RACIAL DIFFERENCES IN HOUSEHOLDS' FINANCIAL
ASSET ALLOCATION, 1992-2004

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ABSTRACT

By combining the data from the 1992, 1995, 1998, 2001 and 2004 Survey of

Consumer Finances, this dissertation examined racial differences in households' financial

asset allocation over the years. The sample size for the 1992 SCF was 3,906; 4,229 for

the 1995 SCF; 4,305 for the 1998 SCF; 4,442 for the 2001 SCF and 4,519 for the 2004

SCF, each with five implicates.

On the basis of the theoretical framework of Expected Utility Theory and Capital

Asset Pricing Model, financial assets were categorized into four groups: equities

(including directly-held stocks and other indirectly-held stocks through mutual funds,

retirement accounts, and etc.); bonds (including directly-held bonds and other indirectly-

held bonds through mutual funds, retirement accounts, and etc.); cash accounts (including

cash, certificates of deposit, and liquid accounts) and other financial assets. Then, this

study employed a two-step approach to analyze investment decisions on the likelihood of

having each financial asset category as well as the relative degree these financial assets

are held in household portfolios conditional on the likelihood. The application of

Heckman selection models provided a more detailed view on household investment

decisions.

Based on the theoretical framework and previous literature, the empirical models set forth the probability and the proportion of holding each financial asset category as a function of year, race, other demographic variables (age, education, gender, marital status and number of kids), socio-economic variables (income, wealth, working status, having defined benefit plans vs. having defined contribution plans, inheritance, homeownership and business ownership) and an attitudinal factor (risk tolerance). Race had four categories: white, black, Hispanic and others. To fully analyze racial differences in holding each of the four financial asset categories, 20 interaction terms of the four racial categories and five years (1992, 1995, 1998, 2001 and 2004) were included in the models. White-headed households in 1992 were used as the reference group.

The results from the four Heckman Selection Models showed that most of the interaction terms between race and year were significant. Racial differences were found when comparing households headed by blacks, Hispanics or other races to households headed by whites. There was, however, little variation in effects among households headed by blacks, Hispanics or other races, in other words, minorities. Households headed by whites increased both the probability of equity ownership and the proportion of financial assets in equities over the period of 1992 to 2004. When compared to a white-headed household in 1992, a household headed by a minority had a lower or equal probability of equity ownership throughout the period. In other words, minorities were worse off than whites in 1992 in terms of the probability of equity ownership. Households headed by blacks, Hispanics or other races increased their equity shares during this period, primarily 1998 or later.

When compared with white-headed households in 1992, the probability of owning bonds and the bond share for white-headed households changed according to the annual return of bonds. The probability of bond ownership and bond share were lower for all other races in all five years, except for 1998.

The probability of holding cash accounts increased, but the proportion of financial assets invested in cash accounts decreased on average over this period for households headed by whites. When compared with households headed by whites in 1992, the probability of owning cash accounts was relatively lower for households headed by blacks, Hispanics and other races during this period. Also, the proportion of financial assets invested in cash accounts was relatively lower for black-headed households. However, the proportion increased for households headed by Hispanics or other races over time.

White-headed households decreased both the ownership and the proportion of other financial assets during the period. Similar trends were shown for households headed by other races. When compared with households headed by whites in 1992, the probability of owning other financial assets decreased, but the proportion invested in other financial assets increased for households headed by blacks or Hispanics over time.

In summary, minorities were much more risk averse in investments, as compared with whites. Financial planners/counselors and educators should realize that the meaning, and understanding, of risk may be different for minority groups. Also, financial planners and educators should educate minorities with financial knowledge related to risk tolerance and characteristics of financial assets, and increase their exposure to the high return/high risk equities and bonds. With financial knowledge, minorities may

substantially increase the likelihood of equity or bond ownership and benefit from the

equity and bond market in accumulating more wealth. Increased equity/bond ownership

should help reduce the wealth gap in the long run. Future research should focus on the

impact of inefficient portfolio planning on the well-being of minority households and on

how to increase the likelihood of equity/bond ownership.

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Chapter One   Introduction

Over the decade of 1992-2004, net worth, the difference between households' gross assets and their liabilities grew broadly across families. In 2004 dollars, the mean net worth of all families doubled from $246,300 in 1992 to $448,000 in 2004. During the same period, the median net worth of all families increased from $65,400 to $93,100. There is strong evidence that black households have added substantially to their net worth, still, compared with white non-Hispanic households, the net worth gap has grown substantially during this decade. The mean net worth for black households increased from $102,100 in 1992 to $153,100 in 2004-almost 50 percent. The median net worth increased from $15, 800 to $24,800 during the same period. However, for white non-Hispanic households, the mean net worth increased even more, by 91.3 percent, from $293,700 in 1992 to $561,800 dollars. The median increased from $91,900 to $140,700 (Survey of Consumer Finances, 1992, 2004), see Table 1-1 for more detail.

This enlarging disparity remains a puzzle even after taking demographic characteristics and income factors into consideration. One possible explanation suggested by Keister (2000) was that there were differences in the financial asset allocation decisions of these two groups. Households always confront the problem of asset allocation, that is, the question of whether and how much to invest in each asset class. This portfolio allocation decision of households is an issue of increasing importance as more and more households control their retirement accounts and other investments. Portfolios held by households not only reflect their investment goals but also their preferences and attitudes for risk, given other demographic characteristics. Substantial

evidence has shown white non-Hispanic households are more likely to hold stocks as compared with black households. In 2004, 18% of white non-Hispanic households were reported to own stocks directly, as compared with only 5.3% of black households (SCF, 2004).

Table 1-1: Median and Mean Net Worth in Thousands of 2004 Dollars, Percent Changes in Median and Mean Net Worth; Africans and White non-Hispanics, SCF 1992-2004.

Year	Median					Mean				
	African Americans		White Non-Hispanics		Ratio: WNH /AA	African Americans		White Non-Hispanics		Ratio: WNH/ AA
	Level	% Change	Level	% Change		Level	% Change	Level	% Change	
1992	15.8	*	91.9	*	5.82	102.1	*	293.7	*	2.88
1995	19.5	23.4	94.3	2.6	4.84	94.9	-7.0	308.7	5.1	3.25
1998	19.3	-1.0	111.0	17.7	5.75	116.5	22.8	391.1	26.7	3.36
2001	19.1	-1.0	129.6	16.8	6.78	123.8	6.3	518.7	32.6	4.19
2004	24.8	29.8	140.7	8.6	5.67	153.1	23.7	561.8	8.3	3.67

Source: Survey of Consumer Finances, 1992-2004

Previous studies have not provided a complete view regarding how households from different ethnicities differ in holding financial assets. In order to provide an overall view of racial differences in financial asset allocation, this work categorizes all financial assets as: equities, bonds, cash accounts and other financial assets, and then examines racial differences in both the probability of ownership and the proportion of financial assets held in each of the four categories for the time period of 1992-2004.

This chapter introduces the trend and pattern in households' financial asset allocation. Then significance of this study is presented. The chapter concludes with a discussion of the organization of the study.

1.1 Trend and Pattern

Several factors underlie the acceleration of net worth accumulation during this period. The first important consideration is the potential deficit of the Social Security

System projected for the year 2016, as more and more baby boomers retire (Economic Report of the President, 2002, p.86). As a pay-as-you-go system, current workers can no longer bear the burden of the retired with the aging of the population. As the Baby Boomers reach retirement age, the number of Americans over 65 will more than double, from 34.8 million in 2000 (12% of the population) to 70.3 million in 2030 (20% of the population). In addition, this generation of retired is expected to have the longest life expectancy in history, with an average additional longevity of 17.9 years. By 2050, 40% of 65-year-olds are likely to reach age 90 (Fact Sheet on Aging America, 2000). It is possible that the age of eligibility for Social Security will increase and/or the benefit will be reduced, thus making it difficult for households to maintain a desired level of living. The crisis of the Social Security System points out the increasing importance of personal financial management to acquire adequate retirement funds. Financial asset allocation decisions are crucial to meet this investment goal.

The second important trend is the shrinking number of defined benefit retirement plans in the private sector, replaced by defined contribution retirement plans (see Figure 1-1). Both types of retirement plans are sponsored by employers. Defined benefit retirement plan is a retirement plan in which participants are guaranteed a certain benefit each year. Defined contribution retirement plans are a retirement plans in which employers guarantee a yearly contribution while participants are working but no guarantee is made regarding the retirement benefit. The participation rate in defined benefit plans for full-time employees in medium and large private establishments has dropped from 63% in 1989 to 33% in 2003. During the same period, the participation rate in defined contribution plans increased from 48% to 51% (U.S Bureau of Labor Statistics,

2004). The most important difference between these two plans is that defined benefit

plans guarantee a certain amount of retirement income, whereas defined contribution

plans do not. As a result, the risk of accumulating retirement resources has been gradually

transferred from employers to employees. In order to have adequate retirement funds,

households have to optimize their portfolios by diversifying their investments across

asset categories.
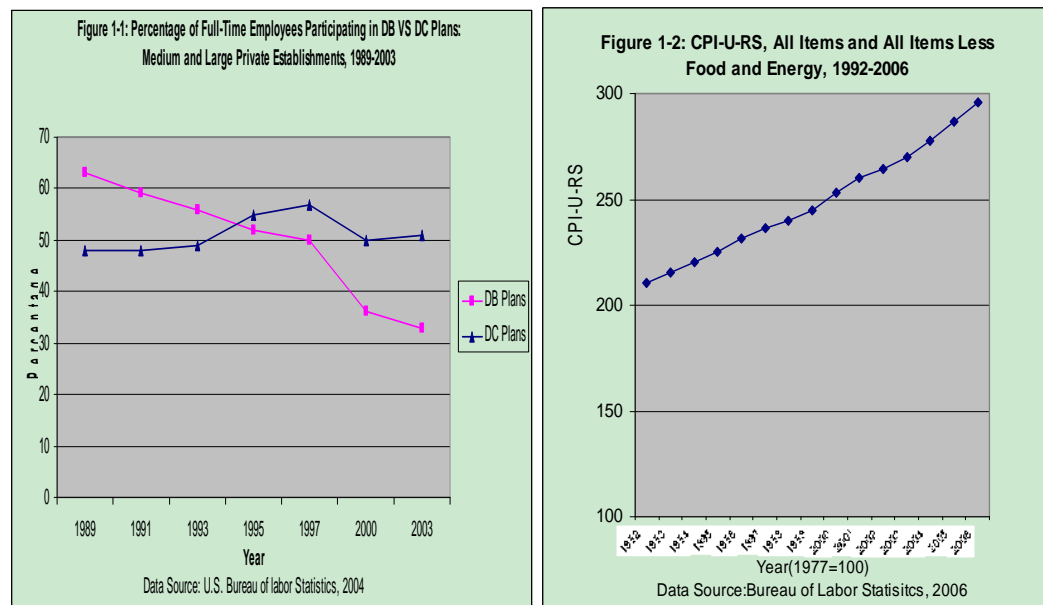
The third important trend is the sustained growth in stock prices over the period.

As shown in Figure 1-3, the S & P 500 stock price index more than tripled between 1991

and 2006, rising from 343 in 1991 to 1136 in 1998 and 1418 in 2006. The historically

high return of equities suggests that it has been possible to be adequately prepared for

retirement through financial asset investments.

Figure 1-3: S&P 500 Index
(Data Source: SBBI 2005 Yearbook)

Figure 1-4: Annual Interest Rate of 6-Month CDs
Data Source: Federal Reserve Bank
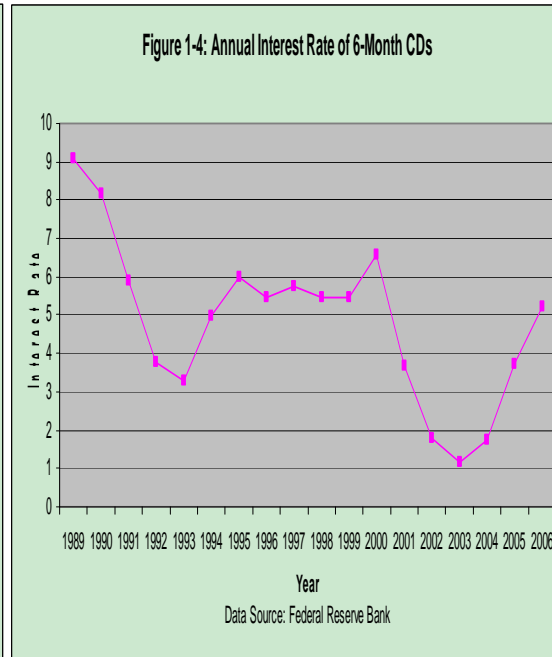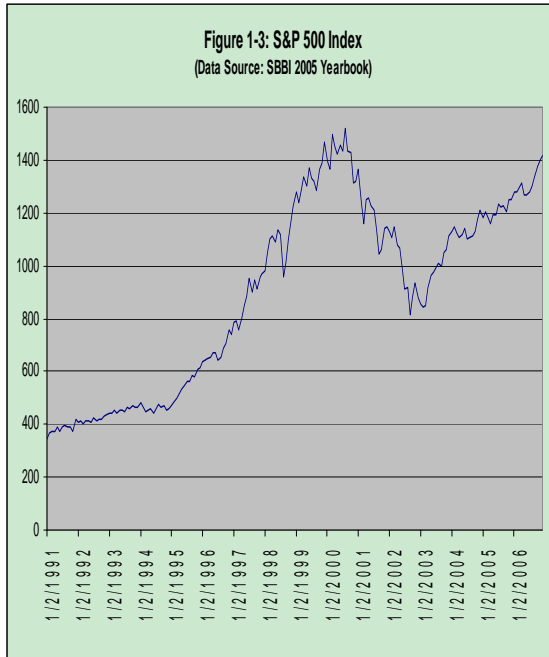
The final and related point concerns the differences among annual returns of certificates of deposit (CDs) and the annual rate of return of stocks, T-bills and long-term corporate bonds. The annual interest rate of 6 month CDs has fluctuated, starting from 3.76% in 1992 and reaching the highest point at 6.59% in 2000 and dropping smoothly to the lowest point of 1.74% in 2004 (Figure 1-4). As shown in Figure 1-5, the annual return of stocks as measured by percentage change in prices varied widely with the highest rate at slightly less than 40% in 1995 and the lowest rate at a negative 20% in 2002. The annual return of long-term corporate bonds showed a similar pattern but was relative smooth compared to stocks. The extent to which an investment is subject to uncertainty is called risk. This uncertainty can be measured by standard deviation. As shown in Figure 1-6, stocks had the highest annual standard deviation, representing the highest risks.

Figure 1-5: Annual Returns

Data Source: SBBI 2005 Yearbook
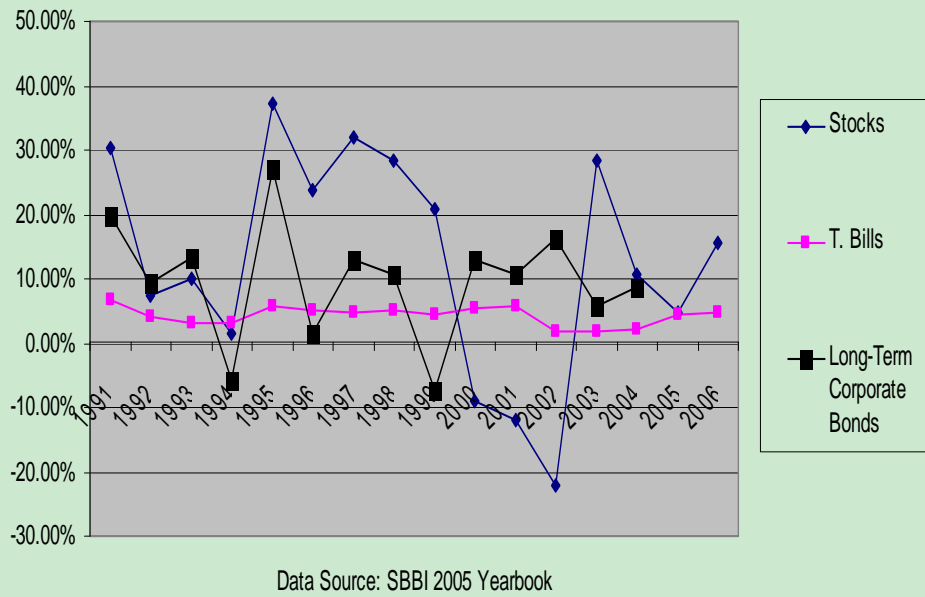
Figure 1-6: Annualized Monthly Standard Deviation

Data Source: SBBI 2005 Yearbook

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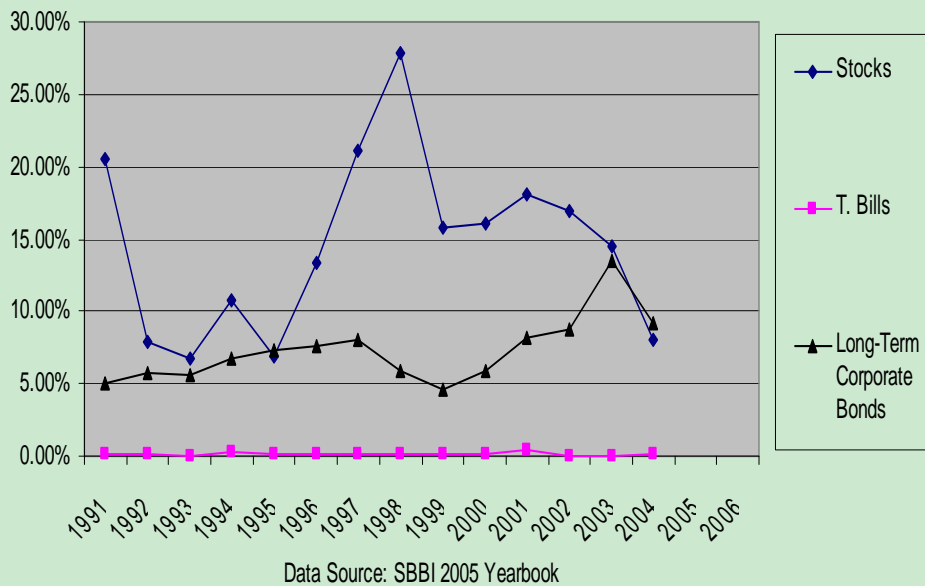
1.2. Contributions of the Study

This study is unique in providing a view of racial differences in financial asset allocation over the period of 1992 to 2004. Though most previous studies discussed the factors related to the level of or the probability of owning certain types of financial assets, few previous studies have analyzed the asset category. Four mutually exclusive categories are used in this study; bonds (including directly or indirectly held bonds), equities (including directly or indirectly held stocks), cash accounts (including CDs and liquid accounts) and other financial assets. Use of these four categorizes provides a more complete view of households' investment decisions.

Furthermore, few studies have examined the racial differences in asset allocation, although the net worth gap is growing between races. Most studies have focused on examining the net worth gap or pattern and neglect the fact that racial differences in financial assets distributions might be an important reason for the growing gap. In addition, this study not only examines racial differences in financial asset allocation but also tries to find the reasons for these differences from both cultural and economic perspectives. For this purpose, this study also examines the changes in average households' financial asset allocation over time, what factors affect portfolio choices and whether the effect of major demographic, economic and attitudinal variables has changed over time.

Thirdly, past researchers who have studied asset allocation used logistic models that assessing whether households owned risky assets or not, or whether households were willing to take financial risks or not (e.g. Haliassos & Bertaut, 1995; Xiao, 1996; Hinz, McCarthy & Turner, 1997; Sung & Hanna, 1996; Gutter, Fox & Montalto, 1999). These

binary analyses can only differentiate whether households have risky assets or not. The level of investments in various financial assets, however, is still unclear. In this study, use of the Heckman selection model will allow both questions to be examined. The probability of holding financial assets as well as the relative degree to which these financial assets are held in household portfolios is evaluated.

In addition, interaction terms between race and year are used to capture the racial differences and changes in financial asset allocation over time. Previous studies have neglected the possible interaction effects of factors in predicting financial asset allocation. Use of interaction terms allow more accurate estimate of racial differences over time.

Also, the study is the first to use the variable of the average age of the couples (married or living with a partner) or the age of the respondent for singles instead of the age of the respondent since both ages of the couple have an effect on a joint financial decision-making in the household. Similarly, the study employed the variable education as the highest degree attained by a couple or by a respondent, if the respondent is single, instead of the education level of the respondent only.

Lastly, predicted values of the proportion of financial asset invested in each category are compared by race and year, by controlling for income and net worth equal and holding other factors constant. This provides a better view of the effect of race on financial asset allocation.

1.3 Definitions

Most of the definitions used in this study follow SCF (Survey of Consumer Finances) definitions.

Household head: the male for mixed-sex couples or the older individual for same-sex couples.

Primary residence: may be single-family or other type of home (mobile home, apartment, town house, etc).

Equities: directly-held stocks, mutual funds invested in stocks, IRA/Keoghs invested in stocks, thrift-type retirement accounts invested in stocks and other managed assets with equity interests, such as annuities, trusts and managed investment accounts.

Mutual funds: directly-held shares in all types of mutual funds, excluding money market.

Retirement accounts: including both individual accounts (IRAs and Keoghs) and employer sponsored or thrift-type retirement accounts.

Trusts and managed assets: trusts, annuities and other managed investment accounts.

Bonds: savings bonds, state and local bonds, mortgage-backed bonds, government bonds and corporate and foreign bonds, mutual funds invested in bonds, retirement accounts invested in bonds and other managed assets invested in bonds.

Savings bonds: U.S. savings bonds.

Cash accounts: cash, CDs and liquid assets including checking accounts, savings accounts, money market deposit accounts, money market mutual funds and margin accounts at brokerages;

Liquid accounts: checking accounts, savings accounts, money market deposit accounts (MMAs) and margin accounts at brokerages.

Margin accounts at brokerages: a brokerage account in which the broker lends the customer cash to purchase securities.

CDs: certificates of deposit (may be short- or long-term).

Other financial assets: cash values of life insurance policies, loans from the household to someone else, future proceeds, royalties, futures, and non-public stocks, etc.

Cash value of life insurance: surrender value of life insurance policies that build up a cash value.

1.4. Organization

The next chapter reviews relevant literature on households' asset allocation, which includes how assets have been categorized, racial differences in net worth accumulation and related fields, effects of major demographic factors (age, gender, marital status, number of children, education), socio-economic factors (income, net worth, working status, inheritance, homeownership, business ownership) and an attitudinal factor (risk tolerance). Chapter three represents a theoretical model based on the Expected Utility Theory and Capital Asset Pricing Model and Capital Market Line, which form the theoretical basis for the empirical model used in this study, and explains how different types of households allocate their net worth among numerous investment vehicles. Chapter four presents the empirical methodology employed in the paper. Explanation of the data and definition of the variables is followed by a brief summary of the statistical model used in this study. Chapter five presents the results. Chapter six summarizes the findings and discusses the implications.

Chapter Two   Literature Review

The purpose of this chapter is to review the literature related to this study. The major topics include: 1) financial asset categorization;2) racial differences in related studies; 3) other factors influencing financial asset allocation including demographic, socioeconomic and attitudinal factors.

2.1 Asset Category

While economic studies on households' asset allocation have extensively discussed the relationship between relative risk aversion and net worth, as well as other socioeconomic variables, most studies only employ the proportion of risky assets to total assets as the dependent variable. The less-risky and risk-free assets have been relatively neglected. On the other hand, some family economists have noticed the problem and tried to fix the problem by extending their research on asset ownership to include individual asset items or categories, not only the broad asset category of risky assets. In the literature, studies on asset allocation have divided household assets into groups and identified characteristics of the different groups of assets in different ways, often dictated by the limitations of the data.

Weagley and Gannon (1991) were among the first to study portfolio allocation. To investigate the effect of net worth and stage in life-cycle on investors' portfolio allocation, they combined 16 asset items into four asset categories, roughly following the pyramid of risk. The four categories were savings (savings accounts, money market deposit account, certificates of deposit, Treasury bills and notes and U.S. savings bonds), housing, financial securities (mutual funds, bonds and common stocks) and retirement

investments (IRAs, Keoghs and private pension funds). They collected data through a survey of Missouri households in 1986, resulting in 249 valid observations. The dependent variable was the log of the ratio of total assets held in a less risky category to the ratio of assets held in each of the other categories. They found that total assets were significantly positively related to the holding of riskier assets. As households aged, levels of risk-taking increased at a decreasing rate, until they approached retirement, then the risk level began to decrease. Dual and single earner household variable had a negative effect both on the ratio of savings and financial securities to retirement assets.

Xiao and Olson (1993) divided household financial asset into three categories, which represented a continuum from most basic to least basic needs. Using data from 1983 and 1986 Survey of Consumer Finances, they found that consumers were more likely to save in the category representing financial needs than the other two categories representing relatively more basic needs.

Based on risk levels, Bertaut and Starr-McCluer (2000) categorized assets into three types as safe, fairly safe and fairly risky assets. According to their categorization, safe assets included liquid accounts (checking, savings and money market accounts), certificates of deposit and US savings bonds. Fairly safe assets included other government bonds, tax-free bonds, cash-value life insurance and amounts in mutual funds, retirement accounts, and trusts. The risky assets include stocks, both domestic and foreign; mutual funds; corporate and mortgage-based bonds. Using a pooled data from the 1989, 1992, 1995 and 1998 Survey of Consumer Finances, Tobit regressions were employed. The results reported that both the younger (under 35) and the older (55-64, and above 65) had a lower risky shares compared to the group aged 35-54. Households where

the head had a college degree and were willing to take financial risks were more likely to have risky assets and to have those assets representing a greater share of total assets, while households being self-employed, retired or unwilling to take financial risks were less likely to hold risky assets.

Based on Lancaster's theory of the demand for characteristics (1966), Schiano (1988) created an index for five portfolio characteristics: expected return, liquidity, divisibility (the smallest dollar units in which the asset could be traded), predictability of return (standard risk element), and reversibility (full value of portfolios net of any reductions including transaction cost and taxes). Twenty-one asset items were given an index score for each of the five characteristics. Using a sample of 2,526 households from the 1983 Survey of Consumer Finances, the demand for the five characteristics were regressed on the ten selected variables including net worth, household size, number of dependents, age of the oldest child under 18, stages in the family life cycle, the number of dependents of the investor, employment status, education level of the head, retirement status and the probability of unemployment. The regression results showed that stage of life-cycle had a significant effect on the demand for portfolio characteristics, except for liquidity. As the number of dependents increased, demand for portfolio divisibility and liquidity decreased, while demand for predictability of return increased.

Lin (1998) further extended Schiano's idea. She categorized eleven financial assets into four categories based on the shared/ similar characteristics including risk (business risk, financial risk, interest-rate risk, market risk and inflation risk), liquidity, marketability, income, growth and tax-benefit. The four categories consisted of the following assets: depository/liquid assets (checking accounts, savings accounts, money

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market accounts, certificates of deposit, cash in brokerage house and government savings bonds), retirement assets (IRAs/Keogh accounts, cash values of life insurances, trusts, annuities, managed accounts and accrued pension plans), stock types of investments (stocks, mutual funds invested in stocks) and bond type of investments (government bonds, treasury bills, notes, government-backed bonds, mortgage-backed bonds, mutual funds in government-backed and tax-free bonds, state and municipal bonds, corporate bonds, foreign bonds, mutual funds in other bonds and combination types, and loans to others). Using data from the 1992 Survey of Consumer Finances, the four categories were regressed on eight independent variables: age, employment income, education, household size, total assets, total debts, marital status and race. The results from the Tobit regression indicated that for both working and retired households, the probability of holding depository/liquid assets, retirement accounts, stock-type investments and bond-type investments were all positively related to age, employment income, total assets, total debts, and married households. Compared to whites, Hispanic, black, Asian or other households were less likely to hold each of the four categories of financial assets.

In summary, there has been no conclusive or standard way to categorize financial assets. On the other hand, the cited papers have provided some guidance on ways where asset categories have been defined and used.

2.2 Racial Differences in Related Studies

White households in the United States are far net worthier when compared to black or Hispanic households. Race is often found to be an important factor in predicting household economic decision-making with respect to the demand for goods. Most studies have found racial differences in net worth and net worth accumulation, however, the role

of race in households' asset allocation decisions has been largely neglected in empirical research.

Using the data from the 1976 and 1978 National Longitudinal Survey of Young Men and Young Women, Blau and Graham (1990) examined racial disparity in the amount and composition of net worth. The data showed that the net worth of young white families was almost five times larger than that of young black families. Their study argued that the net worth gap could be explained not only by differences in income but by inter-generational transfers and the accumulation of both business and home equity.

Brimmer (1991) examined African-American's money income, net worth accumulation and assets. According to his results, black net worth was more concentrated in property when compared to other racial households. The results found that blacks tended to be more conservative in investing financial assets, compared to whites, and that blacks preferred liquidity and safety over higher yields (i.e. greater risks) when holding financial assets.

Xiao (1996) used the 1989 SCF data to examine the determinants of financial asset ownership. Race was categorized as white, black, Hispanic, Asian, and other. The results showed that there was a significant effect of race on asset allocation. Compared with white-headed households, the black-headed, the Hispanic-headed and the Asian-headed households were less likely to hold IRAs or Keoghs, savings bonds, life insurance, mutual funds or common stocks. The logistic regression results also found that there was a significant interaction effect between race and the presence of children on where net worth was held among the eleven assets. The chance of owning savings bonds for a white-headed household increased from 39% to 59% with the presence of children while

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the chance for an otherwise similar black-headed household was close to the overall average at 24%. In contrast, the chance for a Hispanic-headed family was below the overall average, when children were present.

Using data from the 1989 Survey of Consumer Finance, Zhong and Xiao (1995) studied factors related to households' holding of bonds and stocks. The Tobit model showed that white-headed households had greater investments in both stocks and bonds, when compared with households headed by non-whites, while holding other factors constant.

Badu, Daniels and Salandro (1999) used the data from the 1992 Survey of Consumer Finances to empirically analyze the racial differences in asset and liability holdings between blacks and whites. They found that black households had significantly less net worth as well as less financial assets, when compared with white households. Black households tended to be more risk averse in investing assets than whites, which suggested that the differences in asset allocation between black households and white households might be an important reason for the gap in their net worth.

Gutter, Fox and Montalto (1999) examined racial disparity in investment decision making using the data from 1995 Survey of Consumer Finances. The descriptive statistics results showed that white households and black households not only differed significantly in their holdings of risky assets but also in their holdings of each type of assets and net worth. Black households had less risky assets and a lower net worth, when compared with white households. They also found that white households were more willing to take risks, when compared with black households, which helps explain the disparity in holding risky assets.

Using the first wave of the longitudinal data from 1992 Health and Retirement Study, Choudhury (2002) analyzed racial differences in net worth and the possible reasons for them. Their paper compared racial differences in the compositions of aggregate net worth, including non-housing equity, housing equity, financial assets and risky assets. The descriptive analysis showed the largest racial disparity was in the holdings of risky assets. Holding net worth constant, white households invested a significantly larger proportion of their net worth in risky and high-yield assets compared with black and Hispanic households, again, this may partially explain the racial differences in net worth gap.

According to the Federal Reserve Bulletin (2006), the data from the 2004 Survey of Consumer Finances showed that the gap in net worth somehow broadened between the white non-Hispanic families and nonwhite or Hispanic families over the years. The net worth for white non-Hispanic families grew much faster through the three-year period holding previous net worth constant. In contrast to other types of families, there was almost no change in the net worth of African American families, which further enlarged the racial disparity. It suggested racial differences in net worth not only have the effect of changing financial decisions, but also have long-term impacts on future accumulation and the relative economic status of blacks and whites.

In summary, the relationship between race and asset allocation are still unclear. According to the most recent data from the Survey of Consumer Finances, the net worth gap between white households and black households is growing. Undoubtedly this will arouse greater concern on this issue.

2.3. Other Factors

Previous studies have studies the relationship between investment objectives, households' characteristics and asset allocation. The households' characteristics can be divided into demographic factors (age, gender, marital status, number of children, race and education), socio-economic factors (income, total assets, total debts, working status, inheritance, homeownership and business-ownership) and attitudinal factors (risk tolerance).

2.3.1. Demographic Factors

2.3.1.1 Age

With the aging of the baby boom generation and its challenge to the Social Security system, given the average level of private and national savings, concern has arisen on how households allocate their assets over the life-cycle. Substantial literature exists with regard to the relationship between age and asset allocation.

Early studies on age-related patterns of asset allocation were focused on the relationship between age and the holding of risky assets. Morin and Suarez (1983) were among the first to present an empirical investigation of the relationship between age and the holding of risky assets using data from 1970 Canadian Survey of Consumer Finances. Through analysis of covariance, they found that there was a significant effect of age on the patterns of households' asset allocation and people became more risk averse as they aged.

Weagley and Gannon (1991) investigated investor asset allocations among the asset categories of savings, housing, financial securities and retirement investments. The multinomial logit model showed that age had a nonlinear relationship with assets held.

Younger households tended to be more likely to own more savings vehicles. The effect of age on the percentage of housing equity had a humped-shape with a peak at age 50 to 60 year age group. Similarly, financial securities and retirement investments ownership increased with age until a peak at ages 60 to 70 and 50 to 60 years, respectively.

Using the longitudinal data from Survey of Income and Program Participation (SIPP), Riley and Chow (1992) examined asset allocation and attitudes toward risks. The regression model showed that as people reached retirement age, they became more risk averse and tended to invest more in fixed income securities. Younger people, on the other hand, tended to be more concerned about capital appreciation and to invest more in risky assets.

Using a financial diary panel data, McInish, Ramaswami and Srivastava (1993) examined the effect of net worth and income on risk aversion. The effect of age on holding risky assets was also examined in the capital asset pricing model. According to the theory, people with less risk aversion would hold more high risk and high return assets, which would lead to greater net worth. For the group of people under 35 years old, there was no significant relationship between net worth and attitudes toward risks. In contrast, the relationship became strongly significant for those above 35 years old.

Using data from the 1992 Survey of Consumer Finances, Sung and Hanna (1996) examined the relationship between risk tolerance and financial and demographic factors. The effect of age measured as number of years until expected retirement on risk tolerance was studied. The logistic model showed those who expected to retire 30 years later were significantly less risk averse compared to those who expected to retire in less than 30 years.

Xiao (1996) examined how income and household life-cycle stage variables determined the holding of eleven financial assets with the data from the 1989 Survey of Consumer Finances. To measure life-cycle stage, variables used included head's age, marital status, employment, and presence of children in different age groups. The logistic model showed that older people tended to hold more financial assets compared with younger ones. To be more specific, younger families aged below 35 tended to hold fewer checking accounts, certificates of deposit, IRA/Keogh accounts relative to middle-aged (35-64) families while older families (>64) were more likely to hold those assets compared to middle-aged families.

Wang and Hanna (1997) also tested the life-cycle hypothesis using 1983-89 panel data of the Survey of Consumer Finances. The relationship of age and risk tolerance, which was measured as the ratio of risky assets to total net worth, was examined as the focus dependent variable. Their model showed that people tended to invest more in risky assets as age increased, indicating a significantly positive relationship between age and risk tolerance. The results were contrary to the life-cycle hypothesis that risk aversion increases with age.

While early studies on the relationship between age and asset allocation are focused on changes in attitudes toward risk as age increases, recent studies attempt to provide detailed information on the pattern of asset allocation over the life cycle. By pooling data from the Survey of Consumer Finances, Bertaut and Starr-McCluer (2000) examined the allocation of households' assets and liabilities. They categorized the assets into three types as safe, fairly safe and fairly risky assets. They found age had a mixed effect on asset and debt allocation. The holding of risky assets had a humped shape with

the peaks in the 45-54 age group in the 1989 and 1992 surveys and in the 55-64 age group in the 1995 and 1998 data, which suggested a cohort effect might exist.

Chambers and Schlargenhauf (2002) used various Net worth Supplements of PSID data to test the life-cycle hypothesis by examining portfolio allocation. The life-cycle hypothesis assumes people smooth consumption by allocating income across different life-stages. The results showed there was a humped pattern in the amount of stock-holding over the life cycle with the peak in the mid-fifties, which indicated risk aversion decreased as people were getting into their mid-fifties and risk aversion increased as people got older. In contrast, bond holding increased continuously with age until retirement while the pattern for holding money seemed to be U-shaped.

In a more recent study, Ameriks and Zeldes (2004) investigated the effects of age and cohort on asset allocation by pooling SCF data and a panel data from TIAA-CREF. The regression results showed the pattern of equity holding was humped-shaped in the age profile with the highest points between 49 to 58 years old. The cohort study showed that there was a significantly positive relationship between age and equity holding. For those cohorts aged 31 in 1989, the equity shares were almost three times as high in 1998 (31%) as in 1989 (11%), while for those cohorts aged 52 in 1989, the proportion of equity assets increased from 17% in 1989 to 28% in 1998.

In conclusion, the variable age seems to play a significant role in asset allocation decisions. Previous studies showed that the effect of age on holding risky assets had a mixed pattern. The proportion of risky assets increased as households aged until middle-age, then declined as households retired.

2.3.1.2 Gender

It has been a common observation that women are more conservative in investing assets compared with their male counterparts. A few studies have examined gender difference in investment decisions and in attitudes toward risk.

Hinz, McCarthy and Turner (1997) studied the Thrift Savings Plan (TSP) participation by Federal Government Workers. A logistic model was established to study the gender difference in participants. Their results showed that females are significantly less likely to hold risky assets and that the percentage of pension invested in risky assets is significantly lower for females.

Jianakoplos and Bernasek (1998) were among the first to examine the gender difference in risk aversion. Using Survey of Consumer Finance 1989 data, they constructed a measure of relative risk aversion by examining household holdings of risky assets as a percentage of total assets. People who are risk averse were defined as those with a lower proportion of risky assets. They found single women to be relatively more risk averse in holding risky assets compared with single men. In this study, participants' self-reported investment risk tolerance provided additional evidence that gender is significant in predicting risk taking. Women reported being less inclined to take investment risk with 63% of single women and 57% of married women perceiving themselves to be unwilling to accept financial risk, compared with 43% single men and 41% married men holding income and net worth constant.

Another study extended the above results by examining the factors that influence the proportion of household net worth invested in risky pension assets. Using data from the 1989 Survey of Consumer Finances, Bajtelsmit, Bernasek and Jianakoplos (1999)

studied gender differences in allocating household net worth into defined contribution plans. Since defined contribution plans don't guarantee a retirement benefit and they allow individuals to make their own investment decisions, defined contribution plans are considered more risky compared with defined benefit plans. The results showed there was a significant interaction effect between marital status and gender. Single men contributed significantly more into defined contribution plans compared with married men while single women contributed significantly less into defined contribution plans compared with married women.

Using the data provided by a firm, Bajtelsmit and VanDerhei (1996) examined the gender differences in investing in private pension plans. According to the firm's pension plan choices, the employees can invest their accounts in employer stock, government bonds, a guaranteed interest fund or a stock fund. Their result found female employees to be significantly less likely to invest in the employer stock and they tended to invest more in less risky assets.

Using data from the 1992 and 1995 Survey of Consumer Finance, Sunden and Surette (1998) also examined gender differences in the allocation of assets in retirement savings plans. Their results showed that the effects of gender on investment choices were more complicated than previous studies suggested. Gender and marital status had a significant interaction effect in predicting investment choices. They found women were less likely than men to have DC plans invested in stocks, which was consistent with the findings by Bajtelsmit et al. (1999). However, their study also found married women were least likely to have such plans, which was contrary to the findings by Bajtelsmit et al.

Embrey and Fox (1997) studied the differences in investment decision-making process by gender. Using a sample of singles drawn from the 1995 Survey of Consumer Finances, the results of their descriptive analyses were consistent with previous studies; single women self-reported to be more risk averse than single men. Little evidence was found, however, in the Tobit model, to support gender as a significant factor in predicting investment values in stocks versus certificates of deposit.

In a more recent study by Bajtelsmit and Jianakoplos (2000), pension participation, accumulations, and allocations differences were compared between employed men and employed women over the ten-year decade from 1989 to 1998. Employed men's participation in a pension or retirement plan at their current job dropped from 53% to 52%, while employed women's participation increased from 43% to 45% during the same period. As expected, participation in defined contribution plans increased dramatically for both men and women during this period compared with a sharp decline in participation in defined benefit plans. Gender differences with respect to the accumulations within defined contribution plans narrowed during this time with an increase from 40% to 44% in the ratio of women's to men's defined contribution plan accumulations.

A potential problem exists in previous studies, where one is that it is unable to determine who makes the investment decisions in a married couple household. To overcome this problem, Bernasek and Shwiff (2001) included detailed information about household financial decision-making and attitudes toward risk for respondents who were married or cohabiting. Using a survey on pension investments of universities' faculty members, the study found that the most significant differences between men and women

were their attitudes toward risk. Women were more risk averse compared to men. Men whose spouses or partners were more risk averse tended to make less risky investments with their pension plans compared to those whose spouses or partners were more willing to take risks. Women in the same situation tended to react in opposite ways to the attitudes toward risk of their spouses or partners. The results suggested that joint investment decision-making exists and is employed in a married household rather than investment decisions being made by a single individual.

In a longitudinal study of a cohort of households aged 51-61 years old in the first three waves (1992, 1994 and 1996) of the Health and Retirement Study (HRS), Lahey and Kim (2001) examined the non-housing net worth changes by gender, education, religion, income and age. They found as financial assets increased as a percentage of the total non-housing net worth, the increase would be allocated to a higher percentage of stocks for males compared with females.

In a more extensive study using data from the 1989, 1992, 1995, and 1998 Survey of Consumer Finances, Bertaut and Starr-McCluer (2000) documented major trends in household portfolios over fifteen years and measured the impact of demographic factors on household portfolio decisions. They found that households headed by females were more likely to own stocks compared with households headed by men. The inconsistence with other studies may be due to the fact that the household decision-making process was unclear or that other highly correlated factors were not controlled such as marital status.

In Ameriks' dissertation, he used the data from TIAA-CREF (Teachers Insurance and Annuity Association College Retirement Equities Fund) over the period 1995-2001 to examine the relationship between gender and portfolio choices. He found that there

were significant unconditional gender differences in portfolio choices. Males tended to invest more in stock markets compared with females. Controlling for current financial resources (household income), preferences and financial knowledge (education level and occupation), the differences of demand for equity became statistically insignificant between female-headed household and male-headed household (Ameriks, 2001).

In summary, there is mixed pattern of gender differences in asset allocation according to previous studies. Some studies concluded that women were more risk averse in investment attitudes and women allocated their portfolios differently compared with men, while on the other hand, some studies provided strong evidence that there was a significant interaction effect between gender and marital status.

2.3.1.3 Marital Status

Recent decades have witnessed broad changes in the traditional family. Divorce rates and single-parent families have increased dramatically, a potentially huge influence on households' decision making. Some studies have examined how changes in marriage would affect the households' financial decision making on asset allocation.

Financial problems have long been recognized as one of the main causes of family marital stress. In a study on debt, Burkett (1989) pointed out that almost 80% of divorces of young couples who were in their 30's were accounted for by financial problems. Schaninger and Buss (1986) used a panel study to compare the financial management and asset allocation between happily married couples and divorced couples. Their results showed that divorced couples, compared to continually married couples, differed substantially in management and allocation of assets in the early stage of marriage, which was associated with divorce status ten years later. The couples, who

were poorly managed financially (less net worth), were more likely to get divorced in the future.

Xiao (1996) examined the determinants in holding eleven household-held financial assets using the 1989 Survey of Consumer Finance. The eleven financial assets included checking accounts, savings accounts, certificates of deposit, money market accounts, cash value of life insurance, U.S. government savings bond, IRA or Keogh plans, savings plans, bonds, stocks and trusts. The logistic model showed that married households were significantly more likely to hold eight out of eleven assets when compared to single households. The eight asset items included checking accounts, U.S. government savings bonds, certificates of deposit, IRA or Keogh plans, savings bonds, cash value of life insurance, money market accounts and stocks. The significant effect of marital status on holding stocks, while controlling income and net worth constant, further indicated that married couples might be less risk averse in asset allocation.

Using the data from 1996 TIAA-CREF, Bodie and Crane (1997) investigated the asset composition both within and outside retirement accounts of respondents. Using the proportion of equities to total assets as the dependent variable, the Least-square multiple regression model showed that there was no significant relationship between marital status and the holding of risky assets. Although the authors argued that this insignificant effect might be due to the multicollinearity among some of the independent variables including marital status, age and gender, the study didn't further examine the interaction effects among these variables.

By pooling data from the 1992 and 1995 Survey of Consumer Finance, Sunden and Surette (1998) studied the effect of gender differences in households' asset allocation

decisions within retirement savings plans. Their results showed that there was no significant effect of gender alone on retirement asset allocation, but rather there was an interaction effect of gender and marital status on asset choices. The logistic model showed that married men were more likely to have defined-contribution plans compared with married women, while single men were less likely to have DC plans compared with single women.

In a more recent study, Lyons and Yilmazer (2004) used data from the 1995, 1998, and 2001 Survey of Consumer Finances to examine the relationship of marital status and women's decisions on allocating assets within defined-contribution plans. Their study introduced the bargaining model into married-couple financial decision-making and pointed out that asset allocation was the outcome of a joint decision-making process between husbands and wives. Their results showed that married households with wives, younger and more educated than their husbands, were less likely to invest in risky assets compared to other married households. It suggested that joint financial decision-making of married households might be processed through education and age.

In a related study on asset accumulation, Schmidt and Sevak (2006) examined the relationships of gender and marital status to asset accumulation. Their results found that single, female-headed families had significantly less net worth compared with married couples and single, male-headed families controlling for financial resources (income). This result supports findings that marital status might have an indirect effect on asset allocation decisions through financial resources available to households.

In general, previous studies found marital status to have an impact on households' asset allocation directly or indirectly. The effect of marital status on asset allocation has

been found to be inconsistent across studies that have included marital status directly. Other studies found a joint effect of gender and marital status in decisions regarding financial asset allocation. In summary, findings regarding relationships between marital status and asset allocation have been varied. None of these studies have provided strong evidence as to how marital status actually determines portfolio allocations.

2.3.1.4. Education

Another variable that has received attention in the study of asset allocation decisions is education. Households that are more highly educated are usually assumed to have an enhanced understanding of investments and financial knowledge, as their level of knowledge is rarely assessed.

Xiao (1995) used the 1989 Survey of Consumer Finance to investigate patterns in household financial asset ownership. In this study, education was included as a continuous variable in the logistic regression. Households with a higher education level were more likely to have checking accounts, savings accounts, money market accounts, bonds, stocks and IRA accounts.

In another study by Xiao (1996), the education effect on financial asset ownership was again examined. Education was categorized into four levels as under 12th grade, high school, college and post-college. The logistic model found a positive effect of education on asset ownership. Households with college education were significantly more likely to have all types of assets, other than trusts, in their portfolios, when compared with those with less than college degree. Households with postgraduate degrees were found to be more likely to have checking accounts, IRAs or Keoghs, money market accounts and bonds, when compared to those with less than a college degree.

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Schooley and Worden (1996) measured households' attitudes toward risk by investigating households' asset allocation decisions. Risk-taking by households was measured by the ratio of risky assets to total net worth. Risky assets were defined as the market value of all real estate held for investment purposes, mutual funds, corporate stocks, bonds, retirement accounts and an estimation of their human capital. The univariate analysis indicated that the education level had a significant, positive effect on risky assets holding.

Using the 1992 National Longitudinal Survey of Mature women, Papke (1998) investigated asset allocation regarding retirement plans. The results showed there was no significant relationship between education as a continuous variable and investment patterns. Similar evidence was found by Bodie and Crane (1997), the study showed college education was not a significant predictor of asset allocation and the authors argued that this insignificance might be partly due to the multicollinearity effects among the variables such as occupation, education level and gender.

Using data from TIAA-CREF, Poterba and Wise (1999) examined asset allocations in retirement savings plans. There was a significant effect for participants' education level and their income on asset allocation decisions. People with higher education and greater income were less likely to be risk averse, as measured by a higher proportion of assets being allocated into equities.

Grable (2000) examined the demographic, socioeconomic and attitudinal determinants of financial risk tolerance. Greater financial risk tolerance was found for people who were willing to bear more financial risks were more likely to be male, older,

married, with higher income, and more highly educated. The conclusion was that people with these characteristics would be more likely to allocate their assets into equities.

Hariharan, Chapman and Domian (2000) used the first wave of the Health and Retirement Survey (HRS) to examine the effects of risk tolerance on asset allocation. Education was found to be significantly related to portfolio composition. Holding income constant, people with higher education levels were more likely to invest in riskier assets such as bonds and equities.

Waggle and Englis (2000) examined the holdings of IRA accounts and confirmed that people with higher education were more likely to invest their IRA accounts into equities. The study argued that higher education people might have a better understanding of the risks associated with various assets, leading to a larger proportion of risky assets in portfolio composition.

In a related study, Kezdi and Willis (2003) examined the characteristics of stockholders by pooling data from the 1992 and 2002 waves of the Health and Retirement Study. When holding income constant, the results indicated when compared with high-school graduates, people with less than high school education to be less likely to have direct stock ownership and IRAs, while college graduates were significantly more likely to hold stocks and IRAs.

In general, although most studies showed that there was a positive relationship between education and risky asset ownership, studies exist that find no significant relationship between the two variables. The effect of education on asset allocation remains unclear.

2.3.1.5. Number of children

Whether to have children or not and how many are always very important

decisions households need to make. The presence and the number of children have all

been alleged to have important impacts on households' economic decision-making,

including financial asset allocation. Several papers on households' portfolio distribution

have included children as a controlling variable.

Smith and Ward (1980) were among the first to estimate the effects of children

on households' asset accumulation and composition. Using the Panel Study of Consumer

Durables and Installment Debt collected by the Survey Research Center of the University

of Michigan for the period 1967-1970, they estimated the influence of childbearing

patterns on net worth, durable goods and financial assets separately. The set of children

variables was divided into three categories: number of children over 4 years old, number

of children under 5 years old and the interaction term of number of children under 5 years

old and marriage duration. The regression results showed that the set of children variables

were significant in all regressions, except for durables. They found that the number of

children over four years old had a significant negative effect on total family savings and

financial assets holdings.

Bajtelsmit, Bernasek and Jianakoplos (1999) used data from the 1989 Survey of

Consumer Finances to examine gender differences in risk aversion measured by the

allocation of net worth into defined contribution pensions. Based on Heckman's two-step

procedure, they found that people who had DC plans were more likely to be younger, to

be employed by a large firm, to have a higher education and to have more children.

Controlling other factors, the number of children had a significant positive effect on the

amount of net worth invested in DC plans for both women and men, indicating a decreasing relative risk aversion.

Using data from the 1995 Survey of Consumer Finances, Gutter, Fox and Montalto (1999) investigated racial differences in investment decision-making. The logistic regression was used to determine the likelihood that a household held risky assets, including stocks and/or business assets, in their portfolio. They found that changes in the presence of children had different effect on risky asset ownership between white and black households controlling other factors. The presence of children had no significant effect on risky asset ownership by white households, but increased the likelihood of risky assets held by black households.

In a related study by Bernasek and Bajtelsmit (2002), they used the data from a spring 2000 survey of university faculty employed at five Colorado universities to examine women's participation in households' financial decision-making. The variable of children was coded as dummy variable equal to one if there were children under 18 years old in the ordered Probit regression model. Compared to the women as primary decision-maker, the joint decision-makers were more likely to have children under 18. The presence of children under 18 in the households had a statistical negative effect on women's involvement in savings and investment decisions.

By pooling the data from the 1995, 1998 and 2001 Survey of Consumer Finances, Lyons and Yilmazer (2004) examined the asset allocation in women's defined contribution plans. They divided contribution plans into two types: mostly bonds and mostly stocks. All the three multinomial logit models, unitary model, the first collective-

type model and the complete collective model,   showed that number of children had no significant effect on predicting the type of defined contribution plans.

In summary, most of the above studies found a significant relationship between financial asset allocation decisions and the presence of children or the number of children in the households.

2.3.2 Socioeconomic Factors

2.3.2.1. Income

Despite the fact that historical returns on stocks are much higher than the returns on riskless assets, most US households at all income levels still don't hold stocks directly. The stockholding puzzle has been examined in several previous studies.

As early as 1971, using the data from the 1960, 1961, and 1962 Survey of Consumer Finances, Usher and Cragg (1971) investigated how and to what extent households diversified their portfolios among eight types of financial assets including checking accounts, savings accounts, savings bonds, corporate stocks, mortgages, corporate bonds, state and local bonds, and US government bonds. Two forms of statistical analyses were employed on the sample of 965 households. Three income variables were included; current disposal income, disposable income lagged one period, and disposable income lagged two periods. In the multinomial logit functional model, there was no significant relationship between the three income variables and the total amounts of financial assets held at each level of diversification; i.e., the number of different types of financial assets which household held. The amount of money held was investigated as well, which included checking accounts and savings accounts. In the logarithmic regression model, again none of the income variables were significant.

Haliassos and Bertaut (1995) investigated the stock holding puzzle that few U.S households held stocks during three decades although the historic returns for stocks were much higher compared with other assets. Using the 1983 Survey of Consumer Finances, they found that holding stocks either directly or through mutual funds increased with income, when income was measured as the sum of all income reported by the respondents. More than 50% of households in the high-income quintiles (top 95%) held stocks. In contrast to stock holdings, riskless assets (savings accounts, money market funds, certificates of deposit, and bonds) were more widely held and held in larger amounts by all households.

Guiso, Jappelli and Terlizzese (1996) used cross-sectional data from the 1989 Bank of Italy Survey of Household Income and Net worth (SHIW) to examine the holding of risky assets. In the Tobit model, they investigated the effects of various demographic and socioeconomic variables on the demand for risky assets including family size, education, age, income, total net worth, marital status, pension status, gender, income risk, health risk, and a proxy for liquidity constraints. The demand for risky assets was measured in two steps determining 1) whether or not to own risky assets, and 2) how to allocate between safe and risky securities. Income was defined as labor income plus pension income. The regression results showed that the demand for risky assets increased as income increased.

Using the cross-sectional data from the 1978 Survey of Consumer Financial Decisions conducted by SRI International, King and Leape (1998) examined household portfolio allocation and the observed differences in portfolio composition among households. The sample showed that most households owned incomplete portfolios,

perhaps due to the existence of transaction costs and the infeasibility of optimal portfolio construction according to King and Leape. The variables measuring assets and liabilities were divided into four groups including: 1) checking accounts and liquid savings (savings accounts, credit union share accounts and money market funds); 2) equity (stocks and stock mutual funds), municipal bonds, taxable bonds and other assets; 3) homes, less liquid savings(savings certificates, U.S. savings bonds, and money market instruments) and contractual savings (pension or retirement plan accounts, single-premium annuities and cash value of life insurance); and 4) home mortgages and other liabilities. The relationship between these four categories and the explanatory variables was investigated, including current employment income, marginal tax rate, age of head of the household, marital status, net worth, occupation, education, employment status, and aversion to risk etc. The probit regression results showed that income from employment had little effect on asset ownership or the demand for homes and home mortgages. Yet the marginal tax rates seemed to be more important in determining the probability of asset ownership. With an increasing marginal tax rate, households were less likely to own checking accounts, liquid and less liquid savings, owner-occupied housing and home mortgages.

Bertaut (1998) investigated the stock-holding behavior of U.S. households using data from the 1983 and 1989 Survey of Consumer Finance. The CCAPM (Consumption Capital Asset Pricing Model) was applied as theoretical base to examine the relationship between stock-holding behavior and socioeconomic and demographic factors including financial and nonfinancial net worth, income, education, occupation, risk aversion, marital status and age. The bivariate probit regression analysis showed that income was not significant in predicting the probability of holding stocks in either year. As to the

conditional probabilities of changing stockholder status between 1983 and 1989, the results showed that households which were more willing to take financial risks, as defined by the ratio of net worth invested in equities, tended to be more educated and in higher income levels.

Using data from the 1998 Survey of Consumer Finance, Cunningham (2001) examined the effect of economic factors on household financial asset allocation decisions including net worth, income, head's occupation, education level and age. The Ordinary Least Squares regression results showed that there was no significant relationship between household income and the proportion of net worth allocated to stocks.

In a longitudinal study, Lahey and Kim (2001) used the data from the first three waves of the HRS to examine the longitudinal changes in net worth by household income and other demographic factors. Income was employed to divide the sample into quantiles. In the three waves (1992, 1994, and 1996), all income quantiles increased their holding of stocks except the lowest quantiles.

In general, income has a significant influence on households' financial asset allocation. Most previous studies found that, as households' income increased, the probability of holding risky assets increased.

2.3.2.2. Net worth

Households' net worth is an important economic factor when considering households' portfolio decisions. Net worth, total assets minus total debts, measures the strength of the family's financial situation. Households with higher net worth have more choices when making investment decision.

Using the data from the 1960, 1961, and 1962 Survey of Consumer Finances, Usher and Cragg (1971) investigated how and to what extent households diversified their portfolios. The log-linear regression model found net worth was significant in explaining the total amounts of financial assets held. As net worth elasticities increased, the level of diversification within financial assets increased as well. For households who had greater levels of diversification and greater net worth levels, unit increases in net worth brought about greater increases in money holdings than did unit increases in net worth for lower net worth households. However, there was no significant relationship between net worth and the logarithm of the ratio of money to non-money balances in each portfolio.

Haliassos and Bertaut (1995) used the 1983 Survey of Consumer Finances to examine the effects of several factors on stock-holding decisions; including income, net worth, age, liquidity and business cycles; in an attempt to provide a possible explanation for the low incidence of stockholding. The logistic regression results showed that there was a significant positive relationship between net worth and stock-holdings.

King and Leape (1998) examined household portfolio allocation and net worth elasticities of demand for a range of assets and liabilities. A change in net worth would not only change the tendency of a household to own an asset but also changed the quantity demanded for each asset. The probity regression showed that the ownership elasticities of net worth were small for most assets except for corporate equities, taxable bonds, and municipal bonds. The demand elasticities varied significantly across different assets. At the sample mean level of net worth, the point elasticity for municipal bonds and equity were close to unity while the elasticities for checking account and liquid

savings were only one half, which indicated that the holding of equities were highly related to net worth level.

According to Bertaut (1998), financial net worth was defined as including relatively liquid and riskless assets such as stocks held directly or through mutual funds, bonds, trusts and other managed accounts, IRAs, and the cash value of life insurance, less consumer loans. Nonfinancial net worth included the net values of any loans outstanding, for real estate, automobiles and other durable goods. From the bivariate Probit results, there was a significant positive relationship between financial risk taking and both financial net worth (the differences between financial assets and financial liabilities) and nonfinancial net worth (the differences between nonfinancial assets and nonfinancial debts). In both years, both nonfinancial net worth and financial net worth were significantly positively related the probability of holding stocks. Financial net worth had a smaller coefficient than nonfinancial net worth in 1983 and a larger coefficient in 1989.

In a longitudinal study, Hariharan, Chapman and Domian (2000) investigated the influences of factors on the risk tolerance and asset allocation of households near retirement. The Capital Asset Pricing Model (CAPM) was employed as the theoretical base and data from the Health and Retirement Survey were employed for the analysis. The regression results showed that net worth was significant and positively related to the holding of stocks and bonds, although the coefficients were relatively small.

Using data from 1998 Survey of Consumer Finance, Cunningham (2001) employed the OLS model to show that with a one-dollar increase in net worth, the probability of holding stocks was significantly increased.

Based on an assumption that total assets and total debts may have independent effects on household portfolio decisions, Weagley and Gannon (1991) used total assets and total debts as two independent variables in predicting households' asset allocation instead of net worth. According to the risk level, they categorized financial assets into four categories: savings, housing, financial securities and retirement investments. Using data from a 1986 survey of 249 households in Missouri, they found as total assets increased a larger proportion of household assets was placed in riskier assets, on average, households were relatively more willing to invest in financial securities compared to housing. Greater debt was found to reduce households' savings in tax-favored retirement accounts.

In summary, previous studies showed there was consistent relationship between asset allocation and net worth level, and net worth was positively related to risky assets holding.

2.3.2.3. Homeownership

Real estate is one of the most important assets in households' portfolios. Houses are different from other assets since they are durable consumption goods, as well as a long-term investment and savings vehicle. Therefore, the ownership of a principal residence underlies inter-temporal net worth accumulation and asset allocation decisions. A number of previous studies have investigated the influence of housing on portfolio choices.

Devaney and Rayburn (1988) analyzed the households' optimal asset allocation with the presence of homeownership. Based on all sales (140,000 transactions) of single-unit residential real estate for Memphis over the period 1970-1984, they calculated the

returns on housing. The results demonstrated that there was a weak correlation between housing appreciation returns and the returns on financial assets including equities, short and long-term bonds. Goetzmann (1993) used a value-weighted repeated-sales index in four urban US markets (Atlanta, Chicago, Dalas and San Francisco) though the years from 1971 to 1985 and also calculated the appreciated returns on housing. Their analysis further confirmed that the appreciation return of housing was weakly correlated with those found in financial assets. Their results indicated that households were able to benefit from diversification among asset classes.

Henderson and Ioannides (1983) treated housing as a risky asset and pointed out that the value of the housing mortgage cannot exceed the value of the house, referred as the housing investment constraint. Flavin and Yamashita (1999) examined the impact of this housing constraint on households' optimal allocation of financial assets. Using the data from 1998 PSID, they estimated the mean return and risks for both financial assets and housing assets. They found that there was a negative relationship between net worth accumulation and the ratio of housing to net worth, which indicated a life-cycle pattern of households' holding financial assets including stocks and bonds. The housing constraint had an influential effect on the trade-off between risk and return remaining to households. Young households might hold more bonds since they usually had an outstanding balance on their home mortgage. As households got older and had a lower balance, they would pursue more returns for higher risks by holding stocks.

Sung and Hanna (1996) used a sample of households, each with an employed respondent, from the 1992 Survey of Consumer Finances to compare effects of financial and demographic variables on estimated and actual risk tolerance. The estimated risk

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tolerance was estimated by the question from the SCF, which allowed respondents to categorize themselves as taking substantial or above average risk, taking average risk and no risk. The actual risk tolerance was calculated on the basis of the logit of risk tolerance on the log of non-investment income only. Using bivariate regression analysis, homeownership had a significant effect on actual risk tolerance. Households owning a home without a mortgage had significantly higher risk tolerance than otherwise similar households who rented or had an outstanding balance on their home mortgage. The logistic regression showed homeownership had no significant effect on estimated risk tolerance.

Flavin and Yamashita (2002) examined the mean-variance efficiency of portfolios, as households maximized satisfaction with their holdings of housing and financial assets including Treasury bills, Treasury bonds and stocks. Using panel data from the Panel Study of Income Dynamics from 1968 to 1992, real returns of housing appreciation were calculated. The real after-tax returns on the four assets; which are stocks, houses, Treasury bonds and Treasury bills ranked from highest to lowest. The correlations between the returns of each of the four assets were statistically insignificant. Using efficient frontiers of optimal portfolios with different housing constraints, they found as the ratio of housing value to net worth approached the range between 0.4 and 0.8, the proportion of stocks over financial assets reached its peak at about 60 percent.

Lyons and Yilmazer (2004) investigated how defined contribution plans were invested among "mostly bonds", "mostly stocks" and "split between bonds and stocks", using a panel data from the 1995, 1998, and 2001 Survey of Consumer Finances. Homeownership was used as an independent variable in multinomial logit models.

Married men who were homeowners were less likely to invest their defined contribution plans into "mostly bond", compared to a diversified allocation. There was no significant difference between investing into "mostly stocks" and "splitting between stocks and bonds" for the homeowners.

In a word, previous studies found that households benefit from diversifying their portfolios between housing and financial assets, since the appreciation return of housing had weak correlation with the return of financial assets. Homeownership was an important factor in predicting financial asset holdings. Most studies found that the effect of homeownership on stock-holdings had a life-cycle pattern, through the trade-off between risk and return available to households over time.

2.3.2.4 Working Status

Working status\labor force participation is a main economic characteristic of a household. A number of papers in studying households' financial asset allocation have used it as a controlling variable.

Using only the unmarried households in the 1995 Survey of Consumer Finance, Embrey and Fox (1997) studied four ratios based the percentage of financial or total assets invested in each category: stocks, certificates of deposit, houses, and business assets. A smaller proportion of women were reported to be employed full-time compared with men. The Tobit model found there was no significant difference between full-time employed and other working status in the ratio of stock-holding for both men and women. For women, those employed full-time were significantly less likely to have certificates of deposit and houses compared with those not employed full-time. For men, employment full-time had no significant effect on having certificates of deposit, houses or businesses.

Xiao (1996) used 1989 Survey of Consumer Finance to examine ownership of eleven financial assets. The labor force participation was coded as working in some way versus not working at all. The logistic regression found that labor force participation had a mixed effect on the ownership of each of the eleven assets. Employed households were more likely to have checking accounts, savings accounts, savings plans, savings bonds and life insurances with cash values. There was no significant relationship between employment and holding of certificates of deposit, IRAs and Keoghs, MMAs, stocks and trusts. And employed households were less likely to have bonds.

Using multiple imputed data from the 1989 Survey of Consumer Finances, Schooley and Worden (1996) compared self-reported risk tolerance and the risk level of the portfolios of the households. The actual risk tolerance of households was measured by the proportion of net worth invested in risky assets including human capital, mutual funds, stocks and corporate stocks. The multivariate linear regression found that the households where neither the head of household or partner was a full-time earner were less likely to hold risky assets, compared to otherwise similar households.

King and Leape (1998) examined household portfolio allocation by extending the conventional portfolio choice model. They took a stratified random sample of 6010 U.S. households from the 1978 Survey of Consumer Financial Decisions conducted by SRI International. The probit regression model showed that the being employed had a significantly positive effect on the probability of holding a checking account, contractual savings, taxable bonds, while it was negatively related to the probability of holding liquid savings, less liquid savings, corporate equity, municipal bonds, homes and other assets.

In summary, previous studies found that households employed in some way were more likely to hold risky assets compared with households not working at all since the former households were more likely to be risk tolerant with a stable income.

2.3.2.5 Inheritance

Since it is a common wisdom that inheritance is a major source of net worth inequality, households received or expecting an inheritance may have different decisions as to how to allocate their assets. Several studies have used inheritance as a controlling variable in their study of households' asset allocation.

Embrey and Fox (1997) used a sample of unmarried households from the 1995 Survey of Consumer Finances data to study the gender differences in investment decisions. They examined the determinants of four ratios based on the proportion of financial or total assets invested in each category: stock, certificates of deposit, houses, and business assets. The descriptive statistics showed that more women had received an inheritance compared with men and a larger proportion of men were expecting an inheritance. The Tobit model showed that expecting an inheritance had a significant positive effect on holding stocks for women. There was no significant relationship between received inheritance and the ratio of certificates of deposit for both men and women. Women who received an inheritance were less likely to own business assets and more likely to have houses. Men who were expecting an inheritance were more likely to have business assets while less likely to have houses.

Using the data from 1995 Survey of Consumer Finances, Gutter, Fox, and Montalto (1999) examined racial differences in the probability of holding stocks and/or business assets, which was defined as risky assets in the paper. The logistic regression

model revealed that the households which received an inheritance were more likely to own risky assets. The expectation of receiving an inheritance had no significant effect on the probability of having stocks or business assets.

Wang and Hanna (1997) used the 1983-1989 panel data of the Survey of Consumer Finances to examine the relationship between age and the holding of risky assets by households. Risk tolerance was measured by the proportion of total net worth invested in risky assets. The results of the Tobit model showed that households who expected an inheritance were more likely to invest in risky assets.

In conclusion, previous studies found that households who received an inheritance or were expecting an inheritance had higher risk tolerance and were more likely to hold risky assets. Since few studies have investigated the relationship between inheritance and households' financial assets holdings, further evidence needs to be provided to better understand the effect of inheritance expectations and receipt.

2.3.3. Attitudinal Factor: Risk Tolerance

Risk tolerance is one of the key factors in making asset allocation decisions. There is great concern that households with low risk tolerance in their investment plan may be less likely to meet their financial goals and, in particular, saving for their retirement.

Schooley and Worden (1996) made a comparison between households' self-reported risk tolerance and the actual risk level in their portfolios using the data from 1989 Survey of Consumer Finances. Actual risk-taking by households was measured by the ratio of risky assets to net worth, in which risky assets were defined as those provided uncertain nominal cash flows including human capital. The inclusion of human capital as

part of risky assets resulted in a high proportion of risky assets in households' portfolios. Self-reported risk level was categorized as taking substantial financial risks, above average financial risks, average financial risks and no risks. The t-tests suggested the mean values of risky assets to net worth were significantly different across the four categories. They found households' self-reported risk tolerance was highly correlated in their actual risk levels in their portfolios. The group willing to take no risks was found to have the lowest mean risky assets ratio, while the group willing to take substantial risks was found to have the highest mean risky assets ratio.

Using a sample of single-person households from the data of 1995 Survey of Consumer Finances, Embrey and Fox (1997) explored gender differences in investment decisions in stocks, certificates of deposit, houses and business assets. Stocks and certificates of deposit were analyzed by the ratio of the proportion of financial assets invested in these two assets. Houses and business assets were measured as the ratio of total assets invested in these two assets. They used a Tobit model to explore the determinants of these investment decisions including investor net worth, attitude toward risk (SCF measure ranging from substantial risk, above average risk, average risk and no risk), investment horizon (measured by age and three-month investment decisions) and respondents' characteristics (race, marital status and education). They found that there is a positive relationship between self-perceived risk tolerance and the ratio of stock holdings and business asset ownership for men. For women who self-identified as risk averse held less certificates of deposit compared to those taking average risk. Women taking no risks were significantly more likely to have houses and less likely to have business assets compared with those taking average risks.

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Using the 1983-1989 Survey of Consumer Finance, Bertaut (1998) examined households' stock-holding decisions. The bivariate probit regression model showed self-perceived risk tolerance (SCF measure) had a significant positive effect on the probability of stock ownership in both years. The probability of holding stocks was reduced by 0.07 in 1983 and 0.1 in 1989 separately for the respondents who were unwilling to take financial risks compared with those who took average risks, whereas the probability of stock-ownership increased by 0.08 in both years for those who took substantial financial risks.

Sunden and Surette (1998) used the data from 1992 and 1995 Survey of Consumer Finance to examine how households' differed in allocating assets in their defined contribution plans. The multinomial logit regression model showed that the respondents were more likely to choose "mostly stocks" category and less likely to choose "mostly bonds" category for those who were willing to take substantial risks and average risks compared with those who were unwilling to take risks.

Gutter, Fox and Montalto (1999) used data from the 1995 Survey of Consumer Finance to examine the probability that the respondents held risky assets in their portfolios. Risky assets consisted of stocks and/or business assets. The SCF risk question was used as one of the independent variables in the logistic regression model. The logistic regression model revealed that households with a willingness to take risks were more likely to own risky assets. For those who reported themselves as risk-takers, 58% actually owned risky assets, compared to 24% of those who were risk averse.

Friend and Blume (1975) was the first who used the ratio of an individual's assets invested in risky asset to measure a person's risk tolerance. This approach was further

extended by Siegel and Hoban (1982), Morin and Suarez (1983), Bellante and Saba (1986), Riley and Chow (1992) and others. Using the 1984 data from the Survey of Income and Program Participation (SIPP), Riley and Chow (1992) investigated the relationship between individuals' risk tolerance and their allocation of assets. Relative risk aversion index (RRAI), as one minus the risky assets to total net worth, was used to measure the degree of risk aversion. According to Barsky, Juster, Kimball and Shapiro (1997), the relative measure of risk aversion had a significantly positive effect on the probability of holding stocks.

Xiao (1996) used data from the 1989 Survey of Consumer Finance to examine the ownership of eleven financial assets including checking accounts, savings accounts, certificates of deposit, IRAs/Keoghs, savings plans, savings bonds, money market accounts, bonds, stocks, trusts and life insurances with cash values. There were about a half of respondents reported themselves as willing to take at least average risks. The logistic regression model found that risk-taking had no significant effect on holding of checking accounts, savings accounts, or savings bonds. Compared to those who were unwilling to take risks, households who took at least average risks were more likely to have certificates of deposit, IRAs/Keoghs, savings plans, MMA, bonds, stocks, trusts and life insurances with cash values.

Based on the Capital Asset Pricing Model, Hariharan, Chapman, and Domian (2000) examined asset allocation decisions of respondents nearing retirement. Data from the first wave of the 1992 Health and Retirement Survey was used to examine financial asset allocation among risk-free securities, stocks, bonds and risky assets invested in bonds. The risk-free assets were defined as Treasury Bills. Stocks and bonds were two

risky assets with different properties. Risk tolerance was an index with four values ranging from least risk tolerant to most risk-tolerant. They found the proportion of financial assets invested in risky assets increased as risk tolerance increased. Risk tolerance had no effect on the allocation of risky assets between stocks and bonds.

In summary, previous studies found risk tolerance (SCF measure) had a significant positive effect on the holding of risky assets, including stocks. Households who were willing to take above average risks were more likely to invest in stocks.

2.4. Summary

Most studies on households' asset allocation only examined the holding of risky assets using the proportion of risky assets to total assets as the dependent variable. Still, there are a few studies which categorized assets into categories in different ways according to their study purposes.

Demographic, socioeconomic and attitudinal factors determining asset holding decisions have been extensively examined in previous studies, including age, gender, marital status, education, number of children, income, net worth, inheritance, working status, homeownership and risk tolerance. Previous studies found the above factors are significant in predicting households' financial asset allocation. However, patterns of the effects of these variables on asset allocation decisions are mixed and still unclear. Thus, the relationships between the above factors and asset allocation decisions still need to be further examined.

Racial differences in related field of net worth accumulation have also been examined. With the enlarging of the net worth gap between white households and black households, a possible explanation could be the racial differences in preferences in asset

allocation and attitudes toward risk. Thus, further empirical evidence needs to be

provided to help understand policy options to reduce this gap.

Chapter Three Theoretical Framework

This chapter represents a theoretical model based on the Expected Utility Theory and Capital Asset Pricing Model and Capital Market Line (Sharpe, Lintner, & Mossin, 1964), which form the theoretical basis for the empirical model used in this study and to help explain how different types of households allocate their net worth among numerous financial investment vehicles. In the first section, the Expected Utility Theory is introduced and different types of risk are defined and classified. In the second section, the Capital Asset Pricing Model (CAPM) and the Capital Market Line will be introduced to explain how financial assets will be categorized and why different households prefer some assets over others. Testable hypothesis will be presented in the last part of the chapter.

3.1 Expected Utility Theory

Expected utility theory (EUT) is one of the most often used theories in decision-making under risk (Hanna & Chen, 1997). Expected utility is the sum of the utilities associated with all possible outcomes, weighted by the probability that each outcome will occur. In a simple case, utility is assumed to have a particularly convenient form, in which utility is a weighted sum of two different consumptions: $U(c_1)$ with the probability π_1, and $U(c_2)$ with the probability π_2.

$$U(c_1, c_2, \pi_1, \pi_2) = \pi_1 U(c_1) + \pi_2 U(c_2) \tag{3.1}$$

According to the formula, if c_1 and c_2 are the only two bundles or sets of bundles available for consumption choices, the sum of π_1 and π_2 should be one. The utility

obtained is called the expected utility and represents the pattern of consumption (c_1, c_2).
This function is referred to as an expected utility function, or a von Neumann-Morgenstern utility function.

Under EUT, an individual is assumed to make a rational choice to maximize his expected utility.

$$EU(X) = \sum_{i=1}^{n} \pi(x_i)u(x_i) \text{, subject to } \sum_{i=1}^{n} \pi(x_i) = 1 \text{, where} \qquad (3.2)$$

π =probability

EU =expected utility

x_i =possible outcome

Since the outcomes are uncertain, the formula explains how decisions are made under uncertainty. However, the utility function alone can not explain how consumers make decisions since the rate of return in reality fluctuates around the mean (the expected utility). Risk results from the difference between the actual return and the average expected return. Consumers each have a different tolerance or preference toward different risk levels. The inverse of risk tolerance is sometimes called risk aversion. For a risk-averse consumer, the expected utility of different outcomes is less than the utility of the expected value of the outcomes. A consumer may also prefer risk; in such a case, the consumer prefers the expected utility of the outcomes over the utility of the expected value. In addition, the risk not only measures the chance of gaining money, but also measures the chance of losing money.

The simple expected utility model is useful to help understand the concepts like risk aversion and risk preference. However, the basic problem in personal financial

planning is the allocation of resources over time. Thus in the t period consumption-investment decision, the household is facing a lifetime consumption sequence:

$$C_t = (c_1, c_2, \cdots, c_t) \tag{3.3}$$

In the multi-period model the elementary prospects are the different possible lifetime consumption sequences, that is, the different possible values of C_t. The random prospects are the probability distribution of C_t. Households make allocation decisions over time according to their tastes, which can be represented by a utility function below and the rankings of random prospects are chosen on the expected utility.

$$U(C_t) = U(c_1, c_2, \cdots, c_t) \tag{3.4}$$

Holding consumption in other periods constant, the marginal utility of consumption in any given period is positive, that is, more consumption is preferred to less in any given period. Moreover, the relative concavity, convexity or linearity of the utility function $U(C_t)$ represents risk aversion, risk preference, and risk neutrality respectively.

By definition, strict concavity of the function $U(C_t)$ says that for any two consumption sequences $C_t = (c_1, c_2, \cdots, c_t)$ and $\hat{C}_t = (\hat{c}_1, \hat{c}_2, \cdots, \hat{c}_t)$ and any α such that $0 < \alpha < 1$,

$$U(\alpha c_1 + (1-\alpha)\hat{c}_1, \alpha c_2 + (1-\alpha)\hat{c}_2, \cdots, \alpha c_t + (1-\alpha)\hat{c}_t)$$
$$> \alpha U(c_1, c_2, \cdots, c_t) + (1-\alpha)U(\hat{c}_1, \hat{c}_2, \cdots, \hat{c}_t) \tag{3.5}$$

Or equivalently

$$U(\alpha C_t + (1-\alpha)\hat{C}_t) > \alpha U(C_t) + (1-\alpha)U(\hat{C}_t), \quad 0 < \alpha < 1 \tag{3.6}$$

In words, strict concavity of the function U implies that the utility of a weighted average of two consumption sequences is greater than the weighted average of the utilities of the two sequences.

Now suppose that we consider financial asset allocation in which the individual obtains the consumption sequence C_t with probability α or the sequence $\hat{C}_t$, with the probability of $1 - \alpha$. Thus the expected return from the investment is $\alpha C_t + (1 - \alpha)\hat{C}_t$; its expected utility is $\alpha U(C_t) + (1 - \alpha)U(\hat{C}_t)$. Expression (3.6) indicated that when the individual's utility function is concave, the expected utility of investment in risky assets is less than the utility of its expected returns: the individual is risk-averse in the sense that if given the choice, he prefers to have expected return for certain rather than invest in risky assets, that is, he prefers less risky assets (such as bonds) to risky assets (such as stocks), at any given level of expected return. In order for the consumer to prefer the riskier alternative, its expected return would have to be given from the less risky alternatives.

The above conclusion is based on the analysis of risk aversion in any given period. Thus, for example, if $U(C_t)$ is concave in C_t, it is also concave with respect to any component c_i $(i = 1, \cdots t)$ of C_t; that is, holding consumption in other periods constant, $U(C_t)$ is a concave function of c_i for any $i = 1, \cdots t$. For example, in a simple case of two-period ($t=2$) consumption-investment model, given some level of consumption at period 1, the individual's period 1 portfolio decision depends on the shape of his utility function $U(c_1, c_2)$ as a function of consumption in period 2. Thus, if $U(c_1, c_2)$ is a concave function (risk-averse) of (c_1, c_2), then $U(c_1, c_2)$ is also concave in c_2, which

implies that the individual is risk averse in choosing among different probability distributions of period 2 consumption associated with different investment decisions at period 1.

To keep things simple, we assume that the consumer only works in period 1 with income and net worth as w_1 and, at period 2, the consumer only consumes. Let $\tilde{R}_p$ be the one-period return on the portfolio p, $\sigma(\tilde{R}_p)$ be the standard deviation of $\tilde{R}_p$, and $(w_1 - c_1)$ be the investment in p at period 1, then consumption in period 2 is:

$$\tilde{c}_2 = (w_1 - c_1)(1 + \tilde{R}_p) \tag{3.7}$$

where $\tilde{R}_p \overset{>}{\underset{<}{=}} R'_p$, if $\sigma(\tilde{R}_p) \overset{>}{\underset{<}{=}} \sigma(R'_p)$

Then the expected mean and standard deviation for $\tilde{c}_2$ are as below:

$$E(\tilde{c}_2) = (w_1 - c_1)\left[1 + E(\tilde{R}_p)\right] \tag{3.8}$$

$$\sigma(\tilde{c}_2) = (w_1 - c_1)\sigma(\tilde{R}_p) \tag{3.9}$$

The concavity of utility function as a function of (c_1, c_2) implies the marginal utility decreases as consumption in either period increases. Thus, given the decreasing marginal utility function for a risk-averse consumer, the expected utility is a declining function of the standard deviation of return $\sigma(\tilde{R}_p)$ and an increasing function of mean return $E(\tilde{R}_p)$.

Similarly, when an individual prefers risk, his utility function is strictly convex,

$$\begin{aligned} &U(\alpha c_1 + (1-\alpha)\hat{c}_1, \alpha c_2 + (1-\alpha)\hat{c}_2, \cdots, \alpha c_t + (1-\alpha)\hat{c}_t) \\ &< \alpha U(c_1, c_2, \cdots, c_t) + (1-\alpha)U(\hat{c}_1, \hat{c}_2, \cdots, \hat{c}_t) \end{aligned} \tag{3.10}$$

Or $U(\alpha C_t + (1-\alpha)\hat{C}_t) < \alpha U(C_t) + (1-\alpha)U(\hat{C}_t), \quad 0 < \alpha < 1$ (3.11)

The convexity of utility function for the risk lover implies the marginal utility increases as consumption increases in any period. Similarly, we can expect the expected utility function of a risk lover to be an increasing function in both the mean return $E(\tilde{R}_p)$ and standard deviation of return $\sigma(\tilde{R}_p)$.

Finally, when the individual's utility function is linear,

$$
\begin{aligned}
&U(\alpha c_1 + (1-\alpha)\hat{c}_1, \alpha c_2 + (1-\alpha)\hat{c}_2, \cdots, \alpha c_t + (1-\alpha)\hat{c}_t) \\
&= \alpha U(c_1, c_2, \cdots, c_t) + (1-\alpha)U(\hat{c}_1, \hat{c}_2, \cdots, \hat{c}_t)
\end{aligned}
\quad , \quad (3.12)
$$

the individual is risk-neutral in the sense that he is indifferent between investing in risky assets or receiving for certain expected return.

According to the above theory, individual's preferences determine the shape of his utility function. Thus, households that are different, in terms of their socio-demographic profiles, that represent different preferences for risk, have variations in their investment decisions over time. If households have different utility functions, there should exist different exposure to risk among these households, resulting from their individual indifference curves.

3.2 Risk Defined

It is almost impossible for households to allocate their assets without understanding risk. There is a risk/return trade-off. Generally, as the level of risk rises, as measured by the deviation of the return, the expected rate of return also rises and vice versa. Before the theoretical model is applied to the study, how risk is perceived and defined is explained firstly.

Markowitz (1952) defined the variance of the rate of return as the appropriate measure of risk in the portfolio theory. There are two general types of risks: systematic and unsystematic risk. The combination of systematic and unsystematic risk is defined as the total risk (or portfolio risk). Systematic risk is associated with risks within the economic system. Sharpe (1963) defined systematic risk as the proportion of an asset's variability that can be attributed to common factors, resulting from general market and economic conditions that cannot be diversified away. Systematic risk can also be called undiversifiable risk and includes market risk, interest rate risk, purchasing power risk, and exchange rate risk, etc. Similarly, unsystematic risk or diversifiable risk is defined as the proportion of an asset's variability that can be diversified away. There are two types of unsystematic risk: business risk and financial risk, associated with the risks that exist within specific economic enterprises.

Virtually all assets bear systematic risk, since systematic risk exists within the economic system, which is not avoidable or diversifiable. Market risk is the potential of an asset's price to fluctuate with financial markets. All assets, whether stocks, bonds or depository accounts, are exposed to market risks including recessions, wars, economic structure changes, and even consumer preferences changes and other psychological factors, etc. Interest rate risk is the potential loss/gain resulting from unexpected of changes in interest rates. Such changes generally affect securities' prices inversely. As a major risk for bonds, bond-holders face interest rate risk more directly than stock-holders, as present values of bonds move inversely to interest rates. Purchasing power risk or inflation risk is the chance that assets or the income from those assets lose purchasing power as a result of unexpected inflation. The real return is greater (lesser), the lower

(greater) the rate of inflation, for any given nominal return. Individuals may face

exchange-rate risk directly by investing into foreign assets or indirectly as firms with

revenue from other countries are affected by changes in the value of foreign currencies.

Besides the sources of non-diversifiable systematic risk, investors also face

nonsystematic risk, which is unique to a particular business enterprise or the security

which represents ownership in that enterprise, and is attributed to factors such as business

and financial risk. Business risk is the risk associated with the nature of the investment

itself. Different businesses vary in business risk, given their management or market

demand for products, etc. Financial risk refers to how the firm finances its assets through

the use of financial leverage. Financial risk is generated when a firm borrows funds.

Leverage increases returns in good times, but results in financial ruin or bankruptcy in

bad times, due to the inability of firms to repay their debts with their reduced revenue.

All investors bear risk, even an investor who does nothing. By "doing nothing"

and holding cash or a savings account, the investor is still making an investment and

bearing some risk, such as purchasing-power risk. All investors face a trade-off between

risk and return. Risk is concerned with the uncertainty regarding whether the realized

return will equal the expected return. The goal for the investor is to construct a portfolio

which offers the highest expected return, given the individual's willingness to bear risk.

Portfolio theories determine the combination of risk and return that allows the investor to

achieve the highest return for a given level of risk.

3.3 The CAPM Model

The Markowitz model, proposed in 1952 by Harry Markowitz, was the first to

apply returns and risks to explain portfolio diversification based on the utility-

maximization framework commonly used by economists. This model subsequently led to the development of the Capital Asset Pricing Model (CAPM) by William F. Sharpe (1964), John Lintner (1965), and Jan Mossin (1966). The CAPM is one of the most important theoretical concepts in finance and it expands the notion of optimal diversification of portfolios to the valuation of individual securities, as well as to the market on the whole.

Figure 3-1 Capital Market Line
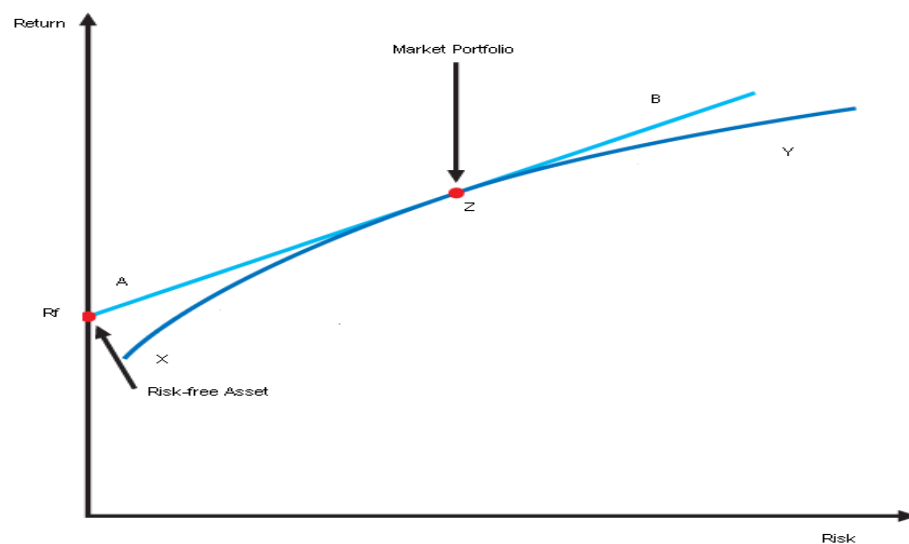
When the market portfolio is combined with the risk-free asset, the result is the Capital Market Line denoted by the CAPM. In Figure 3-1, line AB is the capital market line, which begins from risk-free asset (point A) on the vertical axis. Each point on the line AB indicates a combination of the risk-free assets and risky assets. At point A, where the investor takes no risk and invests in merely risk-free assets, the return is R_f. As the investor moves along line AB, expected return increases with risk. XY stands for the efficient frontier, consisting of the efficient sets of risky portfolios. Any portfolio providing the highest return for a certain amount of risk must lie on the efficient frontier. Any portfolio offering a lower return given the amount of risk is not efficient and lies

below XY. Point Z represents a portfolio consisting completely of risky assets, where the efficient frontier (XY) is tangent to the capital market line (AB).

The following equation represents the capital market line (AB), where R_ρ is the return of the portfolio, R_f is the risk-free rate, σ_ρ is the dispersion of the portfolio and σ_m is the dispersion of the market.

$$R_\rho = R_f + \left(\frac{R_m - R_f}{\sigma_m} \right) \sigma_\rho \qquad\qquad (3.13)$$

The equation indicates that the return on a portfolio is the sum of the return earned on a risk-free asset and a risk premium that depends on (1) the degree to which the return on the market surpasses the risk-free return and (2) the standard deviation of the portfolio proportionate to the standard deviation of the market. Thus, the capital market line designates that to earn a greater return, the investors must bear greater risk.

Figure 3-2 Different Portfolios for Different Investors
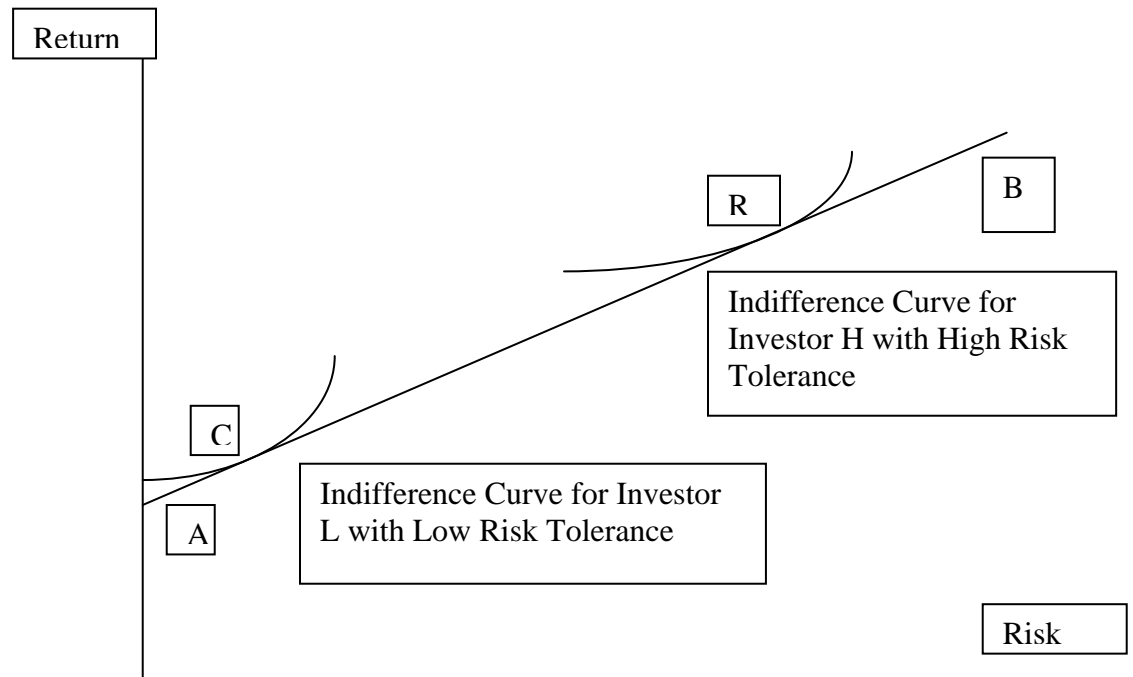
The portfolio an investor acquires not only depends on the capital market line but also the investor's marginal rate of substitution of risk for return, which can be represented by the slope of indifference curves. Figure 3-2 shows the portfolios chosen by two investors with low risk tolerance (L) and with high risk tolerance (H). The indifference curve L stands for the investor with lower risk tolerance and the indifference curve H represents the investor with high risk tolerance. Point C, where the indifference curve is tangent to the capital market line, indicates the optimal portfolio a risk-averse investor to choose, consisting of a large share of the risk-free asset. Point R, where the indifference curve of the risk-favoring investors is tangent to the capital market line, indicates the optimal portfolio which consists of a large percentage of risky assets. The equilibriums at points of C and R designate that risk-averse investors, such as L, are more likely to invest in less risky assets compared to risk-favoring investors, such as H.

3. 4. Financial Asset Categories

Based on the Expected Utility Theory, Capital Asset Pricing Model and Capital Market Line, it is reasonable to divide financial assets into four broad categories reflecting their degree of risk. For the purpose of this study, financial assets have been categorized into four categories: (1) equities, which will include directly-held stocks, mutual funds invested in stocks, IRAs/Keoghs invested in stocks, thrift-type retirement accounts invested in stocks and other managed assets with equity interests, such as annuities, trusts and managed investment accounts; (2) bonds, which will include savings bonds, state and local bonds, mortgage-backed bonds, government bonds and corporate and foreign bonds, mutual funds invested in bonds, retirement accounts invested in bonds and other managed assets invested in bonds; (3) cash accounts, which will include cash,

CDs and liquid assets including checking accounts, savings accounts, money market

deposit accounts, money market mutual funds and margin accounts at brokerages; (4)

other financial assets, which will include cash values of life insurance policies, loans

from the household to someone else, future proceeds, royalties, futures, and non-public

stocks, etc. Table 3-1 summarizes the asset items in each financial asset category.

Table 3-1   Financial Asset Category

Financial Asset Categories	Financial Asset Items
Equities	-Directly-held stocks; -Mutual funds invested in stocks; -IRAs/Keoghs invested in stocks; -Thrift-type retirement accounts invested in stocks; -Other managed assets with equity interests, including annuities, trusts and managed investment accounts;
Bonds	-Savings bonds; -State and local bonds; -Mortgage-backed bonds; -Government bonds; -Corporate and foreign bonds; -Mutual funds invested in bonds; -IRAs/Keoghs invested in bonds; -Thrift-type retirement accounts invested in bonds; -Other managed assets invested in bonds, including annuities, trusts, and managed investment accounts;
Cash Accounts	-Cash; -CDs ; -Liquid assets including checking accounts, savings accounts, money market deposit accounts, money market mutual funds and margin accounts at brokerages ;
Other Financial Assets	-Cash values of life insurance policies; -Non-public stocks; -Future proceeds; -Royalties; -Futures, etc.

Figure 3-3 Financial Asset Categories
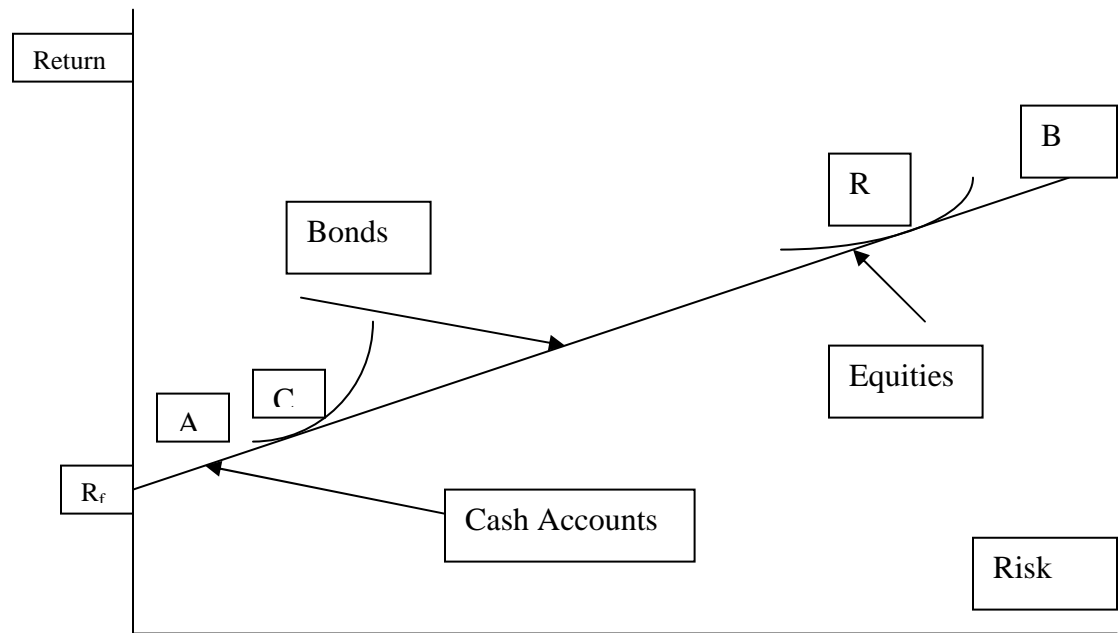
Figure 3-3 represents how the three broad categories of financial assets can be reflected on the Capital Market Line. The slope of the line indicates the additional return associated with each additional unit of risk. Illustrations such as Figure 3-3 are used to indicate how the three categories of financial assets may fall on the capital market line and how the substitution of one category of financial assets increases the households' return and risk exposure. Point C, where the capital market line is tangent to the indifference curve, represents the optimal portfolio of the households with lower risk tolerance including a large proportion of the safe financial assets and fairly safe financial assets. Similarly, point R, where the capital market line is tangent to the indifference curve, represents the optimal choice of the portfolio for a more aggressive household, which consists mostly of risky financial assets. The more risk-averse households C are more likely to invest in cash accounts and bonds and less likely to invest in equities, when compared to risk-favor households R.

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3.5. Research Hypothesis

Based on the above reasoning, portfolios of households with a lower risk tolerance should contain fewer amounts of risk than those of more aggressive households. That is, households which differ in their socio-demographic profiles, which affect their risk tolerance and time preferences, have observable variations in investment behavior over time. Thus, separating households into groups can be justified. If households have different preferences for risk, there should exist different utility surfaces among these households, resulting in different demand for each asset category. Summary of the hypotheses are presented in Table 3-2.

3.5.1. Race and Year

With the variance in returns in financial markets, households' financial asset allocation can be expected to change accordingly over time. The SP 500 index went up steadily from around 400 at the beginning of 1992 to the highest point of 1517 in 2001, and then it dropped to 1058 in December in 2003 (Figure 1-3). Since the data was collected a year before the publishing year, both the probability of having equities and the proportion invested in equities were expected to increase steadily from 1992 to 2001. As the annual return of long-term corporate bonds dropped from 1995 to 1999, and then increased until 2002, and then dropped again in 2003 (Figure 1-5), the probability of holding bonds, as a proportion of financial assets, is expected to decrease in 1995 and 2001. As the interest rate of 6-month Certificates of Deposit went up from 1992 to 1995, and was relatively stable until in 2001 (Figure 1-4), both the probability of cash account ownership and the proportion of financial assets invested in cash accounts are expected to increase in 1995 and decrease in the 2004 survey year.

It is likely that minority groups have received less exposure to investment information due to the fact that most of financial products have been targeted at non-Hispanic whites. Moreover, cultural and social backgrounds may be different between majorities and minorities, resulting in different preferences for asset categories. Thus, white households are speculated to be more risk tolerant than black households, who are more and, consequently, risk-averse and invest in less risky assets over time.

Thus, when compared to equity holding of white-headed households in 1992, both the probability of equity ownership and the equity share of the portfolios are expected to be a positive sign in 1995, 1998, 2001 and 2004, for white-headed households. When compared to white households in 1992, other households would have a negative sign in 1992, 1995, 1998 and 2004, and a positive sign in 2001 for a black-headed, Hispanic-headed or other racial household. When compared to bond holding of a white-headed household in 1992, both the probability and the proportion of bond holding are expected to have a positive sign for white-headed households in 1998 and 2004, and a negative sign for a white-headed household in 1995 and 2001; a negative sign for a black-headed, Hispanic-headed or other racial household in 1992, 1995, 1998, 2001 and 2004, when compared to the white households of 1992. When compared to cash account holding for a white-headed household in 1992, the probability of cash account ownership would be negative in 2004, and positive in 1995, 1998 and 2001, and the proportion would be negative over time for white-headed households. For other races, the probability would be a negative sign, but compared to white-headed households in 1992, proportion would be positive in 1992, 1995, 1998, 2001 and 2004.

3.5.2. Other Demographic Factors

3.5.2.1. Average Age

As households age, they become more risk-averse due to their age and the life span available to adjust a portfolio as well as to recover losses. Moreover, as households near retirement, they anticipate having no employment income to compensate for losses and thus, may be less willing to take greater risks. Further, the life-cycle hypothesis, as described by Ando and Modigliani (1963), indicates that at younger and retired life-cycle stages, dissaving is more likely to occur. As such, risk may be less desirable than at middle life-cycle stages, when saving is at its peak. While employed households are saving for retirement, retired households begin to deplete their savings, reducing their risk tolerances accordingly. Thus, holding of equities would increase as respondents age, until it reaches a peak at middle age (in 50s) then it will decline. Accordingly, the holding of bonds and cash accounts increases as households age.

3.5.2.2. Gender

Women are more risk averse compared with men. Thus, female respondents are expected to be less likely to hold equities and invest less in equities, when compared to male respondents. Also, both the probability of holding bonds and cash accounts and the proportions of financial assets invested in bonds and cash accounts to be greater for female respondents, when compared to male respondents.

3.5.2.3 Marital Status

As people get married, they may either become more risk averse or willing to take more risks, once they share decisions with their wives/husbands, if they do, in fact, share the decisions. Based on previous studies, financial decisions are more likely to be

joint decisions between husbands and wives, rather than individual decisions. Thus, married respondents are expected to be more likely to hold equities and have a greater proportion of financial assets invested in equities, when compared to their unmarried counterparts. Also, both the probability of holding bonds/cash accounts and the proportion invested in bonds/cash accounts are expected to be greater for married respondents.

3.5.2.4. Education

Education, as a measure of human capital, has a positive effect on risk tolerance. Better educated households are expected to have greater financial knowledge and understanding of risks. Thus, better-educated households are expected to be more likely to have equities and bonds and to invest a greater proportion of their financial assets in equities and bonds, and less likely to have cash accounts and to invest less in those cash accounts.

3.5.2.5. Number of Children

With more children, households have less discretionary income and they become more risk averse. Thus, the number of children is expected to have a negative effect on the holding of equities, while a positive effect on the holding of cash accounts and bonds.

3.5.3. Socioeconomic Factors

3.5.3.1. Annual Household Income

Households at a higher income level have more financial resources available to diversify their portfolios. Moreover, greater income allows these households to recover losses with new payment. Thus, income is expected to have a positive effect on the

holding of all financial assets including equities, bonds, cash accounts and other financial assets.

3.5.3.2. Net Worth

Households that have a greater value of net worth have a greater foundation on which to build their portfolios. Moreover, the marginal utility of a dollar is lower for net worthy households, when compared to less net worthy households. Thus, net worth is expected to have a positive effect on the holding of equities, bonds and cash accounts and other financial assets.

3.5.3.3. Homeownership

There is a trade-off relationship between housing investments and financial asset investment with limited financial resources available. Thus, homeowners are expected to be less likely to invest in equities, bonds, cash accounts and other financial assets, when compared to non-homeowners.

3.5.3.4. Business-ownership

Business-ownership is usually treated as risky assets. The ownership of business will deplete risks that a household is willing to take with its financial resources. Thus, business-ownership is assumed to have a negative effect on the holding of equities and positive effect on the holding of bonds and cash accounts.

3.5.3.5. Working Status

Households headed by employees have a stable income source. Most have some retirement security due to Social Security retirement income. Thus, these households are expected to be more willing to bear risks compared with households headed by the self-employed, the retired or someone not working at all. Thus, when compared to households

headed by employees, both the probability of having equities and the proportion of

financial assets invested in equities are assumed to be lower for households headed by the

self-employed, the retired, or someone not working at all. Also, the probability of having

bonds and cash accounts and their proportions are greater for households headed by self-

employed and the retired, while less for households headed by someone not working at

all.

3.5.3.6. Inheritance/Gifts

Households who received an inheritance or expecting an inheritance are usually

more risk tolerant than those otherwise similar households. Thus, a positive relationship

between receiving/expecting an inheritance and the holding of equities, bonds and cash

accounts is expected.

3.5.3.7. Defined Benefit Plans and Defined Contribution Plans

The main differences between defined contribution plans and defined benefit

plans are the guaranteed retirement benefits by employers that exist in defined benefit

plans, while the employee has investment choices within defined contribution plans. Thus,

when compared to households with only defined benefit plans at current jobs, both the

probability and the proportion of holding equities and bonds would be greater for

households with only contribution plans and households with both plans.

3.5.4. Attitudinal Factor: Risk Tolerance

It is obvious that households who are willing to take more risks will invest more

in equities and have a greater proportion of financial assets invested in equities.

Households who are risk averse are more likely to hold more bonds and cash accounts

and to have a greater proportion of financial assets invested in bonds and cash accounts.

3.5 Summary

Based on the Expected Utility Theory, Capital Asset Pricing Model and Capital Market Line, financial assets are divided into four broad categories: (1) equities (including directly-held stocks and indirectly-held stocks); (2) bonds (including directly-held bonds and indirectly-held bonds); (3) cash accounts (including certificates of deposit and liquid accounts); (4) other financial assets. The four categories include all financial assets and are mutual exclusive to each other. Table 3-2 summarized the hypotheses for the interaction terms between race and year, other demographic factors (including average age, gender, marital status, number of children in households and education level), socio-economic factors (including income, net worth, working status, DB or DC plan participating, inheritance, homeownership and business ownership) and an attitudinal factor (risk tolerance).

,

Table 3-2: Summary of Research Hypotheses

Variables	Equities		Bonds		Cash Accounts		Other Financial Assets	
	Ownership	Share	Ownership	Share	Ownership	Share	Ownership	Share
Interaction Terms: Race* Year								
Non-Hispanic White*2004	+	+	+	+	-	-	+	-
Non-Hispanic White*2001	+	+	-	-	+	-	+	-
Non-Hispanic White*1998	+	+	+	+	+	-	+	-
Non-Hispanic White*1995	+	+	-	-	+	-	+	-
Non-Hispanic White*1992	Reference		Reference		Reference		Reference	
Non-Hispanic Black*2004	-	-	-	-	+	+	+	+
Non-Hispanic Black*2001	+	+	-	-	+	+	+	+
Non-Hispanic Black*1998	-	-	-	-	+	+	+	+
Non-Hispanic Black*1995	-	-	-	-	+	+	+	+
Non-Hispanic Black*1992	-	-	-	-	-	+	-	+
Hispanic*2004	-	-	-	-	+	+	+	+
Hispanic*2001	+	+	-	-	+	+	+	+
Hispanic*1998	-	-	-	-	+	+	+	+
Hispanic*1995	-	-	-	-	+	+	+	+
Hispanic*1992	-	-	-	-	-	+	-	-
Others*2004	-	-	-	-	+	+	+	+
Others*2001	+	+	-	-	+	+	+	+
Others*1998	-	-	-	-	+	+	+	+
Others*1995	-	-	-	-	+	+	+	+
Others*1992	-	-	-	-	-	+	-	-
Average Age								
Average Age <35	-	-	-	-	-	+	-	-
Average Age 35-54	Reference		Reference		Reference		Reference	
Average Age 55-64	-	-	+	+	+	+	+	-
Average Age 65+	-	-	+	+	+	+	+	-
Education								
Less than a High School Diploma	-	-	-	-	+	+	+	+
High School Diploma	-	-	-	-	+	+	+	+
Some College	-	-	-	-	+	+	+	+
Bachelor's Degree	Reference		Reference		Reference		Reference	
Graduate Degree	+	+	+	+	-	-	-	-
Marital Status								
Married/Living with a Partner	Reference		Reference		Reference		Reference	
Not Married or Living with a Partner	-	-	-	-	-	+	+	-
Gender								
Male	Reference		Reference		Reference		Reference	
Female	-	-	-	-	+	+	+	+
Number of Children	-	-	-	-	-	-	-	-
Log Income	+	+	+	+	+	+	+	+
Log Net Worth	+	+	+	+	+	+	+	+
Working Status								
Work for Someone Else	Reference		Reference		Reference		Reference	
Self-Employed/Partnership	-	-	-	-	+	+	+	+
Retired/not Working(above 65)	-	-	-	-	+	+	+	+
Not Working(below 65)	-	-	-	-	-	-	-	-
DB vs. DC plans (current Job)								
Both	+	+	+	+	-	-	-	-
Only DB Plans	Reference		Reference		Reference		Reference	
Only DC Plans	+	+	+	+	-	-	-	-
Neither	-	-	-	-	+	+	+	+
Expecting Inheritance/Gift								
Yes	+	+	+	+	+	+	+	+
No	Reference		Reference		Reference		Reference	
Received an Inheritance/Gift								
Yes	+	+	+	+	-	-	-	-
No	Reference		Reference		Reference		Reference	
Homeownership								
Yes	-	-	-	-	+	+	+	+
No	Reference		Reference		Reference		Reference	
Business-ownership								
Yes	-	-	-	-	+	+	+	+
No	Reference		Reference		Reference		Reference	
Risk Tolerance								
Substantial	+	+	+	+	-	-	-	-
Above Average	+	+	+	+	-	-	-	-
Average	Reference		Reference		Reference		Reference	
None	-	-	-	-	+	+	+	+

Chapter Four   Empirical Methodology

This chapter presents the empirical methodology employed. Explanation of the data and variables used to implement the analysis followed by a brief summary of the statistic model used in our study.

4.1 Data

The dataset used in our study was pooled from the 1992, 1995, 1998, 2001 and 2004 Survey of Consumer Finances (SCF). The Survey of Consumer Finances is conducted on a triennial basis by the Federal Reserve Board cooperating with the Statistics of Income Division (SOI) of the Internal Revenue Service. This survey provides very detailed information on households' financial conditions, including assets, debts, credit information, working history and status, income from every source, attitudes and expectations, and demographic characteristics. The data are collected every three years cross-sectionally with a geographically randomly selected sample. In order to more accurately measure aggregate asset holdings, the survey over-samples high-income households and uses weights to be representative of the U.S. population.

To address issues with missing data and to analyze incomplete datasets, a multiple imputation technique has been applied the SCF since 1989. By using stochastic multivariate methods, multiple imputation (MI) is a statistical procedure which substitutes for each missing value, two or more values generated to simulate the sampling distribution of the missing values (Kennickell, 1991). The SCF uses five imputations to replace each missing value since 1989. As a result, each SCF consists of five complete datasets, referred to as "replicates" or "implicates".

Missing values are common in a survey, which cause problems of both efficiency and bias for the users of the data. The reduced sample size due to non-responses to some survey questions means less efficient estimation of and possible bias toward the nonrespondents. The multiple imputation technique not only improves efficiency and moderates possible bias but also provides information which can be used to estimate the extra variability due to missing values. Thus, multiple imputed datasets provide a basis for more valid statistical inference and tests of significance.

Due to the unequal-probability sampling design in the SCFs, weights are important for statistical analysis. For the 1992-2004 pooled datasets used in this paper, the weight variable, X42001, was used as recommended by SCF. For a detailed discussion of this weight, refer to Kennickell and Woodburn (1999). With this weight variable, Montalto and Sung (1996) found that, although the parameter estimates from the multivariate regression were unbiased, the estimation of the standard variance of those parameters were invalid. As a result, statistical inferences would not be valid based on invalid significance tests. To solve this problem, the weight variable is applied only to the descriptive analysis, not the multivariate regression.

The sample size of the 1992 SCF consisted of 3,906 households, with five implicates for each households. The sample size for the 1995 SCF was 4,229; 4,305 for the 1998 SCF; 4,442 for the 2001 SCF and 4, 519 for the 2004 SCF, each with five implicates.

4.2. Variables

4.2.1. Dependent Variables

In order to get a complete view how the race of the household affects portfolio allocation decisions through the years from 1992-2004, total financial assets of households are categorized into four groups: cash accounts, bonds, equities and other assets. The four dependent variables are the likelihood of holding these four categorizes and for those that had them, the percentage of total financial assets invested in each category.

Cash accounts are calculated by adding up the amounts held by households in the following accounts: Certificates of deposit, cash and liquid assets including checking accounts, savings accounts, money market mutual funds, money market deposit accounts and margin accounts at brokerages.

Bonds include U.S. savings bonds, tax-exempt bonds (state and local bonds), mortgage-backed bonds, US government and government agency bonds and bills, corporate or foreign bonds and indirectly-held bonds. Indirectly-held bonds are bond funds including :1) bond mutual funds; 2) IRAs/ Keoghs invested in bonds; 3) thrift-type retirement accounts invested in bonds; 4) and other managed assets invested in bonds, including annuities, trust and managed investment accounts (MIAs). The bond mutual funds are the full value of mutual funds if described as bond mutual fund or the half value of combination mutual funds. IRAs/ Keoghs invested in bonds are calculated by the full value if mostly invested in bonds, or the half value if split between stocks/bonds or bonds/money market, or a one-third value if the asset is split between stocks/bonds/ money market. Thrift-type retirement accounts invested in bonds are calculated as the full

value if mostly invested in bonds or the half value if split between stocks and interest earning assets. Other managed assets (including annuities, trusts and MIAs) with equity interest are calculated as the full value if mostly invested in bonds, or half value if split between stocks/MFs & bonds/CDs, or mixed/diversified.

Equities include directly and indirectly-held stocks. The indirectly-held stocks consist of: 1) stock mutual funds; 2) IRAs/ Keoghs invested in stocks; 3) thrift-type retirement accounts invested in stocks; 4) and other managed assets with equity interest including annuities, trust and managed investment accounts (MIAs). The stock mutual funds are the full value of mutual funds if described as stock mutual fund or the half value of combination mutual funds. IRAs/ Keoghs invested in stocks are calculated by the full value if mostly invested in stocks, or half value if split between stocks/bonds or stocks/money market, or the one thirds value if split between stocks/bonds/money market. Thrift-type retirement accounts invested in stocks are calculated as the full value if mostly invested in stocks or the half value if split between stocks and interest earning assets. Other managed assets (including annuities, trusts and MIAs) with equity interest are calculated as the full value if mostly invested in stocks, or half value if split between stocks/MFs & bonds/CDs, or mixed/diversified.

Other financial assets include cash values of life insurance policies, loans from the households to someone else, future proceeds, royalties, futures and non-public stocks, etc. Other financial assets are calculated as the total financial assets not held in equities, bonds or cash accounts.

4.2.2 Independent Variables

The independent variables included four types of variables: interaction terms between race and year, other demographic characteristics (age, gender, marital status, education, and number of children), socioeconomic characteristics (income, net worth, inheritance, DB/DC plans, employment status, homeownership, and business-ownership) and an attitudinal factor (risk tolerance).

The interaction terms of race and year are categorized into twenty groups: white non-Hispanics in 1992, white non-Hispanics in 1995, white non-Hispanics in 1998, white non-Hispanics in 2001 and white non-Hispanics in 2004; black non-Hispanics in 1992, black non-Hispanics in 1995, black non-Hispanics in 1998, black non-Hispanics in 2001 and black non-Hispanics in 2004; Hispanics in 1992, Hispanics in 1995, Hispanics in 1998, Hispanics in 2001 and Hispanics in 2004; Other races (including Asians and others) in 1992, other races in 1995, other races in 1998, other races in 2001 and other races in 2004. The white non-Hispanics observed in 1992 are used as the reference group.

Age is calculated as the average age of couples (married or living with a partner) or the age of the respondent for singles. It is categorized into four groups including less than 35, 35-54, 55-64 and 65 or above. The 35-64 age group is used as the reference group. Treating age as a group of dummy variables has several advantages over just using age or age squared. Using age alone is based on the assumption that age has a linear effect. Age squared captures nonlinear effects to some degree, but may not fully reflect the age effect. In addition, the categories allow us to make comparison between specific age groups.

The variable education is calculated as the highest degree attained for a couple or for the respondent, if the respondent is single. The education level has five groups; less than a high school diploma, high school diploma, some college, bachelor's degree (reference group), and graduates or above.

Gender of the respondent has two groups: females and males (reference group). Marital status of the head can be categorized as: married/living with a partner (reference group) and neither married nor living with a partner.

Number of children is entered as the actual number of children in the households, include natural children, step children and foster children of the head/spouse/partner.

In each survey year, a question is asked "How much was the total income you and your family living here received in year X (one year before the survey year) from all sources, before taxes and other deductions were made?" The value of income for each year is adjusted into 2004 dollars. From previous literature, income has a nonlinear effect on equity holding. In order to capture the possible nonlinear effect of income, the log value of income is included in the model.

Net worth (total assets minus total debts) is employed as a continuous variable in our study. The values are adjusted into 2004 dollars. Similar to income, the log value of net worth is included in our model.

There are two categorical variables employed to interpret inheritance. The first is regarding whether received a substantial inheritance/gift or not. The other is regarding whether expect to receive a substantial inheritance/gift.

The variable of DB/DC plans has four groups, including either head or spouse/partner have a defined benefit pension on their current jobs (reference group),

having a defined contribution plans on the current jobs, having both DB and DC plans on the current jobs, and having neither of the two plans on the current jobs.

Working status of the head is categorized as working for someone else (reference group); self-employed/partnership; retired, disabled or a student/homemaker/not working and age 65 or older; and other groups not working (under 65 and out of labor force). For the variable of homeownership, owning a principal residence is compared to not having owned housing. For the variable business-ownership, having business is compared with not having businesses.

For the attitudinal factor of risk tolerance, a question is asked in each year of the SCF "Which of the statements on the page comes closest to the amount of financial risk that you and your spouse/partner are willing to take when you save or make investments?" The respondents are asked to choose from taking substantial financial risks expecting to earn substantial returns, taking above average financial risks expecting to earn above average returns, taking average financial risks expecting to earn average returns (reference group) and not willing to take any financial risks.

Table 4-1   Summary of Independent Variables

Variables	Description
Race*Year	white*1992(reference group); white*1995; white*1998;white*2001; white*2004;black*1992;black*1995;black*1998;black*2001;black*2004; Hispanic*1992;Hispanic*1995;Hispanic*1998;Hispanic*2001;Hispanic*2004; Others*1992;others*1995;others*1998;others*2001;others*2004
Average Age	less than 35; 35 -54(reference group); 55-64; 65 and above
Education	less than a high school diploma; high school diploma; some college; bachelor's degree (reference group); graduates or above
Gender	male (reference group); female
Marital Status	married or living with a partner (reference group); neither married or living with a partner
Number of Children	1, 2, 3, 4…………..
Log Income	continuous variable
Log Net Worth	continuous variable
Inheritance	received an inheritance or not: yes; no(reference group) expecting an inheritance or not: yes; no(reference group)
DB/DC Plans	either head or spouse/partner have a defined benefit pension on the current job(reference group); having a defined contribution plans on the current job; having both of DB and DC plans; having neither of the two plans.
Working Status	working for someone else (reference group); self-employed/partnership; retired or disabled or student/homemaker/not working and age 65 or older; other groups not working (under 65 and out of labor force)
Homeownership	having principal residence; not(reference group)
Business-ownership	having business assets; not(reference group)
Risk Tolerance	taking substantial financial risks expecting to earn substantial returns, taking above average financial risks expecting to earn above average returns, taking average financial risks expecting to earn average returns (reference group); not willing to take any financial risks.

4.3. Repeated-Imputation Inference (RII)

Rubin (1987) showed that his "repeated-imputation inference" (RII) method was

valid in statistical inferences by creating imputation results. The results were combined to

generate valid estimates, confidence intervals, and significance tests under uncertain

results from missing values. RII is the last step in Multiple Imputation technique,

applicable to both linear and non-linear models estimated by least squares or maximum

likelihood techniques.

Montalto and Sung (1996) provided an extensive discussion of use of the RII method with the SCF. According to them, the best point estimate of a parameter of interest is the average of the point estimated derived from all of the five implicates independently. However, to estimate the total variance of each parameter, two imputation variances: "within" and "between" must be calculated. The "within" imputation variance is the average of the five separate variance estimates. The "between" imputation variance comes from the imputation of the missing values and is calculated as the sum of the squared deviation of the point estimated in each implicate from the overall average point estimate, divided by the number of implicates minus one. The detailed calculation of the point estimate and total variance is as follows:

$$\overline{Q}_M = \frac{\sum_{i=1}^{m} Q_i}{m} \tag{4.1}$$

$$\overline{U}_M = \frac{\sum_{i=1}^{m} U_i}{m} \tag{4.2}$$

$$B_M = \frac{\sum_{i=1}^{m} (Q_i - \overline{Q}_M)^t (Q_i - \overline{Q}_M)}{m-1} \tag{4.3}$$

$$T_M = \overline{U}_M + (1 + m^{-1}) B_M \tag{4.4}$$

$$\sigma = \sqrt{T_M} \tag{4.5}$$

Where

$m = 5$ implicates

Q_i (i=1,….m) represents the five point estimates from the five imputations, which may be means, proportions or totals from the simple descriptive statistics or coefficients derived from regression results.

$\overline{Q}_M$ is the average of the five estimates, which is the best point estimator.

$\overline{U}_M$ = the average of the "within" imputation variance

B_M = the "between" imputation variance

T_m =total variance

σ =standard deviation

After applying the RII technique to account for imputation variance, the point estimates and their variances estimated by this technique can be used to conduct significance tests for the multiple-imputed data. Appropriate tests of significance should be used for tests of different purposes. A t-test could be used to test the significance of the estimation of the parameter of each independent variable or to test whether the point estimates between two groups are significantly different. To test whether a number of parameters are statistically significant simultaneously, an F-test should be used (for detailed formulas, see Montalto and Sung, 1996). Therefore, statistical results and inferences will be more valid and reliable based the RII technique in processing missing values.

4.4. Statistical Method

4.4.1. Heckman Selection Model

Because of a substantial proportion of households that report zero holdings in some financial assets, type I Tobit model has been often used in this field of study. The type I Tobit model, the traditional Tobit model, is based on the assumption that the parameters for the effect of the independent variables on the probability that an observation is censored and the effect on the conditional mean of the non-censored

observations are the same. This assumption restricts coefficients on the choices of whether to hold and how much to hold to have the same sign because the coefficients of the two different decisions are coming from estimating the same equation, which could result in possible model misspecification. To overcome this shortcoming, the standard Heckman selection model, the two-step approach, is introduced in modeling households' decisions on the holdings of financial assets in our study.

The Heckman selection model was motivated by Heckman (1979), under an observation that individuals (or households) make a two-step decision concerning the purchase of a certain good, the decision to consume and once that is decided, the level of consumption of that good. This approach has been extensively used to model the demand for a certain goods, including cigarettes (Blaylock and Blisard, 1992), alcohol (Yen and Jensen, 1995), and food consumed away from home (Byrne, Capps, and Saha, 1996).

The standard Heckman selection model is as follows:

Selection equation: $Y_{1i}^* = X_{1i}\alpha + v_i$ (4.6)

Main equation: $Y_{2i} = X_{2i}\gamma + u_i$ (4.7)

Where Y_{1i}^* is a latent variable with the value of 1 if a household invested in any of the four financial categories: equities, bonds, cash accounts or other financial assets, and 0 if a household has no investment in this category. Y_{2i} is the proportion of financial assets invested in the four categories, observable only if $Y_{1i} = 1$. The error terms, u_i from the main equation and v_i from the selection equation, are assumed to have a bivariate normal distribution with a correlation coefficient ρ_{uv}. Identification conditions are chosen as $[\sigma_v, \sigma_u, \rho_{uv}] = [1, \sigma_u, \rho_{uv}]$. Least squares regression using the observed data of Y

produces inconsistent estimates of β. Maximum likelihood method is used to estimate selection models[1].

4.4.2 Model Specification

In the study, two regression equations are estimated. The selection equation (4.8)[2] [3]and the main equation (4.9) are given as follows:

$$
\begin{aligned}
Y_{1i}^* = X_{1i}\alpha + v_i = {} & \alpha_0 + \alpha_1 Race*Year + \alpha_2 Age + \alpha_3 Gender + \alpha_4 Marriage \\
& + \alpha_5 Education + \alpha_6 Kids + \alpha_7 LogIncome + \alpha_8 LogWealth \\
& + \alpha_9 DBDC + +\alpha_{10} Inherit + \alpha_{11} ExpectationofInherit \\
& + \alpha_{12} Employment + \alpha_{13} House + \alpha_{14} Bus + \alpha_{15} Risk + v_i
\end{aligned}
\tag{4.8}
$$

$$
\begin{aligned}
Y_{2i} = X_{2i}\gamma + u_i = {} & \gamma_0 + \gamma_1 Race*Year + \gamma_2 Age + \gamma_3 Gender + \gamma_4 Marriage \\
& + \gamma_5 Education + \gamma_6 Kids + \gamma_7 LogIncome + \gamma_8 LogWealth \\
& + \gamma_9 DBDC + \gamma_{10} Inherit + \gamma_{11} ExpectationofInherit \\
& + \gamma_{12} Employment + \gamma_{13} House + \gamma_{14} Bus + \gamma_{15} Risk + u_i
\end{aligned}
\tag{4.9}
$$

Where the investment decision (ID) in a certain category (equities, bonds, cash accounts or other financial assets): ID=1 if $Y_{1i}^* > 0$; ID=0 if $Y_{1i}^* \leq 0$;

$Y_{2i} =$ the proportion of financial assets invested in a certain category: equities, bonds, cash accounts or others (conditional on ID=1).

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[1] The sample selection model is estimated by the PROC QLIM procedure (SAS 9.1.3) using maximum likelihood estimation.
[2] Models with other interaction terms such as race*income, race*year*income and race*education were also tried, but most of the interaction terms were not significant. The best model (4.8, 4.9) I could find was chosen for the analyses.
[3] The full model with the main terms of race, year and 20 interaction terms was tried, but the coefficients for the main effects were all 0s. Thus, main terms were excluded from the models (Brambor, Clark & Golder, 2005).

Chapter Five   Results

This chapter discusses the descriptive statistics and empirical results. The descriptive statistics of the demographic, socio-economic and attitudinal characteristics are presented first. Then, the regression results from Heckman selection model will be presented in the second part.

5.1 Descriptive Statistics

5.1.1   Race/Ethnic Background of Sample Households

The results of Table 5-1 show that the majority of the household heads were non-Hispanic white over the years. The sum of the proportions of non-Hispanic blacks, Hispanics and other races are less than 30%.

Among 3,906 households in 1992, 75.29% of household heads were non-Hispanic white. 12.67% of household heads were non-Hispanic blacks. The proportions of Hispanics and other races (including Asians) were 7.49% and 4.55% respectively. The sample size in 1995 was 4,229. Among them, the proportions of Non-Hispanic white, non-Hispanic blacks, Hispanics and other races were 77.59%, 12.79%, 5.68% and 3.94% respectively. Among 4,305 households in 1998, non-Hispanic white, non-Hispanic blacks, Hispanics and other races were accounted for 77.74%, 11.86%, 7.19% and 3.21% respectively. Similar patterns of race distributions are shown in 2001 and 2004. Among 4,442 households in 2001, 76.23% of household heads were reported to be non-Hispanic white. There were 73.60% of non-Hispanic white households among 4,519 households in 2004. When compared to the national data of America, 80.2% of the population were

whites, 12.8% were blacks and 14.4 percent were Hispanics in 2005 (U.S. Census Bureau, 2005). The inconsistency with the national data results from the different definition of racial categories by the Survey of Consumer Finances.

Table 5-1   Race/Ethnic Background over Years

Race	1992 (sample size=3,906)	1995(sample size=4,229)	1998(sample size=4,305)	2001(sample size=4,442)	2004(sample size=4,519)
Non-Hispanic White	75.29%	77.59%	77.74%	76.23%	73.60%
Non-Hispanic Blacks	12.67%	12.79%	11.86%	13.03%	13.56%
Hispanics	7.49%	5.68%	7.19%	7.96%	9.17%
Others (Asian, etc.)	4.55%	3.94%	3.21%	2.78%	3.67%

Source: 1992, 1995, 1998, 2001, and 2004 Survey of Consumer Finances, weighted.

5.1.2 Other Demographic Characteristics

5.1.2.1 Average Age

Table 5-2 showed the changes of demographic characteristics over years. The median average age of the respondents and their husbands/wives/partners remained constant around 45 in 1992, 1995 and 1998 and a slightly increase to 46 in 2001 and 47 2004. The mean age was 47.66 in 1992, and then increased to 48.82 in 2004. Both mean and median average age increased steadily over years, which means the proportion of younger households decreased and more were older.

From Table 5-2, 28.02 % of households with an average age of heads and their husbands/wives/partners were less than 35 years old in 1992, and the proportion dropped steadily though the years (26.33% in 1995, 25.14% in 1998, 24.21% in 2001, and 23.22% in 2004). The proportion aged 35-64 increased from 38.61% in 1992 until 43.18% in 2001(41.20% in 1995, and 42.18% in 1998) and slightly dropped to 42.54% in 2004. Households aged 55-64 on average remained constant around 12% through 1992 to 2001 and then increased to 14.84% in 2004. The proportion aged 65 or above was 20.55% in 1992, 19.67% in 1995, 20.01% in 1998, 19.76% in 2001 and 19.41% in 2004.

Table 5-3 showed the pattern of racial differences in households' average age in 1992. The median age of households was 46 years for non-Hispanic white, 42 years old for non-Hispanic blacks, 38 for Hispanics and 41 for other races in 1992. The mean age was 48.98 years old for non-Hispanic white-headed households, 45.24 for non-Hispanic black-headed households, 40.83 for Hispanic-headed households and 43.86 for other racial households in 1992. The average age range in 35-54, 34 or less, 65 or above and 55-64 accounted from the highest proportion to lowest proportion for households headed by a white and households headed by a black. For households headed by a Hispanic, the group less than 35 years old accounted for the largest proportion (40.95%), followed by the group in 35-54 (39.28%) and the group in 55-64 (13.24%). The group aged 65 or above accounted for the lowest proportion (6.53%) for Hispanic-headed households. Most of other racial households aged in 35-54 on average, followed by the age group less than 35 years old (35.09%) and the age group in 55-64 (13.69%), least for the age group 65 or above (10.97%). Similar patterns showed in 1995 (Table 5-4), 1998 (Table 5-5), 2001(Table 5-6) and 2004 (Table 5-7).

5.1.2.2. Education

Table 5-2 showed changes in education level through the years from 1992 to 2004. The variable education was measured by the highest education level obtained by a couple or by a respondent, if the respondent is single. The proportion of households with less than a high school diploma decreased constantly through the years, from 16.71% in 1992 to 12.50% in 2004. The proportion of households with a high school diploma was 27.54% in 1992, 28.85% in 1995, 27.14% in 1998, 27.07% in 2001 and 25.24% in 2004. Households with some college accounted for 23.67% in 1992, 25.70% in 1995, 26.58%

in 1998, 24.60% in 2001 and 24.94% in 2004 respectively. The proportion of households with bachelor's degree increased continuously from 17.69% in 1992 to 21.74% in 2004. The proportion of households with graduate degrees dropped form 14.36% in 1992 to 13.63% in 1995, and then increased to 14.16% in 1998, 15.21% in 2001 and 15.59% in 2004.

From Table 5-3, the pattern of education level by racial categories in 1992 was presented. Hispanics had the highest proportion of households who had a less than high school diploma at 44.67%, followed by black households at a ratio of 25.19% and white households at 12.93%, and lowest proportion was found for other racial households at 9.65%. The differences in receiving a high school diploma among the four racial categories were relatively small, highest at 31.71% for other racial households and lowest at 24.95% for Hispanic households in 1992. Similar patterns for racial differences in households with some college in 1992. For households who had a bachelor's degree, racial differences seemed very huge among the four racial categories, highest at 20.81% for other racial households, 19.97% for white households, 9.20% for black households and lowest at only 7.23% for Hispanic households in 1992. Similarly, the proportions who received graduate degree were much higher for white and other racial households than for black and Hispanic households. There were only 3.06% of Hispanic households who had received graduate degree. Similar patterns showed in 1995 (Table 5-4), in 1998 (Table 5-5), in 2001 (Table 5-6) and in 2004 (Table 5-7 and Figure 5-1).

5.1.2.3 Number of Children

From Table 5-2, the mean number of children in the households remained constant around 0.8 through the years from 1992 to 2004. Table 5-3 showed racial

differences in the number of children among the four racial categories in 1992. The mean

numbers of children were much higher for Hispanic and black households than those for

white and other race households in 1992. Black households had 1.45 children on average.

The Hispanic households had 1.11 children on average. The mean numbers of children

for white and other households were 0.75 and 0.85 respectively in 1992. In 1995, the

mean number of children increased to 1.51 for Hispanic households, to 0.98 for other

race households, and decreased to 0.97 for black households (Table 5-4). The number

remained constant for white households. In 1998, the mean number of children increased

continuously for other race households. For the other three race categories, the number

decreased slightly (Table 5-5). The mean number of children for these four racial

categories remained almost the same in 2001 as compared to 1998 (Table 5-6). In 2004,

the mean number of children dropped for all the four categories, 0.73 for white

households, 0.88 for black households, 1.35 for Hispanic households and 0.94 for other

race categories.

5.1.2.4. Gender

From Table 5-2, 72.26% of respondents were males in 1992. The percentage

decreased to 71.09% in 1995 and 72.04% in 1998, and then increased to 73.16% in 2001.

In 2004, the percentage was 71.96%. In 1992, there were 75.62% male respondents for

white households, 51.36% for black households, 75.37% for Hispanic households and

69.74% for other racial households (Table 5-3). Similar patterns showed in 1995 (Table

5-4), in 1998 (Table 5-5), in 2001 (Table 5-6) and in 2004 (Table 5-7).

5.1.2.5. Marital Status

From Table 5-2, the proportion of respondents who were married or living with partners decreased consistently over the years, from 57.59% in 1992 to 50.82% in 2004. The percentage of respondents who were separated increased from 3.47% in 1992 to 4.17% in 1995 and 4% in 1998, and then decreased to 2.88% in 2001 and 3.54% in 2004. The percentage of divorced households kept increasing consistently from 11.97% in 1992 to 16.10% in 2004, except for a decrease from 15.13% in 1995 to 15% in 1998. The proportion of widowed respondents decreased consistently from 12.57% in 1992 to 9.35% in 2004, except for an increase to 10.47% in 2004. The percentage of respondents who were never married kept increasing through the years, from 14.47% in 1992 to 19.07% in 2004.

Table 5-3 showed the pattern of racial differences in marital status in 1992. The proportion of respondents married or living with partners was the highest for non-Hispanic whites at 61.20%, followed by Hispanics at 59.69% and other racial households at 54.25% and least for black households at 35.99%. The proportion of respondents who were separated was greatest for black households at 9.52%, followed by Hispanics at 6.66% and other racial households at 4.43%, and least for white households at 2.08%. The proportions of households divorced or widowed were the least for Hispanic households at 9.96% and 4.84% separately. Black households had the highest divorce rate at 14.62%. The proportions of respondents who were never married were the least for white households at 11.65%, followed by Hispanics at 18.86% and other racial households at 19.08%, and highest for black households at 26.96% (Table 5-3). The pattern was similar in 1995, 1998, 2001 and 2004. In 1995, the proportion of black

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households and white households who were married or living with a partner decreased to 28.67% and 55.73% separately (Table 5-4). The proportions of divorced households increased for whites, blacks and Hispanics except for other racial households. The proportions of households who were never married increased for all races except for Hispanics. In 1998, the proportion of households married or living with partners remained at around 55% for white households, decreased for blacks and Hispanics and increased for other racial households to by 5% (Table 5-.5). The proportions of divorced households decreased slightly for all households except for an increase by 0.4% for white households. In 2001, most proportions of each marital status remained almost the same across the four racial categories compared to those in 1998 (Table 5-6). However, the proportion of Hispanic households who were married or living with partners decreased by almost 7%. The proportion of other racial households who were never married increased by almost 8% compared to 1998. In 2004, the proportion of white and black households who were married or living with a partner further decreased to 54.83% and 26.65% respectively (Table 5-7).

Table 5-2   Demographic Characteristics by Year (weighted)

Variables	1992	1995	1998	2001	2004
Average Age					
< 35	28.02%	26.33%	25.14%	24.21%	23.22%
35-54	38.61%	41.20%	42.18%	43.18%	42.54%
55-64	12.82%	12.81%	12.67%	12.86%	14.84%
65+	20.55%	19.67%	20.01%	19.76%	19.41%
Mean	47.66	47.64	47.99	48.25	48.82
Median	44.50	44.50	45.00	46.00	47.00
Education					
Less than a High School Diploma	16.71%	14.24%	13.88%	13.20%	12.50%
High School Diploma	27.57%	28.85%	27.14%	27.07%	25.24%
Some College	23.67%	25.70%	26.58%	24.60%	24.94%
Bachelor's Degree	17.69%	17.59%	18.15%	19.92%	21.74%
Graduate Degree	14.36%	13.63%	14.16%	15.21%	15.59%
Mean Number of Children	0.85	0.83	0.82	0.81	0.81
Gender					
Male	72.26%	71.09%	72.04%	73.16%	71.96%
Female	27.74%	28.91%	27.96%	26.84%	28.04%
Marital Status					
Married/Living with a Partner	57.58%	52.57%	52.33%	53.08%	50.82%
Separated	3.47%	4.17%	4.00%	2.88%	3.54%
Divorced	11.92%	15.13%	15.00%	15.67%	16.10%
Widowed	12.57%	11.13%	10.28%	9.35%	10.47%
Never Married	14.47%	17.00%	18.38%	19.03%	19.07%

Table 5-3   Demographic Characteristics by Race in 1992 (weighted)

Variables	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
Average Age				
< 35	26.07%	29.43%	40.95%	35.09%
35-54	37.60%	43.63%	39.28%	40.25%
55-64	13.25%	9.70%	13.24%	13.69%
65+	23.08%	17.24%	6.53%	10.97%
Mean	48.98	45.24	40.83	43.86
Median	46.00	42.00	38.00	41.00
Education				
Less than a High School Diploma	12.93%	25.19%	44.67%	9.65%
High School Diploma	27.09%	30.50%	24.95%	31.71%
Some College	24.17%	24.94%	20.08%	17.66%
Bachelor's Degree	19.97%	9.20%	7.23%	20.81%
Graduate Degree	15.84%	10.18%	3.06%	20.18%
Mean Number of Children	0.75	1.11	1.45	0.85
Gender				
Male	75.62%	51.36%	75.37%	69.74%
Female	24.38%	48.64%	24.63%	30.26%
Marital Status				
Married/Living with a Partner	61.20%	35.99%	59.69%	54.25%
Separated	2.08%	9.52%	6.66%	4.43%
Divorced	11.61%	14.62%	9.96%	12.69%
Widowed	13.47%	12.89%	4.84%	9.55%
Never Married	11.65%	26.96%	18.86%	19.08%

Table 5-4   Demographic Characteristics by Race in 1995 (weighted)

Variables	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
Average Age				
< 35	24.23%	31.12%	41.45%	30.28%
35-54	40.42%	43.14%	46.14%	43.13%
55-64	13.14%	11.19%	10.38%	15.18%
65+	22.22%	14.56%	2.03%	11.40%
Mean	48.87	45.11	38.78	44.35
Median	45.50	42.00	36.00	43.00
Education				
Less than a High School Diploma	11.40%	24.78%	30.68%	12.06%
High School Diploma	28.68%	33.91%	26.38%	19.36%
Some College	25.29%	26.99%	27.63%	26.78%
Bachelor's Degree	19.37%	7.37%	11.43%	24.67%
Graduate Degree	15.26%	6.95%	3.88%	17.14%
Mean Number of Children	0.75	0.97	1.51	0.98
Gender				
Male	74.04%	47.60%	79.21%	77.54%
Female	25.96%	52.40%	20.79%	22.46%
Marital Status				
Married/Living with a Partner	55.73%	28.67%	62.10%	54.39%
Separated	3.47%	7.97%	5.48%	3.67%
Divorced	15.11%	17.94%	12.02%	10.92%
Widowed	11.63%	12.26%	3.06%	9.23%
Never Married	14.06	33.16%	17.34%	212.79%

Table 5-5   Demographic Characteristics by Race in 1998 (weighted)

Variables	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
Average Age				
< 35	22.55%	27.85%	43.77%	35.93%
35-54	42.07%	43.30%	40.25%	44.82%
55-64	12.91%	12.91%	9.83%	12.45%
65+	22.46%	15.94%	6.15%	6.79%
Mean	49.35	45.54	39.86	42.54
Median	47.00	43.00	37.00	41.00
Education				
Less than a High School Diploma	10.04%	23.05%	40.00%	14.29%
High School Diploma	27.18%	31.11%	26.21%	13.63%
Some College	26.92%	26.70%	19.99%	32.42%
Bachelor's Degree	19.64%	13.80%	8.53%	19.81%
Graduate Degree	16.22%	5.34%	5.26%	19.84%
Mean Number of Children	0.73	0.99	1.36	1.17
Gender				
Male	74.31%	51.95%	79.54%	74.39%
Female	25.69%	48.05%	20.46%	25.61%
Marital Status				
Married/Living with a Partner	55.09%	27.99%	58.51%	61.72%
Separated	2.60%	11.82%	6.03%	4.66%
Divorced	15.50%	16.57%	10.33%	7.67%
Widowed	10.71%	12.15%	4.22%	6.72%
Never Married	16.11%	31.47%	20.91%	19.23%

Table 5-6   Demographic Characteristics by Race in 2001 (weighted)

Variables	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
Average Age				
< 35	21.79%	28.73%	38.94%	27.38%
35-54	42.22%	45.98%	46.45%	46.78%
55-64	13.75%	9.87%	9.05%	13.35%
65+	22.24%	15.43%	5.56%	12.49%
Median	49.80	45.08	39.93	44.52
Mean	47.50	42.00	38.50	41.00
Education				
Less than a High School Diploma	10.07%	19.73%	33.11%	11.22%
High School Diploma	25.52%	36.09%	29.97%	18.97%
Some College	25.23%	23.42%	22.93%	17.87%
Bachelor's Degree	22.04%	12.57%	9.80%	25.26%
Graduate Degree	17.15%	8.91%	4.19%	26.69%
Mean Number of Children	0.72	0.99	1.30	1.10
Gender				
Male	77.14%	51.94%	69.46%	73.86%
Female	22.86%	48.06%	30.54%	26.41%
Marital Status				
Married/Living with a Partner	57.04%	29.71%	51.58%	58.12%
Separated	1.91%	6.31%	6.20%	3.75%
Divorced	15.35%	19.14%	15.89%	7.41%
Widowed	9.84%	11.09%	3.84%	3.58%
Never Married	15.85%	33.75%	22.49%	27.14%

Table 5-7   Demographic Characteristics by Race in 2004 (weighted)

Variables	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
Average Age				
< 35	20.67%	27.34%	35.72%	27.81%
35-54	41.48%	41.95%	47.90%	52.63%
55-64	15.84%	14.56%	7.43%	14.32%
65+	22.01%	16.16%	8.95%	5.24%
Mean	50.25	47.20	41.41	44.74
Median	49.00	46.00	39.00	46.00
Education				
Less than a High School Diploma	8.55%	18.99%	38.07%	3.79%
High School Diploma	24.70%	28.25%	29.12%	15.20%
Some College	25.08%	27.79%	20.04%	23.79%
Bachelor's Degree	24.15%	14.21%	8.12%	35.37%
Graduate Degree	17.53%	10.77%	4.65%	21.86%
Mean Number of Children	0.73	0.88	1.35	0.94
Gender				
Male	74.63%	49.95%	79.48%	81.09%
Female	25.37%	50.05%	20.52%	18.91%
Marital Status				
Married/Living with a Partner	54.83%	26.65%	51.00%	63.03%
Separated	2.35%	6.83%	8.17%	3.64%
Divorced	15.99%	19.93%	13%	11.91%
Widowed	11.22%	12.97%	2.88%	5.23%
Never Married	15.62%	34.63%	24.95%	16.18%

Figure 5-1　Education Level by Race in 2004
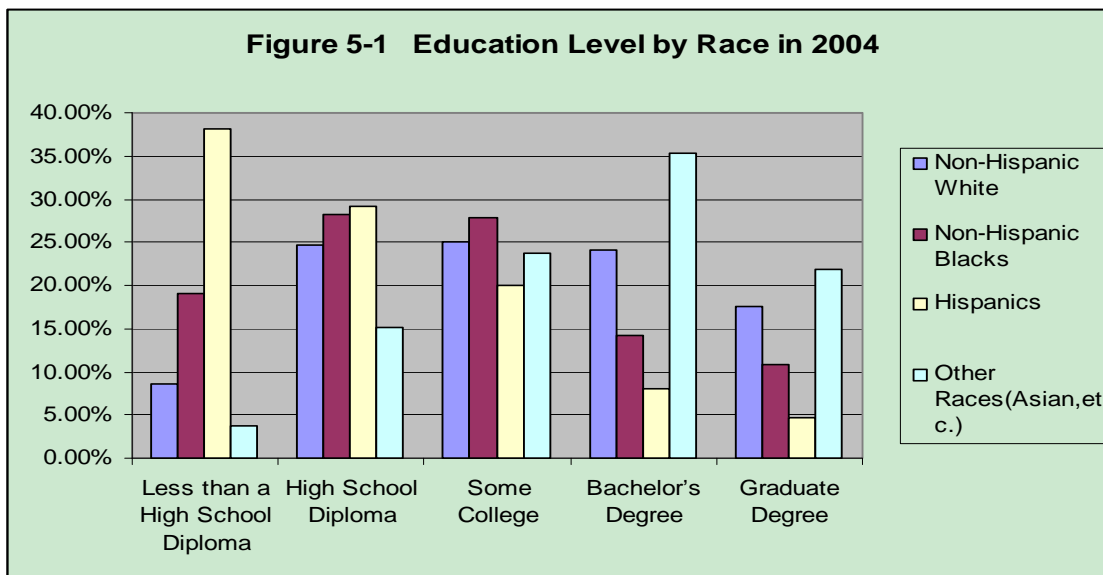
5.1.3. Socio-economic Characteristics

5.1.3.1. Annual Household Income Year before Survey

Both the mean and median level of annual household income increased over the years except for a decrease from 2001 to 2004. Table 5-8 shows that after converting all dollar amounts into 2004 dollars, the median annual household income during the year before the survey year was $35,125 in 1992, $37,829 in 1995, $38,796 in 1998, $42,698 in 2001 and $43,129 in 2004. The mean annual household income the year before the survey year increased steadily from $52,782 in 1992 to $73,621 in 2001, and then decreased to $70,657 in 2004.

From Table 5-9, both the mean and median levels of annual household income the year before the survey year were much higher for white and other racial households in 1992. The mean annual household income the year before the survey year was $58,322 and $56,986 respectively for white households and other racial households, while only $31,599 and $30,370 for black and Hispanic households respectively in 1992. The median income was $40,529 for white households, $36,476 for other racial households,

and the lowest for both blacks and Hispanics at the same level of $22,966 in 1992.

Similar patterns were shown in 1995 (Table 5-10), in 1998 (Table 5-11), in 2001 (Table

5-12) and in 2004 (Table 5-13).

The mean value of the income the year before the survey year for white

households increased over the years except for a decrease from 2001 to 2004. The mean

value of white households' income increased steadily from $58,322 in 1992 to $83,100 in

2001, and then decreased to $79,981 in 2003. The median annual income for white

households was relatively steady over the years. After a slight decrease from $40,529 in

1992 to $40,351 in 1995, then median value increased steadily until $49,290 in 2004. The

mean annual income for black households dropped from $31,599 in 1992 to $28,186 in

1995, and then increased steadily until $39,113 in 2004. The medium annual household

income for blacks showed similar trend. The trend of mean annual income for Hispanic

households was complicated. The mean annual income for Hispanics was $30,370 in

1992, $38,639 in 1995, $36,572 in 1998, $ 41,168 in 2001 and then decreased to $39,484

in 2004. The mean annual income for other racial households increased over the years

from $56,986 in 1992 to $78,145 in 2004 except for a slight decrease from $63,868 in

1998 to $63,104 in 2001. The income gap between white / other racial households and

black/Hispanic households widened through the years.

5.1.3.2. Total Assets

From Table 5-8, both the mean and median level of total assets increased steadily

over the years. After conversion to 2004 dollars, the mean of total assets increased from

$287,988 in 1992 to $527,094 in 2004. The median of total assets increased from

$102,337 in 1992 to $167,001 in 2004.

Table 5-9 showed the pattern of racial differences in total assets in 1992. There was a huge gap in total assets between white/other race households and black/Hispanic households. In 1992, the mean levels of total assets for white and other racial households were $340, 026 and $310,471 respectively. However, the mean levels of total assets for black and Hispanic households were only $82,322 and $99,124. Similar patterns were seen in 1995 (Table 5-10), in 1998 (Table 5-11), in 2001(Table 5-12) and in 2004 (Table 5-13).

The mean and median value of total assets increased over the years for all racial categories. However, the gap of the mean total assets between white/other race households and black/Hispanic households widened. The mean and median value of total assets for white households increased steadily over the years, with the mean value from $340,026 in 1992 to $640,469 in 2004 and the median value from $136,669 in 1992 to $218,170 in 2004. The mean value of total assets for other racial households decreased slightly from $310,474 in 1992 to $309,029 in 2004, and then increased thereafter until $509,958 in 2004. The median value of total assets for other racial households increased steadily from $70,245 in 1992 to $230,000 in 2004. The mean value of total assets for black households decreased a little bit from $82,322 in 1992 to $76,716 in 1995, and then increased thereafter until $153,392 in 2004. The median value of total assets for black households increased over the years. The mean total assets for Hispanics also increased over the years except for a slight decrease from $132,265 in 1995 to $131,929 in 1998.

5.1.3.3. Total Debts

After converting everything into year 2004 dollar, Table 5-8 showed that both mean and median level of total debts for all households increased steadily over the years.

The mean value of total debts for all households was $41,671 in 1992, $44,743 in 1995, $54,458 in 1996, $58,063 in 2001 and $79,083 in 2004. The median value increased from $8,171 in 1992 to $22,480 in 2004.

In 1992, the other racial households had the highest mean value of total debts ($49,657) among the four racial categories (Table 5-9). The mean value of total debts for white was $46,386, and then followed by Hispanic households at a value of $27,847 and black households at $19,057. The median value of total debts was $11,993 for white households, and then followed by other racial households at $5,074 and Hispanics at $1,977. Black households had the lowest mean value of total debts at $1,582. The same pattern was seen in the year 1995 (Table 5-10), in 1998 (Table 5-11), in 2001 (Table 5-12) and in 2004 (Table 5-13).

Both the mean and median value of total debts increased over the years for all racial households. The mean value of total debts almost doubled for white households, from $46,368 in 1992 to $86,758 in 2004. The median value for white households increased from $11,993 in 1992 to $30,460 in 2004. The mean value of total debts for other races almost tripled, from $46,657 in 1992 to $124,639 in 2004. During the same period, the median value increased from $5,074 to $22,000 for other racial households. The mean value of total debts for Hispanics increased over years except for a little decrease by $329 from 1995 to 2001, and then increased to $52,952 in 2004. The median value was $1,977 in 1992, $9,356 in 1995, $4,251 in 2001, and then increased until $6,950 in 2004. During the period 1992-2004, both the mean and median value of the total debts increased for black households, the mean value from $19,057 to $42,782 and the median value from $1,582 to $8,800.

5.1.3.4 Net Worth

From Table 5-8, both the mean and median level of net worth increased steadily over the years. After everything into year 2004 dollar, the mean of net worth increased from $246,317 in 1992 to $448,011 in 2004. The median of net worth increased from $65,369 in 1992 to $93,001 in 2004.

Table 5-9 showed the pattern of racial differences in net worth in 1992. There was a huge gap in net worth between white/other race households and black/Hispanic households. In 1992, the mean levels of net worth for white and other race households were $293,658 and $260,815 respectively. However, the mean levels of net worth for black and Hispanic households were only $63,265 and $71,278. The median values of net worth of white-headed households ($91, 859) and other racial households ($48,961) were much higher than the median values of black-headed households ($13,047) and Hispanic-headed households ($8,949). Similar patterns were seen in 1995 (Table 5-10), in 1998 (Table 5-11), in 2001 (Table 5-12) and in 2004 (Table 5-13).

The mean and median value of net worth increased over the years for all racial categories. However, the gap of the mean net worth between white/other race households and black/Hispanic households had been widened. The mean and median value of net worth for white households increased steadily over the years, with the mean value from $293,658 in 1992 to $553,711 in 2004 and the median value from $91,859 in 1992 to $136,750 in 2004. The mean value of net worth for other racial households decreased slightly from $260,815 in 1992 to $254,469 in 1995, and then increased thereafter until $401,460 in 2001, and then dropped to $378,319 in 2004. The mean value of net worth for other racial households dropped from $48,961 in 1992 to $38,262 in 1995, and then

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increased steadily to $110,608 in 2004. The median value of net worth for black households increased steadily from $13,047 in 1992 to $20,500 in 2004. The mean net worth for Hispanics also increased over the years except for a slight decrease from $100,769 in 1998 to $97,514 in 2001. The median value of net worth for Hispanic households increased   steadily from $8,949 in 1992 to $15,530 in 2004, except for a decrease from $15,388 in 1995 to $11,396 in 1998.

5.1.3.5. Whether Expecting to Receive Substantial Inheritance

The proportion of respondents expecting a substantial amount of inheritance or transfer of assets decreased over the years, except for a slight increase from 12.81% in 2001 to 13.95% in 2004 (Table 5-8).

From Table 5-9, there is a substantial difference in expecting to receive an inheritance among the four racial categories. For white and other race households, the proportions expecting an inheritance were 17.30% and 13.96% respectively in 1992. However, there were only 5.16% of the blacks and 4.26% of Hispanics who were expecting an inheritance. Similar patterns were shown in 1995 (Table 5-10), in 1998 (Table 5-11), in 2001 (Table 5-12) and in 2004 (Table 5-13).

The proportion of white households expecting an inheritance decreased from 17.30% in 1992 to 15.34% in 1995 and 15.15% in 1998, and then increased thereafter until 16.76% in 2004. The proportion of other racial households expecting an inheritance was 13.96% in 1992, 16.31% in 1995, 14.05% in 1998, 8.91% in 2001 and 10.81% in 2004. For black households, the proportion expecting an inheritance decreased steadily from 5.16% in 1992 to 3.05% in 1998, and then increased thereafter until 6.09% in 2004.

The proportion of Hispanic households was 4.26% in 1992, 9.47% in 1995, 9.21% in 1998, 4.84% in 2001 and 5.34% in 2004.

5.1.3.6. Whether Received a Substantial Inheritance

The proportion of respondents who received an inheritance was 20.67% in 1992, 21.35% in 1995, 20.38% in 1998, 17.83% in 2001, and 20.28% in 2004 (Table 5-9).

Table 5-9 showed there was difference in the proportion who received a substantial inheritance among the four racial groups. White households had the largest proportion to receive an inheritance, which was 24.37% in 1992. For other racial households, blacks and Hispanics, the proportion who received an inheritance was 13.32%, 9.36% and 7.14% respectively in 1992. Similar patterns were shown in 1995 (Table 5-10) and 2001 (Table 5-12). However, in 1998 (Table 5-11) and 2004 (Table 5-13), a larger proportion of blacks were reported to have received an inheritance compared to the proportion of other racial households.

Over the years, the proportion of white households who received an inheritance was 24.37% in 1992, 24.52% in 1995, 23.79% in 1998, 21.31% in 2001 and 24.20% in 2004. The proportion of other racial households received an inheritance decreased over the years, from 13.32% in 1992 to 8.64% in 2004. The proportion of black households who received an inheritance increased over the years except for a decrease of 2.63% from year 1998 to 2001. The proportion of Hispanic households who received an inheritance was 7.14% in 1992, 8.10% in 1995, 4.24% in 1998, 3.01% in 2001 and 4.35% in 2004.

5.1.3.7. Participation of DC vs. DB Plans on Current Jobs

From Table 5-8, the proportion of households having both defined benefit plans (DB) and defined contribution plans (DC) on current job was 8.28% in 1992, 7.93% in 1995, 8.36% in 1998, 8.86% in 2001 and 7% in 2004. The proportion having only DB plans on current job decreased over the years, from 13.75% in 1992 to 7.07% in 2004. During the same period, the proportion having only DC plans on current job increased steadily from 16.75% in 1992 to 26.20% in 2004. The proportion having neither DB nor DC plans on current job decreased steadily from 61.22% in 1992 until to 58.40% in 2001, and then increased to 59.73% in 2004.

From Table 5-9, most of the households had neither DB nor DC plans for all races in 1992. The proportion having both plans was largest for whites at 9.52%, and then followed by other racial households at 6.49% and blacks at 5.15%, lowest for Hispanics at 2.20% in 1992. There was not much difference in participating in only DB or DC plans among these four racial categories in 1992. The proportion having neither plans was the largest for Hispanics, and then followed by other racial households and blacks, and lowest for white households. Similar patterns showed in 1995(Table 5-10), in 1998(Table 5-11), in 2001 (Table 5-12) and in 2004 (Table 5-13).

The proportion of white households participating in both plans at current job was 9.52% in 1992, 8.36% in 1995, 9.21% in 1998, 9.76% in 2001 and 7.77% in 2004. The proportion having only DB plans decreased steadily through the years, while the proportion having only DC plans increased steadily. The proportion of white households having neither plan on current jobs was relatively stable over the years, fluctuating from 56.66% to 59.62%. Similar trend can be seen for the three other racial groups. However,

the proportion of blacks participating in only DB plans decreased from 14.43% in 1992 to 5.99% in 1998, and then increased thereafter until 9.10% in 2004. The proportion of DC plan for blacks increased over the years except for a decrease by 5.28% from the year 2001 to 2004. During the same period, the participation rate in only DB plans for Hispanic households decreased except for an increase from 7.62% in 1995 to 9.13% in 1998. The proportion of Hispanics participating only in DC plans was 12.52% in 1992, 19.11% in 1995, 15.68% in 1998, 18.26% in 2001 and 16.91% in 2004. The proportion of other racial households participating in DB plans decreased steadily over the years with an exception of an increase from 5.34% in 2001 to 7.03% in 2004. Similarly, the participation in DC plans for other racial households increased accordingly except for a slight decrease from 33.72% in 2001 to 32.28% in 2004.

5.1.3.8. Working Status

General speaking, Table 5-9 showed that the proportion of respondents who were working, either salary earners or self-employed, became higher over the years, while the percentage of those who were not working or retired decreased.

The proportion who were self-employed/partnership were substantially higher for other racial and white respondents at 16.37% and 12.43% respectively, however the proportion for Hispanics and blacks were only 4.53% and 3.98% respectively in 1992 (Table 5-10). The percentage who were wage earners were highest for Hispanics at 63%, lower for blacks at 55.08% and whites at 54.10% , and lowest for other races at 51.68% in 1992. The proportion retired was 28.06% for whites, 24.87% for blacks, 16.03% for other races and 15.21% for Hispanics in 1992. The proportion not working was much lower for whites at 5.40%, compared with blacks at 16.08%, Hispanics at 17.26% and

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other races at 15.92% in 1992. Similar patterns showed in 1995 (Table 5-10), in 1998 (Table 5-11), in 2001 (Table 5-12) and in 2004 (Table 5-13).

The proportion self-employed/partnership for whites increased over the years except for a slight decrease from 1992 to 1995. The proportion retired for whites decreased from 28.06% in 1992 until to 24.99% in 2001, and then increased to 25.22% in 2004. The proportion of whites not working dropped steadily. The proportion of blacks who were wage-earners increased from 55.08% in 1992 until to 66.84% in 2001, and then decreased to 61.25% in 2004. The proportion self-employed/partnership increased steadily over the years except for a decrease from 5.38% in 1995 to 4.35% in 1998. The proportion of retired was 24.87% in 1992, 21.40% in 1995, 26.68% in 1998, 20.37% in 2001 and 24.96% in 2004. The proportion not working was 16.08% in 1992, 18.02% in 1995, 12.04% in 1998, 7.75% in 2001 and 8.03% in 2004. The proportion of wage earners for Hispanics increased steadily from 63% in 1992 until to 76.23% in 2001, and then decreased to 72.85% in 2004. The proportion of Hispanics retired was 15.21% in 1992, 15.01% in 1995, 10.63% in 1998, 11.20% in 2001 and 14.75% in 2004. The proportion not working decreased steadily over the years with an exception of a decrease from 9.82% in 1998 to 7.05% in 2001. The proportion of self-employed for other racial households decreased from 16.37% in 1992 until to 7.01% in 1998, increased to 14.94% in 2001, and then decreased to 10.50% in 2004. The proportion of other race households who were retired increased from 16.03% in 1992 to 17.91% in 1995, and then decreased thereafter until 12.01% in 2004. The proportion not working decreased from 15.92% in 1992 until to 6.66% in 1995, increased to 11.72% in 2001, and then decreased to 7.64% in 2004.

5.1.3.9. Home Ownership

From Table 5-9, most households had their own home in all survey years, and the proportion of homeowners had a small but steady increase over the years. Homeowner accounted for 63.93% in 1992. The percentage increased from 64.71% in 1995 until 69.05% in 2004, a more than five percentage point increase from 1992.

The proportion of homeowners was the highest for whites at 70.33%, lower for other races at 54.60% and blacks at 43.43%, and lowest for Hispanics at 39.92%. The percentage of each race that was homeowners was the highest for whites, then for other races and blacks and the lowest for Hispanics in all survey years.

The proportion of the sample that were homeowners for all races increased steadily over the years, except a slight decrease for other races from 54.60% in 1992 to 54.18% in 1995. Among them, Hispanics had the biggest increase in home owning by almost 7% during the period, and the smallest increase for other races by less than 3%.

5.1.3.10. Business Ownership

Over the years, the percentage of business ownership was relatively stable around 11% for all households (Table 5-8).

Among the four racial categories, whites and other race households had a much higher business-ownership rate at 13.59% and 14.39% respectively, compared to Hispanics at 6.09% and blacks at 4.89% in 1992 (Table 5-9). Similar patterns showed in 1995(Table 5-10), in 1998 (Table 5-11), in 2001 (Table 5-12) and in 2004 (Table 5-13).

Over the years, the proportion of business-ownership for whites had been stable at around 13%. The proportion for other racial households was around 14% in 1992, 2001 and 2004, but lower at 8.91% in 1995 and 11.25% in 1998. The proportion of business

ownership for blacks was 4.89% in 1992, 3.36% in 1995, 4.69% in 1998, 3.02% in 2001 and 4.70% in 2004. The proportion for Hispanics was 6.09% in 1992, 7.06% in 1995, 3.96% in 1998, 5.26% in 2001 and 3.98% in 2004.

Table 5-8   Socio-economic Characteristics over Years (weighted)

Variables	1992	1995	1998	2001	2004
Income					
Mean(Dollars)	52,782	54,999	61,528	73,621	70,657
Median(Dollars)	35,125	37,829	38,796	42,698	43,129
Total Assets					
Mean(Dollars)	287,988	306,841	382,854	481,143	527,094
Median(Dollars)	102,337	116,497	135,642	145,397	167,001
Total Debts					
Mean(Dollars)	41,671	44,743	54,458	58,063	79,083
Median(Dollars)	8,171	10,587	13,912	15,231	22,480
Net Worth					
Mean(Dollars)	246,317	262,098	328,397	423,080	448,011
Median(Dollars)	65,369	70,972	83,124	92,248	93,001
Expecting Inheritance/Gift					
Yes	14.63%	13.64%	13.25%	12.81%	13.95%
No	85.37%	86.36%	86.75%	87.19%	86.05%
Received an inheritance/Gift					
Yes	20.67%	21.35%	20.38%	17.83%	20.28%
No	79.33%	78.65%	79.62%	82.17%	79.72%
DB vs. DC plans (current Job)					
Both	8.28%	7.93%	8.36%	8.86%	7.00%
Only DB Plans	13.75%	9.01%	7.34%	7.11%	7.07%
Only DC Plans	16.75%	22.11%	25.35%	25.63%	26.20%
Neither	61.20%	60.95%	58.95%	58.40%	59.73%
Working Status					
Work for Someone Else	54.78%	58.26%	59.19%	60.88%	60.05%
Self-Employed/Partnership	10.95%	10.29%	11.26%	11.70%	11.85%
Retired/not Working(above 65)	26.14%	25.06%	24.41%	22.92%	23.74%
Not Working(below 65)	8.12%	6.39%	5.14%	4.50%	4.36%
Homeownership					
Yes	63.93%	64.71%	66.26%	67.69%	69.05%
No	36.07%	35.29%	33.74%	32.31%	30.95%
Business-ownership					
Yes	11.96%	11.10%	11.45%	11.85%	11.47%
No	88.04%	88.90%	88.55%	88.15%	88.53%

Table 5-9 Socio-economic Characteristics by Race in 1992 (weighted)

Variables	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
Income				
Mean(Dollars)	58,322	31,599	30,370	56,986
Median(Dollars)	40,529	22,966	22,966	36,476
Total Assets				
Mean(Dollars)	340,026	82,322	99,124	310,471
Median(Dollars)	136,669	23,195	13,179	70,245
Total Debts				
Mean(Dollars)	46,368	19,057	27,847	49,657
Median(Dollars)	11,993	1,582	1,977	5,074
Net Worth				
Mean(Dollars)	293,658	63,265	71,278	260,815
Median(Dollars)	91,859	13,047	8,949	48,961
Expecting Inheritance/Gift				
Yes	17.30%	5.16%	4.26%	13.96%
No	82.70%	94.84%	95.74%	86.04%
Received an Inheritance/Gift				
Yes	24.37%	9.36%	7.14%	13.32%
No	75.63%	90.64%	92.86%	86.68%
DB vs. DC plans (current Job)				
Both	9.52%	5.15%	2.20%	6.49%
Only DB Plans	13.84%	14.43%	12.54%	12.72%
Only DC Plans	17.96%	13.29%	12.52%	13.47%
Neither	58.69%	67.14%	72.74%	67.32%
Working Status				
Work for Someone Else	54.10%	55.08%	63.00%	51.68%
Self-Employed/Partnership	12.43%	3.98%	4.53%	16.37%
Retired/not Working(above 65)	28.06%	24.87%	15.21%	16.03%
Not Working(below 65)	5.40%	16.08%	17.26%	15.92%
Homeownership				
Yes	70.33%	43.43%	39.92%	54.60%
No	29.67%	56.57%	60.08%	45.40%
Business-ownership				
Yes	13.59%	4.89%	6.09%	14.39%
No	86.41%	95.11%	93.91%	85.61%

Table 5-10   Socio-economic Characteristics by Race in 1995 (weighted)

Variables	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
Income				
Mean(Dollars)	60,493	28,186	38,639	57,476
Median(Dollars)	40,351	21,437	26,481	42,873
Total Assets				
Mean(Dollars)	359,251	76,716	107,632	309,029
Median(Dollars)	143,667	23,551	35,701	73,951
Total Debts				
Mean(Dollars)	48,844	22,581	31,825	54,560
Median(Dollars)	14,342	2,093	9,356	8,851
Net Worth				
Mean(Dollars)	310,407	54,134	75,806	254,469
Median(Dollars)	94,522	13,443	15,388	38,262
Expecting Inheritance/Gift				
Yes	15.34%	4.40%	9.47%	16.31%
No	84.66%	95.60%	90.53%	83.69%
Received an Inheritance/Gift				
Yes	24.52%	10.47%	8.10%	13.48%
No	75.48%	89.53%	91.90%	86.52%
DB vs. DC plans (current Job)				
Both	8.36%	4.79%	7.55%	10.32%
Only DB Plans	8.88%	10.62%	7.62%	8.45%
Only DC Plans	23.14%	18.77%	19.11%	16.91%
Neither	59.62%	65.82%	65.72%	64.32%
Working Status				
Work for Someone Else	57.69%	55.19%	68.28%	65.23%
Self-Employed/Partnership	11.31%	5.38%	8.36%	8.89%
Retired/not Working(above 65)	26.76%	21.40%	15.01%	17.91%
Not Working(below 65)	4.25%	18.02%	8.36%	7.97%
Homeownership				
Yes	70.59%	42.68%	42.90%	51.81%
No	29.41%	57.32%	57.10%	48.19%
Business-ownership				
Yes	12.78%	3.36%	7.06%	8.91%
No	87.22%	96.64%	92.94%	91.09%

Table 5-11   Socio-economic Characteristics by Race in 1998 (weighted)

Variables	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
Income				
Mean(Dollars)	68,027	33,429	36,572	63,868
Median(Dollars)	43,499	23,513	27,040	45,850
Total Assets				
Mean(Dollars)	448,858	103,598	132,265	377,622
Median(Dollars)	164,625	28,983	30,496	93,906
Total Debts				
Mean(Dollars)	59,922	29,083	31,496	67,318
Median(Dollars)	18,433	3,246	4,521	12,869
Net Worth				
Mean(Dollars)	388,936	74,515	100,769	310,304
Median(Dollars)	110,078	17,970	11,396	51,242
Expecting Inheritance/Gift				
Yes	15.15%	3.05%	9.21%	14.05%
No	84.85%	96.95%	90.79%	85.95%
Received an Inheritance/Gift				
Yes	23.79%	10.84%	4.24%	9.07%
No	76.21%	89.16%	95.76%	90.93%
DB vs. DC plans (current Job)				
Both	9.21%	6.37%	2.28%	8.84%
Only DB Plans	7.37%	5.99%	9.13%	7.51%
Only DC Plans	26.75%	21.64%	15.68%	26.66%
Neither	56.66%	66.01%	72.91%	56.99%
Working Status				
Work for Someone Else	57.59%	56.93%	74.22%	72.41%
Self-Employed/Partnership	13.04%	4.35%	5.33%	7.01%
Retired/not Working(above 65)	25.77%	26.68%	10.63%	13.92%
Not Working(below 65)	3.59%	12.04%	9.82%	6.66%
Homeownership				
Yes	71.84%	46.31%	44.17%	54.18%
No	28.16%	53.69%	55.83%	45.82%
Business-ownership				
Yes	13.19%	4.69%	3.96%	11.25%
No	86.81%	95.31%	96.04%	88.75%

Table 5-12   Socio-economic Characteristics by Race in 2001 (weighted)

Variables	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
Income				
Mean(Dollars)	83,100	40,243	41,168	63,104
Median(Dollars)	48,172	27,371	26,276	37,224
Total Assets				
Mean(Dollars)	580,628	115,110	131,929	468,803
Median(Dollars)	191,079	46,545	19,578	89,586
Total Debts				
Mean(Dollars)	64,319	33,927	34,415	67,344
Median(Dollars)	20,556	6,391	4,260	6,913
Net Worth				
Mean(Dollars)	516,309	81,183	97,514	401,460
Median(Dollars)	129,197	20,365	12,195	61,776
Expecting Inheritance/Gift				
Yes	15.39%	3.42%	4.84%	8.91%
No	84.61%	96.58%	95.16%	91.09%
Received an Inheritance/Gift				
Yes	21.31%	8.21%	3.01%	9.90%
No	78.69%	91.79%	96.99%	90.10%
DB vs. DC plans (current Job)				
Both	9.76%	6.36%	5.92%	4.17%
Only DB Plans	7.00%	8.39%	6.68%	5.34%
Only DC Plans	25.92%	26.75%	18.26%	33.72%
Neither	57.32%	58.50%	69.14%	56.77%
Working Status				
Work for Someone Else	58.31%	66.84%	76.23%	59.36%
Self-Employed/Partnership	13.37%	5.05%	5.51%	14.94%
Retired/not Working(above 65)	24.90%	20.37%	11.20%	13.98%
Not Working(below 65)	3.41%	7.75%	7.05%	11.72%
Homeownership				
Yes	74.13%	47.45%	44.29%	53.05%
No	25.87%	52.55%	55.71%	46.95%
Business-ownership				
Yes	13.96%	3.02%	5.26%	14.54%
No	86.04%	96.98%	94.74%	85.46%

Table 5-13   Socio-economic Characteristics by Race in 2004 (weighted)

Variables	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
Income				
Mean(Dollars)	79,981	39,113	39,484	78,145
Median(Dollars)	49,290	28,752	26,699	51,344
Total Assets				
Mean(Dollars)	640,469	153,392	179,529	502,958
Median(Dollars)	218,170	42,150	32,000	230,000
Total Debts				
Mean(Dollars)	86,758	42,782	52,952	124,639
Median(Dollars)	30,460	8,800	6,950	22,000
Net Worth				
Mean(Dollars)	553,711	110,608	126,576	378,319
Median(Dollars)	136,750	20,500	15,530	142,000
Expecting Inheritance/Gift				
Yes	16.76%	6.09%	5.34%	10.81%
No	83.24%	93.91%	94.66%	89.19%
Received an Inheritance/Gift				
Yes	24.20%	12.29%	4.35%	8.64%
No	75.80%	87.71%	95.65%	91.36%
DB vs. DC plans (current Job)				
Both	7.77%	4.79%	5.18%	4.33%
Only DB Plans	7.04%	9.10%	4.31%	7.03%
Only DC Plans	27.92%	21.47%	16.91%	32.28%
Neither	57.26%	64.65%	73.60%	56.36%
Working Status				
Work for Someone Else	57.75%	61.25%	72.85%	69.85%
Self-Employed/Partnership	13.44%	5.75%	8.57%	10.50%
Retired/not Working(above 65)	25.22%	24.96%	14.75%	12.01%
Not Working(below 65)	3.59%	8.03%	3.84%	7.64%
Homeownership				
Yes	75.77%	50.15%	47.69%	57.55%
No	24.33%	49.85%	52.31%	42.45%
Business-ownership				
Yes	13.50%	4.70%	3.98%	14.41%
No	86.50%	95.30%	96.02%	85.59%

5.1.4. Characteristics of Attitudinal Factor

Over the years, respondents who were willing to take substantial risks increased from 3.25% in 1992 to 4.39% in 1998, and then decreased to 3.37% in 2004. The proportion of respondents who were willing to take above average risks also increased from 11.02% in 1992 until to 18.24% in 2001, and then decreased to 15.88% in 2004. The proportion of respondents who took average risks was 35.90% in 1992, 37.25% in 1995, 38.47% in 1998, 37.44% in 2001 and 38.44% in 2004. The proportion of households who were not willing to take any risks decreased from 49.83% until to 38.75% in 1998, and thereafter to 42.31% in 2004. In each survey year, the plurality respondents were not willing to take any risks and fewest were willing to take substantial risks (Table 5-14).

In 1992, the proportion of respondents who were willing to take substantial risks was the highest for Hispanics, lower for other races at 3.53% and blacks at 3.21% and lowest for whites at 2.87%. For those who were willing to take above average risks, the proportion was the highest for other races at 14.31%, lower for whites at 11.80% and blacks at 8.62%, and lowest for Hispanics at 5.34%. Blacks and Hispanics had a higher proportion taking no risks at 66.13% and 65.43%, which was much higher than whites at 45.71% and other races at 46.77% (Table 5-9). Similar patterns were seen in other years, including 1995 (Table 5-10), 1998 (Table 5-11), 2001 (Table 5-12) and 2004 (Table 5-15).

Over the years, the proportion of whites who were willing to take substantial risks increased from 2.87% in 1992 to 4.67% in 1998, and then decreased until 2.63% in 2004. At the same time, the proportion willing to take above average risks increased from

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11.80% in 1992 until to 20.04% in 2001, and then decreased to 17.90% in 2004. The proportion taking average risks also increased over the years except for a slight decrease of less than 2% from year 1998 to 2001. On the contrary, the proportion of whites unwilling to take risks decreased steadily through 1992 over 2001, and then increased a little bit to 36.56% in 2004. The proportion of other racial households who were willing to take substantial risks increased from 3.52% in 1992 until 8.29% in 2001, and then decreased to 5.92% in 2004. The proportion of other race households taking above average risks increased from 14.31% in 1992 to 21.15% in 1998, and then decreased thereafter to 15.19% in 2004. The percentage who took average risks decreased from 35.29% in 1992 to 26.36% in 2001, and then increased to 33.72% in 2004. The proportion of other racial households who were unwilling to take any risks was 46.77% in 1992, 48.64% in 1995, 43.57% in 1998, 45.95% in 2001 and 45.18% in 2004. The proportion of blacks who were unwilling to take risks decreased from 66.13% in 1992 until to 47.26% in 1998, and then increased to 57.26% in 2004. However, the proportion who take average risks increased from 22.05% in 1992 until to 33.48% in 1998, and then decreased to 28.19% in 2004. The proportion of Hispanics who were willing to take above average risks increased sharply from 5.34% in 1992 to 13.53% in 1998, and then decreased to 9.83% in 2004. The proportion of Hispanics not willing to take any risks decreased from 65.43% in 1992 to 59.63% in 1995, and increased thereafter until 65.21% in 2004.

Table 5-14   Changes of Risk Tolerance over Years (weighted)

Risk Tolerance	1992 (sample size=3,906)	1995(sample size=4,229)	1998(sample size=4,305)	2001(sample size=4,442)	2004(sample size=4,519)
Substantial	3.25%	3.48%	4.93%	4.53%	3.37%
Above Average	11.02%	13.61%	17.86%	18.24%	15.88%
Average	35.90%	37.25%	38.47%	37.44%	38.44%
None	49.83%	45.66%	38.75%	39.80%	42.31%

Table 5-15   Changes of Risk Tolerance by Race over Years (weighted)

Year	Risk Tolerance	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
1992	Substantial	2.87%	3.21%	6.92%	3.53%
	Above Average	11.80%	8.62%	5.34%	14.31%
	Average	39.62%	22.05%	22.30%	35.39%
	None	45.71%	66.13%	65.43%	46.77%
1995	Substantial	3.32%	3.73%	4.86%	3.72%
	Above Average	14.71%	7.15%	11.08%	16.64%
	Average	39.79%	29.47%	24.43%	31.00%
	None	42.19%	59.65%	59.63%	48.64%
1998	Substantial	4.67%	5.27%	6.39%	6.62%
	Above Average	18.71%	13.99%	13.53%	21.15%
	Average	42.47%	33.48%	18.64%	28.66%
	None	35.15%	47.26%	61.43%	43.57%
2001	Substantial	4.27%	4.80%	5.19%	8.29%
	Above Average	20.04%	11.39%	11.76%	19.40%
	Average	40.75%	32.07%	18.42%	26.36%
	None	34.94%	51.74%	64.63%	45.95%
2004	Substantial	2.63%	5.32%	5.39%	5.92%
	Above Average	17.90%	9.23%	9.83%	15.19%
	Average	42.91%	28.19%	19.57%	33.72%
	None	36.56%	57.26%	65.21%	45.18%

5.1.5. Characteristics of Financial Asset Ownership

5.1.5.1 Amount and Proportion

After converting everything into the 2004 dollars, the mean and median value of

financial assets held by all families increased steadily from 1992 to 2001, and then

decreased in 2004 by $ 16,485 and $5,238 respectively (Table 5-16). The mean holding

of cash accounts (the sum of CDs and liquid accounts) decreased from $23,110 in 1992 to

$22,102 in 1995, and then increased thereafter until $31,778 in 2004. The mean ratio of

cash accounts to total financial assets was 0.51 in 1992, 0.45 in 1995, 0.44 in 1998/2001

and 0.47 in 2004. The mean value of bonds (including bonds held directly and indirectly)

increased steadily over the years, from $12,919 in 1992 to $40,783 in 2004. Accordingly,

the ratio of bonds accounted for total financial assets increased from 0.059 in 1992, to

0.06 in 1995 and 0.13 in 1998, and then decreased to 0.057 in 2001 and 0.11 in 2004. The

mean value of equities (the sum of stocks held directly and indirectly) increased from

$30,706 in 1992 until $114,378 in 2001, and then decreased to $96,347 in 2004.

Accordingly, the mean ratio of equities divided by total financial assets was 0.15 in 1992,

0.19 in 1995, 0.26 in 1998, 0.296 in 2001 and 0.25 in 2004. The mean value of other

financial assets was $24,461 in 1992, $30,277 in 1995, $20,234 in 1998, $31,513 in 2001

and $19,310 in 2004. The mean proportion of other financial assets accounted for total

financial assets was 0.28 in 1992, 0.30 in 1995, 0.16 in 1998, 0.21 in 2001 and 0.17 in

2004.

Table 5-17 showed racial differences in both the amount and the proportion of

holding of cash accounts, bonds, equities and other financial assets in each survey year.

In 1992, the holding of cash accounts, bonds, equities and other financial assets was

much higher for white and other racial households compared to Hispanics or blacks. The

amount held in cash accounts was $28,582 for whites, $15, 318 for other racial

households, $4,479 for Hispanics and $4,407 for blacks. The difference in the ratio of

cash accounts over total financial assets were not much among the four racial categories,

with 0.63 for Hispanics, 0.53 for other races, 0.52 for blacks and 0.49 for whites. The

mean value of bonds held by white and other racial households was $15,983 and $15,852

respectively, compared to $933 by blacks and $508 by Hispanics. The mean value of

equities held by whites and other racial households were more than five times than that

held by blacks and Hispanics, $38,604 by whites, $20,329 for other racial households,

$4,575 for blacks and $1,822 for Hispanics. The proportion of financial assets invested

in equities was 0.16 for whites, 0.12 for other racial households, 0.10 for blacks and 0.07

for Hispanics. Similar patterns were shown in other survey years.

The mean value of total financial assets held by all the four racial categories

increased steadily over 1992 to 2001, except for a decrease in 2004. The mean value of

cash accounts held by whites decreased from $28,582 in 1992 to $26,078 in 1995, and

then increased thereafter until $39,818 in 2004. The proportion of total financial assets

invested in cash accounts by whites decreased over the years from 0.49 in 1992 to 0.43 in

2004. The mean value of bonds held by whites increased steadily over the years. The

proportion of financial assets invested in bonds by whites was 0.06 in the year 1992,

1995 and 2001, and 0.14 in 1998 and 0.12 in 2004. The mean value of equities held by

whites increased from $38,604 in 1992 until $143, 276 in 2001, and then decreased to

$124, 356. Accordingly, the proportion of financial assets invested in equities also

increased from 0.16 in 1992 until 0.32 in 2001, and then decreased to 0.29 in 2004.

Similar trends were found for financial assets held by other racial households. The

proportion of financial assets invested in cash accounts by other racial households was

0.53 in 1992, 0.48 in 1995, 0.47 in 1998, 0.52 in 2001 and 0.51 in 2004. The proportion

of bonds accounted for total financial assets held by other racial households was 0.08 in

1992, 0.04 in 1995, 0.13 in 1998, 0.02 in 2001 and 0.09 in 2004. The proportion invested

in equities increased steadily from 0.12 in 1992 until 0.29 in 2001, and then decreased to

0.24 in 2004. The mean value of cash accounts held by black households decreased from

$4,407 in 1992 to $4,100 in 1995, and then increased thereafter until $7,113 in 2004. The

proportion of total financial assets invested in cash accounts by black households was

0.52 in both the years 1992 and 2004, 0.45 in both the years 1995 and 1998, and 0.48 in

2001. The mean of bonds held by blacks increased from $993 in 1992 to $6, 371 in 1998,

and then decreased to $3,085 in 2001 and $5,725 in 2004. The proportion, valued

accordingly, was 0.03 in the year 1992, 1995 and 2001, 0.10 in 1998, and 0.05 in 2004.

The mean value of equities held by blacks was $4,575 in 1992, $3,898 in 1995, $11,090

in 1998, $15,647 in 2001 and $12,060 in 2004. The proportion, valued according, was

0.10 for the year 1992, 1995 and 1998, and increased to 0.19 in 2001 and 0.14 in 2004.

For Hispanics, similar trend was seen as compared to blacks. The proportion of financial

assets invested in cash accounts was 0.63 in 1992, 0.55 in 1995, 0.66 in 1998, 0.56 in

2001 and 0.68 in 2004. The proportion invested in bonds held by Hispanics was 0.03 in

1992, 0.01 in 1995, 0.08 in 1998, and 0.04 in both 2001 and 2004. The proportion

invested in equities increased from 0.07 in 1992 until 0.18 in 2001, and decreased to 0.12

in 2004.

The differences in the amount of holding cash accounts enlarged between

white/other racial households and blacks/Hispanics after 1998 (Figure 5-2). The

differences in the proportion of financial assets invested in cash accounts between whites

and other three racial households enlarged over the years (Figure 5-4). The difference in

the mean value of bonds grew steadily between white household and the other three racial

groups over years (Figure 5-4). From Figure 5-5, the differences of proportion invested in

bonds were relatively stable in each survey year. The difference in the mean value of

equities also enlarged over the years as seen in Figure 5-6, however, the difference in the

proportion of financial assets invested in equities remained stable (Figure 5-7).

Table 5-16   Financial Assets Ownership over Years (weighted)

Financial Assets (Dollars)	1992 (sample size=3,906)		1995(sample size=4,229)		1998(sample size=4,305)		2001(sample size=4,442)		2004(sample size=4,519)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Financial Assets	91,195	10,807	113,030	13,911	156,352	20,172	204,705	23,538	188,220	18,300
Cash Accounts	23,110	2,636	22,102	2,339	24,354	3,478	29,961	3,940	31,778	3,300
-CDs	7,279	0.00	6,382	0	6,685	0	6,249	0	6,961	0
-Liquid Accounts	15,831	2,148	15,719	1,970	17,669	2,898	23,712	3,195	24,817	3,000
Cash Accounts/ Financial Assets	0.51	0.44	0.45	0.31	0.44	0.29	0.44	0.29	0.47	0.33
Bonds	12,919	0	15400	0	27,578	0	28,883	0	40,783	0
-Directly-Held	8,671	0	8,624	0	7,750	0	10,615	0	10,954	0
-Indirectly-Held	4,248	0	6776	0	20,007	0	18,267	0	29,829	0
Bonds/Financial Assets	0.059	0	0.06	0	0.13	0	0.057	0	0.11	0
Equities	30,706	0	45,251	0	84,005	0	114,378	586	96,347	35
-Directly-Held	14,960	0	17,654	0	35,398	0	43,626	0	33,013	0
-Indirectly-Held	15,746	0	27,598	0	48,606	0	70,722	0	63,336	0
Equities/Financial Assets	0.15	0	0.19	0	0.26	0.04	0.296	0.124	0.25	0.06
Other Financial Assets	24,461	1054	30,277	1,477	20,234	143	31,513	781	19.310	0
Proportion	0.28	0.16	0.30	0.14	0.16	0.03	0.21	0.03	0.17	0

Table 5-17   Means and proportions of Financial Assets Ownership by Race over Years (weighted)

Year	Financial Assets	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races (Asian, etc.)
	Cash Account	28,582	4,407	4,479	15,318
	(Proportion)	(0.49)	(0.52)	(0.63)	(0.53)
	Bonds	15,983	993	508	15,852
1992	(Proportion)	(0.06)	(0.03)	(0.03)	(0.08)
	Equities	38,604	4,575	1,822	20,329
	(Proportion)	(0.16)	(0.10)	(0.07)	(0.12)
	Other	28,920	7,035	7,957	26,375
	(Proportion)	(0.28)	(0.35)	(0.27)	(0.27)
	Total	112,089	17,009	14,766	77,874
	Cash Account	26,078	4,100	4,577	27,491
1995	(Proportion)	(0.44)	(0.45)	(0.55)	(0.48)
	Bonds	18,945	1,019	1,754	11,958
	(Proportion)	(0.06)	(0.03)	(0.01)	(0.04)
	Equities	55,084	3,898	7,950	39,643
	(Proportion)	(0.21)	(0.10)	(0.11)	(0.18)
	Other	34,207	11,917	18,133	30,018
	(Proportion)	(0.29)	(0.41)	(0.33)	(0.29)
	Total	134,313	20,934	20,112	109,109
	Cash Account	28,473	5,368	12,131	22,135
1998	(Proportion)	(0.43)	(0.45)	(0.66)	(0.47)
	Bonds	33,726	6,371	2,681	18,443
	(Proportion)	(0.14)	(0.10)	(0.08)	(0.13)
	Equities	102,246	11,090	12,475	71,941
	(Proportion)	(0.28)	(0.16)	(0.14)	(0.28)
	Other	22,331	15,989	10,608	6,749
	(Proportion)	(0.15)	(0.29)	(0.13)	(0.12)
	Total	186,775	38,819	37,895	119,268
	Cash Account	36,529	6,473	6,131	28,172
2001	(Proportion)	(0.42)	(0.48)	(0.56)	(0.52)
	Bonds	36,423	3,085	6,556	6,995
	(Proportion)	(0.06)	(0.03)	(0.04)	(0.02)
	Equities	143,276	15,647	14,344	70,139
	(Proportion)	(0.32)	(0.19)	(0.18)	(0.29)
	Other	37,194	13,434	10,415	20,909
	(Proportion)	(0.19)	(0.30)	(0.22)	(0.17)
	Total	253, 423	38,639	37,446	126,215
	Cash Account	39,818	7,113	5,812	26,561
2004	(Proportion)	(0.43)	(0.52)	(0.68)	(0.51)
	Bonds	52,964	5,725	4,664	16,296
	(Proportion)	(0.12)	(0.05)	(0.04)	(0.09)
	Equities	124,356	12,819	10,899	59,190
	(Proportion)	(0.29)	(0.14)	(0.12)	(0.24)
	Other	21,736	12,060	11,311	17,446
	(Proportion)	(0.16)	(0.29)	(0.17)	(0.16)
	Total	238,875	37,087	32,686	119,495

Figure 5-2: Racial Differences in Cash Account Holding Over the Years:1992-2004 SCF

Figure 5-3: Proportion of Financial Assets Invested in Cash Accounts by Race, 1992-2004 SCF

Figure 5-4: Direct and/or Indirect Bond Ownership by Race Category, 1992-2004 SCF
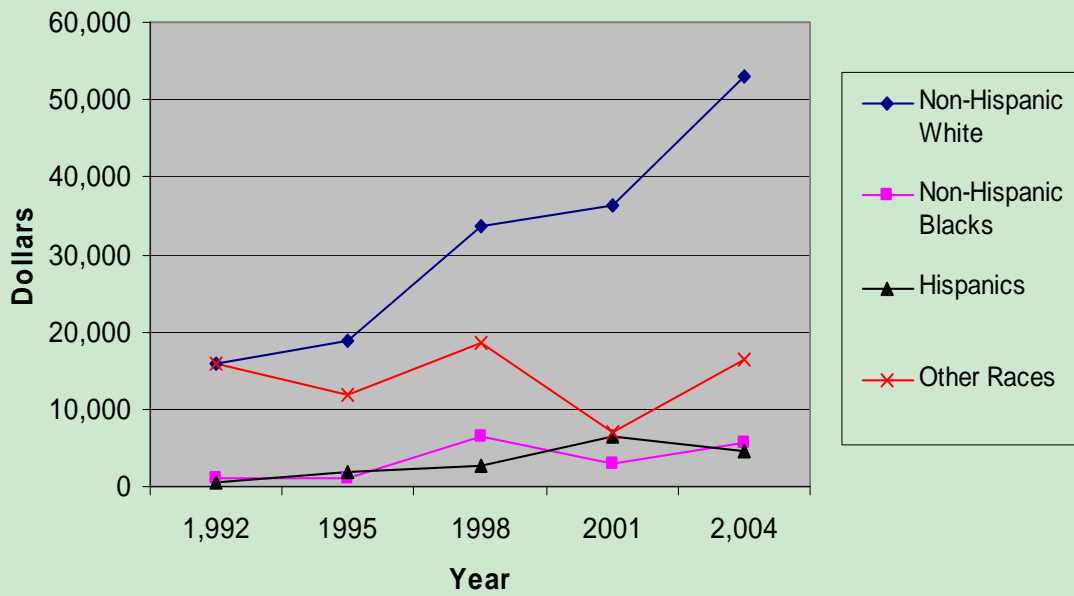
Figure 5-5: Proportion of Financial Assets invested in Bonds by Race Categories, 1992-2004 SCF

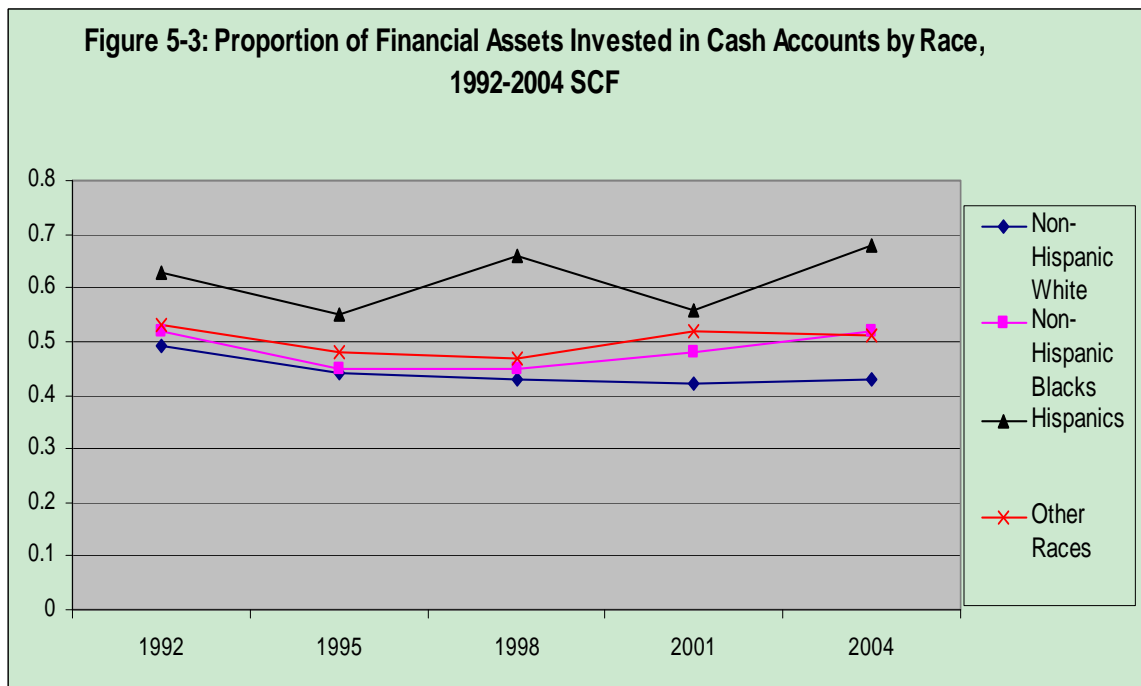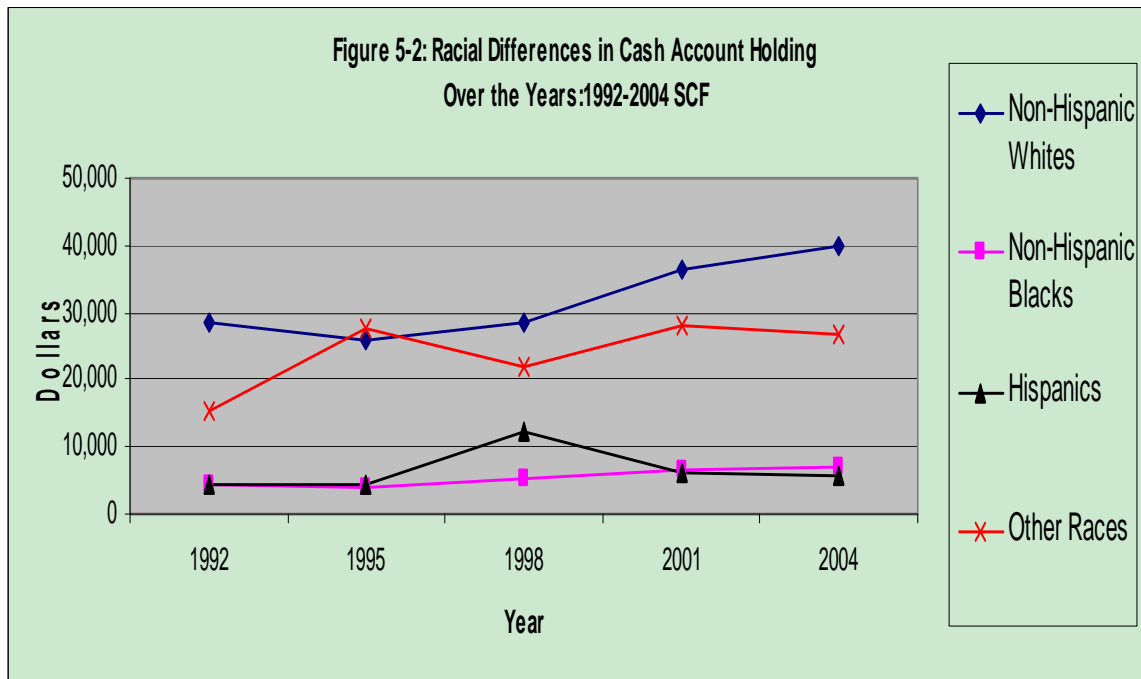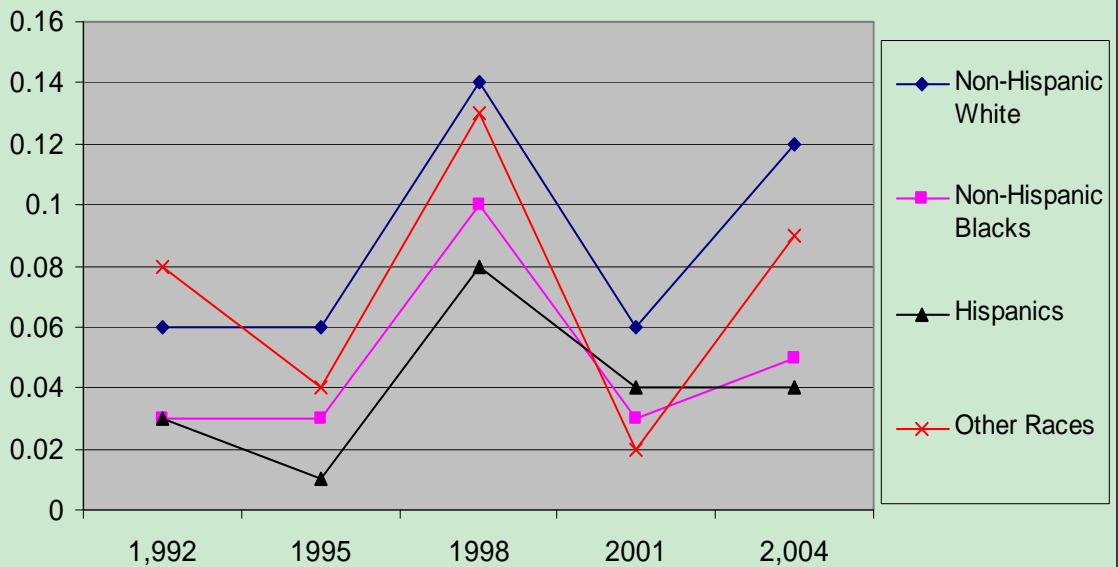**Figure 5-6: Direct and/or Indirect Stock Ownership by Racial Category, 1992-2004 SCF**
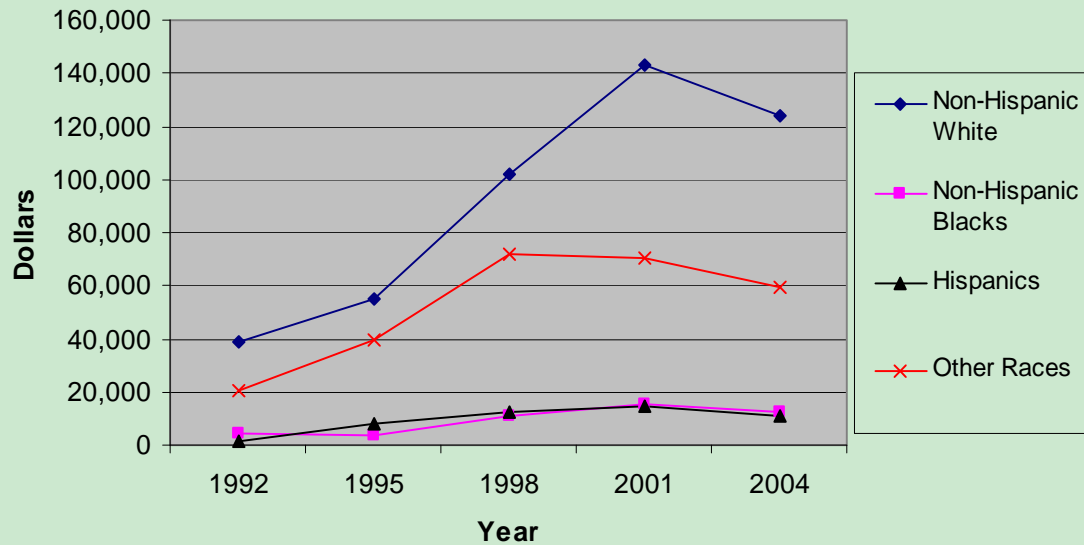
Figure 5-7: Proportion of Financial Assets Invested into Equities, 1992-2004 SCF
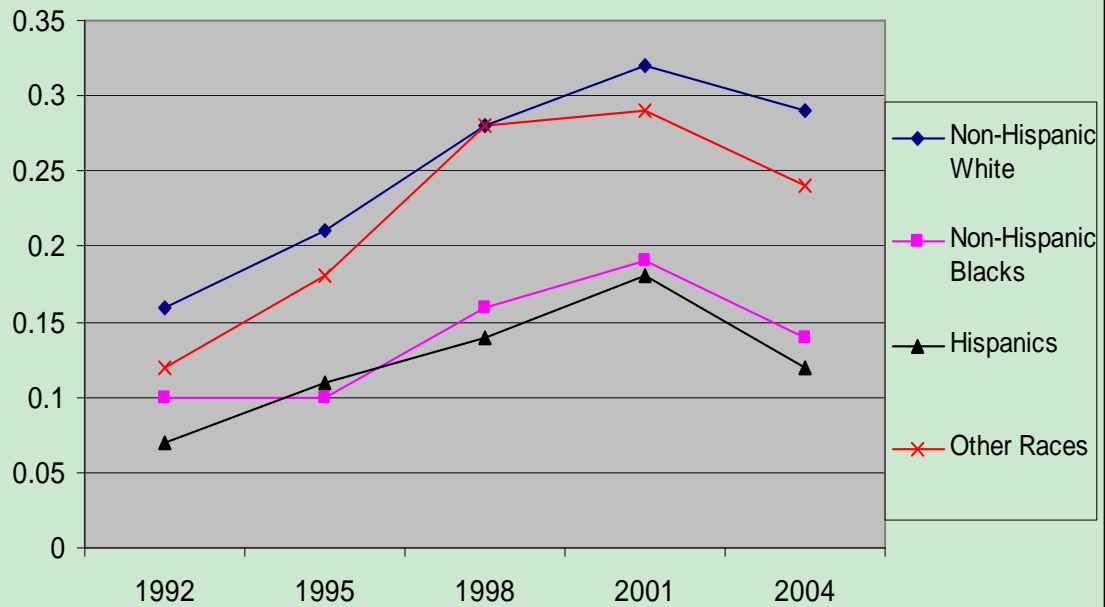
Figure 5-8: Other Financial Assets Ownership by Racial Categories, 1992-2004 SCF
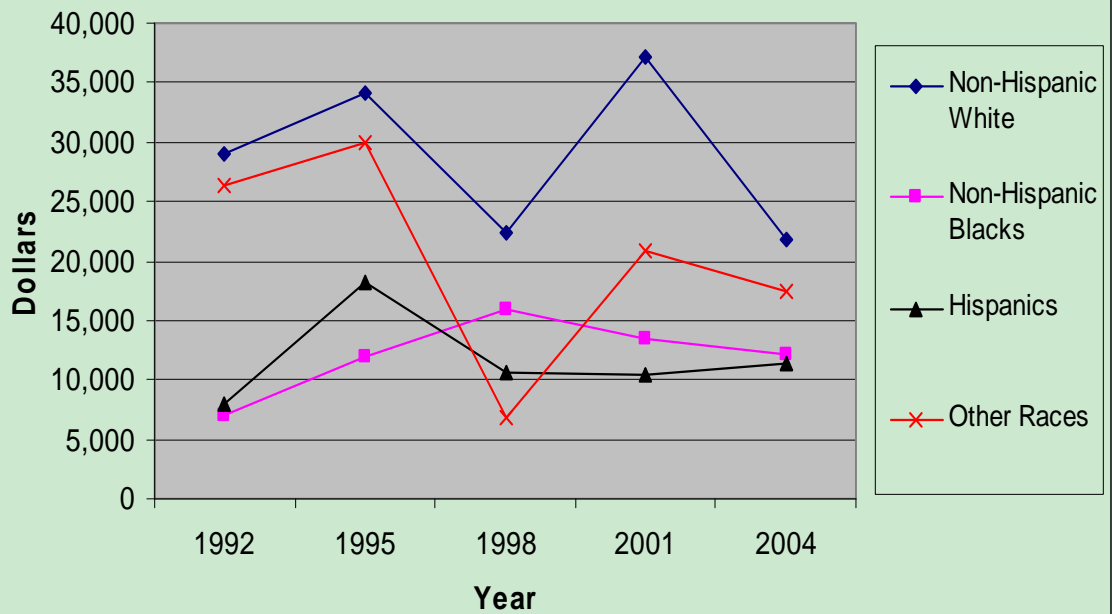
Figure 5-9: Proportion of Financial Assets Invested in Other Financial Assets by Racial Categorizes, 1992-2004 SCF
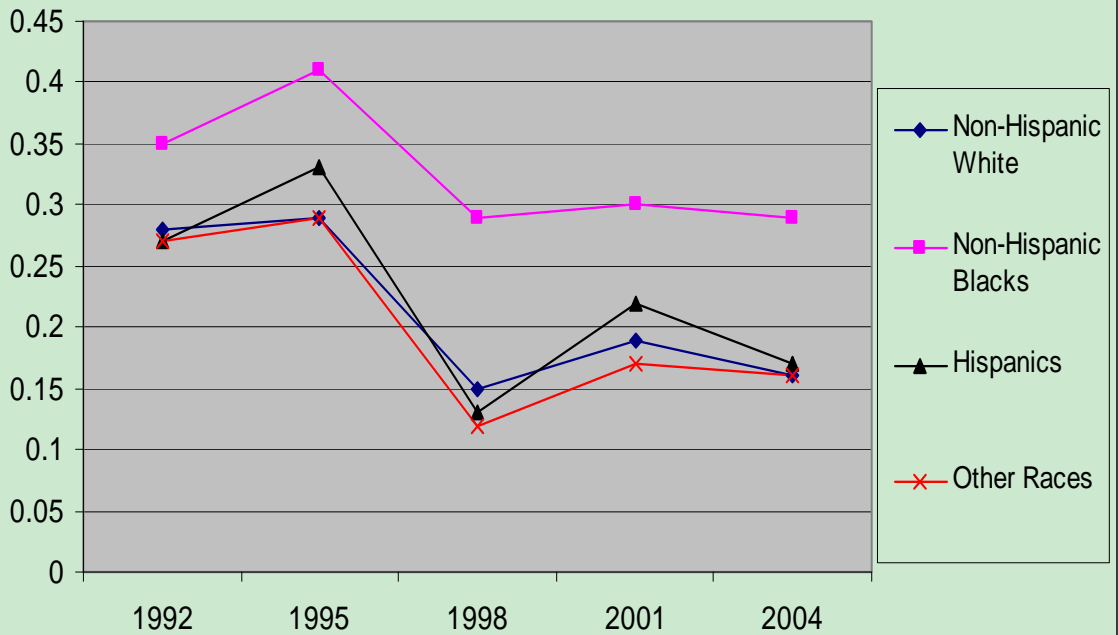
5.1.5.2. Percentage of Ownership of Financial Assets

The percentage of financial asset ownership by race is summarized in Table 5-18. The percentage owning cash accounts for household headed by whites and other races was relatively stable over the period of 1992-2004. For white-headed households and other racial households, the percentage of owning equities were greater than for black-headed households and Hispanic-headed households in each year, but the gap became smaller over the years. For black-headed household, the percentage increased over the years, except for a small drop by 6 percent from 1992 to 1995. For Hispanics, the ownership increased as well.

The percentage of bond ownership fluctuated according to the bond market for all races over the years. In each year, the percentage was greater for white-headed households and households headed by other races.

Generally speaking, the percentage of equity ownership increased over the period from 1992-2004 for all races. For households headed by whites, the percentage who owned equities increased from 43.16 percent in 1992 to 58.21 percent in 2004. The percentage for other races almost doubled over the period, from 26.69 percent in 1992 to 49.84 percent in 2004. The percentage of equity ownership was much greater for white-headed households and households headed by other races than the percentage for blacks and Hispanics, and the gap somehow enlarged, especially for Hispanics.

The percentage of other financial assets was relatively stable over the years for all races. The percentage ranked from the highest to lowest for whites, other races, blacks and Hispanics respectively in each year.

Table 5-18 Percentage of Ownership of Financial Assets by Race, 1992-2004 SCF

Year	Financial Assets (%)	Non-Hispanic White	Non-Hispanic Blacks	Hispanics	Other Races
1992	Cash Account	93.16	68.60	55.77	85.78
	Bonds	39.18	15.48	8.71	29.72
	Equities	43.16	17.14	11.45	26.69
	Other	73.16	46.35	31.32	57.54
1995	Cash Account	92.95	62.67	69.66	88.63
	Bonds	35.69	13.57	8.84	17.79
	Equities	45.07	19.53	24.53	38.75
	Other	72.93	51.49	43.53	62.99
1998	Cash Account	95.09	73.91	74.51	87.44
	Bonds	51.47	25.90	18.24	47.07
	Equities	54.39	30.12	21.34	46.89
	Other	74.45	56.30	36.04	61.06
2001	Cash Account	95.45	81.58	72.23	87.61
	Bonds	34.62	15.25	10.56	17.45
	Equities	57.08	34.53	28.41	51.24
	Other	73.88	57.71	42.32	57.86
2004	Cash Account	95.58	79.21	76.30	95.27
	Bonds	46.84	18.57	10.97	32.08
	Equities	58.21	27.00	20.56	49.84
	Other	56.30	45.09	25.80	47.37

Figure 5-10: Percentage of Cash Account Ownership by Race
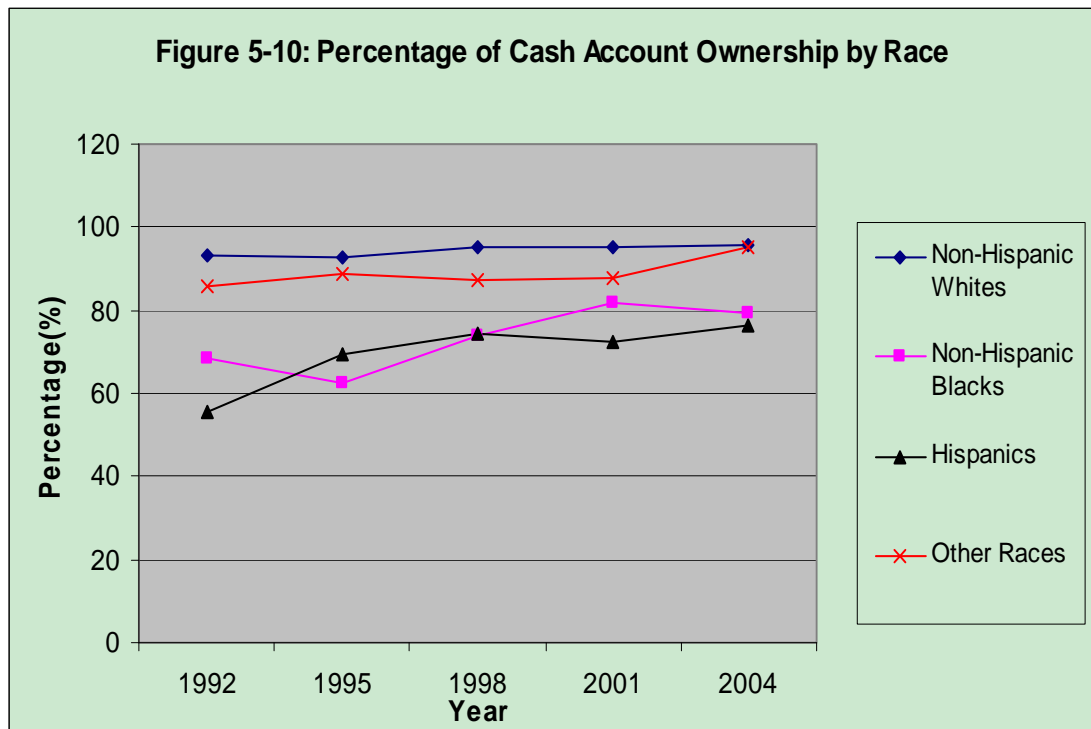
Figure 5-11: Percentage of Bond Ownership by Race
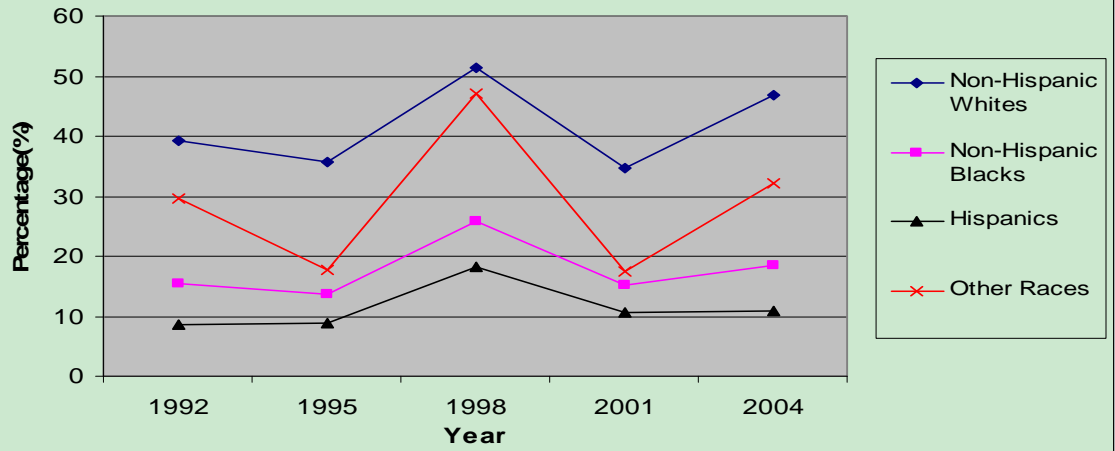
Figure 5-12: Percentage of Equity Ownership by Race
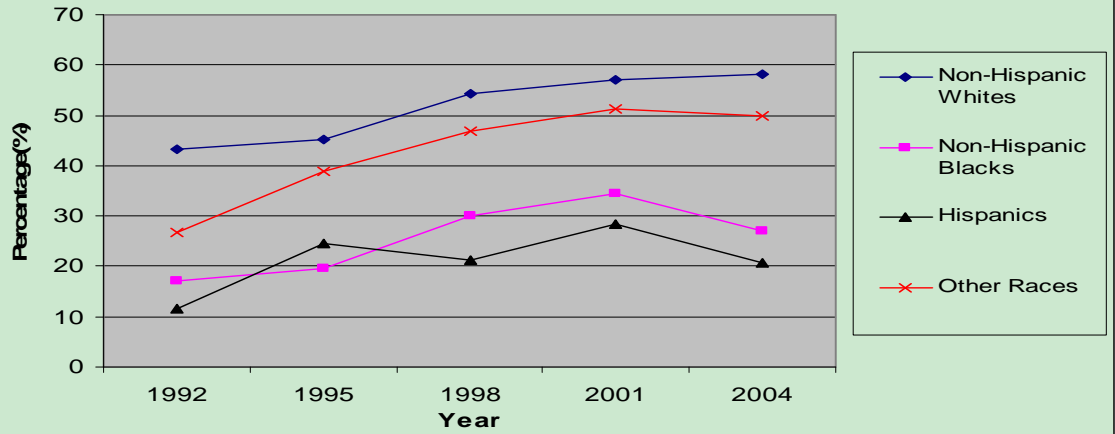
Figure 5-13: Percentage of Other Financial Asset Ownership by Race
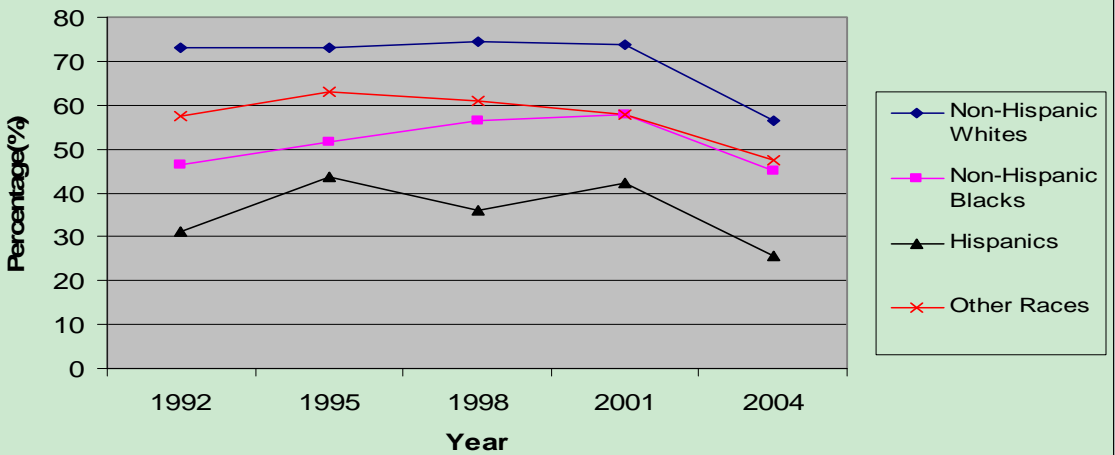
5.2. Heckman Selection Model Results

In this part, the results of four double hurdle models regressed on the four financial asset categories (equities, bonds, cash accounts and other financial assets) are presented and interpreted. Firstly, five datasets are combined from 1992 SCF, 1995 SCF, 1998 SCF, 2001 SCF and 2004 SCF. Next, to control for selection bias effects, the probability of having each financial asset category for each of the five imputations was regressed. Then, the ratio of financial assets invested in each category is estimated based on the probability of having each financial asset category for each of the five imputations. Lastly, RII technique is applied to average the results from the regressions of the five imputations.

5.2.1 Equities

The regression results from Heckman selection model for equity holding are summarized in the Table 5-19 below.

5.2.1.1 Interaction of Race and Year

Most of the interaction terms of race and year are significant in both the ownership equation and the ratio equation. When compared to a white-headed household in 1992, the probability of holding equities for households headed by whites in 1995 was not significantly different. However, the equity proportion was, on average, significantly greater. When compared to white-headed households in the year 1992, households headed by a white were found to have a greater probability of equity ownership and to have a greater proportion of their financial assets invested in equities in 1998, 2001 and 2004.

With reference to the ownership of equities for white-headed households in 1992, the probability of having equities for households headed by blacks was significantly less in 1992, 1995 and 2004. However, in 1998 and 2001, the probability of the equity ownership for black-headed household was not significantly different. When compared to the equity share held by white-headed households in 1992, the ratio of financial assets invested in equities by households headed by a black was significantly greater for households headed by blacks in 1992, 1998, 2001 and 2004,but not significant in 1995.

The probability of owning equities showed a significant negative sign for households headed by Hispanics in 1992, 1995, 1998 and 2004, when compared to households headed by a white in 1992. Households headed by Hispanics had no significant difference in the equity share in 1992 and 1995, but increased the equity share in 1998, 2001 and 2004, when compared to an otherwise similar household headed by a white in 1992.

The probability of equity ownership was significantly less, but the proportion of financial assets invested in equity was not significantly different for households headed by other races in 1992, when compared to white-headed households in 1992. The probabilities in 1995, 1998, 2001 and 2004 were not significantly different from the probability of having equities by white-headed households in 1992. However, the equity share held by households headed by other races was significantly greater in 1998, 2001 and 2004, when compared to white-headed households in 1992.

5.2.1.2 Other Demographic Factors

The average age of the respondents and their husbands/wives/partners showed a mixed effect on the probability of holding equities and the ratio of financial assets

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invested in equities. The probability of equity ownership was significantly higher in 55-64 average age range, but not significantly different for age range under 35 or above 65, when compared to the age range in 35-54. However, the ratio of financial assets invested in equities was significantly lower for households under 35, but not different for households aged in 55-64 or above 65, when compared to households in 35-54. The finding is consistent with previous studies (e.g. Weagley & Gannon, 1991; Riley & Chow, 1992; Ram swami & Srivastava, 1993; Wang & Hanna, 1997; Chambers & Schlargenhauf, 2002).

The highest degree attained by a couple or the respondent (if the respondent was single) had a significantly positive effect on both equations. Both the probability of equity ownership and the proportion of financial assets invested in equities were significantly lower for households with lowest education level (less than a high school diploma), increasing slightly for high school diploma and some college, when compared to households with a college degree. However, the coefficients for households with a graduate degree show a positive sign in the both the ownership equation and the ratio equation, when compared to college-educated households. The results are consistent with previous findings (e.g. Xiao, 1995; Schooley & Worden, 1996; Papke, 1998; Grable, 2000; Hariharan, et al., 2000).

Respondents who were not married or living with a partner were not significantly different from those married or living with a partner in the probability of owning equities and the ratio of financial assets invested in equities. The results are consistent with the previous findings (e.g. Bodie & Crane, 1997; Jianakoplos, et al., 2003).

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Female respondents had a greater probability of owning equities, but showed no difference in the proportion of financial assets invested in equities, when compared to male respondents. The results are inconsistent with the previous findings (e.g. Hinz, et al., 1997; Jianakoplos & Bernasek, 1998; Bajtelsmit, et al., 1999; Sunden & Surette, 1998; Bernasek & Shwiff, 2001), but consistent with the findings by Bertaut and Star-McCluer (2000).

Similar mixed results were shown for the coefficient of the number of children in the households. The probability of having equities was significantly less for households with more children. However, there was no significant effect of the number of children on the ratio of financial assets invested in equities. The results are consistent with previous studies (e.g. Smith & Ward, 1980; Bajtelsmit, et al., 1999).

5.2.1.3 Socioeconomic Factors

Income raised the probability of ownership of equities, but not the equity share. The findings are consistent with previous findings (Usher & Cragg, 1971; Haliassos & Bertaut, 1995, etc.).

As household's net worth increased, both the probability of the equity ownership and the proportion of financial assets invested in equities increased. The findings are consistent with previous findings (e.g. Haliassos & Bertaut, 1995; King & Leape, 1998; Bertaut, 1998; Hariharan, et al., 2000).

When compared to households headed by employees, the probability of owning equities and the equity share were less for households headed by the self-employed/partnership. However, households headed by the retired /not working (above 65) had a greater probability of having equities, but had no significant difference from

households headed by the employed with respect to the share of financial assets in equities. Neither the probability of equity ownership nor the equity share for the heads, not working and below 65, was significantly different from households headed by employees. The results are consistent with previous studies (e.g. Embrey & Fox, 1997; Xiao, 1996; Schooley & Worden, 1996; King & Leape, 1998).

The probability of owning equities and the ratio of financial assets invested in equities were significantly greater for households with both defined benefit (DB) plans and defined contribution (DC) plans and households with only DC plans, when compared to households with only DB plans on current jobs. But the probability and the share were not significantly different for households with neither DB plans nor DC plans, compared to those with only DB plans.

Households expecting a substantial inheritance/ gift had a greater probability of having equities, but no significant difference in the proportion of financial assets invested in equities, when compared to households without such expectations. Both the probability and the share were greater for households who had received an inheritance/gift, when compared to households without any inheritance. The results are consistent with previous findings (e.g. Embrey & Fox, 1997; Gutter, et al., 1999; Wang & Hanna, 1997).

Homeowners were not significantly different from non-homeowners in the probability of having equities and the ratio of financial assets invested in equities. Both the probability and the share were significantly less for business owners, when compared to non-business owners. The findings are consistent with previous studies (e.g. Devaney & Rayburn, 1998; Henderson & Ioannides, 1983; Cocco, 2000; Sung & Hanna, 1996).

5.2.1.4 Attitudinal Factor (Risk Tolerance)

When compared to the average financial risk-taker, the probability of equity ownership was not significant, but the share was significantly greater for substantial financial risk-takers. Above average risk-takers had a greater probability and share, when compared to average risk-takers. Also, both the probability and the share were significantly less for non risk takers compared to average risk takers. The findings are consistent with previous studies (Schooley & Worden, 1996; Embrey & Fox, 1997; Bertaut, 1998; Sunden & Surette, 1998; Gutter, et al., 1999).

Table 5-19   Heckman Selection Model Results for Equity Holdings

Variables	Ownership		Ratio	
	Coefficients	S.E.	Coefficients	S.E.
Intercept	-3.860***	0.156	0.188***	0.039
Interaction Terms: Race* Year				
Non-Hispanic White*2004	0.296***	0.042	0.095***	0.009
Non-Hispanic White*2001	0.324***	0.041	0.145***	0.009
Non-Hispanic White*1998	0.215***	0.042	0.131***	0.009
Non-Hispanic White*1995	0.024	0.041	0.056***	0.010
Non-Hispanic White*1992	Reference			
Non-Hispanic Black*2004	-0.165⁺	0.098	0.060⁺	0.034
Non-Hispanic Black*2001	0.052	0.096	0.079**	0.026
Non-Hispanic Black*1998	0.054	0.097	0.085**	0.028
Non-Hispanic Black*1995	-0.354***	0.107	0.027	0.034
Non-Hispanic Black*1992	-0.298**	0.108	0.061⁺	0.035
Hispanic*2004	-0.326*	0.130	0.071*	0.034
Hispanic*2001	0.135	0.122	0.122***	0.033
Hispanic*1998	-0.191⁺	0.131	0.091*	0.040
Hispanic*1995	-0.252⁺	0.144	-0.019	0.047
Hispanic*1992	-0.458**	0.166	-0.047	0.062
Others*2004	0.068	0.146	0.085**	0.032
Others*2001	0.219	0.182	0.118**	0.038
Others*1998	-0.013	0.147	0.141***	0.037
Others*1995	-0.167	0.123	0.029	0.032
Others*1992	-0.398***	0.122	-0.015	0.035
Average Age				
Average Age <35	0.015	0.039	-0.026**	0.009
Average Age 35-54	Reference			
Average Age 55-64	0.084*	0.041	-0.0008	0.010
Average Age 65+	0.033	0.049	-0.016	0.011
Education				
Less than a High School Diploma	-0.640***	0.056	-0.038⁺	0.025
High School Diploma	-0.376***	0.038	-0.037***	0.010
Some College	-0.179***	0.037	-0.038***	0.009
Bachelor's Degree	Reference			
Graduate Degree	0.084*	0.038	0.016*	0.007
Marital Status				
Married/Living with a Partner	Reference			
Not Married or Living with a Partner	-0.051	0.036	0.001	0.009
Gender				
Male	Reference			
Female	0.097**	0.040	-0.002	0.010
Number of Children	-0.042***	0.013	-0.003	0.003
Log Income	0.111***	0.016	0.002	0.003
Log Net Worth	0.236***	0.011	0.010***	0.003
Working Status				
Work for Someone Else	Reference			
Self-Employed/Partnership	-0.181***	0.043	-0.033***	0.008
Retired/not Working(above 65)	0.083⁺	0.045	-0.004	0.011
Not Working(below 65)	-0.074	0.072	-0.008	0.020
DB vs. DC plans (current Job)				
Both	1.265***	0.065	0.051***	0.014
Only DB Plans	Reference			
Only DC Plans	1.221***	0.048	0.056***	0.013
Neither	-0.065	0.043	0.016	0.012
Expecting Inheritance/Gift				
Yes	0.099**	0.037	0.006	0.007
No	Reference			
Received an Inheritance/Gift				
Yes	0.131***	0.029	0.013*	0.006
No	Reference			
Homeownership				
Yes	-0.054	0.035	0.009	0.009
No	Reference			
Business-ownership				
Yes	-0.101**	0.042	-0.021**	0.008
No	Reference			
Risk Tolerance				
Substantial	-0.016	0.058	0.078***	0.012
Above Average	0.204***	0.035	0.078***	0.006
Average	Reference			
None	-0.613***	0.030	-0.082***	0.009
_Sigma _Ratio	0.283***	0.002	F-value	25.998***
_RHO	0.226***	0.051		

*** Significant at 0.001 level; ** Significant at 0.01 level; *Significant at 0.05 level. ⁺Significant at 0.1 level.

5.2.2. Bonds

The regression results on bond holding from Heckman selection model are summarized in Table 5-20.

5.2.2.1 Interaction of Race and Year

Most interaction terms between race and year were significant in predicting the probability of holding bonds and the ratio of financial assets invested in bonds. When compared to households headed by non-Hispanic whites in 1992, the probability was significantly less, but the ratio was significantly greater for white-headed households in 1995. The probability and the share were also significantly greater for white-headed households in 1998 and 2004. However, households headed by whites had a significantly lower probability of bond ownership and bond share in 2001, when compared to otherwise similar households in 1992.

The households headed by a black had a significantly lower probability of having bonds and a lower proportion of financial assets invested in bonds in the year 1992, 1995, 2001 and 2004, when compared to white-headed households in 1992. However, surprisingly, both the probability and the share were significantly greater for households headed by a black in 1998, when compared to white-headed households in 1992.

For households headed by Hispanics, both the probability and the ratio were significantly less in the year 1992, 1995, 2001 and 2004, when compared to white-headed households in 1992. However, the probability and the ratio were not significantly different for Hispanic-headed households in 1998.

When compared to white-headed households in 1992, the probability and the share were not significantly different for households headed by other races in 1992. Also,

households headed by other races had a lower probability of owning bonds and a lower share in bonds in 1995, 2001 and 2004, when compared to white-headed households in 1992. However, both the probability and the share were significantly higher for households headed by other races in 1998.

5.2.2.2 Other Demographic Factors

The effect of the age of the respondents (if single) or the average age of the respondents and their husbands/wives/partners on the probability of holding bonds and the ratio of financial assets invested in bonds showed a U-shape. The probability of bond ownership was significantly higher for households below 35 and 65 or above, but not significantly different for age range in 55-64, when compared to the age range in 35-54. Similarly, the ratio of financial assets invested in bonds was significantly greater for households under 35 and 65 or above, but not different for households aged in 55-64, when compared to households in 35-54.

The highest degree attained by a couple or the respondent (if the respondent was single) had a significant effect on both equations. Both the probability of bond ownership and the proportion of financial assets invested in bonds were significantly lower for households with the highest education level (among husbands/wives) as less than a high school diploma, high school diploma and some college, when compared to households with a college degree. However, the coefficients for households with a graduate degree showed an insignificant sign in the both the ownership and the ratio equations, when compared to college-educated households.

Respondents who were not married or living with a partner had a significantly less probability of owning bonds, but was not significantly different in the ratio of

financial assets invested in bonds, when compared to those married or living with a partner.

Female respondents had a greater probability of owning bonds and a greater proportion of financial assets invested in bonds, when compared to male respondents. The probability of having bonds increased, but the ratio of financial assets invested in bonds decreased as the number of children in the households increased.

5.2.2.3 Socio-Economic Factors

Income raised both the ownership of bonds and the bond share. Similarly, as household's net worth increased, both the probability of the bond ownership and the proportion of financial assets invested in bonds increased accordingly.

When compared to households headed by employees, the probability of owning bonds and the bond share were significantly less for households headed by the self-employed/partnership. However, the probability and the share were not significantly different for households headed by the retired or not working.

The probability of owning bonds and the ratio of financial assets invested in bonds were significantly greater for households with both defined benefit (DB) plans and defined contribution (DC) plans, when compared to households with only DB plans on current jobs. But the probability and the share were not significantly different for households with only DC plans from households with only DB plans. Also, both the probability and the ratio were significantly less for households with neither DB nor DC plans.

Households expecting a substantial inheritance/ gift had a greater probability of having bonds and a greater proportion of financial assets invested in bonds, when

compared to households without such expectations. Both the probability and the share were not significant for households received an inheritance/gift, when compared to households without any inheritance.

Homeowners were not significantly different from non-homeowners in the probability of having bonds and the ratio of financial assets invested in bonds. Both the probability and the share were significantly less for business owners, when compared to non-business owners.

5.2.2.4 Attitudinal Factor (Risk Tolerance)

When compared to respondents who were willing to take average financial risks, the probability of bond ownership and the share were significantly less for substantial risk-takers, above average risk-takers and non risk-takers, when compared to average risk-takers.

Table 5-20   Heckman Selection Model Results for Bond Holdings

Variables	Ownership		Ratio	
	Coefficients	S.E.	Coefficients	S.E.
Intercept	-2.163***	0.098	0.006***	0.022
Interaction Terms: Race* Year				
Non-Hispanic White*2004	0.212***	0.029	0.062***	0.008
Non-Hispanic White*2001	-0.194***	0.030	-0.056***	0.009
Non-Hispanic White*1998	0.299***	0.029	0.087***	0.009
Non-Hispanic White*1995	-0.053[+]	0.030	-0.015[+]	0.009
Non-Hispanic White*1992	Reference			
Non-Hispanic Black*2004	-0.216**	0.077	-0.062***	0.023
Non-Hispanic Black*2001	-0.447***	0.086	-0.100***	0.025
Non-Hispanic Black*1998	0.268***	0.075	0.079***	0.022
Non-Hispanic Black*1995	-0.363***	0.091	-0.105***	0.027
Non-Hispanic Black*1992	-0.333***	0.089	-0.097***	0.026
Hispanic*2004	-0.434***	0.100	-0.123***	0.029
Hispanic*2001	-0.353**	0.111	-0.096**	0.032
Hispanic*1998	0.005	0.106	0.002	0.031
Hispanic*1995	-0.605***	0.141	-0.116***	0.041
Hispanic*1992	-0.497***	0.130	-0.100***	0.038
Others*2004	-0.172[+]	0.104	-0.049[+]	0.030
Others*2001	-0.487***	0.134	-0.112***	0.039
Others*1998	0.216*	0.109	0.064*	0.032
Others*1995	-0.358***	0.103	-0.103**	0.030
Others*1992	-0.027	0.096	-0.009	0.028
Average Age				
Average Age <35	0.047[+]	0.028	0.014[+]	0.008
Average Age 35-54	Reference			
Average Age 55-64	0.025	0.028	0.008	0.008
Average Age 65+	0.221***	0.033	0.065***	0.010
Education				
Less than a High School Diploma	-0.564***	0.048	-0.164***	0.014
High School Diploma	-0.200***	0.029	-0.059***	0.008
Some College	-0.055*	0.027	-0.016*	0.008
Bachelor's Degree	Reference			
Graduate Degree	0.032	0.023	0.009	0.007
Marital Status				
Married/Living with a Partner	Reference			
Not Married or Living with a Partner	-0.040[+]	0.027	-0.011	0.008
Gender				
Male	Reference			
Female	0.047[+]	0.032	0.013[+]	0.009
Number of Children	0.021*	0.009	0.006*	0.003
Log Income	0.032***	0.010	0.010***	0.003
Log Net Worth	0.149***	0.007	0.043***	0.002
Working Status				
Work for Someone Else	Reference			
Self-Employed/Partnership	-0.114***	0.028	-0.033***	0.008
Retired/not Working(above 65)	0.015	0.032	0.004	0.009
Not Working(below 65)	-0.064	0.056	-0.019	0.016
DB vs. DC plans (current Job)				
Both	0.129***	0.041	0.037**	0.012
Only DB Plans	Reference			
Only DC Plans	0.019	0.034	0.005	0.010
Neither	-0.110***	0.034	-0.032***	0.010
Expecting Inheritance/Gift				
Yes	0.041[+]	0.023	0.011***	0.007
No	Reference			
Received an Inheritance/Gift				
Yes	0.026	0.020	0.008	0.006
No	Reference			
Homeownership				
Yes	0.011	0.028	0.003	0.008
No	Reference			
Business-ownership				
Yes	-0.182***	0.027	-0.053***	0.008
No	Reference			
Risk Tolerance				
Substantial	-0.327***	0.039	-0.095***	0.011
Above Average	-0.097***	0.022	-0.028***	0.006
Average	Reference			
None	-0.209***	0.024	-0.060***	0.007
_Sigma _Ratio	0.291***	0.003	F-value	47.032***
_RHO	-	0		

*** Significant at 0.001 level; ** Significant at 0.01 level; *Significant at 0.05 level. [+]Significant at 0.1 level.

5.2.3. Cash Accounts

The regression results from Heckman selection model on cash accounts are summarized in Table 5-21.

5.2.3.1 Interaction of Race and Year

When compared to households headed by non-Hispanic whites in 1992, the probability of having cash accounts was not significantly different for white-headed households in 1995, but the ratio was significantly less for white-headed households in 1995. The probability was significantly greater for white-headed households in 1998 and 2001, but the ratio was significantly different less. However, both the probability and the ratio were not significantly different for white-headed households in 2004.

The households headed by a black had a significantly lower probability of having cash accounts and proportion of cash accounts in the year 1992, 1995 and 1998, when compared to white-headed households in 1992. No significant difference was found in the probability in 2001, but the proportion was significantly less in 2001, when compared to a white-headed household in 1992. The proportion was not significant for black-headed households in 2004, however, the probability was significantly lower.

For households headed by Hispanics, the probability was significantly less in the year 1992, 1995 and 2004, but not significantly different in 1998 and 2001, when compared to white-headed households in 1992. However, the proportion of financial assets invested in cash accounts was significantly greater in 1992, 1998 and 2004; not significantly different in 1995 and 2001; significantly greater in 1998, when compared to white-headed households in 1992.

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When compared to white-headed households in 1992, the probability and the proportion were not significantly different for other racial households in 1992, 1995 or 1998. However, the probability was not significantly different in 2001 and 2004, but the proportion of financial assets invested in cash accounts was significantly greater in 2001 and 2004.

5.2.3.2 Other Demographic Factors

Most of the categories of the average age of the respondents and their husbands/wives/partners were significant on both the probability of holding cash accounts and the ratio of financial assets invested in cash accounts. The probabilities of cash account ownership were significantly higher for households in 55-64 and 65 or above, when compared to the age range in 35-54. The ratio of financial assets invested in cash account was significantly greater for households under 35, but was significantly less for households in 55-64, when compared to households in 35-54.

The highest degree attained by a couple or the respondent (if the respondent was single) had a significant effect on both equations. The probability of cash account ownership was significantly less for households with the highest education level (among husbands/wives) as less than a high school diploma, high school diploma and some college, but their proportion invested in cash accounts was significantly higher, when compared to households with a college degree. However, the coefficients for households with a graduate degree didn't show a significant sign in the both the ownership equation and the ratio equation, when compared to college-educated households.

Respondents who were not married or living with a partner had a significant lower probability of owning cash accounts, but a significant higher proportion invested in cash accounts, when compared to those married or living with a partner.

Female respondents had a greater probability of owning cash accounts, but had a lower ratio of financial assets invested in cash accounts, when compared to male respondents. The probability of having cash accounts was significant less as the number of children in the households increased. However, the number of children had no significant effect on the cash account share.

5.2.3.3 Socio-Economic Factors

Income raised both the probability of the cash account ownership and the proportion of financial assets invested in cash accounts. As household's net worth increased, the probability of ownership increased, but the proportion decreased accordingly.

When compared to households headed by employees, the probability of owning cash accounts was not significantly different for households headed by the self-employed/partnership, retired or not working. However, the proportion was greater for the self-employed/partners and the retired.

The probability of owning cash accounts was not significantly different for households with both defined benefit (DB) plans and defined contribution (DC) plans and households with only DC plans, when compared to households with only DB plans on their current jobs. Also, the probability was significantly less for households with neither plan. However, the share was significantly higher for households with both plans and with only DC plans.

Households expecting a substantial inheritance/ gift had a greater probability of having cash accounts, but had a significant less proportion of financial assets invested in cash accounts, when compared to households without such expectations. The probability was significantly greater for households who received an inheritance/gift, but the proportion was not significantly different when compared to households without any inheritance.

Homeowners had a significantly greater probability of having cash accounts and a greater ratio of financial assets invested in cash accounts, when compared to non-homeowners. Both the probability and the share were significantly higher for business owners, when compared to non-business owners.

5.2.3.4 Attitudinal Factor (Risk Tolerance)

When compared to respondents who were willing to take average financial risks, the probability of cash account ownership was not significantly different for substantial risk-takers or above average risk-takers, but significantly less for non risk-takers, when compared to average risk-takers. The ratio of financial assets invested in cash accounts was significantly less for above average risk-takers, but significantly greater for non risk-takers.

Table 5-21   Heckman Selection Model Results for Cash Account Holdings

Variables	Ownership		Ratio	
	Coefficients	S.E.	Coefficients	S.E.
Intercept	-1.354***	0.316	0.966***	0.028
Interaction Terms: Race* Year				
Non-Hispanic White*2004	0.098	0.081	-0.006	0.008
Non-Hispanic White*2001	0.147+	0.080	-0.023**	0.008
Non-Hispanic White*1998	0.134+	0.080	-0.040***	0.008
Non-Hispanic White*1995	-0.037	0.075	-0.039***	0.008
Non-Hispanic White*1992	Reference			
Non-Hispanic Black*2004	-0.451***	0.103	-0.028	0.020
Non-Hispanic Black*2001	0.046	0.120	-0.061**	0.020
Non-Hispanic Black*1998	-0.229*	0.114	-0.073***	0.020
Non-Hispanic Black*1995	-0.717***	0.106	-0.052**	0.021
Non-Hispanic Black*1992	-0.450***	0.111	-0.057**	0.021
Hispanic*2004	-0.183+	0.112	0.089***	0.020
Hispanic*2001	-0.118	0.132	-0.006	0.023
Hispanic*1998	-0.075	0.139	0.044+	0.027
Hispanic*1995	-0.357*	0.152	0.023	0.030
Hispanic*1992	-0.627***	0.129	0.082**	0.029
Others*2004	0.342	0.307	0.049+	0.028
Others*2001	-0.146	0.270	0.083**	0.032
Others*1998	-0.095	0.236	0.017	0.031
Others*1995	-0.167	0.219	0.012	0.026
Others*1992	-0.213	0.196	0.027	0.026
Average Age				
Average Age <35	-0.014	0.374	0.036***	0.007
Average Age 35-54	Reference			
Average Age 55-64	0.281***	0.075	-0.020**	0.007
Average Age 65+	0.724***	0.086	-0.0003	0.009
Education				
Less than a High School Diploma	-1.121***	0.094	0.145***	0.011
High School Diploma	-0.686***	0.087	0.063***	0.008
Some College	-0.451***	0.091	0.029***	0.007
Bachelor's Degree	Reference			
Graduate Degree	-0.116	0.133	-0.008	0.007
Marital Status				
Married/Living with a Partner	Reference			
Not Married or Living with a Partner	-0.124*	0.055	0.021**	0.007
Gender				
Male	Reference			
Female	0.360***	0.056	-0.014+	0.008
Number of Children	-0.064***	0.018	-0.0008	0.002
Log Income	0.301***	0.027	0.008**	0.003
Log Net Worth	0.056***	0.014	-0.055***	0.002
Working Status				
Work for Someone Else	Reference			
Self-Employed/Partnership	0.028	0.085	0.033***	0.007
Retired/not Working(above 65)	-0.066	0.070	0.024**	0.009
Not Working(below 65)	-0.042	0.077	0.019	0.014
DB vs. DC plans (current Job)				
Both	0.142	0.145	-0.199***	0.011
Only DB Plans	Reference			
Only DC Plans	0.109	0.098	-0.191***	0.009
Neither	-0.340***	0.090	0.007	0.009
Expecting Inheritance/Gift				
Yes	0.110+	0.073	-0.014*	0.006
No	Reference			
Received an Inheritance/Gift				
Yes	0.146*	0.066	-0.001	0.005
No	Reference			
Homeownership				
Yes	0.123*	0.053	0.017**	0.007
No	Reference			
Business-ownership				
Yes	0.343***	0.099	0.059***	0.007
No	Reference			
Risk Tolerance				
Substantial	-0.142	0.109	0.003	0.010
Above Average	-0.072	0.076	-0.025***	0.006
Average	Reference			
None	-0.264***	0.051	0.107***	0.006
_Sigma _Ratio	0.230***	0.002	F-value	8.216***
_RHO	0.092*	0.040		

*** Significant at 0.001 level; ** Significant at 0.01 level; *Significant at 0.05 level. +Significant at 0.1 level.

5.2.4. Other Financial Assets

The regression results on other financial assets from Heckman selection model are presented in Table 5-22.

5.2.4.1 Interaction of Race and Year

Most interaction terms between race and year were significant in predicting the probability of holding other financial assets and the share of other financial assets. When compared to households headed by non-Hispanic whites in 1992, neither the probability nor the ratio was significantly different for white-headed households in 1995. The probability and the share were significantly less for white-headed households in 1998, 2001 and 2004.

The households headed by a black had a significantly lower probability of having other financial assets in the year 1992 and 2004, when compared to white-headed households in 1992. However, surprisingly, the share was significantly greater for households headed by a black in 1992, 1995, 2001 and 2004.

For households headed by Hispanics, the probability of other financial asset ownership was significantly less in the year 1992, 1995, 1998, 2001 and 2004, when compared to white-headed households in 1992. The ratio was also significantly less for Hispanic-headed households in 1998 and 2001, when compared to whites in 1992. However, surprisingly, the ratio was significantly greater for Hispanic-headed households in 1992, 1995 and 2004.

When compared to white-headed households in 1992, the probability was significantly less for households headed by other races in 1992, 1995, 1998, 2001 and

2004. The ratio was also significantly less for households headed by other races in 1998, 2001 and 2004.

5.2.4.2 Other Demographic Factors

The average age of the respondents and their husbands/wives/partners had a significant effect on both equations. The probability of other financial asset ownership was significantly higher for households in 55-64 and 65 or above, but not significantly different for households below 35, when compared to the age range in 35-54. However, the ratio was significantly less for households under 35 and 65 or above, but not different for households aged in 55-64, when compared to households in 35-54.

The highest degree attained by a couple or the respondent (if the respondent was single) also had a significant effect on both equations. The probability of other financial asset ownership were significantly lower, but the ratio was significantly greater for households at the lower education levels as less than a high school diploma, high school diploma and some college, when compared to households with a college degree. However, the coefficients for households with a graduate degree showed an insignificant sign in the ownership equation but a negative sign in the ratio equation, when compared to college-educated households.

Respondents who were not married or living with a partner had a significantly lower probability of owning other financial assets, but as a ratio to total financial assets, it was not significantly different, when compared to those married or living with a partner.

Female respondents were not significantly different in the probability of owning other financial assets or in the proportion of other financial assets to total financial assets, compared to their male counterparts. The probability of having other financial assets in

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one's portfolio was not significantly affected by the number of children, but the ratio increased as the number of children in the households increased.

5.2.4.3 Socio-Economic Factors

Income had no significant effect on the ownership of other financial assets, but surprisingly reduces the share. As a household's net worth increased, the probability of other financial asset ownership increased, but the proportion of other financial assets to total financial assets decreased.

When compared to households headed by employees, the probability of owning other financial assets was not significantly different for households headed by self-employed, the retired or not working. However, the share of other financial assets was greater for self-employed and those not working, but less for the retired, when compared to households headed by the employed.

The probability of owning other financial assets and the ratio of other financial assets to total financial assets were significantly greater for households with both defined benefit (DB) plans and defined contribution (DC) plans and households with only DC plans, when compared to households with only DB plans on current jobs. The probability was, however, significantly less, for households with neither plan.

Households expecting a substantial inheritance/ gift had a greater probability of having other financial assets, but were not significantly different in the ratio, when compared to households without such expectations. The probability was significant greater, but the share was significantly less for households who had received an inheritance/gift, when compared to households without any inheritance.

Homeowners had a significantly lower probability and a lower share of total

financial assets invested in other financial assets, when compared with non-homeowners.

The probability was significantly lower, but the share was not significantly different for

business owners, when compared to non-business owners.

5.2.4.4 Attitudinal Factor (Risk Tolerance)

When compared to respondents who were willing to take average financial risks,

the probability of other financial asset ownership was significantly less for substantial

risk-takers and non risk-takers, when compared to average risk-takers. The ratio was

significantly less for above average risk-takers, but was significantly greater for non risk-

takers, when compared to average risk-takers.

Table 5-22   Heckman Selection Model Results for Other Financial Asset Holdings

Variables	Ownership		Ratio	
	Coefficients	S.E.	Coefficients	S.E.
Intercept	-1.468***	0.169	0.655***	0.031
Interaction Terms: Race* Year				
Non-Hispanic White*2004	-1.018***	0.042	-0.096***	0.010
Non-Hispanic White*2001	-0.137**	0.045	-0.086***	0.008
Non-Hispanic White*1998	-0.066+	0.045	-0.112***	0.008
Non-Hispanic White*1995	-0.030	0.046	0.012	0.009
Non-Hispanic White*1992	Reference			
Non-Hispanic Black*2004	-0.502***	0.085	0.126***	0.025
Non-Hispanic Black*2001	-0.117	0.091	0.063**	0.022
Non-Hispanic Black*1998	0.002	0.091	0.030	0.022
Non-Hispanic Black*1995	-0.065	0.091	0.161***	0.024
Non-Hispanic Black*1992	-0.179+	0.090	0.153***	0.024
Hispanic*2004	-1.138***	0.095	0.072+	0.039
Hispanic*2001	-0.401***	0.105	-0.051+	0.030
Hispanic*1998	-0.566***	0.117	-0.061+	0.032
Hispanic*1995	-0.466***	0.127	0.144***	0.035
Hispanic*1992	-0.679***	0.120	0.106**	0.040
Others*2004	-1.058***	0.132	-0.048+	0.033
Others*2001	-0.469**	0.179	-0.116***	0.036
Others*1998	-0.296*	0.155	-0.129***	0.033
Others*1995	-0.286*	0.136	0.026	0.027
Others*1992	-0.322**	0.128	0.019	0.029
Average Age				
Average Age <35	-0.040	0.038	-0.032***	0.009
Average Age 35-54	Reference			
Average Age 55-64	0.123**	0.046	0.008	0.008
Average Age 65+	0.097*	0.048	-0.041***	0.010
Education				
Less than a High School Diploma	-0.430***	0.049	0.096***	0.015
High School Diploma	-0.184***	0.038	0.054***	0.009
Some College	-0.074*	0.038	0.029***	0.008
Bachelor's Degree	Reference			
Graduate Degree	0.009	0.041	-0.016**	0.007
Marital Status				
Married/Living with a Partner	Reference			
Not Married or Living with a Partner	-0.069*	0.036	-0.007	0.008
Gender				
Male	Reference			
Female	0.049	0.037	-0.009	0.009
Number of Children	-0.0003	0.013	0.010***	0.003
Log Income	-0.004	0.016	-0.021***	0.003
Log Net Worth	0.236***	0.011	-0.008***	0.003
Working Status				
Work for Someone Else	Reference			
Self-Employed/Partnership	-0.020	0.043	0.022**	0.008
Retired/not Working(above 65)	-0.003	0.044	-0.040***	0.010
Not Working(below 65)	-0.056	0.060	0.034*	0.018
DB vs. DC plans (current Job)				
Both	0.945***	0.078	0.020+	0.013
Only DB Plans	Reference			
Only DC Plans	0.860***	0.052	0.021+	0.011
Neither	-0.232***	0.046	0.015	0.012
Expecting Inheritance/Gift				
Yes	0.208***	0.039	-0.001	0.007
No	Reference			
Received an Inheritance/Gift				
Yes	0.119***	0.034	-0.025***	0.006
No	Reference			
Homeownership				
Yes	-0.176***	0.036	-0.038***	0.008
No	Reference			
Business-ownership				
Yes	-0.122**	0.041	0.006	0.008
No	Reference			
Risk Tolerance				
Substantial	-0.201***	0.059	-0.005	0.012
Above Average	0.018	0.038	-0.036***	0.007
Average	Reference			
None	-0.304***	0.031	0.074***	0.007
_Sigma _Ratio	0.295***	0.002	F-value	50.151***
_RHO	0.152***	0.039		

*** Significant at 0.001 level; ** Significant at 0.01 level; *Significant at 0.05 level. +Significant at 0.1 level.

Chapter Six   Summary, Discussions and Implications

This chapter begins with a summary of the empirical findings. Then, the discussions and implications of this study are presented for researchers, educators, financial planners and policy makers. This chapter concludes with limitations and suggestions for future research.

6.1 Summary and Conclusions

This study used data from the 1992, 1995, 1998, 2001 and 2004 Survey of Consumer Finances to examine racial differences in financial asset allocation over the period from 1992 to 2004. Following the Expected Utility Theory and Capital Asset Pricing Model, financial assets were categorized into four groups: equities (including directly-held stocks and other indirectly-held stocks through mutual funds, retirement accounts, and etc.); bonds (including directly-held bonds and other indirectly-held bonds through mutual funds, retirement accounts, and etc.); cash accounts (including cash, Certificates of Deposit, and liquid accounts) and other financial assets. Four Heckman selection models were used to analyze both the probability of having each financial asset category and the proportion of total financial assets invested in each financial asset category conditional on the probability of ownership.

Based on the theoretical framework and previous literature, the empirical model set forth the probability and the proportion of holding each financial asset category as a function of year, race, other demographic variables (age, education, gender, marital status and number of children), socio-economic variables (income, net worth, working status, having defined benefit plans vs. having defined contribution plans, inheritance,

homeownership and business ownership) and an attitudinal factor (risk tolerance). Race has four categories: white, black, Hispanic and others. To fully analyze racial differences in holding each of the four financial asset categories, 20 interaction terms of the four racial categories and five years (1992, 1995, 1998, 2001 and 2004) were included in the models . Age was calculated as the average age for couples (married or living with a partner) instead of the age of the respondent since both ages of the couple could influence joint financial decisions in households. For singles, age of the respondents was used. Similarly, education was calculated as the highest degree attained by a couple or the respondent, if the respondent is single. Coefficient signs resulting from the four Heckman selection models are summarized in Table 6-3.

6.1.1 Effects of Interaction Terms of Race and Year

Generally speaking, the regression results are consistent with the hypotheses. Racial differences were found when comparing households headed by blacks, Hispanics or other races to households headed by whites. There was, however, little variation in effects among households headed by blacks, Hispanics or other races, in other words, minorities (see Tables 6-1 and 6-2). Households headed by whites increased both the probability of equity ownership and the proportion of financial assets in equities over the period of 1992 to 2004. When compared to a white-headed household in 1992, a household headed by a minority had a lower or equal probability of equity ownership throughout the period. In other words, minorities were worse off than whites in 1992 in terms of the probability of equity ownership. Households headed by blacks, Hispanics or other races increased their equity shares during this period, primarily 1998 or later.

When compared with white-headed households in 1992, the probability of owning bonds and the bond share for white-headed households changed according to the annual return of bonds. The probability of bond ownership and bond share were lower for all other races in all five years, except for 1998.

The probability of holding cash accounts increased, but the proportion of financial assets invested in cash accounts decreased on average over this period for households headed by whites. When compared with households headed by whites in 1992, the probability of owning cash accounts was relatively lower for households headed by blacks, Hispanics and other races during this period. Also, the proportion of financial assets invested in cash accounts was relatively lower for black-headed households. However, the proportion increased for households headed by Hispanics or other races over time.

White-headed households decreased both the ownership and the proportion of other financial assets during the period. Similar trends were shown for households headed by other races. When compared with households headed by whites in 1992, the probability of owning other financial assets decreased, but the proportion invested in other financial assets increased for households headed by blacks or Hispanics over time.

Table 6-1 Summary of Interaction Terms of Race and Year for Probability

Probability	1992	1995	1998	2001	2004
Equities					
Non-Hispanic Whites	Reference	*	+	+	+
Non-Hispanic Blacks	-	-	*	*	-
Hispanics	-	-	-	*	-
Other Races	-	*	*	*	*
Bonds					
Non-Hispanic Whites	Reference	+	+	+	+
Non-Hispanic Blacks	-	-	+	-	-
Hispanics	-	-	*	-	-
Other Races	*	-	+	-	-
Cash Accounts					
Non-Hispanic Whites	Reference	*	+	+	*
Non-Hispanic Blacks	-	-	-	*	-
Hispanics	-	-	*	*	-
Other Races	*	*	*	*	*
Other Financial Assets					
Non-Hispanic Whites	Reference	*	-	-	-
Non-Hispanic Blacks	-	*	*	*	-
Hispanics	-	-	-	-	-
Other Races	-	-	-	-	-

+/-: significant at 0.1; *: not significant

Table 6-2 Summary of Interaction Terms of Race and Year for Share

Share	1992	1995	1998	2001	2004
Equities					
Non-Hispanic Whites	Reference	+	+	+	+
Non-Hispanic Blacks	+	*	+	+	+
Hispanics	*	*	+	+	+
Other Races	*	*	+	+	+
Bonds					
Non-Hispanic Whites	Reference	+	+	-	+
Non-Hispanic Blacks	-	-	+	-	-
Hispanics	-	-	*	-	-
Other Races	*	-	+	-	-
Cash Accounts					
Non-Hispanic Whites	Reference	-	-	-	*
Non-Hispanic Blacks	-	-	-	-	*
Hispanics	+	*	+	-	+
Other Races	*	*	*	+	+
Other Financial Assets					
Non-Hispanic Whites	Reference	*	-	-	-
Non-Hispanic Blacks	+	+	*	+	+
Hispanics	+	+	-	-	+
Other Races	*	*	-	-	-

+/-: significant at 0.1; *: not significant

6.1.2 Effects of Other Demographic Factors

6.1.2.1 Average Age

The probability of holding equities was higher when the average age of the couples in 55-64, but the proportion of financial assets invested in equities peaked in the age range of 35-54. This finding is consistent with the hypothesis. Also, both the probability and the share of holding bonds increased as households aged. Households increased the probability of holding cash accounts and other financial assets, but invested less in cash accounts and other financial assets at old ages.

6.1.2.2 Education

As expected, the likelihood and the proportion of holding equities and bonds increased as households had higher levels of education. Also, better-educated households invested less proportion in cash accounts and other financial assets.

6.1.2.3 Marital Status

Married couples were more likely to have financial assets and to have invested less in cash accounts, when compared to unmarried counterparts. The findings are consistent with previous hypothesis.

6.1.2.4 Gender

Surprisingly, female respondents were more likely to hold equities, bonds, cash accounts and other financial assets, when compared to male counterparts. This finding is not consistent with previous hypothesis. But, as expected, female respondents invested less in equities and more in bonds.

6.1.2.5 Number of Children

As the number of children increased, the probability and the proportion of holding equities and cash accounts decreased, but the probability and the proportion of holding bonds increased. The finding is consistent with previous hypotheses.

6.1.3. Effects of Socio-Economic Factors

6.1.3.1 Income

As anticipated, as household income increased, both the likelihood and the proportion of having equities, bonds and other financial assets increased. But the proportion invested in other financial assets decreased as income increased.

6.1.3.2 Net Worth

As household net worth increased, the probability of holding equities, bonds, cash accounts and other financial assets increased, and the proportion invested in equities and bonds also increased, consistent with previous hypothesis.

6.1.3.3 Working Status

As expected, households headed by self-employed were less likely to hold equities and bonds, and invest less in equities and bonds, when compared to households headed by employees. However, surprisingly, households headed by the retired had a greater probability of holding equities.

6.1.3.4 DB VS. DC Plans

Compared with households with only defined benefit plans, households with only defined contribution plans and households with both plans had a greater probability of and a proportion of having equities and bonds. These findings are consistent with previous hypothesis.

6.1.3.5 Inheritance

As anticipated, households received or expecting an inheritance were more likely to hold equities, bonds, cash accounts and other financial assets. Also, they had a greater proportion of financial assets invested in equities and bonds, but a lower proportion invested in cash accounts and other financial assets.

6.1.3.6. Homeownership

Surprisingly, there was no significant difference in the holding of equities and bonds between homeowners and non-homeowners. However, homeowners had a greater probability of and proportion of owning cash accounts, but a lower probability and proportion of other financial asset ownership.

6.1.3.7 Business-ownership

As anticipated, business-owners had a lower probability of and proportion of holding equities and bonds, but a greater probability and proportion of cash accounts.

6.1.4 Effects of Attitudinal Factor (Risk Tolerance)

Equities were risky assets compared to bonds and cash accounts. As respondents were willing to take more financial risks, they were more likely to hold equities and invested more in equities. This finding was consistent with previous hypothesis. But the effect of risk tolerance on bond holding was bell shaped since both the likelihood and the share were greater for households willing to take average risks, as compared with substantial risk-takers, above average risk-takers or non risk-takers.

Table 6-3   Summary of Heckman Selection Models Results

Variables	Equities		Bonds		Cash Accounts		Other Financial Assets	
	Ownership	Share	Ownership	Share	Ownership	Share	Ownership	Share
Interaction Terms: Race* Year								
Non-Hispanic White*2004	(+)***	(+)***	(+)***	(+)***	(+)	(-)	(-)***	(-)***
Non-Hispanic White*2001	(+)***	(+)***	(-)***	(-)***	(+)+	(-)**	(-)**	(-)***
Non-Hispanic White*1998	(+)***	(+)***	(+)***	(+)***	(+)+	(-)***	(-)+	(-)***
Non-Hispanic White*1995	(+)	(+)***	(-)+	(+)+	(-)	(-)***		(+)
Non-Hispanic White*1992	Reference		Reference		Reference		Reference	
Non-Hispanic Black*2004	(-)+	(+)+	(-)**	(-)***	(-)***	(-)	(-)***	(+)***
Non-Hispanic Black*2001	(+)	(+)**	(-)***	(-)***	(+)	(-)**	(-)	(+)**
Non-Hispanic Black*1998	(+)	(+)**	(+)***	(+)***	(-)*	(-)***	(+)	(+)
Non-Hispanic Black*1995	(-)***	(+)	(-)***	(-)***	(-)***	(-)**	(-)	(+)***
Non-Hispanic Black*1992	(-)**	(+)+	(-)***	(-)***	(-)***	(-)**	(-)+	(+)***
Hispanic*2004	(-)*	(+)*	(-)***	(-)***	(-)+	(+)***	(-)***	(+)+
Hispanic*2001	(+)	(+)***	(-)**	(-)**	(-)	(-)	(-)***	(-)+
Hispanic*1998	(-)+	(+)*	(+)	(+)	(-)	(+)+	(-)***	(-)+
Hispanic*1995	(-)+	(-)	(-)***	(-)***	(-)*	(+)	(-)***	(+)***
Hispanic*1992	(-)**	(-)	(-)***	(-)***	(-)***	(+)**	(-)***	(+)**
Others*2004	(+)	(+)**	(-)+	(-)+	(+)	(+)+	(-)***	(-)+
Others*2001	(+)	(+)**	(-)***	(-)***	(-)	(+)**	(-)**	(-)***
Others*1998	(-)	(+)***	(+)*	(+)*	(-)	(+)	(-)*	(-)***
Others*1995	(-)	(+)	(-)***	(-)**	(-)	(+)	(-)*	(+)
Others*1992	(-)***	(-)	(-)	(-)	(-)	(+)	(-)**	(+)
Average Age								
Average Age <35	(+)	(-)**	(+)+	(+)	(-)	(+)***	(-)	(-)***
Average Age 35-54	Reference		Reference		Reference		Reference	
Average Age 55-64	(+)*	(-)	(+)	(+)	(+)***	(-)**	(+)**	(+)
Average Age 65+	(+)	(-)	(+)***	(+)	(+)***	(-)	(+)*	(-)***
Education								
Less than a High School Diploma	(-)***	(-)+	(-)***	(-)***	(-)***	(+)***	(-)***	(+)***
High School Diploma	(-)***	(-)***	(-)***	(-)***	(-)***	(+)***	(-)***	(+)***
Some College	(-)***	(-)***	(-)*	(-)*	(-)***	(+)***	(-)*	(+)***
Bachelor's Degree	Reference		Reference		Reference		Reference	
Graduate Degree	(+)*	(+)*	(+)	(+)	(-)	(-)	(+)	(-)**
Marital Status								
Married/Living with a Partner	Reference		Reference		Reference		Reference	
Not Married or Living with a Partner	(-)	(+)	(-)+	(-)	(-)*	(+)**	(-)*	(-)
Gender								
Male	Reference		Reference		Reference		Reference	
Female	(+)**	(-)	(+)+	(+)+	(+)***	(-)+	(+)	(-)
Number of Children	(-)***	(-)	(+)*	(+)*	(-)***	(-)	(-)	(+)***
Log Income	(+)***	(+)	(+)***	(+)***	(+)***	(+)**	(-)	(-)***
Log Net worth	(+)***	(+)***	(+)***	(+)***	(+)***	(-)***	(+)***	(-)***
Working Status								
Work for Someone Else	Reference		Reference		Reference		Reference	
Self-Employed/Partnership	(-)***	(-)***	(-)***	(-)***	(+)	(+)***	(-)	(+)**
Retired/not Working(above 65)	(+)+	(-)	(+)	(+)	(-)	(+)**	(-)	(-)***
Not Working(below 65)	(-)	(-)	(-)	(-)	(-)	(+)	(-)	(+)*
DB vs. DC plans (current Job)								
Both	(+)***	(+)***	(+)***	(+)**	(+)	(-)***	(+)***	(+)+
Only DB Plans	Reference		Reference		Reference		Reference	
Only DC Plans	(+)***	(+)***	(+)	(+)	(+)	(-)***	(+)***	(+)+
Neither	(-)	(+)	(-)***		(-)***	(+)	(-)***	(+)
Expecting Inheritance/Gift								
Yes	(+)**	(+)	(+)+	(-)***	(+)+	(-)*	(+)***	(-)
No	Reference		Reference		Reference		Reference	
Received an Inheritance/Gift								
Yes	(+)***	(+)*	(+)	(+)	(+)*	(-)	(+)***	(-)***
No	Reference		Reference		Reference		Reference	
Homeownership								
Yes	(-)	(+)	(+)	(+)	(+)*	(+)**	(-)***	(-)***
No	Reference		Reference		Reference		Reference	
Business-ownership								
Yes	(-)**	(-)**	(-)***	(-)***	(+)***	(+)***	(-)**	(+)
No	Reference		Reference		Reference		Reference	
Risk Tolerance								
Substantial	(-)	(+)***	(-)***	(-)***	(-)	(+)	(-)***	(-)
Above Average	(+)***	(+)***	(-)***	(-)***	(-)	(-)***	(+)	(-)***
Average	Reference		Reference		Reference		Reference	
None	(-)***	(-)***	(-)***	(-)***	(-)***	(+)***	(-)***	(+)***

*** Significant at 0.001 level; ** Significant at 0.01 level; *Significant at 0.05 level. +Significant at 0.1 level.
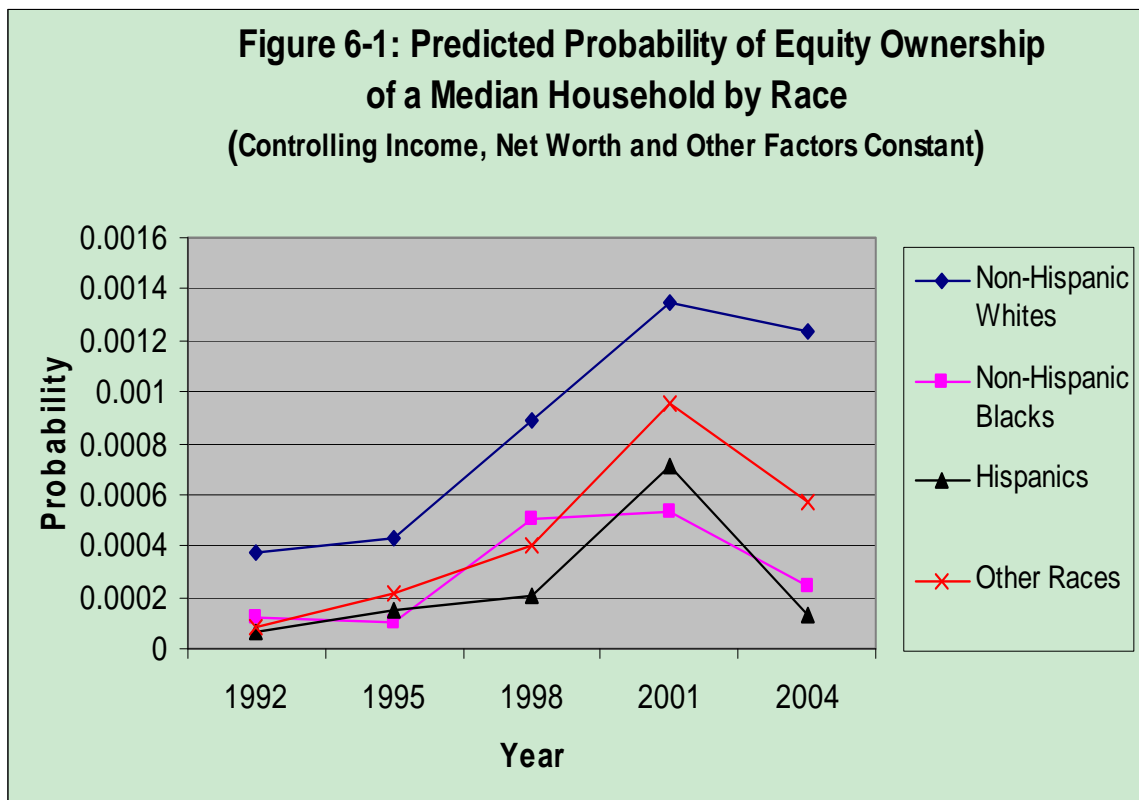
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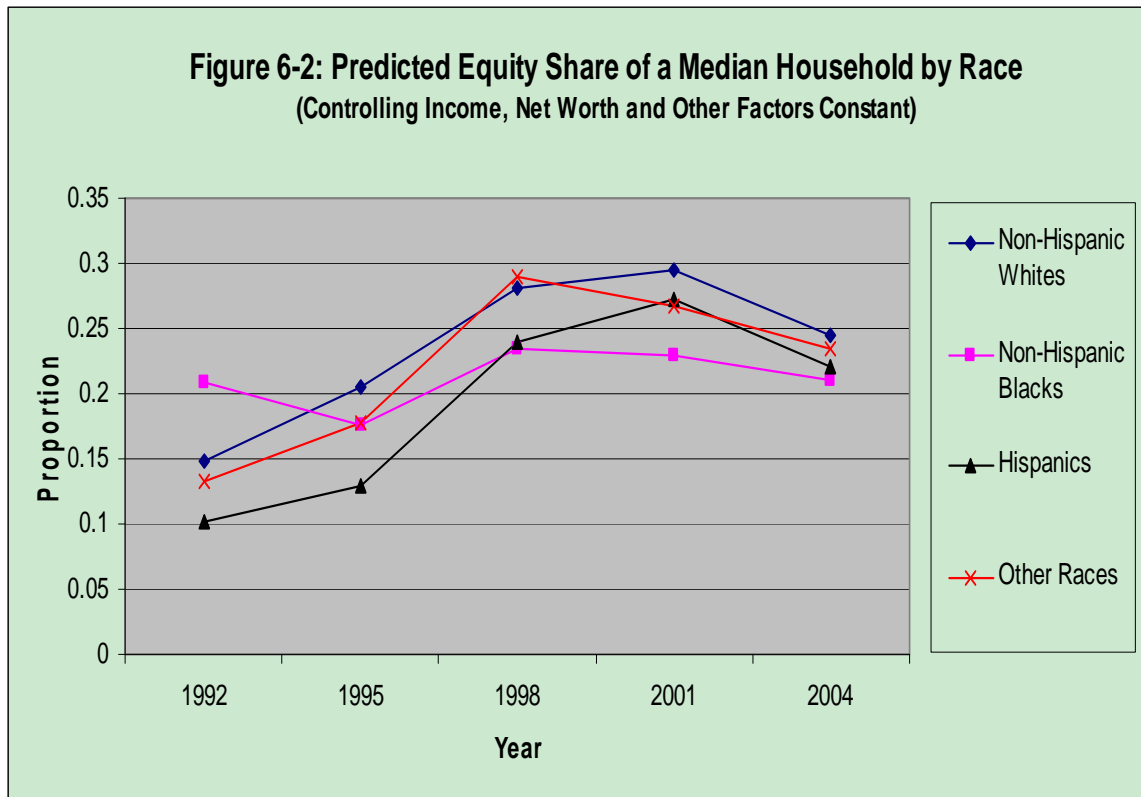### 6.2 Implications and Discussions

Based on the results from the four Heckman Selection models, the predicted

probability and proportion of financial assets invested in each category by race and year

were calculated. Thus, the pattern and trend of the racial differences in household

financial asset allocation over time can be better understood. Since the data from the

Survey of Consumer Finances are skewed toward high-income and high net worth

households, calculation of the proportion of holding each financial asset category

reflected the median household for different racial groups, assuming income and net

worth equal for all racial groups by using median value of income and net worth of the

whole sample in 1992, 1995, 1998, 2001 and 2004 (Table 5-2, Table 5-8). For the

categorical variables, the category with the highest frequency is used in the calculation.

Especially, the categories used a household with an average age in 35-54, a highest

education level as high school diploma, a married/living with a partner male respondent,

employed, without any defined contribution plans or defined benefit plans, not expecting

substantial inheritance/gift and not received any inheritance/gift, owning a home, non

business owners and not willing to take any financial risks. The predicted median

households are also assumed to have one kid in the household.

6.2.1 Equities

Figure 6-1 showed that, holding income, net worth and other factors constant for

all races, the probability of equity ownership for median households from different races

increased until 2001 and declined after 2001. However, the gap between minorities and

whites in the probability of holding equities for median households grew since the

probability for whites increased faster prior to 2001 and declined more slowly post

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2001(see Figure 6-1). This result suggests that whites may be more willing to participate

in equity markets and more reluctant to exit the equity market. The proportion of equities

held by median households headed by whites and Hispanics were parallel over the years.

Hispanics had a lower proportion of financial assets invested in equities each year.

Median households headed by blacks had a lower proportion than whites in most years,

except for 1992. Median households headed by other races also had a less proportion than

whites in most years, except for 1998. These figures indicate that, generally speaking,

whites are likely to invest more in equities compared to blacks, Hispanics, and other races,

which suggests whites are more risk tolerant in financial investments (see Figures 6-1, .6-

2).

Figure 6-1: Predicted Probability of Equity Ownership of a Median Household by Race (Controlling Income, Net Worth and Other Factors Constant)
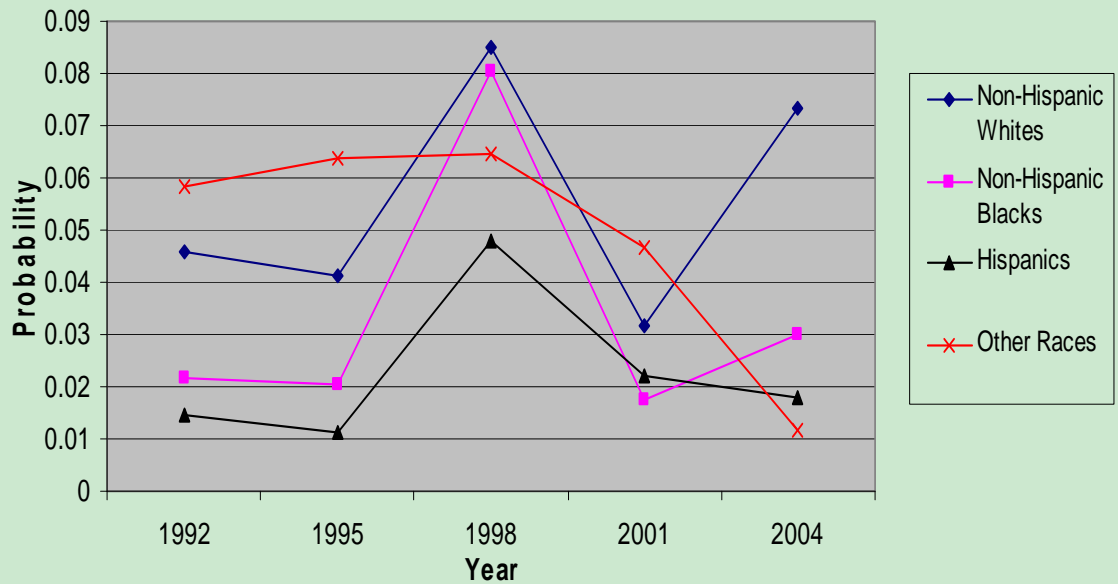
**Figure 6-2: Predicted Equity Share of a Median Household by Race**
(Controlling Income, Net Worth and Other Factors Constant)

6.2.2. Bonds

Generally speaking, bonds generate less return as well as less risk compared to equities. After controlling income, net worth and other factors constant, the probability of bond ownership and the proportion invested in bonds fluctuated widely for all races (see Figures 6-3, 6-4). When compared to whites, median households headed by blacks, Hispanics and other races invested less in bonds over the years. But the general patterns of volatility were the same across all race groups.

Figure 6-3: Predicted Probability of Bond Ownership of a Median Household by Race
(Controlling Income, Net Worth and Other Factors Constant)

Figure 6-4: Predicted Bond Share of a Median Household by Race
(Controlling Income, Net Worth and Other Factors Constant)
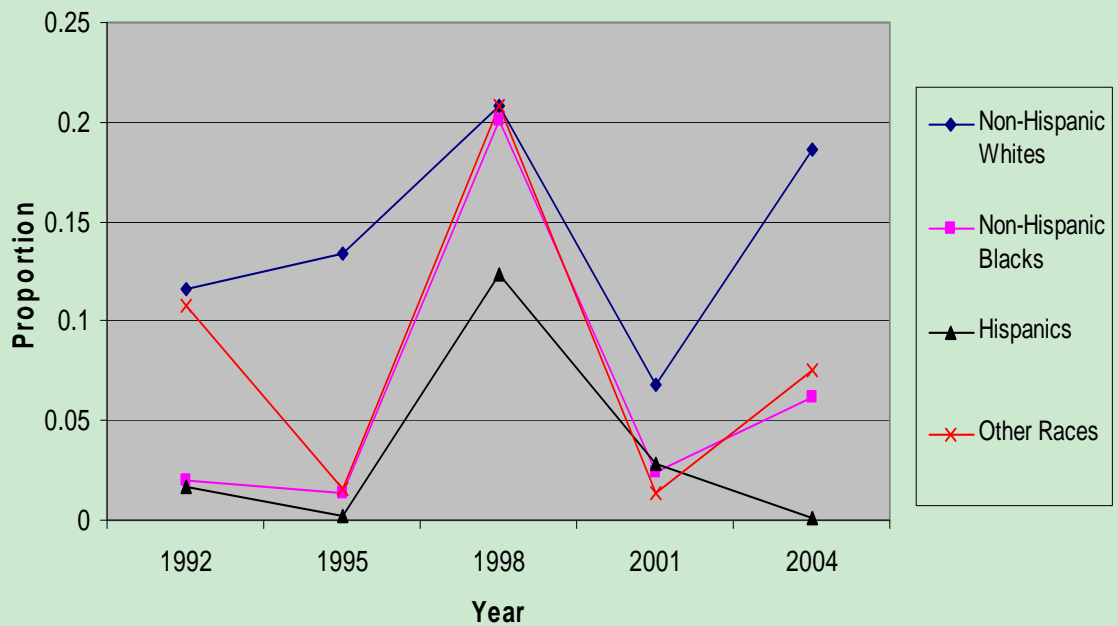
6.2.3 Cash Accounts

Cash accounts are less risky/less return compared to equities and bonds, in most situations. When controlling income, net worth and other factors constant, median households headed by white/other races had a greater probability of having cash account ownership, when compared with blacks/Hispanics (see Figure 6-5). When controlling income, net worth and other factors constant, median households headed by Hispanics and other races held a much higher proportion of cash accounts, when compared to whites, suggesting that these two races are much more conservative investors. The exception was the median households headed by blacks who had the lowest proportion of financial assets invested in cash accounts (see Figure 6-6).

Figure 6-5: Predicted Probability of Cash Account Ownership of a Median Household by Race (Controlling Income, Net Worth and Other Factors Constant)

Figure 6-6: Predicted Cash Account Proportion of a Median Household by Race (Controlling Income, Net Worth and Other Factors Constant)
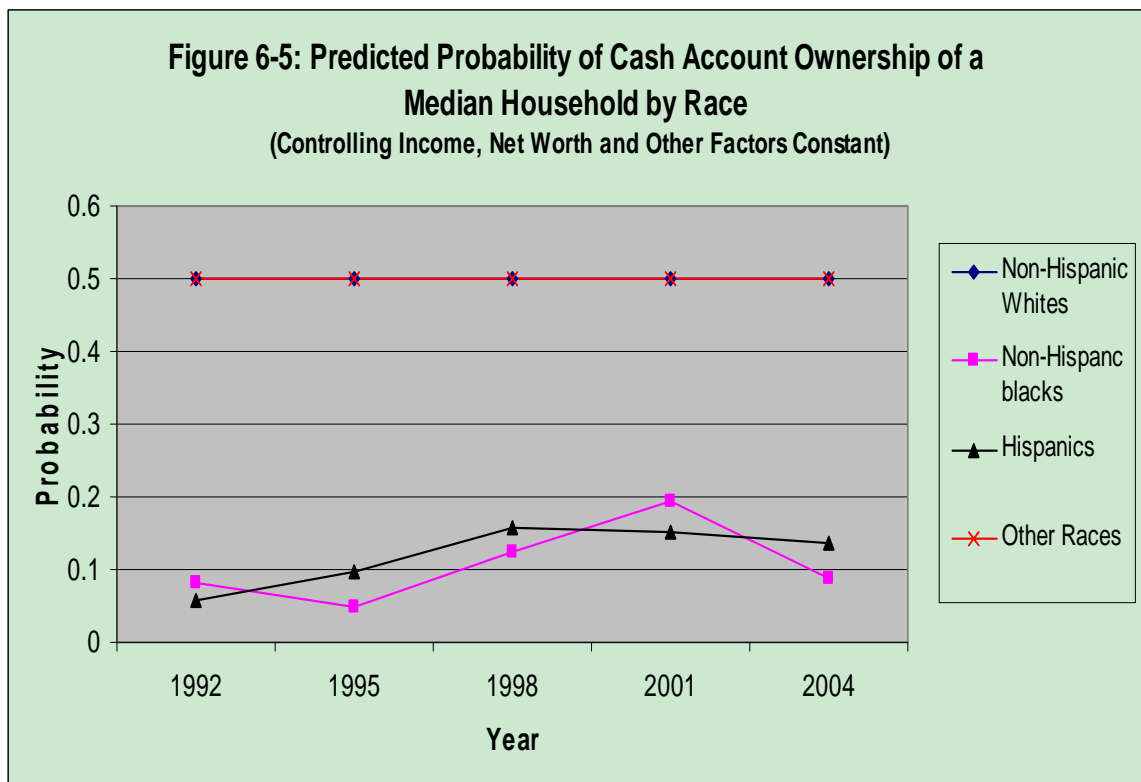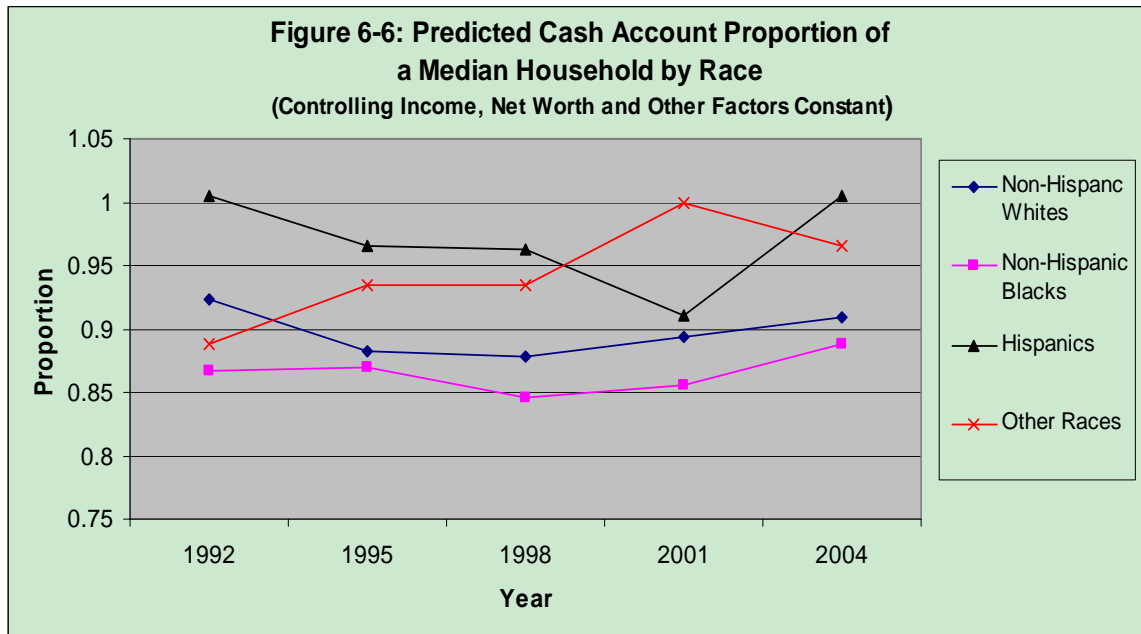
6.2.4 Other Financial Assets

Other financial assets include cash value of life insurance policies, loans from the households to someone else, future proceeds, royalties, futures and non-public stocks, etc. Median households headed by whites or other races had a greater probability of other financial asset ownership although the patterns of changes over time were similar for median households across races (see Figure 6-7). The proportion invested in other financial assets were almost parallel for all races over the years, after controlling income, net worth and other factors constant. Median households headed by Hispanics and blacks had a greater proportion invested in other financial assets in each year, when compared to median households headed whites and other races (see Figure 6-8).

Figure 6-7: Predicted Probability of Other Financial Asset Ownership of a Median Household by Race
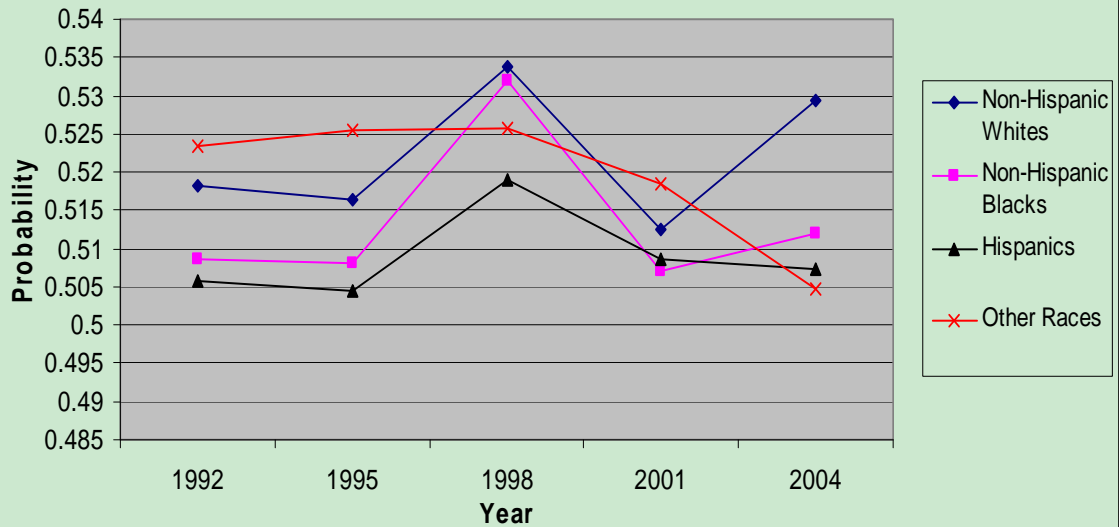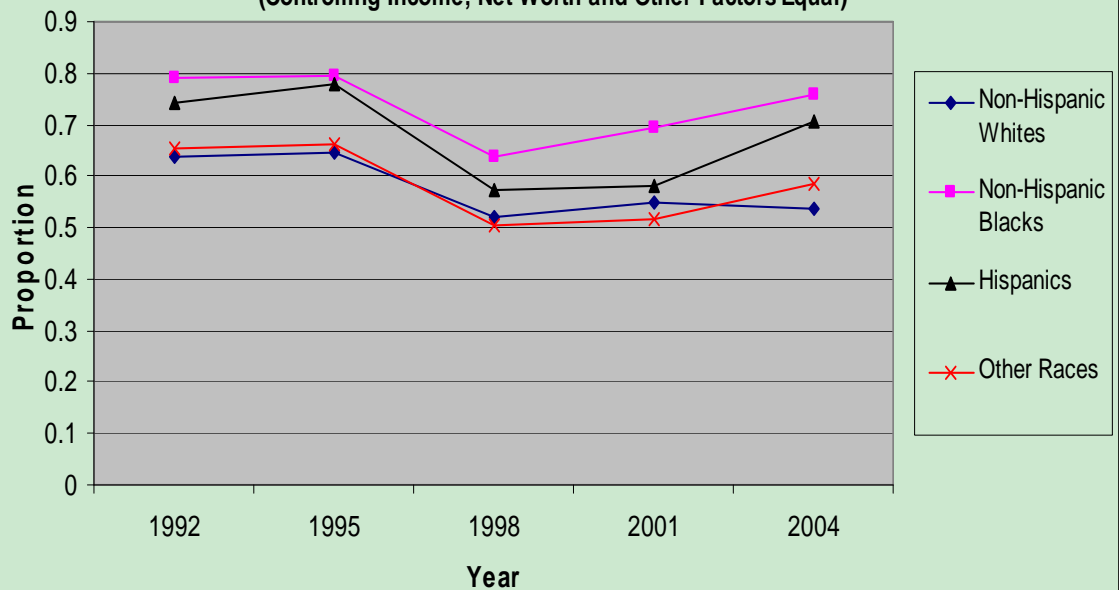(Controlling Income, Net Worth and Other Factors Constant)

Figure 6-8: Predicted Share of Other Financial Assets of a Median Household by Race
(Controlling Income, Net Worth and Other Factors Equal)

There has been no definitive explanation of reasons for the racial gap in participating in financial markets in the literature. However, several hypotheses posited in previous literature may help to understand why racial differences in investments in financial markets beyond what was controlled for.

The first consideration is the exposure to financial markets of minority groups. Compared to whites, minority groups are often less educated in general as well as in financial knowledge. Furthermore, the network and families of minority groups are less likely to invest in financial markets. Also, fewer minority groups may participate in defined benefit plans/ defined contribution plans, which may limit their access to financial markets.

The second consideration comes from the financial industry. Most financial products are targeted to whites, which may neglect the different needs and wants of minority groups. Moreover, a smaller share of financial planners/counselors is from minority groups, which may affect trust from and outreach to various racial groups.

Finally, the cultural differences may also be a factor. In our study, there is only one measure for risk tolerance, which may not capture different cultural understandings of risk for various races. For example, Asians culture was relatively conservative in terms of investments. Also, some races may have a network of family obligations to help each other financially instead making investments in the financial markets.

In summary, minorities are much more risk averse in investments, as compared with whites. Financial planners/counselors and educators should realize that the meaning, and understanding, of risk may be different for minority groups. Also, financial planners and educators should educate minorities with financial knowledge related to risk

tolerance and characteristics of financial assets, and increase their exposure to the high return/high risk equities and bonds. With financial knowledge, minorities may substantially increase the likelihood of equity or bond ownership and benefit from the equity and bond market in accumulating more wealth. Increased equity/bond ownership should help reduce the wealth gap in the long run. Future research should focus on the impact of inefficient portfolio planning on the well-being of minority households and on how to increase the likelihood of equity/bond ownership.

6.3. Strengths and Limitations of this Study

The first strength of this study is the use of the data from Survey of Consumer Finances (SCF). The SCF provides detailed information of household holdings of various assets as well as individual household demographic and socioeconomic background. Moreover, SCFs employ multiple imputation method to deal with the typical problem of missing values in net worth surveys, which provide a basis for more accurate inference and test of significance. Weights are used in the SCFs and employed in this study for descriptive analysis. Repeated-imputation inference (RII) is applied to overcome the problem of additional variance created by the multiple data sets.

Secondly, by combining five SCF surveys between 1992 and 2004 period, this study analyze racial differences in financial asset allocation over a 12-year period. The datasets are almost five times larger than most previous studies in related fields, so results may be more robust than some previous analyses, especially in terms of the effects of racial differences and changes in financial assets allocation over time.

Thirdly, this study categorized financial assets into four categories: bonds (including directly or indirectly held bonds), equities (including directly or indirectly held

stocks), cash accounts (including CDs and liquid accounts) and other financial assets. Based on this categorization, racial differences in the holding of each category of financial assets over time were analyzed, which provided a more complete view of how difference racial households make their investment decisions.

Fourthly, unlike previous studies, this study analyzed the effect of average age of the couple or the age of the respondent and the effect of the highest education level of the couple or the respondent (if single). The two controlling variables helped to capture the possible effect of joint decision on investments in households.

Last but not the least, this study employed a two-step approach to analyze investment decisions on the likelihood of having each financial asset category as well as the relative degree these financial assets are held in household portfolios conditional on the likelihood. The application of Heckman selection models provided a more detailed view on household investment decisions. In addition, 19 interaction terms between four categories of race and five survey years were used in the model to capture the racial differences and changes in financial asset allocation over time.

On the other hand, there are also some limitations in the study. The first concern is the net worth concentration problem in the data sets. The survey over-sampled net worthy households. On average, almost 95 percent of total assets are the business/real estate and collectibles investments, which are held by only 37.2 percent of all households. Future research using SCF data must take consideration of skewness of the dataset.

Second limitation results from using the variable net worth in the model instead of total assets and total debts. Net worth is the difference of total assets and total debts. By using net worth in the model, an assumption was made that total assets and total debts

had the same degree of influences on making financial asset allocation decisions, which is not true in most cases. Future research should take consideration of possible different effects of total assets and total debts.

Third limitation came from the variable of children. This study only analyzed the effect of number of children in the household. However, children in different ages should also have different effects on household financial decision-making. Future research should take consideration of the age effects of children.

Future research is also encouraged to categorize different financial asset items according to their different attributes, such as risk level, liquidity, tax benefits, income, and growth and so on. Moreover, future research can separate all households into different types of household groups according other important household characteristics, such as marital status, education, income level, net worth level, etc. Thus, a more general model could be developed so that educators or financial planners can apply our findings and serve various types of households with different types of financial assets.

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