Racial/Ethnic Differences in High Return Investment Ownership: A Decomposition Analysis

Sherman D. Hanna, Cong Wang, and Yoonkyung Yuh

The racial/ethnic disparities of risky asset ownership were investigated. In the 2004 and 2007 Survey of Consumer Finances datasets, 30% of Hispanic, 36% of Black, and 65% of White households had high return investments such as stocks, investment real estate, or private business assets. Logistic analysis shows that Black and Hispanic households are much less likely to have high return assets, even after controlling for other factors such as education. However, Blinder-Oaxaca decomposition analyses show that if Black households had the same characteristics, including risk tolerance, as White households, they would have the same ownership rates for high return investments, and the gap between Hispanic and White households is much smaller than implied by standard logistic regression.

Key Words: decomposition analysis, individual investing, portfolio allocation, racial/ethnic differences, Survey of Consumer Finances

Introduction

A number of studies have examined racial/ethnic differences in wealth in the U.S. with most studies examining the gaps between White households and minority households (Barsky, Bound, Charles, & Lupton, 2002; Blau & Graham, 1990; Sharmila, 2002; Smith, 1995; Wolff, 1998). The lower wealth levels of minority households might be partly related to differences in ownership of high return investments (Keister, 2000). Investment in risky, high return assets is an important factor in future economic well-being of households, especially in terms of potential retirement adequacy. White households have much higher stock investment ownership rates than minority groups, even after controlling for income and other factors (Schooley & Warden, 1996; Wang & Hanna, 2007; Zhong & Xiao, 1995).

Stock assets, including individual stocks and stocks included in mutual funds, are the most common high return assets owned by U.S. households (Bucks, Kennickel, Mach, & Moore, 2009). Stocks have a high volatility but much higher return than other financial investments (Morningstar, 2007). In addition to stock investment ownership, investment real estate and business ownership are often included in the category of owning risky, high return assets. Unlike stock investments, it is difficult to estimate the rate of return and standard deviation of investment real estate in general because of the diversity of these investments. Between 1972 and 2006, the rates of return for equity Real Estate Investment Trusts (REITS) were higher than large company stocks (i.e., the S&P 500 stock index), 14.5% versus 11.4% (Morningstar, 2007, p. 59). Business ownership might plausibly be assumed to have a higher expected return than stocks of publicly traded small companies with correspondingly higher risk levels (Lai & Hanna, 2004). Bond investments are sometimes assumed to be high return investments, based on having higher mean returns and standard deviations than cash equivalent investments. However, based on the much lower inflation-adjusted mean arithmetic return of long-term corporate bonds compared to stocks (Morningstar, 2007, p. 120), it seems reasonable to exclude bond investments from the high return asset category. During the 1926 to 2006 period, bonds were substantially inferior to stock investments for building wealth. One dollar invested at the beginning of 1926 would by the end of 2006 have turned into an inflation-adjusted value of $273 in a hypothetical large stock

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fund, $1,414 in a small stock fund, $9 in a corporate bond fund, and $6 in an intermediate government bond fund (Morningstar, 2007, p. 105).

Hanna and Chen (1997) concluded that all households should have stock investments, though the time horizon (and therefore age) should be important in determining the portfolio allocation to stocks, as well as other components of household wealth, including human capital and net home equity (Delaney & Reichenstein, 1996). Haliassos and Bertaut (1995) noted that there are fixed monetary and information costs to investing, so low income households might be rational in not holding stocks.

Previous studies have shown that White households are more likely than Black and Hispanic households to own risky, high return assets. Gutter, Fox, and Montalto (1999) found that in 1995 White households were twice as likely as Black households to own risky assets. Gutter and Fontes (2006) reported in 2004 that White households were still twice as likely as Black households to own risky assets. Coleman (2003) found risky asset levels in 1998 to be lower for Hispanic households than for similar White households even after controlling for other characteristics. Hanna and Lindamood (2008) found that Black and Hispanic households were less likely than White households to own stock assets, and that the proportion of Black and Hispanic households owning stock assets had decreased between 2001 and 2004, even though the proportion of White households owning stock assets had not. Many of the studies that have analyzed differences in ownership of high return assets have shown that significant differences between White and minority households persist even after statistically controlling for differences in household characteristics such as income.

What are the most important factors in accounting for differences between White households and minority households in ownership of high return assets? In the current study, a technique proposed by Fairlie (2005), which is an extension of the methods developed by Blinder (1973) and Oaxaca (1973), was used to analyze racial/ethnic differences in high return investment ownership. This method allowed for estimation of the relative importance of different characteristics in accounting for differences between groups. Differences between Whites and Blacks and between Whites and Hispanics were analyzed, and the portion of the observed differences in high return investment ownership that could be explained by differences in household and economic characteristics was calculated.

Literature Review

Households with similar demographic and financial resources might behave quite differently in the allocation of investment portfolios. For financial investments for long-term goals, the portfolio allocation in risky, high return assets will make a substantial difference in the projected accumulation. In the sections below, research related to racial/ethnic differences in risk tolerance and research on racial/ethnic differences in wealth and in stock and other high return investment holdings are discussed.

Racial/Ethnic Differences in Risk Tolerance

Investment behavior can be influenced by preferences. Ogden, Ogden, and Schau (2004) suggested that subculture, which may be represented by race or ethnicity, might impact preferences. Previous studies have shown that the households who are more willing to take risk are more likely to have stock investments (Wang & Hanna, 2007). Most studies have found that Blacks and Hispanics are less willing to take investment risk than Whites (Yao, Gutter, & Hanna, 2005). Yao et al. (2005) analyzed a combination of the 1983 to 2001 Survey of Consumer Finances (SCF) datasets, and reported that Blacks and Hispanics are less willing to take some investment risk than otherwise similar White households. Sung and Hanna (1996) found no significant differences between employed Blacks and employed Whites in the likelihood of stating they would take no risks with investment risks, although they found that Hispanics were significantly more likely than Whites to be unwilling to take risks.

Coleman (2003) analyzed the 1998 SCF to compare the risk tolerance levels of Whites, Blacks, and Hispanics. In a logistic regression controlling for racial/ethnic group, gender, marital status, education, age, and family size, she found that Blacks and Hispanics were more likely to be unwilling to take any risk than otherwise similar Whites. She obtained similar results with a tobit analysis of the risky asset proportion in that Blacks and Hispanics had a significantly lower risky asset proportion than otherwise similar Whites when net worth was not controlled, but when controlling for net worth, the predicted difference between Blacks and Whites was not significant. Wang and Hanna (2007) found that in a combined sample of the 1992 to 2004 SCF datasets, Blacks and Hispanics were less likely to be willing to take some risks than otherwise similar White households.

Despite the preponderance of studies finding that Blacks and Hispanics are less willing to take investment risk than

Whites, it seems possible that minority groups may be less risk tolerant because of limited familiarity with financial investments rather than because of a lower level of true risk tolerance. Barsky, Juster, Kimball, and Shapiro (1997), using an income gamble measure in the Health and Retirement Study (HRS) dataset, reported that Black and Hispanic respondents had risk tolerance levels higher than White respondents. The Barsky et al. (1997) risk tolerance measure was designed to be a pure measure of risk tolerance and is unrelated to financial investments. Therefore, it might be a more accurate assessment of the economic concept of risk tolerance than the SCF measure.

A consumer's access to information and related services in financial markets might also affect financial behavior. If consumers can obtain more information and service for financial investment, they may be more willing to participate in financial markets. Haurin and Morrow-Jones (2006) concluded that differences in knowledge of markets might contribute to lower homeownership rates of Black households, so it is plausible that similar factors may contribute to lower risk tolerance as measured by the SCF risk tolerance measure, as well as lower risky asset ownership rates by Black and Hispanic households.

Racial/Ethnic Differences in Wealth and Investment Holdings

The wealth gap between non-Hispanic White households and households with respondents in other racial/ethnic groups narrowed between 1995 and 2001, but then became much wider in 2004 (Aizcorbe, Kennickell, & Moore, 2003; Bucks, Kennickell, & Moore, 2006; Kennickell, Starr-McCluer, & Sundén, 1997; Kennickell, Starr-McCluer, & Surette, 2000). Smith (1995) compared the racial and ethnic differences in wealth in the 1992 HRS survey and concluded that income is an important reason for racial and ethnic deficits, but that income-conditioned wealth differences in assets remain large. Differences in high return investment ownership may contribute to the wealth differences. Previous researchers have consistently found a wealth gap between White households and Black and Hispanic households.

Given the importance of investments in high return assets contributing to wealth differences between different racial/ethnic groups, many studies have analyzed the ownership of risky high return investments and its relationship to racial/ethnic groups (Coleman, 2003; Haliassos & Bertaut, 1995; Plath & Stevenson, 2000). There have been differences in the definition of high return investments, though

as previously discussed, stock assets, business assets that are not in publicly traded companies, and investment real estate all share the attributes of having high inflation-adjusted returns. Gutter et al. (1999) and Gutter and Fontes (2006) defined risky assets as including stock and business assets but did not include investment real estate. Coleman (2003) analyzed risky assets, which she defined in an unpublished appendix (personal correspondence with Coleman, 2006) to include investment real estate along with stock and business assets.

Choudhury (2001) analyzed the 1992 Health and Retirement Study dataset and demonstrated that Whites, Blacks and Hispanics were different in saving behavior, and minority households were less inclined to invest in riskier, higher-yielding financial assets. Gutter et al. (1999) analyzed Black/White racial difference in the likelihood of owing risky assets households in the 1995 SCF dataset, and found that, controlling for other characteristics, Black households were less likely to own risky assets than White households. In an analysis that included interaction terms of race with other variables, Gutter et al. concluded that differences between Blacks and Whites in the effects of household characteristics were more important in risky asset ownership differences than race alone. However, they did not present a test for multicollinearity (Allison, 1999) so their interpretation about the limited effects of race on risky asset ownership is not conclusive.

Wang and Hanna (2007) found that even after controlling for risk tolerance levels and other variables, Blacks and Hispanics were less likely to directly or indirectly hold stock investments than Whites. Gutter and Fontes (2006) found that risky asset ownership was the key to racial differences in portfolio choices, as Black and Hispanic households that owned any risky asset were not significantly different from similar White households in risky asset proportions. However, they did not use the decomposition method used in the current study and did not report the relative importance of difference household characteristics in accounting for differences in risky asset ownership.

Decomposition Method

The Blinder-Oaxaca technique, first developed by Oaxaca (1973) and Blinder (1973), has been used to decompose racial/ethnic and gender differences in wages, employment, and wealth. The technique was developed to address one limitation of regression analyses of differences between groups that are very different in income and other characteristics. A regression analysis of an outcome vari-

able, such as wages, employment, or homeownership, assumes that the effect of household characteristics, such as income, are similar for all types of households. However, if there are substantial differences, such as in the distribution of income between groups, the assumptions inherent in using a regression analysis may not be valid. One assumption of a linear regression is that the slope of an effect with respect to all other covariates is the same for all groups (e.g., racial groups) and only the intercept of the function is shifted up or down (Fairlie, 1999, 2005). Some authors have employed interaction models to test for differences in the effects of variables (e.g., Gutter et al., 1999), but such tests are still limited by the linear nature of regression analyses. It is more appropriate to employ non-linear decomposition to give a robust estimate of the contribution of racial effects.

Oaxaca and Ransom (1994) suggested a way to avoid the problem of pooled coefficients between groups. The Oaxaca and Ransom method has an advantage over some other techniques referred to as decomposition (e.g., Gutter et al., 1999) in that the relative importance of different factors can be estimated, and it is possible to test for contributions on pooled and also on separate samples. The details of the approach are shown in Appendix A. Fairlie (1999, 2005) proposed an extended, non-linear decomposition technique which uses the coefficients directly from a logit or probit model when the outcome is binary. In the current study, a variation of the Blinder-Oaxaca decomposition method as described by Fairlie (2005) was used to examine how racial/ethnic groups were different in terms of the risky, high return investment ownership and how much of these differences were due to the observed differences in household characteristics.

Controlling for Other Household Characteristics: Normative Considerations

In order to decompose the factors related to racial/ethnic differences in ownership of high return assets, appropriate control variables need to be considered. Campbell and Viceira (2002), Cocco, Gomes, and Maenhout (2005), and Hanna and Chen (1997) presented normative models of portfolio choice. Haliassos and Bertaut (1995) and Hanna and Lindamood (2008) discussed the relationship between normative models and plausible expectations about the effects of various household characteristics on risky investment choices. A household's decision to hold high return investments is related to its risk tolerance, its investment horizon, and its desire to invest for future goals, especially retirement. Risk tolerance should influence portfolio decisions (Campbell & Viceira, 2002). The appropriateness of high return investments for savings goals is strongly related to the investment horizon, given the volatility of high return assets compared to alternate investments such as cash equivalents and shorter term government bonds. Campbell and Viceira (2002) showed that the optimal stock proportion of a portfolio should be related to age for each level of risk aversion. Age should have an effect based on life cycle savings considerations (e.g., young households might not have any savings), and the investment horizon may initially increase after short-term goals have been reached and decrease as retirement approaches (Cocco et al., 2005). The combination of possible influences of age on portfolio decisions makes it reasonable to include both age and age squared to account for non-linear effects of age.

Lower income households may decide not to save much for retirement because of the higher replacement rate for Social Security pensions. Putting funds in any higher return investment should be strongly related to household income. Low income households might also have difficulty in having enough money to invest to justify the monetary and information costs of investing in stocks and similar investments (Haliassos & Bertaut, 1995). Faig and Shum (2002) argued that households saving to buy a house should invest in low volatility investments; therefore, all other things equal, renters should be less likely to invest in high return investments than homeowners.

Education may have an impact on the financial knowledge of the household, and therefore its choices. Haliassos and Bertaut (1995) noted that there are fixed monetary and information costs to investing, so low income households might be rational in not holding stocks. They also noted the cognitive burden of investing, which might account for the strong association between stock holding and education, even after controlling for income. Married couples might have expectations of higher income than single head households, so higher human wealth should lead to greater likelihood of investing in stocks (Hanna & Chen, 1997). Because of different socialization and educational experiences, it is plausible that households with male respondents may make different investment choices than households with female respondents, so even though there is no strong theoretical expectation for a gender difference after controlling for risk tolerance and household characteristics, it might affect high return investment ownership.

Some household characteristics may affect the investment horizon, and therefore influence optimal choices (Hanna & Chen, 1998). Health status may have an impact because of a perceived need for funds to cover uninsured medical expenses in the future. Having a dependent child under the age of 19 may make the investment horizon shorter and also reduce the amount available for investing.

Controlling for Other Household Characteristics: Previous Empirical Research.

Previous empirical research has supported most of the effects of household characteristics predicted from normative analyses. Wang and Hanna (2007) found that stock ownership (a) increased with age to 44, then decreased, (b) increased with income, (c) was higher for married couple households than for single head households, (d) increased with education, and (e) was higher for homeowners than for renters. However, households with female respondents were not significantly different from those with male respondents. Gutter and Fontes (2006) reported that age was not related to risky asset ownership, but they controlled for both income and net worth. Coleman (2003) also controlled for net worth, though there were endogeneity issues as having high return investments tended to result in higher net worth.

Overview of Literature

Previous studies have shown that Blacks and Hispanics have lower investment risk tolerance than White households even after controlling for differences in income and other characteristics, although the differences might be caused by less familiarity with investments. The wealth gap between Black and White households and between Hispanic and White households has remained substantial, and differences in ownership of high return investments might contribute to the wealth disparities.

A regression analysis of differences between racial/ethnic groups may be limited because of substantial differences in characteristics such as income. In the current study, the focus was on differences in risky asset ownership between Black and White households and between Hispanic and White households and ascertaining the relative importance of household characteristic differences in explaining differences in risky asset ownership. A variation of the Blinder-Oaxaca decomposition method (Fairlie, 2005) was used to ascertain the relative importance of different factors in accounting for racial/ethnic differences in ownership of high return assets.

Methods

Data and Variables

A combination of the 2004 and 2007 SCF datasets was used to study the White-Black and White-Hispanic gaps in high return investment ownership because the SCF is the best source of information on the wealth or financial assets holdings and characteristics of American households (Bucks et al., 2009). Households were analyzed and categorized based on the self-identified race/ethnicity of the survey respondent (Hanna & Lindamood, 2008; Lindamood, Hanna, & Bi, 2007). The surveys before 2004 included one racial/ethnic question, with White and Hispanic presented as different categories (Yao et al., 2005). A few respondents also indicated a second category of racial/ethnic identity, but in the public use datasets before 2004, it is impossible to identify respondents who chose Hispanic as a second category. Starting from the 2004 SCF, there has been a separate question about Hispanic status: whether respondents consider themselves to be Hispanic or Latino in culture or origin. Combining that answer with the primary question revealed a higher proportion of Hispanics. However, the results were similar when using the one question racial/ethnic variable, so for consistency with research using previous SCF datasets, the one question categorization was used.

The 2004 SCF dataset included 4,519 households and the 2007 SCF dataset included 4,412 households. Each household was represented by five implicates to allow for appropriate estimates of variance when there are missing values for variables (Lindamood et al., 2007). The coding for the racial/ethnic status variable was different across implicates for 13 households in the 2004 dataset and for six households in the 2007 dataset; therefore, those households were excluded from the analyses. Table 1 shows the number of households of each racial/ethnic self-identification in each survey year.

The number of Black and of Hispanic households in each survey year is relatively small for multivariate analyses, so the 2004 and 2007 datasets were combined. The high return investment ownership rate was not significantly different between 2004 and 2007 for the combined sample or for any of the racial/ethnic subgroups. When a dummy variable for survey year was added to the multivariate analyses, it was not significant for the pooled sample or for any of the separate analyses, so analyses controlling for survey year are not reported. In the combined dataset there are 342 households with respondents choosing some other

Table 1. Number of Households with Respondents Self-Identifying in Racial/Ethnic Category, 2004 and 2007

Category	2004	2007	Combined
White	3,511	3,514	7,025
Black	482	409	891
Hispanic	347	313	660
Asian/other	166	176	342
Total	4,506	4,412	8,918

Note. Unweighted analysis of 2004 and 2007 Surveys of Consumer Finances, excluding 13 households in 2004 and 6 households in 2007 that had different racial/ethnic identifies in different implicates.

racial/ethnic group. The SCF does not provide detailed breakdowns of this last group in the public dataset, though Hanna and Lindamood (2008) suggested that most of this group is likely to be Asian or Pacific Islander. In analyses of all households, "other" households were included, but not presented in separate analyses. For convenience, racial/ethnic identification of households are referred to when technically all we know is that the respondent identified one of the listed categories (Lindamood et al., 2007).

For the overall sample, the basic models for the multivariate analysis were:

Choice of holding any high return investments = f (racial/ethnic group, X) where X is a vector of household characteristics and risk tolerance.

For each of the individual subsamples (White, Black and Hispanic):

Choice of holding any high return asset investments = f (X) where X is a vector of household characteristics and risk tolerance.

The dependent variable was dichotomous and equaled 1 if the household held one or more high return investments, including stock assets, stocks in retirement accounts, investment real estate, and business assets. Logistic regressions (logits) were appropriate methods for analyzing dichotomous dependent variables. The focus on much re-

search and normative analysis in finance is on the ratio of risky assets to the total portfolio (Coleman, 2003). However, most Black and Hispanic households held no risky, high return investments, so a direct comparison of the risky asset ratios of minority households to the ratios of White households did not provide much insight, because most of the racial/ethnic differences in asset allocation were due to differences in ownership of risky assets (Gutter & Fontes, 2006).

Each SCF dataset contains five implicates. The repeated-imputation inference (RII) method was used to correct for underestimation of variances due to imputation of missing data (Montalto & Sung, 1996). The descriptive results were weighted to represent the population proportions of households, with the SCF population weights adjusted so that the apparent sample size was equal to the actual sample size. The standard approach for multivariate analysis, averaging of the five implicates without use of population weights, was followed (Lindamood et al., 2007).

The explanatory variables included the racial/ethnic self-identification of the respondent, age of the head, age squared, education, health status, risk tolerance, household income, presence of children under 19 years of age, homeownership, and gender of respondents. The SCF risk tolerance variable has four levels: no risk, average risk, above average risk, and substantial risk. In the logistic regression, the reference category was no risk, and there were dummy variables for each of the other three levels. For non-couple households, education was based on the highest education attained by the head, but for couple households, it was based on the partner with the higher level of education. For instance, if a husband's highest education was a high school diploma and the wife had a bachelor's degree, education of the household was coded as bachelor's degree. Health status was assessed by the respondent. For couple households, the evaluation of both the respondent and the partner/spouse was based on the one in worse health was used. Excellent meant that the respondent considered both partners to be in excellent health. Good meant that the respondent considered one partner to be in good health and the other in good or excellent health. Both couple households and single head households may have male or female respondents, as the respondent was set by the Survey of Consumer Finances to be the more financially knowledgeable partner in couple households (Lindamood et al., 2007).

The natural log of income was used to reduce possible effects of heteroskedasticity. Even though Gutter and Fontes

(2006) and Coleman (2003) controlled for net worth, there were endogeneity issues as having high return investments tended to result in higher net worth, so net worth was not included as an independent variable in the current study. However, similar results were obtained when net worth was included in the multivariate analyses.

Decomposing the Racial/Ethnic Differences in Ownership of High Return Investments

The racial/ethnic gap in ownership of high return investments can be divided into two parts: one part of explained difference (expressed as the first term in Appendix A, Equation 2) due to the differences in household characteristics we included in the model, and another part of unexplained difference due to the inability to include immeasurable variables (expressed as the second term in Appendix A, Equation 2). The contribution of each variable was equal to the change in predicted probability from replacing the minority with White distribution, holding other variables constant.

Given that the White sample size was much larger than that of Hispanic and Black samples, the average prediction decomposition method was implemented by following the suggestion of Fairlie (2005) to randomly select a White sample to match the minority sample size for the analysis. The minority households and sampled White households were then ranked by race and matched based on their predicted stockownership outcomes. This sampling process was repeated 1,000 times and the statistics that were computed with the alternative weights were averaged. In this way, selection bias from sample differences between different racial groups was largely avoided.

In the current study, the sample weights were used to estimate the mean outcomes but not the logistic regressions. There was no reason to prefer the minority or White estimates in this equation; therefore, both sets of estimates were estimated and another set of pooled sample estimates as proposed by Oaxaca and Ransom (1994) was added. In this way, the sensitivity and consistency of decomposition specifications from estimates were tested. Each model was estimated three times: overall sample with racial/ethnic status controlled, White sample only, and minority (Black or Hispanic) sample only. These estimates included the same explanatory variables with the exception that the racial/ethnic coefficients were dropped when they were applied in decomposition specifications based on separate samples. By incorporating the coefficients from logistic results, decomposition results showed the relative contribution to differences in high return investment ownership

from household characteristics such as age, education, and health status, as well as risk tolerance.

Results

Descriptive Results

Table 2 shows the mean allocation of high return investments for the overall sample and for each racial/ethnic group. Stock investments, including stocks in mutual funds, accounted for 38% of all high return investments, business investments accounted for 38%, and investment real estate assets accounted for 23%. Obviously, non-financial high return assets were very important for households. Households with Black respondents and households with Hispanic respondents were much less likely than those with White respondents to own each type of risky asset. Stock assets comprised a much lower proportion of high return investments for Black and Hispanic households than for White households. For the overall ownership of one or more risky, high return investments, the rates were 65% for White households, 36% for Black households, 30% for Hispanic households, and 67% for Asian/other households (see Table 3). All of these rates were significantly different from each other except for the White versus Asian/other rates. Households with White respondents were older, more educated, in better health, had higher income, had higher net worth, and were more likely to say they were willing to take some risk with investments than were households with Black or Hispanic respondents (see Table 4).

Multivariate Analyses

The dependent variable in the model was an indicator of whether or not households held high return investments. The logistic regressions showed that many household characteristics were related to high return investment ownership (see Table 5). The logit for the overall sample had a concordance ratio of 91%, meaning that the logit correctly classified over 91% of the households in terms of high return investment ownership, and the concordance ratios were also very high for the logits for each subsample. Even after controlling for income, net worth, education, risk tolerance, and other variables, Black and Hispanic households had much lower predicted high return investment ownership rates than White households. The gaps between White and Black households and between White and Hispanic households narrowed after controlling for the independent variables, but the differences were still significant. At the mean levels of other variables, the predicted ownership rate for Black households was 17.5 percentage points lower than the rate for White households, and the predicted rate for Hispanic households was 15.6 percentage points lower than the rate for White households.

Table 2. Ownership and Mean Levels of Stock, Business Assets, and Investment Real Estate by Racial/Ethnic Category

Investment	Racial/Ethnic Category				
	White	Black	Hispanic	Other/Asian	Total
Stock assets: percent owning	58%	28%	22%	57%	51%
Stock assets: mean dollars	$143,758	$14,015	$14,162	$126,170	$111,600
Stock assets: proportion of all risky, high return assets	40%	26%	18%	23%	38%
Business assets: percent owning	14%	5%	6%	13%	12%
Business assets: mean dollars	$137,999	$17,527	$28,356	$126,170	$111,600
Business assets: proportion of all risky, high return assets	38%	32%	35%	44%	38%
Investment real estate: percent owning	20%	12%	12%	19%	19%
Investment real estate: mean dollars	$78,000	$22,555	$38,194	$96,550	$67,767
Investment real estate: proportion of all risky, high return assets	22%	42%	47%	34%	23%
All risky, high return assets: mean dollars	$359,758	$54,097	$80,712	$287,999	$291,086

Note. Table created by authors, using weighted analyses of all five implicates of the 2004 and 2007 SCF datasets, with 19 households deleted that had different responses to racial/ethnic category in different implicates.

Table 3. Ownership of One or More High Return Investments by Racial/Ethnic Category

	Percent Distribution	Percent Owning Any High Return Investment	Significance Levels of Difference from Whites	Significance Levels of Difference from Blacks	Significance Levels of Difference from Hispanics
All households	100.0	58.1	na	na	na
White households	73.8	65.1	na	< 0.001	< 0.001
Black households	13.1	35.7	< 0.001	na	< 0.001
Hispanic households	9.3	30.3	< 0.001	< 0.001	na
Asian/other households	3.9	66.6	0.212	< 0.001	< 0.001

Note. Table created by authors using weighted analyses of all five implicates of the 2004 and 2007 SCF datasets, with 19 households deleted that had different responses to racial/ethnic category in different implicates. Significance tests are based on RII procedures.

Table 4. Means and Proportions of Selected Household Characteristics by Racial/Ethnic Category

Variable	Racial/Ethnic Category			
	White	**Black**	**Hispanic**	**Pooled sample**
Age of head	51.6	46.7	41.7	49.8
Income ($)	91,431	44,301	45,543	80,844
Net worth ($)	640,690	126,506	161,942	523,283
Education[1]				
Less than high school degree	0.07	0.15	0.34	0.10
High school degree	0.28	0.30	0.30	0.28
> 12 years education without degree	0.19	0.22	0.17	0.19
2 year degree	0.13	0.13	0.08	0.13
Bachelor degree	0.20	0.12	0.07	0.18
Post-bachelor degree	0.13	0.08	0.03	0.12
Health status[2]				
Poor health	0.08	0.10	0.09	0.08
Fair health	0.21	0.24	0.33	0.22
Good health	0.50	0.46	0.44	0.49
Excellent health	0.21	0.20	0.15	0.21
Risk tolerance				
Not willing to take risk	0.37	0.55	0.62	0.42
Average risk tolerance	0.42	0.30	0.23	0.38
Above average risk tolerance	0.18	0.11	0.10	0.16
Substantial risk tolerance	0.03	0.04	0.04	0.03
Couple household (versus single head)	0.60	0.30	0.66	0.58
Female respondent	0.54	0.67	0.51	0.55
Homeownership	0.75	0.49	0.48	0.69
Presence of child aged under 19 at home	0.40	0.50	0.63	0.44
Expect substantial inheritance	0.16	0.06	0.07	0.14
Weighted percent of sample	73.80	13.10	9.30	100.00

Note. Calculated by authors, weighted analysis of the 2004 and 2007 SCF datasets combined, with 19 households deleted that had different responses to racial/ethnic category in different implicates. The 342 households with respondents coded as "other racial/ethnic group" are included in the overall analyses, but the separate results are not presented here.

[1] Education was highest level, and for couples, based on one with the higher level, e.g., bachelor degree means that at least one has a bachelor degree and neither have a post-bachelor degree.

[2] Health status is self-assessed, and for couples, based on one with worse health, e.g., excellent means both excellent, good means at least one is good, other good or excellent.

Table 5. Logistic Results: Racial Difference in High Return Investment Ownership in Different Samples

Parameters	Pooled sample		Black		White		Hispanic	
	coefficient	*p*	coefficient	*p*	coefficient	*p*	coefficient	*p*
Intercept	-8.1467	.000	-9.0726	.000	-8.3138	.000	-19.6756	.000
Racial/ethnic groups: reference category = White								
Black	-0.7085	.000						
Hispanic	-0.6318	.000						
Asian/other groups	0.0332	.840						
Age of head	0.0909	.000	0.1277	.001	0.0909	.000	0.1381	.016
Age squared	-0.0007	.000	-0.0013	.002	-0.0006	.000	-0.0013	.033
Education: reference category = less than high school								
High school degree	0.5640	.000	1.1411	.017	0.4852	.005	0.1008	.767
> 12 years but no degree	1.0950	.000	1.6761	.000	0.9847	.000	0.8012	.030
2- year degree	1.3528	.000	2.0593	.000	1.2313	.000	1.0743	.019
Bachelor degree	1.6792	.000	1.9602	.000	1.6905	.000	1.3342	.012
Post bachelor	1.9467	.000	2.3767	.000	1.8731	.000	0.9628	.142
Health status: reference category = poor health								
Excellent health	0.9123	.000	0.7149	.116	1.0395	.000	-0.4271	.522
Good health	0.8568	.000	0.9305	.028	0.9043	.000	0.1135	.842
Fair health	0.4053	.002	0.5943	.186	0.4082	.010	-0.0648	.910
Expect to inherit wealth	0.5396	.000	1.0276	.010	0.5065	.000	0.1604	.718
Risk tolerance: reference category = not willing to take any risk								
Average	1. 3150	.000	1.1035	.000	1.3338	.000	1.2255	.000
Above average	1.7900	.000	1.2661	.000	1.9370	.000	1.3265	.000
Substantial	1.7598	.000	0.8346	.038	2.2457	.000	1.0924	.042
Log of income	0.2597	.000	0.2102	.017	0.2601	.000	1.4187	.000
Couple (versus noncouple)	0.4856	.000	0.3572	.101	0.5185	.000	0.0204	.944
Homeowner (versus rent)	1.0401	.000	1.1837	.000	1.0430	.000	0.5764	.034
Child < 19	-0.1870	.013	-0.0354	.862	-0.1797	.055	-0.7675	.004
Gender of respondent: reference category = male respondent								
Female respondent	-0.2346	.000	-0.3071	.135	-0.2031	.010	-0.1481	.528
Concordance	90.7		85.2		90.2		89.2	

Note. Calculated by authors, unweighted analysis of the 2004 and 2007 SCF datasets with 19 households deleted that had different responses to racial/ethnic category in different implicates.

Table 6. Decomposition of Risky Asset Ownership Differences for White Versus Black Rates and for White Versus Hispanic Rates, Based on Pooled Samples

Component	White-Black		White-Hispanic	
	Contribution to rate difference	Percent of explained difference	Contribution to rate difference	Percent of explained difference
Age of head	0.0206	6.8	0.0134	4.4
Education	0.0444	14.7	0.0657	21.4
Health	0.0087	2.9	0.0081	2.7
Expectation of inheritance	0.0062	2.0	0.0055	1.8
Risk tolerance	0.0646	21.4	0.0713	23.2
Income	0.0450	14.9	0.0233	7.6
Couple household	0.0245	8.1	-0.0002	-0.1
Homeownership	0.0777	25.8	0.0176	5.8
Presence of child < 19	0.0022	0.7	0.0064	2.1
Female respondent	0.0076	2.5	0.0011	0.4
Overall explained difference	0.3015		0.3101	
Actual difference	0.2946		0.3477	
Explained difference as % of actual difference		102.3		89.2
Unexplained difference	-0.0069		0.0376	

Note. Based on analyses of pooled sample of 2004 and 2007 SCF datasets, with 19 households deleted that had different responses to racial/ethnic group in different implicates. The White-Black decomposition is based on a pooled sample of White and Black households. The White-Hispanic decomposition is based on a pooled sample of White and Hispanic households. Appendix B shows decomposition results based on separate White, Black, and Hispanic samples.

Households willing to take some level of risk were much more likely to own high return investments than those who were not willing to take any risk. Age was an important factor affecting the likelihood of high return investment ownership. In the logits based on the pooled sample and each subsample, predicted high return investment ownership increased with age, then decreased. The maximum predicted ownership rate was at age 73 for the White sample, age 69 for the pooled sample, age 51 for the Black sample, and age 52 for the Hispanic sample. Predicted high return investment ownership increased strongly with income based on each logistic regression.

High return investment ownership was positively related to education in the pooled sample and in the subsamples,

although the effect for Hispanic households of having a post-bachelor degree was not significantly different from not having a high school degree, presumably because of the small number of Hispanic households in the highest education category. For the pooled and White samples, the likelihood of having risky investments increased with better health, couples were more likely than single head households to have risky investments, homeowners were more likely than renters to have risky investments, and households with a female respondent were less likely than those with a male respondent to have risky investments. Those with at least one child under 19 were less likely to have risky investments than those with no child under 19, but the effect was significant only in the pooled sample logistic regression. In the following section, the

fractions of the gaps that could be explained by those independent variables based on the decomposition method were examined.

Decomposition of Black-White Difference

The difference between White and Black high return investment ownership rates was 29 percentage points. Table 6 shows the decomposition analysis for Black-White difference in high return investment ownership for the pooled sample. The variables in the logit accounted for 102% of the Black-White difference in high return investment ownership. This means that if Black households had the same characteristics as White households, the predicted Black ownership rate would be slightly higher than the White ownership rate. Homeownership was the most important contributor to the Black-White difference in high return investment ownership, accounting for 26% of the explained difference in the pooled sample. Differences in risk tolerance accounted for 21% of the Black-White difference, differences in income accounted for 15%, and differences in education accounted for 15% of the difference. The results of the decomposition analysis of the Black-only sample (see Appendix B) were very similar to the results for the pooled sample, with homeownership differences accounting for 30%, differences in risk tolerance accounting for 19% of the explained difference, and the overall percentage explained by the independent variables being 99%. The decomposition of the White-Black difference based on the White-only sample (see Appendix B) had very similar results, with homeownership differences accounting for 25% and risk tolerance differences accounting for 22% of the explained difference.

Decomposition of Hispanic-White Difference

The difference between White and Hispanic high return investment rates was 35 percentage points. Table 6 shows the decomposition analyses for the Hispanic-White difference in high return investment ownership based on the pooled sample. Differences in risk tolerance accounted for 23% of the Hispanic-White high return asset ownership difference, and differences in education accounted for 21% of the difference. The explained difference result of the decomposition analysis of the pooled sample of White and Hispanic households (89%) implies that if Hispanic households had the same characteristics as White households, their high return investment ownership rate would be almost as high as White households, with a difference of only 3.8 percentage points. The results of the decomposition analysis of the Hispanic-only sample (see Appendix B) were similar to the results for the pooled sample,

although income differences accounted for 49% of the explained high return investment ownership difference, and risk tolerance differences accounted for 18% of the explained difference. For the Hispanic-only sample, the overall percentage explained by the independent variables was 95%. The decomposition of the Hispanic-White difference based on the White-only sample (see Appendix B) had results very similar to the results for the pooled sample of White and Hispanic households, with an explained difference of 90% and risk tolerance differences accounting for 26% of the explained difference.

Conclusions

Differences in demographic and economic characteristics explain virtually all of the total difference between the Black and White high return investment ownership and about 90% of the total difference between the Hispanic and White high return investments. The results of the decomposition analyses are not consistent with the standard analysis of the logit for the pooled sample in Table 5. There is a striking difference between the pooled logit result, which gives a pessimistic implication for the future of Black-White differences in high return investment ownership (17.5 percentage points lower), and the decomposition result, which implies that if Black and White households were similar in terms of risk tolerance, income, and the other independent variables, they would have approximately the same high return investment ownership rates. If Hispanic households had the same characteristics as White households, they would be much closer to the White rate (3.8 percentage points lower) than implied by the logit result (15.6 percentage points lower).The drastic differences are related to the reason for using decomposition analysis, in that a regression analysis assumes that the effects of other independent variables are the same for each group (Fairlie, 1999). Given the importance of income in accounting for differences in high return investment ownership, and the substantial differences in mean levels of income between racial/ethnic groups (see Table 1), the Blinder-Oaxaca decomposition method that was used provides more reasonable results.

Implications for Researchers

Researchers interested in racial/ethnic or gender differences in financial behavior should consider using the Blinder-Oaxaca decomposition method, as it can provide greater insights into the relative importance of different household characteristics into differences and also provide insight into whether different groups would be similar in financial behavior if they had similar characteristics.

Implications for Financial Educators, Counselors, and Planners

Household economic characteristics, including income and homeownership, are important in causing the gaps in high return investment ownership between Blacks and Whites and between Hispanics and Whites. Obviously, improving those conditions of minority groups may improve their situation in high return investment ownership, but risk tolerance also plays a very important role in explaining both sets of racial/ethnic differences in high return investment ownership. Based on results using a different measure of risk tolerance (Barsky et al.,1997) there is no reason to expect that the lower investment risk tolerance levels of Blacks and Hispanics are unchangeable. Therefore, education targeted at increasing the investment risk tolerance of minorities should increase their likelihood of owning high return investments. A National Endowment for Financial Education White Paper (NEFE, 2006) published in this journal suggested that results from experiments with social learning theory might provide useful insights in how to motivate people to change their behavior. Providing people with examples of successes of other people might help people change behavior or even attitudes.

Haliassos and Bertaut (1995) suggested that White households might be more likely to own stocks because marketing was targeted at them and not minority households. Our decomposition results suggest that limited marketing might not be an important barrier to Black households, given that the decomposition results show that if Black households were similar to White households, they would have slightly higher ownership rates of high return investments. However, Hispanic households may face additional barriers to investing in high return investments because of limited marketing of investment services to Hispanics and limitations in education and adult education. The results imply that increased educational efforts directed at Hispanic households are needed to improve the rate at which the White-Hispanic wealth gap can be narrowed.

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Endnote

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Appendix A. Details of the Blinder-Oaxaca Decomposition Analysis

In general, the disparity of ownership rates between each minority group and Whites can be expressed as Equation 1 below:

$$\bar{Y}^W - \bar{Y}^B = \left[\sum_{i=1}^{N^W} \frac{F\left(X_i^W \hat{\beta}^W\right)}{N^W} - \sum_{i=1}^{N^B} \frac{F\left(X_i^B \hat{\beta}^W\right)}{N^B} \right] +$$

$$\left[\sum_{i=1}^{N^B} \frac{F\left(X_i^B \hat{\beta}^W\right)}{N^B} - \sum_{i=1}^{N^B} \frac{F\left(X_i^B \hat{\beta}^B\right)}{N^B} \right]$$

$\bar{Y}^W$ and $\bar{Y}^B$ represent the average predicted probability of ownership for Whites and the minority group respectively. $F(.)$ is the cumulative distribution function from the logistic distribution and N represents the sample size in different groups. χ^W and χ^B are row vectors of average value for the individual characteristics of White households and minority group households respectively. $\hat{\beta}^W$ and $\hat{\beta}^B$ are the vector of coefficient estimates for Whites and Blacks respectively. For a linear regression, the Blinder-Oaxaca decomposition of the gap in the average of the dependent variable, Y is expressed as Equation 2:

$$\bar{Y}^W - \bar{Y}^B = \left[\left(\bar{X}^W - \bar{X}^B \right) \hat{\beta}^W \right] + \left[\bar{X}^B \left(\hat{\beta}^W - \hat{\beta}^B \right) \right]$$

Equation 2 was used in the current study.

Appendix B. Decomposition of High Return Investment Ownership for White Versus Black Rates and for White Versus Hispanic Rates, Based on Separate Samples

Decomposition of High Return Investment Ownership for White Versus Black Rates

Component	Black-only sample		White-only sample	
	Contribution to rate difference	Percent of explained difference	Contribution to rate difference	Percent of explained difference
Age of head	0.0008	0.3	0.0238	7.8
Education	0.0498	17.0	0.0432	14.2
Health	0.0071	2.4	0.0099	3.2
Expectation of inheritance	0.0127	4.3	0.0058	1.9
Risk tolerance	0.0557	19.0	0.0677	22.2
Income	0.0461	15.7	0.0440	14.4
Couple household	0.0198	6.8	0.0257	8.4
Homeownership	0.0889	30.3	0.0764	25.0
Presence of child < 19	0.0005	0.2	0.0021	0.7
Female respondent	0.0117	4.0	0.0064	2.1
Overall explained difference	0.2931		0.3067	
Actual difference	0.2946		0.3477	
Explained difference as % of difference		99.5		103.5
Unexplained difference	0.0115		-0.0104	

Decomposition of High Return Investment Ownership for White Versus Hispanic Rates

Component	Hispanic-only sample		White-only sample	
	Contribution to rate difference	Percent of explained difference	Contribution to rate difference	Percent of explained difference
Age of head	0.0047	1.4	0.0355	11.3
Education	0.0535	16.2	0.0756	24.1
Health	-0.0023	-0.7	0.0147	4.5
Expectation of inheritance	0.0021	0.6	0.0067	2.2
Risk tolerance	0.0590	17.9	0.0801	25.6
Income	0.1615	49.0	0.0371	11.8
Couple household	0.0000	0.0	-0.0002	-0.1
Homeownership	0.0243	7.4	0.0552	17.7
Presence of child < 19	0.0251	7.6	0.0067	2.1
Female respondent	0.0016	0.5	0.0021	0.7
Overall explained difference	0.3293		0.3079	
Actual difference	0.3477		0.3477	
Explained difference as % of difference		94.7		90.1
Unexplained difference	0.0184		0.0345	

Note. Based on pooled sample of 2004 and 2007 SCF datasets, with 19 households deleted that had different responses to racial/ethnic group in different implicates.