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Racial Differences in Risky Asset Ownership

Dissertation

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

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The Ohio State University

2000

Approved by

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ABSTRACT

The purpose of this dissertation is to examine racial differences in ownership of risky assets, because lower ownership by Black households in the United States of stocks and other investment assets with high rates of return (and high short term risk) has been one factor inhibiting the growth of the net worth of Black households. This study makes several contributions, including a focus on racial differences in risky asset ownership, which has received little research attention in the past. This study also uses techniques that have not been used to address racial differences in investment choice, including the Heckman procedure and the estimation of separate coefficients for Blacks and Whites. Another contribution of this study is a careful estimation of human wealth.

The sample consists of 2938 households with a Black or White household head, taken from the 1998 Survey of Consumer Finances. The multivariate analysis includes a two-step procedure, the Heckman Procedure. The first step is a Probit procedure to determine the likelihood of risky asset ownership. The Heckman Estimator for self-selection, lambda, is calculated using the Probit results. The second step is an OLS regression to estimate the determinants of the proportion of risky assets to wealth with lambda as an independent variable for a sub-sample of risky asset owners.

The results from the Probit procedure show that there are racial differences in the determinants of risky asset ownership, specifically in the relationships with human wealth.
and with a pessimistic economic outlook. Other characteristics related to risky asset ownership include marital status, gender, formal education, horizon, willingness to take risks, and levels of precautionary savings. The results from the OLS procedures show that marital status, gender, formal education, human wealth, and Lambda are all related to the proportion of wealth invested in risky assets. No racial difference is found in the proportion of wealth invested in risky assets when controlling for other factors.

In order to improve the accumulation of net worth of Black households, it is important to improve the understanding of investments and financial markets among those households, so they can make informed investment choices.
Dedicated to my wife, Jessica K. Gutter
Acknowledgments

There are many individuals who have helped me to reach this point in my life. I thank each and every one of them for all that they have done for me. In particular I would like to address several individuals who have helped me to accomplish all that I have.

I would like to first thank Jonathan Fox. Jonathan, you have been more than a mentor, you have been my friend. Jonathan, thank you for giving me a chance, your advice, and of course the office space.

I would also like to thank Sherman Hanna for all of his advice and time spent doing research with me over the last few years. I must also thank you for the late night email discussions about classes and research that we worked on together.

I also want to thank Catherine P. Montalto for her amazing patience and for all of the time that you have put into working with me on this and other projects. You have taught me so much.

I must also thank my parents and brother for their constant encouragement over the years and for always believing in me. Lastly I want to thank my loving wife Jessica. She has been a constant source of strength and encouragement over the last 6 years of my life and even more so over the last three.

I want to thank everyone else in the Department of Consumer and Textile Sciences in the College of Human Ecology who I have come to know over the last 5 years, thank you all for all of your kind words and smiles over the years.
VITA

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students and arranging for students to consult with professionals on research projects

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Management of family financial resources; topics include financial planning and budgeting, insurance, credit, and savings and investments. The course web page is used to provide several resources for the students including homework assignments, solutions to problems, and the instructor's lecture notes. The enrollment for this course is approximately 125 students.

- **360 Family Financial Management II U 5**
  Introduction to family financial management applications through a case study approach. Students analyze and evaluate financial decisions by hypothetical families at various points in family life cycle and apply economic principles to development of aids used by families facing financial decisions. The students work in a lab session with instructors to learn how to use spreadsheets, the Life Cycle Savings Simulation, and the Family Time Use simulation to aid them in their analysis of the families. The course web page is used for providing templates for the students to use as well as important hints and updates. The enrollment Summer 99 was 56 students.

- **560 Family Financial Management III U 5**
  Students analyze and evaluate federal income and estate tax decisions made by families at various points in the family life cycle and apply economic and management principles to the decisions made by families in tax and estate planning. The course web page provides several resources for the students, including homework assignments, solutions to problems, and the instructor's lecture notes. Typical enrollment is about 60 students.

- **660 Family Financial Management Applications U G 5**
  Family financial management concepts are applied to evaluate financial goals and prepare a comprehensive financial plan for a client household. The course web page provides templates for the students to use as well as important hints and updates. Typical enrollment is about 55 students.

- **694 Group Studies U 5**
  Financial advising practicum. Students act as group leaders for Fm Res M 360, work on a special research project, conduct group sessions, assign tentative grades and write comments for presentations and reports, and help students learn techniques, including a financial calculator and software procedures. Typical enrollment is 6-7 students.

**Fields of Study**

**Major Field:** Family Resource Management, Consumer
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CHAPTER 1

INTRODUCTION

1.1 Motivations and Justification

Recent results from the 1998 Survey of Consumer Finances (SCF) point to an increase in the inequality of wealth distribution between Whites and Non-Whites during the period from 1995 to 1998. Although mean net worth increased for both groups, median net worth did not. In 1998, median net worth was $81,200 for White households and $16,800 for non-White households. As seen in Figure 1.1, the median net worth for Whites increased to $94,900 in 1998 while the median net worth for non-Whites decreased to $16,400 (Kennickell, Starr-McCluer, & Surette, 2000). While the decrease is not severe for non-Whites, it does point out a disturbing discrepancy between racial groups in terms of wealth growth from 1995 to 1998. The rate of wealth growth is related to the composition of wealth. This relationship stems from the different rates of returns for various asset types. For example, if assets are mostly tangible, net worth is not likely to increase at the same rate as if assets are mostly investment assets such as stocks.

The recent stock market performance has shown significant returns (Ibbotson Associates, 1997). Major indices such as the Nasdaq, the S&P 500, and Dow Jones have
all had annualized returns over 20%, which included some individual mutual funds returning over 100%. The individuals holding stocks would have earned significantly higher rates of return than others. Any groups not holding stocks or other investment assets over this period would have missed out on opportunities for high growth rates on wealth. If two households with equal wealth in 1995 had allocated their wealth differently, then they would not likely have had the same wealth in 1998.

Given the inequality in stock ownership and recent stock market performance, it is likely that the wealth of households that invested in stocks grew at a higher rate than the wealth of those not invested. If those with higher wealth also invested in stocks or businesses in greater proportions than those with lower wealth, then the inequality in the wealth distribution should increase. However, if both groups had the same return on monetary wealth, then the inequality may not increase as much. Since non-Whites had lower initial wealth than Whites and they are less likely to have stocks or mutual funds, the increase in inequality between Whites and non-Whites may be related to the composition of wealth. The composition of wealth is determined by a household’s preferences and characteristics. Given that investment choice impacts the growth rate of monetary wealth, gaining a further understanding of specific racial differences in investment choices may lead to improved understanding of racial differences in wealth.

A recent study by Ariel Mutual Funds & Charles Schwab showed that African-Americans are less invested in the stock market than Whites (Boyce, 1998; Mabry, 1999). Similar remarks are made by Jackson, Jackson and Gostchall (1999), who add that Blacks should exert some of their potential equity-buying power to encourage companies to change their hiring practices or corporate hierarchy to be more racially integrated.
There were racial differences in the proportion of people owning stocks and mutual funds in both 1995 and 1998 (Figure 1.2). Although the proportion of non-Whites holding stocks or mutual funds increased from 1995 to 1998, the proportion of non-Whites holding these assets still dramatically trailed the proportion of Whites holding these assets. In a recent study, Bertaut and Starr-McCluer (2000) observed racial differences in risky asset ownership. They used 1998 SCF data to examine risky asset ownership. They found that non-whites or Hispanics were less likely than Whites to own risky assets when controlling for other factors. However, another important finding they provide was that the determinants for owning risky assets are not the same as the determinants of the amount of ownership. Although the results mentioned above are generalized to Whites and non-Whites, research examining the ownership of higher yield assets like stocks by specific racial or ethnic groups is needed to understand the nature of the different ownership levels. Historically, Blacks have had a history of economic disadvantage in the U.S. compared to Whites. Although there may have been improvements over time, this disadvantage is still present. One possible reason is that Blacks are more risk averse than Whites when controlling for other factors. Recent results from the 1998 Yankelovich Survey (Loury, 1998) point out that high income Blacks still held more conservative investments than Whites. Determining if there are differences in the investment choice between Whites and Blacks may help lead to strategies for reducing the inequality in risky asset ownership and possibly the inequality in the distribution of wealth. The purpose of this study is to identify whether or not there are racial differences in risky asset ownership and whether there are racial differences in risk aversion.
1.2 Contributions of the Study

This study examines differences in investment choice between Blacks and Whites—specifically, the decision to invest in risky assets such as stocks and/or small businesses—and the issue of racial differences in risk aversion. The empirical analysis will use household data with detailed information about asset holdings, household composition, education, preferences, and expectations. These characteristics are used to examine the nature of racial differences in risky asset ownership. The proposed model for this study specifies that the proportion of total household wealth allocated to risky assets is a function of household characteristics such as demographic and financial factors as well as household preferences. This study will test for racial differences in the likelihood of risky asset ownership and the proportion of wealth invested in risky assets.

Multivariate techniques are used to analyze racial differences in the determinants of risky asset ownership and the proportion of wealth invested in risky assets. The estimation is accomplished by using a Probit procedure to estimate the likelihood of risky asset ownership. Then, in a second step an OLS regression is used to estimate the proportion of risky assets to wealth for the sub-sample owning risky assets. This is known as the Heckman approach (1974; 1976) for dealing with possible sample-selection. For the purposes of this study, wealth is defined using two definitions. The first measure of wealth is each household’s net worth. The second measure of wealth is each household’s total wealth defined as the sum of net worth and human wealth. Human wealth is estimated for each household and is measured as the present value of salaries.
and pensions. "Pensions" includes estimates of defined benefit pensions and Social Security retirement benefits.

This dissertation first examines and discusses the literature related to racial differences in investment choice. The literature includes studies on investment decision-making as well as race-related economic studies. In Chapter 3, the theoretical framework that is rooted in life-cycle theory is outlined. The Afrocentric worldview is also discussed to enhance the understanding of racial differences in investment decision-making.

The contributions of this study are to improve the understanding of racial differences in investment decision-making and to highlight implications for wealth distribution. The empirical model makes use of techniques that have not previously been used to examine racial differences in investment choice. This study estimates human wealth, net worth, value of stock holdings, and value of business assets held using recently released data from the 1998 Survey of Consumer Finances.
Figure 1.1 Median Net Worth by Race: 1995, 1998.

Note. The data for Figure 1.1 comes from Kennickell, Starr-McCluer, & Surette (2000) Recent changes in US family finances: Results from the 1998 survey of consumer finances. Federal Reserve Bulletin, 86(1), 7.
Figure 1.2 Percent Ownership of Assets by Race: 1995, 1998.
Note. The data for Figure 1.2 comes from Kennickell, Starr-McCluer, & Surette (2000)
Recent changes in US family finances: Results from the 1998 survey of consumer
CHAPTER 2

PREVIOUS EMPIRICAL STUDIES

2.1 Overview

There are three general areas of empirical research that are relevant to the study of racial differences in risky asset ownership: investment ownership, housing purchases, and wealth accumulation. Little research has been done in the previously mentioned investment areas to improve the understanding of racial differences in individual investment decisions. However, the relationship between race and other economic decisions such as home ownership and wealth accumulation has been addressed. The discussion of this literature will begin by focusing on the treatment of race in these studies and will continue by discussing the factors affecting economic choice.

2.2 Treatment of Race

The issue of race has not been consistently considered across the literature on economic decision-making. Although it is not specifically mentioned in each study, a household is typically considered a Black household if the respondent reports him/herself
as Black and a White household if the respondent reports him/herself as White. In some
studies respondents can also identify themselves as being Hispanic. While this is more
straightforward for an unmarried-person household, a married household presents the
possibility of interracial marriage. Typically, race has been treated in empirical economic
decision-making literature through one of three approaches. The previous approaches to
considering race in empirical analyses include race not being discussed at all, having race
as an independent variable, or estimating separate models for each racial group. These
treatments imply three opinions about the influence of race on economic decision-
making. The first treatment of race, lack of inclusion, implies that race is not a
significant factor in economic decisions. The second treatment of race, as an intercept
term, implies that race should cause a systematic difference in the mean response, and the
third treatment, using separate models, is the broadest in considering the effects of race.
This model implies that there could be racial differences in the relationship of
determining factors to economic decisions.

Several of the studies on investment choice do not include race as a factor in their
analyses (Baker & Haslem, 1974; King & Leape, 1998; Kreinin, 1959; Ramaswami,
Srivastava, & McInish, 1992). Additionally, several of the studies on retirement decisions
did not account for race (Goodfellow & Schrieber, 1997; Grable & Lytton, 1997). While
specific reasons were not necessarily given, some of the studies used small data sets that
under-represented Blacks, precluding the inclusion of race in the analysis.

Much of the remaining literature on investment choice incorporates race in
empirical models in the form of indicator variables. The findings have produced mixed
results. Wang and Hanna (1997) found that Whites, those of Hispanic ethnicity, and
other non-Black races had higher proportions of net wealth invested in risky assets as compared to otherwise similar Blacks. Using a two-step multivariate analysis, Zhong and Xiao (1995) found that a higher percentage of Whites held stocks than did Blacks and that the extent of these holdings was likely to be substantially higher for Whites than Blacks after controlling for other factors. Using three different multivariate approaches, Bertaut and Starr-McCluer (2000) showed that being non-white or Hispanic was negatively related to risky asset ownership. Similarly, being Black and/or Hispanic was found to be negatively associated with level of retirement savings (Yuh & DeVaney, 1996). In some of the other studies that incorporated race as an explanatory variable, race was not found to be a significant factor in predicting allocations of current balances. When looking at their allocation of contributions, however, Blacks had lower percentages in equities than did Whites (Bajtelsmit & VenDerhei, 1997). Sung and Hanna (1998) included an indicator for race in their model to predict participation in retirement plans, but they did not include this indicator in the model predicting likelihood of stock ownership. In the participation model, however, race was not a significant factor for either spouse. Finally, Haliassos and Bertaut (1995) found that Whites were more likely to own stocks than Non-whites when controlling for other factors. They suggested that discrimination in the financial services industry may be one reason for this racial difference in the likelihood of stock ownership.

The approach taken in the housing and wealth literature when examining racial differences is to estimate separate models for Blacks and Whites. This has been done through either running regressions separately for each group or by the equivalent procedure of using an interaction model. Horton (1992) found significant racial
interaction terms relating to age, marital status, employment status, and residence in a central city. Older Blacks were more likely to own homes compared to all other groups. Additionally, Horton found that marriage increased the likelihood of ownership, but more so for Whites than for Blacks. Finally, Horton found that residing in a central city increased the likelihood of home ownership for Blacks and Whites, but Blacks in a central city were less likely than Whites to own homes controlling for other factors. Although being employed increases the likelihood of ownership for both groups, Whites still maintained an advantage over Blacks. In a follow up study, Horton and Thomas (1998) found that when looking at the value of housing assets, the interaction term for income was the only significant interaction term.

From the two studies discussed, the importance of racial differences in demographic terms can be concluded. Racial differences in demographic terms influence the likelihood of ownership, and racial differences in financial factors are more important in determining the value of the home. Long and Caudill (1992) estimated separate regressions for Blacks and Whites in order to determine housing values (equivalent to a full-interaction model). They supported Horton and Thomas' (1998) findings that the income effect is larger for Whites than for Blacks of similar income and otherwise similar characteristics. After decomposing their results, Long and Caudill (1992) found that 40% of the variability of the housing value was not explained by their model. Several explanations were offered, but the authors felt that the most likely explanation was discrimination in the housing market. Myers and Chung (1996) used similar procedures but decomposed their results into an ownership effect and an equity effect. There were different significant factors for Whites than there were for Blacks in determining home
ownership and home equity. Consistent with the other studies, the financial effects dominated the equity differences, whereas combinations of demographic and financial factors were needed to explain differences in the likelihood of ownership.

Separate regression techniques were also employed in two studies focusing on racial differences in wealth accumulation (Blau & Graham, 1990; Menchik & Jiankoplos, 1997). In both of these studies, regressions estimating ownership of certain types of assets and overall level of wealth were performed separately for sub-samples that were divided by both race and marital status. Both studies further decomposed the results in order to explain the racial differences in wealth. Menchik and Jiankoplos (1997) determined that differences across race by marital status can best be attributed to differences in human wealth. They further add that differences in inheritance were also a significant factor in explaining differences between the average wealth of Blacks and Whites. While Blau and Graham (1990) did find that income was a useful factor, they concluded that differences in household characteristics and rates of return on assets were also important factors to help explain the racial differences in wealth.

2.3 Factors Affecting Economic Choices

2.3.1 Household Demographics

There are several factors from the literature that have been found relevant to economic decision-making. These factors come from three main groups, including household characteristics, financial characteristics, and expectations. The household
demographic characteristics include age, marital status, gender, and dependents. The level of education is a useful predictor that represents human capital and may represent the ability of an individual to process market information. The financial characteristics include household income, net worth, self-employment, precautionary savings, and intergenerational wealth transfers. The expectations or attitudes of the household can be ascertained by knowing the household’s self-reported risk tolerance, economic outlook, and horizon. Each of these factors will be discussed individually.

The influence of age on investment choice is a common factor discussed throughout the literature. Using data collected from several large brokerage firms to compare sample characteristics, Baker and Haslem (1974) found that older investors were more concerned with income-generating assets than with capital gains. The preference for income-producing assets by the elderly may be indicative of increasing conservatism as individuals grow older. The theory of increasing conservatism with age is validated by additional studies of asset ownership. Several studies found that likelihood of ownership and dollar amount of stocks owned increased with age. Kreinin (1959), using data obtained from the Surveys of Consumer Finances and a panel study begun in 1954 by the Ford Foundation, found that individuals over 55 years old, including those already retired, were most likely to own stocks. Although Kreinin’s study used ANOVA techniques, his results are consistent with studies that used multivariate approaches. For example, Zhong and Xiao (1995) found that, holding other factors constant, increasing age was associated with increased likelihood of stock ownership. Their study used data from the 1989 Survey of Consumer Finances. King and Leape (1998) estimated models of asset ownership using data from the 1978 Survey of Consumer Financial Decisions.
They used a two-stage multivariate procedure to estimate the likelihood of ownership of each asset and the dollar amount owned of the asset. They concluded that the effect of age on asset ownership was nonlinear, indicating an initial increase followed by a decrease in the likelihood of owning certain assets. Findings in Bajtelsmit and VenDerhei’s (1997) study on the effects of age on asset allocation were consistent with those of King and Leape (1998). After controlling for other factors, Bajtelsmit and VenDerhei (1997) found that contributions to fixed income plans increased with age while contributions to employer securities increased then began to decrease as individuals allocated more income to fixed income securities. Bertaut and Starr-McCluer (2000) showed that household headed by individuals under 35 and over 55 had less ownership of risky assets than those 35-54 years old. A study by Goodfellow and Schieber (1997) found that younger investors were more likely to be aggressive investors, which may provide additional support for the idea that risk tolerance may decrease with age. However, these results are inconsistent with Wang and Hanna (1997), who found that, all other things being equal, the proportion of risky assets to total wealth always increased with age but at a decreasing rate. Therefore, they found that risk tolerance increases with age but at a diminishing rate. The nonlinear pattern of the risky proportion might be related to the fact that as one ages, the ratio of investment assets to total wealth increases as human wealth decreases. Therefore, the financial assets represent a larger proportion of a household’s wealth. The overall conclusion from the investment literature is that age has a nonlinear relationship with risk tolerance. All studies find that risk tolerance initially increases with age. Wang and Hanna (1997) found that the increase does have a diminishing rate.
Horton (1992), using data from the 1980 Public Use Microdata Samples of U.S. Census data, estimated an interaction model for the likelihood of home ownership. The model interacted a race indicator term with each of the other factors in the model. The factors were demographic and sociological, including age, gender, labor force status, education, region, and others. They found that age increased the likelihood of home ownership for both Blacks and Whites. However, out of all races and ages, elderly Blacks were the group most likely to own a home. The authors mention that this is unexpected since older Blacks would likely have faced the most discrimination in the labor force and housing markets. In a similar study, Myers and Chung (1996) examined racial differences in home ownership and home equity. Using data from the 1992-93 Health and Retirement Survey, they estimated models of ownership likelihood and home equity separately for Blacks and Whites. While age was significant and positive for both races, age was coded continuously in this study so their results are unable to support the results from Horton (1992). Using data from both the 1976 National Longitudinal Surveys of Mature Men (NLS) and the 1989 Survey of Consumer Finances, Menchik and Jiankoplos (1997) estimated wealth using separate regressions for groups defined by race and by marital status. They found that the relationship between age and wealth differed between samples. For the White sample, age increased the level of wealth until a maximum was reached and then began to decrease. This may have coincided with retirement. However, increasing age had a positive effect on Black households, with no decrease when controlling for other factors. Blau and Graham (1990) also used data from the 1976 NLS and the 1978 NLS of young women to estimate wealth using multiple regressions for the subgroups broken down by race and marital status. They found that
age was positively associated with wealth for both races by marital status, except for single Blacks.

The influence of household composition is another issue that has been included in many studies on investing. According to Wang and Hanna (1997), married couples had a higher proportion of their total wealth invested in risky assets than otherwise similar non-married couples, when controlling for other factors such as race. The fact that the ratio is higher for married couples may not be indicative of a higher proportion of married couples owning stocks, but instead it could be related to the dollar amount that those who own stocks are able to invest. Bertaut and Starr-McCluer (2000) found that while married couples were more likely to own risky assets, they had fewer holdings than unmarried households. The possible influence of spouse's choices and characteristics may also complicate the choice for married couples. Sung and Hanna (1998) determined that the choice for husbands to invest is influenced by the spouse's choice, risk tolerance, and job tenure, while the choice for wives was influenced by spouse's choice, retirement horizon, self-employment, and job tenure.

Household characteristics have been found to be relevant factors associated with differences in housing decisions and wealth. Horton (1992) found that married Blacks were less likely to be homeowners than were otherwise similar married Whites. Myers and Chung (1996) add that marriage tenure was a positive factor for Whites but not for Blacks, but being married increased the likelihood of home ownership for both Blacks and Whites. Menchick and Jiankoplos' (1997) findings regarding race and marital status are consistent with Blau and Graham's (1990). Ramaswami, Srivastava and McInish (1992) used panel data broken down by life cycle stage to examine racial difference in
the composition of wealth. They found that the types of assets held were different for households in different life-cycle stages.

The presence of children has also been a factor in several multivariate analyses of home ownership and wealth. However, the conclusions show a potential inconsistency between the relationship of the presence of children on the likelihood of owning a home and the relationship of the presence of children on the value of the home. Horton and Thomas (1998) found that the presence of children was associated with higher housing values. Myers and Chung (1996), however, did not find that the presence of children at home was significantly related to likelihood of home ownership. Blau and Graham (1990) found that increasing numbers of children were associated with higher wealth for both races. They further concluded that the larger portion of racial differences in wealth could be better explained by the differences in household types than by the differences in financial factors. This would include a large difference in the marginal relationship of children on wealth. Menchik and Jiankoplos (1997) found increasing numbers of children to be associated with lower levels of wealth for both racial groups by marriage; however, the number of children was not a significant factor for unmarried Whites, which could be related to the proportion of each group that is composed of single parent households.

While marital status and the presence of children are important factors, the gender of the household head may also be important. Bajtelsmit and Venderhei (1997) found that after controlling for socioeconomic factors, women were more likely to hold conservative investments than men. Baker and Haslem (1974) found that women were more concerned with the dividend yield on a stock than with the capital gains, indicating a preference for a more conservative strategy. However, this relationship is contradicted
somewhat by Bertaut and Starr-McCluer (2000) who found that female-headed households were more likely to own risky assets than male-headed households. Embrey and Fox (1997) found that gender differences in investment choices could be better explained by considering gender differences in the relationships of factors related to ownership—such as net worth when controlling for risk tolerance—than by only considering gender as the source of the difference. Although there are inconsistencies regarding the relationship of gender in the literature, the fact that gender has some relationship with investment choice is clear.

Another important determinant of investment choice discussed in the literature is education. Wang and Hanna (1997) found that the proportion of risky assets to total wealth increased with education, which is indicative of a lower risk aversion or higher risk tolerance for those with higher education. After controlling for many factors, Zhong and Xiao (1995) found that more education was associated with higher levels of bond and stock holdings. Similarly, Bertaut and Starr-McCluer (2000) found that education increased the likelihood of stock ownership as well as the ownership share. Haliassos and Bertaut (1995) also found a positive relationship between education and the likelihood of stock ownership when controlling for other factors, including income. Baker and Haslem (1974) did not find education to be a large factor in stock ownership, but they did find that more educated individuals were willing to accept larger volatility of stock prices. The acceptance of larger volatility of prices can be interpreted to mean that more educated individuals are willing to accept greater risk on their investments. This may also mean that more educated individuals understand the relationship of time and the volatility of their returns. Increasing risk tolerance with increasing education is
consistent with findings by other studies. Grable and Lytton (1997) examined the choice of university employees to invest in either a defined contribution plan or an IRA. They found that more investment knowledge increases the chance of having either type of account. Myers and Chung (1996) found that higher intelligence increased the likelihood of home ownership for both races; their measure of intelligence considered memory and basic analytical skills.

2.3.2 Financial Characteristics

The next issue covered by the literature is the influence of financial factors on risky asset ownership, specifically the importance of income, net worth, self-employment, and inheritances.

Increasing income is associated with increased risk tolerance and ownership of stocks. A common finding in both the investment (Baker & Haslem, 1974; Kreinin, 1959; Ramaswami, Srivastava, & McInish, 1992; Bertaut & Starr-McCluer, 2000; Haliassos & Bertaut, 1995) and the retirement-literature (Goodfellow & Schieber, 1997; Bajtelsmit & VenDerhei, 1997) is that increased income is associated with more aggressive investing. Sung and Hanna (1998) did not support this finding, as income was not significant in their study. Baker and Haslem (1974) found that those with higher income were more concerned with price appreciation of a security than with its current income potential, which may indicate a preference for equities since stocks are more likely to produce capital gains than bonds are. Kreinin (1959), and Ramaswami, Srivastava, and McInish (1992) found that higher income was associated with increased stock ownership.
Haliassos and Bertaut (1995) found that increased income is associated with a higher likelihood of stock ownership. While Bertaut and Starr-McCluer (2000) support the notion that income affects risky asset ownership, they did not find evidence that it affects the ownership share. Racial differences in income and human wealth were also identified as explanatory factors in the racial disparity of home ownership (Horton, 1992; Myers & Chung, 1996). Long and Caudill (1992) examined racial differences in housing values and found that there were racial differences in the model explaining housing wealth. Higher income led to a higher proportional housing value for Whites than it did for Blacks at the same income level. Blau and Graham (1990) found that both human wealth and transitory income were positively associated with wealth for both races. However, they point out that income alone could not explain the racial differences in level of wealth.

Another financial variable that has been considered in several studies is the liquidity of wealth. Kreinin (1959) considered the impact of the level of liquid assets on stock ownership. Increased amounts of liquid assets were related to increased amounts of stock ownership. The relationship of liquid assets to stock ownership may indicate a pecking order in terms of accumulation of liquid assets over illiquid assets. Liquidity may be related to the desire for some level of precautionary savings. Additionally, there is the issue of the certainty of future income flows that the household may consider. Haliassos and Bertaut (1995) found that households that were willing to give up liquidity were more likely to own stocks.

The level of wealth is also related to investment decision-making. Ramaswami, Srivastava, and McInish (1992) and Zhong and Xiao (1995) found that increased wealth
was associated with increased ownership of stocks. King and Leape (1998) specifically addressed the issue of the wealth elasticity of demand for equities and other assets. They measured the wealth elasticity by first determining the probability of ownership and then the dollar demand for those who owned the asset. They determined that the wealth elasticity for equities was second highest, behind municipal bonds. Wang and Hanna (1997) found that the proportion of total wealth allocated to risky assets increased with net worth. Ownership of risky assets increased with pension wealth but at a diminishing rate. Bajtelsmit and VenDerhei (1997) also found that income had a positive effect on ownership of equities and fixed income securities. Differences in the level of other assets held explained some of the racial differences in home ownership (Long & Caudill, 1992).

Kreinin (1959) included an indicator of whether or not the individual was self-employed. Being self-employed reduced ownership of stocks. This might be attributed to the individual’s preference for investing any funds back into the business rather than investing in someone else’s business. Long and Caudill (1992) found that being self-employed had different effects for Whites than it did for Blacks with regard to home ownership. Similarly, Horton (1992) found that employed Whites were more likely to be homeowners than were employed Blacks.

Another source of potential wealth for households can come from intergenerational wealth transfers. Based on the decomposition of their regression results, Menchik and Jiankopoulos (1997) found that the effect of inheritances is a relevant factor in accounting for racial differences in wealth. The implication of intergenerational wealth transfers is uncertain. For instance, intergenerational wealth transfers increase the likelihood of stock ownership. A common assumption is that those who own equities
have done so by choice. However, someone may own stocks because the stock was received in an inheritance and they otherwise would not have invested in equities.

2.3.3 Expectations

Most of the studies attempted to capture some aspect of the investor's attitude or other factors that may affect investment choice. Bajtelsmit and VenDerhei (1997) also found that the amount of pension wealth was positively related to the level of aggressiveness reported by the investor. In addition, Myers and Chung (1996) considered financial attitudes in housing ownership decisions. They found that Whites who were risk takers were less likely to own homes than were Whites who were more risk averse. There were no significant results for risk tolerance for Blacks with respect to home ownership. Menchik and Jiankoplos (1997) found that increasing rates of return were positively associated with wealth. Since risk and return are positively related, the higher rate of return on a portfolio should be associated with a riskier asset and thus a higher risk tolerance.

In their study, Zhong and Xiao (1995) included indicators for the investor's expectations of the economy, interest rates, family income, and the planning horizon most important to the family. When controlling for other factors, having a horizon of a few months was associated with lower amounts of bonds and stocks held when compared with having a longer horizon of several years or more. Myers and Chung (1996) found that Whites with longer horizons had a higher likelihood of home ownership. The horizon term was an indicator for which planning period was most important to the household.
ranging from a few months to over a decade. They further found that Whites with longer horizons had lower home equity than did Whites with shorter horizons. The horizon term was not significant, however, in the prediction model estimated for the Black group. In the study done by Zhong and Xiao (1995), none of the variables regarding expectations were significant except for the fact that a positive economic outlook was associated with lower levels of bond holdings. The positive economic outlook term was not significant, however, for predicting stock ownership.

2.4 Summary

There are several important conclusions to be drawn from this literature. First, although race has been considered in some of the investment literature as an explanatory variable, this is not sufficient to capture the racial difference in asset ownership. The consideration of separate models for Blacks and Whites has added much to the understanding of home ownership and wealth accumulation. When comparing results, it is apparent that racial differences in home ownership and wealth accumulation can be better explained by considering racial differences in the relationships of the determinants of each. Specifically, racial differences in the relationships between household characteristics and wealth/home ownership have been useful in explaining the observed racial differences in home ownership and wealth accumulation.

Previous empirical findings provide an understanding of the factors that govern economic choices, such as investment decisions. There are several important relationships that can be seen in the literature. First, investment choice and asset level are
affected by household characteristics, such as marital status, household size, and the presence of children. The gender of the household head may also be relevant. Additionally, financial factors such as human wealth, annual income, net worth, employment status, and inheritances are also relevant determinants of investment choice. Finally, investment choice is affected by risk tolerance and expectations, such as economic outlook and planning horizon. When controlling for these factors, however, race was also found to be a significant factor in some studies. When one includes findings from studies that have addressed racial differences in wealth or housing, the idea that the factors governing investment choice may behave differently for Blacks and Whites is introduced. The possibility of separate models of investment choice for Whites and Blacks has not yet been considered in the investment choice literature. An empirical study on racial differences in investment ownership should consider separate investment choice models for Blacks and Whites.
CHAPTER 3

THEORETICAL FRAMEWORK

3.1 Chapter Overview

In this chapter, a framework of the investor decision-making process is outlined and theoretical reasons for racial differences are presented. Life-cycle theory describes the relationship between savings behavior and human wealth, household characteristics, and interest rates. Additionally, life-cycle theory extends the ideas of expected utility to cover multiple time periods in order to capture the household's inter-temporal preferences for consumption. The decision to own risky assets can be formally modeled using an expected utility framework. However, the challenge then becomes explaining why there may be racial differences in the proportion of wealth invested in risky assets after considering household characteristics. The first step toward examining racial differences is developing an understanding of differences in Black and White households, especially differences in decision-making. The Afrocentric worldview proposes that perceptions and choices may be different for Blacks and Whites as a result of historical and cultural differences. These differences may contribute to our understanding of racial differences in risky asset ownership. This chapter discusses economic theory and the
Afrocentric worldview by considering the contributions of each to the understanding of racial differences in risky asset ownership. The last section of this chapter will state specific hypotheses that will be recast for empirical testing in Chapter 4.

3.2 Economic Theory and Life-Cycle Savings

Economic theory proposes that an individual or household makes decisions about purchasing goods and services that yield the highest expected utility. The idea is that each individual or household has a utility function that incorporates preferences into an economic model. The expected utility of a choice is equal to the probability-weighted sum of the possible outcomes from a decision. Consumers will choose the option that produces the highest expected utility and, in terms of consumption and savings, the highest lifetime utility.

Life-cycle savings, which builds on the basic expected utility model, is one of the predominant economic views with regard to a household’s total consumption and savings behavior. This theory proposes that households maximize lifetime utility by smoothing consumption over the different stages of the life-cycle (Ando & Modigliani, 1963). Total wealth is the sum of human wealth and net worth. Human wealth is the present value of future non-investment income. Net worth is defined as the sum of assets less the sum of liabilities. If real interest rates on savings and borrowing are zero, the optimal consumption for any given year should be a fraction of the household’s total wealth. However, in any given year income may be less or more than the average of lifetime income. Saving in periods of high income and dissaving in periods of lower income
smoothes consumption over the life-cycle. Hanna, Fan, and Chang (1995) show the basic two period life-cycle model, which accounts for interest rates on borrowing and savings. Their equation, which builds from the following expression of expected utility, is:

\[ LU = U(C_1) + \frac{U(C_2)}{(1+p)} \]  \hspace{1cm} (3.1)

Where:
- \( LU \) = the sum of current and future (discounted) utility
- \( C_1 \) = Consumption in period 1
- \( C_2 \) = Consumption in period 2
- \( p \) = personal discount rate or the opportunity cost of future consumption

Total or lifetime utility is maximized by smoothing consumption across the different stages. Equation 3.1 is maximized subject to separate budget constraints for period 1 and period 2, equations 3.2 and 3.3 respectively. This accounts for the possibility of saving or borrowing in period 1 as well as changes in income (Hanna, Fan, and Chang, 1995; Deaton, 1992). The wealth available for consumption in each period can be shown as:

\[ C_1 = Y - S \]  \hspace{1cm} (3.2)

\[ C_2 = Y(1+g) + S(1+r) \]  \hspace{1cm} (3.3)

Where:
- \( Y \) = income from wages
- \( S \) = savings
One assumption of the life cycle theory is that a household can, with certainty, estimate its human wealth. Human wealth is defined as the current amount of future income streams anticipated by the household. Therefore, one considers total wealth, or the sum of the human wealth and net worth, when making consumption and savings decisions. Human wealth, or factors affecting one’s perception of human wealth, may be different for Blacks and Whites. An examination of actual behavior reveals that some households exhibit a preference for liquidity. Hanna, Gutter, and Fan (1999) as well as Hanna and Chen (1997) and Haliassos and Michaelides (1999) state that inconsistencies between economic models of risk tolerance and empirical results may be related to low amounts of liquid assets held by households and that these households may be less likely to hold risky assets as a result. This brings up the idea that there may be a hierarchy in asset holdings with an initial preference for liquidity. This must be addressed in the estimation of the determinants of risky asset ownership. Households may first desire to meet some level of precautionary savings to overcome income shocks or more short-term goals before becoming willing to invest in less liquid investments such as stocks and businesses. This may be in the form of precautionary savings, which may be in place to smooth consumption over short-term income shocks.

The level of precautionary savings or emergency funds a household should hold has been discussed in the literature. Chang, Hanna, and Fan (1997) present a three period
life cycle model of consumption. This model allows for negative income shocks to have an effect on consumption and savings. The three-period utility model they present is:

\[ T = U(C_1) + \left\{ \left[ PU(C_2) + (1-P)U(C_{2a}) \right]/(1+\rho) \right\} + \left\{ \left[ PU(C_3) + (1-P)U(C_{3a}) \right]/(1+\rho)^2 \right\} \]  
\[ (3.4) \]

Where:

\[ T = \text{Total utility across the three periods.} \]
\[ C_1 = \text{Consumption in period 1} \]
\[ C_2 = \text{Consumption in period 2} \]
\[ C_{2a} = \text{Consumption in period 2 if there is no income change} \]
\[ C_3 = \text{Consumption in period 3} \]
\[ C_{3a} = \text{Consumption in period 3 if there is no income change} \]
\[ \rho = \text{personal discount rate or the opportunity cost of future consumption} \]
\[ P = \text{probability that real income decreases} \]

Chang, et al. (1997) describes the budget constraint for each period and show that the constraints in periods two and three are dependent upon any growth in income, positive or negative. They propose the following constraints:

\[ C_1 = Y - S_1 \]  
\[ (3.5) \]
\[ C_2 = (1+g)Y + (1+r)S_1 - S_2 \]  
\[ (3.6) \]
\[ C_{2a} = Y + (1+r)S_1 - S_2 \]  
\[ (3.7) \]
\[ C_3 = (1+g)Y + (1+r)S_2 \]  
\[ (3.8) \]
\[ C_{3a} = Y + (1+r)S_2 \]  
\[ (3.9) \]
Where:

\[ Y = \text{Income from wages} \]

\[ S_1 = \text{Savings in period 1} \]

\[ g = \text{growth rate of income} \]

\[ r = \text{growth rate on assets} \]

\[ S_2 = \text{Savings in period 2} \]

The model presented by Chang et al. (1997) shows that the amount saved during the first period will depend on the household's expectations regarding growth rates and decreases to income. The effect of the growth rate on the optimal consumption level choice in period one depends on how likely it is that income will decrease in the future. If a household expects to have its income reduced for the short-term, it is likely to rely on savings to smooth over this income shock. However, this may create the need for households to have some level of savings and credit to offset income shocks.

In order to understand savings and spending behavior, one must also consider the impact of the life cycle stage of the household. The life cycle stage is defined by age, marital status, and the presence of children. However, there may be racial differences in the life-cycle stages themselves. For example, Blacks may have a different household composition because they have different marital or child rearing patterns than Whites. This could mean that the life-cycle stages are different for Blacks and Whites. Differences in the life-cycle stages themselves, or in their order, could affect consumption and savings behavior.
Another concern is that there may be a racial difference in the relevant interest rates. Several interest rates may be of concern to households. For example, the interest rate that can be obtained on debt may influence whether a household can purchase a home or take out a small business loan. The rate of return available on savings may also influence consumption and savings behavior since the rate of return on savings is representative of the opportunity cost of current consumption. However, there is a concern as to whether Blacks and Whites have the same relevant interest rates to consider. That is to say, can Blacks and Whites borrow and invest at the same rates, or more simply, do Blacks face the same opportunity cost for consumption or savings choices, as do similar Whites? Although both can theoretically choose the same investment assets, it is not clear that both groups would be able to borrow at equal rates if there is discrimination in the credit market or if they are not exposed to the same information.

A positive rate of return on savings increases the household's potential consumption by reducing the amount that needs to be saved, on average, in any one year. Thus, all things being equal, the higher the real rate of return, the more the overall consumption can be increased through saving and investing, which also increases total lifetime utility. Therefore, the real rate of return on savings is representative of the opportunity cost of consumption. Since stocks have the highest real rate of return of all financial investments in the long run (Siegel, 1994), it may be rational for individuals who understand investment fundamentals to hold stocks, depending on their investment horizon. Similarly, ownership of a business has a high potential return.
Friend and Blume (1975) use an expected utility framework to examine the relationship between household wealth and the household utility function. Using household level cross-sectional data, they empirically estimate the utility function for household demand for risky assets. In their study, investment choice is shown to be dependent on several factors. However, the predominant concept is that the level of risk that the investor is willing to assume will drive investment choices. Arrow (1971) describes risk aversion in terms of an absolute measure and a relative measure. Absolute risk aversion is being measured as a level of wealth, and relative risk aversion is defined as a proportional change in wealth. Relative risk aversion is also described as the elasticity of the marginal utility of wealth. These two concepts are illustrated by the following:

\[ R_a(W) = -\frac{U''(W)}{U'(W)} \]  
\[ R_r(W) = -\frac{WU''(W)}{U'(W)} \]  

Where:

\( R_a(W) \) = absolute risk aversion  
\( R_r(W) \) = relative risk aversion  
\( W \) = wealth  
\( U'(W) \) = marginal utility of wealth  
\( U''(W) \) = rate of change of marginal utility of wealth
Huang and Litzenberger (1988) explain absolute and relative risk aversion in terms of the demand for risky assets. Absolute risk aversion is related to the individual’s dollar demand for risky assets, whereas relative risk aversion is related to the proportion of wealth that an individual would allocate to risky assets. Friend and Blume (1975), show that, assuming no taxes, the relationship between relative risk aversion and the proportion of wealth can be shown as:

\[ \alpha_k = \frac{E(r_m - r_f) / \sigma_m^2}{\alpha_k} \]  

(3.12)

Where:

- \( \alpha_k \) = The proportion of wealth invested in risky assets
- \( E(r_m) \) = The expected return on the stock market
- \( E(r_f) \) = The expected risk free rate
- \( \sigma_m^2 \) = The expected market variance
- \( C_k \) = The Arrow-Pratt measure of relative risk aversion

Equation 3.12 shows that the proportion of wealth is related to the market price of risk \( [E(r_m - r_f) / \sigma_m^2] \) and the inverse of the coefficient of relative risk aversion for the kth individual. If one assumes that the market price of risk is equal for all investors then when holding it constant, there is an inverse relation between the proportion of wealth invested in risky assets and relative risk aversion. However this equation assumes that human wealth is liquid which may not be appropriate.

Friend and Blume (1975) account for this possibility and show that the relationship of taxes and the non-marketability of human wealth can also be included in
the model relating the proportion of wealth invested in risky assets to relative risk aversion. They approximate this relationship through the following expression:

\[ \alpha_k = \frac{[E(r_m - r_f)/\sigma^2_m] * 1/(1-t_k)(1-h_k)C_k - h_k)/(1-h_k)*B_{hk,m}}{1/(1-t_k)(1-h_k)C_k - h_k)/(1-h_k)*B_{hk,m}} \]  

(3.13)

Where:

\( \alpha_k \) = The proportion of wealth invested in risky assets

\( E(r_m) \) = The expected return on the stock market

\( E(r_f) \) = The expected risk free rate

\( \sigma^2_m \) = The expected market variance

\( C_k \) = The Arrow-Pratt measure of relative risk aversion

\( t_k \) = tax rate for kth individual

\( h_k \) = ratio of human wealth to net worth

\( B_{hk,m} \) = slope coefficient for regression of \( r_{hk} \) on \( r_m \)

Both Equation 3.12 and Equation 3.13 as described by Friend and Blume mention that several assumptions about household behavior are necessary in order for the model to be considered appropriate for investor behavior and to be applied empirically. These include the assumptions of constant relative risk aversion, homogeneous expectations about the returns, and no transactions or other frictions in the market place. Hanna and Chen (1997) specify two assumptions, full information and rationality, that are required to show the described relationship empirically.

The issue of rationality is a common assumption in Economic Theory, but the assumption of rationality is not always beyond dispute. This is because even if
individuals do not behave consistently with expectations their actions may still be considered rational. For example, if an individual has thirty years from retirement but does not currently hold stocks they may still be considered rational. This is because the individual may have costly debt or he or she might lack the surplus income for investing purposes. Therefore considering the person to be behaving irrationally would be inaccurate since they are unable to invest. For the purposes of this dissertation the assumption of rationality is considered reasonable.

Several studies (Merton, 1969; Hanna, Fan, & Chang, 1995; Friend and Blume, 1975) discuss guidelines that characterize the form of utility functions: first that Absolute Risk Aversion (ARA) is either constant or decreasing with wealth, and second, that Relative Risk Aversion (RRA) is constant with wealth. The idea of constant relative risk aversion implies that for fixed levels of wealth, households should hold equal portions of their wealth in risky assets. For example, Merton (1969) showed, using Pratt’s measure of relative risk aversion (equivalent to that of Arrow), that constant relative risk aversion, specifically a log functional form, was a good representation of the relationship between consumption behavior and wealth. Constant relative risk aversion implies that the proportion of wealth allocated to risky assets should be constant for a given level of wealth. While this may or may not be reasonable to assume, the other two assumptions are of greater concern for this study.

The second assumption mentioned by Friend and Blume (1997) is that investors have homogeneous expectations about the nature of the investment returns. This assumption is related to the concern of Hanna and Chen that all investors have full information. This is because in order for investors to have homogeneous expectations,
they would all need full information, but additionally, this makes two additional concerns. The first concern is that all investors given the same information may not make the same choices. The second concern is that all investors or would-be investors may not have equal ability to process investment information. Both of these concerns make the assumption of equal or full information one that may not be reasonable to assume for purposes of this study. If investors do not have equal information then it is not likely that they have homogeneous expectations about investments.

The third assumption of concern is that there are no frictions in the market. This assumption implies that there are no transaction costs, no discrimination in the marketplace, and no other barriers to entry. Transactions costs do exist, even discount or on-line brokerage services still have transaction costs as well as minimum investment requirements. Additionally those with less investment experience or that do not have a strategy might be better off working with an advisor, yet because they have no assets to speak of, they would not be solicited by members of the financial services industry in their community and they would likely be unable to afford the fees. Further, although on-line services are more accessible to investors than some full-service firms, this is only true for those investors with access to a computer and the Internet. Additionally there has been discrimination toward Blacks throughout history; a point that will be expanded upon in the next section.

In summary, economic theory proposes that investment decisions are related to human wealth, human capital, household composition, and preferences, specifically risk aversion. One of the major issues this study addresses is to determine if there are racial
differences in the relationships of human wealth, human capital, household composition, and preferences on risky asset ownership. Although relative risk aversion is related to the decision to own risky assets and there is some relationship between risk aversion and portfolio allocation, two of the three assumptions mentioned by Friend and Blume (1975) are not met with certainty in this study. Specifically there are concerns mentioned which make the assumptions of homogeneous expectations and frictionless investing inappropriate. This study will continue to examine racial differences in risky asset ownership, but the relationship between the investment allocation and the concept of relative risk aversion will not be stressed.

3.3 Accounting for Racial Differences

3.3.1 The Afrocentric Worldview

One issue not addressed in these studies is whether households of different races, with otherwise similar levels of characteristics, will have the same proportion of wealth invested in risky assets or whether this differs between Blacks and Whites? It is also possible that different preference shifters need to be considered for each race. Haliassos and Bertaut (1995) discuss among other factors the possible influence of culture on investment choice, stating that culture could be linked to race, gender, or marital status. Thus, economic theory provides only a basic understanding of any observed racial differences in investment choice. Individuals will choose a desired rate of return to maximize wealth/utility and will choose investment allocations based on the
desired rate of return. The investment choice will be subject to the constraint on resources and will be affected by preference shifters; although these preference shifters are discussed, they are not specifically defined. Economic theory does not provide any guidance as to what the other factors might be and why they would have different relationships for Blacks and Whites. On one hand, this makes economic theory relatively flexible with regard to the assumptions made on preference shifters because different household characteristics may be considered. However, this freedom may also be seen as a limitation of economic theory as there is no real guidance in terms of what factors need to be considered. Certainly there is a need for financial factors that would be representative of a household's budget constraint. Yet there is no indication of whether or not the influence of demographic or financial factors is constant for all groups. This is because there is no underlying basis in this theory, which states that these preference shifters should be different for Blacks and Whites. However, because of the flexibility of the theory, it is possible that the framework could be adapted for the possibility of racial differences in the relationships between household characteristics and risky asset ownership.

Although the inclusion of the life-cycle savings framework serves to provide an understanding of savings behavior in an inter-temporal context, it does not address all of the issues that need to be considered in order to examine racial differences. Specific insights that life-cycle theory has added include the fact that household economic decisions are affected by household composition, household characteristics, household inter-temporal preferences, external factors, and resource constraints. The key missing
component to understanding racial differences is explaining why economic/financial
decisions should be different for Blacks and Whites when controlling for other factors.

Economic theory does not account for the fact that some factors will have
different effects on certain racial subgroups depending on their specific and unique
experiences (Palm, 1972). Palm (1972) suggests that economic theories are based on,
and primarily tested on, experiences of White, middle-class societies, which have
historically enjoyed higher standards of living than Black societies, along with different
patterns in household composition. The ideal framework for examining racial differences
in risk aversion includes ideas from the traditional economic model of consumption and
savings/ investing behavior and allows for the factors considered in the models to impact
Blacks differently than Whites.

In examining racial differences in economic decision-making, one must draw
upon literature that specifically addresses the differences between Blacks and Whites.
Several scholars point out the importance history has played on Blacks (Nobles, 1978;
preferences and perceptions as well as the importance of history in Black culture.
Boulding (1972) and Semmes (1981) proposed that studies focusing on Black issues
should consider the culture of the Black family or household. An emphasis of this
approach is to consider issues that have affected Blacks, for example, reduced access to
education. This issue includes not only access to schools but also the fact that Blacks
have been less likely to be targeted for marketing by financial services and other
providers of financial information. While this may not prevent Blacks who are already
knowledgeable from investing, it might reduce the likelihood of investing by those less financially savvy.

The Afrocentric worldview considers the impact of history and culture on the circumstances each group faces (Milam, 1992). The Afrocentric worldview proposes that there may not be a racial difference in the decision process itself (Nobles, 1978; Sudarkasa, 1981). Instead, Blacks and Whites may have different perceptions because of differences in the choices available as well as the cultural belief system used to guide these choices. Racially focused economic inquiries should include issues relevant to the historic perspective of the Black experience (Nobles, 1978; Sudarkasa, 1981). One example of an important issue is the effect of racism. Examples of racism include discrimination in wage setting, hiring practices, granting promotions, and obtaining credit. This type of financial discrimination may be one reason why Blacks in the U.S. have accumulated less wealth than Whites. Such a history would provide Blacks with fewer opportunities to gain wealth than Whites (Darity, 1999).

Darity (1999) points out that the ancestors of today’s Blacks faced harsh discrimination and inequality in education, which resulted in less wealth to be passed down through the generations. Less wealth may influence other aspects of the household such as educational attainment and exposure to information. For example, those with less wealth may be less likely to have need for financial advisors and as a result may be given less information about investment strategies and products. Additionally, Chiteji and Stafford (1999) showed that younger families were more likely to own stocks if their parents owned stocks. They point out that this is an indication of parental influence on investment choice. This may mean that if the parents were subjected to racism or
discrimination, they may have developed a distrust of financial advisers. Loury (1998) provides several examples of the influence older generations may have on the investment habits of youth. One such example is a distrust of financial advisers because of discrimination toward a family member. This type of attitude may be passed on from parent or relative to child, which also indicates the importance of history on investment choice. Blacks are less likely to have been exposed to investing while they were growing up or when asking parents for advice after they had grown up. All of these factors may independently or collectively affect the economic decisions made by Blacks.

### 3.3.2 Household Structure

Critical differences in household composition may also come into play in understanding racial differences in risky asset ownership. Historically, Blacks are not best represented by the modified nuclear family but rather by other family types such as single parents. These other types, which have been more prevalent for Black households, may have different preferences for investing than the traditional nuclear family (Dilworth-Anderson, Burton, & Johnson, 1993). Despite the economic advantage of marriage, there is a declining rate of marriage for Black women, which is largely due to the declining marriage pool (Staples, 1997). Likewise, the greater likelihood of Blacks living in an extended family may be the product of a history of poverty since blacks may live in larger groups to pool economic resources (McAdoo, 1997). Further, Black families tend to define themselves less by legality and more by lineage (Sudarkasa, 1997). This may also be related to the higher divorce and out-of-wedlock birth rates for
Blacks compared to Whites, thus causing a greater dependence on relatives. Collins (1987) also points out that there is more flexibility in the defining of gender roles in Black homes. Consequently, Black married couples may have different economic preferences and thus different decision-making patterns than White married couples.

Another example of Black-White marital differences is the increased acceptance by Black husbands of their wives' participation in the labor force. This is also a result of the independent nature of Black women, who are more likely to be single parents (Collins, 1987). This pattern may also be a reaction to the men's lower earnings as a result of discrimination in the labor market, as well as to the greater availability of jobs for Black women. This dual work pattern is likely the result of greater economic need within Black families.

Given that in 1992 the proportion of Black households with children that were single parent households was twice that of Whites, the situations for single persons or single parent households also need to be considered, (Glick, 1997). Generally, a single person is one who is not currently married but may have been previously. Males or females can head single person households. Single female households without children are expected to exhibit fewer racial differences in economic behavior. In fact, Black women as a group are considered more independent that White women (McKelvey & McKenry, 2000). The more limited marriage pool Black women expect to face may prepare them for independent living. The presence of children in a household may provide an advantage to Black women through community or family support. In fact, Black communities historically have been characterized by having women in the community who shared mothering responsibilities (Collins, 1987). However, Sudarkasa
(1997) points out that in more recent years these community mechanisms have greatly diminished in the support that they provide, and today most of the help comes from extended families. Further, McAdoo (1997) discusses mixed views about possible familial support, which some see as a hindrance to economic mobility. Regardless of whether or not the presence of children is seen as an empowerment for woman and family, having a large number of dependent children or other dependents would still indicate a larger strain on resources; thus, a larger family would not necessarily be indicative of increased family well-being.

From the investment literature, there is some evidence that gender is a factor related to investment choice. Therefore, if women are more conservative investors and tend to be the decision-makers for Black families, then racial differences in risky asset ownership for married couples might be related to gender differences. However, there is also evidence that single men and single women had similar determinants of stock ownership except that expectation of an inheritance was significantly related to stock ownership for the single women only (Embrey & Fox, 1997). If the determinants of stock ownership for single households are similar for both genders overall, then the gender of the decision-maker in a married couple may be less important to determining risky asset ownership than other household characteristics.

3.3.3 Human Capital

Blacks as a group may have lower educational attainment than Whites, largely as a result of barriers to education. Although there is a substantial amount of financial aid
available for Blacks to pursue formal education, this aid is most commonly in the form of
loans, which may not be seen as a choice for Black households already heavily indebted
(McAdoo, 1997). Further, Blacks who do obtain education face greater discrimination in
employment and/or wages (Cherry, 1989; McAdoo, 1997). Blacks may be denied jobs or
promotions because of their race. They have received lower wages for equal work and
skills. Recently, fewer Black males than Black females have gone to college (McAdoo,
1997). This gender difference in educational attainment for Blacks has developed over
time and is a product of Black women having more opportunity for investing in their
human capital than Black men. To some extent, this phenomenon is linked to the
support system in place for Black women. The difference in educational attainment
potentially gives Black females a human capital advantage over Black males; however,
this is not the same for White males and females. Additionally, if unmarried Black men
have lower education, then they are less likely to own risky assets since education is
positively associated with risk tolerance.

The assumption that households have complete equal information about investing
would not be valid if households are unwilling, unlikely, or unable to obtain information.
However, as this applies to investing, the issue is not whether the household has complete
information but whether or not the household has any information about investing. For
example, if an individual is going to choose to invest in mutual funds, he or she should
select a fund for which the objectives are clear. The key issue is the individual’s or
household’s understanding of the relationship between risk and return as well as the
impact of longer time horizons on the expected return and optimal portfolio choice.
Having a basic understanding of these concepts could help an investor make the best
choice. Hanna and Chen (1997) showed that all portfolios should hold some level of stocks regardless of the individual's level of risk aversion. Yet despite this fact many individuals do not hold stocks or other risky assets such as businesses. This may also be the result of a difference in the understanding of the nature of the risk involved in the stock market. For example, if one is unaware of the fact that stocks are superior in the long run to all other investments, he or she may not invest in them because of this lack of knowledge. Therefore, if there are racial differences in exposure to this information as a result of target marketing by media and financial firms, then racial differences in investment choice may be expected.

3.3.4 Expectations

One specific issue brought up by Dilworth-Anderson, Burton, and Johnson (1993) was the need to consider the different values of a group. For example, monetary wealth may be viewed differently between Blacks and Whites or there might be differences in the perception of risk in investing. The Afrocentric worldview suggests what may be unique temporal preferences for Blacks. Blacks are not overly materialistic, but they may value current consumption more in order to have a standard of living comparable to their peers, both White and Black (Burlew, Banks, McAdoo, & Azibo, 1992). Coles (1975) points out that the economic goals of Black society are more likely to be structured around closing Black-White gaps in earnings to improve the economic well-being of Blacks. The shorter the horizon is for different financial goals, the less willing an investor might be to place his or her wealth in stocks because of the increased uncertainty.
of the returns in the short run. Therefore, if Blacks tend to have more myopic financial goals such as current consumption, they may be more likely to hold assets that are less volatile in the short run, such as time deposits like CDs or money market accounts.

Blacks may be less optimistic regarding their future than Whites. Fairlie and Sundstrom (1997) point out that the unemployment gap between Black and White non-student, non-institutionalized men 30 years or older and in the labor force has shown a trend of widening over the last century, with Black men at a disadvantage to White men. While Black women have made large advances over time in their labor force activities, Fosu (1997) shows through an index of occupational standing that much of the gains made by Black women were episodic and their rate of increase on the index has diminished, especially compared to White women. The uncertainty about future income flows may increase the need for precautionary savings. Huston and Chang (1997) found that Blacks were less likely than Whites to meet any of their three measures of adequate emergency funds. If Blacks are less likely to meet adequate levels of emergency funds, they may not own illiquid risky assets because they lack sufficient emergency funds.

Hanna and Chen (1997) show that the proportion of wealth allocated to stocks should increase with the planning horizon. However, they mention that having short-term goals or uncertainty about income flows may increase the desire of a household to accumulate precautionary savings. This savings motive would be consistent with having a shorter investment horizon until the desired level is achieved. The uncertainty about the future and the desire for current consumption may make saving for "future utility" less attractive to Blacks. The preference for current consumption might cause Black families to extend current resources by accumulating debt instead of accumulating savings. While
this seems consistent with some ideas of the life-cycle approach, it may actually not be since Blacks may not seek to maximize lifetime consumption but rather they may only seek to maximize current consumption. If their wealth is to be used in the short term, then Blacks may be less likely to hold assets whose value is more uncertain in the short term than in the long run, such as stocks. Being able to increase Black household’s upward income and/or wealth mobility may contribute to breaking the trend of Blacks having less wealth than Whites on average.

Some economic differences such as asset holdings or wealth may be the result of a history of discrimination. For example, Blacks may not be less invested than Whites of equal standing by choice but instead because of having less financial ability to enter the investment market. The inability to enter the market could be a result of differences in wages or wealth, lack of trust in advisors, pessimism regarding markets, or lack of tradition. Another possible result of discrimination is a distrust of White advisors and institutions, which may affect access to investments or credit markets. In fact, lower financial well-being may be a product of history and discrimination in the workplace and other environments as opposed to simply a consequence of choice. Discrimination in financial markets could reduce access to credit and limit access to information (Vatter, 1972). Limitations on credit or discouragement could prevent individuals from creating their own businesses since many startups require some amount of borrowing for needed capital or investors willing to go into business together. Reduced access to credit could be related to historical financial well-being. For example, individuals may not know someone who can co-sign for them because their parents or siblings also have little resources to spare. Further, individuals may have bad credit history because of their own
financial records, such as low net worth or failures to pay debts on time. Williams (1999) discusses the impact of discrimination on Blacks in modern America. She points out that even with today's civil rights laws, Blacks still feel the effects of a history of discrimination on their parents and grandparents, which in turn has affected the acquisition of human capital of today's adult Blacks.

Typically, discrimination based solely on race would not be considered rational behavior and thus causes a conflict with economic theory that is rooted in rational behavior. Consider the following hypothetical situation. A Black couple is interested in opening an investment account but is quoted very high fees or is otherwise discouraged by an advisor. If the advisor is seeking to maximize his or her profits, then he or she should not discourage a client. What is worse yet, the couple may not even be solicited to open an account in the first place. In either event, the couple might develop distrust for advisors and as such may avoid the established traditional financial sector, closing doors to important information and investment opportunities.

3.4 Summary

Consideration of the influence of both cultural and historical differences between Blacks and Whites on their economic choices may provide a better guide for explaining racial differences in risky asset ownership than economic theory alone. Key differences highlighted include household financial status, household/family dynamics, planning horizon, and goals/values. Household composition may have different implications for Blacks than for Whites in terms of the economic choices that they make. Additionally,
education may not provide the same opportunities for both Blacks and Whites. Finally, as a result of a history of struggling to get by, Blacks have adopted a more myopic view of consumption than Whites, which would influence their savings and allocation decisions as well. These issues require empirical testing to determine the extent to which racial differences in economic choices can be explained by integrating the Afrocentric framework and economic theory.

3.5 Hypotheses

The combination of the economic and Afrocentric explanations of behavior is formalized below in 7 hypotheses. The method for testing these hypotheses will be discussed in the next chapter. Hypotheses 2-5 test specific relationships between risky asset ownership and the explanatory factors. Each hypothesis will be stated as a null hypothesis. Although potential specific racial differences have been discussed for many of these characteristics the hypotheses do not imply specific directions of the relationships, but rather that the relationship of the explanatory factor should be different for Blacks and Whites.
<table>
<thead>
<tr>
<th>Hypothesis Number</th>
<th>Null Hypothesis</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>There are no racial differences in the relationships of the determinants of risky asset ownership.</td>
</tr>
<tr>
<td>2</td>
<td>There are no racial differences in the relationship between risky asset ownership and household demographics.</td>
</tr>
<tr>
<td>3</td>
<td>There is no racial difference in the relationship between formal education and risky asset ownership.</td>
</tr>
<tr>
<td>4</td>
<td>There are no racial differences in the relationships between household or individual financial characteristics and risky asset ownership.</td>
</tr>
<tr>
<td>5</td>
<td>There are no racial differences in the relationship between risky asset ownership and measures of household preferences and expectations.</td>
</tr>
<tr>
<td>6</td>
<td>There is not a racial difference in the likelihood of risky asset ownership that explain some the racial differences in the proportion of wealth invested in risky assets.</td>
</tr>
<tr>
<td>7</td>
<td>There are not race-specific external forces that explain some of the differences in risky asset ownership between Blacks and Whites.</td>
</tr>
</tbody>
</table>

Table 3.1
List of Hypotheses
Previous empirical work in housing and wealth has shown that observed racial
differences in risky asset ownership can be better explained by using separate models for
Blacks and Whites. Further, the idea of racial differences in investment choice is
consistent with the basic principles of an Afrocentric worldview. The first null hypothesis
is that there are no racial differences in the determinants of risky asset ownership. The
alternative hypothesis is that there are racial differences in the relationships between
household characteristics and risky asset ownership and the best model is the one that
allows for the determinants and the impact of the determinant on risky asset ownership to
be different for Blacks and Whites.

The composition of Black and White households is quite different as are some of
the interpersonal relationships in the households. The second null hypothesis is that there
are no racial differences in the relationship between risky asset ownership and household
demographics.

There are differences in the level of formal educational attainment (human
capital) between Blacks and Whites. However, education should be related to risky asset
ownership for both races when controlling for other household characteristics. The third
null hypothesis is that there is no racial difference in the relationship between formal
education and risky asset ownership.

Risky asset ownership should be related to household financial characteristics.
The fourth null hypothesis is that there are no racial differences in the relationships
between household or individual financial characteristics and risky asset ownership.

Risky asset ownership should be related to household preferences and
expectations; the fifth null hypothesis is that there are no racial differences in the
relationship between risky asset ownership and measures of household preferences and expectations.

One idea seen in the literature examining racial differences in home ownership and wealth is the idea that the likelihood of ownership may be as complicated an issue as the value of the asset owned. The sixth null hypothesis is that there is not a racial difference in the likelihood of risky asset ownership that explains some of the racial differences in the proportion of wealth invested in risky assets.

The effect of history and discrimination are important when considering differences in investment choice between Blacks and Whites. While these factors may be difficult to measure, they need to be identified as best as possible. Therefore, the seventh null hypothesis is that there are not race-specific external forces that explain some of the differences in risky asset ownership between Blacks and Whites.
CHAPTER 4

METHODOLOGY

4.1 Introduction

The purpose of this study is to examine racial differences in investment choice, more specifically, in the determinants of risky asset ownership. This chapter describes the empirical procedures that will be used in this study. The first section of the chapter will include a description of the data set that will be used, the 1998 Survey of Consumer Finances (SCF). Several complications that arise when using the SCF will be addressed. The second section will focus on the empirical model and the description of the variables; particular attention will be paid to the complexities that arise when estimating the proportion of total wealth allocated to stocks and business assets. The amount of risky assets held is relatively straightforward; however, the estimation of human wealth for the households is complex and requires several assumptions, which will be discussed in detail. This section will also describe the explanatory variables that will be used in the empirical model. The third section will contain discussion of the descriptive and multivariate procedures that will be used in this study. The multivariate analysis will be
carried out using a two-step regression procedure. The last section of this chapter will describe the methods that will be used to test the hypotheses presented in Chapter 3.

4.2 Data and Sample

The data for this study will come from the 1998 Survey of Consumer Finances (SCF). The Federal Reserve Board sponsors the SCF with cooperation from the Department of the Treasury. The SCF is an ideal choice for a study on risky asset ownership because the SCF 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 that arise when using the SCF. These concerns come from issues relating to over-sampling of wealthy households, weighting, and multiple imputation. Each of these will be discussed individually.

The SCF has two components to the sample. The first component over samples high-income households to try to reach wealthy households. The approach taken to identify households likely to be wealthy is to identify high-income households using tax records from the Individual Tax File (ITF) maintained by the IRS Statistics of Income Division (SOI) (Kennickell, 1998). The 1998 SCF uses information from the 1996 ITF for its sample selection after eliminating certain households because of age criteria. The income information is used to predict the household’s wealth index. Since income and wealth tend to be positively correlated, this approach is considered to be an appropriate means to reach a greater number of wealthy households. The second component is a multi-stage probability sample (Kennickell, 1998).
The result of this sample design is that the SCF over-samples wealthy households. A weight variable that can be used to correct point estimates for over sampling of wealthy households is provided in the public use data set (Kennickell, McManus, & Woodburn, 1996). However, this weight variable also raises some issues of its own. Kennickell and McManus (1993), and Montalto, (1998a; 1998b) discuss the drawbacks of using the weight variable in a multivariate analysis on SCF data. One concern is that the weights are endogenous to variables such as income that are commonly used by researchers in multivariate analyses. Additionally, there is the issue of whether or not to use the whole-weight provided or to construct a fractional or scaled weight. The whole weight would correct for over sampling of wealthy households, but it would also inflate the degrees of freedom and thus impact the tests of significance. Since the tests of the hypotheses depend on these tests of significance, a scaled weight will be used to correct for the over sampling of the wealthy households without altering the degrees of freedom. The inclusion of the scaled weight variable in the descriptive analysis will correct for the bias of over sampling the wealthy households.

There are two choices for weights provided in the data set: the original Kennickell and Woodburn weight and one that has been revised based on home ownership from the Current Population Survey (Kennickell, 1999). The revised weight will be used for the descriptive analysis in this study. However, in the multivariate analyses, the weight variable will not be used because the multivariate analysis has included some of the stratum-defining variables such as age and race. Additionally, other stratum defining variables such as income, wealth, and home ownership are integrated into the dependent variable. Therefore, weighted multivariate analysis may be affected by bias due to
endogeneity of the weights. Unweighted analysis may have bias due to over sampling of wealthy households. The bias related to over sampling is the least problematic, and therefore all multivariate analyses will be unweighted.

The Survey of Consumer Finances consists of five data sets due to multiple imputation of missing responses (Kennickell, 1997). Multiple imputation allows the survey to be analyzed as a complete data set but requires greater effort (Rubin, 1987). Additionally, some of the values may vary slightly from one implicate to the next. Montalto and Sung (1996) describe the application of Rubin's repeated imputation inference technique for analyzing the SCF's multiply imputed data. Repeated Imputation Inference (RII) procedures use data from all five implicates and incorporate estimates of error due to missing data, known as imputation error (Rubin, 1987). RII techniques will be used for estimating both the descriptive statistics and the OLS procedures in this study, but they cannot be used with the Probit procedure in this study. The Probit procedure in SAS does not produce an output data set of the covariance matrix that is required for RII techniques (SAS Institute Inc., 1989) and therefore RII cannot be used. However, in order to use all of the information to obtain the best estimate possible, the data from all five implicates of the SCF will be pooled for the Probit procedure even though doing so will inflate the sample size. Kennickell (1997) recommends that the estimates of the standard error be multiplied by the square root of 5 to correct for the exaggerated sample size for the purposes of significance tests. Since RII procedures cannot be used with the Probit procedure in SAS, there can be no accounting for imputation error in the estimate of standard error, and therefore significance may be overstated. However, the amount of imputation error is unknown. For the purposes of the
Probit analysis, an alpha of 0.05 will be used to determine significant coefficients, and the individual levels of significance will be reported for all coefficients in the appropriate tables. This is less of an issue for the OLS procedure in the second step because RII techniques can be used with SAS when running an OLS regression.

Two sample selection criteria have been used in this study to facilitate hypothesis testing and the estimation of household human wealth. First, the sample is limited to households with either a Black or White household head. This allows differences between Blacks and Whites to be clearly identified and simplifies the testing of the hypotheses raised in the previous chapter. There is some concern that inclusion of households of mixed racial lines may introduce bias in the empirical analysis. However, results from the March 1998 Current Population Report by the US Census indicates that about 14% of all White husbands were married to non-White spouses. Only 6% of all Black husbands were married to a non-Black spouse. Since the multiracial marriages represent a small proportion of the population, the potential bias in using the race of the respondent should be minimal, thus making any remedy unnecessary. Although the 1998 SCF does provide a variable for whether or not the household reported having a member of another race in the household other than the respondent, it does not say what that race is and as such would only be of limited use for the purposes of this study.

Another sample selection criterion is that the household head should be between the ages of 30-70. Unmarried households were removed if the respondent’s age was not within this range. Married couple households were removed if both spouses did not fit within this range. One reason for this is related to estimation of life expectancy, which will be discussed shortly. Another reason is that there would be more uncertainty in
projecting wages for younger households since their earnings may change drastically over time. However, the assumption is that once a respondent is in his or her thirties, the current earnings may be a more reasonable proxy for future earnings than they would be if the respondent were younger.

Blacks and Whites have differences in household composition and they hold somewhat different definitions of family. As a result, the model will account for three main household types: married couple, unmarried male, or unmarried female. The indicators of household composition will enable the model to properly control for the expected impact of marital status and gender. For the purposes of this study, a married couple will be defined as a householder that reported him/herself as married. Although couples living in cohabitation may share current resources, whether or not they consider their partner’s (non-spouse) future resources in investment decisions is questionable. It seems more reasonable to assume this behavior in a married couple. Therefore, in order to best capture the anticipated behavior, couples living together but not married will be treated like other non-married households.

4.3 Empirical Models and Variable Choice

4.3.1 Empirical Model

The empirical model for this study draws from both previous studies on investing as well as the theories presented in Chapter 3. Several categories of characteristics were seen as important factors associated with ownership of risky assets. The first category is
household demographic characteristics. These demographic characteristics include variables such as age, marital status, gender, race, and number of dependents. The next category is financial factors, which include: human wealth, indicators of precautionary savings, and inheritances. Measures of expectations will also be used, including self-reported risk tolerance, planning horizon, and economic outlook. The last factor related to risky asset ownership is obtained from the results of the Probit procedure, namely, $\lambda$, the Heckman (1974; 1976) estimate of sample-selection of owning risky assets. Therefore, the empirical model for estimating the relationship of risky asset ownership to household characteristics is:

$$RA = \beta(D) + \beta(F) + \beta(E) + \beta(\lambda) + \varepsilon$$  \hspace{1cm} (4.1)

Where:

- $RA$ = Ownership of risky assets
- $D$ = Household demographic characteristics
- $F$ = Financial characteristics
- $E$ = Expectations
- $\lambda$ = Heckman estimator for self-selection
- $\varepsilon$ = Error (unexplained difference)

Risky asset ownership should be related to household demographic and financial characteristics as well as household expectations. The model shown above does not quite capture the idea that the relationships of household characteristics to risky asset ownership should be different for Blacks and Whites. This is accomplished through a
model that allows the estimated coefficients on each independent variable to differ between Blacks and Whites. Thus, the following model allows for the relationship of the determinants of risky asset ownership to be different for Blacks and Whites:

\[ RA = \beta(D) + \beta(F) + \beta(E) + \beta(\lambda) + \beta(\text{Race}) + \beta(D*\text{Race}) + \beta(F*\text{Race}) + \beta(E*\text{Race}) + \beta(\lambda*\text{Race}) + \varepsilon \]  \hspace{1cm} (4.2)

\[ D = \text{Household demographic characteristics} \]

\[ F = \text{Financial characteristics} \]

\[ E = \text{Expectations} \]

\[ \lambda = \text{Heckman estimator for self-selection} \]

\[ \text{Race} = \text{Race Specific unexplained difference} \]

\[ D*\text{Race} = \text{Household demographic characteristics interacted with race} \]

\[ F*\text{Race} = \text{Financial characteristics interacted with race} \]

\[ E*\text{Race} = \text{Expectations interacted with race} \]

\[ \lambda*\text{Race} = \text{Heckman estimator interacted with race} \]

\[ \varepsilon = \text{Error (unexplained difference)} \]

The proportion of wealth allocated to risky assets is the dependent variable for the OLS regressions. Although the relationship to relative risk aversion is not considered appropriate for this study the proportion of wealth allocated to risky assets is still a useful dependent variable for several reasons. First, previous studies like Friend and Blume (1975) and Wang and Hanna (1997) used similar proportions and this would facilitate
comparison of the results. Second, although for the purposes of this study the relationship between the risky proportion of wealth and relative risk aversion is not assumed, the proportion of wealth allocated to risky assets is still a useful measure of risky asset ownership. This is because wealth including human wealth is a resource spread across time, and the investment decision, based on the life-cycle perspective is one that should consider future income flows and resources. For the purposes of this study, risky assets will be defined as the total dollar amount invested in stocks and small businesses. The term "stocks" will refer to actual shares owned, stock mutual funds, and stocks in pension accounts. Small businesses are included for two reasons. First, small businesses are a risky venture for an individual because the individual not only risks losing the capital investment but also wages that may be forfeited if the business fails (Kreinin, 1959). Additionally, those who invest in small businesses often do so by sacrificing potential diversification in other assets.

Friend and Blume (1975) present two measures of wealth to be considered for the denominator in their estimate of $\alpha_k$, the proportion of wealth allocated to risky assets. The numerator for both measures of relative risk aversion is the same, namely, the dollar value of risky assets. However, they present two alternative denominators based on two definitions of wealth. One definition is net worth only and the other definition is the sum of net worth and human wealth. In their study of the demand for risky assets, Friend and Blume focus on net worth only so as to be consistent with the existing finance literature. This study will utilize both definitions of wealth, which means that there are two proportions that will be examined using OLS regressions. The first measure of wealth is
a household’s net worth and the second measure of wealth is the sum of net worth and human wealth.

Net worth is defined as total household assets minus total household liabilities. Total household assets include tangible and financial assets. Tangible assets consist of homes, cars, other real estate, collectibles, etc. Financial assets would include investments, monetary accounts like checking or money markets, and cash. Households with negative or zero net worth will be set to one since a negative ratio of risky assets to wealth is difficult to interpret and division by a net worth of zero is impossible. However, the sample descriptive statistics will include all values of net worth, and this truncation at zero will only be used in the multivariate analysis.

The second definition of wealth is total wealth. Total wealth is defined as the household’s net worth plus the human wealth of the household. Human wealth is calculated as the discounted value of non-investment income based on current income levels. Thus, human wealth includes current and future salaries, defined benefit pensions, and Social Security. In order to estimate human wealth, predicted values of a household’s life expectancy and future Social Security retirement benefit will be needed, and some assumptions will have to be made about income growth rates and relevant discount rates. The estimation of human wealth is described in detail in the next section.

4.3.2 Estimating Human Wealth

Human wealth is defined as the present value of future flows of non-investment income to the household. This includes the present value of future salaries and wages,
the present value of anticipated pensions including Social Security, and the present value of future disability benefits and income from businesses and partnerships. Although the SCF does not have a specific estimate of income growth, the SCF contains information about whether or not households expect income to grow at a rate higher than, less than, or the same as prices over the next year. For households expecting a real increase in the following year, it will be assumed that their income will grow at a real rate of increase of 3% per year until retirement. Households not expecting a real increase or even expecting a decrease will be assumed to have no real change (increase or decrease) in income throughout the working years.

In order to estimate human wealth, the number of years that each cash flow type will be received needs to be known or estimated. For salaries, business income, and disability benefits, the number of years before the stated retirement age will be used. However, for retirement benefits, in order to determine the present value of pensions (including Social Security), the life expectancy at the time the benefits begin needs to be known. The life expectancy needs to be predicted individually for the respondents and their spouses if married for their known or assumed benefits. For married couples, the human wealth of both spouses 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 calculator uses age and different transformations of that age to estimate life expectancy based on information obtained from the Internal Revenue Service Actuarial Tables (1998). The equations predict life expectancy for male or female individuals between the ages of 30 and 70. Therefore, while the sample only includes those
households between the ages of 30 and 70, all households will also be assumed to retire at 70 unless an earlier retirement age is given so that the Hanna and Montalto (2000) life expectancy estimation equations can be used to estimate life expectancy in retirement. While a joint life expectancy equation is available, the equations for females and males will be used to represent household head and spouse (if married) in order to identify the time for the present value calculation of each individual's cash flows. For example, for a married couple where both spouses receive Social Security, in the event one predeceases the other the decedent's benefits would stop. Using a joint life expectancy assumes that both sets of benefits will exist for the survivor should one spouse pass before the other, this would tend to overstate the human wealth of the household. For unmarried households in the sample, the equation used will be consistent with the gender of the respondent. The equations for females and males are:

\[ f = -0.87609 \cdot \text{age} - 0.003611811 \cdot \text{age}^2 + 0.000000587 \cdot \text{age}^3 - 0.0000000067 \cdot \text{age}^4 + 75.47206 \]  

\[ m = -0.742256684785431 \cdot \text{age} - 0.00748563829734842 \cdot \text{age}^2 + 0.000116385408539856 \cdot \text{age}^3 - 3.36351726878028 \cdot 68.8961977991023 \]  

**Social Security Wealth**

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, according to the Social Security Administration, approximately 96% of all jobs in the United States are covered by Social Security (Social Security Administration, 1998). Therefore, this study will assume that all of the respondents and their spouses who earned income in 1997 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. The assumptions made for estimating income growth will also be carried over for the benefit estimate. Therefore, a 3% constant growth in annual earnings until retirement will be used for households expecting a real rate of increase in earnings over the next year.

Yuh (1998) described a procedure of linear interpolation to estimate the PIA replacement rates for individuals and households based on their current earnings. The 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. Few households reported that they currently receive retirement benefits including Social Security. The amount of Social Security received by the household is reported in the SCF and will be added into their human wealth; therefore, there is no need to estimate the benefit for these households.

In addition to the initial PIA estimate, adjustments must be made for individuals who are not retiring at their full retirement age. There are two possible adjustments that can be made: a delayed retirement credit for those retiring after their full retirement age and an early-retirement deduction for those individuals retiring before their full
retirement age but after the minimum age (Social Security Administration, 1998). Currently, the full retirement age is 65 for most individuals but is being raised to 67. No benefits can be collected prior to age 62 except in the case of disability or survivor’s benefits. Workers turning 62 during 2005-2016 will receive full benefits at age 66 and workers turning 62 after 2022 will receive full benefits at age 67 (Social Security Administration, 1998). The annual reduction rate for retirement benefits prior to the full retirement age is 6% for the first 3 years prior to full retirement (e.g., Age 62) and for those retiring in the future when full retirement ages are 66 or 67, there will be an additional reduction of 5% for the next two years of the early retirement. The delayed retirement credit works in the opposite manner. For every year past the full retirement age, the benefit is raised. For workers turning 62 in 1997, the rate of annual increase was 6%, and for workers turning 62 in 1999 the rate is 6 ½% per annum. Finally, for workers turning 62 after 2005, the rate of increase will be 8% (Social Security Administration, 1998). These adjustments will be made to the benefit estimates for the households.

The complexity of the benefit estimation for unmarried households and married couples can be quite different because the estimation for married couples can involve several steps. The benefit for the unmarried respondent is based on his or her individual earnings if he or she is employed and no benefits for other household members are estimated. However, for married couples the issue becomes more complex because of the potential spouse benefit. The first step is to estimate the benefit for the first member of the household who reaches eligibility, which is based on his or her individual earnings. Next, the spouse benefit for his or her significant other will be estimated (if available at retirement). Spouse benefits are at most half of the other’s benefits based on whether or
not both are at full retirement. The first to retire/reach eligibility can only claim the benefit based on their earnings. However, when that individual's spouse reaches eligibility, the first to retire/reach eligibility can choose to claim the benefit based on their spouse's benefit if it is greater. Therefore, it is possible for one member of a married couple to switch benefits once retired.

As mentioned earlier, the number of years that the benefit will be received by the households must be estimated in order to compute the present value of the Social Security benefits. The Hanna and Montalto (2000) life expectancy estimation equations are used to estimate the life expectancy for each respondent and spouse (for married couples only). This life expectancy must be estimated from the age at which the benefits will begin. For households that are currently receiving Social Security, life expectancy is estimated based on the household members' current age. However, 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 this may be after the individual's retirement age since Social Security retirement benefits cannot begin before age 62. If the individual retires after 62, then that retirement age is used for the life expectancy calculation, otherwise, age 62 is used. Upon reaching eligibility, each married individual will choose the greater of his/her own benefits and a spouse benefit if available. Since it is possible that the first to retire may switch his or her benefit when his or her spouse retires (and/or reaches eligibility), it is possible for individuals to have more than one stage of benefits. The number of years for the first stage of benefits is known and the life expectancy of the individual during the second stage of benefits is based on their age at the time that his or her spouse (second to retire) retires.
The present value of each spouse’s benefit will be discounted until the age that they will begin receipt of benefits, which cannot be prior to age 62. This present value will then be discounted back to their current age in 1997. The same conservative interest rate will be used for both stages of discounting. Whenever a married couple is not retiring in the same calendar year or if one is retiring prior to his or her first age of eligibility, there is a multistage Social Security decision to be made. The multistage retirement calculation occurs because the first to retire can only choose the benefit based on his or her individual earnings, but then 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. The formula for the present value of the Social Security Benefits is

\[
\frac{\{\{1-1/(1+i)^{nr}\}*A\}/i\}/((1+i)^{nw})}{(1+i)^{n}}
\]

(4.5)

Where:

\(nr\) = the number of years during retirement the person will receive benefits

\(i\) = a conservative real rate of return

\(A\) = the annual SS benefit

\(nw\) = number of years prior to receipt of the benefits (= 0 if currently receiving benefits)
In addition to Social Security retirement benefits, some of the households also are entitled to one or more defined benefit pension plans. These plans are formula-based pension plans offered to household members by current and/or past employers. There are several questions in the SCF that establish information for a basic estimate of these benefits, including questions related to the expected dollar amount of the benefit and the frequency of the payment. This provides enough information to estimate an annual benefit from up to three plans per spouse. Several households in the sample are already receiving defined benefit pension benefits so the present value calculation for these benefits is also discussed.

As with Social Security benefits, it is essential to know the number of years that the defined benefit pensions will be received or to determine the individual’s life expectancy while being eligible for the benefit. If an individual is currently receiving defined benefit pensions, then the life expectancy for the future benefit streams is calculated based on the current age of the respondent and spouse (if married). The present value calculation of the defined benefit pensions is more straightforward. It will be taken using the following formula, discounting the annuity until retirement age and then discounting the present value of the annuity until the current age of the respondent. The formula for the present value of future defined benefit payments is:
\[ \frac{\left\{ \left[ 1 - \frac{1}{(1+i)^{nr}} \right] \cdot D \right\}}{i} \left/ (1+i)^{nw} \right. \]  \hspace{1cm} (4.6)

Where:

- \( nr \) = the number of years during retirement the person will receive benefits
- \( i \) = a conservative real rate of return
- \( D \) = the annual defined benefit pension distribution
- \( nw \) = the number of years prior to receipt of the benefits (0 for those currently receiving benefits)

**Other Human Capital Wealth**

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. However, 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 practices or businesses (Kennickell, 1997). There are a few households that had negative business income. While it is possible that these businesses may become profitable, this is not certain; further, the estimation of such positive income is beyond the scope of this study. Therefore, all negative business incomes will be set to zero. For all households that have
positive business income, the present value of this income stream 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 will be 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 of these components of human wealth. Some of these households may have net worth and may be using assets for consumption purposes. Even though there are some households that will have zero amounts for human wealth and net worth, the assumption that these households have no human wealth is not appropriate. These households may expect benefits from a deceased or estranged spouse whose income was not reported and thus no SS retirement benefits would be estimated. Also, these households may be receiving some form of monetary or non-monetary government aid that is not included in the human wealth calculation. For these households with no wealth based on the chosen components, it will be 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). The present value of this assumed income will be taken 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.
Discount Rates

The discount rate used in the present value calculations should be based on the opportunity cost that the household faces. One way to determine this is to consider the relevant rates of return to the household. The choice of relevant discount rates is one that must be carefully considered. Two studies that have commented on this issue are Lee (1995) and Wang (1998). In these studies, the rate chosen to discount the annual non-investment income was based on the real rate of return for stocks, and the discount rate used for pension income was the real rate of return on a conservative investment such as corporate bonds. This method assumes that the same rate of return would be relevant for all households, which may or may not be reasonable. However, choosing a constant discount rate for all households is preferable so that the human wealth of households of equal income will only differ by the number of working years. If instead a discount rate based on the current portfolio were used, this would then cause a difference in the estimation of human wealth for the households, which would in turn alter the estimate of the proportion of total wealth allocated to risky assets. The discount rate will be used to take into account the present value of the various income streams such as salaries and pensions. The present value of each of these segments of human wealth will be taken and added together. The discount rate used for each component and possible stages of the components will be constant for all households in the sample that have that type of income source.

The discount rate for pre-retirement income will be the real rate of return on large stocks based on historical returns from 1926-1996 provided by Ibbotson Associates.
(1997). The 1997 records are chosen since this would have been the most current information that households could have used to make decisions in 1997. The nominal rate of return was 10.7% and the inflation rate was 3.1%. Therefore, the annualized real rate of return on large stocks from 1926-1996 was 7.4%, which will be used as the discount rate on pre-retirement income. The discount rate for expected defined benefit pension and/or Social Security income should be based on a more conservative rate of return so as to reflect the concern of capital preservation. This may be more reasonable for households in which the members are retired. The discount rate chosen for pension and Social Security income is the historical real rate of return on corporate bonds for 1926-1996. Although T-bills are technically considered risk-free investments, the return on long-term corporate debt is more reasonable since it is unlikely that individuals in retirement would choose to invest their assets solely in Government bonds. The discount rate for pension income is 2.4%. This discount rate will be used for both stages of discounting. These stages include the initial present value of the pension “annuity” and the discounting of this present value to the age of the individual in 1997.

To summarize, the present value of defined benefit pension income, the present value of Social Security retirement benefits, the present value of disability income and the present value of salaries for both spouses (if married) will be summed to provide the estimate of total human wealth for the households. Households having none of these measures and having 0 or negative net worth will be assumed to earn at least the equivalent of the 1997 poverty threshold appropriate for the household’s size.
4.3.3 Measuring Household Composition

There are numerous household characteristics that may influence the demand for risky assets by households. According to Life Cycle theory, the life cycle stage of the household is relevant. Several issues contribute to classification of life cycle stage. The first variable is an indicator of marital status. Households headed by an unmarried individual will be divided between male and female household heads while households responding that they are married will be labeled as married. This allows for the possibility that unmarried household heads may behave differently from married households, and unmarried female households may behave differently than unmarried male household heads, which is supported by findings from previous studies (Baker & Haslem, 1974; King & Leape, 1998; Ramaswami, Srivastava, & McInish, 1992; Sung & Hanna, 1998; Wang & Hanna, 1997). While it is not necessarily the case that men and women behave differently, the focus is to establish whether unmarried households exhibit the same behavior as married households and to allow this to differ by the gender and race of the household head.

The next aspect of the life cycle stage is the age of the respondent, is a relevant factor in household investment choice (King & Leape, 1998; Kreinin, 1959; Ramaswami, Srivastava, & McInish, 1992; Wang & Hanna, 1997; Zhong & Xiao, 1995). Categorical indicator variables for the age of the respondent will be used to capture the possible nonlinear effect of age. These categories are “under 35,” “35 to 40,” “45 to 60,” and “over 60.” These categories are similar to those used by Bertaut and Starr-McCluer (2000), but they have been adjusted to account for the fact that the age distribution for
this sample is truncated and only includes households where the respondent is between the ages of 30 and 70. While the inclusion of age may seem redundant because of the inclusion of human wealth, there are two reasons why it is included. In the two models that control for human wealth, age is included to account for a cohort effect that may be a product of history. For example, those who were working prior to Civil Rights legislation may have faced harsh discrimination that impacts current decisions or resources. In the second regression where human wealth is not an explanatory factor, human wealth is one component of the denominator of the dependent variable. The inclusion of age in this model is intended to control for the cohort effect, but its relationship to human wealth may also be related to any results for age in this model.

Another factor that should be considered when capturing the life cycle stage of a household is the presence of children. The Afrocentric literature points out that the presence of children should empower the mother or the family with additional family or community resources, and, as such, the presence of a child should be a benefit for a Black household. However, regardless of increased resources, the larger the family size, the more constraints there are likely to be on any resources available. One other issue that should be addressed is the possibility of other adults present who are dependent on the household head, such as elderly parents or siblings. This variable will help establish the picture of the household in terms of dependents. Thus, the number of dependents in the household will be coded continuously and is included to adjust for any effects the presence of children or other dependents may have on resources.

The potential community resources that exist for families with children can be difficult to measure. One alternative is to include an indicator variable for
metropolitan/non-metropolitan residence. This variable would also be representative of the potential exposure to financial information and services that a household might have. However, this variable is not included in the SCF public use data set. One possible proxy might be home value, but since this measure is a component of net worth—which is in the dependent variable—it should not also be an explanatory factor. Therefore, although there should be a measure (proxy) for community resources available in the model, this study will proceed without one. Since Black and White households are different demographically and culturally, the variables discussed so far provide both a representation of the life cycle stage of the household as well as a representation of the issues that may be useful in explaining racial differences (Allen, 1978; Glick, 1997; McAdoo, 1997; Staples, 1986; 1997; Sudarkasa, 1997).

4.3.4 Household Financial Characteristics

The next category of variables incorporated into the model is financial characteristics of the household. There are several financial characteristics from the literature and theory that should be related to risky asset ownership. These include income/human wealth, net worth, adequacy of precautionary savings, and intergenerational wealth transfers.

Two factors related to risky asset ownership are small businesses ownership and net worth. Each of these will be a component in the dependent variable, which is the proportion of total wealth, including human wealth, invested in risky assets. Business assets are included in the numerator as risky assets. Since the measures are a component
of the dependent variable, they will not be included as explanatory variables. Net worth is not included as an explanatory variable in the Probit estimating the likelihood of risky asset ownership because of a high correlation with human wealth. Human wealth will be included as an explanatory factor to predict the likelihood of risky asset ownership.

There are two dependent variables in the OLS regression. The first one is the proportion of net worth held in risky assets. Since human wealth is relevant to both of these factors and is not a component of the dependent variable, human wealth will be used as an explanatory factor for the first OLS procedure. The second dependent variable is the proportion of total wealth, including human wealth, allocated to risky assets. Therefore, in the second OLS procedure human wealth cannot be included as an explanatory factor because it is a component of the dependent variable in this procedure.

One issue brought up in the literature is the idea that a household prefers to meet some standard of liquidity before investing for the long term (Halliassos & Michaelides, 1999). Hanna and Chen (1997) showed that all portfolios should have some amount invested in stocks but also explained that households may have short horizons for goals or desire emergency funds for coping with income shocks that need to be accounted for before investing in less liquid higher risk investments like stocks. Sung and Hanna (1998) used two indicators to capture a household's precautionary savings. The first was an indicator for whether households held the equivalent of three months' non-investment income in liquid assets. The second indicator examined whether households held the equivalent of six months income in financial assets. Huston and Chang (1997) described similar measures they used when they examined household emergency funds. The first measure is whether the household held three months' income in highly liquid assets. The
second measure used by Huston and Chang (1997) is whether the household held three months of income in liquid assets plus CDs and short-term securities. The third measure is whether or not three financial assets are greater than or equal to three months of income. This study will use slightly different versions of the Sung and Hanna (1998) indicators. The first indicator will be whether liquid assets are greater than or equal to one month’s non-investment income. Household liquid assets will include CDs because they can be short term and can usually be cashed in for an emergency at whatever interest is due minus a penalty. The ratio only uses one month’s income because a household may also have access to credit, which can be used in case of a short-term emergency, and there is no opportunity cost to having access to credit (assuming no annual fees), unlike holding liquid investments. If a household has access to sufficient credit, then it may wish to allocate more resources to higher returning assets than leaving it in cash, which has the opportunity cost of the forgone potential return. The second measure will be the same as Sung and Hanna’s (1998), focusing on whether or not the household held at least six months’ income in financial assets.

Another issue pointed out in some of the literature is the possible influence of inheritances on risky asset ownership. Intergenerational wealth transfers represent an important financial characteristic in explaining racial differences in wealth accumulation (Menchik & Jiankopoulos, 1997) and therefore may also be useful in explaining racial differences in asset allocation decisions. The SCF contains information as to whether a household has received an inheritance or expects to receive one. These indicators will be included in the empirical model. Together these financial measures help to shape the image of a household’s resources and ability to overcome market barriers to entry.
4.3.5 Formal Education

A greater number of years of formal schooling is associated with higher income, higher wealth (including human wealth), and a greater likelihood of owning risky assets. Even though education and human wealth are related, the level of education that is achieved is not perfectly related to the estimated human wealth. For example, stockbrokers have higher median salary than that of university faculty who are likely to have higher levels of formal education (Bureau of Labor Statistics, 2000, April 19). Additionally, human capital for some professions—such as musicians and athletes—may not be obtained by formal education but through talent. Another reason for the inclusion of formal education is that it represents a level of ability of an individual to process certain information. Specifically, the issue is that education should be related to an individual's ability to process and analyze information regarding investments and market conditions. Therefore education may be expected to affect risky asset ownership independent of human wealth. The SCF provides information about the number of years of each type of education that was completed by the household head. For the purposes of this study, indicator variables will be coded for four levels of educational achievement from "no completion of high school" to "college or more."

4.3.6 Expectations

The third set of variables included in the empirical model measures the expectations and perceptions of the household. One of the underlying themes of the
Afrocentric literature is the need to consider the possibility that Blacks and Whites may have different values and perceptions.

The SCF contains a question that asks respondents to choose the level of investment risk and return that they prefer, ranging from no risk at all to high. The purpose of the study is to examine racial differences in risky asset ownership, including this variable may capture a difference in the interpretation of the question or differences in knowledge regarding the nature of investment risk. An indicator for whether or not the household is willing to take any investment risk will be included as an explanatory variable. Additionally, a comparison between self-reported risk tolerance and observed risk tolerance based on ownership of risky assets may also help to illustrate a possible racial difference in the interpretation of this question. It may also show if Blacks and Whites who are willing to take risks, are actually doing so by owning risky assets.

Hanna and Chen (1997) showed that households with planning horizons of at least five years should have substantial proportions of their wealth in stocks and that all portfolios should have some level invested in stocks. Respondents in the SCF were asked which planning period they thought to be most important and were given several ranges to select from such as “less than a year” or “more than ten years.” Therefore, the models estimating the determinants of the likelihood of risky asset ownership and the determinants of the proportion of wealth invested in risky assets will include an indicator for whether or not the household’s planning horizon is at least five years.

Another factor related to risky asset ownership is the household’s views about the future economy. A household’s opinion about the economy may guide its investment allocation. If it believes that the economy will behave poorly, it would be less likely to
invest in risky assets. The SCF asks a question about the respondent’s beliefs about the economy’s movement over the next five years. Their opinion could be expressed as the economy being better, worse, or unchanged. Indicator variables will be created with the variable equal to one for the appropriate opinion stated by the household, zero if otherwise.

There are other factors that may also be important in understanding racial differences in risky asset ownership, but these factors cannot be adequately measured in a cross-sectional data set. As pointed out in the Afrocentric literature, the impact of a history of discrimination and different cultures are important in understanding differences between Blacks and Whites. These factors might include discrimination in the labor force or financial services industry. Discrimination in the labor force affects the investment choice because it may increase the uncertainty of future cash flows. The greater the uncertainty, the less risk one may be willing to assume since the investor may have reduced ability to recover losses. The indicator variable of racial status should capture these race-specific external forces that are not controlled for in the model. If the coefficient for this variable is significant, it might be related to effects of discrimination or culture that may not be possible to identify. Information related to the well-being of relatives may also be useful; especially information regarding older generations and any influence discrimination may have played in their lives. Issues such as the wealth of the parents and the financial socialization that the household head would have experienced also cannot be measured using this data. The interpretation of this variable is best described as an indicator of any race-specific factor that is not controlled for in the empirical model that could be related to discrimination.
4.4 Procedures

4.4.1 Descriptive and Multivariate Analysis

There are several phases to this analysis. The first step in the analysis will be to determine racial differences in measures of central tendency for the demographic, financial, and perceptual factors in the model. The descriptive analyses will be weighted using a scaled weight variable. Additionally the repeated imputation inference procedure is implemented to account for imputation error. In order to test for differences in specific household characteristics between Blacks and Whites, T-tests will be used for the continuous variables and Chi-Square tests will be used for the categorical variables to determine significant racial differences in the factors. The T-tests will use the means and standard deviations obtained from the RII procedure output. The Chi-Square tests for sample differences will be conducted using data pooled from all five implicates to account for any differences between them. The consequence to using data pooled from the five implices is that the sample size is inflated. Multiplying the scale for the weight variable by five adjusts for the increased sample size resulting from the pooling of the data.

The dependent variables for the OLS regressions are the proportion of net worth invested in risky assets and the proportion of total wealth invested in risky assets. One concern for the OLS regressions is that there will be a large number of households with no risky assets and therefore ratios equal to zero. If a large number of observations have zero risky assets, then there is a possibility that the coefficients in an OLS regression
procedure will be pulled down in order to minimize the squared residuals (Kennedy, 1997). This complication introduces self-selection bias into the results since the proportion of wealth invested in risky assets can only be measured when the household owns risky assets. There are several approaches for dealing with this issue. One possible approach is to limit the sample to those observations with nonzero values without making an adjustment for self-selection. This approach would overstate the true coefficients. There are several procedures that can be considered to correct for this bias. Two of the most commonly used are the Heckman (1974; 1976) correction and the Tobit procedure. Both of these procedures introduce an adjustment for having a truncated or censored dependent variable, which will then compensate for the self-selection bias. One advantage of the Tobit procedure is that the whole sample may be included in the procedure while the Heckman correction will only use the sub-sample of risky asset owners. Heckman's procedure is preferred here because it allows for both the likelihood and the level of ownership to be modeled separately; in addition, it allows the factors affecting both ownership likelihood and ownership level to be different (Heckman, 1974; 1976; Kennedy, 1997). James Heckman (1974) used this procedure to estimate wage rates and shadow wage rates for women because he wanted to be able to predict these rates for working and non-working women. However, there were no observable wage rates for non-working women. The two-step procedure Heckman used was to first determine the probability that the women earned wages and second, use this information to predict wage rates. The specific advantage in using the Heckman procedure for this study is that the best model can be chosen for the likelihood of ownership and the ownership level. This makes it possible for the interaction model to be best for one step if
not for both. This is similar to the approach taken in Bertaut and Starr-McCluer (2000) who showed that the determinants of risky asset ownership and the determinants of the amount invested in risky assets were not entirely the same. They showed this by comparing the results from a Heckman (1974; 1976) procedure to the results from a Tobit.

The first step of this multivariate analysis is to estimate the likelihood function using a Probit model. The likelihood of owning risky assets—which can be obtained from the results of the Probit procedure—is used to estimate $\lambda$, which is equal to $\phi/\Phi$ the inverse mills ratio or the ratio of the univariate normal density function to the cumulative probability density function. Lambda is calculated using the cumulative probability estimate and the $X\beta$ output from the Probit procedure placed into the formula described by Heckman (1974) in the Appendix which using SAS notation is:

$$\lambda = \frac{\phi}{\Phi} = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{(X\beta)^2}{2}\right) / \text{cumulative probability density function} \quad (4.7)$$

Lambda will be included as an explanatory variable in both OLS regression procedures to estimate the proportion of risky assets to wealth for the two measures of wealth. The inclusion of Lambda corrects the self-selection bias that exists in estimating this ratio using only the sub-sample of households that own risky assets. As mentioned earlier, the RII procedure cannot be used with a Probit estimated using the SAS software system; data for the Probit will be pooled from all five implicates to improve the estimated coefficients and tests of significance. As stated previously, the standard errors
for the coefficients obtained in the Probit procedure are multiplied by the square root of five to correct for the exaggerated sample size.

4.4.2 Hypotheses Testing

In Chapter 3, some hypotheses were stated based on findings from previous studies and the theoretical framework that was discussed. The testing of the hypotheses will be explained in this section.

The first null hypothesis is that there are no racial differences in the relationships of the determinants of risky asset ownership. The alternative hypothesis is that allowing the impact of the independent variables on risky asset ownership to exhibit racial differences best identifies the determinants of risky asset ownership and the proportion of wealth invested in risky assets. In other words, the racial differences in the determinants of risky asset ownership should be better explained by considering the racial differences in the explanatory factors than by only considering an indicator of race as the factor for difference. The test for this hypothesis will compare a model with racial interaction terms to a reduced model with only a race indicator variable.

Jackson and Lindley (1989) outline a procedure for decomposing any statistical difference to more accurately understand the nature of the between-group differences. To carry out the decomposition, two additional models are estimated: a reduced model that omits the indicator variable and the set of interaction variables, and an intermediate model that includes the indicator variable but omits the interaction variables. The interaction model and the reduced model are compared using a Rau’s F-test to determine
the joint significance of the indicator variable for race and the set of racial interaction
variables. If this joint test is significant, then Jackson and Lindley (1989) outline a
procedure for decomposing the total between-group difference into three components: the
constant effect, the endowment effect, and the coefficient or response effect. The
endowment effect is the portion of the total difference accounted for by differences
between the two groups in the level of the explanatory variables. The constant effect is
the portion of the total difference that cannot be accounted for by differential
endowments or differential responses. The coefficient or response effect is a measure of
the difference between the two groups in the response of the dependent variable to
changes in the independent variables. The interaction model and the intermediate model
are compared to determine if there is a significant coefficient effect. Gujarati (1995)
describes this as testing the full versus the reduced model and uses a Rau’s F-test. The
test for specific coefficient effects will be utilized with the third through sixth hypotheses.

This procedure will be slightly different for the Probit and the OLS regression. An
interaction model and reduced model with only an intercept will be estimated for the
Probit. A likelihood ratio will be calculated in order to compare the two Probits. The
likelihood ratio test is the appropriate test for comparing two Probits and is equivalent to
the Rau’s F-test. The likelihood ratio test statistic for comparing full and reduced models
is computed by $2*(LLF-LLR)$, and LLF and LLR are the log likelihood for the full and
reduced models. The OLS procedure will use the Rau’s F-test described by Jackson and
Lindley (1989) and Gujarati (1995) to test the full and reduced models.

The second through fifth hypotheses are designed to test the interaction models of
the regression using the Rau’s F-test, which compares full and reduced models. These

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hypotheses test the improvement of adding any one of the four categories of variables: demographic, human capital, financial, and expectations. The full models will include all of the racial interaction variables. The reduced model will then have all variables except the ones being tested. If the Rau's F-test allows us to keep the tested variables in the model, then the hypothesis is accepted. This procedure will then test for specific coefficient effects. If the interaction regression model is not significant, then the main effects for each factor will still be discussed.

The sixth null hypothesis is that there are not racial differences in the likelihood of risky asset ownership that explain some of the racial differences in the proportion of total wealth invested in risky assets. The test for this hypothesis will involve the coefficient for the interaction term between race and Lambda. If this interaction term is significant, this suggests a racial difference in the relationship between the likelihood of ownership and the proportion of risky assets to wealth. Further, if Lambda is significant and race is not, then there may not be a racial difference in the proportion of wealth invested in risky assets when controlling for racial differences in the determinants of risky asset ownership.

The seventh and final hypothesis is that there are race-specific external forces that influence relative risk aversion. This is the same idea represented in the procedure outlined by Jackson and Lindley (1989). The estimated parameter on the race indicator variable in the interaction model is used to determine if there is a significant constant effect. A significant constant effect, shown by a significant t value on the interaction term for Lambda, provides evidence of racial differences in the proportion of wealth invested in risky assets beyond those factors controlled for in the model. If there is a
significant constant effect, then the seventh hypothesis will be accepted. If there are race
specific external factors, then there may be a racial difference in relative risk aversion
and hence a racial difference in the demand for risky assets as a result of discrimination
and historical influence. This same procedure is relevant to the Wald test for the racial
indicator in the Probit model.

The results from both descriptive and multivariate analyses will be presented and
discussed in the next chapter. The results for both the Probit and OLS regression will be
discussed to provide a clear picture of the likelihood of risky asset ownership and the
proportion of wealth invested in risky assets and any racial differences in the
determinants of either.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Variables</strong></td>
<td></td>
</tr>
<tr>
<td>Age of respondent (reference category: respondent 35-44)</td>
<td></td>
</tr>
<tr>
<td>Age 1</td>
<td>=1 if respondent &lt; 35</td>
</tr>
<tr>
<td>Age 3</td>
<td>=1 if respondent 45-55</td>
</tr>
<tr>
<td>Age 4</td>
<td>=1 if respondent &gt; 60</td>
</tr>
<tr>
<td>Household type (reference category: married couple)</td>
<td></td>
</tr>
<tr>
<td>Unmarried male</td>
<td>=1 if householder is unmarried male, 0 otherwise</td>
</tr>
<tr>
<td>Unmarried female</td>
<td>=1 if householder is unmarried female, 0 otherwise</td>
</tr>
<tr>
<td># Dependents</td>
<td>Continuous measure of the number of dependents in the household (not including spouse or partner)</td>
</tr>
<tr>
<td>Race</td>
<td>Indicator =1 if the respondent is Black or African-American</td>
</tr>
<tr>
<td>Education (reference category: college graduate)</td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>=1 if years of education &lt; 12, 0 otherwise</td>
</tr>
<tr>
<td>High school</td>
<td>=1 if years of education = 12, 0 otherwise</td>
</tr>
<tr>
<td>Some college</td>
<td>=1 if years of education &gt; 12 and &lt; 16, 0 otherwise</td>
</tr>
<tr>
<td><strong>Financial Variables</strong></td>
<td></td>
</tr>
<tr>
<td>Human Wealth</td>
<td>= Sum of Expected SS, DB, income, business income, etc.</td>
</tr>
<tr>
<td>Received inheritance</td>
<td>=1 if household has received an inheritance, 0 otherwise</td>
</tr>
<tr>
<td>Expects future</td>
<td>=1 if household expects future inheritance, 0 otherwise</td>
</tr>
<tr>
<td>1 month liquidity</td>
<td>=1 if liquid assets divided by monthly income is &gt;1</td>
</tr>
<tr>
<td>6 month liquidity</td>
<td>=1 if financial assets divided by 6 months income is &gt;1</td>
</tr>
<tr>
<td>Expectations:</td>
<td></td>
</tr>
<tr>
<td>Willingness to take investment risk</td>
<td>=1 if respondent is willing to have some risk on investments</td>
</tr>
<tr>
<td>Positive economic outlook</td>
<td>=1 if household expects economy to improve over next 5 years, 0 otherwise</td>
</tr>
<tr>
<td>Negative economic outlook</td>
<td>=1 if household expects economy to do worse over next 5 years, 0 otherwise</td>
</tr>
<tr>
<td>Felt discouraged with credit</td>
<td>=1 if household reported previously feeling discouraged when applying for credit, 0 otherwise</td>
</tr>
<tr>
<td>Investment horizon</td>
<td>=1 if investment horizon is greater than 5 years</td>
</tr>
</tbody>
</table>

Table 4.1

Description of the Variables
Chapter 5

Results and Discussion

5.1 Overview

Chapter 5 provides a description of the variables used in the empirical analysis, including household demographic characteristics, financial characteristics, and expectations. Chapter 5 also describes the empirical procedures used to test the hypotheses for this study. In order to identify the relationships of the factors with relative risk aversion, a two-step regression using the Heckman (1974; 1976) procedure will be used. The first step involves estimating a Probit whose dependent variable is a dichotomous indicator of whether the household’s ratio of risky assets to wealth is greater than zero. The results from this procedure are used to estimate $\lambda$, which is the Heckman estimate for self-selection of owning risky assets. This variable is included as an explanatory variable in the OLS regression. The two dependent variables for the OLS regressions are the household’s ratio of risky assets to wealth where wealth is defined first as net worth and second as the sum of net worth and human wealth. This chapter will focus on the results of the empirical analysis. The first section of the chapter will describe the sample used for this study and provide descriptive statistics for all variables.
used in the Probit analysis. The descriptive statistics have been weighted to account for
the over sampling of wealthy households by the SCF. The means were obtained using
the Repeated Imputation Inference procedure that, as explained in Chapter 4, is used to
account for the imputation error that occurs from multiple imputation of missing values.
The next section of this chapter will then discuss the results from the Probit, including the
testing of the interaction model. The third section of this chapter will present the
descriptive statistics for the sub-sample that owns risky assets and is used in the second
stage of the Heckman (1974; 1976) procedure. The multivariate analyses are not
weighted because of the possible endogeneity of the weight variable with other variables
controlled for in the model. The fourth and fifth sections of this chapter will report the
results of the OLS regression estimated for the proportion of risky assets held to net
worth and the proportion of risky assets held to total wealth. The results from each
regression set are presented separately and then discussed together in the last section as
the results of the hypotheses tests are presented.

5.2 Descriptive Analysis and Sample Composition

The sample for this study consists of 2938 households who have either a Black or
White household head who is between the ages of 30 to 70. Of the 2938 households, 298
(10%) households are classified as Black households and the remaining 2640 (90%)
households are classified as White. As expected, there are numerous differences in
household characteristics between the Black and White households. The next sections
will describe the demographic, financial, educational, and expectations/attitudinal characteristics of the households in the sample.

5.2.1 Demographic Profile of Samples

The household composition in the sample is very different between Blacks and Whites, as would be expected. A smaller proportion of the Blacks are married compared to the Whites (Table 5.1). Almost 61% of the White households are married while only 30% of the Black households are married. The largest household type for the Black households is a non-married female-headed household, which comprises 46% of the Black sample. In comparison, only 20% of the White sample consists of non-married female-headed households. Additionally, a higher proportion of the Black households in the sample, 24%, are non-married male-headed households compared with 19% of the White households in the sample. While there is not a significant difference in age between Blacks and Whites, Blacks in the sample are somewhat younger than the Whites (Table 5.1). A higher proportion of Blacks than Whites are under the age of 44. Of the Black sample, 14% are under 35 years old compared with 12% of the White sample. Also, 37% of the Black sample is between 35 and 44 years old compared with 32% of the White sample. A higher proportion of Whites are over the age of 45. More Whites, 38%, are between 45 and 60, leaving 19% of the White sample over the age of 60. This is compared with 34% of the Black sample being aged between 45 and 60, and 16% of Blacks being aged over 60 years old.

The Whites in the sample tended to have higher educational attainment than the
Blacks (Table 5.1). A higher proportion of the Blacks (26%) than the Whites (12%) had not graduated high school. A higher proportion of Blacks (32%) than Whites (29%) had only a high school education. The proportion of Whites who had some college education was 25% and the proportion of Blacks who had some college was 24%. Almost double the proportion of Whites (34%) as Blacks (18%) have at least an undergraduate degree.

5.2.2 Human Wealth of the Sample

The lower educational attainment of Blacks is one explanation for the difference in human wealth between White and Black households. Another possible related issue is the higher proportion of Black households compared to White households that are not married. Whites had higher levels of all components of human wealth except for the estimation of poverty thresholds for income (Figure 5.1). Only 1% of White households had no values for the human wealth variables measured in this research, compared to 6% of the individual amounts can be seen in Table 5.2. While Whites tended to have higher income in every category, perhaps the most significant difference is that total household human wealth for the Whites in the sample is $619,368 while the total human wealth for the Black households is only $341,369 on average. This is consistent with the expectations established in Chapter 3, namely, that Blacks are at disadvantage to Whites when comparing human wealth because of a history of lower human capital attainment and possible discrimination in the labor force. One concern is the lower amounts of defined benefit and Social Security retirement benefits expected for Blacks because this may mean that Blacks may have fewer resources in retirement than Whites. Overall,
Blacks in the sample had lower human wealth than Whites. Having a lower human wealth makes investing even more important for Blacks as a resource for future consumption. However, since they have lower human wealth, Blacks have less capital to invest.

![Graph showing present value of human wealth components by race]

**Figure 5.1**
Present Value of Human Wealth Components by Race; Data from the 1998 Survey of Consumer Finances

5.2.3 Non-Human Wealth

There are significant racial differences in wealth and the ownership of risky assets (Table 5.3). The White households in the sample had a net worth of $376,648, which is
much higher than the average net worth of Blacks in the sample ($76,257). When summing net worth and human wealth into total household wealth, the racial difference in household wealth is even more pronounced because Whites have higher net worth and higher human wealth than Blacks (Figure 5.2). Having lower human wealth means that Blacks may have less lifetime resources that can be allocated across time than Whites. Having fewer resources over time means that, on average, Blacks are able to consume less than Whites without taking on debt. As a group, Blacks also have much lower net worth than Whites. The lower wealth and income may limit the amount of investment advice and information they receive.

Having less financial wealth is likely to make ownership of risky assets that are less liquid more challenging for Blacks. A much higher proportion of the Whites than the Blacks in the sample own some amount of stocks, stock mutual funds, stocks in defined contribution plans, combination mutual funds, or business assets. Over 52% of the Whites in the sample have some level of any of these risky assets while less than 23% of the Blacks in the sample own risky assets (Table 5.3). The mean ownership levels of each individual asset type also show Whites owning larger amounts of each of the types of risky assets. The Whites own $41,154 in individual stock shares on average, which is almost thirteen times higher than the amount owned by the Blacks ($3,222). Similarly, the Whites own $16,056 worth of stock mutual funds on average and the Blacks show significantly less ownership at an average of $1,341 (Table 5.3). Although there is a significant difference between Black and White ownership of combination mutual funds, this difference is less severe than the other two. Ownership of combination mutual funds for the Whites on average is $1,422 compared to $773 owned on average by the Blacks.
The average difference in the amount of stocks held in defined contribution accounts is also very different between the Blacks and Whites in the sample. The mean amount of equity held in defined contribution accounts is $12,421 for the Whites and $3,277 for the Blacks. The last type of risky asset for this study also shows that the mean amount of business assets for the Whites is much higher than the mean amount of business assets for the Blacks, $85,704 and $4,184 respectively (Table 5.3).

In the sample, the Whites had more intergenerational wealth transfers than the Blacks. A greater percentage of the Whites have received an inheritance (23%) or expect an inheritance (16%) compared to the percentage of Blacks who have received an inheritance (10%) or expect an inheritance (2%). The lower prevalence of intergenerational wealth transfers for Blacks is indicative of their lower wealth throughout history and represents another financial disadvantage of Blacks compared to Whites (Darity, 1999) in addition to lower human wealth and lower household net worth.

In the sample, fewer Blacks than Whites met either of the liquidity indicators (Table 5.3). The first measure was the ratio of monetary assets to one month's income; 30% of Blacks and 38% of Whites met this indicator of precautionary savings. The second indicator—the sum of all financial assets divided by six months' income—still showed Blacks at a disadvantage in meeting this criteria. As mentioned earlier, households not meeting these indicators of precautionary savings are less likely to have substantial holdings of less liquid risky assets such as stocks.
5.2.4 Expectations and Preferences

One of the major ideas discussed in Chapter 3 is that Blacks and Whites behave differently, not just because of differences in their household characteristics, but also because of differences in perceptions, values, and preferences. There is some evidence to
support some of these ideas in comparing Black and White expectations and preferences in the sample. More Blacks in the sample have a shorter time horizon than Whites. More specifically, 27% of the Blacks replied that their most important planning period was more than five years away compared to 47% of the Whites.

As mentioned in Chapter 3, Blacks have a more myopic consumption preference or preference for liquidity. The higher level of uncertainty Blacks face about their future may cause Blacks to be more concerned with the present, to maintain precautionary savings, and to accumulate items like durable goods that can be consumed over time. This may mean that Blacks have a higher desired level of precautionary savings or current spending goals to be met. It could also mean that Blacks prefer tangible assets to financial ones. Loury (1998) presented results of a recent Yankelovich Survey in which high income Blacks preferred real estate investments, whereas Whites preferred stocks.

There are significant racial differences in the measure of economic outlook (Table 5.4). A higher proportion of Blacks (39%) have a positive economic outlook compared to Whites (20%). Over half of the Whites in the sample (52%) feel that the economy is not going to change, while only 36% of the Blacks had a neutral economic outlook (Table 5.4). A larger proportion of Whites (27%) than Blacks (25%) has a negative economic outlook. However, it is not clear how the respondents defined the term "economy". To some, it may refer to the labor market and to others this may be equated with the stock market. Another issue from Chapter 3 is that it is unclear if Blacks and Whites have the same ideas about how a positive or negative economy would affect their financial well-being in terms of severity. This is because throughout history changes in the economy have been more severe on the economic well-being of Blacks who faced economic
discrimination along with economic downturns (Williams, 1999).

Another issue that is related to risky asset ownership is the household's understanding of the nature of investment risk. Although more than half of the Blacks and Whites in the sample say that they are willing to take some investment risk, the actual proportion of Whites (70%) who would take investment risk is significantly larger than the proportion of Blacks (54%). However, as pointed out earlier, only 23% of the Blacks actually own risky assets versus 52% of the Whites, which shows that some of each group who say that they are willing to take on investment risk are not doing so as defined by this study. Table 5.5 shows a closer examination of whether households who report themselves as willing to take risks are actually being consistent by owning risky assets. Results of the comparison show that those who are willing to take investment risk are more likely to do so (Table 5.5 Panel A). However, 36% of the combined sample is inconsistent in their behavior. There is also a racial difference in the consistency indicator. A higher proportion of the Blacks (46%) than the Whites (34%) in the sample are inconsistent in their willingness to accept investment risk and ownership of risky assets (Table 5.5). It is possible that some Blacks who are willing to assume risk are unable to do so because they lack sufficient capital, face discrimination in financial services, or possibly have greater uncertainty about their human capital.

5.2.5 Proportion of Wealth Invested in Risky Assets

As would be expected from the previous discussion of risky asset ownership, Blacks have a lower proportion of risky assets to net worth and total wealth than Whites
This is also the case for the proportion of risky assets to total wealth. The mean proportion of risky assets to net worth for Blacks is 0.08 while for Whites the mean proportion of risky assets to net worth is 0.18 (Table 5.3). The racial difference in the proportion of risky assets to total wealth is even more pronounced than in the first measure. The mean proportion of risky assets to total wealth is 0.01 for Blacks and 0.06 for Whites (Table 5.3). However, the racial difference as seen in these results may be less of an issue once other factors are controlled for in the multivariate analysis. Further, when controlling for the self-selection of owning risky assets, the racial differences in these proportions may also become less severe. The multivariate procedures will help to isolate the impact of racial differences in the factors related to the risky asset ownership. These results are discussed in the next section.

5.3 Results of the Multivariate Analyses

5.3.1 Probit Procedure

The results for both the full Probit model and reduced Probit model are reported in Table 5.6. Using a likelihood ratio test, the full model with racial interaction terms was tested against the reduced model with only a race intercept term. The likelihood ratio test statistic is significant at an alpha of 0.005 (Table 5.6). The significant likelihood ratio test means that the reduced model with only an intercept term is rejected in favor of the full model with racial interaction terms. Therefore, the model that best explains the likelihood of owning risky assets is the one that allows the response of the dependent
variable to changes in the explanatory variables to be different for Blacks and Whites.
The results for individual factors will be discussed next by focusing on those factors that are significant at an alpha of 0.05 or less.

None of the indicators for age were significant for either subgroup, which could be attributable to human wealth being included in the model, since human wealth for households is generally decreasing with age and is also positively related to risky asset ownership. The reference category for age is the group between the ages of 35 and 45. This is inconsistent with previous studies that found a significant relationship between risky asset ownership and age. However, several of these studies used annual income or a transformation of annual income as a proxy for human wealth (Bertaut & Starr-McCluer, 2000). The insignificance of age in this model is interpreted such that there is no age cohort effect on the likelihood of owning risky assets when controlling for human wealth and other characteristics.

The two indicators tested for marital status and gender are unmarried male and unmarried female households compared to married couple households. While there are no significant racial differences in the relationship of marital status to risky asset ownership, marital status is significantly related to risky asset ownership. Unmarried females are less likely than married couples to own risky assets, and the relationship of being an unmarried male is not significantly different than being married (Table 5.6). However, when controlling for other factors, the fact that married couples are more likely to own risky assets than unmarried females is not surprising and is in line with Wang and Hanna’s (1997) findings that married couples were more likely to have a greater proportion of wealth invested in risky assets. Additionally, some of the previous
literature (Baker & Haslem, 1974; Bajtelsmit & VenDerhei, 1997) on investment choice has found that women tend to be more risk averse than otherwise similar men and married couples.

The number of dependents is not significantly related to the likelihood of risky asset ownership. However, other indicators of financial well-being are also included and were significant. Although the Afrocentric worldview suggests that children may influence family resources differently for Blacks and Whites, perhaps when controlling for resources and marital status, the number of dependents is not significantly related to the decision to own risky assets.

The positive relationship of educational attainment on the likelihood of risky asset ownership is consistent with findings by Wang and Hanna (1997) that those who are more educated tend to have higher risk tolerance. Similarly, Zhong and Xiao (1995) found that education is positively related to the amount a household has invested in stocks. Additionally, more educated individuals may be more likely to have jobs that offer defined contribution plans that can provide a means to invest in stocks via mutual funds. Since human wealth is controlled for, the relationship between education and risk aversion is likely related to the increased ability of those who are more educated to analyze market information, and perhaps the household’s understanding of investment fundamentals.

There is a racial difference in the relationship between human wealth and risky asset ownership. Human wealth increases are positively related to the likelihood of risky asset ownership but the relationship is stronger for Blacks, which might mean that Blacks with higher human wealth are more risk tolerant than Whites with higher human wealth.
Human wealth represents the present value of the household’s future expected cash flows. Households with greater human wealth are likely to feel more comfortable allocating some wealth to risky assets. One rationale is that any losses could be made up with future income. The indicators for received and expected inheritances are not significantly related to the likelihood of risky asset ownership. Households of both races with financial assets greater than six months’ income are more likely to own risky assets. While Blacks are less likely to meet this threshold than Whites, the effect of not meeting this standard should discourage Blacks and Whites from investing in illiquid investments.

There are also racial differences in the variables accounting for household expectations. First, different economic views are not significantly related to the likelihood of risky asset ownership for Whites. However, Blacks with a negative economic outlook are less likely than others to hold risky assets (Table 5.6). Anyone with a negative economic view may prefer more liquid and safe investments, but Blacks may feel more concern than Whites because they are less likely to meet this threshold and more likely to face hardship in a worsening economy (Darity, 1999).

Households that reported a willingness to take investment risk are more likely to own risky assets than those who did not (Table 5.6). This is consistent with King and Leape’s (1998) findings that an increased willingness to take investment risk is related to risky asset ownership. However, it should be noted that the interaction term between being Black and displaying willingness to take investment risk is not considered significant since the p-value for the Wald test on this coefficient was 0.053. Had this variable been considered significant, it would mean that Blacks who are willing to take risks are less likely to own risky assets than otherwise similar Whites who are willing to
take risks.

The estimate of Lambda will be based on the interaction model because of the significant likelihood ratio test (Table 5.6). Lambda is included as an explanatory variable in all of the OLS procedures, and interaction terms for Lambda will be included in the full models estimated for both measures of relative risk aversion.

5.3.2 Description of Regression Sub-Sample

There are fewer significant differences between Black and White household characteristics in the sub-sample of risky asset owners. However, there are significant differences in each of the categories of household characteristics. The sample statistics can be found in Table 5.7.

The Black households in the sample who own risky assets tend to be younger than the White households. The largest age group for the Blacks who own risky assets are 35-44 while the age cohort that represents the largest percent of Whites owning risky assets is the group 45-60 years old (Table 5.7). However, the majority of the sub-sample in both racial groups is between 35-60.

The household composition of Blacks and Whites who are risky asset owners differs from the whole sample. The majority of Blacks and Whites in the sub-sample are married (Table 5.7), although more White households are married than Black households. As expected, a greater proportion of unmarried Black households are headed by unmarried females compared to the proportion of unmarried White household headed by unmarried females. Blacks in the sub-sample have a higher number of dependents in
their households than do Whites in the sub-sample (Table 5.7). Taken together with the fact that Blacks in the sub-sample are less likely to be married, this may mean that Blacks in the sub-sample have less of a surplus available after taxes and expenses than Whites do.

There are also significant differences in the amount of formal education between the Blacks and the Whites in the sub-sample. A small percentage of those who own risky assets (7%) did not complete high school, and there is no significant difference between the proportion of Blacks and Whites who have not completed high school. However, while 38% of the Blacks who own risky assets discontinued their education after high school, this is true for only 25% of the Whites in the sub-sample (Table 5.7). Approximately one quarter of the sub-sample (both Blacks and Whites) had some college education but less than four years (Table 5.7). A large percentage of Whites (44%) in the sub-sample have completed at least four years of college, while about one quarter of the Blacks in the sub-sample had obtained at least four years of college.

There is not a significant difference in the human wealth calculated for Blacks and Whites in the sub-sample. There are significant differences in two of the components of risky assets. The mean stock holding for Blacks is $14,207, which is significantly less than the mean stock holding for Whites, which is $78,910 (Table 5.7). Additionally, Blacks held a significantly lower amount of stock mutual funds than Whites did. The mean holding of stock mutual funds for Blacks in the sub-sample is $5,918 and for Whites it is $30,787 (Table 5.7). However, there is not a significant difference between Blacks and Whites in the sub-sample in terms of their holdings of stocks in defined contribution funds and combination mutual funds. The average for stock holdings in

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defined contribution accounts in the sub-sample is $23,215 and the average value of combination mutual funds held is $2,771. On the other hand, there is a significant racial difference in the value of business assets owned. The mean value for business assets is $164,347 for Whites and only $18,259 for Blacks. A significantly larger proportion of the Whites in the sub-sample meet the one-month emergency fund measure (Table 5.7).

The sum of these stock and business assets represents the numerator for both measures of relative risk aversion. In three of the five components of the risky assets measure, mean asset values for Whites are significantly higher than mean asset values for Blacks in the sub-sample.

There are significant racial differences in the households that have received or expect to receive intergenerational wealth transfers. A much higher percentage of Whites (29%) have received an inheritance compared with only 5% of Black households in the sample. The difference between Blacks and Whites is even larger for the proportion of each expecting an inheritance. While only 3% of the Black households expect an inheritance at some point, 21% of White household expect an inheritance. The composition of an expected inheritance is not in the SCF public use data set; however, if the household knows the composition, it may affect their choices. For example, a household may choose to invest their own resources conservatively if they expect to inherit a business or other risky asset like stocks. However, the expectation may also encourage households to assume more risk since they would be able to use the inheritance to make up for losses.

There are significant racial differences in the measures of household expectations and preferences. First, a higher proportion of the Whites than the Blacks in the sub-
sample report a willingness to take investment risks (Table 5.7). However, given that everyone in the sample owns some level of risky assets, those who are unwilling to take risks may not believe or consider the assets they hold to be risky. Additionally, they may have interpreted the question differently. This is consistent with the earlier finding that Blacks are more inconsistent than Whites in their reported risk tolerance and observed behavior regarding risky asset ownership.

A larger proportion of the Whites than the Blacks in the sub-sample have a planning horizon of five years or more; the difference in proportions is almost 20 percentage points. This is consistent with ideas presented in Chapter 3 that Blacks have more myopic consumption preferences compared to Whites.

One concern in the sample is that 28% of the Blacks expressed feelings of discouragement about credit use in recent history compared with 9% of Whites. This may be an indicator that Blacks in the sub-sample have had more financial problems in recent history such as excessive debt, bad credit, low net worth, etc. which would make them feel that they would be rejected by creditors. This may also include discouragement as a result of known or perceived discrimination in recent attempts for access to credit.

One curious difference from the whole sample used in the Probit is the economic outlook of Blacks and Whites who own risky assets. A larger proportion of the Blacks in the sub-sample have a positive economic outlook compared to the Whites in the sub-sample. Whites who own risky assets are more likely to have negative economic outlooks than Blacks. While a higher proportion of Whites in the sub-sample have a neutral economic outlook, close to half of each group has a neutral economic outlook (Table 5.7). The most intriguing difference is that while fewer Blacks in the whole
sample had a positive economic outlook (Table 5.4), those who own risky assets are more likely to be optimistic (Table 5.7).

In the sub-sample of risky asset owners, the Whites have a lower proportion of net worth invested in risky assets than the Blacks do, however there is not a significant difference. The mean proportion of net worth invested in risky assets for Blacks is 0.36 compared to 0.34 for Whites in the sub-sample. However, the Whites have a higher proportion of total wealth invested in risky assets than the Blacks. The mean proportion of total wealth invested in risky assets for Blacks is 0.05 compared to 0.12 for Whites in the sub-sample. The racial differences will be further examined in the results from the OLS regressions.

5.3.3 Proportion of Net Worth Invested in Risky Assets

The results of the OLS regression of the proportion of net worth invested in risky assets show that the best model after controlling for the likelihood of ownership is the reduced model without a race intercept term. This is determined by comparing the sum of the squared residuals (SSR) from the reduced model with the SSR from the intermediate model and those from the full model (Table 5.10). The test determines whether or not the addition of a variable or group of variables better explains the response of the dependent variable. The F-test was done separately for each of the five implicates. Additionally, the intercept term in the intermediate model is not significant, therefore indicating that when controlling for possible self-selection of risky asset ownership, race is not significantly related to the proportion of net worth invested in risky
assets. There are factors from several of the categories in the reduced model that are significantly related to the proportion of net worth invested in risky assets; each category of variables will be discussed.

Several of the demographic characteristics are significantly related to the proportion of net worth invested in risky assets when controlling other factors in the reduced OLS model. Although age is included in the model to account for a cohort effect, its relationship to human wealth may confound the cohort effect. The indicators for marital status and gender are intended to control for the gender of an unmarried decision-maker versus a joint decision between spouses. When controlling for other factors, unmarried women have a lower proportion of net worth invested in risky assets than other household types (Table 5.8). This is consistent with findings from Baker and Haslem (1974) and Bajtelsmit and VenDerhei (1997) who found that after controlling for other factors, women tend to be more conservative investors than men. Although the coefficient for being an unmarried male is not considered significant, it should be noted that it is positive, which if significant could indicate that unmarried men have a lower proportion of net worth invested in risky assets than married couples.

The level of formal education attained is related to the proportion of net wealth held in risky assets. The indicator for having less than a high school education is not significant but it should be noted that the sign of the coefficient is negative, which is consistent with expectations. Having completed high school only is negatively related to the proportion of net worth allocated to risky assets when compared to those who have completed a college education or beyond. When controlling for other factors like human wealth, the indicator for the respondent having completed less than four years of college
is also negatively related to the proportion of net worth allocated to risky assets when compared to those who have completed a college education or beyond (Table 5.8). The proportion of net worth allocated to risky assets increases with higher levels of educational attainment, indicating that those who are more educated have a larger proportion of net worth invested in risky assets. This may be because increased educational attainment represents an increased understanding of investments. Another possibility is that those who are more educated may be more likely to be exposed to information regarding investments through acquaintances or through personal research skills.

Human wealth is positively related to the proportion of net worth invested in risky assets (Table 5.8). This seems reasonable since those with greater human wealth may be more comfortable owning risky assets because any losses on the investments can be made up with future income. This finding is consistent with Kreinin (1959) and Ramaswami, Srivastava, & McInish (1992) who found higher income to be positively related to increased stock ownership. Even though their findings are related to annual income, the same relationship would be expected with human wealth, as it is merely a function of current and future income.

The indicators for the economic outlook of the respondent are not significantly related to the proportion of net worth invested in risky assets (Table 5.8). Neither is the indicator for whether or not the respondent reported a planning horizon of five years or more. While some of these variables are significantly related to the likelihood of owning risky assets, they are not significantly related to the proportion of net worth invested in risky assets. The indicator for willingness to take investment risk is not significantly
related to the proportion of net worth invested in risky assets. Although the willingness to take investment risk is related to the likelihood of owning risky assets, it is not related to the level of the investment when controlling for ownership of risky assets.

Households in which the respondent reports having felt discouraged about applying for credit have higher proportions of net worth held in risky assets than households who have not (Table 5.8). These households may have a large amount of debt, which would decrease their net worth; thus, risky assets may represent a larger proportion of net worth because of low net worth.

The estimator for self-selection, Lambda, (Heckman, 1974; 1976) is not significantly related to the proportion of net worth invested in risky assets. The lack of significance can be interpreted to mean that there is no self-selection bias in the OLS regression of the proportion of net worth invested in risky assets. It is possible that the determinants of risky asset ownership and the proportion of net worth invested in risky assets are similar so that Lambda does not significantly contribute to model for the determinants of the proportion of net worth invested in risky assets.

5.3.4 Proportion of Total Wealth Invested in Risky Assets

As seen in Table 5.10, the intermediate model is the best model for the proportion of total wealth, including human wealth, invested in risky assets. The F-test for the intermediate versus the reduced model is significant in three of the five implicates (Table 5.10). The F-test for the full model versus the reduced model is significant, but the F-test for the full model versus the intermediate model is not significant. Although the full
interaction model is significantly a better choice than the reduced model, it is not a significantly better choice than the intermediate model. One important distinction between this regression and the first one is that human wealth is not an explanatory variable because it is a component of the denominator in the dependent variable. While there are similar findings in this analysis compared to the first, there are several distinct differences.

Unlike the first procedure, there is a significant relationship between age and the proportion of total wealth invested in risky assets. Households that are older are more likely to have a larger proportion of total wealth allocated to risky assets. Generally, as households get older, their human wealth decreases. Lower human wealth would mean that the denominator in the dependent variable would be smaller, thus increasing the proportion of wealth that is comprised of risky assets but this is not the case. The idea that the proportion of total wealth invested in risky assets increases with age is consistent with findings by Wang and Hanna's (1997) findings that, after controlling for other factors, the proportion of net wealth invested in risky assets increases with age. That this result is not seen in the first model could be related to the fact that the model controls for human wealth, whose relationship with age may confound the cohort effect.

Unmarried men have a higher proportion of total wealth invested in risky assets as compared to married couples (Table 5.9). Unmarried men may allocate more wealth to risky assets than married couples because a spouse who may be more conservative may influence the investment decision for married couples. Additionally, unmarried males are likely to have less human wealth than married couples; and so the amount of risky assets held may not be different but rather the proportion of total wealth that the risky assets
make up will be larger for those with lower human wealth. However unmarried females are not significantly different than married couples, yet unmarried females should have less human wealth than married couples.

The results regarding the measure of education are consistent with results from the regression of the proportion of net worth invested in risky assets. In the first procedure, increasing education is associated with greater allocation of wealth to risky assets. In this model, those who have had some college education have a lower proportion of wealth invested in risky assets than those who have completed four years of college or higher education (Table 5.9). Although the indicators for those who have only completed high school and those who have not done so are not significant, it is interesting that compared to those with college or more, the proportion of wealth invested in risky assets increases with education. The increase in the proportion of total wealth with higher education may mean that those who are more educated have a better understanding or exposure to investment strategies and information.

One of the three measures of household financial characteristics is significantly related to the proportion of total wealth invested in risky assets. The indicators for whether or not the household has received an inheritance and whether or not they expect one are not significant. However the indicator for whether or not the household’s monetary assets exceed one month’s income is significantly related to the proportion of total wealth invested in risky assets. Households that meet this criterion tend to have a higher proportion of total wealth invested in risky assets, which may be because they have achieved what they consider to be a sufficient level of precautionary savings. Therefore, since they are prepared for short-term income shocks, the household should be
willing to invest more of their total wealth in risky assets that are less liquid in the short term.

Although most of the variables measuring household expectations are not significant, households with a positive economic outlook have a higher proportion of total wealth invested in risky assets than do households with a neutral economic outlook when controlling for other factors (Table 5.9). Those who have a positive economic outlook may hold more risky assets than others because the stock market or a business is likely to have the best returns when the economy is doing well.

The estimate of Lambda is significant and negatively related to the proportion of total wealth invested in risky assets. The significance of Lambda may indicate that there is self-selection bias in the OLS regression for the proportion of total wealth invested in risky assets. The negative sign for Lambda may be related to the fact that the OLS is run only for households that own risky assets. Without an adjustment for self-selection, coefficients estimated in a regression using the sub-sample might be biased upward. In the case of this OLS regression Lambda may be adjusting the regression equation downward to correct for selection bias. Although the full model is rejected for this analysis, it is interesting to note that the racial interaction term between Black and Lambda in the full model is significant. Had this model been significant when compared to the intermediate model, this term would be interpreted as further evidence that the racial difference in the proportion of total wealth invested in risky assets is related to racial differences in the determinants of the likelihood of owning risky assets.
5.3.5 Hypotheses Tests

The hypotheses will be discussed in the order that they were presented. Each hypothesis will be discussed as it is supported by the results of the multivariate procedures.

The first null hypothesis is that there are no racial differences in the relationships of the determinants of risky asset ownership. The alternative is that using separate models (interaction models) for Blacks and Whites would better explain differences in risky asset ownership. While the interaction models are not appropriate for the OLS regression procedures, the full model is appropriate for the Probit procedure (Table 5.6). Therefore, it might be said that the proportion of wealth allocated to risky assets is better explained by controlling for racial differences in the likelihood of owning risky assets. There is some evidence to support this in the regression for the proportion of total wealth invested in risky assets (Table 5.9). Although the intermediate model is considered appropriate for this dependent variable (Table 5.10), the full model is significantly different than the reduced model if not the intermediate model. The significant interaction term for Lambda in the full model for the proportion of total wealth invested in risky assets lend some support to the idea that racial differences in the allocation of wealth to risky assets are related to racial differences in the determinants of risky asset ownership.

The second null hypothesis cannot be rejected. Each hypothesis is designed to test specific household demographic for significance and possible racial differences in their relationships to risky asset ownership and the proportion of wealth invested in risky assets. There were no significant interaction terms for any of the household demographic
characteristics in the Probit that would indicate that there is not a racial difference in the relationship of these factors on risky asset ownership. There is not a significant age cohort relationship with risky asset ownership and the proportion of net worth invested in risky assets. However, there is a positive relationship between age and the proportion of total wealth invested in risky assets. There are no racial differences in the relationship between risky asset ownership and the gender of unmarried household heads and married couples. Marital status and the gender of unmarried household heads are significant to some extent in each of the models estimated. However, the coefficients for the race-demographic interaction terms are not significant. Married couples are more likely to own risky assets than unmarried females. In the first regression, unmarried females have a lower proportion of net worth invested in risky assets than married couples when controlling for other factors. In the second regression model, unmarried males have a lower a higher proportion of total wealth invested in risky assets than married couples. The variable for the number of dependents was not significant in either the model for owning risky assets or in either of the two OLS regression procedures.

Hypothesis three cannot be rejected since there are no significant interaction terms involving education. However the level of formal education is positively related to risky asset ownership as seen in the significant Wald tests done on the education coefficients (Table 5.6). Those who had not attended college were less likely to own risky assets. The coefficient for respondents who had completed some college was not significant in the Probit. There is also support that the proportion of wealth invested in risky assets increases with the level of formal education. In the first regression in which human wealth is controlled for, those with at least a college education had higher
proportions of net worth invested in risky assets than those with less education. In the second OLS model, those who had some college had lower proportions of total invested in risky assets than those with four years or more. The other two indicators of educational attainment were not significant in this model. However, the hypothesis that the level of education is positively related to risky asset ownership and the allocation of wealth to risky assets

The fourth null hypothesis is that there are no racial differences in the relationships between the financial characteristics of the investor and ownership of risky assets. There is supporting evidence in order to reject the null hypothesis. In the Probit model, the coefficient for the racial interaction and main effects for the household’s human wealth are both significant (Table 5.6). There is a stronger relationship between the likelihood of risky asset ownership and human wealth for Blacks than otherwise similar Whites. Further, higher human wealth is positively related to the proportion of net worth invested in risky assets. When controlling for other factors, the indicators for having received and expecting to receive an inheritance are not significantly related to the likelihood of owning risky assets nor are they related to the proportion of wealth invested in risky assets. There are no racial differences in the relationships of the other financial characteristics although there are significant main effects. There is significant evidence that meeting one month and/or six month guidelines for the household’s level of precautionary savings is related to risky asset ownership. These variables are both significant, and those households meeting the guidelines are more likely to own risky assets than those that do not. The indicator for meeting a one-month standard of precautionary savings was positively related to the proportion of net worth invested in
risky assets. This may mean that those with an emergency fund may feel more comfortable assuming risk because of the ability to smooth over short-term income shocks.

There is some evidence to support rejecting the fifth null hypothesis, that there are no racial differences in the relationship between risky asset ownership and household expectations. Although the indicator for having a negative economic view is not significantly related to risky asset ownership for Whites in the Probit, the racial interaction term is significant, which indicates that Blacks with a negative economic view are less likely to own risky assets. These indicator variables are not significant in the first regression; however, in the regression for the proportion of total wealth invested in risky assets, households with positive economic outlooks have a greater proportion of total wealth invested in risky assets than do households with a neutral economic outlook. The indicator for having a negative economic view is not significant in this regression. Households with horizons greater than five years are more likely to own risky assets (Table 5.6) but horizon is not significant in either of the OLS regressions. Similarly, households that reported a willingness to take investment risks are more likely to own risky assets. There is weak evidence of racial differences in the relationship of the willingness to take risk indicator. Although it is not considered significant, its negative sign would indicate that Blacks who are willing to take risks are less likely to own risky assets than Whites who are willing to take risks. However, this indicator variable is not significant in either of the OLS regressions. Finally, there is also limited evidence that households who have been discouraged from applying for credit tend to have higher proportions of their net worth invested in risky assets. However, this is considered weak
support since the relationship is only seen in one procedure.

There is sufficient evidence to reject the sixth null hypothesis that there are no racial differences in the likelihood of risky asset ownership that explain racial differences in the proportion of wealth invested in risky assets. This is because of the significant interaction model being appropriate for the estimation of the ownership of risky assets but not for the OLS regressions of the two proportions of wealth invested in risky assets. Further, it is noted that the interaction term for Lambda is significant in the interaction model estimated for the factors related to the proportion of total wealth invested in risky assets. This conflicts with the seventh null hypothesis. The seventh null hypothesis is that there are no race specific external forces that are related to risky asset ownership. In the first regression, the reduced model could not be rejected, thus indicating that there is no race specific factor affecting the proportion of net worth invested in risky assets when controlling for the likelihood of ownership and household characteristics. However, in the second OLS regression of the proportion of total wealth invested in risky assets, the reduced model is rejected and the intermediate model is accepted in three of the five implicates. However, the indicator variable for a Black respondent is not significant in this regression, although it should be noted that the p-value was 0.0534. This is weak evidence of external race specific factors in the OLS regression for the proportion of total wealth invested in risky assets. Considering the the full model for this dependent variable, it could be that this term is related to racial differences in the likelihood of risky asset ownership. However, a second interpretation is that this is further evidence of discrimination or historical or cultural values that are not captured in the model.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>White n=2640</th>
<th>Black n=298</th>
<th>Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent’s Age</td>
<td></td>
<td></td>
<td>$\chi^2 = 6.38$</td>
</tr>
<tr>
<td>Age &lt;35</td>
<td>13.53%</td>
<td>11.93%</td>
<td></td>
</tr>
<tr>
<td>Age 35 - 44</td>
<td>37.27%</td>
<td>31.95%</td>
<td></td>
</tr>
<tr>
<td>Age 45 - 60</td>
<td>33.58%</td>
<td>37.62%</td>
<td></td>
</tr>
<tr>
<td>Age &gt;60</td>
<td>15.63%</td>
<td>18.5%</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td>$\chi^2 = 151.30^{**}$</td>
</tr>
<tr>
<td>Married Couples</td>
<td>60.8%</td>
<td>30.1%</td>
<td></td>
</tr>
<tr>
<td>Non-married Male</td>
<td>19.2%</td>
<td>23.5%</td>
<td></td>
</tr>
<tr>
<td>Non-married Female</td>
<td>20.1%</td>
<td>46.4%</td>
<td></td>
</tr>
<tr>
<td># Dependents</td>
<td>0.897</td>
<td>1.15</td>
<td>$t = 3.06^{**}$</td>
</tr>
<tr>
<td>Educational Attainment:</td>
<td></td>
<td></td>
<td>$\chi^2 = 72.15^{**}$</td>
</tr>
<tr>
<td>Less than High School</td>
<td>12.07%</td>
<td>25.80%</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>29.24%</td>
<td>32.27%</td>
<td></td>
</tr>
<tr>
<td>Some College</td>
<td>24.53%</td>
<td>24.22%</td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>34.16%</td>
<td>17.71%</td>
<td></td>
</tr>
</tbody>
</table>

**P-value<0.01

Table 5.1
Household Demographic Characteristics By Race
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>White n=2640</th>
<th>Black n=298</th>
<th>Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV Earnings from Wages</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband</td>
<td>$286,352.45</td>
<td>$155,891.28</td>
<td>T = -5.60**</td>
</tr>
<tr>
<td>Wife (If Married, 0 if not)</td>
<td>$83,596.33</td>
<td>$59,936.54</td>
<td>T =-2.19*</td>
</tr>
<tr>
<td>PV Expected Social Security Retirement Benefits:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband</td>
<td>$31,167.84</td>
<td>$19,545.68</td>
<td>t =-8.80**</td>
</tr>
<tr>
<td>Wife (If Married)</td>
<td>$20,863.97</td>
<td>$11,318.67</td>
<td>t = 0.15</td>
</tr>
<tr>
<td>PV Expected Defined Benefit Plan Benefits:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband</td>
<td>$31,523.92</td>
<td>$13,054.96</td>
<td>t =-4.06**</td>
</tr>
<tr>
<td>Wife (If Married)</td>
<td>$6,626.08</td>
<td>$4,556.53</td>
<td>t =-1.74</td>
</tr>
<tr>
<td>PV Poverty Threshold for Households with no other wealth:</td>
<td>$2,341.63</td>
<td>$14,470.06</td>
<td>t = 3.48**</td>
</tr>
<tr>
<td>PV Business Income</td>
<td>$99,536.91</td>
<td>$13,750.05</td>
<td>t =-8.05**</td>
</tr>
<tr>
<td>PV Social Security Retirement or Disability Income</td>
<td>$39,123.55</td>
<td>$38,702.86</td>
<td>t =-1.76</td>
</tr>
<tr>
<td>PV Other Pension Income</td>
<td>$29,087.01</td>
<td>$22,818.51</td>
<td>t =-0.18</td>
</tr>
<tr>
<td>Total Human Wealth</td>
<td>$619,367.95</td>
<td>$341,368.60</td>
<td>t =-7.91**</td>
</tr>
</tbody>
</table>

*P-value <0.05

**P-value <0.01

Table 5.2
Household Financial Characteristics By Race: Components of Human Wealth
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>White n=2640</th>
<th>Black n=298</th>
<th>T or $\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Worth</td>
<td>$375,648.29</td>
<td>$76,256.73</td>
<td>t =-10.29**</td>
</tr>
<tr>
<td>Total Wealth</td>
<td>$995,852.79</td>
<td>$418,429.48</td>
<td>t =-11.39**</td>
</tr>
<tr>
<td>Stock Shares</td>
<td>$41,154.45</td>
<td>$3,222.05</td>
<td>t =-5.65**</td>
</tr>
<tr>
<td>Stock Mutual Funds</td>
<td>$16,056.24</td>
<td>$1,340.59</td>
<td>t =-7.24**</td>
</tr>
<tr>
<td>Combination Mutual Funds</td>
<td>$1,422.13</td>
<td>$773.44</td>
<td>t =-3.33**</td>
</tr>
<tr>
<td>Stocks in Defined Contribution Plans</td>
<td>$12,420.53</td>
<td>$3,276.69</td>
<td>t =-6.15**</td>
</tr>
<tr>
<td>Business Assets</td>
<td>$85,703.57</td>
<td>$4,183.56</td>
<td>t =-8.35**</td>
</tr>
<tr>
<td>Owns Risky Assets</td>
<td>52.15%</td>
<td>22.66%</td>
<td>$\chi^2=112.73**</td>
</tr>
<tr>
<td>Received Inheritance</td>
<td>23.43%</td>
<td>9.74%</td>
<td>$\chi^2=36.78**</td>
</tr>
<tr>
<td>Expects Inheritance</td>
<td>16.40%</td>
<td>2.12%</td>
<td>$\chi^2=53.26**</td>
</tr>
<tr>
<td>Liquidity Indicators:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monetary Assets/1 month income</td>
<td>37.91%</td>
<td>30.11%</td>
<td>$\chi^2=8.46*$</td>
</tr>
<tr>
<td>Financial Assets/6 months income</td>
<td>62.44%</td>
<td>43.28%</td>
<td>$\chi^2=49.34**</td>
</tr>
<tr>
<td>Risky Assets / Net Worth</td>
<td>0.1785</td>
<td>0.0819</td>
<td>t =-11.51**</td>
</tr>
<tr>
<td>Risky Assets / Total Wealth</td>
<td>0.0627</td>
<td>0.0112</td>
<td>t =-19.05**</td>
</tr>
</tbody>
</table>

*P-value <0.05  
**P-value <0.01

Table 5.3  
Household Financial Characteristics By Race
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>White n=2640</th>
<th>Black n=298</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Willing to Take Investment Risks</td>
<td>70.32%</td>
<td>53.97%</td>
<td>39.85**</td>
</tr>
<tr>
<td>Horizon &gt;= 5 years</td>
<td>47.02%</td>
<td>27.21%</td>
<td>51.49**</td>
</tr>
<tr>
<td>Felt Discouraged about Using Credit</td>
<td>12.53%</td>
<td>33.66%</td>
<td>110.91**</td>
</tr>
<tr>
<td>Economic Outlook</td>
<td></td>
<td></td>
<td>70.02**</td>
</tr>
<tr>
<td>Positive Economic Outlook</td>
<td>20.05%</td>
<td>39.07%</td>
<td>-</td>
</tr>
<tr>
<td>Neutral Economic Outlook</td>
<td>52.46%</td>
<td>35.95%</td>
<td>-</td>
</tr>
<tr>
<td>Negative Economic Outlook</td>
<td>27.49%</td>
<td>24.98%</td>
<td>-</td>
</tr>
</tbody>
</table>

**P-value <0.01

Table 5.4
Household Expectations By Race
Panel A: Observed and Self-Reported Willingness to Take Risks (Column Percentages)

<table>
<thead>
<tr>
<th>Does not own risky assets</th>
<th>Owns risky assets</th>
<th>Total Sample</th>
<th>Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not willing to take investment risks</td>
<td>46.52%</td>
<td>16.15%</td>
<td>31.89%</td>
</tr>
<tr>
<td>Willing to take investment risks</td>
<td>53.48%</td>
<td>83.85%</td>
<td>68.11%</td>
</tr>
</tbody>
</table>

Panel B: Consistency between observed investment behavior and response by race

<table>
<thead>
<tr>
<th>Black</th>
<th>White</th>
<th>Total Sample</th>
<th>Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inconsistent</td>
<td>46.47%</td>
<td>33.79%</td>
<td>35.50%</td>
</tr>
<tr>
<td>Consistent</td>
<td>53.53%</td>
<td>66.21%</td>
<td>64.50%</td>
</tr>
</tbody>
</table>

Table 5.5
Chi-Square Tests for Independence using data pooled from all five implicates
<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>Coefficient Reduced Model</th>
<th>Coefficient Full Model</th>
<th>P-Value for Wald Test Reduced Model</th>
<th>P-Value for Wald Test Full Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.8157052</td>
<td>-0.9552231</td>
<td>.0001</td>
<td>.0001</td>
</tr>
<tr>
<td>Demographic Characteristics:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;35 years old</td>
<td>-0.0379329</td>
<td>-0.0537327</td>
<td>.8195</td>
<td>.7497</td>
</tr>
<tr>
<td>35-45 years: reference category</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-60 years old</td>
<td>0.05297609</td>
<td>0.0608015</td>
<td>.646</td>
<td>.5982</td>
</tr>
<tr>
<td>&gt;60 years old</td>
<td>0.02106403</td>
<td>0.07071333</td>
<td>.8883</td>
<td>.6361</td>
</tr>
<tr>
<td>Married: reference group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>-0.2588683</td>
<td>-0.2291091</td>
<td>.0668</td>
<td>.1108</td>
</tr>
<tr>
<td>Female</td>
<td>-0.5393649</td>
<td>-0.5041711</td>
<td>.0001</td>
<td>.0004</td>
</tr>
<tr>
<td>Number of Dependents</td>
<td>0.01828948</td>
<td>0.03899611</td>
<td>.676</td>
<td>.3195</td>
</tr>
<tr>
<td>Human Capital:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>-0.639156</td>
<td>-0.5938585</td>
<td>.0001</td>
<td>.0003</td>
</tr>
<tr>
<td>High School only</td>
<td>-0.2950692</td>
<td>-0.2845661</td>
<td>.0144</td>
<td>.0171</td>
</tr>
<tr>
<td>Some college</td>
<td>-0.228775</td>
<td>-0.2258119</td>
<td>.0561</td>
<td>.0562</td>
</tr>
<tr>
<td>College: reference category</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Characteristics:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Wealth</td>
<td>1.67999 * 10^-7</td>
<td>1.51319 * 10^-7</td>
<td>.0008</td>
<td>.0011</td>
</tr>
<tr>
<td>Receipt of Inheritance</td>
<td>0.11156152</td>
<td>0.11575027</td>
<td>.3145</td>
<td>.2805</td>
</tr>
<tr>
<td>Expectation of Inheritance</td>
<td>0.15738295</td>
<td>0.15553944</td>
<td>.2342</td>
<td>.217</td>
</tr>
<tr>
<td>Preferences and Expectations:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willing to take risk</td>
<td>0.6083479</td>
<td>0.68585986</td>
<td>.0001</td>
<td>.0001</td>
</tr>
<tr>
<td>Horizon &gt; than 5 years</td>
<td>0.36461079</td>
<td>0.35665048</td>
<td>.0001</td>
<td>.0001</td>
</tr>
<tr>
<td>1 month liquidity measure</td>
<td>0.10193182</td>
<td>0.10937441</td>
<td>.3759</td>
<td>.0001</td>
</tr>
<tr>
<td>6 month liquidity measure</td>
<td>0.89628245</td>
<td>0.92581426</td>
<td>.0001</td>
<td>.0011</td>
</tr>
<tr>
<td>Expects economy to be better</td>
<td>-0.0012357</td>
<td>0.01948342</td>
<td>.9915</td>
<td>.8678</td>
</tr>
<tr>
<td>Expects economy to be unchanged: reference</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expects economy to be worse</td>
<td>0.05602588</td>
<td>0.11512646</td>
<td>.6044</td>
<td>.2799</td>
</tr>
<tr>
<td>Discouraged about using credit</td>
<td>-0.000553</td>
<td>-0.0172068</td>
<td>.9969</td>
<td>.7197</td>
</tr>
<tr>
<td>Black</td>
<td>-0.3864088</td>
<td>-0.0487046</td>
<td>.0151</td>
<td>.9439</td>
</tr>
</tbody>
</table>

Table 5.6
Results from the Probit estimation for owning risky assets; Reduced and Full Model using pooled data
<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>Reduced Model</th>
<th>Full Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>P-Value for Wald Test</td>
</tr>
<tr>
<td><strong>Interaction Terms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black*&lt;35 years old</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* 45-60 years old</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black*&gt;60 years old</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Male</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Female</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Number of Dependents</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Less than High School</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* High School only</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Some college</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Human Wealth</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Receipt of Inheritance</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Expectation of Inheritance</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Willing to take risks</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Horizon greater than 5 years</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* 1 month liquidity measure</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* 6 month liquidity measure</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Expects economy to be better</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black* Expects economy to be worse</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Log Likelihood***</td>
<td>-6464.16</td>
<td>-3633.01</td>
</tr>
</tbody>
</table>

***The likelihood ratio is 202.2904 with D.F. = 19 (significant at P<0.005)
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Sub-Sample</th>
<th>Blacks</th>
<th>Whites</th>
<th>Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respondent's Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age &lt;35</td>
<td>0.1138</td>
<td>0.1823</td>
<td>0.1091</td>
<td></td>
</tr>
<tr>
<td>Age 35 - 44</td>
<td>0.3286</td>
<td>0.3883</td>
<td>0.3246</td>
<td></td>
</tr>
<tr>
<td>Age 45 - 60</td>
<td>0.3970</td>
<td>0.3536</td>
<td>0.4000</td>
<td></td>
</tr>
<tr>
<td>Age &gt;60</td>
<td>0.1606</td>
<td>0.0758</td>
<td>0.1664</td>
<td></td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married Couples</td>
<td>0.6903</td>
<td>0.5005</td>
<td>0.7032</td>
<td></td>
</tr>
<tr>
<td>Non-married Male</td>
<td>0.1573</td>
<td>0.2040</td>
<td>0.1542</td>
<td></td>
</tr>
<tr>
<td>Non-married Female</td>
<td>0.1524</td>
<td>0.2954</td>
<td>0.1427</td>
<td></td>
</tr>
<tr>
<td># Dependents</td>
<td>0.9772</td>
<td>1.1102</td>
<td>0.9682</td>
<td>t = 1.31</td>
</tr>
<tr>
<td><strong>Educational Attainment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>0.0656</td>
<td>0.0766</td>
<td>0.0648</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>0.2532</td>
<td>0.3801</td>
<td>0.2446</td>
<td></td>
</tr>
<tr>
<td>Some College</td>
<td>0.2540</td>
<td>0.2837</td>
<td>0.2520</td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>0.4273</td>
<td>0.2596</td>
<td>0.4386</td>
<td></td>
</tr>
<tr>
<td><strong>Financial Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Worth</td>
<td>596952.80</td>
<td>108144</td>
<td>625255.58</td>
<td>t = -0.27</td>
</tr>
<tr>
<td>Human Wealth</td>
<td>777948.8</td>
<td>602099.03</td>
<td>789882.66</td>
<td>t = -0.07</td>
</tr>
<tr>
<td>Total Wealth</td>
<td>137938</td>
<td>782243.02</td>
<td>1419938.6</td>
<td>t = -0.14</td>
</tr>
<tr>
<td>Stock Shares</td>
<td>74796.46</td>
<td>14206.665</td>
<td>78910.469</td>
<td>t = -1.99*</td>
</tr>
<tr>
<td>Stock Mutual Funds</td>
<td>29205.54</td>
<td>5917.77</td>
<td>30786.932</td>
<td>t = -6.49***</td>
</tr>
<tr>
<td>Combination Mutual Funds</td>
<td>2770.80</td>
<td>3413.91</td>
<td>2727.372</td>
<td>t = 0.44</td>
</tr>
<tr>
<td>Stocks in Defined Contribution Plans</td>
<td>23215.44</td>
<td>14478.22</td>
<td>23809.01</td>
<td>t = -0.76</td>
</tr>
<tr>
<td>Business Assets</td>
<td>155074.9</td>
<td>18256.49</td>
<td>164347.01</td>
<td>t = -1.73*</td>
</tr>
<tr>
<td>Received Inheritance</td>
<td>0.2712</td>
<td>0.0530</td>
<td>0.2860</td>
<td>( \chi^2 = 21.77^{***} )</td>
</tr>
<tr>
<td>Expects Inheritance</td>
<td>0.1999</td>
<td>0.0251</td>
<td>0.2118</td>
<td>( \chi^2 = 17.28^{***} )</td>
</tr>
</tbody>
</table>

* P-value <0.05  ** P-value <0.01  *** P-value <0.001

Table 5.7
Characteristics of the sub-sample owning risky assets
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Sub-Sample</th>
<th>Blacks</th>
<th>Whites</th>
<th>Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monetary Assets/1 month income</td>
<td>0.4487</td>
<td>0.3407</td>
<td>0.4560</td>
<td>$\chi^2 = 4.26^*$</td>
</tr>
<tr>
<td>Risky Assets / Net Worth</td>
<td>0.3435</td>
<td>0.3614</td>
<td>0.3422</td>
<td>$t = 0.05$</td>
</tr>
<tr>
<td>Risky Assets / Total Wealth</td>
<td>0.1158</td>
<td>0.0495</td>
<td>0.1203</td>
<td>$t = -7.43^{***}$</td>
</tr>
<tr>
<td>Expectations:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willing to Take Investment Risks</td>
<td>0.8385</td>
<td>0.6651</td>
<td>0.8503</td>
<td>$\chi^2 = 20.05^{***}$</td>
</tr>
<tr>
<td>Horizon &gt;= 5 years</td>
<td>0.5552</td>
<td>0.3638</td>
<td>0.5682</td>
<td>$\chi^2 = 13.44^{***}$</td>
</tr>
<tr>
<td>Felt Discouraged about Using Credit</td>
<td>0.1059</td>
<td>0.2790</td>
<td>0.0942</td>
<td>$\chi^2 = 28.74^{***}$</td>
</tr>
<tr>
<td>Economic Outlook</td>
<td></td>
<td></td>
<td></td>
<td>$\chi^2 = 29.38^{***}$</td>
</tr>
<tr>
<td>Positive Economic Outlook</td>
<td>0.1988</td>
<td>0.4152</td>
<td>0.1841</td>
<td>-</td>
</tr>
<tr>
<td>Neutral Economic Outlook</td>
<td>0.5224</td>
<td>0.4563</td>
<td>0.5269</td>
<td>-</td>
</tr>
<tr>
<td>Negative Economic Outlook</td>
<td>0.2788</td>
<td>0.1285</td>
<td>0.2890</td>
<td>-</td>
</tr>
</tbody>
</table>

* P-value <0.05  ** P-value <0.01  *** P-value <0.001
<table>
<thead>
<tr>
<th>Factor</th>
<th>Coefficient No Race Intercept</th>
<th>P-Value</th>
<th>Coefficient Intercept Only</th>
<th>P-Value</th>
<th>Coefficient Full Interaction</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.4276</td>
<td>6.661E-16</td>
<td>0.426</td>
<td>1.11E-15</td>
<td>0.4412</td>
<td>2.22E-15</td>
</tr>
<tr>
<td>Age: Reference Group = Age 35-44</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age &lt;35</td>
<td>-0.012056</td>
<td>0.71747</td>
<td>-0.0122</td>
<td>0.7147</td>
<td>0.0053</td>
<td>0.8704</td>
</tr>
<tr>
<td>Age 45-60</td>
<td>-0.03502</td>
<td>0.06933</td>
<td>-0.0349</td>
<td>0.0703</td>
<td>-0.0343</td>
<td>0.0779</td>
</tr>
<tr>
<td>Age &gt; 60</td>
<td>-0.0472</td>
<td>0.06076</td>
<td>-0.0476</td>
<td>0.0581</td>
<td>-0.0443</td>
<td>0.0851</td>
</tr>
<tr>
<td>Marital Status: Reference Group = Married</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmarried Male</td>
<td>0.0473</td>
<td>0.0779424</td>
<td>0.0476</td>
<td>0.0765</td>
<td>0.0586</td>
<td>0.0283</td>
</tr>
<tr>
<td>Unmarried Female</td>
<td>-0.0795</td>
<td>0.0163</td>
<td>-0.0789</td>
<td>0.0173</td>
<td>-0.0839</td>
<td>0.0092</td>
</tr>
<tr>
<td>Number of dependents</td>
<td>-0.0012</td>
<td>0.855252</td>
<td>-0.0011</td>
<td>0.8765</td>
<td>0.0005</td>
<td>0.9479</td>
</tr>
<tr>
<td>Education: Reference Group = College or more</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>-0.0749</td>
<td>0.0735</td>
<td>-0.0773</td>
<td>0.066</td>
<td>-0.0534</td>
<td>0.2129</td>
</tr>
<tr>
<td>High School Only</td>
<td>-0.0553</td>
<td>0.01541</td>
<td>-0.056</td>
<td>0.0141</td>
<td>-0.0446</td>
<td>0.0667</td>
</tr>
<tr>
<td>Some College</td>
<td>-0.0456</td>
<td>0.025</td>
<td>-0.0458</td>
<td>0.0244</td>
<td>-0.0417</td>
<td>0.0441</td>
</tr>
<tr>
<td>Financial Characteristics:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received Inheritance</td>
<td>0.0085</td>
<td>0.5937</td>
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Table 5.8
Results from the OLS estimation for determinants of the proportion of net worth invested in risky assets; Reduced and Full Models using RII techniques

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Economic Outlook: Reference group = Does not expect the economy to change

Table 5.9
Results from the OLS estimation for determinants of the proportion of total wealth invested in risky assets; Reduced and Full Models using RII techniques
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Racial Interaction Terms:

- **Age:** Reference Group = Age 35-44
- **Marital Status:** Reference Group = Married
- **Number of dependents**
- **Education:** Reference Group = College or more
- **Financial Characteristics:**
  - Received Inheritance
  - Expects Inheritance

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### Table 5.10
Regression Sum of Squares and F-test for Reduced, Intermediate, and Interaction Models

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* P-value <0.05
Chapter 6

Summary, Conclusions, Limitations, and Implications

This chapter will present the overall findings of this study. The chapter will begin by summarizing the findings and conclusions of this study. The next section will address the limitations of the research and its findings. The last sections will present implications for the Online Financial Services Industry, Cooperative Extension, Government Policy and future research on investment behavior.

6.1 Summary and Conclusions

The purpose of this study is to examine racial differences in risky asset ownership. Of chief concern is whether or not there are racial differences in the determinants of the proportion of wealth invested in risky assets when controlling for racial differences in the determinants of risky asset ownership. This study used a two-step multivariate procedure to analyze this problem. The first step uses a Probit procedure to determine Lambda, the Heckman estimator for self-selection of risky asset ownership. The second step performed an OLS regression on the sub-sample that owned...
risky assets. This procedure regressed the proportion of wealth invested in risky assets on household characteristics, which are categorized as demographic, financial, education, or expectations.

The major finding for this study is that while there are racial differences in the determinants of risky asset ownership, there is little evidence that there are racial differences in proportion of wealth invested in risky assets when adjusting for ownership of risky assets and self-selection. The reduced ownership model is rejected in favor of the full model with racial interaction terms. This indicates that the racial differences in the likelihood of owning risky assets are better explained by considering racial differences in human wealth, negative economic views, and possibly the perception or acceptance of investment risk. When controlling for racial differences in the likelihood of risky asset ownership, race has a weak relationship with the proportion of wealth invested in risky assets, which is most likely attributable to variables that are not considered in the model for likelihood of risky asset ownership. The fact that race is borderline significant may be an indication that while some Blacks are willing to take investment risks, there may be other race-specific factors not accounted for that are related to risky asset ownership.

The findings and conclusions from this study are generally consistent with those from previous studies on risky asset ownership, save where race is concerned. Demographic characteristics such as age and marital status are relevant to risky asset ownership. While the likelihood of risky asset ownership is not significantly related to age, the proportion of wealth invested in risky assets increases with age when not controlling for human wealth. Unmarried males and married couples tend to invest
greater proportions of their wealth than unmarried women. Higher levels of formal education are positively related to the likelihood of risky asset ownership and the proportion of wealth invested in risky assets. Household financial characteristics are also important. Higher human wealth is positively related to risky asset ownership for Blacks and Whites and all other things equal, the likelihood of owning risky assets increases with human wealth at a higher rate for Blacks than for Whites. Higher human wealth is also related to higher proportions of wealth invested in risky assets for Blacks and Whites. The adequacy of household precautionary savings is also relevant to risky asset ownership. Households meeting the one month and six month threshold are more likely to own risky assets. Further, households meeting the one-month measure tend to have a higher proportion of wealth invested in risky assets than those who do not meet this guideline. Finally, there is evidence that household expectations are related to risky asset ownership. When controlling for other factors, Blacks with a negative economic outlook are less likely than Whites with a negative economic outlook to own risky assets. Households with a positive economic outlook have a higher proportion of wealth invested in risky assets than other households. Whether or not the individual felt discouraged about credit use is not significantly related to risky asset ownership, but is positively related to the proportion of net worth invested in risky assets.

In summary, Black households are less likely to own risky assets but when controlling for this, there is little evidence of racial differences in the proportion of wealth invested in risky assets. The racial differences in risky asset ownership are related to racial differences in the determinants of ownership. However, when accounting for racial differences in the determinants of the likelihood of risky asset ownership, race is
not related to the proportion of wealth invested in risky assets

6.2 Limitations of the Study

There are several limitations in this study that should be considered. The first limitation of this study is the low representation of Blacks in the sample and sub-sample. Given the number of interaction terms, the number of Blacks is small and may preclude factors from being significantly different between Blacks and Whites.

Additionally, knowing whether the individual resided in a metropolitan or non-metropolitan area may also provide information regarding the level of exposure one may have to media and other means of obtaining financial information such as word of mouth. While the region code for each household is known, it is not known whether each one resides in a metropolitan area or not. Additionally, the presence of discrimination in financial services is not constant from city to city, and knowing the level of discrimination in each area may also contribute to understanding racial differences in risky asset ownership. However, the variable for metropolitan status is not included in the SCF public use data set and there is no scale for discrimination by city available either; therefore, these variables cannot be controlled for in the model.

Further, as seen in Chiteji and Stafford (1999), the investment behavior of the parents may be related to the investment behavior of the children. Having information about the investment socialization the individual underwent may also contribute to understanding risky asset ownership. One possible proxy is the type of residence the individual grew up in (e.g., an affluent neighborhood). Another possible factor to be
considered is the parent’s holdings, either current or historical might be useful. However, since this type of historical information is unavailable in the SCF, these factors could not be controlled for but may be relevant to the weak indication of racial differences in the proportion of total wealth invested in risky assets.

6.3 Implications

6.3.1 Implications for Online Financial Services Industry and Extension

Blacks have substantially less wealth and human wealth than Whites. This may make Blacks less attractive as potential clients for financial planners and stockbrokers. If this is true, then Blacks as a group are less likely to be targeted by financial service firms to receive information about financial services and products. Reduced exposure to investment information for one group such as Blacks would mean that some Blacks might not receive any advice or any professional advice about investing. However, recent growth in the online and discount brokerage firms are breaking down barriers to entry in financial markets as well as access to financial information. Yet in a recent press release from Jupiter Communications, the largest gaps in Internet usage are between high and low income groups and different racial groups. According to results from online research conducted by Jupiter Communications 60% more White households are online than Black households. While about half of the Whites households have regular Internet usage, only 30% of Black households currently have regular Internet usage (Jupiter Communications, 2000). Despite the low cost, it may not be advisable for everyone to
invest online because of lack of experience. However, basic investment strategies are simple to implement and explain. Basic strategies and definitions of terms can be found on the Internet, newspapers, television and books. Several books recently published target Black households and address numerous financial issues. Jackson, Jackson, and Gotschall, (1999 p 125-145) and Brown (2000) explain basic investing terms, concepts, and strategies as well as make recommendations as to how households can obtain additional information.

Although use of online investing may make it easier for those who are using the Internet to invest, it is not of much use to those groups that are not on the Internet. Jackson, Jackson, and Gotschall, (1999 p 145-168) point out the potential ways that the Internet can be used to obtain less expensive financial services, conduct research, and even purchase products. For those unable to afford computers, the authors stress that there are inexpensive and even free computers that can be obtained. They stress that using the Internet for investing can be more cost effective than full service brokerage firms for most people.

The introduction of the Internet to more Black and low-income households may help them to learn more about investing. One possibility is for online financial firms and Extension cooperatively to provide free informational seminars on investing online in Black and low-income communities. Additionally, these seminars could include proper budgeting techniques to help households obtain the minimum required investment capital. Similar efforts have begun through a joint effort by Ariel Capital Management and Charles Schwab; they have begun hosting seminars on investment strategies and tips targeted at Black communities (Loury, 1998).
6.3.2 Implications for Policy

To reduce wealth inequality, the Federal Government has policy initiatives in place such as House Resolution 2849, which is also known as the Assets for Independence Act (1997, November 6). This act is designed to encourage projects whose purpose is to help individuals with low net worth or low income to acquire an asset base. While the trustee must be a federally insured financial institution, some thought should be given to asset allocation. Typically, these funds are in savings accounts. However, one suggestion is that these accounts have some form of mutual fund component that is invested in higher yield investments, such as index funds.

Additionally, if education in this study is representative of an individual’s understanding of basic investing principles, then those who are less educated should still receive some basic investing principles. Perhaps employers who offer defined contribution plans should require employees to attend investing seminars or workshops when they are eligible to participate in the defined contribution plan. This way, an individual who may not otherwise be exposed to investment information will at least learn basic investment fundamentals such as the importance of the investment horizon on the expected return.

In conclusion, there is a large gap in the human wealth estimates for Blacks and Whites and increasing human wealth is positively related to risky asset ownership for Blacks and Whites. One of the most direct means to improve human wealth for a society is to further provide incentives and financial assistance to those whose families are unable to assist their children in paying for college. The Assets for Independence Act
(H.R. 2849 1997, November 6) is a step in the right direction. However, if education is the primary goal for the savings plan for the family and this is more than several years away, then a portion of the savings should be allocated to higher returning investments such as stock index funds. This might better enable children from low-income families or low wealth families to achieve a higher level of formal education than they might otherwise be able to afford.

6.3.3 Implications for Further Research

Further examination of the types of specific assets held by Blacks and Whites is needed. While there has been some research into broad asset categories, understanding the specific types of assets held should be examined to further understand racial differences in investment choices. For example, are the majority of investments held in retirement accounts or are there other types of products being used.

A second issue is that the use of financial services by Blacks should be examined both in terms of whether Blacks are targeted by financial advisors and the types of services used, such as online banking and/or investing.

Another important note is that future studies on investing should allow for differences between the decision to own assets and the amount of the holding. Findings from this study support those by Bertaut and Starr-McCluer (2000) that these two decisions should be modeled separately to allow for differences in the determinants of ownership and level of ownership.


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