DIRECT HOUSEHOLD INVESTMENT IN RESIDENTIAL RENTAL REAL ESTATE DURING THE 2000S

by

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(Under the Direction of Lance Palmer)

ABSTRACT

This research investigated the household characteristics associated with investment in rental real estate during the 2000s. Furthermore, the effects of changing economic conditions on the household decision to invest in rental real estate were examined. Given limited targeted research, a literature review was constructed incorporating studies related to both investor risk-tolerance and risky asset ownership to develop a basis for understanding household investment behavior. The Life-Cycle Hypothesis of Savings (LCH), with support from Modern Portfolio Theory (MPT), was utilized to form a theoretical basis, indicating changes in household investment behavior would be minimal due to short-term trends in market conditions. Data were utilized from the 2001, 2004, and 2008 panels of the Survey of Income and Program Participation (SIPP).

Bivariate descriptives indicated the majority of rental real estate investors were non-Hispanic, White, married, childless, homeowners, healthy, high net worth, had either some college or a bachelor's degree, were age 45 or older, lived in the south or west, high income and not housing burdened on their primary home. Furthermore, Non-Hispanics, Whites, Asians, homeowners, married individuals, householders in good health, high income households, high

net worth households, highly educated households, and households that were not housing burdened consistently reported higher levels of investment.

A series of logistic regression analyses indicated that, holding all else equal, African-Americans, homeowners, and higher net worth households were consistently more likely to be invested in rental real estate, as compared with Whites, non-homeowners, and lower net worth households, respectively. Marital status, age, ethnicity, income, and housing burdened status were significantly correlated at the multivariate level with rental property investment at some point in the decade. Lastly, shifts in the relationship between household characteristics and investment in rental real estate were noted. Characteristics that exhibited changing relationships with rental real estate investment include marital status, age, net worth, and ethnicity.

The results and implications of this study provide the foundation for understanding household investment in rental real estate and add to the literature on risky asset investment. Furthermore, this study provides evidence that some investors are sensitive to short term market trends in their investment behavior.

INDEX WORDS: Rental Real Estate, Investment Behavior, Recency Effects, Delta Method, Life Cycle Hypothesis, Modern Portfolio Theory

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DEDICATION

To my wife, Katie, and my grandmother for giving me the ring to put on her finger.

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I want to thank the faculty and staff of the Department of Housing and Consumer Economics, and of the College of Family and Consumer Sciences as a whole, for their help and guidance over the last 6 years. I came into HACE an unmotivated slacker, content with sliding by. You challenged me, demanded my best and refused to settle for anything less. You have molded me into the person I am today, and for that I will be eternally grateful.

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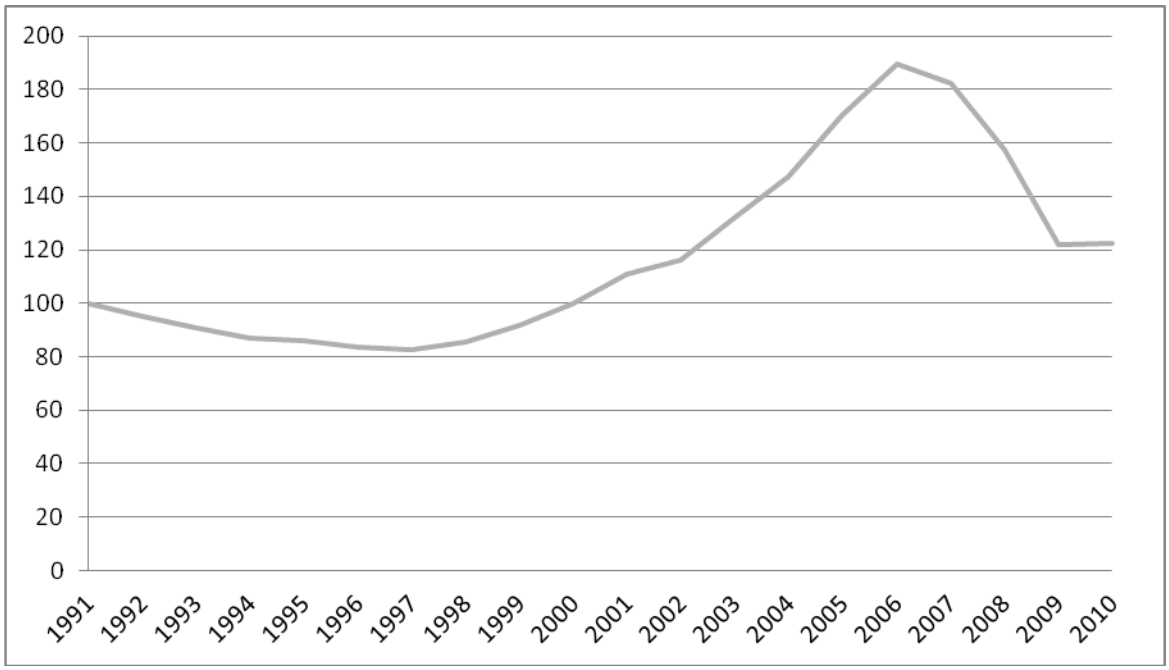
CHAPTER 1

INTRODUCTION

When constructing a diversified household investment portfolio, the incorporation of investment real estate has traditionally been considered both a viable and valuable component, and can provide meaningful tax benefits. According to the 2001 Residential Finance Survey, 56 percent of the nation's rental housing stock was owned by individuals (Harvard University Joint Center for Housing Studies, 2008). However, an explosion in the real estate market in the late 1990s and early 2000s served to drastically increase interest in expanding exposure to the real estate market through the purchase of rental property. This interest was spearheaded by the growth of Real Estate Investment Trusts (REITs) indices. Between 2000 and 2002, REITs returned an average of 49 percent, as compared with a negative 38 percent return by the S&P 500 (Mannes, 2009). By 2005, over a quarter of all real estate transactions in the United States were for investment purposes (McGinn, 2008), and popular literature was extolling the virtues of using rental properties as an essential part of a household's investment portfolio (Anderson, 2008; Burrell, 2006;Lederer, 2009; Lereah, 2005). This real estate boom was followed by a sharp decline and, by the end of the decade, a majority of the gains had been swept away. This period of incredible appreciation, followed by a similarly drastic period of depreciating values, created an ideal opportunity to study household investment behavior as evidenced by investment in rental real estate.

Market Conditions

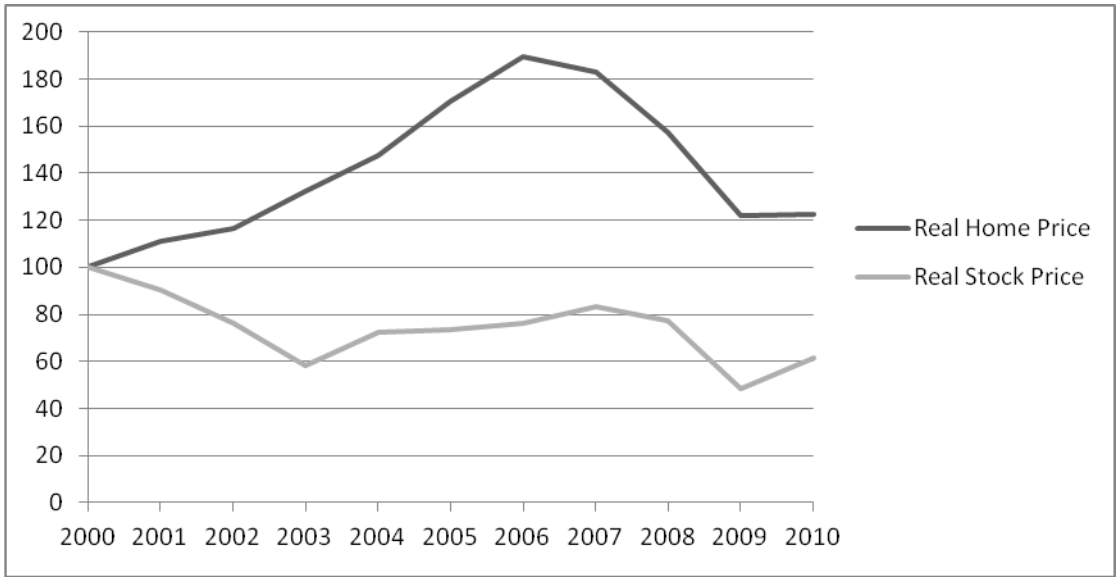
Shiller (2008) indicated that the real estate market in the 2000s was a tale of two halves. Beginning in the late 1990s, real estate experienced nearly unprecedented appreciation through the middle of the decade. This trend began to change in 2005, as appreciation slowed. By 2006, the U.S. had entered a period of depreciating home prices that remained through the end of the decade. This dramatic market change is illustrated in Figure 1, which depicts real home price data derived from the Case-Shiller 10-City Composite Index from 1991 to 2010. Using real home prices in 1991 as a reference, it is evident that real estate experienced tremendous growth from 1997 to 2005, doubling in real value over this time period. Similarly striking is the depreciation in home values seen over the rest of the decade. By 2010, real home prices had returned to the levels experienced in 2002, negating many of the gains experienced in the first half of the decade.



Source: Figure constructed using data from Shiller (2012)

Figure 1. S&P Case-Shiller Real Home Price 10-City Composite Index from 1991 to 2010

In order to properly frame overall market conditions, stock market returns over the same time period must be considered. Figure 2 overlays the real prices of the S&P 500 Index with the Case-Shiller 10-City Composite Index from 2000 to 2010, utilizing 2000 values as a reference point. While the real estate market was booming from 2000-2003, the stock market was in a period of steady decline. A reversal of fortune was evident from 2006 to 2008, as the stock market experienced gains while the real estate market was in sharp decline. These time periods of divergent returns warrant questions regarding consumer investment behavior.



Source: Figure constructed using data from Shiller (2011, 2012)

Figure 2. S&P 500 Real Price and Case-Shiller Real Home Price 10-City Composite Indexes from 2000 to 2010

Investment Decision

The decision to invest in rental real estate is driven by three distinct sources of return on investment. The first source of return is in the form of monthly rental payments received from tenants. Ideally, this constant stream of income serves to offset the costs of ownership through

covering mortgage costs, insurance, taxes, and funding necessary maintenance. In essence, rental income is utilized to increase owner equity without requiring the investor to incur any out-of-pocket expenses. Perhaps even more importantly, rental income serves to minimize carrying costs while facilitating exposure to the real estate market. This exposure constitutes the second source of return on investment. During the height of the real estate market boom, properties experienced significant capital gains through appreciation over short periods of time. The magnitude of this return is often amplified due to the use of leverage, as many investors borrowed 80 percent of the costs of the property. For example, assume a $100,000 property is purchased using a $20,000 down payment and appreciates at 5 percent, both a relatively high down payment and a modest annual return for this time period. This provides a home value of $105,000 at the end of one year. This $5,000 in overall asset appreciation equates to a 25 percent return for the investor, whose reference point is the initial $20,000 investment. This legal form of leverage was incredibly attractive to investors, especially considering that downside risk in the real estate market was thought to be minimal. With the cost of the mortgage covered by renters, and possible income tax savings resulting from depreciation, even a 2-3 percent appreciation rate equates to a sizable return. Conversely, losses are magnified in the same manner, creating a large amount of inherent risk within the investment.

Additionally, there are significant tax benefits to rental real estate investment, as returns are both protected and enhanced through the U.S. Tax Code. Tax advantages include the deductibility of interest, taxes, casualty losses, maintenance, utilities, and insurance, all of which serve to minimize holding costs of the property (Anderson, 2008). Furthermore, the ability to claim depreciation deductions can offset short-term losses through reduced tax liability. For example, an investor with an Adjusted Gross Income of less than $100,000 would be eligible to

deduct up to $25,000 of residential loses, thereby shielding other income from taxation. This benefit is maximized for middle-income investors, although high-income investors can claim losses to offset other passive income as well. It is important to note that when the property is eventually sold, the claimed depreciation will be subject to taxation at a maximum rate of 25%. However, these gains can be further sheltered through the use of tax-free rollovers of rental real estate gains through IRS Section 1031 exchanges. Section 1031 exchanges allows investors to swap investment properties of a like-kind with no tax consequences.

It should also be noted that rental real estate has enjoyed considerable interest as a financial investment internationally. Burns and Dwyer (2007) indicated that this foreign interest was driven by two reasons. First, in many countries, real estate returns are historically higher than those of stocks and bonds. Secondly, there is a perception that real estate holds a lower risk than less tangible financial assets. However, despite this international attention, the overarching trend towards real estate investment is distinctly American, as Americans place a higher percentage of their total real estate portfolio holdings into investment properties relative to other developed countries (Scobie, Le, & Gibson, 2006).

Investment Evaluated

Investment in rental real estate seems promising as an investment strategy. but may have more risks than originally foreseen by individual investors. LeReah (2005) indicated that it was rare for rental real estate investors to make money in the first year of ownership. This was attributed to the time and costs associated with preparing a property for rental occupancy and both locating and securing acceptable tenants. For new investors, there are often unforeseen financial costs of investing including expenses related to leasing, accounting, maintenance,

rental-loss insurance, financing, and property management service fees (Lederer, 2009). Many of these expenses can be limited by a hands-on investor able to perform repairs and services themselves, but even then there are likely more expenses than expected by those lacking experience in owning and operating rental properties (Lederer, 2009). Additionally, the nature of rental real estate requires the maintenance of sizable contingency reserves for any emergencies that may occur. Invariably, these expenses served to undercut both short- and intermediate-term investment returns.

In addition to the financial cost, there are significant intangible costs associated with investment in rental real estate. Operation and maintenance of a property generates a considerable amount of stress. As opposed to investing in the stock market, landlords are required to actively maintain their investment and ensure that tenants have a suitable living environment (Anderson, 2008). Additionally, depending on the quality of tenant, there may be significant stressors in the tenant-landlord relationship (Lederer, 2009). There are also huge opportunity costs, as time is lost to handle property-related issues. The end result of these factors is not only in lost time, but possibly adds stressors to the home environment.

Purpose

Savage (1998) and Bogdon and Ling (1998) provided the most recent profile of ownership characteristics utilizing the U.S. Census Bureau's Property Owners and Managers Survey (POMS), a 1995 questionnaire that the Bureau discontinued shortly thereafter. Their analysis of ownership characteristics was limited to the bivariate level, limiting the implications that can be drawn. More than fifteen years have passed, and additional research into this area is scarce. Given the cultural acceptance and promotion of direct investment in rental real estate, a

more up-to-date picture of the market is necessary. This research will provide for a greater understanding of the motives of individual investors and will serve to establish the observed pattern of rental real estate investment over the decade. The following research questions will investigate the relationship between household characteristics and direct investment in rental real estate:

1- What are the demographic and financial profiles of investors in rental real estate in the 2001, 2004, and 2008 time periods?

2- What is the relationship between demographic and financial characteristics and investment in rental real estate in 2001, 2004, and 2008?

Moreover, this research explores the effects of the changing economic conditions experienced throughout the decade on the household decision to invest in rental real estate. Modern Portfolio Theory (MPT) indicates that rational investors would exhibit very little change in investment behavior due to short-term investment trends (Markowitz, 1952). However, there is significant evidence that investors are sensitive to short-term trends when making investment decisions (Bondt & Thaler, 1987; Camerer, 1987; Grether, 1980). Furthermore, Yao, Hanna, and Lindamood (2004) found evidence of "recency" effects during the early 2000s, as stock market changes were manifested in altered risk-tolerance levels of investors. Unfortunately, Yao, Hanna, and Lindamood (2004) were unable to determine if these changes led to subsequent changes in investment behavior. To investigate whether short-term trends affected investment behavior, an analysis of household rental real estate investment behavior was conducted in this research using three separate time periods; 2001, 2004, and 2008. These time periods coincide with the early to mid-boom (2001), the height of the boom (2004), and after the market began to decline (2008), providing the opportunity to investigate the presence of effects of changing economic conditions

on investment behavior. The following research questions will investigate the effect of short-term market trends on household investment behavior in rental real estate:

3- Is the relationship between demographic and financial characteristics and investment in rental real estate consistent between 2001 and 2004, 2004 and 2008, and 2001 and 2008?

4- If the relationship between investment in rental real estate and investor profiles is different, then what relational differences are evident across time periods?

This study progresses as follows. Chapter 2 presents a review of relevant literature and introduces the theoretical framework utilized in the analyses. Chapter 3 introduces the empirical model and the methods utilized to investigate the relationships between demographic and financial characteristics and investment in rental real estate. Chapter 4 provides the results of the aforementioned analyses. Lastly, chapter 5 discusses the implications of the results found in chapter 4, highlights the strengths and weaknesses of the study, and provides insight into future research opportunities.

CHAPTER 2

LITERATURE REVIEW

Academic research into rental real estate investment behavior has been limited. As previously mentioned, the most recent profile of rental property owners was provided by Savage (1998) and Bogdon and Ling (1998). Given the limited nature of targeted research, a literature review was constructed incorporating studies related to both investor risk-tolerance and risky asset ownership to develop a basis for understanding household investment behavior. Participation in the stock market has long been seen as the default investment option for households, and consequently research into household stock ownership patterns is a much more established field. As a whole, stock ownership represents a similar savings option, seeking to gain exposure to the economy through the purchase of businesses. For this reason, the literature investigating household stock ownership has served as the backbone of this literature review. However, there are several key differences between investment in rental property and stock ownership. Most notably rental property's tangibility, the ability to use leverage when investing, and the increased "hands on," day-to-day responsibility clearly distinguish rental real estate as a unique investment type. For this reason, a more comprehensive literature base was incorporated to provide guidance on how the investments differ.

Understanding the relationship between risk-tolerance and investment in rental real estate is crucial to framing the household investment decision. As a whole, real estate is typically viewed as a low-risk investment due to historically moderate, but steady returns. However, increased volatility in the real estate market during the 2000s served to increase the level of risk

inherent in the investment of rental property. More importantly, volatility of returns is vastly magnified through the use of the principle of leverage utilized within most rental property investments. Depending on the amount of leverage, investor rate of returns can be four to five times higher than the overall asset growth. Therefore, the investment in rental property will be viewed as a high-risk investment, expected to be correlated with households with high risk tolerances and established patterns of risky asset ownership. It is important to note that the focus of this research is to investigate the effects of the changing economic environment on investment behavior. Therefore, this literature review is focused on identifying characteristics that inform the investment decision so that their relationship with rental real estate investment behavior may be tracked and compared over time.

This literature review proceeds as follows. First, an overview of existing research was used to identify characteristics that have been shown to affect household investment behavior. These characteristics were used to establish observed patterns of risky asset ownership and provide a basis from which to understand rental property investment. Next, the Life-Cycle Hypothesis of Savings (LCH), was introduced and a summary of articles utilizing this theory was provided. The LCH is ideal for this study, given that it offers insight into investment and savings behavior over time.

Household and Householder Characteristics

Race

Racial differences in asset choice and accumulation has been a target of academic literature for over 40 years. One of the earliest examples is Terrell (1971), which utilized the 1967 Survey of Economic Opportunity (SEO). The SEO was conducted by the U.S.Census

Bureau to augment the Current Population Survey (CPS) by providing additional information on low-income households through oversampling in poor and predominantly black areas. This survey was only conducted over a four-year period and was created due to a lack of quality data on this sub-population during the time period. Overall, African-American households were observed to have less than 20 percent of the wealth levels of Whites. More significantly to this study, differences were noted in terms of wealth composition. African-Americans placed a larger portion of their wealth in consumptive oriented goods such as housing and cars, although this is partially explained by their lower overall wealth levels. Additionally, African-American wealth tended to be more concentrated in the equity in their home, car, and business, and less concentrated in the stock market. It is important to note that these findings were based only on bivariate statistics, and therefore are limited in their power.

Later, these findings were echoed in Blau and Graham (1990), which explored the wealth gap between African-Americans and Whites. Utilizing the 1976 and 1978 panels of the National Longitudinal Surveys (NLS), young African-American families were observed to hold only 18 percent of the wealth of young White families. Regression analysis was utilized to understand the determinants of this wealth gap. Several results were pertinent to understanding the connection between race and investment in rental property. A strong positive relationship between income, marital status, and housing equity was observed for African-American families. African-American families with low income and wealth levels were found to hold a relatively smaller proportion of wealth as housing equity, when compared to Whites. By comparison, married families with higher income and wealth levels appeared to overinvest in housing relative to Whites. This relationship indicates a predilection among African-Americans toward housing and real estate for households that have the economic assets to do so.

One of the earlier studies investigating the relationship between risk-tolerance and race is provided by Gutter, Fox, and Montalto (1999), which utilized the 1995 Survey of Consumer Finances (SCF). The SCF is a nationally representative survey conducted by the Board of Governors of the Federal Reserve Board every three years. Data are collected from 4,500 households, with an overweighting of wealthy households. The authors attempted to determine if the observed racial differences in investment behavior were driven not by race, but rather by socio-economic factors. A logistic model was created to estimate the likelihood of holding stocks based on socio-economic, financial, and attitudinal factors. Results indicated that differing levels of stock ownership between racial groups was largely based on household status, specifically the presence of children and household size. Additionally, results indicated that differences in asset ownership between racial groups was more complex than simply including a variable for race in the analysis, as different factors influence each race differently.

Similar results were observed by Coleman (2003), who found no effect of race on either self-reported risk-tolerance levels or the proportion of risky assets held. Utilizing data from the 1998 SCF, Coleman analyzed the effect of race and ethnicity on risk-tolerance profiles through two separate methods. First, a logistic regression model was created to determine the effect of race and ethnicity on a householder's self-reported willingness to accept substantial risk, accounting for other socio-economic and financial characteristics. When controlling for all else, no significant differences were noted between African-American and White householders, which coincided with the findings of Gutter, Fox and Montalto (1999). Next, a Tobit model was created to estimate the effect of race and ethnicity on the proportion of risky assets to net worth held within a household's investment portfolio. Again, similar results were observed, as no significant differences were noted between races. It is interesting to note that this study includes ethnicity as

a separate category, while most previous attempts do not. It is possible that previous studies suffered from a missing variable bias, with the results observed by race being attributable to ethnicity.

Later, Gutter and Fontes (2006) also demonstrated that there was no difference in the level of risky asset ownership. Using a two-state model with data from the 2004 SCF, a model was first created to estimate the likelihood of owing risky assets. Then, a separate model was created to examine the portfolio allocations for those households with investments. This two-stage model allowed the researchers to distinguish between the decision to own stocks and the proportion of risky assets to hold within a portfolio. Independent variables in the analysis include demographic, financial, and several preference variables. In accordance with previous literature, results from stage one indicate that, holding all else equal, African-Americans are less likely to own stocks than Whites. However, stage two results indicate that, once invested, there are no differences attributable to race in the level of risky assets held within a portfolio. The authors conclude that differences in risky asset ownership may be attributable to information exposure and barriers to investment, rather than differences in risk-tolerance.

Conflicting evidence was provided by Hanna, Wang, and Yuh (2010), which explored the differences in high return investment ownership between racial and ethnic groups. A decomposition analysis was conducted to isolate the effects of race and ethnicity on risky asset ownership. Utilizing the 2004 and 2007 SCFs, a series of four logistic regression models were created to predict any risky asset ownership using different samples: African-American only, White only, Hispanic only, and the full pooled sample. It should be noted that, instead of treating ethnicity as a separate category, Hispanic was combined into the racial groups. Therefore, an individual was categorized as White, African-American, Hispanic, or Asian. Utilizing the full

sample, African-Americans were found to be much less likely to own risky assets, as compared to Whites, holding all else equal. However, decomposition analysis shows that, if African-Americans had the same socio-demographic characteristics and self-reported risk-tolerance levels as White households, they would have the same risky asset ownership rates.

Yao, Gutter, and Hanna (2005) found that the relationship between risk-tolerance and race may not be as simple as a linear relationship. Utilizing a combination of the 1983, 1989, 1992, 1995, 1998, and 2001 SCFs, the authors explored the effects of race on financial risk-tolerance. A cumulative Logit model was used, with the dependent variable being self-reported risk-tolerance as reported in four levels ranging from "willing to accept no risk" to "high risk." Similar to previous results, African-Americans were only 84 percent as likely to report a willingness to take some risk as Whites, holding all else equal. The authors concluded that this was driven from a lack of familiarity with financial institutions and the stock market. However, African-Americans were 30 percent more likely to report a willingness to take substantial risk than Whites, insinuating split risk-tolerance levels among African-Americans. The authors attributed this to a strong desire to gain headway in terms of standard of living, leading to an increased willingness to accept significant risk. These conflicting results indicated that there may be additional cultural factors that are driving African-Americans to make different investment decisions.

A compilation of survey results from the annual Ariel/Schwab Black Investor Surveys provided further evidence of a preference for real estate among higher income African-American households. The Ariel/Schwab Black Investor Survey consisted of data collected through phone interviews, utilizing random digit dialing to create a national random sample. Respondents were required to be over the age of 18, the primary household decision maker, and have household

income of at least $50,000. Sample sizes range from 1,000 to 1,700, with roughly half of the respondents being African-American each year. According to Ariel Mutual Funds/Charles Schwab & Company (2004), in 1998, 46 percent of African-Americans reported perceiving real estate to be the best investment, as compared to 32 percent of Whites. By 2004, this gap had shrunk to 40 percent for African Americans, and 34 percent for Whites. By 2008, this gap had widened, as 39 percent of Blacks reported real estate as the best investment, as compared to 28 percent of Whites (Ariel Mutual Funds/Charles Schwab & Company, 2008). These results combined to indicate that, at the bivariate level, African-Americans consistently demonstrated a preference for real estate as an investment asset as compared to Whites over the time period of interest. However, this also indicated that differences in attitudes towards real estate as an investment may be minimal during the middle of the decade.

Plath and Stevenson (2000) explored the differences in investment holdings between African-American and White households as a whole utilizing the 1998 SCF. Analysis of asset holding patterns between African-American and White households using cross tabulation illustrated differences in the allocation of investment assets. In accordance with previous literature, African-American households were found to invest a greater proportion of their assets in consumption-oriented real estate, in this case their primary and vacation homes. Additionally African-Americans demonstrated a relative lack of bonds and equity as compared to White households' portfolios. Additionally, Plath and Stevenson (2000) indicate that African-American households reported higher levels of mortgage balances as a proportion of properties' fair market value. These high mortgage balances indicated a heavy use of leverage in their investments, possibly making the rental property investment more attractive, and consequently more risky.

Lastly, African-Americans were found to place a strong emphasis on near-term investments, indicating a shortened investment time horizon (Plath & Stevenson, 2000).

Additional research supports that African-Americans may have been drawn to the structure of the rental property investment through the ability to incorporate debt in the purchase. Badu, Daniels, and Salandro (1999) utilized the 1992 SCF to analyze the difference in asset and liability combinations between African-Americans and Whites. The authors found that African-American households expressed more favorable attitudes toward the use of credit to finance assets, in spite of the fact that they typically paid higher interest rates than their White counterparts. Additionally, African-Americans were found to have higher relative debt loads on their assets. This favorable attitude toward the use of credit may signal a willingness to use leverage for the purchase of rental property as an investment. However, the study also indicated that African-Americans reported lower risk-tolerance, which may have limited their willingness to enter the real estate market during these volatile times.

Changes in public policy and lending standards leading up to the 2000s may also have encouraged African-American investment in rental property (Carswell, 2009). By 2005, programs aimed at allowing minority households to experience first-time homeownership had wide proliferation. This familiarity may have created an overconfidence to extend real estate holdings beyond primary residences and into the rental market. As Huberman (2001) noted, people tend to invest in what they know. Additionally, Katz (2009) and Immergluck (2009) reported that the mortgage lending industry began extending credit to minority populations at unprecedented rates during the early portions of the 2000s. The combination of easing credit standards and a familiarity bias may have helped influence African-Americans to invest in rental property.

It has also been shown that minorities are responsive to short-term trends in their investment behavior in the stock market. Hanna and Lindamood (2008) utilized the 1992, 1995, 1998, 2001, and 2004 SCFs to track stock ownership rates between 1992 and 2004. At the bivariate level, African-Americans' stock ownership rates decreased significantly during a period of poor returns between 2001 and 2004, while White ownership rates remained constant. A logistic regression model was created to determine whether these changes could be explained by other socio-demographic characteristics. The analysis showed that, all else equal, African-Americans still demonstrated a declining propensity toward stock ownership between 2001 and 2004. This trend indicated a sensitivity to short-term trends in making investment decisions, which has significant implications toward real estate investment over the 2000s given the volatile real estate market. This finding suggested that African-Americans would demonstrate an increased propensity toward rental property investment between 2001 and 2004, with a declining propensity thereafter.

Overall, the literature informing the relationship between African-Americans and rental real estate investment is inconclusive. Literature on the risk-tolerance levels of African-Americans, as compared to Whites, was split between demonstrating no differences (Coleman, 2003; Gutter & Fontes, 2006; Gutter, Fox, & Montalto, 1999), demonstrating lower risk-tolerance levels for African-Americans (Hanna, Wang, & Yuh, 2010), and suggesting that the relationship is non-linear (Yao, Gutter, & Hanna, 2005). Meanwhile, the literature consistently indicated a predilection for real estate among African-Americans (Ariel Mutual Funds/Charles Schwab & Company, 2004, 2008; Badu, Daniels, & Salandro, 1999; Blau & Graham,1990; Plath & Stevenson, 2000; Terrell, 1971). A combination of changes in public policy (Immergluck, 2009; Katz, 2009) and a propensity to follow short-term investment trends (Hanna &

Lindamood, 2008), which would tend to encourage investment in rental real estate, must also be considered.

Hispanic

The investigation of ethnic differences in investment behavior is rather, only receiving significant academic attention in the last decade. While inconclusive as a whole, previous literature tends to support a negative relationship between Hispanics and both risky asset ownership and risk tolerance levels (Coleman, 2003; Hanna, Wang, & Yuh, 2010; Wang & Hanna, 2007). However, complications arise in integrating previous literature due to an inconsistency in identifying Hispanics as a subset of race or as a separate demographic characteristic. Evidence was provided by Yao, Gutter, and Hanna (2005), who included ethnicity as a race variable, that Hispanics were not a uniform population in terms of their risk-tolerance preference. Given this results, Hispanics will be investigated as a separate demographic characteristic than race to allow differences due to racial background to be evidenced. A summary of the literature investigating ethnic differences in investment behavior are as follows.

One of the earlier efforts to analyze the effects of ethnicity on risk-tolerance profiles was provided by Coleman (2003), utilizing data from the 1998 SCF. As described above, Coleman performed two analyses to estimate the effect of ethnicity on both self-reported risk-tolerance and the proportion of risky assets held. As compared to non-Hispanics, Hispanics were found to be less likely to be willing to accept substantial risk, all else equal. Similarly, Hispanic householders were found to hold a significantly lower proportion of risky assets. Both of these models indicated that Hispanics were observed to have lower risk-tolerance levels than non-Hispanics. Coleman noted that Hispanics tended to hold a high percentage of their assets in the form of transaction-oriented bank accounts. The combination of these results raises questions as

to whether a language barrier, combined with a lack of experience in the stock market, may lead these households to rely on financial accounts that are easier to both obtain and understand.

Lower ownership rates of risky assets among Hispanics was supported by Hanna, Wang, and Yuh (2010), who explored the differences in high-return investment ownership between racial and ethnic groups. A decomposition analysis is conducted in an attempt to better isolate the effects of race and ethnicity on risky asset ownership. Instead of treating ethnicity as a separate category, Hispanic was combined with racial groups. Utilizing the full sample, Hispanics were found to be much less likely to own risky assets, as compared to Whites, all else equal. Additionally, decomposition analysis showed that, even if Hispanics had the same characteristics as Whites, they would still demonstrate lower risky asset ownership patterns. These results indicated an aversion for risky asset ownership among Hispanics, and therefore lower risk-tolerance levels. However, the combination of racial and ethnic groups into one variable could be clouding the results.

Similar evidence was found by Wang and Hanna (2007) in an analysis of the risk-tolerance and stock ownership of business-owning households. Using pooled data from the 1992 through 2004 SCFs, a logistic regression model was used to predict stock ownership using demographic, financial, and business-ownership characteristics. Self-reported risk-tolerance level was also included as an independent variable in the analysis. It should be noted that ethnic and racial groups were lumped as in Hanna, Wang, and Yuh (2010), requiring an individual to identify as White, Black, Hispanic, or Asian. Multivariate analysis indicated that, holding all else equal, Hispanics were significantly less likely to own stocks as compared to Whites. While this supports a negative correlation between Hispanics and risky asset ownership, the combination of

racial and ethnic groups into one variable raises questions about the generalizability of these results.

Conflicting evidence was provided by Yao, Gutter, and Hanna (2005), who found that the relationship between risk-tolerance and ethnicity may be more complex. Utilizing a combination of the 1983, 1989, 1992, 1995, 1998, and 2001 SCF datasets, the authors explored the effects of ethnicity on self-reported financial risk-tolerance. The use of a cumulative Logit model revealed a split in risk-tolerance levels among Hispanics. As compared to non-Hispanics and holding all else equal, Hispanics were less likely to be willing to take some risk but demonstrated an increased likelihood to be willing to take substantial risk. This result indicated that Hispanics may not be a uniform population, with sub-cultures that foster different propensities for levels of risk-tolerance.

Overall, literature tends to support a negative relationship between Hispanics and both risky asset ownership and risk tolerance levels (Coleman, 2003; Hanna, Wang, & Yuh, 2010; Wang & Hanna, 2007). This body of literature generates a hypothesis that Hispanic households will be less likely to invest in rental real estate. However, it is important to recognize that the results of Yao, Gutter, and Hanna (2005), would indicate that Hispanics would be more likely to be willing to accept the substantial risk of investment in rental real estate.

Age

Research into the relationship between age and risk-tolerance has often led to conflicting results. Researchers have found a significant positive relationship between age and risk-tolerance (Zhong & Xiao,1995), while others have found a negative relationship (Coleman, 2003; Yao, Sharpe, & Wang, 2011). Still others have found a curvilinear relationship, with the relationship

between age and risk-tolerance following an inverted U-shape (Bertaut & Starr-McCluer, 2002; Gutter, Fox, & Montalto, 1999; Plath & Stevenson, 2000; Wang & Hanna, 2007).

Positive Relationship. One of the earlier examples of research providing insight into the relationship between age and risk-tolerance was provided by Zhong and Xiao (1995). The 1989 SCF was utilized to analyze factors associated with the dollar value of households' stock and bond investments. Two Tobit regression models were used to estimate both the bond and stock holdings based on socio-demographic, financial, and psychological characteristics. Tobit results indicated a positive relationship between age and the value of stock holdings, which the authors implied as increased risk-tolerance with age. However, the measure of risk-tolerance as total dollar values of investment raises questions as to the validity of these findings. One can expect life cycle factors to cause increased dollar values of investments with age regardless of risk-tolerance. Risk-tolerance would be better analyzed using a ratio of stock holding to overall investment assets or net worth. In light of the findings of other researchers, it should also be noted that the analysis ignores any curvilinear relationship that may exist through only utilizing age as a linear variable.

Negative Relationship. The opposite was observed by Coleman (2003), which found a significant negative relationship between age and risk-tolerance in the analysis on the effect of race and ethnicity on risk-tolerance profiles. Holding all else equal, increases in age were associated with a decreased likelihood of reporting a willingness to take significant risks. Similarly, older householders were found to hold a significantly lower proportion of risky assets to net worth. It is important to note that, like Zhong and Xiao (1995), age was only included in the analysis as a linear variable, ignoring any possible curvilinear relationship that may exist.

Similar results were observed by Yao, Sharpe, & Wang (2011). Seeking to further explore the relationship between age and risk-tolerance, the authors included generational and time period variables in an effort to isolate potentially cofounding characteristics. Utilizing data from the 1989 through 2007 SCFs, a cumulative Logit was created to estimate self-reported risk-tolerances. Independent variables included age, generation, year reported, and other socio-demographic characteristics. All else equal, results indicated that a one-year increase in age was associated with a 2 percent decrease in the likelihood of reporting a willingness to take financial risks. Interestingly, generational effects proved to be insignificant. However, time period variables were found to be associated with willingness to take high risks. These results were consistent with Coleman (2003), but once again failed to include any independent variable that would allow a curvilinear relationship to be revealed.

Curvilinear Relationship. One of the first studies to show the possibility of a curvilinear relationship between age and risk-tolerance was Plath and Stevenson (2000). The authors used the 1998 SCF to compare asset holding patterns of African-American and White households. Using equity security holdings as a proxy for risk-tolerance, the authors found that the relationship between risk-tolerance and age followed an inverted U-shape. Equity holdings were found to increase with age until the period between the ages of 45 and 64, before beginning to decrease. Interestingly, racial differences were observed, as risk-tolerance reached its maximum for Whites between the ages of 54 and 64, while African-Americans peak between 45 and 54. It is important to note that the analysis was limited to cross tabulations, with no multivariate analysis. Additionally, the measure of risk-tolerance could be misleading in this study, as the standard retirement asset allocation models would lead to decreasing stock ownership in retirement regardless of risk-tolerance.

A curvilinear relationship was also observed using multivariate analysis by Bertaut and Starr-McCluer (2002). Bertaut and Starr-McCluer sought to determine the factors associated with household portfolio allocations using a two-stage model. First, a model was used to predict ownership of any risky assets. Next, a model was created to estimate the proportion of risky assets held within the portfolio. Data for this analysis was drawn from the 1989, 1992, 1995, and 1998 SCFs. For this analysis, age was measured in categories: "less than 35", "35 to 54", "55 to 64", and "65 and over." Results indicated no differences in risky asset ownership between the "less than 35" and "35 to 54" age groups, holding all else equal. However, those age 55 to 64 and 65 and over were increasingly less likely to own risky assets than those age 35 to 54. Differences were also noted in the proportion of risky assets held, as those less than age 35 and those age 65 and older held significantly lower proportions of risky assets than those 55 to 64. These results combine to create a picture of increasing risk-tolerance with age before a decline after mid-life. However, the broadness of the age categories, specifically the reference group of age 35 to 54, created some concerns as to whether additional factors may have had an effect.

A similar pattern was also observed by Gutter, Fox, and Montalto (1999), although only for White households. As described above, interaction variables were used to isolate the factors associated with stock ownership for African-American and White households separately. The authors found conflicting results, demonstrating that a curvilinear relationship exists between age and risky asset ownership only for White households, while no relationship was found to exist for African-Americans. When considering these results, it was possible that differences could be a function of varying sources of retirement income. As described above, the standard retirement model requires the reduction of stock ownership levels into retirement to ensure portfolio values. Given the low levels of wealth observed for African-Americans, this population was more likely

to receive the majority of their retirement income through Social Security, invalidating the traditional model. The lack of a relationship between age and risk-tolerance, as measured through risky asset holding, could be an end result.

Once again, a curvilinear relationship between age and risky asset ownership was observed by Wang and Hanna (2007), in their analysis of the risk-tolerance of business-owning households. Similarly, a logistic regression model was created to predict stock ownership using demographic, financial, and business-ownership characteristics. All else equal, results indicated an increased likelihood of ownership for an increase in age, and a decreasing likelihood of ownership for age squared. These results combined to create an inverted U-shape relationship between age and risky asset ownership. The authors found that 44 was the age associated with the maximum likelihood of risky asset ownership.

While there is no clear consensus on the relationship between age and risky asset ownership, an analysis of the quality of methods used appears to support a curvilinear relationship. From this literature review, any analysis that has incorporated a method of allowing the researcher to view a non-linear relationship has come to the same conclusion. For this reason, previous evidence appears to support an inverted U-shape relationship between age and risky asset ownership. Therefore, the evidence suggests that investment in rental real estate will increase with age through mid-life, before decreasing thereafter.

Income

Using household income as a determining factor of risky asset ownership and risk-tolerance levels has been an issue that has seen considerable research dedicated to it. Several researchers have found that overall, house hold income is positively associated with risky asset ownership and risk tolerance levels (Cohn, Lewellen, Lease, & Schlarbaum, 1975; Gutter, Fox,

& Montalto, 1999; Grable, 2000; Sung & Hanna, 1996). One of the earlier examples of research into the relationship between risky asset ownership and income was provided by Cohn, Lewellen, Lease, and Schlarbaum (1975). Data were gathered from 972 randomly selected brokerage firm clients using a 100-item questionnaire regarding investment goals, asset holdings, and market beliefs. Chi-square, regression, and multiple discriminant analyses were all utilized to investigate this relationship. Results indicated that the proportion of stock investments to wealth increased with income, all else equal.

Gutter, Fox, and Montalto (1999) observed a positive relationship between income and the likelihood of owning risky assets in their analysis of racial differences in investment behavior. Income quartiles were generated and utilized as independent variables in their analysis predicting risky asset ownership. Holding all else equal, households in the highest income quartile were more likely to own risky assets than those in the middle two quartiles. When combined with results that indicated households in the lowest quartile were less likely to own risky assets, the indication of a strong positive relationship between household income and risky asset ownership was formed.

Wang and Hanna (2007) in their analysis of the risky asset ownership of business-owning households, created a logistic regression model to predict stock ownership using data from the 1992 through 2004 SCFs. Independent variables for the analysis included demographic, financial, and business-ownership characteristics. Increases in income, as measured by the log of household annual income, were found to increase the likelihood of household stock ownership, all else equal.

Grable (2000) explored the relationship between demographic, socio-economic, and attitudinal characteristics and risk taking in everyday money matters. Data were gathered from a

convenience sample of 1075 faculty and staff from a large southeastern university. Descriptive discriminate analysis indicated that respondents with higher incomes were more risk tolerant than those with lower incomes.

Sung and Hanna (1996) utilized data from the 1992 SCF to explore factors associated with risk-tolerance for employed individuals. Logistic regression analysis was used to predict self-reported risk-tolerance levels based on financial and demographic variables. Income in this analysis was measured as the log of non-investment income. Results indicated that, holding all else equal, increases in non-investment income were associated with an increased likelihood of reporting a willingness to take average, above average, or substantial risks as compared with a willingness to take below average risks.

Overall, the literature indicates a positive relationship between income and both risky asset ownership and risk tolerance levels. Furthermore, the body of literature supports the hypothesis that increasing income levels will be associated with an increased likelihood of investment in rental real estate.

Net Worth

Similar to income, household net worth has been consistently found to have a positive relationship with both risky asset ownership and risk tolerance (Coleman, 2003; Grable & Yoo, 2004; Gutter, Fox, & Montalto, 1999; Jianakoplos & Bernasek, 1998; Sung & Hanna, 1996). The following are representative of the literature analyzing this relationship.

A positive relationship between net worth and risky asset ownership was observed by Jianakoplos and Bernasek (1998), which analyzed gender differences in levels of risk aversion. Using data from the 1989 SCF, three separate Tobit models were used to estimate the proportion of risky asset holdings to net worth for single women, single men, and married couples.

Independent variables included net worth, age, employment status, education, race, homeownership status, presence of children, and a measure of human capital. Results in all three models indicated that increases in net worth, as measured by the log of net worth, were associated with higher portions of risky asset ownership. The authors noted that this relationship was stronger for single men, as compared to single women and married couples.

The relationship between net worth and risky asset ownership was also explored by Gutter, Fox, and Montalto (1999). Net worth, as measured in $1000s, was included as an independent variable in their analysis of racial differences in investment behavior. Holding all else equal, results indicated a significant positive relationship between net worth and the likelihood of owning risky assets. It should be noted that, while the results were valid, there is some concern as to the measure of net worth. The effect of a $1000 increase in net worth on the likelihood of risky asset ownership is likely not consistent across varying net worth levels, varying due to its relative size to total net worth.

Consistent results were offered by Coleman (2003), who analyzed the relationship between net worth and both self-reported risk-tolerance and risky asset ownership. First, a model was created to predict the likelihood of reporting a willingness to take risks, a measure of risk-tolerance. Holding all else equal, increases in net worth, as measured by the log of net worth, were found to be associated with an increased likelihood of reporting willingness to take significant risks. Next, a Tobit regression model was created to estimate the proportion of risky assets held to total net worth. Results indicated that increases in net worth were associated with holding a significantly higher proportion of risky assets. Both these conclusions support a positive relationship between net worth and risky asset ownership.

Utilizing slightly different measures, Sung and Hanna (1996) provided similar results in their analysis of the factors associated with risk-tolerance for employed individuals. Net worth was indirectly measured in two ways. Two dummy variables were created to indicate whether a household had more than three months of non-investment in liquid or non-liquid assets. All else equal, households that had more than three months of non-investment income in liquid assets were more likely to report a willingness to take average, above average, or substantial risks. Similar results were observed for households with more than three months of non-investment income in non-liquid assets. These combine to indicate that households with higher net worth are more likely to report higher risk-tolerance levels.

Using a multidisciplinary approach and marginally different methods, Grable and Yoo (2004) also found a positive relationship between net worth and risk-tolerance. Grable and Yoo analyzed the effects of environmental and biopsychosocial factors on financial risk-tolerance using data gathered from 305 faculty and staff from two large southern universities. Instead of using self-reported risk-tolerance measures, five Likert-type items were used to create a risk-tolerance scale. Regression analysis was then used to estimate risk-tolerance levels based on demographic, financial, and biopsychosocial variables. Biopsychosocial variables included measures of personality type, self-esteem, and sensation seeking tendencies. Results indicated that, holding all else equal, higher levels of net worth were associated with higher levels of risk-tolerance.

Education

A review of literature showed an almost unanimous conclusion that there is a positive relationship between educational attainment levels and ownership of risky assets (Gutter, Fox, & Montalto, 1999; Plath & Sterenson, 2000; Hanna, Wang, & Yuh, 2010; Wang & Hanna, 2007;

Sung & Hanna, 1996; Coleman, 2003). The following paragraphs provide examples of numerous studies that have drawn such a conclusion.

Gutter, Fox, and Montalto (1999), which focused on the difference in stock ownership between African-American and White households, included education as an independent variable within their analysis. Holding all else equal, households with householders who have a college degree were found to be more likely to own risky assets as compared to those with less than a high school, high school, or some college education. Similarly, Plath and Stevenson (2000), which explored the differences in investment holdings between African-American and White households, found that equity holdings were much greater for households with householders that possessed a college degree. However, the magnitude of this relationship was not shown to be very strong.

Higher education levels were found to be associated with both higher self-reported risk-tolerance and higher ratios of risky asset ownership as compared to net worth (Coleman, 2003). As compared to householders who never attended college, householders with at least some college were found to be more likely to report a willingness to take investment risks. Similarly, householders with at least a college education were found to hold a significantly larger proportion of risky assets, all else equal. These models indicated that higher educational attainment levels were associated with higher risk-tolerance levels. However, the utilization of only two education levels within these analyses may serve to limit the explanatory power of these results.

Most recently, Hanna, Wang, and Yuh (2010) took the research one step further, which produced similar conclusions. The authors conducted a decomposition analysis in an attempt to better isolate the effects of race and ethnicity on risky asset ownership. Education was measured

by six classifications: less than a high school degree, high school degree, some college, 2-year degree, bachelor's degree, and post-bachelor's degree. Utilizing the full sample and less than a high school degree as a reference group, each additional level of education was associated with an increased likelihood of risky asset ownership when holding all else equal. This relationship holds true in the subsample models for African-Americans and Whites. The general pattern was also revealed for Hispanics, although no significant differences were noted between less than a high school education, high school education, and post-bachelor's degree. The lack of significance for post-bachelor's degree could be due to sample size issues, as the number of Hispanics with a post-bachelor's degree was a considerably small sample.

Evidence of a positive relationship between education and risk-tolerance was also provided by Wang and Hanna (2007) in their analysis of the risk-tolerance of business-owning households. A logistic regression model was created using data from the 1992 through 2004 SCFs to predict stock ownership using demographic, financial, and business-ownership characteristics. Unlike the previously mentioned studies, education was measured in four categories: less than a high school degree, high school degree, some college, and bachelor's degree and above. All else equal, householders with higher educational attainment levels were increasingly more likely to own stocks as compared to householders with less than a high school education. It should be noted that, while income was included, the failure to include net worth in the analytical model could create a missing variable bias.

Similar results were provided by Sung and Hanna (1996) in their analysis of the factors associated with risk-tolerance for employed individuals. Logistic regression analysis was used to predict the likelihood of reporting a willingness to take average, above average, or substantial risks based on demographic and financial variables. As compared to high school graduates, less

than high school graduates were less likely to report a willingness to take risks. Similarly, both individuals with some college and those with a college degree or above were found to be more likely to report a willingness to take risks. These combine to indicate a positive relationship between education and risk-tolerance levels.

Household net worth has been consistently found to have a positive relationship with both risky asset ownership and risk tolerance (Coleman, 2003; Grable & Yoo, 2004; Gutter, Fox, & Montalto, 1999; Jianakoplos & Bernasek, 1998; Sung & Hanna, 1996). Therefore, past literature indicates that investment in rental real estate will increase with household net worth.

Marital Status

Gaining an understanding of the effects of marital status on the decision to invest in rental property is based on a two-step process. First, basic differences in investment behavior between men and women must be discussed. Given this backdrop, the effect of marriage on these individual risk tolerances can then be explored. The synthesis of these two bodies of literature provides an overall understanding of the effect of marital status on risk tolerance and risky asset ownership.

Bajtelsmit, Bernasek, & Jiankoplos (1999) utilized the 1989 SCF to analyze gender differences in financial risk taking behavior within defined contribution plan allocations. Utilizing Tobit regression analysis, socio-demographic and financial characteristics served as independent variables to estimate the percentage of risky assets held within retirement plans. All else equal, women were found to be more risk averse, holding a lower proportion of their wealth in risky assets, as compared to men. Additionally, net worth was found to have a negative relationship with risky asset holdings among women investors. This decrease in ownership indicated that as their net worth increases, women tend to shift away from risky assets. These

results combined to show that women consistently seek to minimize the amount of risk that they take in their investments, as compared to men. Similar results were also observed by Embrey and Fox (1997) using the 1995 SCF. The authors focused on understanding gender differences in investment choices among single-person households. A series of four Tobit models were utilized to estimate the proportion of financial assets invested in four categories: stocks, certificates of deposit (CDs), housing, and business investments. Holding all else equal, results indicated that women invested more conservatively than men through heavier investment in CDs, as compared to stocks. However, the researchers do note that a large part of the differences in overall investment levels observed at the bivariate levels by previous researchers were driven by other socio-demographic characteristics, rather than gender alone. Although limited in terms of the assets that are included, these analyses support women as more conservative investors as compared to men.

While gender differences begin to shape the relationship between marital status and investment decisions, it is important to consider the effects of marriage on household decisions. Insight into the effect of marital status on investment decisions was provided by Yao and Hanna (2005). Utilizing a combination of the 1983, 1989, 1992, 1995, 1998, and 2001 SCFs, the authors sought to analyze the differences in self-perceived risk-tolerance levels between unmarried males, unmarried females, married males, and married females. First, a cross tabulation of risk-tolerance levels and gender was conducted. When comparing males and females, results showed that males, controlling for marital status, reported higher levels of risk-tolerance. This result coincides with previous literature (Bajtelsmit, Bernasek, & Jiankoplos, 1999; Embrey & Fox, 1997), indicating higher risk-tolerance levels for men. When comparing marital status, married females reported a statistically significant increased willingness to take some risk, while married

males reported lower levels of willingness to take risk. Multivariate analysis was conducted using a cumulative Logit model due to the progressive nature of the dependent variables, which included a reported willingness to take some risk, substantial risk, and high risk. All else equal, unmarried males report the highest risk-tolerance levels, followed by married males, unmarried females, and married females.

The spousal effect of individual risk-tolerances on married families' investment decisions was further explored by Sung and Hanna (1998) and Coleman (2003). Using the 1992 SCF, Sung and Hanna utilized two Probit regression models to estimate the likelihood of participating in a retirement plan and the portion of stocks held within each individual's separate retirement portfolio. Holding all else equal, a significant relationship was revealed between a husband's risk-tolerance and his portfolio allocation. However, a wife's risk-tolerance proved insignificant in estimating her portfolio holdings. A significant spousal effect was found to exist, especially for women, where an individual's portfolio tended to be similar to their spouse's. Sung and Hanna conclude that husbands exert significant impact on their wives' investment decisions, although in return their risk taking levels were somewhat moderated. This conclusion indicates that a household's investment decisions were shaped by a combination of the spouses' risk-tolerances, inferring a household risk-tolerance somewhere in between that of individual men and women.

Coleman (2003), in his study of the effect of race and ethnicity on risk-tolerance, also provided evidence of a relationship between marital status on risk attitudes. Holding all else equal, single women were more likely to report a preference for lower risk than that for single men, while married individuals were less likely to do so. Similarly, single women were found to hold relatively lower proportions of risky assets, with the opposite being true of married

householders. The findings insinuate a lower risk-tolerance for single women as compared to single men, while married individuals were observed to have higher risk-tolerance levels than unmarried individuals. To an extent, these results coincide with Sung and Hanna (1998), as there appears to be an association between married individuals and higher levels of risk-tolerance. However, married couples were found to be more risk tolerant than single men.

Some conflicting evidence was provided by Gutter, Fox, and Montalto (1999). Holding all else equal, single male and single female households were less likely to be invested in risky assets as compared to married couples. However, given that their model only estimated the likelihood of owning any risky assets, the effects of the family life cycle might help explain these findings. Additionally, the combination of two individuals' assets into one household's portfolio would serve by itself to increase the likelihood of any ownership. Results also indicated that the presence of children in the household did not affect the likelihood of owning risky assets for White households, although a strong negative relationship existed for African-Americans.

Overall, the literature supported single men as more risk tolerant and more likely to own risky assets as compared to women. Furthermore, there appears to be a commingling effect in married households, with the joint risk-tolerance profile being somewhere in between the individual spouses. Given these findings, previous research appears to point to single men as the most aggressive household type, followed by married couples and single women.

Homeownership Status

On an intuitive level, homeownership status appears to be an important measure when analyzing the rental property investment decision. Homeowners have already established a pattern of purchasing real estate, although the home purchase was primarily based off of a household's consumption desires rather than investment purposes. It is possible that familiarity

with the real acquisition process, and the benefits of leverage, may serve to increase the likelihood of rental property investment. Additionally, a positive relationship between risky asset ownership and homeownership status has been observed in the literature (Hanna, Wang, & Yuh, 2010; Wang & Hanna, 2007), although results are not universal (Grable & Yoo, 2004; Sung & Hanna, 1996; Xiao, Alhabeeb, Hong, & Haynes, 2001).

Wang and Hanna (2007) provided evidence of a positive relationship between homeownership and risky asset holding in their analysis of the risk-tolerance of business-owning households. A logistic regression model was created using data from the 1992-2004 SCF to predict stock ownership using demographic, financial, and business-ownership characteristics. All else equal, homeowners were found to be significantly more likely to own stocks, as compared to renters. It should be noted that, while income was included, the failure to include net worth in the analytical model could create a missing variable bias.

Additional evidence of a positive relationship between homeownership status and risky asset ownership was provided by Hanna, Wang, and Yuh (2010) in their decomposition analysis of the effects of race and ethnicity on risky asset ownership. Utilizing the 2004 and 2007 SCFs, a series of four logistic regression models were created to predict any risky asset ownership using different samples: African-American only, White only, Hispanic only, and the full pooled sample. All four models indicated an increased likelihood for homeowners to own risky assets as compared to renters, holding all else equal. These findings would suggest an increased likelihood of rental property ownership for homeowners.

However, not all research has found a relationship between homeownership and risky asset ownership. Sung and Hanna (1996) explored the relationship between homeownership and self-reported risk-tolerance levels in their analysis of the factors associated with risk-tolerance

among employed individuals. Logistic regression results indicated no significant relationship exists, holding all else equal. When considering these results, it is important to note that the population for this study was restricted and may not be representative of the larger population.

Similar results were observed by Xiao, Alhabeeb, Hong, and Haynes (2001) in their comparison of risk attitude and risky asset ownership between business-owning and non-owning families. Logit and Tobit regression models were created to determine the characteristics associated with self-reported risk-tolerance and the proportion of risky assets, respectively. Data were utilized from the 1995 SCF. Results indicated that there was no relationship between homeownership and either self-reported risk-tolerance or risky asset ownership, all else equal.

Additionally, no relationship was found by Grable and Yoo (2004) in their analysis of the effects of environmental and biopsychosocial factors on financial risk-tolerance. As described previously, five Likert-type items were used to create a risk-tolerance scale. Regression analysis was then used to estimate risk-tolerance levels based on demographic, financial, and biopsychosocial variables. Results showed no significant relationship between homeownership and risk-tolerance levels. It should be noted that the sample for this study was only 305 and that the population was limited to university employees, restricting its generalizeability.

Health Status

There are also reasons to believe that a householder's health status may affect the likelihood of rental property investment. As compared to alternative investments, rental property is a very "hands on" investment, requiring significant time and effort on the investor's part to maintain the property. For this reason, at an intuitive level householders with poor health would seem to be less likely to choose it as an investment option. This relationship is supported by

research indicating increased risky asset ownership levels as a whole for healthy individuals (Hanna, Wang, & Yuh, 2010; Yao & Hanna, 2005).

A positive relationship between self-reported health status and risk-tolerance was observed by Yao and Hanna (2005). A combination of the 1983, 1989, 1992, 1995, 1998, and 2001 SCFs were used to analyze the differences in self-perceived risk-tolerance levels between unmarried males, unmarried females, married males, and married females. First, a cross tabulation of risk-tolerance levels and gender was conducted. A cumulative Logit model was utilized to predict the likelihood of reporting willingness to take some risk, substantial risk, and high risk. Holding all else equal, respondents in excellent health were more likely to be willing to take substantial risks as compared to those in good health. Additionally, while insignificant, the sign of the coefficients for those in fair and poor health was negative.

Self-reported health status was included in the Hanna, Wang, and Yuh (2010) analysis of the effects of race and ethnicity on risky asset ownership. Four levels of self-reported health status were included: poor health, fair health, good health, and excellent health. The analysis of the pooled sample of the 2004 and 2007 SCF revealed that, as compared to those in poor health, increasing levels of health were associated with an increasing likelihood of risky asset ownership. These results were reflected in analysis of the African-American and White sub-populations, although no relationship was found to exist amongst Hispanics. When taken in totality, these results suggested increasing levels of risky asset ownership for healthy individuals.

Housing Burdened Status

The relationship between housing costs on a primary home and private rental property investment may be more complex than perceived at first glance. In terms of primary home affordability, the general rule of thumb is housing costs over 30% of gross income indicate a

household is housing burdened (Stone, 2006). A household with such high cost may be viewed as cash constrained, thereby making rental property investment unlikely. However, a trend towards speculative investing in primary homes leading up to the 2000 may indicate that high cost of ownership was driven by a desire to increase exposure to the real estate market (Dean, 1945; Stone, 1975; Kemeny, 1981; Edel, Sclar, & Luria, 1984; Stone, 1993, 2009). Therefore, the high costs may be indicative of an individual's predilection towards investment in real estate. Additionally, high housing costs are a measure of a household's comfort level with debt, perhaps indicating an increased likelihood to utilize debt in their investment endeavors.

Theoretical Framework

The Life-Cycle Hypothesis of Savings (LCH) was set forth by Modigliani and Brumberg (1954) to help understand consumer consumption and savings behavior. Unlike previous attempts limited to single or two time period models, the LCH views consumption and savings behavior over an individual's entire life. The LCH states that consumers attempt to spread consumption over the course of their lives. Therefore, consumption and savings decisions are based on a culmination of current assets and the present value of expected future income. The value of these assets is divided by the number of years the consumer is expected to live to construct their permanent income. This is viewed as an annuity that will be paid out until death, with no assets remaining. Cognitively, the LCH is easily understood when viewing a typical consumer's life course. Young individuals, most notably college students, often borrow and overspend based on their current income to maintain a higher standard of living. In midlife, earnings are used to both pay back loans and save for retirement, with consumption being less

than current income. The cycle is complete in retirement, when savings are utilized to maintain a consumer's standard of living.

LCH is based on the assumption that a consumer's utility is maximized by consistent consumption across their life course. This assumption necessitates that consumers are both rational and able to determine the present value of their lifetime income. In order to do this, consumers' expected earnings, raises, work life expectancy, retirement life expectancy, rates of return, and inflation rates are stated to be both known and certain. In reality, these factors are uncertain, causing consumers to constantly re-evaluate the present value of their assets and income, adjusting their consumption behavior accordingly. Additionally, it is assumed that there is free access to the credit market, with loans being readily available to allow borrowing when needed. In actuality, free credit markets do not exist, as borrowers are often subject to income, personal credit, or down payment constraints. Lastly, it is assumed that consumers do not plan to give or receive inheritances, with all resources due to personal savings. This assumption infers total depletion of assets at death, while in reality consumers, by choice or accident, often leave significant estates behind.

This LCH was refined by Deaton (1992). Similarly, consumption was based on both current income and the expected value of future income flows. A budget constraint was developed defining assets in period t+1 (A_{t+1}) as a function of the real rate of return (r_{t+1}), assets in period t (A_t), income in period t (y_t), and consumption in period t (C_t). This relationship was defined by the following formula:

$$A_{t+1} = (1 + r_{t+1}) (A_t + y_t - C_t) \quad (1)$$

Furthermore, Deaton described current utility as a function of both the present and future discounted values of the utility received from consumption. The value of current utility (V_t) is

stated to be derived from the number of assets (n), the marginal rate of utility in period t (v_t), assets in period t (A_t), income in period t (y_t), and the real expenditures on assets (N). The following utility function is created, where formula three in the expected future value of assets:

$$V_t(A_t) = \max n[v_t(y_t + A_t - \sum N_i) + E_t V_{t+1}(1 + r_{it+1}(\sum(N_i))] \quad (2)$$

$$E_t V_{t+1}(1 + r_{it+1}(\sum(N_i))] \quad (3)$$

Maximizing the value function subject to the budget constraint yields the following:

$$v_t(C_t) = E_t[(1 + r_{it+1})V_{t+1}(A_{t+1}) \quad (4)$$

This function indicates that the marginal utility of consumption in period t is a function of the expected value of money in the future, based on a non-zero interest rate. Furthermore, it infers that varying interest rates will lead to varying rates of utility. More precisely, higher rates of return will yield higher levels of utility, whereas lower rates of return will lead to lower levels of utility.

Utilizing this framework, Gutter, Fox and Montalto (1999) concluded that rational consumers will seek to increase real rates of return on their investments. Accordingly, stock market participation was stated to be attractive due to its historically high rates of returns as compared to traditional investment classes. However, a broader understanding of investment choices was provided by Modern Portfolio Theory (MPT), which indicates that investment returns are maximized through the construction of a diversified portfolio (Markowitz, 1952). Furthermore, investments are chosen not only based on returns but also their volatility. When optimally constructed, investment returns will provide the maximum rate of return given a certain level of risk. Therefore, MPT would indicate that, while information on short-term shifts in assets return would be reflected in the portfolio, only minor changes in the overall portfolio would be resultant. Furthermore, asset allocation within portfolio allocation should remain

constant. With this theoretical basis, LCH indicates changes in consumer investment behavior would be minimal due to the short-term trends in the real estate market.

CHAPTER 3

METHODOLOGY

Data and Sample

The Survey of Income and Program Participation (SIPP) is a nationally representative longitudinal survey conducted by the U.S. Census Bureau. Established in 1984, it seeks to provide both accurate and timely information to measure the participation of households in federal, state, and local government programs, as well as their effectiveness (U.S. Census Bureau, 2001). Additionally, it provides the information necessary to evaluate current programs, as well as to estimate their future costs. Households are selected to provide a nationally representative sample of the civilian, non-institutionalized population, but given the stated purpose of the data set, there is an oversampling of the low-income population. To achieve this representativeness, the SIPP utilizes a two- stage complex sampling design (U.S. Census Bureau, 2001). First, primary sampling units (PSUs) were selected, each consisting of counties and independent cities. Next, housing units within each PSU are identified using five separate, non-overlapping frames: a unit area frame, a group quarters frame, a housing unit coverage frame, a coverage improvement frame, and a new-construction frame. These frames combine to allow for population representativeness, with an oversampling of the low-income population. Due to the unequal probability of selection, care must be taken when conducting analyses to ensure that standard errors are computed correctly and population representativeness is maintained.

Households were interviewed through a combination of in-person visits and telephone interviews on a rotating schedule every four months (each interview period is referred to as a

"wave") for the duration of the panel. Respondents were asked to provide information related to the four months preceding each interview. Each interview contains both a "core" survey module, which remained consistent throughout, and a "topical" survey module, which rotated every wave. While the core module gathered critical data on a consistent basis, the topical modules explored various aspects of a respondent's life. These topical modules fall into seven thematic categories: Health, Disability, & Physical Well-Being; Financial; Child Care & Financial Support; Education & Employment; Family & Household Characteristics & Living Conditions; Personal History; and Welfare Reform (U.S. Census Bureau, 2001).

As with many data sets, the SIPP faces problems with missing data. The SIPP categorizes missing data in two ways, unit nonresponse and item nonresponse (U.S. Census Bureau, 2001). Unit nonresponse occurs when the respondent is not interviewed. Data lost to unit nonresponse is left missing, and sample weighting is adjusted on the remaining respondents to maintain population representativeness. Item nonresponse occurs when single questions are not answered on a survey that was otherwise correctly administered. The Census Bureau utilizes a data imputation process to address these cases, providing mostly complete data to researchers in the final public version of the SIPP. In large part, this internal data imputation process limits issues of missing data to occurrences when respondents simply ceased to participate in the survey.

Although the SIPP is a longitudinal data set, it utilizes a new panel every three to four years, restricting the ability to follow households over an extended period of time. Due to the extended time period of analysis, the use of multiple panels is required in the current analysis. To gather data from various points throughout the decade, data were taken from the 2001, 2004, and 2008 panels of the SIPP. Each panel consisted of 36,700; 46,500 and 45,000 households, respectively. Data from 2001 and 2004 were taken from core modules one through three and

topical module three. The survey was slightly reorganized for the 2008 panel, requiring the use of core modules two through four and topical module four to provide the necessary data for the 2008 time period.

The sample for this analysis was drawn from the SIPP based on the following criteria. First, because the analysis was done at a household level, only observations from the householder were retained. A householder was identified as an individual that either owns their place of residence or, in the case of rental, is the leaseholder. Secondly, only those observations that reported being age 25 or older at the beginning of the time period of analysis were included. Lastly, only observations containing completed surveys in all three core modules and the topical module were included. The final samples consisted of 24,068 households, (96,110,000 when weighted), 34,756 households (100,620,000 when weighted) and 31,075 households (101,150,000 when weighted), respectively.

Variables

Ownership of either residential or vacation rental property served as the dependent variable in this study. Independent variables used in this analysis were split into two groups : Household and Householder characteristics. Household characteristics included *marital status, income, net worth, homeownership status,* and *housing burdened status*. Householder characteristics include *age, ethnicity, race, educational attainment level*, and *self-perceived health status*. Additionally, two control variables were included: census region and the number of children present in the household.

Table 1

Measurement of Variables

Variables		Measurement
Dependent Variable		
Rental property ownership		1 if respondent reported owning either residential or vacation rental property; 0 otherwise
Independent Variables		
Age		
	25-34	1 if respondent was age 25-34; 0 otherwise
	35-44	1 if respondent was age 35-44; 0 otherwise
	45-54	1 if respondent was age 45-54; 0 otherwise
	55-64	1 if respondent was age 55-64; 0 otherwise
	65 plus	1 if respondent was age 65 or above; 0 otherwise
Hispanic		
	Hispanic	1 if respondent was Hispanic; 0 otherwise
Race		
	White	1 if respondent was White ; 0 otherwise
	Black	1 if respondent was Black; 0 otherwise
	Asian	1 if respondent was Asian; 0 otherwise
	Other	1 if respondent was multi-racial or of other race: 0 otherwise
Education		
	Less than high school	1 if respondent has less than a high school diploma; 0 otherwise

Variables		Measurement
	High school	1 if respondent's highest level of education was a high school diploma; 0 otherwise
	Some college	1 if respondent's highest level of education was some college; 0 otherwise
	Bachelor's degree	1 if respondent's highest level of education was a bachelor's degree; 0 otherwise
	Post-graduate degree	1 if respondent received a post-graduate degree ; 0 otherwise
Region		
	Northeast	1 if respondent lived in the Northeast; 0 otherwise
	Midwest	1 if respondent lived in the Midwest; 0 otherwise
	South	1 if respondent lived in the South; 0 otherwise
	West	1 if respondent lived in the West; 0 otherwise
Marital Status		
	Married	1 if respondent was married; 0 otherwise
	Male householder	1 if respondent was single male; 0 otherwise
	Female householder	1 if respondent was single female; 0 otherwise
Children		
	Number of Children	Number of children in family
Household income		

Variables		Measurement
	Q1	1 if respondent household income was in the first quintile; 0 otherwise
	Q2	1 if respondent household income was in the second quintile; 0 otherwise
	Q3	1 if respondent household income was in the third quintile; 0 otherwise
	Q4	1 if respondent household income was in the fourth quintile; 0 otherwise
	Q5	1 if respondent household income was in the fifth quintile; 0 otherwise
Household net worth		
	Q1	1 if respondent household net worth was in the first quintile; 0 otherwise
	Q2	1 if respondent household net worth was in the second quintile; 0 otherwise
	Q3	1 if respondent household net worth was in the third quintile; 0 otherwise
	Q4	1 if respondent household net worth was in the fourth quintile; 0 otherwise
	Q5	1 if respondent household net worth was in the fifth quintile; 0 otherwise
Homeownership status		

Variables	Measurement
Homeowner	1 if respondent reported owning residence; 0 otherwise
Health status	
Good health	1 if respondent reported excellent, very good, or good health; 0 otherwise
Housing burdened status	
Housing burdened	1 if respondent reported primary housing expenses including mortgage, rent, and utilities greater than 30% of gross income; 0 otherwise

Empirical Model

Three separate analyses were conducted to estimate the likelihood of investing in rental property in 2001, 2004, and 2008. The following model was utilized in each of these analyses:

$$Pr[RP_t=1] = F(\beta_1 D_t + \beta_2 F_t + \beta_3 HS_{t+} \beta_4 C) \quad (5)$$

The dependent variable in this model, RP_t represented owning residential or vacation rental property in a given time period. The independent variables for this analysis included demographic characteristics, financial characteristics, and self-reported health status in a given time period, represented by D_t, F_t , and HS_t, respectively. Demographic characteristics hypothesized to have a relationship with rental property investment included both householder (age, race, ethnicity, and education) and household characteristics (marital status). Household financial characteristics hypothesized to have a relationship with investment include income, net worth, homeownership status, and housing burdened status. Lastly, householder health status

was hypothesized to be important to the rental property investment decision. Two control variables were also included: region and number of children.

Research Questions and Hypotheses

Research questions used for this study are as follows:

1- What are the demographic and financial profiles of investors in rental real estate in 2001, 2004, and 2008 time periods?

2- What is the relationship between demographic and financial characteristics and investment in rental real estate in 2001, 2004, and 2008?

3- Is the relationship between demographic and financial characteristics and investment in rental real estate consistent between 2001 and 2004, 2004 and 2008, and 2001 and 2008?

4- If the relationship between investment in rental real estate and investor profiles is different, then what relational differences are evident across time periods?

Hypotheses for Research Questions

The following hypotheses were created based upon previous literature and theoretical implications. Since research question one will be answered by descriptive statistics, no testable hypothesis is provided. Question two provides the baseline analysis from which to investigate changes in investment behavior over time and has no testable hypothesis. However, the expected relationship between demographic and financial characteristics and rental real estate investment based upon the literature review is provided is in Table 2:

Table 2

Expected Direction of Relationship

Independent variables	Probability of investing in rental real estate
Age	+/-
Ethnicity (Non-Hispanic)	
Hispanic	-
Race (White)	
Black	+
Education	+
Household type (Married)	
Male householder	+
Female householder	-
Household income	+
Household net worth	+
Homeownership status	+
Health status	+
Housing burdened status	-

The following hypotheses are provided for research question 3:

H_{o1}: There is no difference in the relationship between demographic and financial characteristics and investment in rental real estate across time periods.

H_{a1}: There are differences in the relationship between demographic and financial characteristics and investment in rental real estate across time periods.

Statistical Analysis

Bivariate statistics were generated to address research question one. Three identical logistic regression models, one for each year, were created to address research question two. Due to unequal probability of selection, data were weighted based on the complex sampling information contained in the SIPP to provide population representativeness. Previous work with

the SIPP has shown that failure to account for the complex sampling design when making estimates can lead to Type I errors (Nielsen, Davern, Jones, & Boies, 2009). Accordingly, the Taylor series method (Tepping, 1968) was utilized to incorporate the complex sampling design information into the analysis.

Question three insinuates a comparison of model coefficients between time periods. However, Allison (1999) indicated that care must be taken when comparing model coefficients between logistic regression coefficients for separate groups due to varying levels of residual variation. Furthermore, a simple comparison of coefficients was found to be insufficient. Therefore, question three was addressed using the two-step process described by Allison (1999), which is hereby referred to as Allison's method.

The first procedure prescribed in Allison's method identified the difference in disturbance variation between panels (δ). The following steps were undertaken. First, data from separate panels were combined. Next, variables for one panel were adjusted by a factor of $1 + \delta$. Lastly, a series of logistic regression models, with the inclusion of a panel indicator, were created utilizing various levels of δ. Testing continued until the level of δ that maximizes the model's log likelihood was found. This δ was then identified as the actual difference in disturbance variation between panels.

The second step utilized a chi-square test to determine if model coefficients were the same across panels. As described by Allison's method, the sum of the -2 log likelihood of the separate panel models, as constructed to answer question 2, was computed. This sum was subtracted from the -2 log likelihood of the model with the optimized δ computed in step 1. The value of this difference was then subjected to a chi-square test. A significant result indicated

differences in model coefficients between years, and therefore differing relationships between characteristics and rental property investment across time.

With a positive result, Question four was investigated through the addition of interaction variables between investor characteristics and panel year to the model created by Allison's Method. Interaction terms were only included for characteristics which provided evidence of change between time periods. Allison (1999) recommended this approach, as the inclusion of unnecessary variables increased the likelihood of observing Type I errors. Two criteria were used to identify variables for further investigation. First, characteristics that exhibited a significant relationship with investment behavior in one year and not another were investigated. Secondly, characteristics that consistently exhibited a statistically significant relationship with rental real estate investment were investigated to determine if the magnitude of this relationship changed between time periods. Unfortunately, the combination of survey panels makes the incorporation of complex survey information impossible, increasing the likelihood of type I errors. In an attempt to minimize this error, confidence level requirements were raised from 95 percent to 98 percent in identifying statistically significant results.

CHAPTER 4

RESULTS

Using the Survey of Income and Program Participation (SIPP), various steps were taken to answer each research question. Descriptive statistics were generated to answer research question one. Three logistic regression models were utilized to answer research question two. Allison's method (Allison, 1999) was employed to answer research question three. Lastly, three logistic regression models were utilized to answer research question four. Questions one and two were investigated utilizing three separate panels of the SIPP, one for 2001, 2004, and 2008. These data sets consisted of 24,068 households, (96,110,000 when weighted), 34,756 households (100,620,000 when weighted) and 31,075 households (101,150,000 when weighted), respectively. Data were weighted and the Taylor series method was utilized to incorporate complex sampling design information. Questions three and four were investigated using data from three pooled data sets containing 2001-2004, 2004-2008, and 2001-2008 data. These data sets consisted of 58,825 households, 65,831 households, and 55,143 households, respectively. Data were not weighted for these analyses, as pooling data removed the ability to incorporate complex sampling design information. Descriptive statistics for all the panels are included in the Appendices.

Research Question One

The first set of analyses sought to determine the demographic and financial profiles of investors in rental real estate in the 2001, 2004, and 2008 time periods. Table 3 provides a profile of rental real estate investors. Overall, Table 3 shows that the number of rental real estate

investors steadily increased from 4,392,000 in 2001 to 5,138,000 in 2008. The majority of investors in all three time periods were non-Hispanic, White, married, childless, homeowners, healthy, high net worth, and not housing burdened on their primary home. Additionally, the majority of investors had either some college or a bachelor's degree, were age 45 or older, lived in the south or west, and had high income. This ownership profile coincides with the limited profiles provided by Savage (1998) and Bogdon and Ling (1998), which indicated that the majority of owners were higher income, White, and non-Hispanic.

Table 3

Characteristics of Rental Property Investors: 2001-2004-2008

Characteristic	2001		2004		2008	
	n (1000s)	% of Owners	n (1000s)	% of Owners	n (1000s)	% of Owners
Total Property Investors	4,392	100.00%	5,031	100.00%	5,138	100.00%
Age of Householder						
Age 25-34	377	8.58%	411	8.16%	424	8.24%
Age 35-44	837	19.06%	995	19.77%	940	18.29%
Age 45-54	1,160	26.41%	1,329	26.42%	1,288	25.06%
Age 55-64	969	22.06%	1,202	23.89%	1,295	25.21%
Age 65 plus	1,047	23.83%	1,092	21.71%	1,196	23.28%
Hispanic						
Hispanic	294	6.69%	245	4.86%	323	6.29%
Not Hispanic	4,092	93.17%	4,779	94.99%	4,819	93.77%

Characteristic	2001		2004		2008	
	n (1000s)	% of Owners	n (1000s)	% of Owners	n (1000s)	% of Owners
Race						
White	3,904	88.89%	4,338	86.22%	4,495	87.47%
Black	310	7.06%	393	7.81%	378	7.37%
Asian	156	3.56%	166	3.31%	187	3.64%
Other	23	0.52%	133	2.64%	83	1.62%
Education						
Less the high school graduate	388	8.84%	244	4.86%	156	3.03%
High school graduate	1,051	23.92%	1,002	19.91%	817	15.90%
Some college or associate's	1,239	28.20%	1,704	33.87%	1,718	33.44%
Bachelor's degree	1,045	23.79%	1,296	25.76%	1,423	27.70%
Post-graduate degree	668	15.20%	782	15.55%	1,027	19.99%
Region[a]						
Northeast	917	20.88%	1,003	19.95%	892	17.37%
Midwest	942	21.45%	1,082	21.52%	1,020	19.85%
South	1,322	30.09%	1,507	29.95%	1,590	30.94%

Characteristic	2001		2004		2008	
	n (1000s)	% of Owners	n (1000s)	% of Owners	n (1000s)	% of Owners
West	1,208	27.51%	1,434	28.50%	1,641	31.94%
Marital Status						
Married	3,086	70.27%	3,364	66.87%	3,501	68.14%
Single Male	589	13.41%	811	16.12%	707	13.77%
Single Female	716	16.31%	849	16.88%	929	18.08%
Children						
0	3,125	71.15%	3,561	70.78%	3,534	68.77%
1	548	12.48%	572	11.38%	645	12.55%
2	476	10.83%	554	11.01%	620	12.06%
3 or more	242	5.52%	337	6.71%	345	6.72%
Household Income						
Q1	356	8.10%	435	8.64%	413	8.03%
Q2	621	14.14%	640	12.72%	716	13.94%
Q3	775	17.63%	875	17.40%	825	16.06%
Q4	1,109	25.25%	1,121	22.29%	1,260	24.53%
Q5	1,530	34.83%	1,958	38.91%	1,928	37.52%
Household Net Worth						
Q1	104	2.36%	48	0.96%	207	4.02%
Q2	192	4.38%	227	4.52%	176	3.42%
Q3	623	14.18%	622	12.36%	513	9.98%

Characteristic	2001		2004		2008	
	n (1000s)	% of Owners	n (1000s)	% of Owners	n (1000s)	% of Owners
Q4	1,055	24.02%	1,153	22.92%	1,243	24.19%
Q5	2,414	54.96%	2,976	59.15%	3,006	58.50%
Homeownership Status						
Homeowner	4,084	92.99%	4,717	93.75%	4,832	94.04%
Non-homeowner	304	6.91%	308	6.13%	311	6.05%
Health Status[b]						
Good health	3,801	86.54%	4,449	88.43%	4,623	89.98%
Poor health	588	13.38%	576	11.46%	519	10.10%
Housing Burdened[c]						
Yes	687	15.64%	878	17.46%	1,148	22.33%
No	3,702	84.29%	4,154	82.57%	3,993	77.71%

Note. Calculations based on the SIPP, 2001 panel, waves 1-3 and topical module 3, 2004 panel, waves 1-3 and topical module 3, and 2008 panel, waves 2-4 and topical module 4.

[a] Regions based on census regions.

[b] Determined based on self-reported health status. Health status rated good if indicated to be excellent, very good, or good. Health status rated poor if indicated to be fair or poor.

[c] Housing burdened is defined as spending more than 30% of gross income on primary residence's housing costs including rent, mortgage payment, and utilities.

Further insight into investment patterns is provided in Table 4, which indicates investment rates related to householder and household characteristics in each time period. An overall trend towards increased investment in rental real estate is revealed, as reported investment rates rose from 4.57% in 2001 to 5.08% in 2008. Generally, the pattern of rental real estate investment remained consistent over the three time periods. Non-Hispanics, Whites, Asians, homeowners, married individuals, householders in good health, and households that are not housing burdened consistently reported higher levels of investment. Additionally, increases in income, net worth, and educational attainment levels were associated with higher reported levels of rental property investment. Furthermore, a curvilinear pattern between age and reported investment holdings was exhibited in all three time periods, as higher levels of reported investment rates were associated with increases in age group through age 55-64, before decreasing afterwards.

Table 4

Rental Property Investment by Selected Characteristics: 2001-2004-2008

Characteristic	2001		2004		2008	
	n (1000s)	Ownership %	n (1000s)	Ownership %	n (1000s)	Ownership %
Total Households	96,110	4.57%	100,620	5.00%	101,150	5.08%
Age of Householder						
Age 25-34	18,040	2.09%	18,330	2.24%	16,610	2.55%
Age 35-44	23,250	3.60%	23,130	4.30%	20,610	4.56%

Characteristic	2001		2004		2008	
	n (1000s)	Ownership %	n (1000s)	Ownership %	n (1000s)	Ownership %
Age 45-54	20,530	5.65%	22,450	5.92%	23,330	5.52%
Age 55-64	13,820	7.01%	15,980	7.52%	18,480	7.01%
Age 65 plus	20,480	5.11%	20,730	5.27%	22,110	5.41%
Hispanic						
Hispanic	8,670	3.39%	10,280	2.38%	11,420	2.83%
Not Hispanic	87,440	4.68%	90,340	5.29%	89,730	5.37%
Race						
White	81,000	4.82%	82,620	5.25%	82,930	5.42%
Black	11,040	2.81%	12,130	3.24%	12,130	3.12%
Asian	3,140	4.98%	2,930	5.68%	3,160	5.92%
Other	930	2.46%	2,940	4.52%	2,940	2.83%
Education						
Less the high school graduate	14,820	2.62%	10,220	2.39%	8,200	1.90%
High school graduate	27,500	3.82%	26,930	3.72%	26,780	3.05%
Some college or associate's	27,900	4.44%	35,720	4.77%	34,920	4.92%

Characteristic	2001		2004		2008	
	n (1000s)	Ownership %	n (1000s)	Ownership %	n (1000s)	Ownership %
Bachelor's degree	16,380	6.38%	17,540	7.39%	19,580	7.27%
Post-graduate degree	9,510	7.02%	10,210	7.66%	11,670	8.80%
Region[a]						
Northeast	18,870	4.86%	19,260	5.21%	18,710	4.77%
Midwest	22,590	4.17%	23,080	4.69%	23,080	4.42%
South	34,510	3.83%	36,050	4.18%	37,150	4.28%
West	20,140	6.00%	22,230	6.45%	22,210	7.39%
Marital Status						
Married	51,870	5.95%	53,740	6.26%	52,890	6.62%
Single Male	16,590	3.55%	18,100	4.48%	19,120	3.70%
Single Female	27,660	2.59%	28,780	2.95%	29,130	3.19%
Children						
0	62,250	5.02%	65,100	5.47%	67,180	5.26%
1	13,700	4.00%	14,750	3.88%	14,140	4.56%
2	12,790	3.72%	13,030	4.25%	12,270	5.05%
3 or more	7,370	3.29%	7,740	4.36%	7,560	4.57%
Household Income						
Q1	19,220	1.85%	20,130	2.16%	20,230	2.04%

Characteristic	2001		2004		2008	
	n (1000s)	Ownership %	n (1000s)	Ownership %	n (1000s)	Ownership %
Q2	19,230	3.23%	20,120	3.18%	20,230	3.54%
Q3	19,220	4.03%	20,120	4.35%	20,230	4.08%
Q4	19,220	5.77%	20,130	5.57%	20,230	6.23%
Q5	19,220	7.96%	20,120	9.73%	20,230	9.53%
Household Net Worth						
Q1	19,220	0.54%	20,130	0.24%	20,250	1.02%
Q2	19,220	1.00%	20,120	1.13%	20,220	0.87%
Q3	19,220	3.24%	20,120	3.09%	20,270	2.53%
Q4	19,220	5.49%	20,120	5.73%	20,180	6.16%
Q5	19,220	12.56%	20,120	14.79%	20,230	14.86%
Homeownership Status						
Homeowner	68,760	5.94%	71,250	6.62%	71,270	6.78%
Non-homeowner	27,350	1.11%	29,370	1.05%	29,880	1.04%
Health Status[b]						
Good health	79,020	4.81%	83,310	5.34%	84,990	5.44%
Poor health	17,090	3.44%	17,310	3.33%	16,160	3.21%
Housing Burdened[c]						

Characteristic	2001		2004		2008	
	n (1000s)	Ownership %	n (1000s)	Ownership %	n (1000s)	Ownership %
Yes	23,530	2.92%	26,700	3.29%	31,100	3.69%
No	72,590	5.10%	73,920	5.62%	70,050	5.70%

Note. Calculations based on the SIPP, 2001 panel, waves 1-3 and topical module 3, 2004 panel, waves 1-3 and topical module 3, and 2008 panel, waves 2-4 and topical module 4.

[a] Regions based on census regions.

[b] Determined based on self-reported health status. Health status rated good if indicated to be excellent, very good, or good. Health status rated poor if indicated to be fair or poor.

[c] Housing burdened is defined as spending more than 30% of gross income on primary residence's housing costs including rent, mortgage payment, and utilities.

Overall, this bivariate profile provides a picture of investment in rental real estate over the decade of the 2000s. However, this analysis alone does not provide evidence of a relationship between demographic and financial characteristics and investment in rental real estate. Multivariate analysis is necessary in order to isolate the factors associated with the decision to be invested in rental real estate.

Research Question Two

Next, the relationship between demographic and financial characteristics and investment in rental real estate in 2001, 2004, and 2008 was explored. Table 5 provides the results of three logistic regression models estimating the likelihood of investing in rental real estate. Data were

weighted and the Taylor Series method was utilized to incorporate complex sampling design information. Table 6 is provided to offer both a summary of significant results and to illustrate the changes in relationships that appear over time.

Overall, the results of these logistic regression analyses serve two distinct purposes. First, they provide snapshots of the relationship between demographic and financial characteristics within each time period. Furthermore, they provide evidence of possible shifts in investment behavior for further analysis in research questions three and four. Given the importance of revealing possible shifts in investment behavior to inform research questions 3 and 4, results are currently presented in this context. Results pertaining to implications on investment behavior in individual years will be discussed later in this chapter.

Two criteria were utilized in selecting characteristics for further exploration in determining if shifts in their relationship with investment in rental real estate occurred over time. First, characteristics that consistently exhibited a statistically significant relationship with rental real estate investment are noted. These characteristics warrant further investigation to determine if the magnitude of their relationship with rental real estate changed over time. Secondly, characteristics exhibiting a significant relationship with investment behavior in one time period and not in others are noted. The presence of a statistically significant relationship in one time period creates the possibility of a shift in investment behavior. It is important to note that this shift in statistical significance alone does not necessarily indicate changes in investment behavior.

Table 5

Logistic Regression Results Estimating Probability of Holding Rental Real Estate: 2001-2004-2008

	2001		2004		2008	
Characteristic	Odds Ratio	P-value	Odds Ratio	P-value	Odds Ratio	P-value
Intercept						
Age of Householder						
Age 25-34	-	-	-	-	-	-
Age 35-44	1.050	0.736	1.113	0.341	0.956	0.711
Age 45-54	1.277	0.048*	1.185	0.128	0.884	0.270
Age 55-64	1.424	0.012*	1.361	0.019*	0.958	0.685
Age 65 plus	1.194	0.251	1.133	0.294	0.823	0.120
Hispanic						
Hispanic	1.496	0.007**	0.796	0.116	1.027	0.855
Race						
White	-	-	-	-	-	-
Black	1.464	.005**	1.427	.001**	1.374	.0191**
Asian or other	1.000	0.999	1.077	0.554	0.849	0.213
Education						
Less the high school graduate	-	-	-	-	-	-

Characteristic	2001 Odds Ratio	2001 P-value	2004 Odds Ratio	2004 P-value	2008 Odds Ratio	2008 P-value
High school graduate	0.971	0.808	0.916	0.434	1.009	0.960
Some college or associate's	0.952	0.704	0.983	0.897	1.323	0.118
Bachelor's degree	0.963	0.808	1.043	0.747	1.381	0.090
Post-graduate degree	0.900	0.509	0.887	0.413	1.411	0.073
Region[a]						
Northeast	1.053	0.616	1.017	0.831	0.929	0.394
Midwest	0.937	0.448	1.024	0.759	0.973	0.783
South	-	-	-	-	-	-
West	1.281	.005**	1.153	0.074	1.551	.001**
Marital Status						
Married	-	-	-	-	-	-
Single Male	0.973	0.791	1.417	.001**	1.013	0.895
Single Female	0.801	0.018*	0.937	0.455	0.937	0.395
Children						
Number of Children	0.949	0.251	0.975	0.455	1.007	0.827

	2001		2004		2008	
Characteristic	Odds Ratio	P-value	Odds Ratio	P-value	Odds Ratio	P-value
Household Annual Income						
Q1	0.704	.030*	0.811	0.057	0.793	0.088
Q2	0.935	0.574	0.915	0.411	1.079	0.542
Q3	-	-	-	-	-	-
Q4	1.264	.006**	1.035	0.729	1.143	0.149
Q5	1.208	0.103	1.225	0.057	1.197	0.057
Household Net Worth						
Q1/Q2	0.291	.001**	0.271	.001**	0.467	.001**
Q3	-	-	-	-	-	-
Q4	1.642	.001**	1.815	.001**	2.375	.001**
Q5	3.747	.001**	4.799	.001**	5.858	.001**
Homeownership Status						
Homeowner	1.577	.006**	1.636	.003**	2.189	.001**
Health Status[b]						
Good health	0.960	0.694	1.047	0.613	1.037	0.665
Housing Burdened[c]						
Yes	1.197	0.062	1.266	.001**	1.419	.001**
Pseudo R^2		0.122		0.142		0.144

	2001		2004		2008	
Characteristic	Odds Ratio	P-value	Odds Ratio	P-value	Odds Ratio	P-value
Concordance Ratio		77.9%		78.5%		78.9%

Note. Calculations based on the SIPP, 2001 panel, waves 1-3 and topical module 3, 2004 panel, waves 1-3 and topical module 3, and 2008 panel, waves 2-4 and topical module 4.

[a] Regions based on census regions.

[b] Determined based on self-reported health status. Health status rated good if indicated to be excellent, very good, or good. Health status rated poor if indicated to be fair or poor.

[c] Housing burdened is defined as spending more than 30% of gross income on primary residence's housing costs including rent, mortgage payment, and utilities.

*p<.05. **p<.01.

Table 6

Revealed Relationships between Characteristics and Investment in Rental Real Estate: 2001-2004-2008

	Relationship		
Characteristic	2001	2004	2008
Age	+/-	+/-	n/a
Ethnicity (Non-Hispanic)			
Hispanic	+	n/a	n/a
Race (White)			
Black	+	+	+
Education	n/a	n/a	n/a
Household type (Married)			
Male householder	n/a	+	n/a
Female householder	-	n/a	n/a
Household income	+	n/a	n/a
Household net worth	+	+	+
Homeownership status	+	+	+
Health status	n/a	n/a	n/a
Housing burdened status	n/a	+	+

Consistent Investment Patterns

Overall, there were several relationships between demographic and financial characteristics that remained consistent during each individual time period. All else equal, Black

investors were consistently more likely to be invested in rental real estate as compared to White investors in 2001, 2004, and 2008. Similarly, homeowners were more likely to be invested as compared to non-homeowners throughout the decade, holding all else equal. Lastly, households with a higher net worth were consistently found to be more likely to be invested in rental real estate, holding all else equal.

Intertemporal Variations in Investment Patterns

Several differences in the relationship between demographic and financial characteristics and investment in rental property appear over time. These differences are noted as they exist between 2001-2004, 2004-2008, and 2001-2008. These findings are discussed below.

The 2001 and 2004 time period. Differences in the relationship between both householder (age, Hispanic, and marital status) and household (income and housing burdened status) characteristics and investment in rental real estate were noted between 2001 and 2004. The first possible shift revealed is in the relationship between age and investment in rental real estate. Holding all else equal, householders age 45-54 were more likely to be invested in rental real estate than householders age 25-34 in 2001, whereas no significant differences were noted in 2004. However, those age 55-64 were more likely to be invested as compared to those age 25-34 in both time periods, indicating a significant relationship between age and investment in 2001 and 2004. Differences in the relationship between Hispanics and investment in rental real estate were also noted between the two time periods. Holding all else equal, Hispanics were more likely to be invested in rental real estate in 2001 as compared to non-Hispanics, while no significant relationship existed in 2004.

Two distinct differences in the relationship between marital status and investment in rental real estate, holding all else equal, were also revealed between time periods. First, single

female householders were less likely to be invested in rental real estate in 2001 as compared to married householders, whereas no significant differences were noted in 2004. Secondly, while no significant differences in investment behavior were noted between single males and married householders in 2001, the odds of single males being invested in rental real estate were 41.7% more than those of married householders in 2004.

Lastly, differences were noted over time in the relationship between investment in rental real estate and both income and housing burdened status. A relationship between higher income levels and investment in rental real estate, holding all else equal, existed in 2001, but was no longer present in 2004. Differences were also noted in the relationship between household housing burdened status and investment in rental real estate, as households that were housing burdened on their primary homes were more likely to be invested in rental real estate in 2004, while no significant relationship existed in 2001.

The 2004 and 2008 time period. Fewer differences were noted between 2004 and 2008, as changes in statistically significant relationships were only revealed for householder age and marital status. All else equal, householders age 55-64 were more likely to be invested in rental real estate in 2004 as compared to those age 25-34, while no significant relationship between age and investment behavior was revealed in 2008. The 2008 finding is especially interesting, as it is the only time period where no significant relationship between age and investment in rental real estate is found. Furthermore, a shift in the relationship of marital status and investment in rental real estate was also revealed. While single males were more likely to be invested in rental real estate in 2004, no significant relationship was revealed in 2008. Interestingly, the direction of the shift between 2004 and 2008 is the opposite of that detected for single males between 2001 and

2004. The compilation of these two shifts draws considerable attention to the possibility of recency effects altering the investment behavior of single males.

The 2001 and 2008 time period. Differences in the relationship between both householder (age, Hispanic, and marital status) and household (income and housing burdened status) characteristics and investment in rental real estate were noted between 2001 and 2008. It should be noted that these are the same characteristics that exhibited possible changes between the 2001 and 2004 time periods.

The first characteristic warranting further investigation was age. Holding all else equal, householders age 45-54 and 55-64, as compared to householders age 25-34, were significantly more likely to be invested in rental real estate in 2001. However, no significant relationship between age and investment in rental real estate was revealed in 2008, the only time period no such relationship was observed. Given that a decreased relationship between age and investment behavior was also noted between 2001 and 2004 individual year models, considerable evidence supports investigating a shift in this relationship over the course of the decade.

Two additional shifts in the relationship between householder characteristics (marital status and Hispanic) and investment behavior, that were first noted between 2001 and 2004, remained in place between 2001 and 2008. Holding all else equal, both non-Hispanics and single female householders were significantly less likely to be invested in rental real estate in 2001 as compared to Hispanics and married householders, respectively. As in 2004, no significant relationship with rental real estate investment was revealed for these characteristics in 2008.

Lastly, shifts in the relationship between household characteristics (income and housing burdened status) and investment in rental real estate were also noted between 2001 and 2008. The first change illustrated was a shift from a significant positive relationship, holding all else

equal, between income and investment in rental real estate in 2001 to no significant relationship in 2008. Additionally, a shift from no significant relationship between housing burdened status and investment in rental real estate in 2001 to a significant positive relationship, holding all else equal, in 2008 was noted. Once again, these shifts in relationships were also indicated between the 2001 and 2004 time periods.

Research Question Three

Given the results of the individual time period models, the next set of analyses seek to determine if the relationship between demographic and financial characteristics and investment in rental real estate are consistent between 2001 and 2004, 2004 and 2008, and 2001 and 2008. This question was investigated using Allison's method (Allison, 1999). Data were combined to create three pooled samples, one for 2001-2004, 2004-2008, and 2001-2008. Within the 2001-2004 and 2004-2008, data from the 2004 panel was adjusted by a factor of $1 + \delta$. Similarly, data from the 2008 panel was adjusted by a factor of $1 + \delta$ in the 2001-2008 data set. Next a sequence of logistic regression models utilizing varying levels of δ were generated. According to Allison's method, δ is optimized in the model where the log likelihood is maximized. Since the log likelihood is reported below in the form of -2 * Log Likelihood, the model with minimum value represents the model with the optimal δ. Results generated using Allison's method are reported in Table 7.

Table 7

Delta and Log Likelihoods for Delta Selection Algorithm

2001 - 2004		2004 - 2008		2001- 2008	
Delta	-2 * Log Likelihood	Delta	-2 * Log Likelihood	Delta	-2 * Log Likelihood
-0.10	19367.762	-0.10	2249.974	-0.10	18371.709
-0.05	19361.157	-0.06	22447.099	-0.05	18363.216
0.00	19357.55	-0.05	22446.756	0.00	18357.770
0.03	19356.633	-0.04	22446.555	0.05	18354.940
0.04	19356.515	-0.03	22446.49	0.07	18354.447
0.05	19356.486	-0.02	22446.557	0.08	18354.330
0.06	19356.544	0.00	22447.072	0.09	18354.295
0.10	19357.578	0.05	22450.396	0.10	18354.940

Repeated testing with the 2001-2004, 2004-2008, and 2001-2008 samples indicated that the difference in the disturbance variation was .05, -.03, and .09, respectively. These results can be interpreted such that the standard deviation of the disturbance variance for the 2004 panel is five percent greater than that of the 2001 panel, the standard deviation of the disturbance variation for the 2004 sample is three percent less than that of the 2008 sample, and the standard deviation of the disturbance variation for the 2008 sample is nine percent greater than that of the 2001 sample.

Table 8 provides the full results of the logistic regression models identified by Allison's method. These models were created only to perform the chi-square testing performed above and will not be interpreted.

Table 8

Rental Real Estate Investment Logistic Regression Results: 2001-2004, 2004-2008, and 2001-2008, Adjusted for 1 + δ

	2001-2004		2004-2008		2001-2008	
Characteristic	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Panel						
2004	0.209	0.001**	-0.062	0.104	0.282	0.001**
Age of Householder						
Age 25-34	-	-	-	-	-	-
Age 35-44	0.096	0.241	0.056	0.484	-0.018	0.825
Age 45-54	0.206	0.011*	0.019	0.812	-0.029	0.726
Age 55-64	0.298	0.001**	0.105	0.209	0.046	0.596
Age 65 plus	0.138	0.140	-0.052	0.553	-0.105	0.244
Hispanic						
Hispanic	0.081	0.399	-0.138	0.168	0.144	0.112
Race						
White	-	-	-	-	-	-
Black	0.333	0.001**	0.265	0.001**	0.283	0.001**
Asian or other	0.058	0.521	-0.059	0.475	-0.112	0.220

Characteristic	2001-2004		2004-2008		2001-2008	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Education						
Less the high school graduate	-	-	-	-	-	-
High school graduate	-0.129	0.137	-0.078	0.445	-0.065	0.502
Some college or associate's	-0.051	0.556	0.116	0.235	0.084	0.373
Bachelor's degree	-0.006	0.945	0.155	0.138	0.099	0.320
Post-graduate degree	-0.139	0.156	0.080	0.459	0.075	0.472
Region[a]						
Northeast	0.054	0.344	-0.027	0.636	0.001	0.986
Midwest	0.005	0.929	-0.005	0.919	-0.046	0.407
South	-	-	-	-	-	-
West	0.200	0.001**	0.288	0.001**	0.344	0.001**
Marital Status						
Married	-	-	-	-	-	-
Single Male	0.169	0.005	0.186	.002**	0.017	0.788
Single Female	-0.146	0.011*	-0.080	0.140	-0.128	0.025

Characteristic	2001-2004		2004-2008		2001-2008	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Children						
Number of Children	-0.052	0.030*	-0.031	0.187	-0.027	0.254
Household Annual Income						
Q1	-0.254	0.003**	-0.234	.005**	-0.311	0.001**
Q2	-0.049	0.486	0.014	0.841	-0.009	0.899
Q3	-	-	-	-	-	-
Q4	0.125	0.045*	0.128	.035*	0.161	.010**
Q5	0.194	0.002**	0.208	0.001**	0.168	.009**
Household Net Worth						
Q1/Q2	-1.213	0.001**	-1.003	0.001**	-0.891	0.001**
Q3	-	-	-	-	-	-
Q4	0.521	0.001**	0.711	0.001**	0.648	0.001**
Q5	1.394	0.001**	1.650	0.001**	1.493	0.001**
Homeownership Status						
Homeowner	0.492	0.001**	0.649	0.001**	0.632	0.001**
Health Status[b]						
Good health	0.001	0.988	0.017	0.784	-0.003	0.961

	2001-2004		2004-2008		2001-2008	
Characteristic	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Housing Burdened[c]						
Yes	0.209	0.001**	0.339	0.001**	0.284	0.001**
Puesdo R^2		0.640		0.754		0.760
Concordance Ratio		78.2%		78.6%		78.3%

Note. Calculations based on the SIPP, 2001 panel, waves 1-3 and topical module 3, 2004 panel, waves 1-3 and topical module 3, and 2008 panel, waves 2-4 and topical module 4.

[a] Regions based on census regions.

[b] Determined based on self-reported health status. Health status rated good if indicated to be excellent, very good, or good. Health status rated poor if indicated to be fair or poor.

[c] Housing burdened is defined as spending more than 30% of gross income on primary residence's housing costs including rent, mortgage payment, and utilities.

With the disturbance variation identified, a chi-square test was performed on the following hypothesis for each pooled sample:

H_{o1}: There is no difference in the relationship between demographic and financial characteristics and investment in rental real estate across time periods.

H_{a1}: There are differences in the relationship between demographic and financial characteristics and investment in rental real estate across time periods.

Results of these tests are found in Table 9.

Table 9

Chi-Square Test Results for Model Differences

2001 - 2004		2004 - 2008		2001 - 2008	
Sample	-2 * Log Likelihood	Sample	-2 * Log Likelihood	Sample	-2 * Log Likelihood
2001	7613.530	2008	10673.644	2001	7613.530
2004	11707.418	2004	11707.418	2008	10673.644
2001-2004	19356.486	2004-2008	22446.490	2001-2008	18354.295
Test Statistic	35.538	Test Statistic	65.428	Test Statistic	67.121
P value	0.001	P value	0.001	P value	0.001

As described by Allison's method, the sum of the -2 log likelihood of the separate panel models, as constructed to answer question 2, were computed. This summation was subtracted from the -2 log likelihood of the optimized models, providing the chi-square test statistic. The value of this difference was subjected to a chi-square test with 4 degrees of freedom (equal to the sum of difference in the number of parameters between models). In each instance, P-values of .001 are reported, indicating that the null hypothesis be rejected for all three time periods. Furthermore, differences in the relationship between demographic and financial characteristics and investment in rental real estate across time periods were indicated, validating the exploration of research question four.

Research Question Four

Lastly, analyses were performed to determine the relational differences evident across time periods. This question was addressed through the creation of three logistic regression models which incorporated interaction terms. These interaction terms were included for characteristics based on evidence of possible changes in their relationship with rental real estate noted in the results to research question two. Confidence level requirements for these analyses were raised from 95 percent to 98 percent in identifying statistically significant results due to the increased probability of Type 1 errors resulting from an inability to incorporate complex sampling design information. It is important to note that the δ adjustments utilized in addressing research question three is included in these analyses. Results are presented for each time period separately. When interpreting these results, in is important to note that changes in the relationship between characteristics and rental property investment can be driven by three things: shifts in the investment behavior of the specified category, shifts in the investment behavior of the reference category, or a combination of shifts in the investment behavior of both. Analyses of the bivariate descriptives provided in Table 4 and the individual model analyses in Table 5 were utilized to provide further insight in interpreting these shifts.

2001-2004 Time Period

Several differences in the relationship between demographic and financial characteristics and investment in rental real estate were noted between the separate 2001 and 2004 time period analyses provided in Table 5. Based on these analyses and the two selection criteria, the characteristics identified for further investigation included both householder (age, race, Hispanic, and marital status) and household (income, net worth, homeownership status, and housing burdened status) characteristics. A logistic regression model estimating the likelihood of

investment in rental real estate was created with the inclusion of interaction terms for these characteristics and the panel year.

Results of this analysis are provided in Table 10, with the left side column representing the standard model and the right side column providing results for the interaction variables created specifically for this analysis. Many of the characteristics investigated were found to have no significant differences in their relationship between investment in rental real estate between time periods. These characteristics include age, race, income, net worth, homeownership status, and housing burdened status. However, significant differences were noted for both ethnicity and marital status. A summary of these results are provided in Table 13.

Table 10

Interaction Model for Rental Real Estate Investment Logistic Regression Results: 2001-2004

Characteristic	Coefficient	P-value	Characteristic	Coefficient	P-value
Intercept	-3.987	0.001**	Interaction Variables (2004)		
Panel			Age of Householder		
2001	-	-	Age 25-34	-	-
2004	-0.119	0.632	Age 35-44	0.095	0.569
Age of Householder			Age 45-54	-0.042	0.799
Age 25-34	-	-	Age 55-64	-0.054	0.753
Age 35-44	0.037	0.781	Age 65 plus	-0.053	0.765
Age 45-54	0.231	0.073	Hispanic		
Age 55-64	0.326	0.017*	Hispanic	-0.683	0.001**
Age 65 plus	0.164	0.252	Race		
Hispanic			White	-	-
Hispanic	0.450	0.001**	Black	-0.108	0.484
Race			Asian or other	0.002	0.993

Characteristic	Coefficient	P-value	Characteristic	Coefficient	P-value
White	-	-	Marital Status		
Black	0.394	0.001**	Married	-	-
Asian or other	0.056	0.732	Single Male	0.318	0.010*
Education			Single Female	0.146	0.220
Less the high school graduate	-	-	Household Income		
High school graduate	-0.126	0.150	Q1	0.211	0.237
Some college or associate's	-0.046	0.592	Q2	0.066	0.650
Bachelor's degree	-0.005	0.955	Q3	-	-
Post-graduate degree	-0.135	0.168	Q4	-0.099	0.441
Region[a]			Q5	0.043	0.737
Northeast	0.053	0.357	Household Net Worth		
Midwest	0.005	0.932	Q1/Q2	0.044	0.826
South	-	-	Q3	-	-
West	0.202	0.001**	Q4	0.084	0.531
Marital Status			Q5	0.114	0.368
Married	-	-	Homeownership Status		
Single Male	-0.037	0.718	Homeowner	0.004	0.983
Single Female	-0.235	0.015*	Housing Burdened[c]		
Children			Yes	0.102	0.402

Characteristic	Coefficient	P-value	Characteristic	Coefficient	P-value
Number of Children	-0.053	0.028			
Household Income					
Q1	-0.392	0.007**			
Q2	-0.089	0.440			
Q3	-	-			
Q4	0.185	0.068			
Q5	0.164	0.111			
Household Net Worth					
Q1/Q2	-1.246	0.001**			
Q3	-	-			
Q4	0.473	0.001**			
Q5	1.329	0.001**			
Homeownership Status					
Homeowner	0.490	0.001**			
Health Status[b]					
Good health	0.003	0.960			
Housing Burdened[c]					
Yes	0.147	0.135			
Puesdo R^2		0.134			
Concordance Ratio		78.3%			

Note. Calculations based on the SIPP, 2001 panel, waves 1-3 and topical module 3, 2004 panel, waves 1-3 and topical module 3, and 2008 panel, waves 2-4 and topical module 4.

[a] Regions based on census regions.

[b] Determined based on self-reported health status. Health status rated good if indicated to be excellent, very

Characteristic	Coefficient	P-value	Characteristic	Coefficient	P-value

good, or good. Health status rated poor if indicated to be fair or poor.

[c] Housing burdened is defined as spending more than 30% of gross income on primary residence's housing costs including rent, mortgage payment, and utilities.

*p<.02. **p<.01.

Holding all else equal, Hispanics were significantly less likely to be invested in rental real estate in 2004 than 2001, as compared to Non-Hispanics. Bivariate descriptives indicate that reported investment rates for Hispanics decreased from 3.39 percent in 2001 to 2.38 percent in 2004. During this same time period, reported investment rates for non-Hispanics increased from 4.68 percent to 5.29 percent. This evidence suggests that the shift in the relationship between Hispanics and investment in rental real estate was driven by both increased investment by non-Hispanics and decreased investment by Hispanics in 2004.

A change in the relationship between marital status and rental real estate investment was also noted between time periods. Holding all else equal, single males were significantly more likely to be invested in rental real estate in 2004 than 2001, as compared to married couples. Bivariate descriptives indicate that investment rates for single males increased from 3.55 percent in 2001 to 4.48 percent in 2004. During this same time period, investment rates for married couples increased from 5.95 percent to 6.26 percent. Given that investment rates for both demographics increased, the evidence indicates the shift in the relationship between marital status and rental real estate was driven by a relatively aggressive increase in investment behavior by single males in 2004.

2004-2008 Time Period

Several differences in the relationship between demographic and financial characteristics and investment in rental real estate were noted between the separate 2004 and 2008 samples. Based on these analyses and the two selection criteria, the characteristics identified for further investigation included both householder (age, race, and marital status) and household (net worth, homeownership status, and housing burdened status) characteristics. A logistic regression model estimating the likelihood of investing in rental real estate was created with the inclusion of interaction terms for these characteristics and the panel year. Results of this analysis are provided in Table 11. As before, the left hand column represents the standard model and the right side column provides results for the interaction variables created specifically for this analysis.

Table 11

Interaction Model for Rental Real Estate Investment Logistic Regression Results: 2004-2008

Characteristic	Coefficient	P-value	Characteristic	Coefficient	P-value
Intercept	-4.416	0.001**	Interaction Variables (2004)		
Panel			Age of Householder		
2008	-	-	Age 25-34	-	-
2004	0.110	0.638	Age 35-44	0.205	0.200
Age of Householder			Age 45-54	0.482	0.002**
Age 25-34	-	-	Age 55-64	0.520	0.001**
Age 35-44	-0.054	0.635	Age 65 plus	0.531	0.001**
Age 45-54	-0.242	0.032	Race		
Age 55-64	-0.171	0.138	White	-	-
Age 65 plus	-0.334	0.005**	Black	0.117	0.433
Hispanic			Asian or other	0.194	0.242
Hispanic	-0.138	0.168	Marital Status		

Characteristic	Coefficient	P-value	Characteristic	Coefficient	P-value
Race			Married	-	-
White	-	-	Single Male	0.267	0.018*
Black	0.211	0.051	Single Female	-0.027	0.798
Asian or other	-0.155	0.194	Household Net Worth		
Education			Q1/Q2	-0.564	0.003**
Less the high school graduate	-	-	Q3	-	-
High school graduate	-0.076	0.456	Q4	-0.267	0.043
Some college or associate's	0.118	0.237	Q5	-0.260	0.034
Bachelor's degree	0.156	0.135	Homeownership Status		
Post-graduate degree	0.080	0.462	Homeowner	-0.235	0.174
Region[a]			Housing Burdened[c]		
Northeast	-0.025	0.661	Yes	-0.141	0.155
Midwest	-0.005	0.920			
South	-	-			
West	0.290	0.001*			
Marital Status					
Married	-	-			
Single Male	0.048	0.567			
Single Female	-0.064	0.397			

Characteristic	Coefficient	P-value	Characteristic	Coefficient	P-value
Children					
Number of Children	-0.031	0.183			
Household Income					
Q1	-0.240	0.004**			
Q2	0.010	0.886			
Q3	-	-			
Q4	0.124	0.041			
Q5	0.205	0.001**			
Household Net Worth					
Q1/Q2	-0.723	0.001**			
Q3	-	-			
Q4	0.858	0.001**			
Q5	1.796	0.001**			
Homeownership Status					
Homeowner	0.765	0.001**			
Health Status[b]					
Good health	0.020	0.745			
Housing Burdened[c]					
Yes	0.404	0.001**			
Puesdo R^2		0.138			
Concordance Ratio		78.7%			

Note. Calculations based on the SIPP, 2001 panel, waves 1-3 and topical module 3, 2004 panel, waves 1-3 and topical module 3, and 2008 panel, waves 2-4 and topical module 4.

[a] Regions based on census regions.

Characteristic	Coefficient	P-value	Characteristic	Coefficient	P-value

[b] Determined based on self-reported health status. Health status rated good if indicated to be excellent, very good, or good. Health status rated poor if indicated to be fair or poor.

[c] Housing burdened is defined as spending more than 30% of gross income on primary residence's housing costs including rent, mortgage payment, and utilities.

*p<.02. **p<.01.

Several of the characteristics investigated were found to have no significant differences in their relationship between investment in rental real estate between time periods. These characteristics include race, homeownership status, and housing burdened status. However, significant differences in investment behavior over time were revealed for age, marital status, and net worth. A summary of these results are provided in Table 13.

A combination of results indicate changes in the relationship between age and investment behavior across the decade. Holding all else equal, householders age 45 and older, as compared to those age 25-34, were significantly less likely to be invested in rental real estate in 2008 than in 2004. The bivariate and multivariate analyses of each of these individual time periods provide evidence of the source of this shift. Bivariate descriptives indicate that investment rates for those age 25-34 increased from 2.24 percent in 2004 to 2.55 percent in 2008. During this same time period, investment rates for those age 45-54 and 55-64 decreased from 5.92 and 7.52 percent to 5.52 and 7.01 percent, respectively. Meanwhile, investment rates from those age 65 and above remained relatively flat, increasing from 5.27 to 5.41 percent. Additional evidence is provided by the multivariate analyses of the individual time periods. While not all statistically significant, coefficient point estimates in the 2004 model indicate an increased likelihood of investment behavior for householders age 35 and older as compared to householders age 25-34. The reverse

is true in 2008, as coefficient point estimates indicate a decreased likelihood of investment behavior for those older than 35 as compared to those 25-34. This universal shift provides strong evidence that a shift in behavior of the reference category, those age 25-34, is the driving factor behind a shift in the relationship between age and rental real estate. However, the shift in relationship between age and investment in rental real estate appears to be further magnified by either no change or a decrease in investment behavior by householders in the older age group.

A change in relationship was also noted for marital status. Holding all else equal, single males, as compared to married couples, were significantly less likely to be invested in rental real estate in 2008 than in 2004. Bivariate descriptives indicate that investment rates for single males decreased from 4.48 percent in 2004 to 3.70 percent in 2008. During this same time period, investment rates for married couples increased from 6.26 percent to 6.62 percent. This evidence indicates that the shift in relationship was driven by both increased investment by married couples and decreased investment by single males in 2008. It should be noted that this shift is in the opposite direction of the one revealed between 2001 and 2004.

Lastly, a change in the relationship between household net worth and investment in rental real estate was noted. Holding all else equal, households in the first and second quintiles, as compared to those in the third quintile, were significantly more likely to be invested in rental real estate in 2008 than in 2004. Bivariate descriptives indicate that investment rates for households in the first and second quintiles increased from .69 percent in 2004 to .95 percent in 2008. During this same time period, investment rates for households in the third quintile decreased from 3.09 percent to 2.53 percent. This evidence indicates that this shift was driven by both increased investment by households in the first and second quintiles and decreased investment by households in the third quintile. This shift serves to decrease the magnitude of the relationship

between net worth and investment in rental real estate, although a significant relationship was still revealed in 2008.

2001-2008 Time Period

Several differences in the relationship between demographic and financial characteristics and investment in rental real estate were noted between the separate 2001 and 2008 time period analyses provided in Table 5. Based on these analyses and the two selection criteria, the characteristics identified for further investigation included both householder (age, race, Hispanic, and marital status) and household (income, net worth, homeownership status, and housing burdened status) characteristics. A logistic regression model estimating the likelihood of investment in rental real estate was created with the inclusion of interaction terms for these characteristics and the panel year.

Results of this analysis are provided in Table 12, with the left side column representing the standard model and the right side column providing results for the interaction variables created specifically for this analysis. Many of the characteristics investigated were found to have no significant differences in their relationship with investment in rental real estate between time periods. These characteristics include race, income, marital status, homeownership status, and housing burdened status. However, significant differences were noted for age, ethnicity, and net worth. A summary of these results are provided in Table 13.

Table 12

Interaction Model for Rental Real Estate Investment Logistic Regression Results: 2001-2008

Characteristic	Coefficient	P-value	Characteristic	Coefficient	P-value
Intercept	-4.124	0.001**	Interaction Variables (2008)		
Panel			Age of Householder		
2001	-	-	Age 25-34	-	-
2008	-0.280	0.251	Age 35-44	-0.083	0.624
Age of Householder			Age 45-54	-0.470	0.004**
Age 25-34	-	-	Age 55-64	-0.522	0.002**
Age 35-44	0.030	0.821	Age 65 plus	-0.509	0.004**
Age 45-54	0.246	0.056	Hispanic		
Age 55-64	0.360	0.009	Hispanic	-0.490	0.006**
Age 65 plus	0.198	0.166	Race		
Hispanic			White	-	-
Hispanic	0.427	0.001**	Black	-0.196	0.209
Race			Asian or other	-0.154	0.432
White	-	-	Marital Status		
Black	0.411	0.001**	Married	-	-
Asian or other	-0.007	0.969	Single Male	0.088	0.487
Education			Single Female	0.201	0.091
Less the high school graduate	-	-	Household Income		
High school graduate	-0.037	0.705	Q1	0.054	0.764

Characteristic	Coefficient	P-value	Characteristic	Coefficient	P-value
Some college			Q2		
or associate's	0.111	0.244		0.105	0.471
Bachelor's			Q3		
degree	0.122	0.224		-	-
Post-graduate			Q4		
degree	0.101	0.337		-0.019	0.886
Region[a]			Q5	0.063	0.626
Northeast	0.001	0.986	Household Net Worth		
Midwest	-0.046	0.407	Q1/Q2	0.575	0.003**
South	-	-	Q3	-	-
West	0.345	0.001**	Q4	0.323	0.020
Marital Status			Q5	0.352	0.008**
Married	-	-	Homeownership Status		
Single Male	-0.039	0.698	Homeowner	0.210	0.243
Single			Housing Burdened[c]		
Female	-0.252	0.009**			
Children			Yes	0.259	0.029
Number of					
Children	-0.029	0.225			
Household Income					
Q1	-0.352	0.016*			
Q2	-0.076	0.514			
Q3	-	-			
Q4	0.169	0.095			
Q5	0.127	0.217			

Characteristic	Coefficient	P-value	Characteristic	Coefficient	P-value
Household Net Worth					
Q1/Q2	-1.239	0.001**			
Q3	-	-			
Q4	0.460	0.001**			
Q5	1.291	0.001**			
Homeownership Status					
Homeowner	0.498	0.001**			
Health Status[b]					
Good health	-0.002	0.974			
Housing Burdened[c]					
Yes	0.112	0.254			
Puesdo R^2					
Concordance Ratio					

Note. Calculations based on the SIPP, 2001 panel, waves 1-3 and topical module 3, and 2008 panel, waves 2-4 and topical module 4.

[a] Regions based on census regions.

[b] Determined based on self-reported health status. Health status rated good if indicated to be excellent, very good, or good. Health status rated poor if indicated to be fair or poor.

[c] Housing burdened is defined as spending more than 30% of gross income on primary residence's housing costs including rent, mortgage payment, and utilities.

*p<.02. **p<.01.

A combination of results indicate that, holding all else equal, those age 45 and older were significantly less likely to be invested in rental real estate, as compared to those age 25-34, in 2008 than in 2001. The bivariate and multivariate analyses of each of these individual time

periods provide evidence of the source of this shift. At the bivariate level, increased reported investment rates are illustrated for those age 25-34, with rates increasing from 2.09 percent in 2001 to 2.55 percent in 2008. Reported investment rates for those age 45-54 were found to have decreased from 5.65 percent to 5.52 percent, while the rates for those age 55-64 remained constant at 7.01 percent. These shifts combine to help explain the decreased relationship between age and rental real estate investment in 2008 for those age 45-54. However, investment rates for those age 65 and older actually increased from 5.11 percent in 2001 to 5.41 percent in 2008. This change would suggest that a decrease in the differences in investment behavior was driven largely by a relatively aggressive entry into the market by householders age 25-34.

Further guidance in determining the driving factor in the shift in these relationships is provided by the single period analyses. Odds-ratio point estimates in 2001, while not all statistically significant, all indicate an increased likelihood of investment behavior for those older than 35 as compared to those 25-34. The reverse is true in 2008, as all odds-ratio point estimates indicate a decreased likelihood of investment behavior for those older than 35 as compared to those 25-34. The culmination of this evidence suggests increased investment activity by those age 25-34 was the primary driving factor in the changing relationship between age and investment in rental real estate.

It important to note that a similar shift in the relationship between age and investment in rental real estate was revealed between 2004 and 2008. Given that much of the evidence was the same, it is unsurprising that similar conclusions were drawn regarding the driving factors of this shift. Given this backdrop, the lack of significant shifts in the relationship between age and rental real estate investment in 2001 and 2004 suggests that the majority of the shift in this relationship between 2001 and 2008 occurred in the latter half of the decade.

Changes were also noted in the relationship between Hispanics and investment in rental real estate. Holding all else equal, Hispanics were found to be significantly less likely to be invested in rental real estate, as compared to non-Hispanics, in 2008 than in 2001. At the bivariate level, decreased reported investment rates for Hispanics (3.39 percent to 2.83 percent) and increased reported investment rates for non-Hispanics (4.68 percent to 5.37 percent) were observed between 2001 and 2008. These variations in investment rates suggest that the shift in relationship between time periods were driven by both increased investment by non-Hispanics and decreased investment by Hispanics. It is important to note that similar results were detected in the analysis of the 2001 and 2004 time periods. Given this backdrop and the lack of a shift in the relationship between Hispanics and investment in rental real estate between the 2004 and 2008, it appears that the bulk of the shift in this relationship took place in the first half of the decade.

Two distinct changes in the relationship between household net worth and investment in rental real estate, holding all else equal, were noted between 2001 and 2008. First, households in the first and second quintiles, as compared to those in the third quintile, were significantly more likely to be invested in rental real estate in 2008 than in 2001. Bivariate descriptives indicate that investment rates for households in the first and second quintiles increased from .77 percent in 2001 to .95 percent in 2008. During this same time period, investment rates for households in the third quintile decreased from 3.24 percent to 2.53 percent. This evidence indicates that the shift in relationship was driven by both increased investment by households in the first and second quintiles and decreased investment by households in the third quintile in 2008. Given that a similar shift was also detected between 2004 and 2008, it is fairly safe to say that the majority of the shift in this relationship took place in the latter half of the time period.

Lastly, households with net worths in the fifth quintile, as compared to those in the third quintile, were significantly more likely to be invested in rental real estate in 2008 than in 2001. Bivariate descriptives indicate a fairly dramatic increase in the reported investment rates for households in the fifth quintile from 12.56 percent in 2001 to 14.86 percent in 2008, while investment rates for households in the third quintile decreased from 3.24 percent to 2.53 percent. This evidence suggests that the shift in relationship was driven by both increased investment by households in the fifth quintile and decreased investment by households in the third quintile. No similar shift was noted between 2001 and 2004 or 2004 and 2008, indicating that this shift was a function of gradual changes over the decade.

Table 13

Revealed Shifts in the Relationship between Characteristics and Investment in Rental Real Estate Investment: 2001-2004, 2004-2008, and 2001-2008

	Shifts		
Characteristic	2001-2004	2004-2008	2001-2008
Age	n/a	-	-
Ethnicity (Non-Hispanic)			
Hispanic	-	n/a	-
Race (White)			
Black	n/a	n/a	n/a
Education	n/a	n/a	n/a
Household type (Married)			
Male householder	+	-	n/a

	Shifts		
Characteristic	2001-2004	2004-2008	2001-2008
Female householder	n/a	n/a	n/a
Household income	n/a	n/a	
Household net worth	n/a	+	+
Homeownership status	n/a	n/a	n/a
Health status	n/a	n/a	n/a
Housing burdened status	n/a	n/a	n/a

Summary of Results

Overall, four different sets of analyses were utilized over the course of this research project. Consequently, an enormous amount of information was generated. In order to synthesize these results in an understandable manner, they are presented below as they pertain to each of the individual demographic and financial characteristics explored.

Race

Conflicting evidence was found regarding the relationship between race and investment in rental real estate. At the bivariate level, Whites consistently reported higher rates of investment than Blacks during 2001, 2004, and 2008. Furthermore, Whites were found to compromise between 86 and 89 percent of rental real estate investors in each time period, as compared to between 7 and 8 percent for Blacks. While these results tend to support a negative association between Blacks and investment in rental real estate, multivariate analysis provided conflicting evidence. Logistic regression results indicate that, holding all else equal, Black

investors were consistently more likely to be invested in rental real estate than White investors in all three time periods. No changes in the relationship between race investment behavior was noted between time periods. However, Blacks were consistently revealed to be more likely to be invested in rental real estate, holding all else equal, in all three of the intertemporal models.

Hispanic

Differing results were found regarding the relationship between Hispanics and investment in rental real estate. The bivariate profile indicated that Hispanics consistently reported lower levels of investment in rental real estate as compared to non-Hispanics. In contrast, results of the multivariate analysis of the 2001 time period indicated that Hispanics, holding all else equal, were more likely to be invested in rental real estate as compared to non-Hispanics. However, no significant relationship was found in either 2004 and 2008. Changes were noted in the relationship between Hispanics and investment in rental real estate. Holding all else equal, Hispanics were significantly less likely to be invested in rental real estate, as compared to non-Hispanics, in 2004 than in 2001. This result explained the shift between a significant positive relationship in 2001 and the lack of such a relationship in 2004. Furthermore, the shift in the relationship observed between 2001 and 2004 was found to carry through to 2008.

Age

Significant evidence is provided indicating a curvilinear relationship between age and investment in rental real estate. At the bivariate level, a pattern of increasing levels of reported investment behavior with increases in age is revealed through age 55-64 in all three time periods. However, reported investment rates for householders age 65 and older are consistently lower than householders age 55-64. The combination of these two patterns provides the first evidence of an upside down U relationship between age and investment in rental real estate. Additional

evidence of a curvilinear relationship is provided at the multivariate level. Holding all else equal, householders age 55-64, as compared to householders age 25-34, were significantly more likely to be invested in rental real estate in both 2001 and 2004. Furthermore, no significant differences in investment behavior between householders age 65 years and older and householders age 25-34 were noted in these time periods. The increased likelihood of investment through the middle ages combined with a lack of significant differences for elderly individuals provides significant evidence of an upside down U relationship between age and investment in rental real estate. It should be noted that no significant relationship, holding all else equal, was noted in 2008.

The analyses of changes in the relationship between demographic and financial characteristics and rental real estate between time periods provided evidence as to why no significant relationship was detected in 2008. The first analysis of changes in the relationship, isolating the 2001 and 2004 time periods, revealed no changes in the relationship between age and investment in rental real estate. However, changes were noted between 2004 and 2008. Holding all else equal, those age 45 and older, as compared to those age 25-34, were significantly less likely to be invested in rental real estate in 2008 than in 2004. The shift between 2004 and 2008 was found to be large enough for significant changes to be revealed between 2001 and 2008.

Income

Somewhat inconclusive results were found regarding the relationship between income and investment in rental real estate. At the bivariate level, reported rates of investment were found to increase with income in all three time periods. Additionally, the majority of investors in each time period were found to be in the fourth and fifth income quintiles, revealing investors in rental real estate to be a high income group. Further evidence of a positive relationship between

income and rental real estate investment was provided at the multivariate level in 2001 by a combination of two separate results. First, households in the first quintile were found to be significantly less likely to be invested in rental real estate as compared to those in the third quintile, holding all else equal. When combined with results indicating that households in the fourth quintile were significantly more likely to be invested in rental real estate, strong evidence of a positive relationship appears. However, no significant relationship was found to exist in 2004 or 2008. It is important to note that several results that would have supported a positive relationship between income and rental real estate investment were very close (p-values of less than .06) to gaining statistical significance. No changes in the relationship between income and investment in rental real estate was noted in the intertemporal analyses.

Net Worth

Evidence of a strong association between household net worth and investment in rental real estate was revealed across the decade of the 2000s. Bivariate profiles in 2001, 2004, and 2008 show increased reported investment rates for each successive net worth quintile. Furthermore, holding all else equal, households with higher net worths were consistently found to be more likely to be invested in rental real estate. The evidence of this relationship was strengthened by the utilization of the third net worth quintile as the reference group. This selection of reference group allowed a consistent decrease in likelihood of investment, holding all else equal, for lower quintiles while simultaneously revealing an increased likelihood of investment for higher quintiles.

However, changes is this relationship were noted over time. A shift in the first and second quintiles towards increased likelihood of investment in rental real estate, as compared to the third quintile, was revealed between both 2004 and 2008 as well as between 2001 and 2008.

Additionally, an increased likelihood of investment for households with net worths in the fifth quintile in 2008, as compared to those in the third quintile, was also revealed.

Education

Educational attainment level, holding all else equal, was not found to be a significant factor in the decision to be invested in rental real estate at any point in the decade. However, results of the bivariate profiles do provide useful information about rental real estate investors. In all three time periods, reported rates of investment increased with education. Furthermore, the majority of investors throughout the decade had either some college education or a bachelor's degree.

Marital Status

Bivariate descriptives offer insight into the relationship between marital status and investment in rental real estate. Overall, married householders consistently reported higher rates of investment than single householders and comprised the majority of investors. Among single householders, single males consistently reported higher rates of investment than single females. However, single females consistently represented a larger portion of overall investors in rental real estate due to their significantly larger population size.

Additional insight into the relationship between marital status and investment in rental real estate was provided at the multivariate level through the single time period analyses. Significant differences in the investment behavior of single householders, as compared to married householders, were noted. Holding all else equal, single female householders were significantly less likely to be invested in rental real estate in 2001. Additionally, single male householders were significantly more likely to be invested in rental real estate in 2004.

Shifts in the relationship between marital status and investment in rental real estate were noted over the course of the decade. A change in relationship was first noted between 2001 and 2004. Holding all else equal, single males, as compared to married householders, were significantly more likely to be invested in rental real estate in 2004 than in 2001. The evidence indicates the shift in relationship was driven by a relatively aggressive increase in investment behavior by single males in 2004. An opposite shift was noted between 2004 and 2008. Holding all else equal, single males, as compared to married couples, were significantly less likely to be invested in rental real estate in 2008 than in 2004. This evidence indicates that the shift in relationship was driven by both increased investment by married couples and decreased investment by single males in 2008. The net effect of these shifts appeared to cancel each other out, as no differences in the relationship between marital status and investment behavior were noted over the full time period of 2001 and 2008.

Homeownership Status

A combination of evidence supports a strong positive relationship between homeownership and investment in rental real estate. Reported investment rates for homeowners were consistently found to be five to six times those of non-homeowners throughout the decade, with homeowners representing over 90 percent of investors. Additional support for the existence of a positive relationship between homeownership and investment in rental real estate was provided at the multivariate level. Holding all else equal, homeowners were more likely to be invested in rental real estate as compared to non-homeowners in 2001, 2004, and 2008. However, no shifts in the relationship between homeownership status and investment in rental real estate were noted through the intertemporal analyses.

Health Status

Bivariate profiles indicate that the majority of investors were in good health and that the reported rates of investment were consistently higher for healthy householders. However, no significant relationship between health status, holding all else equal, and rental real estate was found in either 2001, 2004, or 2008. Furthermore, no shifts in the relationship between health status and investment in rental real estate were noted through the intertemporal analyses.

Housing Burdened Status

Differing results were uncovered at the bivariate and multivariate levels regarding the relationship between housing burdened status and investment in rental real estate. Bivariate profiles indicate that housing burdened households consistently reported lower levels of investment in rental real estate. However, analysis of the individual 2004 and 2008 time periods revealed that, holding all else equal, housing burdened households were significantly more likely to be invested in rental real estate as compared to unburdened households. No shifts in the relationship between housing burdened status and investment in rental real estate were noted through the intertemporal analyses.

CHAPTER 5

DISCUSSION

The purpose of this study was to examine household investment behavior in rental real estate over the 2000s, specifically by comparing and pooling cross-sectional data from 2001, 2004 and 2008. First, investor profiles were established using bivariate statistics. Next, relationships between household characteristics and direct investment in rental real estate were investigated using a series of logistic regression models estimated on the separate cross-sectional data sets. The possibility of effects of shifting economic conditions over the decade on household investment behavior was then investigated by pooling cross-sectional data sets. Lastly, once effects were detected, household characteristics associated with shifts in investor characteristics and behavior were identified.

This chapter provides a discussion of the results and implications generated by this study. First, results are analyzed and framed in terms of theory and previous literature, with an emphasis on highlighting implications to understanding household investment behavior, as they pertain to the three objectives listed above. The contributions to the overall body of literature are then discussed. Next, the strengths and limitations of the study are noted. Lastly, suggestions for future research are provided.

Investor Profiles

The first objective of this study was to provide an updated demographic and financial profile of rental real estate investors. This objective was motivated by the significant passage of

time since Savage (1998) and Bogdon and Ling (1998) created rental real estate investor profiles based on 1995 data. Bivariate descriptives indicate the majority of investors were non-Hispanic, White, married, childless, and age 45 or older. Furthermore, investors tended to either have some college or a bachelor's degree education. Financially, the majority of investors were homeowners, high net worth, high income, and not housing burdened on their primary home. These profiles were found to be consistent over time, as the same trends were revealed in 2001, 2004, and 2008. However, the number of households invested in rental real estate steadily increased from 4,392,000 to 5,138,000 over this time period. This ownership profile coincides with the limited profiles provided by Savage (1998) and Bogdon and Ling (1998), which indicated that the majority of owners were higher income, White, and non-Hispanic.

Additional insight was provided by the exploration of sub-population investment rates for demographic and financial characteristics. An overall trend towards increased investment in rental real estate was revealed; as reported, investment rates rose from 4.57% in 2001 to 5.08% in 2008. Demographic characteristics of householders associated with relatively higher levels of reported investment rates include Non-Hispanics, Whites, Asians, married individuals, and higher levels of educational attainment. Financial characteristics of households associated with relatively higher levels of reported investment rates were found to include high income, high net worth, homeowners, and households unburdened by the costs of their primary home. Furthermore, a curvilinear pattern between householder age and reported investment rates was exhibited in each time period. Higher levels of reported investment rates were associated with increases in age through the 55-64 cohort before decreasing for older cohorts. Overall, the pattern of reported levels of investment for each demographic and financial characteristic was found to be consistent across the decade.

Overall, this profile coincides with what would be expected based on the Life Cycle Hypothesis (LCH). LCH, at its core, provides insight into asset accumulation and deccumulation over the course of an individual's life cycle. Under this model, assets are expected to increase through the working years before decreasing after retirement. This pattern of asset accumulation and deccumulation indicates an upside down U shaped relationship between age and asset ownership. This pattern is revealed by this profile, as increased investment rates are reported through age 64, before decreasing afterwards. Unfortunately, the lack of a breakdown of the retirement age group prevents this trend, if present, to be revealed in greater detail post-retirement. Nonetheless, this trend in asset ownership provides support of the LCH.

Meanwhile, the profile provides mixed results when viewed through the lens of Modern Portfolio Theory (MPT). MPT indicates that a diversified portfolio would not be significantly over weighted in any category. In this case, investment in rental property represents a significant exposure to real estate as an asset class. On average, due to the relatively large portion of net worth their primary homes represent, homeowners have a tendency to be over weighted into real estate. Given the relatively higher reported investment rates of homeowners, there is a significant concern that homeowners may be overinvested in real estate in general as an asset class. However, this concern is mitigated by the correlation noted between net worth and investment in rental real estate. The percentage of an investment portfolio compromised by a household's primary home would be relatively lower for these high net worth households. Therefore, it is possible that investment in rental property is a mechanism by which high net households achieve proper allocation to real estate in general as an asset class. Furthermore, rental real estate, due to its income generating component, may behave differently as a sub asset class than non-rental

developed real estate, where exposure to the real estate market is the sole means of investment returns. Therefore, it may not be exactly duplicating the risks inherent with homeownership.

The Relationship between Demographic and Financial Characteristics

The second objective of this study was to determine the relationship between demographic and financial characteristics and investment in rental real estate. The results of these analyses revealed that several characteristics (race, net worth, and homeownership status) consistently influenced the investment decision. Additionally, several characteristics (Hispanic, age, income, marital status, and housing burdened status) were found to significantly influence the decisions to invest in rental real estate in at least one time period. The implications of the relationships of these characteristics are discussed below.

Race

Regression results indicate that, holding all else equal, Black householders were consistently more likely to be invested in rental real estate than Whites. The magnitude of this relationship was shown to be fairly large, as point estimates across the decade indicated that the odds of a Black householder being invested were between 37 and 46 percent higher than those of White householders. The results coincide with early studies noting a preference among Blacks for real estate (Ariel Mutual Funds/Charles Schwab & Company, 2004, 2008; Badu, Daniels, & Salandro, 1999; Blau & Graham,1990; Plath & Stevenson, 2000; Terrell, 1971), and appears to indicate that rental real estate investment is a particularly attractive investment alternative for Black households. Additional explanations for the revealed preference of Black households for rental real estate could be that they have a greater familiarity with real estate and the rental market leading to increased likelihood of investment (Huberman, 2001) and a predilection

towards consumptive oriented goods (Stevenson & Plath, 2002). This finding is intriguing, as it stands in contrast to numerous studies which find that Blacks demonstrate lower risky asset ownership rates, measured in the form of stock investment, than Whites (Hanna & Lindamood, 2008; Xiao, 1996; Wang & Hanna, 2007). One hypothesis for this gap in stock investment is a lack of familiarity with the stock market and financial institutions (Yao, Gutter, & Hanna, 2005). These issues are not as prevalent in the real estate transaction, perhaps reducing perceived barriers to investment for Black households.

Overall, these findings imply that a portion of the observed differences in risky asset investment behavior between Blacks and Whites may be a function of the investment asset utilized, most often stocks, rather than underlying differences between races. Previous literature, which has focused on risky asset investment through stock ownership rates, may be biased by the underlying characteristics of stocks. In other words, African-Americans may not be opposed to risky assets ownership, but rather have an aversion to investment in stocks due to their innate characteristics. While certainly exhibiting racial differences in investment behavior, it is possible past findings need to be looked from a different angle.

While these multivariate results are revealing, it must be noted that bivariate statistics tell a very different story. Whites consistently reported higher rates of investment in rental property than Blacks during 2001, 2004, and 2008. Furthermore, Whites were found to comprise between 86 and 89 percent of rental real estate investors in each time period, as compared to between 7 and 8 percent for Blacks. Therefore, even though it appears that Blacks demonstrate a predilection for investment in rental real estate, overall levels of investment remain relatively low.

Hispanic

No consistent relationship between Hispanics and investment in rental real estate was revealed. Results of the multivariate analysis of the 2001 time period indicated that Hispanics, holding all else equal, were more likely to be invested in rental real estate as compared to Non-Hispanics. This finding was unexpected, as much of the previous literature indicates Hispanics to be less likely to be invested in risky assets (Coleman, 2003; Hanna, Wang, & Yuh, 2010; Wang & Hanna, 2007). A basis for this result is found in Yao, Gutter, and Hanna (2005), which found that, while less likely to be willing to take some risk, Hispanics were more likely to be willing to take significant risks. However, no relationship between Hispanics and investment in rental real estate was evident in either 2004 or 2008, suggesting that any relationship that may have existed disappeared over the course of the decade. Furthermore, the bivariate profile of investors indicate that Hispanics consistently reported lower levels of investment in rental real estate as compared to Non-Hispanics.

Age

Significant evidence indicates a curvilinear relationship between age and investment in rental real estate in 2001 and 2004. Holding all else equal, householders age 45-64, as compared to householders age 25-34, were significantly more likely to be invested in rental real estate in 2001. Similarly, householders age 55-64, as compared to householders age 25-34, were significantly more likely to be invested in rental real estate in 2004. These results indicated an increased likelihood of ownership through the retirement years, before decreasing thereafter. This upside down U relationship between age and investment in rental real estate is similar to patterns observed in previous literature (Bertaut & Starr-McCluer, 2002; Gutter, Fox, &

Montalto, 1999; Plath & Stevenson, 2000; Wang & Hanna, 2007). Furthermore, this relationship is what would be expected based on the LCH, as previously described. However, no relationship between age and investment behavior in rental real estate is noted in 2008.

It is important to note that, due to the passage of time, many householders shifted age groups over the course of this study. This creates the possibility of an underlying cohort effect clouding the results received across time periods. This possibility is somewhat mitigated, as the shifts in the relationship between age and rental real estate were found to be driven by shifts in the investment behavior of those age 25-34, rather than a cohort moving through the age groups. However, it is quite possible that a cohort effect was introduced among those 25-34 in 2008. The shift towards an increased preference for real estate may be driven by a new cohort, rather than a change in the relationship between age and investment in rental real estate.

Income

No consistent results were found regarding the relationship between household income and investment in rental real estate. A combination of results provided evidence of a positive relationship between income and rental real estate investment in 2001. First, households in the first income quintile were found to be significantly less likely to be invested in rental real estate as compared to those in the third income quintile, holding all else equal. Second, households in the fourth income quintile were significantly more likely to be invested in rental real estate as compared with the households in the third income quintile. When combined, these results provided strong evidence of a positive relationship. The positive relationship is grounded in previous literature, which indicated increased risk tolerance and risky asset ownership for higher income individuals (Cohn, Lewellen, Lease, & Schlarbaum, 1975; Grable, 2000; Gutter, Fox, & Montalto, 1999; Sung & Hanna, 1996; Wang & Hanna, 2007). However, no significant

relationship was found to exist in 2004 or 2008. It is important to note that several results that would have supported a positive relationship between income and rental real estate investment were very close (p-values of less than .06) to gaining statistical significance. However, the lack of a significant relationship over these two time periods raises questions about the existence of a relationship, and at the very least suggests the magnitude of this relationship to be minimal.

Net Worth

Evidence of a strong association between household net worth and investment in rental real estate was revealed across the decade of the 2000s. Holding all else equal, higher net worth households were consistently found to be more likely to be invested in rental real estate. The evidence of this relationship was strengthened by the utilization of the third net worth quintile as the reference group. This selection of reference category allowed a consistent decrease in the likelihood of investment, holding all else equal, for lower quintiles to be exhibited, while simultaneously revealing an increased likelihood of investment for higher quintiles. The existence of a positive relationship between net worth and rental real estate investment is strongly supported by the literature, given the increased propensity to be invested in risky assets among higher net worth individuals (Coleman, 2003; Grable & Yoo, 2004; Gutter, Fox, & Montalto,1999; Jianakoplos & Bernasek, 1998; Sung & Hanna,1996). The net worth relationship also finds strong support in MPT, as higher net worth individuals will be more likely to need further exposure to the real estate market than just their primary homes. Therefore, the high net worth individuals will be much more likely to be led to investment in rental property.

Education

Educational attainment level, holding all else equal, was not found to be a significant factor in the decision to be invested in rental real estate at any point in the decade. However,

results of the bivariate profiles do provide useful information about rental real estate investors. In all three time periods, reported rates of investment increased with education as inferred by previous literature (Coleman, 2003; Gutter, Fox, & Montalto, 1999; Hanna, Wang, & Yuh, 2010; Plath & Stevenson, 2000; Sung & Hanna, 1996; Wang & Hanna, 2007). Furthermore, the majority of investors throughout the decade had either some college education or a bachelor's degree. This information provides insight into the profile of householders invested in rental real estate, as they are found to be a relatively more educated group.

Marital Status

No consistent relationship between marital status and investment in rental real estate was found. However, significant differences in the investment behavior of single householders, as compared to married householders, were noted in 2001 and 2004. Holding all else equal, single female householders were significantly less likely to be invested in rental real estate in 2001 when compared to married householders. Additionally, single male householder were significantly more likely to be invested in rental real estate in 2004 when compared to married households. The presence of increased risk taking behavior for single males and decreased risk taking behavior for females, as compared to married households, is supported by previous literature (Bajtelsmit, Bernasek, & Jiankoplos, 1999; Coleman, 2003; Embrey & Fox, 1997; Sung & Hanna,1998; Yao & Hanna, 2005). Nevertheless, these differences in investment behavior were not evident across the time period, raising questions about the strength of this relationship. However, these results do contribute to the general body of literature by indicating that males have a tendency to be more aggressive in their investment behavior, and that females are less aggressive.

Homeownership Status

A positive relationship between homeownership and investment in rental real estate was found throughout the decade of the 2000s. Holding all else equal, homeowners were more likely to be invested in rental real estate as compared to non-homeowners in 2001, 2004, and 2008. This propensity towards increased likelihood of investment in rental real estate is in keeping with previous literature indicating an increased propensity for homeowners to own risky assets (Hanna, Wang, & Yuh, 2010; Wang & Hanna, 2007). However, it does raise concerns about an overweighting in real estate when considering MPT, given that, on average, homes typically make up a significant portion of a households net worth.

Health Status

No significant relationship between health status, holding all else equal, and rental real estate was found over the decade of the 2000s. However, bivariate profiles indicated that the majority of investors were in good health. Furthermore, the reported rates of investment were consistently higher for healthy householders. These results provide information about investors as a whole, although the evidence does not indicate that health status is a significant factor in the investment decision.

Housing Burdened Status

Overall, logistic regression results indicated that housing burdened households, holding all else equal, are more likely to be invested in rental real estate. This relationship was found to be statistically significant in 2004 and 2008, and came very close to being significant in 2001. The basis for understanding this relationship may be found in the literature indicating speculative investing in primary homes leading up to this time period (Dean, 1945; Stone, 1975; Kemeny,

1981; Edel, Sclar, & Luria, 1984; Stone, 1993, Stone, 2009). It is possible that housing burdened individuals are revealing a preference for real estate as an investment beyond their primary home. When combined with results indicating homeowners are more likely to be invested in rental real estate, significant concerns about an overreliance on real estate as an investment strategy are created. This result implies that households, with exposure to real estate through homeownership, that are currently overextended on their primary residences are more likely to be further exposed to real estate through rental property. When considering MPT, a household's further expansion into real estate may indicate a lack of diversification in its overall portfolio. Furthermore, these results revealed a scenario with many households positioned for financial difficulties in the latter half of the decade due to an overreliance on real estate.

Shifts in Relationships Over Time

The third and final objective of this study, comprising research question three and four, was to explore the effects, if any, of the changing economic environment on the relationship between demographic and financial characteristics and investment in rental real estate. Three separate time periods were explored: 2001 to 2004, 2004 to 2008, and 2001 to 2008. This investigation was accomplished using a two step process. The first step involved a global test to determine if any differences in the relationship between demographic and financial characteristics were observed between time periods. When changes were noted, a follow up analysis was conducted to identify the characteristics that exhibited changes.

A combination of the LCH and MPT was utilized to provide a theoretical basis for this analysis. LCH indicates that households will attempt to maximize returns on their investment in order to maximize utility. In order to optimize returns given a level of risk, MPT indicates that

households will create a diversified investment portfolio. Furthermore, MPT indicates that short term trends in investment returns will not result in significant shifts in overall portfolio allocations. Therefore, theory was found to indicate that no significant changes in the relationship between demographic and financial characteristics and investment in rental real estate would be expected.

This theoretical basis was tested in the first step of the analysis process. Results of global tests, as recommended by Allison's method (1999), revealed that shifts in the relationship between demographic and financial characteristics and investment in rental real estate were evident in all three time periods. These results were contrary to what theory would suggest, indicating that consistent investment behavior was not exhibited between time periods. Furthermore, they imply that changes in the economic environment have an impact on investment behavior. While contrary to theory, these results do find a considerable basis in previous literature, indicating that short term investment trends are over weighted in investment decision making (Bondt & Thaler, 1987; Camerer, 1987; Grether, 1980; Yao, Hanna, & Lindamood, 2004).

Follow up analyses were conducted to reveal the individual characteristics that exhibited changes in relationship with investment in rental real estate between time periods. Results revealed these characteristics to include Hispanic and marital status from 2001 to 2004; age, marital status, and net worth from 2004 to 2008; and age, Hispanic, and net worth from 2001 to 2008. Care was taken in interpreting these results, as changes in the relationship between household characteristics and rental property investment can be driven by three factors: shifts in behavior of the specified group, shifts in the investment behavior of the reference category, or a combination of shifts in the investment behavior of both. Therefore, while a combination of

bivariate and multivariate analysis results were utilized to provide evidence as to the source of the relationship shift, it is important to note that no definitive analysis was conducted. Furthermore, it is important to note that changing economic conditions are only one of the factors that may have contributed to changes in investment behavior, and there are certainly other factors that led to these shifts.

The most interesting set of findings are those indicating dual shifts in investment behavior by single male householders, as compared to married householders, over the course of the decade. The first set of results indicated a shift towards the increased likelihood of investment for single males, as compared to married householders, between 2001 and 2004. Analysis of bivariate statistics suggests that single males were relatively aggressive in their entry into the rental real estate market between these time periods. Given that the 2001 to 2004 time period represents the boom in the real estate market, these results perhaps indicate an overreliance on short-term trends in investment decision making by single males. Further evidence is provided by results of the 2004 to 2008 analysis, which indicated a shift towards a decreased likelihood of investment in rental property for single males, as compared to married householders. Analysis of bivariate statistics suggests that this shift in relationship was driven by single males leaving the rental real estate market between these time periods, although the change in relationship was spurred on by increased reported investment rates for married householders. Given that this time period represents the real estate market decline, the evidence suggests that single male householders may have once again placed an overemphasis on short term investment trends in exiting the real estate market.

The combination of these results provides strong evidence that single males are sensitive to recency effects in their investment decisions. This conclusion is not altogether unexpected,

given that single males have consistently been found to be relatively aggressive investors (Bajtelsmit, Bernasek, & Jiankoplos, 1999; Coleman, 2003; Embrey & Fox, 1997; Sung & Hanna,1998; Yao & Hanna, 2005). However, it is important to note that these observed shifts largely negated each other, as no significant differences in the relationship between marital status and investment in rental real estate were noted between 2001 and 2008.

There are several possible implications for single males based off of these revealed shifts in rental real estate investment behavior. These implications center on the effect of the market downturn on single males' financial situations, who were revealed to be more likely to invest in rental real estate at the height of the market. As previously discussed, the effect of the ability to utilize leverage in the rental real estate is a significant benefit during up markets. However, the downside is that the losses experienced over the second part of the decade were hugely magnified. For example, assume two investors have $10,000 to invest. One chooses to invest in stocks, while the other chooses to use it as a down payment for a $100,000 rental property. In both cases, assume that market value drops by 40%. The investor in stocks experiences significant losses, but is left with $6,000. On the other hand, the investor in rental real estate not only lost their full $10,000 investment, but now owes approximately $30,000 more on a mortgage than their property is worth. This leads to several possible consequences for the investor, the most severe of which include a serious decrease in net worth or a serious negatiove impact to their credit score due to a foreclosure or short sale. While the stock investor is able to walk away relatively unscathed, the rental property investor will be carrying around the scars of their loss for several years to come.

The significant decrease in financial well-being for single males has several possible consequences. Given the strong relationship between financial stability and family formation

(Gibson-Davis, 2009; Schneider, 2011), it is likely that family formation will be delayed significantly for this sub-population. Additionally, many of these investors were likely entrepreneurs utilizing rental property to start a new business, given the predilection for males to be entrepreneurs (Diaz-Garcia & Jimenez-Moreno, 2010) and the characteristics of rental property investment. This experience will likely have a negative impact on the likelihood that these rental real estate investors will exhibit further entrepreneurial behavior (Amarel, Baptista, & Lina, 2011). Overall, this shock may decrease the likelihood of further risk-taking behavior in the future and serve to decrease the amount of entrepreneurial behavior exhibited nationwide among this sub-population.

Two distinct shifts in the relationship between household net worth and investment in rental real estate were observed between time periods. First, a shift among households in the first and second net worth quintiles towards increased likelihood of investment in rental real estate, as compared to the third quintile, was revealed between 2004 and 2008. A similar result was found between 2001 and 2008. Bivariate statistics indicated that reported investment rates for households in the first and second quintiles increased over both these time periods, while reported investment rates decreased for households in the third quintile. Despite the shift towards increased likelihood of investment, households in the first and second quintiles were still significantly less likely to be invested in rental real estate, as compared to households in the third quintile, in 2008. Overall, the shift in this relationship indicates that differences in investment behavior for lower net worth households became smaller over time. It is possible that this increased investment for low income households is a function of the relaxed lending standards evident through the decade (Carswell, 2009). The increased availability of credit could have served to mitigate the practical limitations felt by minimal net worth households when

attempting to invest in rental real estate. The timing of this shift creates concerns of low net worth households arriving in the rental real estate market just in time for the downturn, with limited resources to cover loan costs on homes with severely diminished values.

Meanwhile, households with net worths in the fifth quintile, as compared to those in the third quintile, were significantly more likely to be invested in rental real estate in 2008 than in 2001. Bivariate descriptives indicate a fairly dramatic increase in the reported investment rates for households in the fifth quintile from 12.56 percent in 2001 to 14.86 percent in 2008, while investment rates for households in the third quintile decreased from 3.24 percent to 2.53 percent. These results indicate a significant increase in the differences in investment behavior between high net worth households and relatively lower net worth households. When combined with the decreased differences noted between households in the first and second net worth quintiles and those in the third quintile, it appears that high net worth households may be operating as a sub-population. MPT indicates that this conclusion is to be expected, as increased asset levels and decreased relative value of a primary home would drive high net worth households to seek further exposure to the real estate market in order to maintain a diversified investment portfolio.

Shifts were also noted in the relationship between age and investment in rental real estate. In 2001, a significant relationship was noted, as a combination of results indicate those age 45-64 were more likely to be invested in rental real estate as compared to those age 25-34. The first analysis of changes in the relationship, isolating the 2001 and 2004 time periods, revealed no changes in the relationship between age and investment in rental real estate. However, changes were noted between 2004 and 2008, and proved large enough to create an overall shift between 2001 and 2008. Holding all else equal, those age 45 and older, as compared to those age 25-34, were significantly less likely to be invested in rental real estate in 2008 than in 2004 and 2001.

Given that the coefficient point estimates in the individual 2001 and 2004 year model were all positive, this negative shift would appear to indicate a reduction in the relationship between age and investment in rental real estate over the course of the decade. This shift was manifested in the 2008 individual year model, as no significant relationship between age and investment in rental real estate was noted. Furthermore, the presence of similar shifts in relationship for three separate age groups implies the shift in the relationship between age and rental real estate was driven by increased investment by the reference category, those age 25-34. Given that the majority of this shift was found to take place between 2004 and 2008, it would appear that this age group was attracted to investment in rental real estate during the downturn in the market. No clear reason for this behavior is apparent, requiring further investigation to verify its existence and to understand its motivations. However, it is possible that a cohort effect was introduced among those 25-34 in 2008. The shift towards an increased preference for real estate among this group may be driven by the emergence of a new cohort that grew up during the boom of the real estate market, possibly gaining a preference for real estate as an investment. Therefore, the shift in age may be resultant of a cohort effect rather than a change in the relationship between age and investment in rental real estate.

Lastly, changes were noted in the relationship between Hispanics and investment in rental real estate between time periods. Holding all else equal, Hispanics were significantly less likely to be invested in rental real estate, as compared to non-Hispanics, in 2004 than in 2001. This shift was evidenced in the single year models, as no relationship between Hispanics and investment in rental real estate was noted in 2004 after Hispanics were found to be significantly more likely to be invested in rental real estate in 2001. Furthermore, the shift in the relationship observed between 2001 and 2004 was evident in the 2001 to 2008 analysis. Given the lack of a

shift in the relationship between Hispanics and investment in rental real estate between the 2004 and 2008 time period, it appears that the majority of the shift in this relationship took place in the first half of the decade. Analysis of bivariate statistics suggests that the shift in relationship between time periods was driven by both increased investment by non-Hispanics and decreased investment by Hispanics. Given that the majority of the shift took place during the boom market between 2001 and 2004, it would appear that non-Hispanics may have been drawn to rental real estate by short term investment trends in the real estate market.

Contributions to the Literature

This study contributes to the literature in several ways. Foremost, it represents the first research into investment behavior in rental real estate since 1998. Given that rental real estate is a viable investment alternative and, when purchased, typically represents a significant portion of an overall investment portfolio, it is important for both the academic and practitioner community to have a better understanding of investment behavior. Second, it is the first work to conduct multivariate analyses exploring the relationship between demographic and financial characteristics and investment in rental real estate. This rigorous treatment of the subject makes this study the most thorough analysis of rental real estate behavior within the literature. Third, it provides insight into the effect of changing economic conditions on investment behavior and provides evidence of recency effects influencing investment in rental real estate for some subpopulations. This work will contribute to the growing body of literature in the field of behavioral economics, as academics seek to understand patterns of behavior exhibited by consumers.

Limitations and Strengths

This study sought to determine the relationship between demographic and financial characteristics and investment in rental real estate throughout the decade of the 2000s. Furthermore, it attempted to determine if there were changes in these relationships due to changes in economic conditions over time. However, many challenges were faced in conducting these analyses, leading to several limitations. The following limitations were noted during the course of this study.

The most significant limitation of this study was driven by the possibility of omitted variable bias. Given that the previous literature addressing investment in rental real estate is sparse, the selection of variables was driven by parallel research into stock market investment and risk tolerance levels. While this provided a strong basis of core variables from which to work, there is a significant possibility that other factors not included in this analysis influenced the investment decision. Two of these factors, risk tolerance and prior exposure to real estate, were identified but could not be included in the analyses due to data limitations. Risk tolerance was clearly identified in the literature as informing investment decisions. However, no measure of risk tolerance was available in the SIPP, making its direct incorporation impossible. Therefore, an attempt was made to incorporate risk tolerance by utilizing previous literature to establish patterns of risk tolerance as related to demographic and financial characteristics explored in this study, but the inclusion of a direct measure of risk tolerance would have been ideal. It would have also been preferable to include a measure for exposure to real estate, given a predilection for people to invest in what they know (Huberman, 2001). Both job and industry information was present in the data set, which initially allowed for the identification of individuals working in fields related to real estate. However, the sample size for this sub-

population proved to be too small to allow inclusion in the overall analysis. In addition to these two factors, it is both possible and likely that there are other factors that may have led to an omitted variable bias.

Another issue faced in this study is the presence of left censoring. Left censoring occurs when a respondent has already been exposed to or taken part in an event prior to observation. While information as to whether respondents were invested in rental real estate was contained in the SIPP, no insight was provided as to when this investment took place. Therefore, it is possible that respondents purchased rental properties in past years, when demographic and financial characteristics were very different from those observed today. Therefore, while this study is successful in ascertaining relationships with *being invested* in rental real estate, it is limited in its ability to explain the *decision to invest* in a given time period.

Data limitations also led to the selection of time periods for the analysis that were less than ideal. Shiller (2008) indicated that the real estate market reached its peak in 2006, before depreciating through the rest of the decade. Therefore, the ideal time periods to compare the effect of the market upswing and downswing would have been 2001, 2006, and 2010. However, data were not available for either 2006 or 2010, with 2004 and 2008 data being the best alternative. Unfortunately, these time periods do not allow for the full extent of either the market upswing or downswing to be evident. Additionally, it is possible that there were significant effects of data attrition on the results' validity due to the loss of respondents over time. A requirement of this research was that householders continued to participate in the SIPP for a full year. In an attempt to minimize the effects of attrition, data were utilized from the first year of each of the panels selected.

Lastly, the inability to include complex sampling design information into the intertemporal analyses created the possibility of an increased likelihood of Type I errors. Several different attempts to replicate the effects of its inclusion, including the use of robust standard errors, failed to provide adequate results. Therefore, the practice of raising confidence requirements to the 98 percent level was employed. Despite these precautions, it is possible that the likelihood of Type I errors was greater than the traditionally acceptable level of 5 percent.

Strengths of this Research

Despite the limitations faced over the course of this research, there are several strengths that enhance its overall validity. First, this research provides a much needed update to the profile of investors in rental real estate. Second, it is the first research that provides a multivariate analysis of household investment behavior as related to rental real estate. Third, it utilizes a nationally representative data set which allows results to be generalized to the U.S. population as a whole. Furthermore, the SIPP is the only nationally representative data set containing information on direct investment into real estate, making its results valuable. Fourth, the selection of variables of interests was driven by a thorough literature review of research into household investment behavior. Lastly, a strong theoretical framework was utilized to ground the research, and theory was incorporated in making implications from results throughout.

Suggestions for Future Research

Over the course of this study, several areas for future research were identified. The motivation for further exploration of these areas is either driven by the results of this study or by the identification of a gap in the current literature. Suggestions for future research are as follows. No academic literature investigating the financial outcomes associated with rental real estate

ownership was found. However, data were located in the SIPP that would allow a researcher to identify both the financial characteristics of the rental property and the income and expenses associated with its operation. Furthermore, the longitudinal nature of the SIPP would allow, with limitations, a researcher to follow property over a several year time period. An understanding of the financial outcomes associated with investment in rental real estate would prove useful to both academics and practitioners in advising their clients. Furthermore, a combination of this data and overall asset information, as contained in the SIPP, would provide for a much more specific analysis of the role rental property plays in investors overall asset allocation. Given this information, MPT could be used to determine if the concerns about overinvestment into real estate raised in this study were valid.

Further exploration into the differences in investment behavior between races is also needed. An analysis similar to Gutter, Fox, and Montalto (1999), which sought to determine if the observed racial differences in investment behavior in stocks were driven by socioeconomic factors rather than race, would provide for a better understanding of the driving factors of the observed differences in investment behavior. These differences are especially important to understand, given that the relationship found between race and investment behavior were the opposite of that observed in the literature for stock market investment.

Lastly, it is suggested that an analysis similar to the one employed in this research be conducted using data from a later date. Due to data limitations, the latest time period used for analysis was 2008. However, the downturn in the real estate market has continued into 2012. Furthermore, there is evidence that there have been increases in real estate investment activities in recent years (Anderson, 2010; Passy, 2011), possibly driven by the availability of relatively inexpensive foreclosed homes (Immergluck, 2012). An exploration of investment behavior in

rental real estate at a later time period, preferably 2010 or later, would allow the full effects of the decline on investment behavior to be revealed.

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APPENDIX A

Sample Characteristics: 2001 Panel

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
Total Households	24,068	100.00%	96,110	100.00%	-
Age of Householder					
Age 25-34	4,459	18.53%	18,040	18.77%	0.311
Age 35-44	5,835	24.24%	23,250	24.19%	0.306
Age 45-54	5,148	21.39%	20,530	21.36%	0.297
Age 55-64	3,400	14.13%	13,820	14.38%	0.235
Age 65 plus	5,226	21.71%	20,480	21.31%	0.369
Hispanic					
Hispanic	2,160	8.97%	8,670	9.02%	0.216
Not Hispanic	21,908	91.03%	87,440	90.98%	0.216
Race					
White	19,974	82.99%	81,000	84.28%	0.306
Black	3,091	12.84%	11,040	11.49%	0.233
Asian	750	3.12%	3,140	3.27%	0.128
Other	253	1.05%	930	0.97%	0.137
Education					

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
Less the high school graduate	3,968	16.49%	14,820	15.42%	0.256
High school graduate	6,967	28.95%	27,500	28.61%	0.331
Some college or associates	6,919	28.75%	27,900	29.03%	0.312
Bachelors degree	3,930	16.33%	16,380	17.04%	0.259
Post-graduate degree	2,284	9.49%	9,510	9.89%	0.201
Region[a]					
Northeast	4,543	18.88%	18,870	19.63%	0.253
Midwest	5,799	24.09%	22,590	23.50%	0.325
South	8,824	36.66%	34,510	35.91%	0.325
West	4,902	20.37%	20,140	20.96%	0.343
Marital Status					
Married	12,933	53.74%	51,870	53.97%	0.383
Single Male	4,059	16.86%	16,590	17.26%	0.260
Single Female	7,076	29.40%	27,660	28.78%	0.315
Children					
0	15,261	63.41%	62,250	64.77%	0.361

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
1	3,504	14.56%	13,700	14.25%	0.234
2	3,348	13.91%	12,790	13.31%	0.222
3 or more	1,955	8.12%	7,370	7.67%	0.188
Household Income					
Q1	5,053	20.99%	19,220	20.00%	0.286
Q2	4,848	20.14%	19,230	20.01%	0.312
Q3	4,767	19.81%	19,220	20.00%	0.249
Q4	4,728	19.64%	19,220	20.00%	0.264
Q5	4,672	19.41%	19,220	20.00%	0.311
Household Net Worth					
Q1	5,012	20.82%	19,220	20.00%	0.252
Q2	4,964	20.62%	19,220	20.00%	0.281
Q3	4,831	20.07%	19,220	20.00%	0.282
Q4	4,683	19.46%	19,220	20.00%	0.250
Q5	4,578	19.02%	19,220	20.00%	0.297
Homeownership Status					
Homeowner	16,949	70.42%	68,760	71.54%	0.295
Non-homeowner	7,119	29.58%	27,350	28.46%	0.295
Health Status[b]					

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
Good health	19,598	81.43%	79,020	82.22%	0.251
Poor health	4,470	18.57%	17,090	17.78%	0.251
Housing Burdened[c]					
Yes	5,962	24.77%	23,530	24.48%	0.300
No	18,106	75.23%	72,590	75.53%	0.300

Note. Calculations based on the SIPP, 2001 panel, waves 1 -3 and topical module 3.

[a] Regions based on census regions.

[b] Determined based on self reported health status. Health status rated good if indicated to be excellent, very good, or good. Health status rated poor if indicated to be fair or poor.

[C] Housing burdened is defined as spending more than 30% of gross income on primary residence's housing costs including rent, mortgage payment, and utilities.

APPENDIX B

Sample Characteristics: 2004 Panel

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
Total Households	34,756	100.00%	100,620	100.00%	-
Age of Householder					
Age 25-34	5,964	17.16%	18,330	18.22%	0.264
Age 35-44	7,901	22.73%	23,130	22.99%	0.272
Age 45-54	7,703	22.16%	22,450	22.31%	0.224
Age 55-64	5,626	16.19%	15,980	15.88%	0.218
Age 65 plus	7,562	21.76%	20,730	20.60%	0.237
Hispanic					
Hispanic	2,447	7.04%	10,280	10.22%	0.274
Not Hispanic	32,309	92.96%	90,340	89.78%	0.274
Race					
White	28,308	81.45%	82,620	82.11%	0.308
Black	4,356	12.53%	12,130	12.06%	0.266
Asian	917	2.64%	2,930	2.91%	0.099
Other	1,175	3.38%	2,940	2.92%	0.142
Education					

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
Less the high school graduate	3,731	10.73%	10,220	10.16%	0.218
High school graduate	9,498	27.33%	26,930	26.76%	0.377
Some college or associates	12,387	35.64%	35,720	35.50%	0.323
Bachelors degree	5,786	16.65%	17,540	17.43%	0.259
Post-graduate degree	3,354	9.65%	10,210	10.15%	0.221
Region[a]					
Northeast	5,683	16.35%	19,260	19.14%	0.280
Midwest	9,091	26.16%	23,080	22.94%	0.255
South	12,922	37.18%	36,050	35.83%	0.247
West	7,050	20.28%	22,230	22.09%	0.275
Marital Status					
Married	18,300	52.65%	53,740	53.41%	0.314
Single Male	5,907	17.00%	18,100	17.99%	0.253
Single Female	10,549	30.35%	28,780	28.60%	0.277
Children					
0	22,429	64.53%	65,100	64.70%	0.311

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
1	5,028	14.47%	14,750	14.66%	0.199
2	4,564	13.13%	13,030	12.95%	0.232
3 or more	2,735	7.87%	7,740	7.69%	0.156
Household Income					
Q1	7,506	21.60%	20,130	20.01%	0.278
Q2	7,075	20.36%	20,120	20.00%	0.271
Q3	6,923	19.92%	20,120	20.00%	0.251
Q4	6,708	19.30%	20,130	20.01%	0.277
Q5	6,544	18.83%	20,120	20.00%	0.275
Household Net Worth					
Q1	7,048	20.28%	20,130	20.01%	0.253
Q2	7,086	20.39%	20,120	20.00%	0.276
Q3	7,089	20.40%	20,120	20.00%	0.245
Q4	6,915	19.90%	20,120	20.00%	0.237
Q5	6,618	19.04%	20,120	20.00%	0.239
Homeownership Status					
Homeowner	24,876	71.57%	71,250	70.81%	0.291
Non-homeowner	9,880	28.43%	29,370	29.19%	0.291
Health Status[b]					

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
Good health	28,320	81.48%	83,310	82.80%	0.255
Poor health	6,436	18.52%	17,310	17.20%	0.255
Housing Burdened[c]					
Yes	9,004	25.91%	26,700	26.54%	0.277
No	25,752	74.09%	73,920	73.46%	0.277

Note. Calculations based on the SIPP, 2004 panel, waves 1 -3 and topical module 3.

[a] Regions based on census regions.

[b] Determined based on self reported health status. Health status rated good if indicated to be excellent, very good, or good. Health status rated poor if indicated to be fair or poor.

[C] Housing burdened is defined as spending more than 30% of gross income on primary residence's housing costs including rent, mortgage payment, and utilities.

APPENDIX C

Sample Characteristics: 2008 Panel

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
Total Households	31,075	100.00%	101,150	100.00%	-
Age of Householder					
Age 25-34	4,558	14.67%	16,610	16.42%	0.268
Age 35-44	5,963	19.19%	20,610	20.38%	0.246
Age 45-54	7,093	22.83%	23,330	23.06%	0.238
Age 55-64	6,014	19.35%	18,480	18.27%	0.241
Age 65 plus	7,447	23.96%	22,110	21.86%	0.264
Hispanic					
Hispanic	2,703	8.70%	11,420	11.29%	0.288
Not Hispanic	28,372	91.30%	89,730	88.71%	0.288
Race					
White	25,352	81.58%	82,930	81.99%	0.312
Black	3,706	11.93%	12,130	11.99%	0.294
Asian	1,009	3.25%	3,160	3.12%	0.106
Other	1,008	3.24%	2,940	2.91%	0.149
Education					

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
Less the high school graduate	2,670	8.59%	8,200	8.11%	0.235
High school graduate	8,549	27.51%	26,780	26.48%	0.324
Some college or associates	10,692	34.41%	34,920	34.52%	0.333
Bachelors degree	5,734	18.45%	19,580	19.36%	0.255
Post-graduate degree	3,430	11.04%	11,670	11.54%	0.239
Region[a]					
Northeast	5,643	18.16%	18,710	18.50%	0.214
Midwest	7,740	24.91%	23,080	22.82%	0.292
South	11,307	36.39%	37,150	36.73%	0.344
West	6,385	20.55%	22,210	21.96%	0.298
Marital Status					
Married	16,304	52.47%	52,890	52.29%	0.357
Single Male	5,381	17.32%	19,120	18.90%	0.271
Single Female	9,390	30.22%	29,130	28.80%	0.295
Children					
0	20,845	67.08%	67,180	66.42%	0.303

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
1	4,214	13.56%	14,140	13.98%	0.232
2	3,744	12.05%	12,270	12.13%	0.205
3 or more	2,272	7.31%	7,560	7.47%	0.164
Household Income					
Q1	6,539	21.04%	20,230	20.00%	0.294
Q2	6,293	20.25%	20,230	20.00%	0.258
Q3	6,144	19.77%	20,230	20.00%	0.252
Q4	6,027	19.40%	20,230	20.00%	0.255
Q5	6,072	19.54%	20,230	20.00%	0.281
Household Net Worth					
Q1	6,052	19.48%	20,250	20.02%	0.279
Q2	6,117	19.68%	20,220	19.99%	0.273
Q3	6,268	20.17%	20,270	20.04%	0.258
Q4	6,315	20.32%	20,180	19.95%	0.297
Q5	6,323	20.35%	20,230	20.00%	0.293
Homeownership Status					
Homeowner	22,255	71.62%	71,270	70.46%	0.324
Non-homeowner	8,820	28.38%	29,880	29.54%	0.324
Health Status[b]					

Characteristic	n	Percent	Weighted n (1000s)	Percent	Std. Err. Of Percent
Good health	25,737	82.82%	84,990	84.02%	0.246
Poor health	5,338	17.18%	16,160	15.98%	0.246
Housing Burdened[c]					
Yes	9,266	29.82%	31,100	30.75%	0.371
No	21,809	70.18%	70,050	69.25%	0.371

Note. Calculations based on the SIPP, 2008 panel, waves 2-4 and topical module 4.

[a] Regions based on census regions.

[b] Determined based on self reported health status. Health status rated good if indicated to be excellent, very good, or good. Health status rated poor if indicated to be fair or poor.

[C] Housing burdened is defined as spending more than 30% of gross income on primary residence's housing costs including rent, mortgage payment, and utilities.