, investment assets are defined as the sum of the previously mentioned financial assets in the first ratio less the value of liquid assets including checking accounts, savings accounts, money market accounts, and CDs. The fact that the third definition excludes liquid assets for investments is likely to produce the greatest effect on households who are retired. This is because many retired households may have converted less liquid securities such as stocks and bonds to more liquid assets such as money markets and CDS. Therefore it may seem that many of these households have fewer investment assets under the second definition. However this may not have the same effect on younger households who would not need the liquidity of retired households, but instead require growth. This may mean that the ratio of investment assets to total wealth might decrease with age using the standard definition of investment assets but this need not be the case when using the Lee and Hanna definition

Estimation of Human Wealth

Human wealth is likely the largest component of a household's total wealth and total portfolio. While the SCF provides detailed information on household assets, there is no composite measure of household human wealth. As such, this study has carefully estimated human wealth for households in this study. Human wealth is defined as the present value of future flows of non-investment income. This includes the present value of future salaries, wages, and pension benefits (including disability) as well as the present value of anticipated pensions including Social Security. There are several assumptions made, including the growth rate of income, the length of time that income will be received, and the discount rate for that income.

In order to estimate human wealth, the number of years that each cash flow type will be received needs to be determined. For salaries, business income, and disability benefits, the number of years before the stated retirement age will be used. However, for retirement benefits, such as pensions (including Social Security), the life expectancy at the time the benefit begins must be known. The life expectancy must be predicted individually for the respondents and spouses for known or estimated benefits. The different components of human wealth will be added together to give a total measure of human wealth for the household. The Hanna and Montalto (2000) life expectancy estimation equation is incorporated into the SAS program code to estimate life expectancy for the sample. The equation uses several transformations of age to estimate life expectancy based on information obtained from the IRS Actuarial Tables (1998). The equations predict life expectancy for male or female individuals. All households will also be assumed to retire at 70 unless an earlier retirement age is given, to facilitate the estimation of human wealth for the household. While a joint life expectancy equation is available, the equations for females and males will be used to estimate life expectancy separately for respondents and spouses in order to identify the appropriate time frame for the present value calculation for each individual's cash flows.

The SCF contains information on whether or not the household expects income to experience real growth. If the household expects real income growth, then a real rate of increase of 3% per year during working years is assumed for these households. Otherwise, income is assumed to remain constant in real terms throughout the working years.

The discount rate for the present value calculations should be based on the opportunity cost that the household faces. Several previous studies use real rates of return on stocks and bonds (Lee, 1995; Lee & Hanna, 1995; Wang, 1998). Lee and Hanna (1995) use the real rate of return on government bonds for the present value calculations, however, this may be too conservative of a discount rate for pre-retirement income. Since many individuals may change careers or jobs during his or her working years, the discount rate for income earned during working years should be one that is more indicative of the uncertainty.

The discount rate is used in the calculation of the present value of the various income streams, such as salaries and pensions. The present value of each of these components of human wealth is calculated and added together. The discount rate for pre-retirement income is 7.4%, which is the real rate of return on large stocks based on historical returns from 1926-1996, as provided by Ibbotson Associates (1997). Although many households do not invest in stocks, this study assumes that pre-retirement income may be seen as less certain than income received during retirement, such as Social Security. The discount rate used on pre-retirement income should be higher so as to be consistent with an investment that is considered to be of higher risk compared with bonds. The discount rate for pension and Social Security income is 2.4%, which is the historical real rate of return on corporate bonds for 1926-1996. The real rate of return for retirement income should be based on a more conservative rate of return so as

to reflect the concern of capital preservation. These discount rates are used for both the initial present value of the pension annuity and the discounting of this present value to the age of the individual in 1997. Although this assumes these discount rates are applicable to all households, this is preferable so that the human wealth of households of equal income will only differ by the number of working years. In addition, although younger households have a greater number of years considered, the income from retirement sources and latter working years is discounted considerably in the present value estimation. One of the most complex estimations is the prediction of Social Security retirement benefits for the households. The 1998 SCF public use data set does not contain information as to who is entitled to Social Security benefits. However, since approximately 96% of all jobs in the United States are covered by Social Security (Social Security Administration, 1998), this study assumes that all of the respondents and their spouses who earned income in 1997 are or will be eligible for Social Security retirement benefits.

The estimation of Social Security benefits is challenging because the household income information is cross-sectional. Thus, no income pattern can be established for the purposes of estimating the level of the benefit. However, a linear interpolation procedure described by Yuh (1998) is implemented in this study to estimate the Social Security retirement benefits to which the household is entitled. This benefit is based on average annual income and uses previously stated assumptions about income growth. This procedure will be used for households who are not currently receiving benefits in order to estimate future benefits. Additionally, adjustments must be made for individuals retiring prior to or after full retirement age in the form of either an early-retirement deduction or a delayed retirement credit (Social Security Administration, 1998). The possibility that the household would elect to use the spousal benefit is also considered.

When estimating the life expectancy for predicted benefits, the age at which the benefits will be received is used for the respondent and spouse individually. It is important to note that regardless of when the individual retires, Social Security benefits cannot be received prior to age 62. Whenever a married individual is planning to retire in a different calendar year than his or her spouse, or if one spouse is retiring prior to his or her first age of eligibility, there is a multistage calculation for the Social Security benefits. The multistage calculation occurs because the first to retire can only choose the benefit based on his or her individual earnings, but when the second spouse reaches eligibility, he or she must choose between his or her own benefit and the spouse's benefit to which he or she is also entitled. If both retire and are eligible at the same time, then this optimization decision occurs upon eligibility, providing only a one-stage choice. However, in the two-stage choice, in order to add the second segment of benefits to the first, the second segment must be discounted as an annuity and then again as a lump sum so that it is discounted to the same age of the recipient at the time the first stage begins. The present value of the benefit at retirement is then discounted for each spouse to his or her current age during 1997.

In addition to Social Security retirement benefits, some households are also entitled to defined benefit pension plans. The SCF provides sufficient information to estimate an annual benefit for up to three plans per spouse in addition to providing information about defined benefit pensions that the household may already be receiving. The length of time that these benefits will be received will be determined using the same methods as those described for Social Security. The formula for the present value of future defined benefit payments is similar to the one used for Social Security.

The SCF provides information about disability payments that are currently being received by household members from Social Security, military, etc. The amount is provided by the SCF, however, the specific life of the benefit is unknown. Typically, the life of a disability benefit does not exceed retirement since it might then be replaced with a retirement benefit, but this information about the households is unavailable. Since a time period is required for the present value calculation, the number of years until retirement will be assumed to be the number of years that the disability benefit is received.

There is information in the SCF about household income received for businesses (Kennickell, 2000). All negative business incomes will be set to zero because while these businesses may become profitable, this is not certain. Although positive income is included, no growth is assumed in real terms. While positive income may not be more certain than negative income, the fact that it is positive allows it to be included, since any assumption made on behalf of negative income to facilitate its inclusion in the human wealth estimate would be purely speculative. Thus, the present value of positive business income will be included in the estimation of human wealth. The number of years appropriate for the present value calculation is unknown. A conservative assumption is that these households will not receive income from these businesses once they retire. Based on this assumption, the number of years assumed for the life of the future income flow from the business is the number of years until the respondent's retirement age.

There is also a concern for households that do not have amounts reported for any component of human wealth. Some of these households may have net worth and may be using assets for consumption purposes. For these households with no wealth based on the chosen components, it is assumed that their annual income is equivalent to the appropriate poverty threshold for that household based on 1997 poverty thresholds. This is similar to the approach used by Wang (1998) and seems reasonable because these households may expect benefits from a deceased or estranged spouse whose income was not reported or they may be receiving some form of monetary or non-monetary government aid that is not included in the human wealth calculation. The present value of this assumed income is calculated for the household using the life expectancy predicted from the respondent's current age. The poverty thresholds used for this procedure are based on the thresholds obtained from the US Census Bureau (1999, May 25). These thresholds are determined by the age of the householder and the number of individuals in the household, particularly the number of children under age 18.

To summarize, the present values of defined benefit pension income, Social Security retirement benefits, disability income, and salaries for both spouses (if married) are summed to provide the estimate of total human wealth for the households. Households having none of these measures and having zero or negative net worth are assumed to earn at least the equivalent of the 1997 poverty threshold appropriate for the household's size.

There are three steps in examining the three ratios in this study. The first step is to determine the distribution of these ratios, looking not only at the mean and median, but also 10%, 25%, 75%, and 90% quantiles. The next step is to repeat this for households over the age of 65. These first two steps facilitate comparison between the results from this study and those from Lee and Hanna (1995) and give an indication of the distributions for the three ratios. The final step is to break down the ratios by age, willingness to take investment risks, and ownership of risky assets, such as stocks or small businesses. This will help provide information about relationships between basic characteristic and the ratios. This study also presents sample descriptions including demographic and financial characteristics.

Results

The sample consists of 3,700 households whose head is over the age of 30. It should be noted that financial assets and human wealth are capped at $10,000,000. While the maximum is well over $100 million, this would have shown an extremely skewed distribution and there are very few households who had human wealth over $1,000,000, let alone over $10,000,000.

The average age of the sample is 53 with over 50% of the sample between the ages of 40-64 (Table 1). The majority of the households in the sample are headed by married couples (53.5%). The remaining household heads might be divorced, widowed, separated, cohabitating, or never married, and an unmarried female headed most of these. In addition, the majority of the household heads are White (79.6%) with the rest being Black (11.6%), Hispanic (6.0%), or of other racial or ethnic groups (Table 1). This last category includes households headed by Asian, Native American, Pacific Islander, or other racial/ethnic groups.

Table 1
Sample Characteristics

Age	Proportion
30-39	21.8%
40-50	26.2%
50-64	26.3%
65+	25.8%
Married	53.5%
Unmarried Male	18.6%
Unmarried Female	28%
Black	11.6%
White	79.6%
Hispanic	6.%
Other	2.8%
Willing to take investment risk	60%
Owns Risky Assets	42.9%

Results weighted

The median level of human wealth is $314,241, which is much less than the 75th percentile of $605,950 (Table 2). However, 10% of the sample had human wealth at or below $46,697 while the top 10% had human wealth in excess of $980,203 (Table 2). The median level of financial assets is $26,904, but this is still higher than the median level of investment assets using either definition. Lee and Hanna (1995) reported a median level of financial assets in 1986 of $6,500, which is equivalent to about

$9,667 in 1998 dollars. Therefore, the median level of financial assets in 1998 was almost 2.8 times as high in real terms as the level in 1986. The median level of investment assets using the Lee and Hanna (1995) definition is $15,804 and the median level using the more standard definition is $3,925 (Table 2). However, the values of investment assets are not included in Lee and Hanna (1995), which prevents direct comparison. While 25% of the sample does not have investment assets to speak of based on either definition, at least 90% of the sample has some level of financial assets, however 10% have $144 or less. One reason for the difference between these two measures of investment assets is the exclusion of liquid assets in the standard definition. However liquid assets follow a similar pattern in that the bottom 10% have less than $36 in liquid assets, while the top 10% have liquid assets exceeding $50,880; the median level of liquid assets is $4,034. Median net worth is $95,874 while the top 10% of the sample have a net worth over $567,670 and the bottom 10% have a net worth of less than $686.

The ratios of financial assets to total wealth and investment assets to total wealth are somewhat different than those found in Lee and Hanna (1995). The median ratio of financial assets to total wealth is 5.8%, which is higher than the median of 1.3% identified in Lee and Hanna (1995). However, their results are from 1986, prior to the economic boom of the nineties. The median ratio of investment assets to total wealth using the Lee and Hanna definition is 3.4%, but the median ratio is only 0.9% using the standard definition. Over 25% of the sample has a ratio of investment assets to total wealth of zero using either definition of investment assets. The median found in Lee and Hanna (1995) for the second ratio is zero. The difference in this measure may indicate that a greater proportion of individuals are investing for their future now than did during the 80s. The top 25% has a ratio of financial assets to total wealth of 17.5% or higher, and a ratio of investment assets to total wealth of 15% or higher. The top 10% of the sample has a ratio of financial assets to total wealth of 37.2% or higher. The top 10% has a ratio of investment assets to total wealth of 24.8% using the standard definition. Therefore, there is a substantial portion of households for whom financial assets represent a significant portion of total wealth.

A substantial portion of households who are age 65 or older have high proportions of total wealth in financial assets. It is likely that these individuals are more dependent on their financial and investment assets to support their consumption needs. Table 3 provides a breakdown of the distribution of the components of household wealth for those 65 and over. The median level of financial assets for these households is $34,900 with the top 25% having over $128,723 and the top 10% having over $321,150. However, the lowest 25% has financial assets under $3,075. This represents a significant concern for the ability of these households to meet their spending needs. The distribution, when examining investment assets presents an even more pessimistic view. The bottom 25% of those 65 and older has zero investment assets using either definition. The median level of investment assets for those 65 and over using the Lee and Hanna definition is $29,125. While the median using the standard definition of investment assets is only $2,260. The top 25% of those 65 and up has investments over $118,403 using the Lee and Hanna definition and $68,040 using the standard definition. The striking difference is likely related to the fact that the more standard definition would exclude liquid assets such as money markets and Certificates of Deposit. Further, older households are likely to hold their wealth in more liquid assets for consumption purposes. The median level of liquid assets for households 65 and older is $10,140, with the bottom 25% having less than $1,020 and the top 10% having over $100,298. Since financial assets play an integral role in the consumption spending of retired households this points out a disturbing inequality in the distribution of financial assets for older households.

The median ratio of financial assets to total wealth for households 65 and older is 12%, but for the top 10% of this group, the ratio increases to 47.5%. The median ratio of investment assets to total wealth using the Lee and Hanna definition is 10%, which increases to 45.5% for the top 10% of the sample. Since the more standard definition excludes liquid assets, and many older households may use liquid assets for consumption needs, the ratio of investment assets for households 65 and over is lower using this definition. The median ratio of investment assets to total wealth for households 65 and over using the standard definition is 0.9% but increases to over 31% for the top 10%. Using either definition, investment assets represent a significant proportion of available resources for consumption for the upper end of the distribution. This would seem to be consistent with the idea that older or retired households should be somewhat more conservative in their allocation of investment assets because much of their resources for consumption during retirement come from these investments. While the households having lower proportions of wealth allocated to investment assets cannot necessarily afford to lose as much as households with high higher proportions, any loss they have would represent a smaller proportion of their total wealth that can be used during retirement years.

The three ratios are also broken down by age, willingness to take investment risk, and ownership of risky assets. The proportion of wealth attributable to financial or investment

assets tends to increase in age. This is expected since the accumulation of financial and investment assets should increase over time at least until retirement, while human wealth is decreasing over time. An ANOVA procedure shows that there is a significant relationship between the willingness to take risks and the ratios of financial or investment assets to wealth, which should be explored further using multivariate techniques (Table 4). There are also significant differences in the ratios of financial assets and investment assets to total wealth, when looking at whether or not the individual was willing to take investment risks or whether or not they owned risky assets. Individuals who were willing to take investment risks had a greater amount of total wealth attributable to financial and investment assets. This is also the case with those individuals who owned stocks in various forms or owned business assets. While it may be the case that those who are less willing to take risk or who do not own risky assets would place a greater portion of their wealth into liquid assets, households willing to take risk or who own risky assets have higher levels of liquid assets than households who are not. This may be the case because those individuals willing to take risk or who did own risky assets may have experienced higher growth rates on wealth.

Finally this study determines the percent of the sample that is considered to have high objective risk tolerance based on the Hanna and Chen (1997) definition which would include any household with a ratio of 20% or less (Table 5). When considering all financial assets, 78% of the sample would be considered to have high objective risk tolerance however when limiting this to investment assets this percentage increases. Using the Lee and Hanna (1995) definition of investment assets, 81% of the sample would be considered to have high objective risk tolerance and based on the standard definition of investment assets this percentage increases to 85% (Table 5). A smaller percentage of households age 65 and over are considered to have high objective risk tolerance. When considering all financial assets 65% of those 65 and over would be considered to have high objective risk tolerance. This increases to 68.7% when using the Lee and Hanna (1995) definition of investment assets. When using the standard definition of investment assets, the percentage of households 65 and older who are consider to have high objective risk tolerance increases substantially to 80.6% (Table 5). This is reasonable since many older households hold more liquid assets such as CDs and Money Markets which are not included in the standard definition. Since Hanna and Chen point out that the households that have high objective risk tolerance should hold stock portfolios it is also interesting to note the percentage of households who risky assets and have high objective risk tolerance. The majority (at least 86%) of households who do not own risky assets have high objective risk tolerance using any of the three ratios (Table 5). Although the majority of households that own risky assets also have high objective risk tolerance, the percentage of these households with high objective risk tolerance (67%) is less compared to those that do not own risky assets (Table 5). The fact that so many risky asset owners have high objective risk tolerance is not surprising since other factors are also related to the proportion of total wealth attributable to financial or investment assets, such as age.

Conclusions

This study provides an estimate of a comprehensive measure of human wealth in order to determine the total wealth a household has and thus the total resources a household considers for spending and saving. The ratio of total wealth attributable to financial assets and investment assets is examined. The distributions of these ratios are presented and broken down by age, willingness to own risky assets, and risky asset ownership.

Although the values found in this study differ between the two definitions of investment assets, they show similar patterns in their distribution with the upper end of the distribution being substantially higher for both the whole sample and for those 65 years and older of age. When considering the level of liquid assets for older households, it is clear that many of these households lack significant illiquid investments and also do not have substantial liquid assets. Overall, the findings of this study are consistent with those in Lee and Hanna (1995). The amount of total wealth attributable to financial and investment assets is small for the majority of households. Households 65 and up however, have a greater amount of their total wealth held in financial assets, specifically more liquid assets such as money market accounts and CDs. In fact for both the whole sample and those age 65 and older, the majority have high objective risk tolerance (Hanna and Chen, 1997). This indicates that the majority of households should hold stocks and other risky assets in their portfolios since these investments would not represent a significant proportion of their wealth at risk. In the event of unfavorable market conditions, it is these older households who may suffer the most. Although some younger households may have over 20% of their wealth attributable to investment assets, many of these households will make up investment losses with income over the long run. The same would not be true for older households.

Most households do not have substantial investment assets. Half of the households have less than $15,804 in investment assets using the Lee and Hanna (1995) definition and only $3,925 using the standard definition. Given these low figures, it is not likely that many

households are using professional money managers. If these households lack a proper background in investment fundamentals, they might benefit from obtaining basic sound advice such as investing in stocks for the long run.

Implications for Further Research

The results of this study point out possible relationships between the ratio of financial and investment assets to wealth and age, willingness to take investment risks, and ownership of risky assets. These possible relationships should be examined within a multivariate context to determine their true nature as well as other possible determinants of the proportion of wealth allocated to financial and investment assets. By identifying the determinants of these three ratios, it will become clearer which groups tend to be lowest on the distribution. Groups who have very high ratios should be closely examined to determine the relationship of investment returns to income. If there is a relationship then this should influence the overall diversification of their wealth. Groups who have smaller ratios should be examined to determine their investing behavior, and specifically, whether or not these groups are being aggressive enough in their investment selection.

An additional issue raised is the choice of definition for investment assets. While the standard definition of investment assets as being financial assets less liquid assets and CDs may still be appropriate for younger households, perhaps the definition Lee and Hanna (1995) suggest may be more relevant for older households who should have some of their savings held in liquid assets for consumption purposes.

Table 2
Means, Medians, and Quantiles of Household Wealth and its Components

		Quantiles				
	Mean	10%	25%	Median	75%	90%
Human Wealth	$484,061	$46,697	$135,503	$314,241	$605,950	$980,203
Net Worth	$298,438	$686	$22,442	$95,874	$255,596	$567,670
Total Wealth	$782,499	$103,079	$231,006	$470,672	$878,570	$1,486,195
Liquid Assets	$24,493	$36	$688	$4,034	$16,420	$50,880
Financial Assets	$147,040	$144	$2,586	$26,904	$106,540	$283,070
Investment Assets (Lee & Hanna definition +)	$134,965	$0	$0	$15,804	$91,640	$262,715
Investment Assets (standard)	$30,097	$0	$0	$3,925	$63,510	$208,290
Ratio of Financial Assets to Total Wealth	0.1322	0.0019	0.0105	0.0582	0.1750	0.3715
Ratio of Investment Assets to Total Wealth (Lee & Hanna definition of investment assets+)	0.1098	0.0000	0.0000	0.0343	0.1504	0.3380
Ratio of Investment Assets to Total Wealth (standard)	0.0792	0.0000	0.0000	0.0092	0.0966	0.2484

+Investment assets = portion of financial assets exceeding 3 months of income.
Results weighted.

Table 3
Distribution of Household Wealth and its Components for Households 65 and Over

	Quantiles					
	Mean	10%	25%	Median	75%	90%
Human Wealth	$224,985	$22,263	$60,852	$138,880	$270,697	$534,484
Net Worth	$347,183	$4,618	$52,753	$135,808	$308,613	$662,238
Total Wealth	$572,168	$68,846	$142,714	$305,394	$621,149	$1,127,590
Liquid Assets	$37,672	$100	$1,020	$10,140	$39,520	$100,298
Financial Assets	$181,651	$185	$3,075	$34,900	$128,723	$321,150
Investment Assets (Lee & Hanna definition +)	$173,549	$0	$0.0625	$29,125	$118,403	$308,668
Investment Assets (standard)	$138,218	$0	$0	$2,260	$68,040	$218,820
Ratio of Financial Assets to Total Wealth	0.1878	0.0014	0.02303	0.1199	0.2791	0.4751
Ratio of Investment Assets to Total Wealth (Lee & Hanna definition +)	0.1692	0	0	0.0993	0.2600	0.4554
Ratio of Investment Assets to Total Wealth (standard)	0.0993	0	0	0.0086	0.1379	0.3121

+Investment assets = portion of financial assets exceeding 3 months of income.
Results weighted.

Table 4
Wealth Components and Ratios of Assets to Total Wealth by Age and Risky Asset Ownership

	<40 years old	40-49 years old	50-64 years old	65 years old	Willing to take investment risk	Not Willing to take investment risk	Owns Risky Assets	Does Not Own Risky Assets
Human Wealth	$593,404	$654,422	$477,615	$224,985	$619,310*	$279,920*	$703,187†	$319,530†
Net Worth	$133,901	$259,604	$425,998	$347,183	$416,508*	$120,182*	$558,030†	$103,481†
Liquid Assets	$9,913	$17,141	$31,005	$37,672	$32,015*	$13,140*	$39,151†	$13,489†
Financial Assets	$62,827	$116,039	$213,933	$181,651	$215,887*	$43,103*	$287,083†	$41,868†
Investment Assets (Lee and Hanna +)	$52,932	$101,600	$198,506	$173,549	$199,243*	$37,926*	$266,742†	$36,001†
Investment Assets (standard)	$44,097	$86,140	$171,579	$138,218	$170,215*	$26,170*	$231,169†	$23,938†
Ratio of Financial Assets to Total Wealth	0.0764	0.1024	0.1538	0.1878	0.1569*	0.0950*	0.1828†	0.0942†
Ratio of Investment Assets to Total Wealth (Lee and Hanna definition +)	0.0517	0.0798	0.1296	0.1692	0.1350*	0.0716*	0.1638†	0.0692†
Ratio of Investment Assets to Total Wealth (standard)	0.0416	0.0653	0.1046	0.0993	0.1052*	0.0400*	0.1338†	0.0382†

*T-test by willingness to take risks significant at $p<0.0001$
† T-test by ownership of risky assets significant at $p<0.0001$
+Investment assets = portion of financial assets exceeding 3 months of income
Results weighted.

Table 5
Proportion of the Sample with High Objective Risk Tolerance

	Financial Assets/Total Wealth 20%	Investment Assets/Total Wealth 20% (Lee and Hanna +)	Investment Assets/Total Wealth 20% (standard)
Whole Sample	78%	81%	85.1%
Age 65 and older	65.2%	68.7%	80.6%
Owns Risky Assets	66.9%*	70.1%*	74.6%*
Does Not Own Risky assets	86.2%*	89.3%*	92.9%*

*Chi-Square test by ownership of risky assets significant at $p<0.0001$
+Investment assets = portion of financial assets exceeding 3 months of income
Results weighted.

Implications for Financial Advisors

This study shows that investment assets represent a small portion of total wealth for most households. Therefore, based on the Hanna and Chen (1997) analyses, most households should have 100% stock portfolios for investing with horizons of five years or more. Over 78% of the whole sample has high objective risk tolerance based on the Hanna and Chen definition, and a majority of elderly households have high objective risk tolerance. However, one concern is that over 86% of the households who do not own risky assets have high objective risk tolerance. Households falling into this category would likely benefit from professional advice so that their portfolios may be more consistent with their objective risk tolerance. Financial assets are an important retirement resource for almost half of the population 65 years or older, although the difference between the financial asset and investment asset results suggest that many elderly households keep their financial assets in less volatile, low-return forms such as money market funds, checking accounts, and CDs. However, based on the three ratios, over 65% of the sample that is 65 and older has high objective risk tolerance. This may indicate that many older households should have some portion of wealth allocated to stocks. With increasing life expectancies, many retirees need to structure their finances to allow for steady income to cover basic expenses but they also need to have a substantial portion of assets in a form that is likely to grow enough to prevent erosion of purchasing power. Financial advisors should encourage retirees to put some portion of financial assets in higher growth assets such as stock mutual funds or balanced funds.

Financial advisors can use a spreadsheet to estimate a client household's human wealth, or use a computer program which estimates human wealth, such as the Life Cycle Savings Program (Hanna, 2000). Total wealth is composed of net worth plus human wealth, and typical financial planning clients are likely to have ratios of investment assets to total wealth much higher than the general population.

Further, financial advisors should consider the relationship of a client's human wealth to the performance of the stock market. Planners should modify their advice for clients whose income is correlated with the movements of the market, because for those households, human wealth should be counted as part of the portfolio, rather than independent as was assumed by Hanna and Chen (1997). For such clients, a lower proportion of stocks may be appropriate for horizons less than 15 years.

Implications for Policy

This study shows that many households still do not hold substantial investment assets, which could negatively impact well being in retirement. There are two implications for policy raised by this finding. First, programs that try to foster financial self-sufficiency should focus on building up financial assets for these households as well as providing the necessary education to manage these assets. Second, many households would benefit from some professional advice and as such, perhaps there should be some pro-bono requirement for financial planners to ensure that households with less wealth and income still have the ability to obtain professional advice when they need it the most, when they are trying to build wealth.

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