ARE WOMEN MORE RISK AVERSE?

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We find that single women exhibit relatively more risk aversion in financial decision making than single men. Using U.S. sample data, we examine household holdings of risky assets to determine whether there are gender differences in financial risk taking. As wealth increases, the proportion of wealth held as risky assets is estimated to increase by a smaller amount for single women than for single men. Gender differences in financial risk taking are also influenced by age, race, and number of children. Greater financial risk aversion may provide an explanation for women's lower levels of wealth compared with men's. (*JEL* J16, D81, G11)

I. INTRODUCTION

The purpose of this paper is to investigate whether women exhibit greater financial risk aversion than men. When asked, women indicate greater risk aversion than men. For example, in the 1989 *Survey of Consumer Finances* (SCF89) sponsored by the Federal Reserve System, each of the 3,143 respondents was asked the following question: "Which of the statements on this (page/card) comes closest to the amount of financial risk that you (and your husband/wife) are willing to take when you save or make investments? (1) take *substantial* financial risk expecting to earn *substantial* returns, (2) take *above average* financial risks expecting to earn *above average* returns, (3) take *average* financial risks expecting to earn *average* returns, or (4) *not* willing to take any financial risks." Roughly 60% of the female respondents said they were not willing to accept any risk, while only 40% of the men said they were unwilling to take risks. Our investigation seeks to determine whether the greater stated risk aversion by women is confirmed in their financial decision making.

It has been well established in finance theory that more risky assets must compensate risk averse investors with higher expected returns (Huang and Litzenberger [1988]). The more risk averse investors are, the lower will be their expected returns on investments. As reported in Table I, single women surveyed in the SCF89 held 40% of their investment wealth in risky assets, compared to 46% for single men (wealth, risky and risk-free assets are defined below). This difference in the allocation of wealth between risky and risk-free assets can have a substantial impact on portfolio returns. For example, assume that: gender differences in portfolio allocation between risky and risk-free assets match those reported in the survey; that men and women divide their risky assets evenly between stocks and bonds; and that risk-free assets earn the rate of return on U.S. Treasury Bills. These assumptions and the average annual real returns over the twenty-year period from 1976 to 1995 for stocks, bonds, and U.S. Treasury Bills compiled by Ibbotson Associates [1996] generate an annual average portfolio yield of 4.66% for women, compared to 5.57% for men. At these rates of return investing $1,000 over 20 years would generate $2,485 for the woman, but $2,956 for the man, a difference

ABBREVIATION
SCF89: 1989 Survey of Consumer Finances

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TABLE I

Variable Means by Household Type for Households with Wealth Exceeding $1,000

Variable Definition	Single Women	Single Men	Married Couples
RATIO (Ratio of Risky Assets to *WEALTH*)	.40	.46	.50
Human Capital	209,382	427,614	725,059
HUMAN (Ratio of Human Capital to *WEALTH*)	31.7	59.3	63.2
WEALTH			
Mean	67,298	121,652	202,519
Median	18,750	17,200	32,050
AGE (Head of Household Age Category):			
Less than 25	.05	.14	.02
26–30	.03	.15	.09
31–35	.08	.09	.12
36–40	.06	.14	.15
41–45	.09	.07	.13
46–50	.06	.04	.08
51–55	.08	.05	.10
56–60	.08	.06	.06
61–65	.08	.07	.07
Over 65	.39	.17	.17
WORK (Labor Force Status of Household Head):			
Self-employed	.06	.15	.14
Employed by others	.51	.54	.61
Retired	.25	.17	.19
Farmer	.00	.02	.02
Unemployed or Not in the Labor Force	.17	.12	.05
EDUCATION (Head of Household Years of Schooling):			
Grade School or less	.03	.06	.03
Some High School	.18	.13	.18
High School Degree	.33	.19	.29
Some College	.22	.24	.20
College Graduate	.25	.37	.30
RACE (% Black)	.12	.06	.05
KIDS (Number of children in the household)	.28	.17	1.04
HOMEOWNER	.60	.46	.77
Number of Observations	384	230	1,980

equal to 47% of the original investment.[1] This difference is based only on the gender difference in the allocation of wealth between risky and risk-free assets and increases to over 80% of the initial investment if the gender differences in the allocation of risky assets between stocks and bonds are taken into account. Women in the sample report holding approximately equal amounts of stocks and bonds on average, while men report holding twice as many dollars in stocks as bonds. Systematic differences in risk aversion by gender may provide an explanation for women's systematically lower levels of income and wealth compared with men's.

This topic is related to two areas of previous research. One line of investigation, conducted in studies by Friend and Blume [1975], Morin and Suarez [1983], Bellante and Saba [1986] and Siegel and Hoban [1982; 1991] among others, has focused on determining the coefficient of relative risk aversion, i.e., whether the proportion of risky assets held increases, decreases, or remains constant as wealth increases. While these studies provide the theoretical and empirical framework for

1. This example assumes that stocks are divided equally between large-company and small-company stocks and that bonds are divided equally between long-term corporate and long-term government bonds. Furthermore, we recognize that past returns may not be good indicators of future returns.

the current investigation, none of these previous studies considered whether relative risk aversion differed by gender. Some studies, such as those by Bajtelsmit and VanDerhei [1997] and Hinz, McCarthy and Turner [1997], have examined gender differences in the allocation of pension assets, but not the allocation of total household wealth.

Another line of research has investigated gender differences in risk taking, although it has not focused on financial risk taking. Recent studies include one by Brinig [1994], who found that women appear to be less willing to risk being caught and convicted of speeding than men, and one by Hersch [1996], who found that on average women made safer choices than men when it came to making risky consumer decisions, such as smoking behavior, seat-belt use, preventative dental care, and having regular blood pressure checks.

II. A FRAMEWORK FOR MEASUREMENT OF RISK AVERSION

According to expected utility theory, the dollar amount and the proportion of risky assets in an investor's portfolio are assumed to be a function of the person's wealth and degree of risk aversion. A person's degree of risk aversion is, in turn, assumed to depend on their wealth. Pratt [1964] and Arrow [1971] are credited with developing measures of risk aversion both in an absolute sense (the dollar amount of risky assets in a portfolio) and a relative sense (the proportion of risky assets in a portfolio). There is consensus that absolute risk aversion decreases with wealth. However, there is no such consensus when it comes to relative risk aversion. The relationship between relative risk aversion and wealth is thus an empirical question.

Friend and Blume [1975] developed a framework to measure relative risk aversion in which they explain the division of an individual's portfolio between risky and risk-free assets, in the absence of taxes,[2] according to the following:

$$(1) \qquad \alpha_k = [E(r_m - r_f) / \sigma_m^2] \, (1 / C_k)$$

where α_k is the proportion of net worth that investor k places in risky assets, $E(r_m - r_f)$ is the expected difference between the return on the market portfolio of risky assets (r_m) and the return on the risk free asset (r_f), σ^2_m is the variance of the return on the market portfolio of risky assets, C_k is Pratt's measure of relative risk aversion ($C_k = [-U''(W_k)/U'(W_k)]W_k$), and W_k is investor k's wealth.

Equation (1) forms the basis for numerous empirical studies that estimate how the coefficient of relative risk aversion varies with wealth. The results are particularly sensitive to the way in which wealth is defined. None of the previous research has considered gender differences in relative risk aversion.

III. EMPIRICAL MODEL AND DATA

Equation (1) forms the theoretical basis for our analysis of gender differences in relative risk aversion. Since the coefficient of relative risk aversion is a function of wealth, inferences about the effect of changes in wealth on C_k can be made by regressing the proportion of risky assets (α_k) on wealth. This assumes that the first term on the right hand side of the equation (the market price of risk) is the same for all investors and is subsumed in the constant term. We expand equation (1) to control for other economic and demographic variables which may influence portfolio allocation as done by previous researchers. Our empirical representation of this equation takes the form of:

$$(2) \quad RATIO_k = \beta_1 + \beta_2 \ln WEALTH_k + \beta_3 RACE_k + \beta_4 KIDS_k + \beta_5 HOMEOWNER_k + \beta_6 HUMAN_k + \sum_{i=1}^{i=10} \gamma_i AGE_{ik} + \sum_{j=1}^{j=5} \delta_j WORK_{jk} + \sum_{m=1}^{m=5} \lambda_m EDUCATION_{mk} + u_k ,$$

2. We ignore the effects of taxes in our estimation of the model. Bellante and Saba [1986] report that numerous studies, some of which include taxes and some of which do not, have produced inconsistent results. In their particular study, which also follows Friend and Blume [1975], taxes do not significantly affect the results.

where *RATIO* is the ratio of risky assets to *WEALTH*; *RACE* is a dummy variable equal to one if the respondent is black and zero otherwise; *KIDS* is the number of people 18 years or younger in the household; *HOMEOWNER* is a dummy variable indicating whether or not the respondent is a homeowner; *HUMAN* is the ratio of human capital to *WEALTH*; AGE_i is a set of dummy variables indicating into which of ten age categories the household head falls; $WORK_j$ is a set of dummy variables indicating five categories of labor force status of the household head, and $EDUCATION_m$ is a set of dummy variables indicating which of five levels of educational attainment the household head has reached. More detailed definitions and summary statistics for the variables are presented in Table I. In previous research, some investigators have used the logarithm of *RATIO* as the dependent variable. Since that specification forces one to exclude households with no risky assets, we have chosen to use the level of the variable *RATIO* as the dependent variable.

We estimate equation (2) using data from the SCF89. The SCF89 sample of 3,143 households was chosen to provide a comprehensive picture of the financial situation of all U.S. households in 1989. Because wealth is highly skewed, the SCF89 oversampled high-income households in order to obtain a more accurate estimate of total household wealth. We make use of the SCF89 data employing the multiple imputation procedure undertaken by researchers at the Board of Governors of the Federal Reserve System. More information about these data can be obtained in Kennickell and Shack-Marquez [1992] and Weicher [1995]. Because of the oversampling of high-income households, all statistics reported in this paper are sample weighted.

Although these data are well-suited for our analysis, they do suffer from some limitations. For purposes of this study there are two important limitations of the data. First, no information regarding geographic location of households is available in the public-use version of the data. Consequently, we are unable to construct estimates of household average tax rates since state of residence is unknown. Second, for married households no information is provided as to which spouse makes decisions regarding the allocation of assets.

As mentioned previously, estimates of relative risk aversion are sensitive to the definition of wealth, particularly the inclusion of residential real estate and human capital. Several previous studies, such as Friend and Blume [1975] and Siegel and Hoban [1991] have focused on how alternative specifications of wealth alter estimates of the coefficient of relative risk aversion. However, since the focus of this study is on gender differences in risk taking, for purposes of comparison we have chosen to focus on only one of the definitions of wealth used in previous research. Because the derivation of equation (1) assumes that assets are infinitely divisible and transactable, we have chosen a relatively narrow definition of wealth which excludes investments in residential housing and human capital. It is unclear the extent to which houses are owned for investment purposes in addition to consumption purposes and human capital is certainly not infinitely divisible. However, holdings of residential real estate and human capital will certainly influence the allocation of remaining wealth between risky and risk-free assets. Consequently, we include measures of these assets as explanatory variables in the estimating equation.

WEALTH is measured as the sum of the net value of risky and risk-free assets. The division of wealth into risky and risk-free is by nature arbitrary, but we have tried to be consistent with previous studies. Risk-free assets are defined to include dollar balances in checking, savings, and money market accounts, certificates of deposit, U.S. savings bonds, IRA balances invested in certificates of deposit or bank accounts, and the cash value of life insurance less policy loans outstanding. Risky assets (which include mixed-risk assets) are defined as the sum of balances in IRAs not invested in bank deposits, stock holdings less margin loans outstanding, bonds, trust assets, the net value of real estate owned other than residential housing, the net value of businesses owned, and the net value of other miscellaneous assets (e.g. precious metal, futures contracts, art work) reported by the household.

Human capital is estimated by assuming that 1989 wage, salary, and self-employment earnings of the household continue until retirement. Earnings are calculated separately

for each spouse and summed for married couples. The present discounted value of this earnings stream using a 2% discount rate is used as an estimate of human capital.[3] Following Friend and Blume [1975] if the head of household was under 65, retirement was assumed at age 65. If the head of household was working and aged 66 through 69, retirement was assumed in four years; if aged 70 through 74, three years; if aged 75 through 79, two years; and if over 79, one year. Although this measure of human capital it at best a very rough approximation, analysis by Thornton, Rodgers, and Brookshire [1997] suggests that the assumption of a constant growth rate of earnings, which is implicit in our choice of a discount rate, rather than a traditional inverted u-shaped pattern, is supported by longitudinal data.

Because the dependent variable *RATIO* can only take on values between zero and one, we use a maximum likelihood tobit regression procedure, which allows for both an upper and lower bound on the dependent variable, to estimate equation (2). Consistent with previous research, only households with *WEALTH* greater than $1,000 are included in the samples. The most direct test of gender differences in portfolio allocation is between households headed by never married females and never married males. However, the sample sizes of these subgroups are too small to allow for valid inferences, particularly regarding the influence of the socio-demographic variables included in equation (2). Consequently, we estimate equation (2) separately for single women and single men, where single includes widowed and divorced as well as never married.[4] To the extent that widows and/or divorced women continue the investment strategies begun by their late or ex-husbands, we have biased our results against finding any gender differences in financial risk taking.

3. Friend and Blume [1975] assume that wages increase at a 4% rate and use a 10% discount rate, which together are equivalent to assuming constant earnings and a 6% discount rate. Bellante and Saba [1986] assume constant earnings and a 10% discount rate. We have chosen a 2% discount rate as one which more closely equals the long-run growth rate of real GDP.

4. Of the 384 single women in the sample, 46% are widowed, 38% divorced, and 16% never married. In contrast, among the 230 single men in the sample, 18% are widowed, 41% are divorced, and 41% are never married.

Since it is unclear whether financial portfolio-allocation decisions of married households are made by men or women, we have also estimated the equation for married couples. To the extent that males in the married households make the financial decisions, these estimates indicate whether there are gender differences in portfolio allocation between married men and single women. However, we recognize that these estimates are more likely to be clouded by our inability to determine the financial decision maker in married households.

IV. EMPIRICAL RESULTS

Table II presents the estimated coefficients for equation (2) when it is estimated separately for single women, single men, and married couples. Likelihood ratio tests indicate that the estimated equations are significantly different between single women and both single men and married couples. Equation (2) was also estimated jointly for single women and single men including a dummy variable *FEMALE*, which equals one for single women, interacted with each explanatory variable in order to ascertain which coefficients are statistically different between single women and single men. The coefficients found to be statistically different by gender in this manner are also indicated in Table II. The same exercise was conducted for single women and married couples and the statistically different coefficients also are indicated in Table II.

The estimated coefficient on ln *WEALTH* provides an estimate of the inverse of the coefficient of relative risk aversion (C_k) up to a positive multiplicative constant. A positive (negative) coefficient indicates decreasing (increasing) relative risk aversion. For all three household types, the estimated coefficient on ln *WEALTH* is positive and significantly different from zero, indicating decreasing relative risk aversion. This is consistent with previous findings of decreasing relative risk aversion found by Friend and Blume [1975], Moran and Suarez [1983], Bellante and Saba [1986], and Riley and Chow [1992], when similar definitions of wealth and risky assets were used.

The estimated coefficient on ln *WEALTH* for single women is significantly less than for

single men. Thus, while both single men and women exhibit decreasing relative risk aversion, single women do so to a lesser degree. This suggests that single women are relatively more risk averse than single men. This result is robust when estimated over the sample of never-married women and men, although the set of explanatory variables used is more restricted as required by the smaller sample sizes. We find no significant difference in relative risk aversion exhibited by married couples versus single females. More conclusive results, however, require information regarding the gender of the financial decision maker in married households.

To illustrate the impact of this difference in relative risk aversion, Table III presents the predicted share of risky assets in the portfolio of each household type based on the equations estimated in Table II. The base case is *one* set of household characteristics which, when applied to each of the *three* estimated equations, generates approximately the average proportion of risky assets held by that household type. Thus, in the base case, where wealth equals $20,000, single women are predicted to hold 43% of their wealth in risky assets, compared to 51% by single men. If wealth increases to $100,000, holding other household characteristics constant, the share held in risky assets is predicted to increase for both single women and men (evidence of decreasing relative risk aversion); however, the share increases by 19 percentage points for women, compared to 28 percentage points for men (evidence of greater risk aversion by women). As illustrated earlier, even small percentage differences in the allocation of wealth between risky and risk-free assets can result in substantial differences in portfolio returns, especially when compounded over a number of years.

The estimates indicate that age has a very different impact on portfolio allocation for single women versus single men and married households. All of the estimated coefficients associated with the age categories are significantly different for single women versus single men. Every coefficient except that for the over-65 age group is also different between single women and married couples. Table III indicates the predicted proportion of risky assets for each age category for each of the three household types, holding constant the other characteristics of the base case. These predictions are graphed in Figure 1. For single women the predicted proportion of risky assets approximates an inverted u-shape—increasing from the youngest cohorts, reaching a peak with the 36–40 year old cohort, then declining in older cohorts (a negative predicted value can be interpreted as the willingness to buy insurance to avoid any risks). For most age cohorts, the predicted proportion of risky assets held by single women tends to be below that for both single men and married couples, indicating that regardless of age-cohort, single women tend to be more risk averse than comparable single men and married couples. Other studies, such as those by Moran and Suarez [1983], Bellante and Saba [1986] and Riley and Chow [1992], have found evidence of increasing relative risk aversion with age, but these studies did not examine how this relationship might differ by gender.

It is tempting to draw conclusions about how financial risk taking varies over the life cycle based on these predictions, but that would be incorrect. These predictions are based on a cross section of data that show *different* people at the same moment, while the life cycle refers to changes as the *same* person ages. Inferences about life-cycle changes in risk taking require longitudinal data, or at least several cross sections. Life-cycle inferences are beyond the scope of this paper, but are a topic for future research.

The categorical variables indicating labor force status are all significantly negative for single women, indicating that single women in all categories take fewer financial risks than self-employed women, the omitted category. However, only single females categorized as farmers have a significantly different portfolio allocation than single males based on labor force status and holding other factors constant. All of the labor-force-status coefficients for married couples are significantly different from those of single women, but there is no consistent pattern of differences in predicted portfolios. Self-employed and retired single women hold relatively more risky assets than married couples, while married couples who are employed by others, farmers, or out of the labor force (including the unemployed, but excluding the retired) hold significantly more risky assets than single females, holding other factors constant.

TABLE II
Tobit Regression Results—Dependent Variable: *RATIO*
(standard errors in parentheses)

	Single Women	Single Men	Married Couples
ln *WEALTH*	.117***	.170***†	.128***
	(.009)	(.010)	(.003)
AGE 26–30	.044	−.137***†	.004†
	(.079)	(.047)	(.033)
AGE 31–35	.127**	−.342***†	−.090***†
	(.063)	(.059)	(.032)
AGE 36–40	.381***	−.263***†	−.014†
	(.066)	(.049)	(.032)
AGE 41–45	.241***	−.252***†	.018†
	(.062)	(.059)	(.032)
AGE 46–50	.325***	−.295***†	−.055*†
	(.066)	(.078)	(.034)
AGE 51–55	.130**	−.350***†	−.059*†
	(.064)	(.074)	(.033)
AGE 56–60	.065	−.322***†	−.078**†
	(.065)	(.065)	(.035)
AGE 61–65	.250***	−.540***†	.015†
	(.066)	(.077)	(.036)
AGE over 65	−.232***	−.668***†	−.122***
	(.061)	(.069)	(.035)
Employed by others	−.262***	−.113***	−.069***†
	(.044)	(.043)	(.013)
Retired	−.181***	−.040	−.241***†
	(.049)	(.057)	(.019)
Farmer	−.431***	.120†	.065**†
	(.165)	(.108)	(.030)
Not in the labor force	−.395***	−.222***	−.032†
	(.051)	(.053)	(.023)
Some high school	−.310***	−.300***	.000†
	(.066)	(.067)	(.029)
High school degree	−.336***	−.274***	−.014†
	(.064)	(.067)	(.029)
Some college	−.254***	.325***†	−.037†
	(.067)	(.070)	(.029)
College graduate	−.339***	−.244***	−.002†
	(.067)	(.068)	(.029)
RACE	.154***	−.024†	−.065***†
	(.035)	(.066)	(.019)
KIDS	−.030*	.034†	.013***†
	(.016)	(.027)	(.004)
HOMEOWNER	−.068***	.070**†	−.037***†
	(.024)	(.031)	(.011)
HUMAN	−.002***	−.000†	−.000***†
	(.000)	(.000)	(.000)
constant	−.244**	−.668***†	−.704***†
	(.121)	(.126)	(.054)

TABLE II continued
Tobit Regression Results—Dependent Variable: *RATIO*
(standard errors in parentheses)

	Single Women	Single Men	Married Couples
sigma hat	.415	.401	.398
log likelihood	−1177.399***	−679.521***	−5891.676***
Number of Observations	384	230	1980
pseudo R^2	.248	.312	.228
Number left-censored	123	65	450
Number right-censored	2	6	17

†Significantly different from the single-female coefficients at the 10% significance level or lower.
*Significantly different from zero at the 10% significance level.
**Significantly different from zero at the 5% significance level.
***Significantly different from zero at the 1% significance level.

While one might expect more years of schooling to increase household risk taking, this result is not found when other factors are held constant. As Table III indicates, single women and single men with less than a sixth grade education are predicted to hold portfolios with much greater percentages of risky assets (close to 80%), compared with those having more education, holding other factors constant. For every level of education except for the 13–16 years of schooling category, single women are predicted to hold fewer risky assets than single men. However, none of these differences are statistically significant.

Race appears to play a very different role in financial risk taking for single women versus single men and married couples. Single black women are estimated to hold significantly more risky assets than single white women, but the reverse is estimated for single men and married couples. Given base case household characteristics, and changing only the racial characteristic, single black women are predicted to hold the largest proportion of risky assets—58%, compared to 49% and 42% for single black men and married black couples, respectively. This result is consistent with other anecdotal evidence, such as survey findings reported by Smith [1997], showing that 21% of the women in African-American households were the primary financial decision maker, compared to only 10% of the women in white married couples. This suggests that black women (albeit the survey refers to married women) are more involved in investing and perhaps more inclined to risk taking than white women.

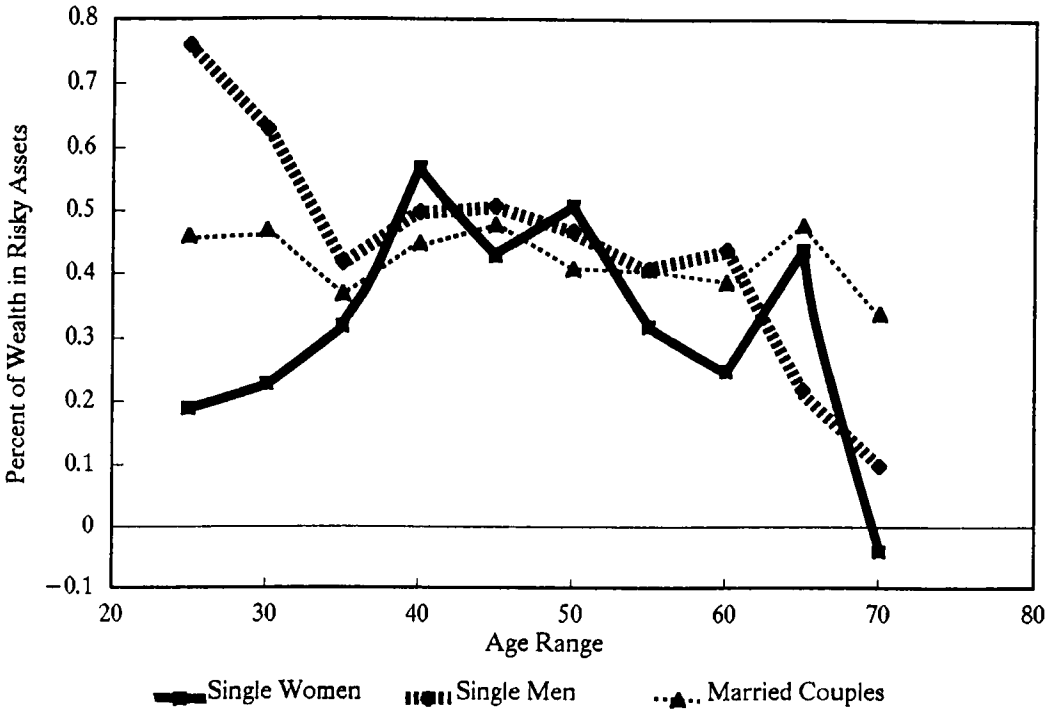
Additionally, risk taking is influenced by the number of people under 18 in the household. In most cases this is the influence of children, but by measuring the variable in this way, we are also allowing for the presence of grandchildren, younger brothers or sisters, nieces, nephews, and other young people who may be dependents in household. As the number of young dependents in a household increases, the proportion of risky assets held significantly decreases for single women, is unaffected for single men, and significantly increases for married couples.

Finally, we recognize that residential housing and human capital have been treated as risky assets in other studies, but because of indivisibility in the case of human capital and the consumption component of investments in residential housing, we prefer not to incorporate these assets directly into our measure of risky assets. Nevertheless, these assets may be expected to influence the allocation of other wealth between risky and risk-free assets. In the case of human capital, we find that the greater the value of human capital relative to

TABLE III
Predicted Proportion of Risky Assets

	Single Females	Single Males	Married Couples
BASE CASE: 41–45 year old, white, homeowner, employed, high school degree, $20,000 investment wealth, 2 children, human capital to investment wealth ratio of 3	.43	.51	.48
DEVIATIONS FROM BASE CASE: (* indicates base case value)			
WEALTH:			
$10,000	.35	.39	.39
$20,000*	.43	.51	.48
$100,000	.62	.79	.69
$500,000	.81	1.06	.89
AGE:			
Under 25	.19	.76	.46
26–30	.23	.63	.47
31–35	.32	.42	.37
36–40	.57	.50	.45
41–45*	.43	.51	.48
46–50	.51	.47	.41
51–55	.32	.41	.41
56–60	.25	.44	.39
61–65	.44	.22	.48
Over 65	−.04	.10	.34
WORK:			
Self-employed	.69	.63	.55
Employed by others*	.43	.51	.48
Retired	.51	.59	.31
Farmer	.26	.75	.62
Unemployed or not in the labor force	.30	.40	.52
EDUCATION:			
6 years or less	.77	.79	.50
7–12 years	.46	.49	.50
High School degree*	.43	.51	.48
Some college	.51	.46	.46
More than 16 years	.43	.54	.49
RACE:			
White or other*	.43	.51	.48
Black	.58	.49	.42
KIDS:			
0	.49	.45	.46
1	.46	.48	.48
2*	.43	.51	.50
3	.40	.55	.51
4	.37	.58	.52
HOMEOWNER:			
No	.50	.44	.52
Yes*	.43	.51	.48
HUMAN:			
0	.43	.51	.48
1	.43	.51	.48
2	.43	.51	.48
3*	.43	.51	.48
4	.43	.51	.48
5	.43	.51	.48
10	.42	.51	.48

FIGURE 1
Age Profile of Risky Assets



wealth, the smaller the proportion of other risky assets held, holding other factors constant. While this is a statistically significant effect and differs for single women versus single men and married households, quantitatively the impact is not large. The impact of home ownership is also to reduce holdings of risky assets for single women and married couples, but to increase risky assets for single men.

V. SUMMARY AND CONCLUSIONS

Women are significantly more risk averse in financial decision making than men based on survey responses. In this paper we seek to empirically verify the stated and popularly perceived notion that there are gender differences in risk taking. We estimate the impact of household wealth and other socioeconomic variables on the proportion of risky assets held, comparing single women with single men and married couples.

On balance, we find that single women are relatively more risk averse than single men. We confirm previous studies which find that relative risk aversion decreases as household wealth increases when wealth is measured excluding residential housing and human capital. However, we find that relative risk aversion does not decrease as much for single women as for single men, indicating that single women are relatively more risk averse. We also find that over most age ranges single women hold smaller proportions of risky assets than either single men or married couples, holding other factors constant. In addition, we find that, unlike single men or married couples, single women reduce the proportion of risky assets they hold as the number of children in their household increases, holding other factors constant. We also find evidence that single black women are willing to hold a

larger proportion of risky assets on average than single white women, single men and married couples.

Our results represent a first attempt to investigate the question of gender differences in financial risk taking in the allocation of total household wealth. Evidence of gender differences in risk taking has several important implications. Greater risk aversion can lead to asset-allocation decisions that result in relatively lower levels of wealth. To the extent that women exhibit greater risk aversion, this can help to explain women's lower levels of wealth. Given women's greater longevity and the increasing tendency towards self-directed pensions, greater risk aversion exhibited by women can have a significant impact on resources available to them in retirement.

We must point out a number of limitations of this analysis and suggestions for further research following from them. First, our focus on comparing relative risk aversion among single women and single men may not generalize to men and women in general. We were limited by our inability to determine the gender of financial decision makers in married households. Second, our empirical results pertain to financial risk taking only. There are other types of risk taking to which these results may not be applicable. Finally, these results are specific to the United States in 1989. It would be very interesting to determine whether the results are country-specific or differ across countries. In addition, it would be useful to determine whether the results are the same over time, or if gender difference in relative risk aversion are increasing or decreasing over time.

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